

## Pressure Measurement

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You can download all instructions, catalogs and certificates for SITRANS P free of charge at the following Internet address: [www.siemens.com/sitransp](http://www.siemens.com/sitransp)







### Overview




	Application	Description		Software for parameterization
<b>SITRANS P Single-range transmitters for general applications</b>				
	Two or three-wire transmitters for measuring gauge and absolute pressure	<p><b>SITRANS P200</b></p> <ul style="list-style-type: none"> <li>• Single-range transmitters for gauge and absolute pressure</li> <li>• Ceramic measuring cell</li> <li>• For general applications</li> </ul> <p><b>SITRANS P210</b></p> <ul style="list-style-type: none"> <li>• Single-range transmitters for gauge pressure</li> <li>• Stainless steel measuring cell</li> <li>• For low-pressure applications</li> </ul> <p><b>SITRANS P220</b></p> <ul style="list-style-type: none"> <li>• Single-range transmitters for gauge pressure</li> <li>• Stainless steel measuring cell, fully welded</li> <li>• For high-pressure applications and refrigeration technology</li> </ul>	1/6 1/12 1/17	– – –
	Two-wire transmitter for measuring hydrostatic levels	<p><b>SITRANS LH100</b></p> <ul style="list-style-type: none"> <li>• For measuring liquid levels in wells, tanks, channels, dams etc.</li> <li>• With ceramic diaphragm, Ø 23.4 mm</li> </ul>	1/23	–
	Two-wire transmitter for measuring hydrostatic levels	<p><b>SITRANS LH300</b></p> <ul style="list-style-type: none"> <li>• For measuring liquid levels in wells, tanks, channels, dams etc.</li> <li>• With ceramic diaphragm, Ø 30 mm</li> <li>• Suitable for small measuring ranges</li> </ul>	1/28	–
 	Transmitters for gauge and absolute pressure for food, pharmaceuticals and biotechnology	<p><b>SITRANS P Compact</b></p> <ul style="list-style-type: none"> <li>• Single-range transmitters in two-wire system</li> <li>• Hygiene-based design with various aseptic connections according to EHEDG, FDA and GMP recommendations.</li> </ul>	1/34	–
<b>SITRANS P · Transmitters for food, pharmaceuticals and biotechnology</b>				
 	Two-wire transmitters for measuring gauge and absolute pressure	<p><b>SITRANS P300</b></p> <ul style="list-style-type: none"> <li>• Hygiene-based design according to EHEDG, 3A, FDA and GMP</li> <li>• Parameterization using 3 buttons and communication over HART, PROFIBUS PA or FOUNDATION Fieldbus</li> <li>• Standard process connection G1/2", 1/2-NPT and front-flush process connections available</li> <li>• Measuring range adjustment 100 : 1</li> </ul>	1/43	SIMATIC PDM
		<p>Factory-mounting of valve manifolds on SITRANS P300 transmitters</p> <ul style="list-style-type: none"> <li>• Simplified assembly</li> <li>• With pressure test</li> <li>• Stainless steel valve manifolds</li> </ul>	1/66	–
<b>SITRANS P · Transmitters for gauge pressure for the paper industry</b>				
	Two-wire transmitters for measuring gauge pressure	<p><b>SITRANS P300 and SITRANS P DS III with PMC connection for the paper industry</b></p> <ul style="list-style-type: none"> <li>• Measuring range adjustment 100 : 1</li> <li>• Process connections for the paper industry</li> <li>• Parameterization using 3 buttons and HART, PROFIBUS PA or FOUNDATION Fieldbus</li> </ul>	1/68	SIMATIC PDM

# Pressure Measurement

## Product overview

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	Application	Description		Software for parameterization
<b>SITRANS P Transmitters for applications with advanced requirements (Advanced)</b>				
	Two-wire transmitters for measuring: <ul style="list-style-type: none"> <li>• Gauge pressure,</li> <li>• Absolute pressure,</li> <li>• Differential pressure and</li> <li>• Flow or</li> <li>• Level</li> </ul>	<b>SITRANS P320/P420</b> <ul style="list-style-type: none"> <li>• Measuring accuracy:               <ul style="list-style-type: none"> <li>- SITRANS P320: 0.065 %</li> <li>- SITRANS P420 0.04 %</li> </ul> </li> <li>• Fast step response time of up to 105 ms</li> <li>• Developed according to IEC 61508, SIL2/3 applications</li> <li>• SIL validation remotely</li> <li>• Diagnostics according to Namur NE107</li> <li>• 4-key operation</li> </ul>	1/86	SIMATIC PDM
	Two-wire transmitters for measuring: <ul style="list-style-type: none"> <li>• Gauge pressure,</li> <li>• Absolute pressure,</li> <li>• Differential pressure and</li> <li>• Flow or</li> <li>• Level</li> </ul>	<b>SITRANS P DS III</b> <ul style="list-style-type: none"> <li>• Measuring accuracy up to 0.065 %</li> <li>• Measuring range adjustment: 100 : 1</li> <li>• Parameterization using:               <ul style="list-style-type: none"> <li>- 3 buttons and HART for SITRANS P DS III HART</li> <li>- 3 buttons and PROFIBUS PA for SITRANS P DS III PA series</li> <li>- 3 buttons and FOUNDATION Fieldbus for SITRANS P DS III FF series</li> </ul> </li> <li>• Available ex stock</li> </ul>	1/166	SIMATIC PDM
		Factory mounting of valve manifolds on gauge, absolute or differential pressure transmitters SITRANS P DS III <ul style="list-style-type: none"> <li>• Simplified assembly</li> <li>• With pressure test</li> <li>• Stainless steel valve manifolds</li> </ul>	1/253	-
	Two-wire transmitters for measuring: <ul style="list-style-type: none"> <li>• Gauge pressure,</li> <li>• Differential pressure and</li> <li>• Flow</li> </ul>	<b>SITRANS P410</b> <ul style="list-style-type: none"> <li>• Measuring accuracy up to 0.04 %</li> <li>• Measuring range adjustment 100 : 1</li> <li>• Parameterization using:               <ul style="list-style-type: none"> <li>- 3 buttons and HART for SITRANS P410 HART</li> <li>- 3 buttons and PROFIBUS PA for SITRANS P410 PA</li> <li>- 3 buttons and FOUNDATION Fieldbus for SITRANS P410 FF</li> </ul> </li> </ul>	1/257	SIMATIC PDM
		Factory mounting of valve manifolds on gauge, absolute or differential pressure transmitters SITRANS P410 <ul style="list-style-type: none"> <li>• Factory valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/253).</li> </ul>		-
<b>SITRANS P - Transmitters for applications with highest requirements (Premium)</b>				
	Two-wire transmitters for measuring: <ul style="list-style-type: none"> <li>• Differential pressure</li> <li>• Volume flow</li> <li>• Mass flow</li> <li>• Level</li> <li>• Volume</li> <li>• Mass</li> </ul>	<b>SITRANS P500</b> <ul style="list-style-type: none"> <li>• Measuring accuracy up to 0.03 %</li> <li>• Measuring range adjustment: 200 : 1</li> <li>• High measuring accuracy</li> <li>• Very fast response time</li> <li>• Extremely good long-term stability</li> <li>• Parameterization using 3 buttons or HART</li> </ul>	1/297	SIMATIC PDM
		Factory-mounting of manifolds on differential pressure transmitters SITRANS P500 <ul style="list-style-type: none"> <li>• Simplified assembly</li> <li>• With pressure test</li> <li>• Stainless steel valve manifolds</li> </ul>	1/321	-

Application	Description	Software for parameterization
<b>Remote seals for transmitters SITRANS P</b>		
	Remote seals for measuring viscous, corrosive or fibrous media (as well as media at extreme temperatures)	Remote seals for SITRANS P320/420 Remote seals for SITRANS P300, P DS III, P410, P500 <ul style="list-style-type: none"> <li>• Remote seals in sandwich and flange designs</li> <li>• Quick-release remote seals for the food industry</li> <li>• Wide range of diaphragm materials and fill fluid available</li> </ul>
<b>Fittings</b>		
	Shutting off the lines for the medium and differential pressure Mounting of transmitter on valve manifold or shut-off fitting	Shut-off fittings and valve manifolds available in steel, brass or stainless steel Valve manifolds available for the various process connections of the SITRANS P transmitters
	As accessory for fittings are available:	<ul style="list-style-type: none"> <li>• Oval flange 1/503</li> <li>• Adapters 1/504</li> <li>• Connection glands 1/505</li> <li>• Connection parts G<math>\frac{1}{2}</math> 1/506</li> <li>• Water traps 1/507</li> <li>• Sealing rings to EN 837-1 1/507</li> <li>• Pressure surge reducers 1/508</li> <li>• Primary shut-off valves 1/509</li> <li>• Compensation vessels 1/511</li> <li>• Connection parts 1/512</li> </ul>

### Supplied product documentation on DVD and safety instructions



The scope of delivery of the Siemens products for process instrumentation includes a multilingual instruction sheet with **safety instructions** as well as a uniform **mini DVD – Process Instrumentation and Weighing Systems**.

This DVD contains the most important manuals and certificates for the Siemens process instrumentation and weighing technology portfolio. The delivery may also contain product-specific or order-specific printed materials.

For additional information, refer to the Annex on page 10/3.

## Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

### SITRANS P200 for gauge and absolute pressure

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#### Overview



The SITRANS P200 pressure transmitter measures the gauge and absolute pressure of liquids, gases and vapors.

- Ceramic measuring cell
- Gauge and absolute measuring ranges 1 to 60 bar (15 to 1000 psi)
- For general applications

#### Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

#### Application

The SITRANS P200 pressure transmitter for gauge and absolute pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

#### Design

##### **Device structure without explosion protection**

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a device plug M12 (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

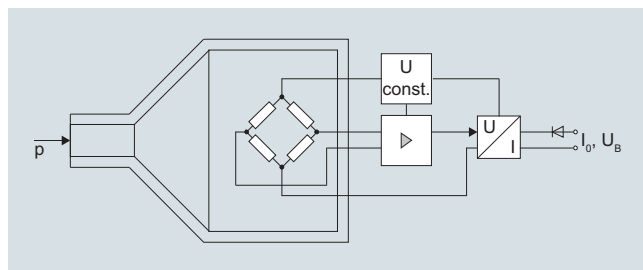
##### **Device structure with explosion protection**

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a device plug M12 (IP67) connected electrically. The output signal is between 4 and 20 mA.

#### Function

The pressure transmitter measures the gauge and absolute pressure of liquids and gases as well as the level of liquids.

##### **Mode of operation**



SITRANS P200 pressure transmitters (7MF1565-...), functional diagram

The ceramic measuring cell has a thick-film resistance bridge to which the operating pressure  $p$  is transmitted through a ceramic diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

## Technical specifications

<b>Application</b>		Electromagnetic compatibility	
Gauge and absolute pressure measurement	Liquids, gases and vapors		<ul style="list-style-type: none"> <li>• acc. IEC 61326-1/-2/-3</li> <li>• acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation <math>\leq 1\%</math></li> </ul>
<b>Mode of operation</b>		<b>Design</b>	
Measuring principle	Piezo-resistive measuring cell (ceramic diaphragm)	Weight	Approx. 0.090 kg (0.198 lb)
Measured variable	Gauge and absolute pressure	Process connections	See dimension drawings
<b>Inputs</b>		Electrical connections	<ul style="list-style-type: none"> <li>• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11</li> <li>• Device plug M12</li> <li>• 2 or 3-wire (0.5 mm<sup>2</sup>) cable (<math>\varnothing \pm 5.4</math> mm)</li> <li>• Quickon cable quick screw connection</li> </ul>
Measuring range		Wetted parts materials	
<ul style="list-style-type: none"> <li>• Gauge pressure <ul style="list-style-type: none"> <li>- Metric</li> <li>- US measuring range</li> </ul> </li> <li>• Absolute pressure <ul style="list-style-type: none"> <li>- Metric</li> <li>- US measuring range</li> </ul> </li> </ul>	1 ... 60 bar (15 ... 870 psi) 15 ... 1000 psi	<ul style="list-style-type: none"> <li>• Measuring cell</li> <li>• Process connection</li> <li>• Gasket</li> </ul>	Al <sub>2</sub> O <sub>3</sub> - 96 % Stainless steel, mat. No. 1.4404 (SST 316 L) • FPM (Standard) • Neoprene • Perbunan • EPDM
	0.6 ... 16 bar a (10 ... 232 psi apsi a) 10 ... 300 psi a	Non-wetted parts materials	Stainless steel, mat. No. 1.4404 (SST 316 L) Plastic PVC
<b>Output</b>		<b>Certificates and approvals</b>	
Current signal	4 ... 20 mA	Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
<ul style="list-style-type: none"> <li>• Load</li> <li>• Auxiliary power U<sub>B</sub></li> </ul>	(U <sub>B</sub> - 10 V)/0.02 A DC 7 ... 33 V (10 ... 30 V for Ex)	Lloyd's Register of Shipping (LR) <sup>1)</sup>	12/20010
Voltage signal	0 ... 10 V DC	Germanischer Lloyd (GL) <sup>1)</sup>	GL19740 11 HH00
<ul style="list-style-type: none"> <li>• Load</li> <li>• Auxiliary power U<sub>B</sub></li> <li>• Power consumption</li> </ul>	≥ 10 kΩ 12 ... 33 V DC < 7 mA at 10 kΩ	American Bureau of Shipping (ABS) <sup>1)</sup>	ABS_11_HG 789392_PDA
Ratiometric output	0 ... 90 %	Bureau Veritas (BV) <sup>1)</sup>	BV 271007A0 BV
<ul style="list-style-type: none"> <li>• Load</li> <li>• Auxiliary power U<sub>B</sub></li> <li>• Power consumption</li> </ul>	≥ 10 kΩ 5 V DC $\pm 10\%$ < 7 mA at 10 kΩ	Det Norske Veritas (DNV) <sup>1)</sup>	A 12553
Characteristic curve	Linear rising	Drinking water approval (ACS) <sup>1)</sup>	ACS 15 ACC NY 360
<b>Measuring accuracy</b>		EAC <sup>1)</sup>	№ TC RU C-DE.ГБ05.B.00732 OC НАННО «ЦБЭЭ»
Error in measurement at limit setting incl. hysteresis and reproducibility	<ul style="list-style-type: none"> <li>• Typical: 0.25 % of measuring span</li> <li>• Maximum: 0.5 % of measuring span</li> </ul>	Underwriters Laboratories (UL) <sup>1)</sup>	<ul style="list-style-type: none"> <li>• for USA and Canada</li> <li>• worldwide</li> </ul>
Step response time T <sub>99</sub>	< 5 ms		UL 20110217 - E34453 IEC UL DK 21845
Long-term stability		<b>Explosion protection</b>	
<ul style="list-style-type: none"> <li>• Lower range value and measuring span</li> </ul>	0.25 % of measuring span/year	Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
Influence of ambient temperature		EC type-examination certificate	SEV 10 ATEX 0146
<ul style="list-style-type: none"> <li>• Lower range value and measuring span</li> <li>• Influence of power supply</li> </ul>	0.25 %/10 K of measuring span 0.005 %/V	Connection to certified intrinsically-safe resistive circuits with maximum values:	U <sub>i</sub> ≤ 30 V DC; I <sub>i</sub> ≤ 100 mA; P <sub>i</sub> ≤ 0.75 W
<b>Operating conditions</b>		Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	L <sub>i</sub> = 0 nH; C <sub>i</sub> = 0 nF
Process temperature with gasket made of:			
<ul style="list-style-type: none"> <li>• FPM (Standard)</li> <li>• Neoprene</li> <li>• Perbunan</li> <li>• EPDM</li> </ul>	-15 ... +125 °C (+5 ... +257 °F) -35 ... +100 °C (-31 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -40 ... +125 °C (-40 ... +257 °F), usable for drinking water		
Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)		
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)		
Degree of protection (to EN 60529)	<ul style="list-style-type: none"> <li>• IP 65 with connector per EN 175301-803-A</li> <li>• IP 67 with device plug M12</li> <li>• IP 67 with cable</li> <li>• IP 67 with cable quick screw connection</li> </ul>		

<sup>1)</sup> For variants with output signal 0 ... 5 V and ratiometric output available soon.

# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

#### SITRANS P200 for gauge and absolute pressure

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##### Selection and ordering data

Article No.

Order code

##### SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications

7MF1565 -

Characteristic curve deviation typ. 0.25 %

Wetted parts materials: Ceramic and stainless steel + sealing material

Non-wetted parts materials: stainless steel

[Click on the Article No. for the online configuration in the PIA Life Cycle Portal.](#)

##### Measuring range

##### Overload limit

##### Burst pressure

Min.

Max.

##### For gauge pressure

0 ... 1 bar	(0 ... 14.5 psi)	-1 bar	(-14.5 psi)	2.5 bar	(36.26 psi)	> 2.5 bar	(> 36.3 psi)	<b>3 BA</b>	
0 ... 1.6 bar	(0 ... 23.2 psi)	-1 bar	(-14.5 psi)	4 bar	(58.02 psi)	> 4 bar	(> 58.0 psi)	<b>3 BB</b>	
0 ... 2.5 bar	(0 ... 36.3 psi)	-1 bar	(-14.5 psi)	6.25 bar	(90.65 psi)	> 6.25 bar	(> 90.7 psi)	<b>3 BD</b>	
0 ... 4 bar	(0 ... 58.0 psi)	-1 bar	(-14.5 psi)	10 bar	(145 psi)	> 10 bar	(> 145 psi)	<b>3 BE</b>	
0 ... 6 bar	(0 ... 87.0 psi)	-1 bar	(-14.5 psi)	15 bar	(217 psi)	> 15 bar	(> 217 psi)	<b>3 BG</b>	
0 ... 10 bar	(0 ... 145 psi)	-1 bar	(-14.5 psi)	25 bar	(362 psi)	> 25 bar	(> 362 psi)	<b>3 CA</b>	
0 ... 16 bar	(0 ... 232 psi)	-1 bar	(-14.5 psi)	40 bar	(580 psi)	> 40 bar	(> 580 psi)	<b>3 CB</b>	
0 ... 25 bar	(0 ... 363 psi)	-1 bar	(-14.5 psi)	62.5 bar	(906 psi)	> 62.5 bar	(> 906 psi)	<b>3 CD</b>	
0 ... 40 bar	(0 ... 580 psi)	-1 bar	(-14.5 psi)	100 bar	(1450 psi)	> 100 bar	(> 1450 psi)	<b>3 CE</b>	
0 ... 60 bar	(0 ... 870 psi)	-1 bar	(-14.5 psi)	150 bar	(2175 psi)	> 150 bar	(> 2175 psi)	<b>3 CG</b>	

Other version, add Order code and plain text: Measuring range: ... up to ... bar (psi)

9 AA H 1 Y

##### For absolute pressure

0 ... 0.6 bar a	(0 ... 8.7 psi a)	0 bar a	(0 psi a)	2.5 bar a	(36.26 psi a)	> 2.5 bar a	(> 36.3 psi a)	<b>5 AG</b>	
0 ... 1 bar a	(0 ... 14.5 psi a)	0 bar a	(0 psi a)	2.5 bar a	(36.26 psi a)	> 2.5 bar a	(> 36.3 psi a)	<b>5 BA</b>	
0 ... 1.6 bar a	(0 ... 23.2 psi a)	0 bar a	(0 psi a)	4 bar a	(58.02 psi a)	> 4 bar a	(> 58.0 psi a)	<b>5 BB</b>	
0 ... 2.5 bar a	(0 ... 36.3 psi a)	0 bar a	(0 psi a)	6.25 bar a	(90.65 psi a)	> 6.25 bar a	(> 90.7 psi a)	<b>5 BD</b>	
0 ... 4 bar a	(0 ... 58.0 psi a)	0 bar a	(0 psi a)	10 bar a	(145 psi a)	> 10 bar a	(> 145 psi a)	<b>5 BE</b>	
0 ... 6 bar a	(0 ... 87.0 psi a)	0 bar a	(0 psi a)	15 bar a	(217 psi a)	> 15 bar a	(> 217 psi a)	<b>5 BG</b>	
0 ... 10 bar a	(0 ... 145 psi a)	0 bar a	(0 psi a)	25 bar a	(362 psi a)	> 25 bar a	(> 362 psi a)	<b>5 CA</b>	
0 ... 16 bar a	(0 ... 232 psi a)	0 bar a	(0 psi a)	40 bar a	(580 psi a)	> 40 bar a	(> 580 psi a)	<b>5 CB</b>	

Other version, add Order code and plain text: Measuring range: ... up to ... mbar a (psi a)

9 AA H 2 Y

##### Measuring ranges for gauge pressure

0 ... 15 psi	-14.5 psi	35 psi	> 35 psi	<b>4 BB</b>
3 ... 15 psi	-14.5 psi	35 psi	> 35 psi	<b>4 BC</b>
0 ... 20 psi	-14.5 psi	50 psi	> 50 psi	<b>4 BD</b>
0 ... 30 psi	-14.5 psi	80 psi	> 80 psi	<b>4 BE</b>
0 ... 60 psi	-14.5 psi	140 psi	> 140 psi	<b>4 BF</b>
0 ... 100 psi	-14.5 psi	200 psi	> 200 psi	<b>4 BG</b>
0 ... 150 psi	-14.5 psi	350 psi	> 350 psi	<b>4 CA</b>
0 ... 200 psi	-14.5 psi	550 psi	> 550 psi	<b>4 CB</b>
0 ... 300 psi	-14.5 psi	800 psi	> 800 psi	<b>4 CD</b>
0 ... 500 psi	-14.5 psi	1400 psi	> 1400 psi	<b>4 CE</b>
0 ... 750 psi	-14.5 psi	2000 psi	> 2000 psi	<b>4 CF</b>
0 ... 1000 psi	-14.5 psi	2000 psi	> 2000 psi	<b>4 CG</b>

Other version, add Order code and plain text: Measuring range: ... up to ... psi

9 AA H 1 Y

##### Measuring ranges for absolute pressure

0 ... 10 psi a	0 psi a	35 psi a	> 35 psi a	<b>6 AG</b>
0 ... 15 psi a	0 psi a	35 psi a	> 35 psi a	<b>6 BA</b>
0 ... 20 psi a	0 psi a	50 psi a	> 50 psi a	<b>6 BB</b>
0 ... 30 psi a	0 psi a	80 psi a	> 80 psi a	<b>6 BD</b>
0 ... 60 psi a	0 psi a	140 psi a	> 140 psi a	<b>6 BE</b>
0 ... 100 psi a	0 psi a	200 psi a	> 200 psi a	<b>6 BG</b>
0 ... 150 psi a	0 psi a	350 psi a	> 350 psi a	<b>6 CA</b>
0 ... 200 psi a	0 psi a	550 psi a	> 550 psi a	<b>6 CB</b>
0 ... 300 psi a	0 psi a	800 psi a	> 800 psi a	<b>6 CC</b>

Other version, add Order code and plain text: Measuring range: ... up to ... psi a

9 AA H 2 Y



# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

#### SITRANS P200 for gauge and absolute pressure

1

Selection and ordering data	Article No.	Order code
<b>SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications</b> Accuracy typ. 0.25 % Wetted parts materials: Ceramic and stainless steel + sealing material Non-wetted parts materials: stainless steel	7MF1565-	
<b>Output signal</b> 4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions) 0 ... 10 V; three-wire system; power supply 12 ... 33 V DC 0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 %		0 10 20 30
<b>Explosion protection (only 4 ... 20 mA)</b> None With explosion protection Ex ia IIC T4		0 1
<b>Electrical connection</b> Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling) Device plug M12 per IEC 61076-2-101 Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i") Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i") Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling) Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling) Fixed mounted cable, length 5 m Special version		1 2 03 04 5 6 07 9 N1Y
<b>Process connection</b> G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar) G½" male thread and G1/8" female thread G¼" male per EN 837-1 (¼" BSP male) 7/16"-20 UNF male ¼"-18 NPT male (standard for pressure ranges inH <sub>2</sub> O and psi) ¼"-18 NPT female ½"-14 NPT male ½"-14 NPT female 7/16"-20 UNF female M20x1.5 male G1/4" to DIN 3852 Form E G1/2" to DIN 3852 Form E Special version		A B C D E F G H J P Q R Z P1Y
<b>Sealing material between sensor and enclosure</b> Viton (FPM, standard) Neoprene (CR) Perbunan (NBR) EPDM Special version		A B C D Z Q1Y
<b>Version</b> Standard version		1
<b>Further designs</b> Supplement the Article No. with "-Z" and add Order code. Quality test certificate, 5-point factory calibration (IEC 60770-2) Oxygen version, free of oil and degreased, max. operating pressure 60 bar, max. temperature of medium +85 °C (only in conjunction with the sealing material Viton between sensor and enclosure and not with explosion protection version)	C11 E10	

# Pressure Measurement

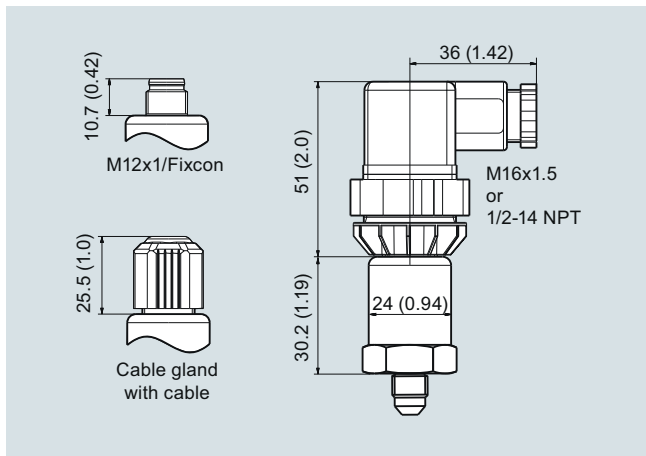
Pressure transmitters

Single-range transmitters for general applications

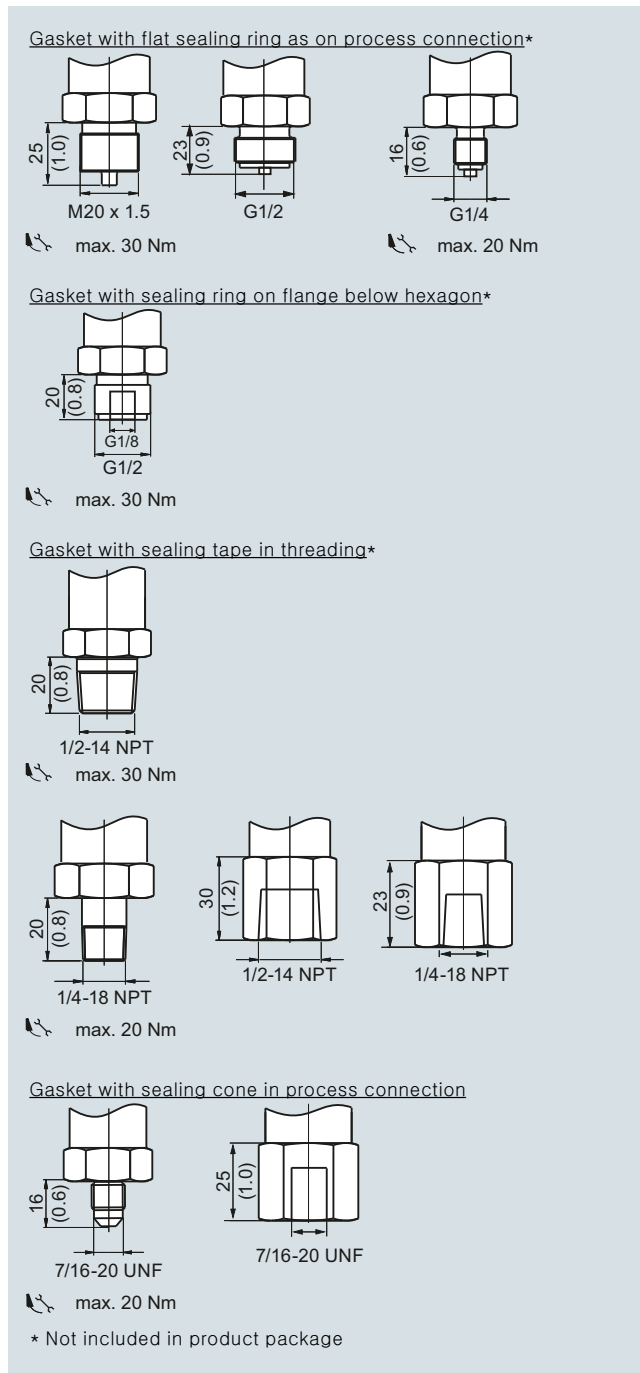
## SITRANS P200 for gauge and absolute pressure

1

### Dimensional drawings



SITRANS P200, electrical connections, dimensions in mm (inch)



SITRANS P200, process connections, dimensions in mm (inch)

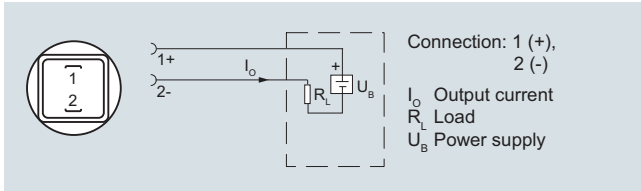
# Pressure Measurement

## Pressure transmitters

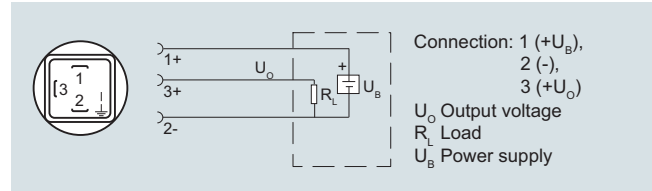
### Single-range transmitters for general applications

#### SITRANS P200 for gauge and absolute pressure

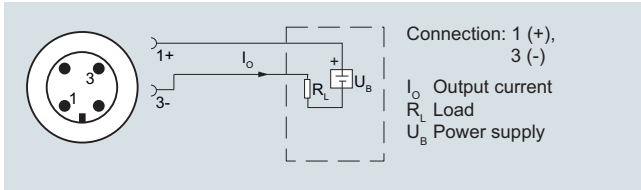
#### Schematics



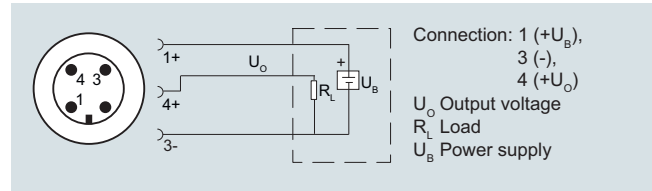
Connection with current output and connector per EN 175301



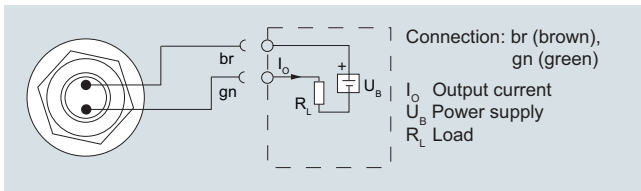
Connection with voltage output, ratiometric output and plug according to EN 175301



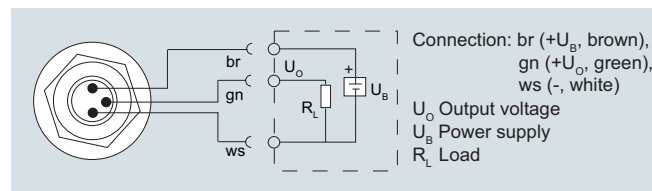
Connection with current output and device plug M12x1



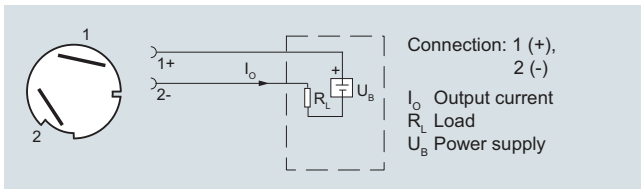
Connection with voltage output, ratiometric output and device plug M12x1



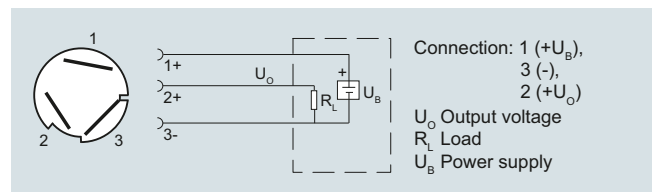
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



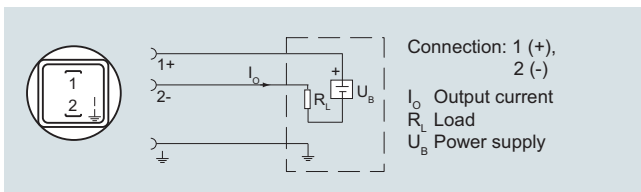
Connection with current output and Quickon cable quick screw connection



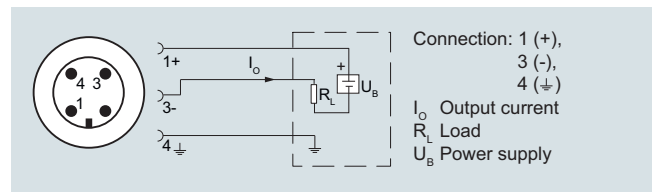
Connection with voltage output, ratiometric output and Quickon fast cable termination

#### Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and device plug M12x1 (Ex)

## Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

### SITRANS P210 for gauge pressure

1

#### Overview



The pressure transmitter SITRANS P210 measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell
- Measuring ranges 100 to 600 mbar (1.45 to 8.7 psi) relative
- For low-pressure applications

#### Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

#### Application

The pressure transmitter SITRANS P210 for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

#### Design

##### **Device structure without explosion protection**

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a device plug M12 (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

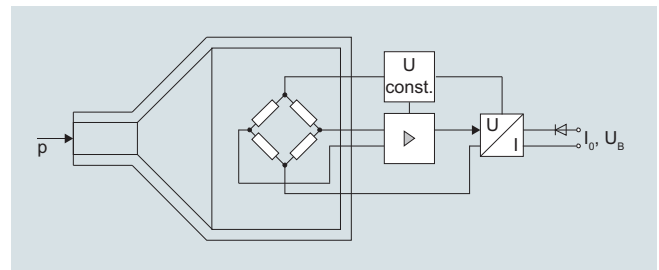
##### **Device structure with explosion protection**

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a device plug M12 (IP67) connected electrically. The output signal is between 4 and 20 mA.

#### Function

The pressure transmitter measures the gauge pressure of liquids and gases as well as the level of liquids.

##### **Mode of operation**



SITRANS P210 pressure transmitters (7MF1566-...), functional diagram

The stainless steel measuring cell has a thin-film resistance bridge to which the operating pressure  $p$  is transmitted through a stainless steel diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

#### SITRANS P210 for gauge pressure

1

#### Technical specifications

<b>Application</b>	Liquids, gases and vapors
<b>Mode of operation</b>	
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)
Measured variable	Gauge pressure
<b>Inputs</b>	
Measuring range	
• Gauge pressure	100 ... 600 mbar (1.5 ... 8.7 psi)
<b>Output</b>	
Current signal	4 ... 20 mA
• Load	$(U_B - 10 \text{ V})/0.02 \text{ A}$
• Auxiliary power $U_B$	DC 7 ... 33 V (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	$\geq 10 \text{ k}\Omega$
• Auxiliary power $U_B$	12 ... 33 V DC
• Power consumption	$< 7 \text{ mA}$ at 10 k $\Omega$
Ratiometric output	0 ... 90 %
• Load	$\geq 10 \text{ k}\Omega$
• Auxiliary power $U_B$	5 V DC $\pm 10 \%$
• Power consumption	$< 7 \text{ mA}$ at 10 k $\Omega$
Characteristic curve	Linear rising
<b>Measuring accuracy</b>	
Error in measurement at limit setting incl. hysteresis and reproducibility	<ul style="list-style-type: none"> <li>• Typical: 0.25 % of measuring span</li> <li>• Maximum: 0.5 % of measuring span</li> </ul>
Step response time $T_{99}$	$< 5 \text{ ms}$
Long-term stability	
• Lower range value and measuring span	0.25 % of measuring span/year
Influence of ambient temperature	
• Lower range value and measuring span	<ul style="list-style-type: none"> <li>• 0.25 %/10 K of measuring span</li> <li>• 0.5 %/10K of measuring span for a measuring range 100 ... 400 mbar</li> </ul>
• Influence of power supply	0.005 %/V
<b>Operating conditions</b>	
Process temperature with gasket made of:	
• FPM (Standard)	-15 ... +125 °C (+5 ... +257 °F)
• Neoprene	-35 ... +100 °C (-31 ... +212 °F)
• Perbunan	-20 ... +100 °C (-4 ... +212 °F)
• EPDM	-40 ... +125 °C (-40 ... +257 °F), usable for drinking water
Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
Degree of protection (to EN 60529)	<ul style="list-style-type: none"> <li>• IP 65 with connector per EN 175301-803-A</li> <li>• IP 67 with device plug M12</li> <li>• IP 67 with cable</li> <li>• IP 67 with cable quick screw connection</li> </ul>
Electromagnetic compatibility	<ul style="list-style-type: none"> <li>• acc. IEC 61326-1/-2/-3</li> <li>• acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation <math>\leq 1 \%</math></li> </ul>
Mounting position	upright

<b>Design</b>	
Weight	Approx. 0.090 kg (0.198 lb)
Process connections	See dimension drawings
Electrical connections	<ul style="list-style-type: none"> <li>• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11</li> <li>• Device plug M12</li> <li>• 2 or 3-wire (0.5 mm<sup>2</sup>) cable (<math>\varnothing \pm 5.4 \text{ mm}</math>)</li> <li>• Quickon cable quick screw connection</li> </ul>
Wetted parts materials	
• Measuring cell	Stainless steel, mat.-No. 1.4435
• Process connection	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Gasket	<ul style="list-style-type: none"> <li>• FPM (Standard)</li> <li>• Neoprene</li> <li>• Perbunan</li> <li>• EPDM</li> </ul>
Non-wetted parts materials	
• Enclosure	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Rack	Plastic
• cables	PVC
<b>Certificates and approvals</b>	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; meets requirements as per article 4, paragraph 3 (good engineering practice)
Lloyd's Register of Shipping (LR) <sup>1)</sup>	12/20010
Germanischer Lloyd (GL) <sup>1)</sup>	GL19740 11 HH00
American Bureau of Shipping (ABS) <sup>1)</sup>	ABS_11_HG 789392_PDA
Bureau Veritas (BV) <sup>1)</sup>	BV 271007A0 BV
Det Norske Veritas (DNV) <sup>1)</sup>	A 12553
Drinking water approval (ACS) <sup>1)</sup>	ACS 15 ACC NY 360
EAC <sup>1)</sup>	№ TC RU C-DE.ГБ05.В.00732 OC НАННО «ЦБВЭ»
Underwriters Laboratories (UL) <sup>1)</sup>	
• for USA and Canada	UL 20110217 - E34453
• worldwide	IEC UL DK 21845
<b>Explosion protection</b>	
Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
EC type-examination certificate	SEV 10 ATEX 0146
Connection to certified intrinsically-safe resistive circuits with maximum values:	$U_i \leq 30 \text{ V DC}$ ; $I_i \leq 100 \text{ mA}$ ; $P_i \leq 0.75 \text{ W}$
Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	$L_i = 0 \text{ nH}$ ; $C_i = 0 \text{ nF}$
<sup>1)</sup> For variants with output signal 0 ... 5 V and ratiometric output available soon.	

# Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

## SITRANS P210 for gauge pressure

1

### Selection and ordering data

Article No.

Order code

#### SITRANS P 210 pressure transmitters for gauge pressure for low pressure applications

Accuracy typ. 0.25 %

Wetted parts materials: Stainless steel + sealing material

Non-wetted parts materials: stainless steel

[Click on the Article No. for the online configuration in the PIA Life Cycle Portal.](#)

7MF1566 -

#### Measuring range

#### Overload limit

#### Burst pressure

min.

max.

#### For gauge pressure

Measuring range	Overload limit min.	Overload limit max.	Burst pressure
0...100 mbar (1.45 psi)	-400 mbar (-5.8 psi)	400 mbar (5.8 psi)	1 bar (14.5 psi)
0...160 mbar (2.32 psi)	-400 mbar (-5.8 psi)	400 mbar (5.8 psi)	1 bar (14.5 psi)
0...250 mbar (3.63 psi)	-800 mbar (-11.6 psi)	1000 mbar (14.5 psi)	2 bar (29.0 psi)
0...400 mbar (5.8 psi)	-800 mbar (-11.6 psi)	1000 mbar (14.5 psi)	2 bar (29.0 psi)
0...600 mbar (8.7 psi)	-1000 mbar (-14.5 psi)	2000 mbar (29.0 psi)	3 bar (43.5 psi)

Other version, add Order code and plain text:

Measuring range: ... up to ... mbar (psi)

#### Output signal

4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions)

0 ... 10 V; three-wire system; power supply 12 ... 33 V DC

0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC

Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC  $\pm$  10 %

#### Explosion protection (only 4 ... 20 mA)

None

With explosion protection Ex ia IIC T4

#### Electrical connection

Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)

Device plug M12 per IEC 61076-2-101

Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")

Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")

Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)

Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling)

Fixed mounted cable, length 5 m

Special version

#### Process connection

G1/2" male per EN 837-1 (1/2" BSP male) (standard for metric pressure ranges mbar, bar)

G1/2" male thread and G1/8" female thread

G1/4" male per EN 837-1 (1/4" BSP male)

7/16"-20 UNF male

1/4"-18 NPT male (standard for pressure ranges inH<sub>2</sub>O and psi)

1/4"-18 NPT female

1/2"-14 NPT male

1/2"-14 NPT female

7/16"-20 UNF female

M20x1.5 male

G1/4" to DIN 3852 Form E

G1/2" to DIN 3852 Form E

Special version

#### Sealing material between sensor and enclosure

Viton (FPM, standard)

Neoprene (CR)

Perbunan (NBR)

EPDM

Special version

#### Version

Standard version

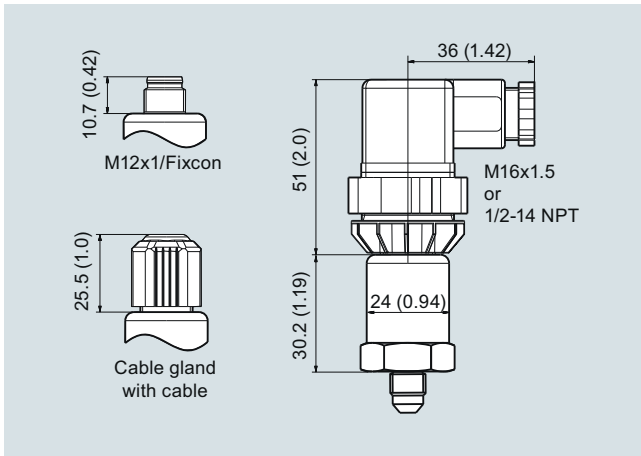
#### Further designs

Supplement the Article No. with "-Z" and add Order code.

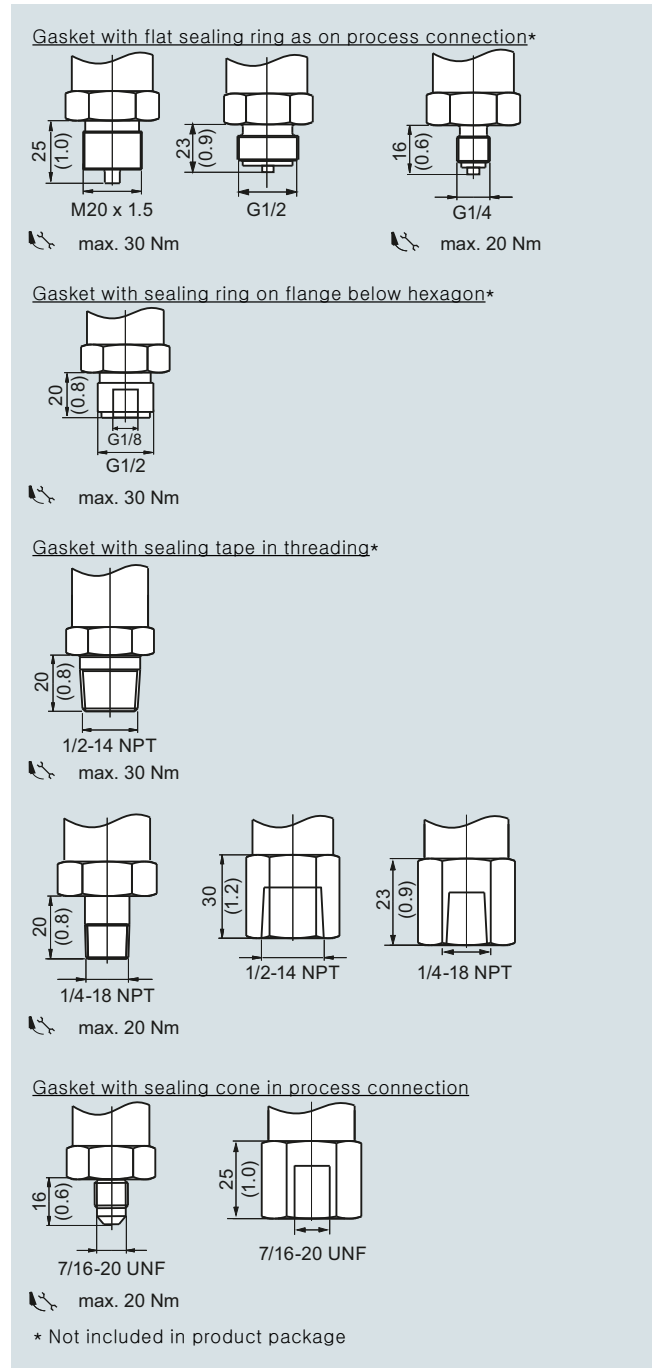
Quality test certificate, 5-point factory calibration (IEC 60770-2)

Article No.	Order code
7MF1566 -	
	3 A A
	3 A B
	3 A C
	3 A D
	3 A G
	9 A A
	H 1 Y
	0
	1 0
	2 0
	3 0
	0
	1
	1
	2
	0 3
	0 4
	5
	6
	0 7
	9
	N 1 Y
	A
	B
	C
	D
	E
	F
	G
	H
	J
	P
	Q
	R
	Z
	P 1 Y
	A
	B
	C
	D
	Z
	Q 1 Y
	1
	C 11

**Dimensional drawings**



SITRANS P210, electrical connections, dimensions in mm (inch)



SITRANS P210, process connections, dimensions in mm (inch)

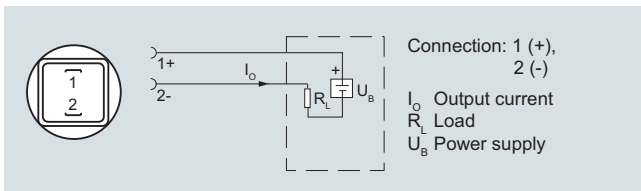
## Pressure Measurement

Pressure transmitters

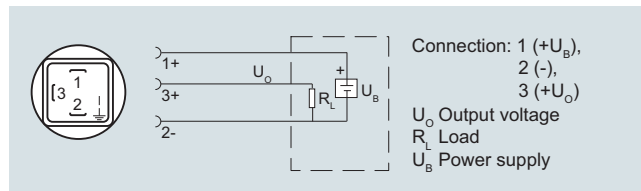
Single-range transmitters for general applications

### SITRANS P210 for gauge pressure

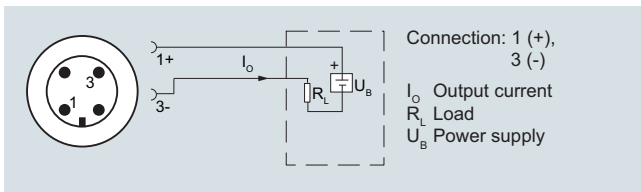
#### Schematics



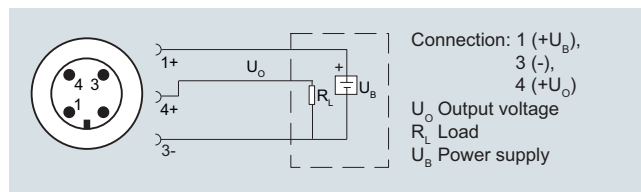
Connection with current output and connector per EN 175301



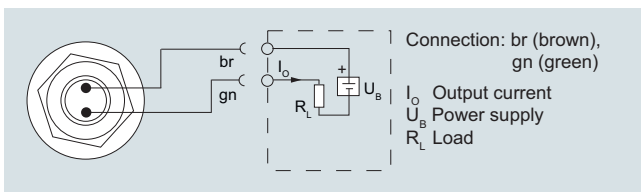
Connection with voltage output, ratiometric output and plug according to EN 175301



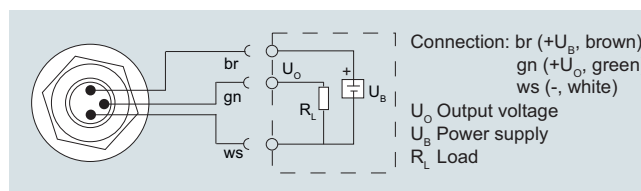
Connection with current output and device plug M12x1



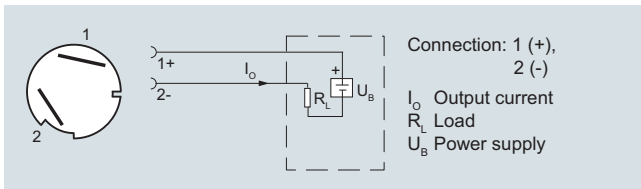
Connection with voltage output, ratiometric output and device plug M12x1



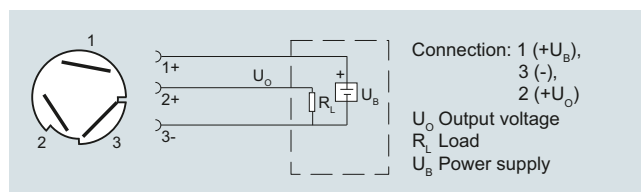
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



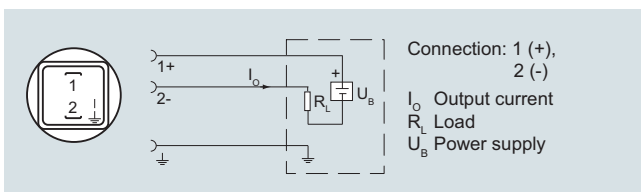
Connection with current output and Quickon cable quick screw connection



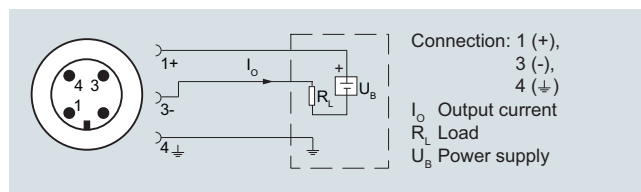
Connection with voltage output, ratiometric output and Quickon fast cable termination

#### Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and device plug M12x1 (Ex)



## Overview



The pressure transmitter SITRANS P220 measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell, fully welded
- Measuring ranges 2.5 to 1000 bar (36.3 to 14500 psi) relative
- For high-pressure applications and refrigeration technology division

## Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design
- Gasket-less

## Application

The pressure transmitter SITRANS P220 for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

## Design

### Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a device plug M12 (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

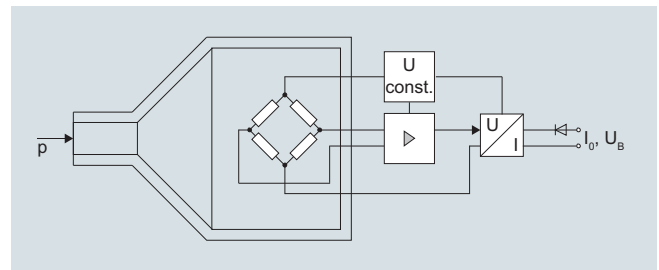
### Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a device plug M12 (IP67) connected electrically. The output signal is between 4 and 20 mA.

## Function

The pressure transmitter measures the gauge pressure of liquids and gases as well as the level of liquids.

### Mode of operation



SITRANS P220 pressure transmitters (7MF1567-...), functional diagram

The stainless steel measuring cell has a thick-film resistance bridge to which the operating pressure  $p$  is transmitted through a stainless steel diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

#### SITRANS P220 for gauge pressure

1

#### Technical specifications

<b>Application</b>	Gauge pressure measurement	Liquids, gases and vapors
<b>Mode of operation</b>	Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)
	Measured variable	Gauge pressure
<b>Inputs</b>	Measuring range	
	• Gauge pressure	
	- Metric	2.5 ... 1000 bar (36 ... 14500 psi)
	- US measuring range	30... 14500 psi
<b>Output</b>	Current signal	4 ... 20 mA
	• Load	( $U_B - 10 V$ )/0.02 A
	• Auxiliary power $U_B$	DC 7 ... 33 V (10 ... 30 V for Ex)
	Voltage signal	0 ... 10 V DC
	• Load	$\geq 10 \text{ k}\Omega$
	• Auxiliary power $U_B$	12 ... 33 V DC
	• Power consumption	< 7 mA at 10 k $\Omega$
	Ratiometric output	0 ... 90 %
	• Load	$\geq 10 \text{ k}\Omega$
	• Auxiliary power $U_B$	5 V DC $\pm 10 \%$
	• Power consumption	< 7 mA at 10 k $\Omega$
	Characteristic curve	Linear rising
<b>Measuring accuracy</b>	Error in measurement at limit setting incl. hysteresis and reproducibility	<ul style="list-style-type: none"> <li>• Typical: 0.25 % of measuring span</li> <li>• Maximum: 0.5 % of measuring span</li> </ul>
	Step response time $T_{99}$	< 5 ms
	Long-term stability	
	• Lower range value and measuring span	0.25 % of measuring span/year
	Influence of ambient temperature	
	• Lower range value and measuring span	0.25 %/10 K of measuring span
	• Influence of power supply	0.005 %/V
<b>Operating conditions</b>	• Process temperature	-40 ... +120 °C (-40 ... +248 °F)
	• Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
	• Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
	• Degree of protection (to EN 60529)	<ul style="list-style-type: none"> <li>• IP 65 with connector per EN 175301-803-A</li> <li>• IP 67 with device plug M12</li> <li>• IP 67 with cable</li> <li>• IP 67 with cable quick screw connection</li> </ul>
	Electromagnetic compatibility	<ul style="list-style-type: none"> <li>• acc. IEC 61326-1/-2/-3</li> <li>• acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation <math>\leq 1 \%</math></li> </ul>

<b>Design</b>	Weight	Approx. 0.090 kg (0.198 lb)
	Process connections	See dimension drawings
	Electrical connections	<ul style="list-style-type: none"> <li>• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11</li> <li>• Device plug M12</li> <li>• 2 or 3-wire (0.5 mm<sup>2</sup>) cable (<math>\varnothing \pm 5.4 \text{ mm}</math>)</li> <li>• Quickon cable quick screw connection</li> </ul>
	Wetted parts materials	Stainless steel, mat.-No. 1.4016
	• Measuring cell	Stainless steel, mat. No. 1.4404 (SST 316 L)
	• Process connection	
	Non-wetted parts materials	Stainless steel, mat. No. 1.4404 (SST 316 L)
	• Enclosure	Plastic
	• Rack	PVC
	• cables	
<b>Certificates and approvals</b>	Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
	Lloyd's Register of Shipping (LR) <sup>1)</sup>	12/20010
	Germanischer Lloyd (GL) <sup>1)</sup>	GL19740 11 HH00
	American Bureau of Shipping (ABS) <sup>1)</sup>	ABS_11_HG 789392_PDA
	Bureau Veritas (BV) <sup>1)</sup>	BV 271007A0 BV
	Det Norske Veritas (DNV) <sup>1)</sup>	A 12553
	Drinking water approval (ACS) <sup>1)</sup>	ACS 15 ACC NY 360
	EAC <sup>1)</sup>	№ TC RU C-DE.ГБ05.В.00732 ОС НАИИО «ЦСВЭ»
	CRN <sup>2)</sup>	0F18659.5C
	Underwriters Laboratories (UL) <sup>1)</sup>	
	• for USA and Canada	UL 20110217 - E34453
	• worldwide	IEC UL DK 21845
<b>Explosion protection</b>	Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
	EC type-examination certificate	SEV 10 ATEX 0146
	Connection to certified intrinsically-safe resistive circuits with maximum values:	$U_i \leq 30 \text{ V DC}$ ; $I_i \leq 100 \text{ mA}$ ; $P_i \leq 0.75 \text{ W}$
	Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	$L_i = 0 \text{ nH}$ ; $C_i = 0 \text{ nF}$
	CSA <sup>2)</sup>	70006348
		Class I, Division I, Groups A, B, C and D; Class II, Division 1, Groups E, F and G, Class III Class I, Division 2, Groups A, B, C and D; Class II, Division 2, Groups F and G, Class III A/Ex ia IIC T4 Ga/Gb A/Ex ia IIIC T125°C Da/Db

<sup>1)</sup> For variants with output signal 0 ... 5 V and ratiometric output available soon.

<sup>2)</sup> See ordering data for available versions.

# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

## SITRANS P220 for gauge pressure

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Selection and ordering data					Article No.	Order code
<b>SITRANS P 220 pressure transmitters for gauge pressure, high-pressure and refrigeration applications, fully-welded version</b>					7MF1567-	-A
Accuracy typ. 0.25 %						
Wetted parts materials: stainless steel						
Non-wetted parts materials: stainless steel						
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>						
Measuring range	Overload limit		Burst pressure			
	Mini- mum	Max.				
<b>For gauge pressure</b>						
0 ... 2.5 bar (0 ... 36.3 psi)	-1 bar (-14.5 psi)	6.25 bar (90.7 psi)	25 bar (363 psi)		<b>3 BD</b>	
0 ... 4 bar (0 ... 58 psi)	-1 bar (-14.5 psi)	10 bar (145 psi)	40 bar (870 psi)		<b>3 BE</b>	
0 ... 6 bar (0 ... 87 psi)	-1 bar (-14.5 psi)	15 bar (217 psi)	60 bar (522 psi)		<b>3 BG</b>	
0 ... 10 bar (0 ... 145 psi)	-1 bar (-14.5 psi)	25 bar (362 psi)	60 bar (870 psi)		<b>3 CA</b>	
0 ... 16 bar (0 ... 232 psi)	-1 bar (-14.5 psi)	40 bar (580 psi)	96 bar (1392 psi)		<b>3 CB</b>	
0 ... 25 bar (0 ... 363 psi)	-1 bar (-14.5 psi)	62.5 bar (906 psi)	150 bar (2176 psi)		<b>3 CD</b>	
0 ... 40 bar (0 ... 580 psi)	-1 bar (-14.5 psi)	100 bar (1450 psi)	240 bar (3481 psi)		<b>3 CE</b>	
0 ... 60 bar (0 ... 870 psi)	-1 bar (-14.5 psi)	150 bar (2175 psi)	360 bar (5221 psi)		<b>3 CG</b>	
0 ... 100 bar (0 ... 1450 psi)	-1 bar (-14.5 psi)	250 bar (3625 psi)	600 bar (8702 psi)		<b>3 DA</b>	
0 ... 160 bar (0 ... 2320 psi)	-1 bar (-14.5 psi)	400 bar (5801 psi)	960 bar (13924 psi)		<b>3 DB</b>	
0 ... 250 bar (0 ... 3625 psi)	-1 bar (-14.5 psi)	625 bar (9064 psi)	1500 bar (21756 psi)		<b>3 DD</b>	
0 ... 400 bar (0 ... 5801 psi)	-1 bar (-14.5 psi)	1000 bar (14503 psi)	2400 bar (34809 psi)		<b>3 DE</b>	
0 ... 600 bar (0 ... 8702 psi)	-1 bar (-14.5 psi)	1500 bar (21755 psi)	3600 bar (52200 psi)		<b>3 DG</b>	
0 ... 1000 bar (0 ... 14500 psi)	-1 bar (-14.5 psi)	1500 bar (21755 psi)	5000 bar (72520 psi)		<b>3 EA</b>	
Other version, add Order code and plain text:					<b>9 AA</b>	<b>H1 Y</b>
Measuring range: ... up to... bar (psi)						
<b>Measuring ranges for gauge pressure</b>						
0 ... 30 psi	-14.5 psi	75 psi	360 psi	*	<b>4 BE</b>	
0 ... 60 psi	-14.5 psi	150 psi	580 psi	*	<b>4 BF</b>	
0 ... 100 psi	-14.5 psi	250 psi	580 psi	*	<b>4 BG</b>	
0 ... 150 psi	-14.5 psi	375 psi	870 psi	*	<b>4 CA</b>	
0 ... 200 psi	-14.5 psi	500 psi	1390 psi	*	<b>4 CB</b>	
0 ... 300 psi	-14.5 psi	750 psi	2170 psi	*	<b>4 CD</b>	
0 ... 500 psi	-14.5 psi	1250 psi	3481 psi	*	<b>4 CE</b>	
0 ... 750 psi	-14.5 psi	1875 psi	5220 psi	*	<b>4 CF</b>	
0 ... 1000 psi	-14.5 psi	2500 psi	5220 psi	*	<b>4 CG</b>	
0 ... 1500 psi	-14.5 psi	3750 psi	8700 psi	*	<b>4 DA</b>	
0 ... 2000 psi	-14.5 psi	5000 psi	13920 psi	*	<b>4 DB</b>	
0 ... 3000 psi	-14.5 psi	7500 psi	21750 psi	*	<b>4 DD</b>	
0 ... 5000 psi	-14.5 psi	12500 psi	34800 psi	*	<b>4 DE</b>	
0 ... 6000 psi	-14.5 psi	15000 psi	34800 psi	*	<b>4 DF</b>	
0 ... 8700 psi	-14.5 psi	21755 psi	52200 psi	*	<b>4 DG</b>	
0 ... 14500 psi	-14.5 psi	21755 psi	72520 psi	*	<b>4 EA</b>	
Other version, add Order code and plain text: Measuring range: ... up to ... psi					<b>9 AA</b>	<b>H1 Y</b>
<b>Output signal</b>						
4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions)					<b>0</b>	
0 ... 10 V; three-wire system; power supply 12 ... 33 V DC					<b>10</b>	
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC					<b>20</b>	
Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 %					<b>30</b>	
<b>Explosion protection (only 4 ... 20 mA)</b>						
None					<b>0</b>	
With explosion protection Ex ia IIC T4					<b>1</b>	
<b>Electrical connection</b>						
Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling) *					<b>1</b>	
Device plug M12 per IEC 61076-2-101					<b>2</b>	
Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")					<b>0 3</b>	
Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")					<b>0 4</b>	
Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling) *					<b>5</b>	
Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling) *					<b>6</b>	
Fixed mounted cable, length 5 m					<b>0 7</b>	
Special version					<b>9</b>	<b>N1 Y</b>
* Order code E21 required for complete configuration with CRN and <sub>c</sub> CSA <sub>US</sub> Ex approval.						

# Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

## SITRANS P220 for gauge pressure

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### Selection and ordering data

#### SITRANS P 220 pressure transmitters for gauge pressure, high-pressure and refrigeration applications, fully-welded version

Accuracy typ. 0.25 %

Wetted parts materials: stainless steel

Non-wetted parts materials: stainless steel

### Process connection

G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar)

G½" male thread and G1/8" female thread

G¼" male per EN 837-1 (¼" BSP male)

7/16"-20 UNF male

¼"-18 NPT male (standard for pressure ranges inH<sub>2</sub>O and psi) \*

¼"-18 NPT female

½"-14 NPT male

½"-14 NPT female (Only for measuring ranges ≤ 60 bar (870 psi))

7/16"-20 UNF female

M20x1.5 male

G1/4" to DIN 3852 Form E

G1/2" to DIN 3852 Form E

Special version

### Version

Standard version \*

### Further designs

Supplement the Article No. with "-Z" and add Order code.

Quality test certificate, 5-point factory calibration (IEC 60770-2)  
(not possible for measuring ranges > 0 ... 600 bar/0 ... 8 702 psi)

Oxygen version, free of oil and degreased (not in conjunction with explosion protection version)

With CRN and cCSA<sub>US</sub> Ex approval (only for measuring ranges 0 ... 30 psi bis 0 ... 8 700 psi)

\* Order code E21 required for complete configuration with CRN and cCSA<sub>US</sub> Ex approval..

Article No.

Order code

7MF1567 - - - - - A

A

B

C

D

E

F

G

H

J

P

Q

R

Z

P1Y

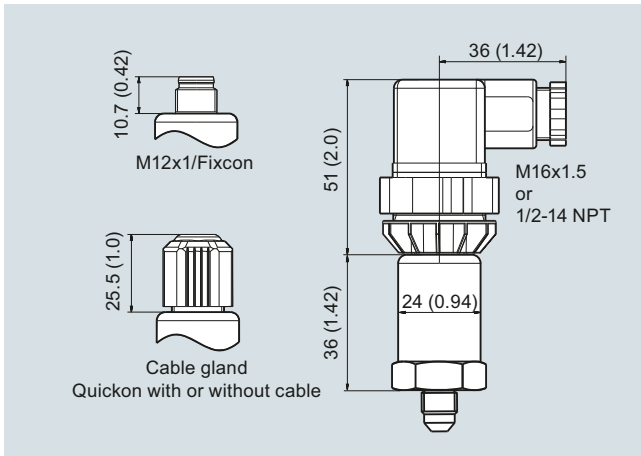
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C11

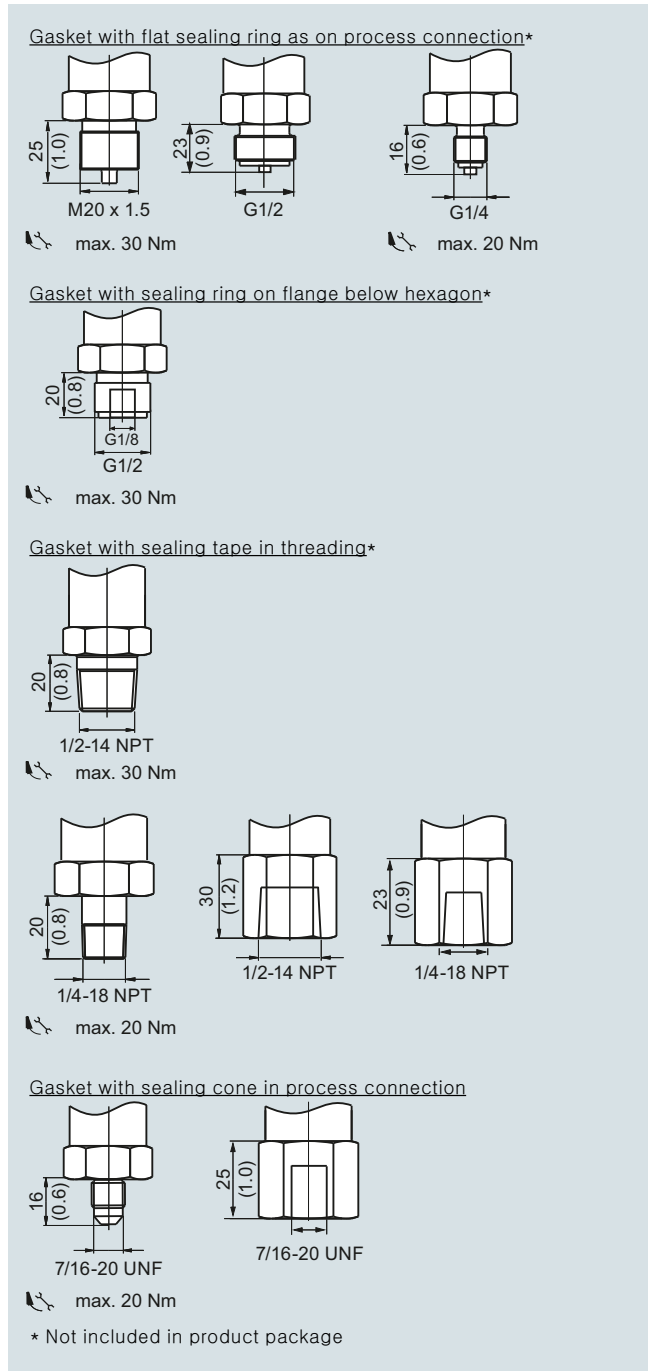
E10

E21

**Dimensional drawings**



SITRANS P220, electrical connections, dimensions in mm (inch)



SITRANS P220, process connections, dimensions in mm (inch)

# Pressure Measurement

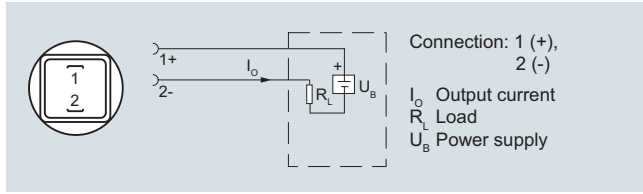
Pressure transmitters

Single-range transmitters for general applications

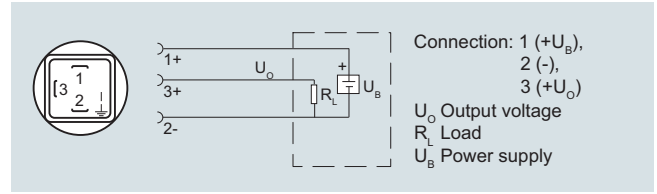
1

## SITRANS P220 for gauge pressure

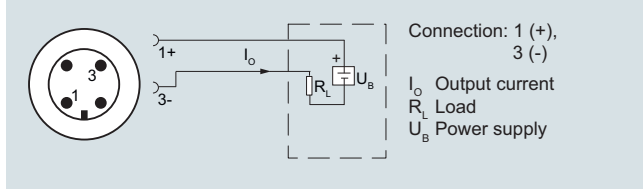
### Schematics



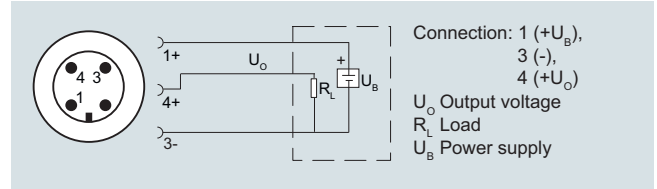
Connection with current output and connector per EN 175301



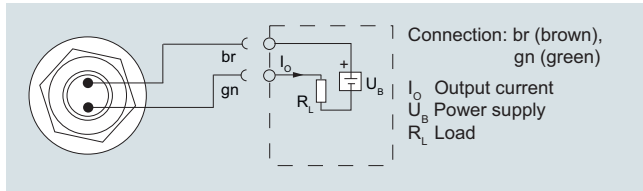
Connection with voltage output, ratiometric output and plug according to EN 175301



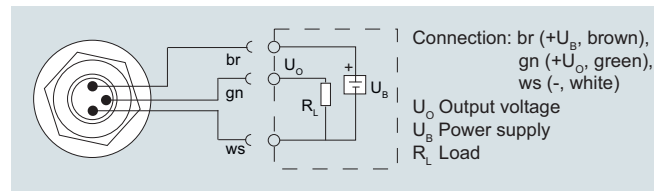
Connection with current output and device plug M12x1



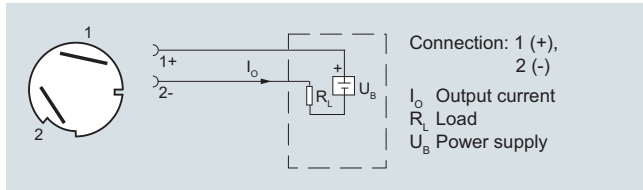
Connection with voltage output, ratiometric output and device plug M12x1



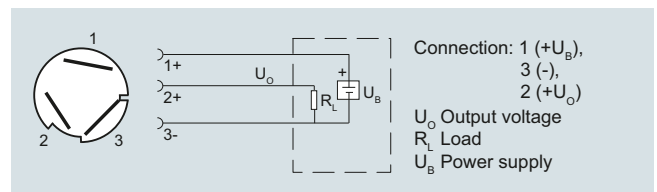
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



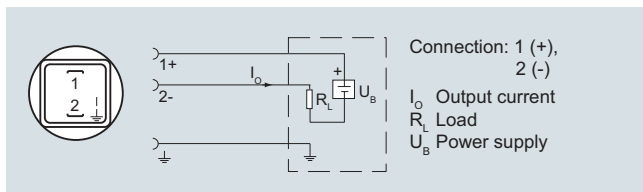
Connection with current output and cable quick screw connection Quick-on



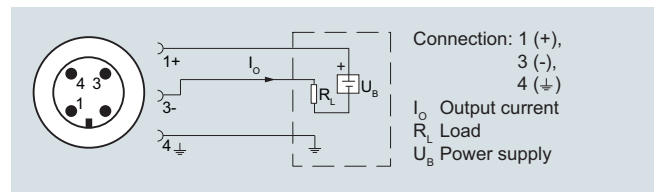
Connection with voltage output, ratiometric output and Quickon fast cable termination

### Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and device plug M12x1 (Ex)

## Overview



The pressure transmitter SITRANS LH100 is a submersible sensor for hydrostatic level measurement.

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH100 pressure transmitters are available for various measuring ranges and with explosion protection as an option.

A junction box and a cable hanger are available as accessories for simple installation.

## Benefits

- Compact design
- Simple installation
- Small error in measurement (0.3 %)
- Degree of protection IP68

## Application

SITRANS LH100 pressure transmitters are used in the following branches, for example:

- Shipbuilding
- Water/waste water supply
- For use in unpressurized/open vessels and wells

## Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

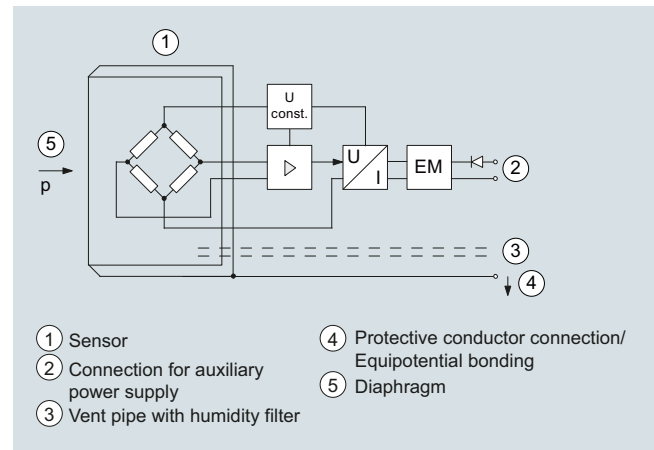
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel enclosure. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

The diaphragm is protected against external influences by a protective cap.

The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

## Function



SITRANS LH100 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

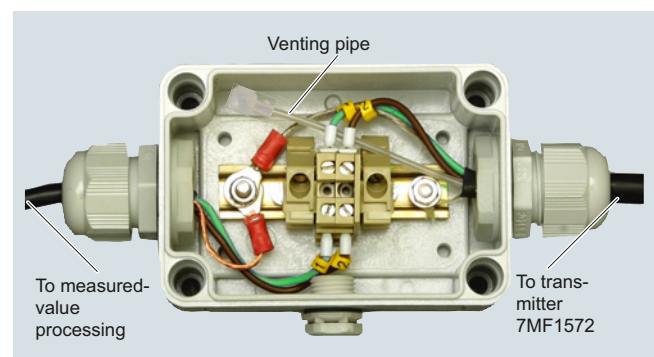
The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

## Integration

It is generally recommended that the connecting cable of the SITRANS LH100 transmitter is connected to the cable box, which can be ordered separately, and secured with the anchoring clamp, also available separately. The junction box has to be installed near the measuring point.

If the medium is anything other than water, it is also necessary to check compatibility with the specified materials of the transmitter.



Junction box 7MF1572-8AA, open, schematic diagram

## Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

### SITRANS LH100 Transmitter for hydrostatic level

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Measuring point setup, generally with junction box 7MF1572-8AA and 7MF1572-8AB cable hanger

#### Technical specifications

##### Pressure transmitter SITRANS LH100 (submersible sensor)

###### Mode of operation

Measuring principle piezo-resistive

###### Input

Measured variable Hydrostatic level

Measuring range

Measuring range	Max. permissible operating pressure
• 0 ... 3 mH <sub>2</sub> O (0 ... 9 ftH <sub>2</sub> O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))
• 0 ... 4 mH <sub>2</sub> O (0 ... 12 ftH <sub>2</sub> O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))
• 0 ... 5 mH <sub>2</sub> O (0 ... 15 ftH <sub>2</sub> O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))
• 0 ... 6 mH <sub>2</sub> O (0 ... 18 ftH <sub>2</sub> O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))
• 0 ... 10 mH <sub>2</sub> O (0 ... 30 ftH <sub>2</sub> O)	• 3.0 bar (43.5 psi) (corresponds to 30 mH <sub>2</sub> O (90 ftH <sub>2</sub> O))
• 0 ... 20 mH <sub>2</sub> O (0 ... 60 ftH <sub>2</sub> O)	• 5.0 bar (72.5 psi) (corresponds to 50 mH <sub>2</sub> O (150 ftH <sub>2</sub> O))
• 0 ... 0.3 bar	• 1.5 bar
• 0 ... 0.4 bar	• 1.5 bar
• 0 ... 0.5 bar	• 1.5 bar
• 0 ... 0.6 bar	• 1.5 bar
• 0 ... 1 bar	• 3.0 bar
• 0 ... 2 bar	• 5.0 bar

###### Output

Output signal 4 ... 20 mA

###### Measuring accuracy

According to IEC 60770-1

Error in measurement at limit setting including hysteresis and reproducibility

Measuring range

• 0 ... 3 mH <sub>2</sub> O (0 ... 9 ftH <sub>2</sub> O bzw. 0 ... 0.3 bar)	0.5 % of upper range value (typical) 1.0% of upper range value (maximum)
• For all other measuring ranges	0.3 % of upper range value (typical) 0.6% of upper range value (maximum)

###### Influence of ambient temperature

Measuring range

• 3 mH <sub>2</sub> O (9 ftH <sub>2</sub> O or 0.3 bar)	Zero and span 0.5 %/10 K of upper range value
• 4 ... 6 mH <sub>2</sub> O (12 ... 18 ftH <sub>2</sub> O or 0.4...0.6 bar)	0.45 %/10 K of upper range value
• > 6 mH <sub>2</sub> O (> 18 ftH <sub>2</sub> O or > 0.6 bar)	0.3 %/10 K of upper range value

###### Long-term stability

Measuring range

• 3 mH <sub>2</sub> O (9 ftH <sub>2</sub> O or 0.3 bar)	Zero and span 0.4 % of upper range value/year
• 4 ... 6 mH <sub>2</sub> O (12 ... 18 ftH <sub>2</sub> O or 0.4...0.6 bar)	0.25% of upper range value/year
• > 6 mH <sub>2</sub> O (> 18 ftH <sub>2</sub> O or > 0.6 bar)	0.2 % of upper range value/year

###### Operating conditions

Ambient conditions

- Process temperature -10 ... +80 °C (14 ... 176 °F)
- Storage temperature -40 ... +80 °C (-40 ... +176 °F)

Degree of protection according to IEC 60529

IP68



# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

#### SITRANS LH100 Transmitter for hydrostatic level

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<b>Design</b>	
Weight	
• Pressure transmitter	≈ 0.2 kg (≈ 0.44 lb)
• Cable; maximum cable length 100 m (330 ft)	0.025 kg/m (≈ 0.015 lb/ft)
Electrical connection	Cable with 3 conductors, vent pipe and integrated humidity filter
Material	
• Seal diaphragm	Al <sub>2</sub> O <sub>3</sub> ceramic, 96%
• Enclosure	Stainless steel, mat. no. 1.4404/316L FPM (standard)
• Gasket	EPDM (optional)
• Connecting cable	PE-HD (standard) PE-LD (in the case of versions with EPDM seal, suitable for drinking water)
<b>Auxiliary power</b>	
Terminal voltage on pressure transmitter $U_B$	10 ... 33 V DC 10 ... 30 V DC for transmitter with intrinsic safety explosion protection
<b>Certificates and approvals</b>	
Drinking water approval (ACS)	15 ACC NY 360
EAC	№ TC RU C-DE.ГБ05.В.00732 ОС НАННО «ЦСВЭ»
Underwriters Laboratories (UL)	2014-11-17 - E344532
The transmitter is not subject to the pressure equipment directive (PED 2014/68/EU)	
Explosion protection	
• Intrinsic safety "i"	IECEX SEV 14.0003 SEV 14 ATEX 0109
- Marking	II 1 G Ex ia IIC T4 Ga
• EAC Ex	TC RU C-DE.AA87.B.00324

<b>Junction box</b>	
<b>Application</b>	for connecting the transmitter cable
<b>Design</b>	
Weight	0.2 kg (0.44 lb)
Electrical connection	2 x 3-way (28 to 18 AWG)
Cable entry	2 x Pg 9
Enclosure material	polycarbonate
Vent valve for atmospheric pressure	
<b>Operating conditions</b>	
Degree of protection according to IEC 60529	IP65
<b>Cable hanger</b>	
<b>Application</b>	for mounting the transmitter
<b>Design</b>	
Weight	0.16 kg (0.35 lb)
Material	Galvanized steel, polyamide

## Pressure Measurement

Pressure transmitters

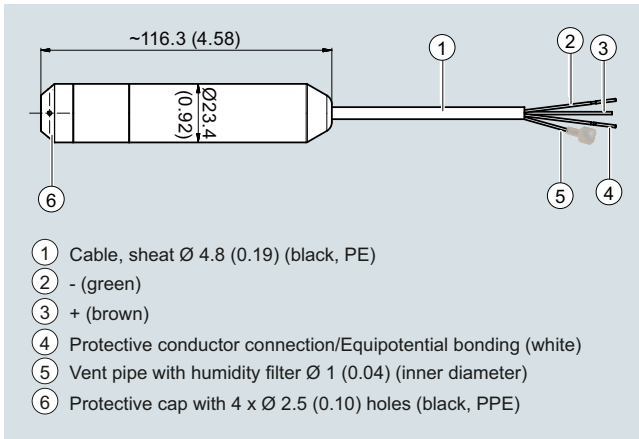
Single-range transmitters for general applications

### SITRANS LH100 Transmitter for hydrostatic level

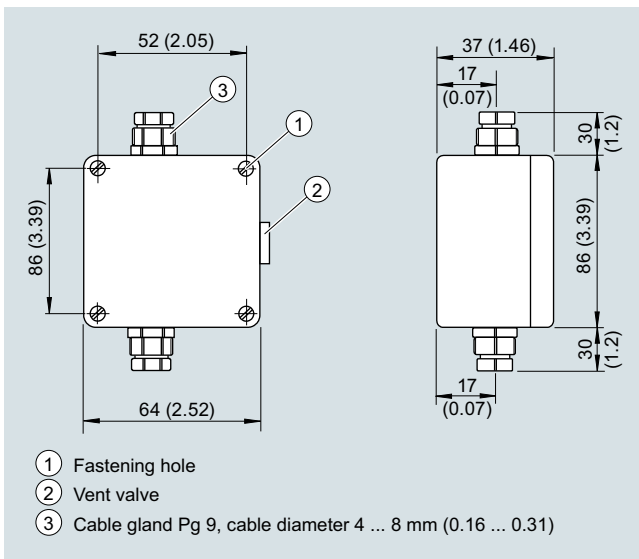
1

Selection and ordering data	Article No.	Order code	Selection and ordering data	Article No.	Order code
<b>Pressure transmitter</b> <b>SITRANS LH100 (submersible sensor)</b>  For measurement of the hydrostatic level through submersion, two-wire system, 4...20 mA, enclosure material mat. no. 1.4404 (316L), measuring cell Al <sub>2</sub> O <sub>3</sub> ceramic, with permanently mounted PE cable  ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7MF1572-	A	<b>Pressure transmitter</b> <b>SITRANS LH100 (submersible sensor)</b>  For measurement of the hydrostatic level through submersion, two-wire system, 4...20 mA, enclosure material mat. no. 1.4404 (316L), measuring cell Al <sub>2</sub> O <sub>3</sub> ceramic, with permanently mounted PE cable	7MF1572-	A
<b>Measuring range Cable length</b> 0 ... 3 mH <sub>2</sub> O <sup>1)</sup> 10 m 0 ... 4 mH <sub>2</sub> O 10 m 0 ... 5 mH <sub>2</sub> O 10 m 0 ... 6 mH <sub>2</sub> O 10 m 0 ... 10 mH <sub>2</sub> O 20 m 0 ... 20 mH <sub>2</sub> O 30 m  0 ... 9 ftH <sub>2</sub> O <sup>1)</sup> 33 ft 0 ... 12 ftH <sub>2</sub> O 33 ft 0 ... 15 ftH <sub>2</sub> O 33 ft 0 ... 18 ftH <sub>2</sub> O 33 ft 0 ... 30 ftH <sub>2</sub> O 66 ft 0 ... 60 ftH <sub>2</sub> O 98 ft  0 ... 0.3 bar <sup>1)</sup> 10 m 0 ... 0.4 bar 10 m 0 ... 0.5 bar 10 m 0 ... 0.6 bar 10 m 0 ... 1 bar 20 m 0 ... 2 bar 30 m		1 C 1 D 1 E 1 F 1 H 1 K  2 C 2 D 2 E 2 F 2 H 2 K  3 C 3 D 3 E 3 F 3 H 3 K	<b>Sealing material between sensor and enclosure</b> • FPM (Standard) • EPDM (for drinking water applications)		1 2
<b>Explosion protection</b> • without • With ATEX II1 G Ex ia IIC T4 Ga and IECEx Ex ia IIC T4 Ga			<b>Explosion protection</b> • without • With ATEX II1 G Ex ia IIC T4 Ga and IECEx Ex ia IIC T4 Ga		0 1
<b>Special versions:</b> Measuring ranges for special versions between 0 ... 3 mH <sub>2</sub> O and 0 ... 30 mH <sub>2</sub> O or 0 ... 9 ftH <sub>2</sub> O and 0 ... 100 ftH <sub>2</sub> O or 0 ... 0.3 bar and 0 ... 3 bar possible.  Special cable length/Special measuring range Please add „-Z“ to Article No. and specify Order code and plain text. Note: Indication of measuring range Y01 is always necessary.		9 A	<b>Additional versions</b>  Quality test certificate, 5-point factory calibration (IEC 60770-2), add „-Z“ to article no. and add order code.  Indication of measuring range (only at special cable lengths) in "… to … mH <sub>2</sub> O" or "… to … ftH <sub>2</sub> O" or "… to … bar"		Order code <b>C11</b>  <b>Y01</b>
For evaluation of the maximum possible cable length following data have to be regarded: Transmitter: $C_i = 0 \mu\text{F}$ , $L_i = 0 \mu\text{H}$ Cable: $C_k = 0,19 \text{ nF}$ per meter cable $L_k = 1,5 \mu\text{H}$ per meter cable  The maximum permitted data of the transmitter's power supply have to be considered!			<b>Accessories/spare parts</b>  <b>Junction box</b> for connecting the transmitter cable  <b>Cable hanger</b> for securing the pressure transmitter  <b>Protective caps as spare parts (10-pack)</b>  <b>Humidity filters as spare parts (10-pack)</b>		Article No. <b>7MF1572-8AA</b>  <b>7MF1572-8AB</b>  <b>7MF1572-8AD</b>  <b>7MF1572-8AE</b>
3 m (10 ft) 5 m (16 ft) 7 m (23 ft) 10 m (33 ft) 15 m (49 ft)  20 m (66 ft) 25 m (82 ft) 30 m (98 ft) 40 m (131 ft) 50 m (164 ft)  60 m (198 ft) <sup>1)</sup> 70 m (231 ft) <sup>1)</sup> 80 m (264 ft) <sup>1)</sup> 90 m (297 ft) <sup>1)</sup> 100 m (330 ft) <sup>1)</sup>			<b>Humidity filters as spare parts (10-pack)</b> 1) Approvals pending.		
					H . . + Y 0 1
					H 1 A H 1 B H 1 C H 1 D H 1 E  H 1 F H 1 G H 1 H H 1 J H 1 K  H 1 L H 1 M H 1 N H 1 P H 1 Q

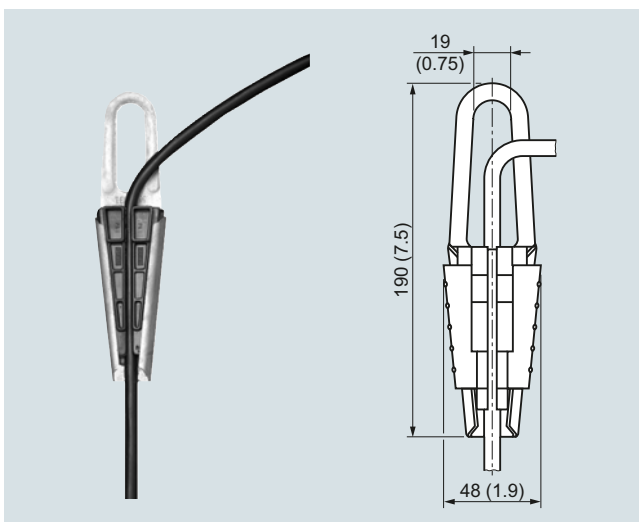
## Dimensional drawings



SITRANS LH100 pressure transmitter, dimensions in mm (inch)

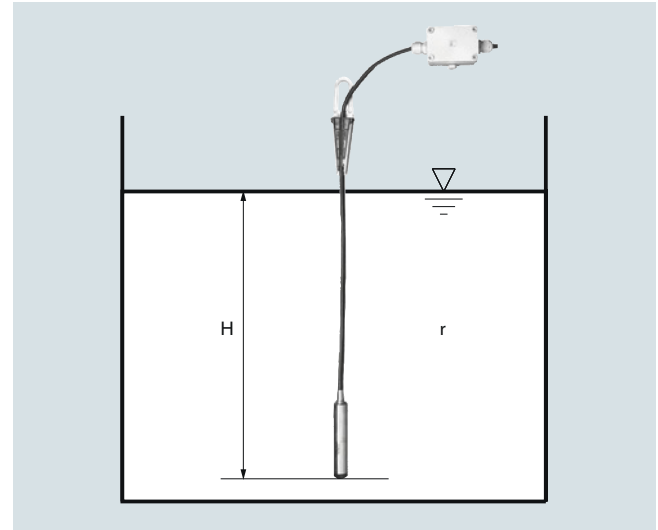


Junction box, dimensions in mm (inch)



Cable hanger, dimensions in mm (inch)

## More information

**Establishing the measuring range for water as process medium**

Calculation of the measuring range:

$$p = \rho \times g \times H$$

with:

 $\rho$  = density of medium $g$  = local acceleration due to gravity $H$  = maximum level

Example:

Medium: Water,  $\rho = 1\,000 \text{ kg/m}^3$ Acceleration due to gravity:  $9.81 \text{ m/s}^2$ 

Lower range value: 0 m

Maximum level: 6.0 m

Cable length: 10 m

Calculation:

$$p = 1\,000 \text{ kg/m}^3 \times 9.81 \text{ m/s}^2 \times 6.0 \text{ m}$$

$$p = 58\,860 \text{ N/m}^2$$

$$p = 589 \text{ mbar}$$

Transmitter to be ordered:

**7MF1572-1FA10**

Plus, if required, junction box 7MF1572-8AA and cable hanger 7MF1572-8AB

## Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

### SITRANS LH300 Transmitter for hydrostatic level

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#### Overview



The pressure transmitter SITRANS LH300 is a submersible sensor for hydrostatic level measurement with cap made of PPE (left), stainless steel (mid) and ETFE (right).

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH300 pressure transmitters are available for various measuring ranges and with explosion protection as an option.

A junction box and a cable hanger are available as accessories for simple installation.

#### Benefits

- Compact design
- Simple installation
- Small error in measurement (0.15 % typical)
- Degree of protection IP68

#### Application

SITRANS LH300 pressure transmitters are used in the following branches, for example:

- Shipbuilding
- Water/waste water supply
- Drinking water facilities
- For use in unpressurized/open vessels and wells
- Desalination plants

#### Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

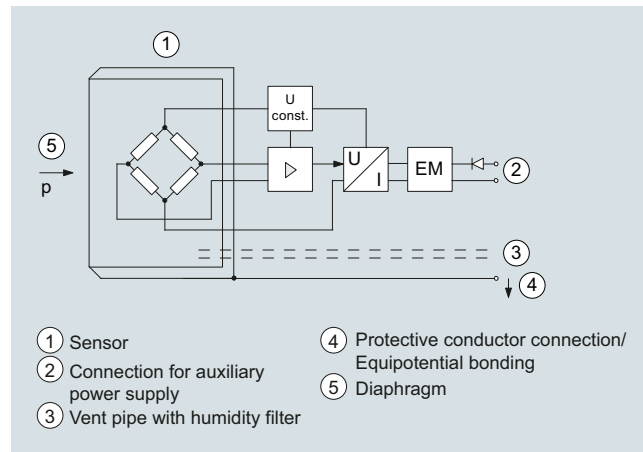
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel enclosure. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

The diaphragm is protected against external influences by a protective cap.

The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

#### Function



SITRANS LH300 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

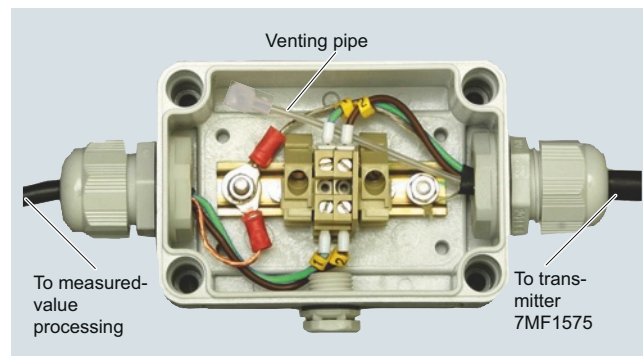
The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

#### Integration

It is generally recommended that the connecting cable of the SITRANS LH300 transmitter is connected to the cable box, which can be ordered separately, and secured with an anchoring clamp, also available separately. The cable plug is to be installed near the measuring point, but outside the medium.

Likewise, in the case of media other than water the compatibility with the specified materials of the transmitter, cable and seal must be checked.



Junction box 7MF1575-8AA, open, schematic diagram

# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

#### SITRANS LH300 Transmitter for hydrostatic level

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Measuring point setup, generally with junction box 7MF1575-8AA and 7MF1575-8AB cable hanger

#### Technical specifications

##### Pressure transmitter SITRANS LH300 (submersible sensor)

###### Mode of operation

Measuring principle Piezo-resistive

###### Input

Measured variable	Hydrostatic level
Measuring range	Max. permissible operating pressure
• 0 ... 1 mH <sub>2</sub> O (0 ... 3 ftH <sub>2</sub> O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))
• 0 ... 2 mH <sub>2</sub> O (0 ... 6 ftH <sub>2</sub> O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))
• 0 ... 3 mH <sub>2</sub> O (0 ... 9 ftH <sub>2</sub> O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH <sub>2</sub> O (45 ftH <sub>2</sub> O))
• 0 ... 4 mH <sub>2</sub> O (0 ... 12 ftH <sub>2</sub> O)	• 2 bar (29 psi) (corresponds to 20 mH <sub>2</sub> O (60 ftH <sub>2</sub> O))
• 0 ... 5 mH <sub>2</sub> O (0 ... 15 ftH <sub>2</sub> O)	• 2 bar (29 psi) (corresponds to 20 mH <sub>2</sub> O (60 ftH <sub>2</sub> O))
• 0 ... 6 mH <sub>2</sub> O (0 ... 18 ftH <sub>2</sub> O)	• 2 bar (29 psi) (corresponds to 20 mH <sub>2</sub> O (60 ftH <sub>2</sub> O))
• 0 ... 10 mH <sub>2</sub> O (0 ... 30 ftH <sub>2</sub> O)	• 5 bar (72.5 psi) (corresponds to 50 mH <sub>2</sub> O (150 ftH <sub>2</sub> O))
• 0 ... 20 mH <sub>2</sub> O (0 ... 60 ftH <sub>2</sub> O)	• 10 bar (145 psi) (corresponds to 100 mH <sub>2</sub> O (300 ftH <sub>2</sub> O))
• 0 ... 40 mH <sub>2</sub> O (0 ... 120 ftH <sub>2</sub> O)	• 20 bar (290 psi) (corresponds to 200 mH <sub>2</sub> O (600 ftH <sub>2</sub> O))

###### Special measuring ranges

• Up to 100 mH <sub>2</sub> O (300 ftH <sub>2</sub> O)	• 20 bar (290 psi) (corresponds to 200 mH <sub>2</sub> O (600 ftH <sub>2</sub> O))
• Up to 160 mH <sub>2</sub> O (480 ftH <sub>2</sub> O)	• 24 bar (348 psi) (corresponds to 240 mH <sub>2</sub> O (720 ftH <sub>2</sub> O))

###### Measuring range

• 0 ... 0.1 bar	• 1.5 bar
• 0 ... 0.2 bar	• 1.5 bar
• 0 ... 0.3 bar	• 1.5 bar
• 0 ... 0.4 bar	• 2 bar
• 0 ... 0.5 bar	• 2 bar
• 0 ... 0.6 bar	• 2 bar
• 0 ... 1 bar	• 5 bar
• 0 ... 2 bar	• 10 bar
• 0 ... 4 bar	• 20 bar

###### Special measuring range

• Up to 10 bar	• 20 bar
• Up to 16 bar	• 24 bar

###### Output

Output signal 4 ... 20 mA

###### Measuring accuracy

	According to IEC 60770-1
Error in measurement at limit setting including hysteresis and reproducibility	≤ 0.15 % of upper range value (typical) ≤ 0.3 % of upper range value (maximum)
Influence of ambient temperature	≤ 0.05 %/10 K of upper range value (zero and span)
Long-term stability	≤ 0.15 % of upper range value/year (zero and span)

###### Operating conditions

Ambient conditions	
• Process temperature	-10 ... +80 °C (14 ... 176 °F)
• Storage temperature	-20 ... +80 °C (-4 ... +176 °F)
Degree of protection according to IEC 60529	IP68

## Pressure Measurement

### Pressure transmitters

#### Single-range transmitters for general applications

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#### SITRANS LH300 Transmitter for hydrostatic level

<b>Design</b>	
Weight	≈ 0.4 kg (≈ 0.88 lb)
<ul style="list-style-type: none"> <li>• Pressure transmitter</li> <li>• Cable</li> </ul>	0.08 kg/m (≈ 0.059 lb/ft)
Maximal freely suspended length	300 m (990 ft)
Electrical connection	Cable with 2 conductors, vent pipe and integrated humidity filters
Material	
<ul style="list-style-type: none"> <li>• Seal diaphragm</li> <li>• Enclosure</li> </ul>	Al <sub>2</sub> O <sub>3</sub> ceramic, 99.6 % Stainless steel, mat. no. 1.4404/316L and 1.4539/904L (sea water applications) respectively
<ul style="list-style-type: none"> <li>• Gasket</li> </ul>	FPM (standard) EPDM (optional)
<ul style="list-style-type: none"> <li>• Connecting cable</li> </ul>	PE (standard/drinking water applications)
<ul style="list-style-type: none"> <li>• Cap</li> </ul>	FEP (for aggressive media) Stainless steel, PPE or ETFE
<b>Auxiliary power</b>	
Terminal voltage on pressure transmitter $U_B$	10 ... 33 V DC for transmitter without explosion protection 10 ... 30 V DC for transmitter with intrinsic safety explosion protection
<b>Certificates and approvals</b>	
Drinking water approval (ACS)	17 ACC NY 055
EAC	TC N RU Д-DE.ГА02.В.05092
Underwriters Laboratories (UL)	ML File No. E344532, issued 2017-08-17
Shipbuilding approval (LR)	LR_18/20074
Shipbuilding approval (DNV/GL)	TAA00000CE
Shipbuilding approval (BV)	56926/A0 BV
Shipbuilding approval (ABS)	HG1881314_P
Shipbuilding approval (RINA)	ELE067319XG
Pressure equipment directive	The transmitter is not subject to the pressure equipment directive (PED 2014/68/EU)
Explosion protection	
<ul style="list-style-type: none"> <li>• ATEX</li> <li>• IEC Ex</li> <li>• EAC Ex</li> <li>• Intrinsic safety "i"</li> </ul>	SEV 16 ATEX 0121 IEC Ex SEV 16.0003 TC RU C-DE.AA87.B.00324
- Marking	II 1 G Ex ia IIC T4 Ga

<b>Junction box</b>	
<b>Application</b>	For connecting the transmitter cable
<b>Design</b>	
Weight	0.2 kg (0.44 lb)
Electrical connection	2 x 3-way (28 to 18 AWG)
Cable entry	2 x PG 13.5
Enclosure material	Polycarbonate
Vent valve for atmospheric pressure	
<b>Operating conditions</b>	
Degree of protection according to IEC 60529	IP65
<b>Cable hanger</b>	
<b>Application</b>	For mounting the transmitter
<b>Design</b>	
Weight	0.16 kg (0.35 lb)
Material	Galvanized steel, polyamide
Terminal area	For cable with a diameter of 5.5 ... 9.5 mm

# Pressure Measurement

## Pressure transmitters

### Single-range transmitters for general applications

#### SITRANS LH300 Transmitter for hydrostatic level

1

Selection and ordering data		Article No.	Order code	Selection and ordering data		Article No.	Order code
<b>Pressure transmitter SITRANS LH300 (submersible sensor)</b>		<b>7MF1575-</b>		<b>Pressure transmitter SITRANS LH300 (submersible sensor)</b>		<b>7MF1575-</b>	
For hydrostatic level measurement, submersible transmitter, two-wire connection, 4 ... 20 mA, enclosure material see Order option, measuring cell Al <sub>2</sub> O <sub>3</sub> ceramics (99.6 % purity), with fixed mounted cable, material of protective cap at PE cable: PPE (colour black) material of protective cap at FEP cable: PPE (colour white) Note: junction box and cable hanger have to be ordered separately.				<b>PE cable for general purpose and drinking water applications</b>			
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>				Special cable length Please add „-Z“ to Article No. and specify Order code and plain text: Y01: Cable length .....		<b>9 X</b>	<b>H . . + Y 0 1</b>
<b>Measuring range</b>	<b>Cable length (PE cable)</b>			3 m (≈ 10 ft)			<b>H 1 A</b>
0 ... 1 mH <sub>2</sub> O	5 m	<b>1 A</b>		5 m (≈ 16 ft)			<b>H 1 B</b>
0 ... 2 mH <sub>2</sub> O	5 m	<b>1 B</b>		7 m (≈ 23 ft)			<b>H 1 C</b>
0 ... 3 mH <sub>2</sub> O	10 m	<b>1 C</b>		10 m (≈ 33 ft)			<b>H 1 D</b>
0 ... 4 mH <sub>2</sub> O	10 m	<b>1 D</b>		15 m (≈ 50 ft)			<b>H 1 E</b>
0 ... 5 mH <sub>2</sub> O	10 m	<b>1 E</b>		20 m (≈ 65 ft)			<b>H 1 F</b>
0 ... 6 mH <sub>2</sub> O	10 m	<b>1 F</b>		25 m (≈ 80 ft)			<b>H 1 G</b>
0 ... 10 mH <sub>2</sub> O	20 m	<b>1 H</b>		30 m (≈ 100 ft)			<b>H 1 H</b>
0 ... 20 mH <sub>2</sub> O	30 m	<b>1 K</b>		40 m (≈ 130 ft)			<b>H 1 J</b>
0 ... 40 mH <sub>2</sub> O	50 m	<b>1 L</b>		50 m (≈ 160 ft)			<b>H 1 K</b>
0 ... 3 ftH <sub>2</sub> O	5 m (≈ 15 ft)	<b>2 A</b>		60 m (≈ 200 ft)			<b>H 1 L</b>
0 ... 6 ftH <sub>2</sub> O	5 m (≈ 15 ft)	<b>2 B</b>		70 m (≈ 230 ft)			<b>H 1 M</b>
0 ... 9 ftH <sub>2</sub> O	10 m (≈ 30 ft)	<b>2 C</b>		80 m (≈ 265 ft)			<b>H 1 N</b>
0 ... 12 ftH <sub>2</sub> O	10 m (≈ 30 ft)	<b>2 D</b>		90 m (≈ 295 ft)			<b>H 1 P</b>
0 ... 15 ftH <sub>2</sub> O	10 m (≈ 30 ft)	<b>2 E</b>		100 m (≈ 330 ft)			<b>H 1 Q</b>
0 ... 18 ftH <sub>2</sub> O	10 m (≈ 30 ft)	<b>2 F</b>		125 m (≈ 410 ft)			<b>H 1 R</b>
0 ... 30 ftH <sub>2</sub> O	20 m (≈ 60 ft)	<b>2 H</b>		150 m (≈ 495 ft)			<b>H 1 S</b>
0 ... 60 ftH <sub>2</sub> O	30 m (≈ 90 ft)	<b>2 K</b>		175 m (≈ 575 ft)			<b>H 1 T</b>
0 ... 120 ftH <sub>2</sub> O	50 m (≈ 150 ft)	<b>2 L</b>		200 m (≈ 650 ft)			<b>H 1 U</b>
0 ... 0.1 bar	5 m	<b>3 A</b>		225 m (≈ 740 ft)			<b>H 1 V</b>
0 ... 0.2 bar	5 m	<b>3 B</b>		250 m (≈ 820 ft)			<b>H 1 W</b>
0 ... 0.3 bar	10 m	<b>3 C</b>		275 m (≈ 900 ft)			<b>H 1 X</b>
0 ... 0.4 bar	10 m	<b>3 D</b>		300 m (≈ 990 ft)			<b>H 2 A</b>
0 ... 0.5 bar	10 m	<b>3 E</b>		350 m (≈ 1150 ft)			<b>H 2 B</b>
0 ... 0.6 bar	10 m	<b>3 F</b>		400 m (≈ 1320 ft)			<b>H 2 C</b>
0 ... 1 bar	20 m	<b>3 H</b>		450 m (≈ 1480 ft)			<b>H 2 D</b>
0 ... 2 bar	30 m	<b>3 K</b>		500 m (≈ 1650 ft)			<b>H 2 E</b>
0 ... 4 bar	50 m	<b>3 L</b>		550 m (≈ 1815 ft)			<b>H 2 F</b>
Special versions:				600 m (≈ 1980 ft)			<b>H 2 G</b>
<u>Measuring ranges</u> for special versions between				650 m (≈ 2145 ft)			<b>H 2 H</b>
0 ... 1 mH <sub>2</sub> O and 0 ... 160 mH <sub>2</sub> O or				700 m (≈ 2310 ft)			<b>H 2 J</b>
0 ... 3 ftH <sub>2</sub> O and 0 ... 530 ftH <sub>2</sub> O or				750 m (≈ 2475 ft)			<b>H 2 K</b>
0 ... 0.1 bar and 0 ... 16 bar possible.				800 m (≈ 2640 ft)			<b>H 2 L</b>
				850 m (≈ 2800 ft)			<b>H 2 M</b>
				900 m (≈ 2970 ft)			<b>H 2 N</b>
				950 m (≈ 3135 ft)			<b>H 2 P</b>
				1000 m (≈ 3300 ft)			<b>H 2 Q</b>
				Other special cable length Please add „-Z“ to Article No. and specify Order codes and plain text: H1Y: Cable length .....	<b>9 X</b>		<b>H 1 Y + Y 0 1</b>
				Y01: Measuring range .....			

## Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

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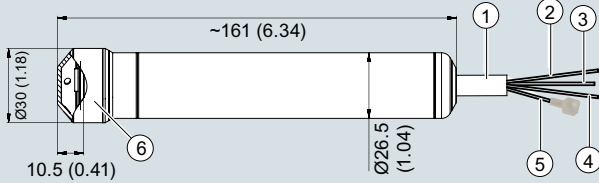
### SITRANS LH300 Transmitter for hydrostatic level

Selection and ordering data	Article No.	Order code	Selection and ordering data	Article No.	Order code
<b>Pressure transmitter SITRANS LH300 (submersible sensor)</b>	<b>7 MF 1 5 7 5 -</b>		<b>Pressure transmitter SITRANS LH300 (submersible sensor)</b>	<b>7 MF 1 5 7 5 -</b>	
<b>FEP cable for aggressive media</b>			<b>Enclosure material</b>		
Special cable length Please add „-Z“ to Article No. and specify Order code and plain text: Y01: Cable length .....	<b>9 X</b>	<b>H . . + Y 0 1</b>	<b>Material of protective cap</b>		
3 m (≈ 10 ft)		<b>H 5 A</b>	Stainless steel 316L (1.4404)	<b>A</b>	
5 m (≈ 16 ft)		<b>H 5 B</b>	Stainless steel 316L (1.4404)	<b>B</b>	
7 m (≈ 23 ft)		<b>H 5 C</b>	Stainless steel 316L (1.4404)	<b>C</b>	
10 m (≈ 33 ft)		<b>H 5 D</b>	Stainless steel 904L (1.4539) for sea water applications	<b>D</b>	
15 m (≈ 50ft)		<b>H 5 E</b>	Stainless steel 904L (1.4539) for sea water applications	<b>E</b>	
20 m (≈ 65 ft)		<b>H 5 F</b>	Stainless steel 904L (1.4539) for seawater applications	<b>F</b>	
25 m (≈ 80 ft)		<b>H 5 G</b>			
30 m (≈ 100 ft)		<b>H 5 H</b>			
40 m (≈ 130 ft)		<b>H 5 J</b>			
50 m (≈ 160 ft)		<b>H 5 K</b>			
60 m (≈ 200 ft)		<b>H 5 L</b>			
70 m (≈ 230 ft)		<b>H 5 M</b>			
80 m (≈ 265 ft)		<b>H 5 N</b>			
90 m (≈ 295 ft)		<b>H 5 P</b>			
100 m (≈ 330 ft)		<b>H 5 Q</b>			
125 m (≈ 410 ft)		<b>H 5 R</b>			
150 m (≈ 495 ft)		<b>H 5 S</b>			
175 m (≈ 575 ft)		<b>H 5 T</b>			
200 m (≈ 650 ft)		<b>H 5 U</b>			
225 m (≈ 740 ft)		<b>H 5 V</b>			
250 m (≈ 820 ft)		<b>H 5 W</b>			
275 m (≈ 900 ft)		<b>H 5 X</b>			
300 m (≈ 990 ft)		<b>H 6 A</b>			
350 m (≈ 1150 ft)		<b>H 6 B</b>			
400 m (≈ 1320 ft)		<b>H 6 C</b>			
450 m (≈ 1480 ft)		<b>H 6 D</b>			
500 m (≈ 1650 ft)		<b>H 6 E</b>			
550 m (≈ 1815 ft)		<b>H 6 F</b>			
600 m (≈ 1980 ft)		<b>H 6 G</b>			
650 m (≈ 2145 ft)		<b>H 6 H</b>			
700 m (≈ 2310 ft)		<b>H 6 J</b>			
750 m (≈ 2475 ft)		<b>H 6 K</b>			
800 m (≈ 2640 ft)		<b>H 6 L</b>			
850 m (≈ 2800 ft)		<b>H 6 M</b>			
900 m (≈ 2970 ft)		<b>H 6 N</b>			
950 m (≈ 3135 ft)		<b>H 6 P</b>			
1000 m (≈ 3300 ft)		<b>H 6 Q</b>			
Other special cable length Please add „-Z“ to Article No. and specify Order codes and plain text: H1Y: Cable length .....	<b>9 X</b>	<b>H 5 Y + Y 0 1</b>	<b>Sealing material between sensor and enclosure</b>		
Y01: Measuring range .....			FPM (Standard)	<b>1</b>	
			EPDM (for drinking water)	<b>2</b>	
			<b>Explosion protection</b>		
			without	<b>0</b>	
			With ATEX II1 G Ex ia IIC T4 Ga, IECEx Ex ia IIC T4 Ga and EAC Ex (only possible for cable length ≤ 300 m (990 ft))	<b>1</b>	
			<b>Additional versions</b>		Order code
			Quality test certificate, 5-point factory calibration (IEC 60770-2)		<b>C11</b>
			<b>Accessories/spare parts</b>		Article No.
			<b>Junction box</b>		<b>7MF1575-8AA</b>
			<b>Cable hanger</b>		<b>7MF1575-8AB</b>
			<b>Protective caps, PPE, as spare part (10-pack)</b>		<b>7MF1575-8AD</b>
			<b>Protective caps, ETFE, as spare part (10-pack)</b>		<b>7MF1575-8AE</b>
			<b>Humidity filters as spare part (10-pack)</b>		<b>7MF1575-8AF</b>
			<b>Protective cap, stainless steel 316L (1.4404) for waste water applications</b>		<b>7MF1575-8AG</b>
			<b>Protective cap, stainless steel 904L (1.4539) for sea water applications</b>		<b>7MF1575-8AH</b>

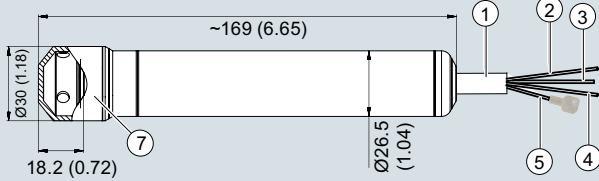


## Dimensional drawings

## Sensor with protective cap (PPE, ETFE)

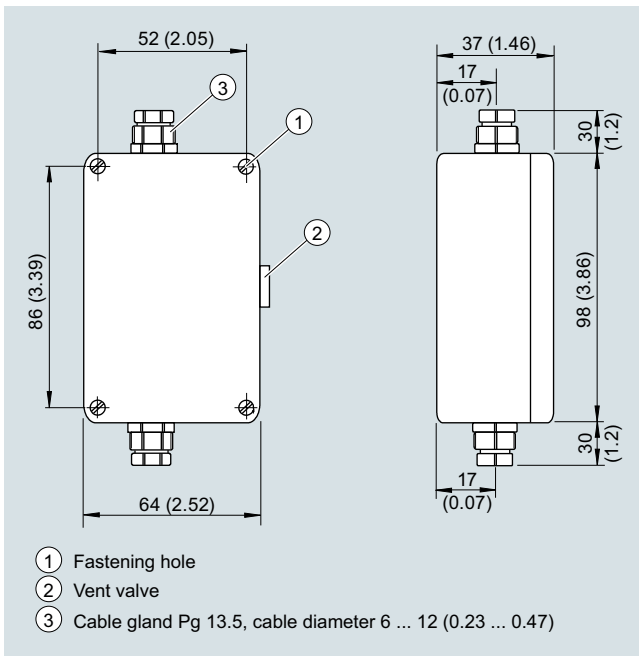


## Sensor with protective cap (stainless steel)

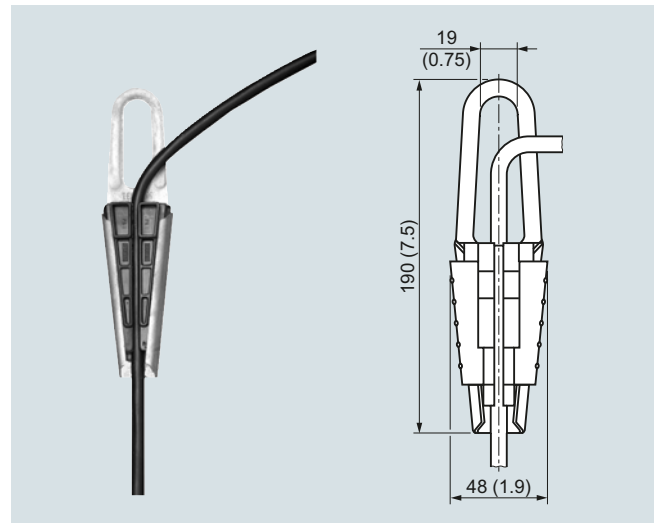


- ① Cable, sheath  $\varnothing$  8.3 (0.33)
- ② - (blue)
- ③ + (brown)
- ④ Protective conductor connection/Equipotential bonding (black)
- ⑤ Vent pipe with humidity filter  $\varnothing$  1 (0.04) (inner diameter)
- ⑥ Protective cap (PPE or PTFE) with 4 x  $\varnothing$  2.5 (0.10) holes
- ⑦ Protective cap (stainless steel) with 4 x  $\varnothing$  5 (0.20) holes

SITRANS LH300 pressure transmitter, dimensions in mm (inch)

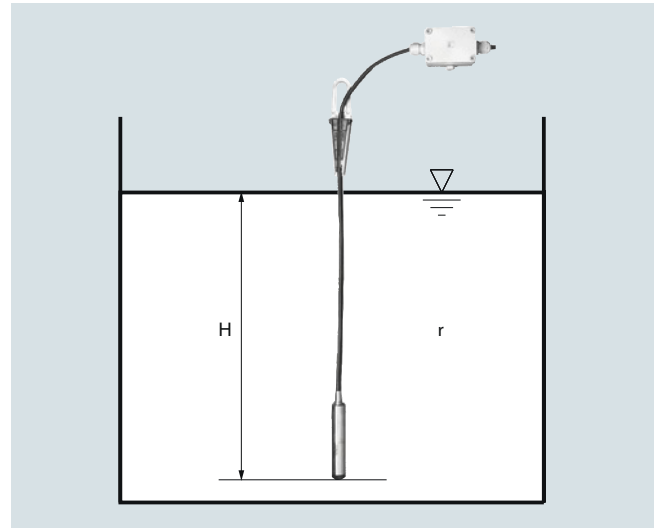


Junction box, dimensions in mm (inch)



Cable hanger, dimensions in mm (inch)

## More information

**Determination of the measuring range for medium water**

Calculation of the measuring range:

$$p = \rho \times g \times H$$

with:

 $\rho$  = density of medium $g$  = local acceleration due to gravity $H$  = maximum level

Example:

Medium: Water,  $\rho = 1\,000 \text{ kg/m}^3$ Acceleration due to gravity:  $9.81 \text{ m/s}^2$ 

Lower range value: 0 m

Maximum level: 6.0 m

Cable length: 10 m

Calculation:

$$p = 1\,000 \text{ kg/m}^3 \times 9.81 \text{ m/s}^2 \times 6.0 \text{ m}$$

$$p = 58\,860 \text{ N/m}^2$$

$$p = 589 \text{ mbar}$$

Transmitter to be ordered:

**7MF1575-1FA10**

Plus, if required, junction box 7MF1575-8AA and cable hanger 7MF1575-8AB

## Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

### SITRANS P Compact for gauge and absolute pressure

1

#### Overview



The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

Particular value has been placed on a high surface quality. The system can be electropolished in addition.

A further important feature is the hygiene-based design of the process connection by means of various aseptic connections.

The completely welded stainless steel enclosure can be designed up to degree of protection IP67.

Using appropriate thermal decouplers, the SITRANS P Compact pressure transmitter can be used for process temperatures up to 200 °C (392 °F).

#### Benefits

- Measuring ranges from 0 to 160 mbar (0 to 2.32 psi) to 0 to 40 bar (0 to 580 psi)
- Linearity error including hysteresis < +0.2 % of the end value
- Piezo-resistive measurement system, vacuum-proof and overload-proof
- Hygiene-based design according to EHEDG, FDA and GMP recommendations
- Material and surface quality according to hygiene requirements
- Wetted parts made of stainless steel; completely welded
- Signal output 4 to 20 mA (0 to 20 mA as option)
- Stainless steel enclosure with degree of protection IP65 (IP67 as option)
- Process temperature up to 200 °C (392 °F)
- Explosion protection II 2G Ex [ib] IIC T6 to ATEX
- Easy and safe to clean

#### Application

The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

The SITRANS P Compact pressure transmitter is available in many versions. Exact adaptation of the pressure transmitter to conditions at the place of use is thus possible

#### Design

The electronics is potted to protect it against moisture, corrosive atmospheres and vibration.

#### Notes on operating the pressure transmitter

##### Compensation of internal atmospheric pressure

Compensation of the internal atmospheric pressure of the SITRANS P Compact pressure transmitters is performed as follows:

- in the plug versions by means of the screwed gland (IP65)
- in the field enclosures by means of an integral sintered filter (IP65) or a vented cable (IP67)
- in versions with cable outlet by means of a vented cable (IP67)

In the absolute pressure range there is no need for compensation with respect to atmospheric pressure.

**Note:** These degrees of protection are only achieved under the following conditions:

- if the pressure transmitter is installed correctly
- if the screwed glands are securely tightened
- if the cable diameters agree with the nominal diameters of the gaskets in the enclosure

**Note:** The integral EMC measures are only effective if the earth connection is made correctly.

##### CE marking

The CE marking of the pressure transmitter certifies compliance with the guidelines of the European Council (9/336/EC), the EMC law (13.11.1992), as well as the applicable generic standards.

Interference-free operation in systems and plants is achieved only if the specifications for shielding, earthing, cable routing and electrical isolation are observed during installation and assembly.

##### Hazardous areas

**Note:** Electrical equipment in hazardous areas must only be installed and operated by trained personnel.

Modifications to units and connections result in cancellation of the explosion protection and guarantee.

With intrinsically-safe circuits, make sure that equipotential bonding exists throughout the complete cabling inside and outside of the hazardous area. The limits specified in the ATEX approval must be observed.

**Function**

The process pressure acts on a piezo-resistive semiconductor measuring bridge through a remote seal and a transmission liquid. The pressure transmitter converts the pressure values into a load-independent current.

A compensation network makes the output signal largely independent of the ambient temperature. As a result of a specially adapted remote seal connection with minimized volume, the influence of the process temperature on the output signal is greatly reduced compared to a conventional screw connection.

The pressure transmitters can be powered with a non-regulated DC voltage of 10 to 30 V. Output signals common to measuring technology are available.

**Technical specifications****Pressure transmitters for food, pharmaceuticals and biotechnology****Mode of operation**

Measuring principle	piezo-resistive
---------------------	-----------------

**Input**

Measured variable	gauge or absolute pressure
Measuring range	0 ... 160 mbar (0 ... 2.32 psi) ... 0 ... 40 bar (0 ... 580 psi)

**Output**

Output signal	
• 2-wire system	4 ... 20 mA
• Three-wire system	0 ... 20 mA

**Measuring accuracy**

Accuracy	Acc. to IEC 60770-1
Error in measurement at limit setting incl. hysteresis and reproducibility	≤ 0.2 % of upper range value
Adjustment accuracy	≤ ± 0.2 % of upper range value
Step response time	< 20 ms
<b>Influence of ambient temperature</b>	
On the enclosure	
• Zero point	< 0.2 %/10 K of upper range value
• Measuring span	< 0.2 %/10 K of upper range value
On the process connection (remote seals)	
• Flange remote seal	Zero error (depends on design)
- DN 25 / 1"	4.8 mbar/10 K (0.069 psi/10 K)
- DN 32 / 1¼"	2.3 mbar/10 K (0.033 psi/10 K)
- DN 40 / 1½"	1.6 mbar/10 K (0.023 psi/10 K)
- DN 50 / 2"	0.6 mbar/10 K (0.009 psi/10 K)
• Inline seal	
- DN 25 / 1"	9.5 mbar/10 K (0.14 psi/10 K)
- DN 32 / 1¼"	4.1 mbar/10 K (0.06 psi/10 K)
- DN 40 / 1½"	3.9 mbar/10 K (0.05 psi/10 K)
- DN 50 / 2"	3.9 mbar/10 K (0.05 psi/10 K)

The zero error specified for the process connection should be considered as a guideline for a standard design. We will produce a detailed system calculation on request. Systems with reduced remote seal errors are available on request.

**Operating conditions**

Installation conditions	
• Mounting position	Any, vertical as standard
Ambient conditions	
• Ambient temperature	-10 ... +70 °C (14 ... 158 °F)
• Storage temperature	-10 ... +90 °C (14 ... 194 °F)
• Process temperature	Max. 200 °C (392 °F), depending on design
Vacuum-resistant	0 mbar (0 psi) absolute at max. 50 °C. Higher process temperatures on request.
• Degree of protection (to EN 60529)	IP65, optional IP67
• Electromagnetic Compatibility	
- Emitted interference	To EN 50081 Part 1, issue 1993 (residential and industrial areas). The unit has no own emissions.
- Noise immunity to	EN 50082 Part 2, issue March 1995 (industrial areas)

**Design**

Weight (without remote seal)	
• Field enclosure	≈ 460 G (≈ 1.01 lb)
• Enclosure with plug	≈ 200 g (≈ 0.44 lb)
Enclosure	
• Designs	<ul style="list-style-type: none"> <li>• Field enclosure IP65 or IP67, with screwed gland</li> <li>• Angled plug DIN 43650, IP65</li> <li>• Cable connection, IP67</li> <li>• Device plug M12, IP65</li> </ul>
• Material	Stainless steel, mat. no. 1.4404/316L/1.4305
Material of union nut	Polyamide (with electrical connection using plug or cable) Electronics unit potted with silicone Internal ventilation for measuring ranges < 16 bar (< 232 psi), through enclosure thread or connection cable depending on design
Process connection	
• Versions	See ordering data
• Material of coupling	Stainless steel, mat. no. 1.4404/316L

**Power supply**

Terminal voltage on transmitter	10 ... 30 V DC
Rated voltage	24 V DC

**Certificates and approvals**

Classification according to pressure equipment directive (PED 2014/68/EU)	
• For 7MF8010-1... (with diaphragm seal)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
• For 7MF8010-2... (with inline seal)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord

**Explosion protection**

• Intrinsic safety "i"	TÜV 03 ATEX 2099 X
- Marking	Ex II 2G Ex ib IIC T6

# Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

## SITRANS P Compact for gauge and absolute pressure

1

Selection and Ordering data	Article No.	Ord. code	Selection and Ordering data	Article No.	Ord. code
<b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front</b>	7MF8010 -		<b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front</b>	7MF8010 -	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA	1		2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA	1	
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>					
<b>Diaphragm seal with quick-release clamp</b>			<b>Diaphragm seal with aseptic connection</b>		
Milk pipe union to DIN 11851 with slotted union nut			Aseptic screwed gland to DIN 11864-1, form A, with slotted union nut		
• DN 25	AD		• 1 inch	PM	
• DN 32	AE		• 1½ inch	PN	
• DN 40	AF		• 2 inch	PP	
• DN 50	AG		• 2½ inch	PQ	
• DN 65	AH		Aseptic screwed gland to DIN 11864-1, form A with threaded socket		
Milk pipe union to DIN 11851 with threaded socket			• 1 inch	QM	
• DN 25	BD		• 1½ inch	QN	
• DN 32	BE		• 2 inch	QP	
• DN 40	BF		• 2½ inch	QQ	
• DN 50	BG		Aseptic screwed NEUMO with slotted union nut <sup>1)</sup>		
• DN 65	BH		• DN 25	RD	
Clamp connection to DIN 32676			• DN 32	RE	
• DN 25	CD		• DN 40	RF	
• DN 40	CF		• DN 50	RG	
• DN 50	CG		Aseptic screwed NEUMO with threaded socket <sup>1)</sup>		
Clamp connection to ISO 2852			• DN 25	SD	
• 1 inch	DM		• DN 32	SE	
• 1½ inch	DN		• DN 40	SF	
• 2 inch	DP		• DN 50	SG	
• 2½ inch	DQ		Aseptic screwed NEUMO with clamp connection, form R <sup>1)</sup>		
IDF standard with slotted union nut			• DN 25	TD	
• 1 inch	EM		• DN 32	TE	
• 1½ inch	EN		• DN 40	TF	
• 2 inch	EP		• DN 50	TG	
IDF standard with threaded socket			Aseptic screwed NEUMO with clamp connection, form V <sup>1)</sup>		
• 1 inch	FM		• DN 25	UD	
• 1½ inch	FN		• DN 32	UE	
• 2 inch	FP		• DN 40	UF	
SMS standard with slotted union nut			• DN 50	UG	
• 1 inch	GM		Male thread DIN 3852 Form A		
• 1½ inch	GN		• G½", min. meas. span 1.6 bar (23.2 psi)	XA	
• 2 inch	GP		• G¾", min. meas. span 1 bar (14.5 psi)	XB	
SMS standard with threaded socket			• G1", min. meas. span 0.4 bar (5.8 psi)	XC	
• 1 inch	HM		• G1½", min. meas. span 0.25 bar (3.63 psi)	XD	
• 1½ inch	HN		• G2", min. meas. span 0.16 bar (2.32 psi)	XE	
• 2 inch	HP		Special version (add Order code and plain text)	ZA	J 1 Y
DRD flange, without welding-type flange			<b>Filling liquid</b>		
• DN 50, PN 40	JH		Food oil, FDA-listed	3	
Varivent connection (Tuchenhausen)			Special version (add Order code and plain text)	9	L 1 Y
• D = 50, for Varivent enclosure DN 25 and 1 inch	KF		<b>Output signal</b>		
• D = 68, for Varivent enclosure DN 40 ... DN 125 and 1½ ... 6 inch	KL		4 ... 20 mA	1	
Special version (add Order code and plain text)	ZA	J 1 Y	Special version (add Order code and plain text)	9	M 1 Y
<b>Filling liquid</b>					
Food oil, FDA-listed	3				
Special version (add Order code and plain text)	9	L 1 Y			
<b>Output signal</b>					
4 ... 20 mA	1				
Special version (add Order code and plain text)	9	M 1 Y			

<sup>1)</sup> Please specify as well:  
Connections for pipes: R01, R02 or R03, see table "Further designs" on next page

Selection and Ordering data	Article No.	Ord. code	Selection and Ordering data	Article No.	Ord. code
<b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front</b>	7MF8010-		<b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front</b>	7MF8010-	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA			2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA		
<b>Enclosure design (stainless steel mat. No. 1.4404/316L) / electr. connection</b>			<b>Measured range</b>		
Enclosure with angled plug to DIN 43650, IP65		1	(continued)		
Enclosure with device plug M12, IP65, union nut made of polyamide		2	-1 ... +9 bar (-14.5 ... +130.5 psi)		GA
Enclosure with device plug M12, IP65, union nut made of stainless steel		3	-1 ... +15 bar (-14.5 ... +217.6 psi)		GB
Stainless steel field enclosure (small) with cable gland, IP65		4	0 ... 1 bar a (0 ... 14.5 psi a)		HA
Stainless steel field enclosure (small) with cable gland, IP67		5	0 ... 1.6 bar a (0 ... 23.2 psi a)		HB
Internal ventilation for measuring ranges < 16 bar (< 232 psi)			0 ... 2.5 bar a (0 ... 36.3 psi a)		HC
<b>Measured range</b>			0 ... 4 bar a (0 ... 58 psi a)		HD
0 ... 160 mbar (0 ... 2.32 psi)		BB	0 ... 6 bar a (0 ... 87 psi a)		HE
0 ... 250 mbar (0 ... 3.63 psi)		BC	0 ... 10 bar a (0 ... 145 psi a)		JA
0 ... 400 mbar (0 ... 5.8 psi)		BD	Special version (add Order code and plain text)		ZA P1Y
0 ... 600 mbar (0 ... 8.7 psi)		BE	<b>Explosion protection</b>		
0 ... 1 bar (0 ... 14.5 psi)		CA	without		1
0 ... 1.6 bar (0 ... 23.2 psi)		CB	with, to ATEX 100a, II 2 G, Ex ib IIC T6		2
0 ... 2.5 bar (0 ... 36.3 psi)		CC	<b>Further designs</b>		Order code
0 ... 4 bar (0 ... 58 psi)		CD	Please add "-Z" to Article No. and specify Order code		
0 ... 6 bar (0 ... 87 psi)		CE	<b>Hygiene version</b>		P01
0 ... 10 bar (0 ... 145 psi)		DA	Roughness of process connection: Foil $R_a < 0.8 \mu\text{m}$ ( $3.15 \cdot 10^{-8}$ inch); Welded seams $R_a < 1.5 \mu\text{m}$ ( $5.9 \cdot 10^{-8}$ inch)		
0 ... 16 bar (0 ... 232 psi)		DB	<b>Integral cooling element</b>		K01
0 ... 25 bar (0 ... 363 psi)		DC	Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)		
0 ... 40 bar (0 ... 580 psi)		DD	<b>Connections for pipe</b>		R01 R02 R03
-160 ... 0 mbar (-2.32 ... 0 psi)		EB	Pipes to DIN 11850		
-250 ... 0 bar (-3.73 ... 0 psi)		EC	ISO pipes to DIN 2463		
-400 ... 0 bar (-5.8 ... 0 psi)		ED	Pipes to O. D. Tubing "BS 4825 Part 1"		
-600 ... 0 bar (-8.7 ... 0 psi)		EE	<b>Certificates</b>		C11 C12 C17
-1 ... 0 bar (-14.5 ... 0 psi)		FA	Quality test certificate, 5-point factory calibration (IEC 60770-2)		
-1 ... 0.6 bar (-14.5 ... 8.7 psi)		FB	Inspection certificate to EN 10204-3.1		
-1 ... 1.5 bar (-14.5 ... 21.8 psi)		FC	Use of FDA-listed remote seal filling liquids certified by factory certificate according to EN 10204-2.2		
-1 ... 3 bar (-14.5 ... 43.5 psi)		FD	Roughness depth measurement $R_a$ certified by factory certificate according to EN 10204-3.1		C18
-1 ... 5 bar (-14.5 ... 72.5 psi)		FE	Certification to EHEDG for inline seals with aseptic screwed gland to DIN 11864		C19

# Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

## SITRANS P Compact for gauge and absolute pressure

1

### Selection and Ordering data

**SITRANS P Compact pressure transmitters for pressure and absolute pressure with inline seal**

2-wire system  
Process temperature up to 140 °C (284 °F)  
Accuracy: 0.2 % of upper range value  
Output 4 ... 20 mA

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Inline seal (screwed gland at both ends) with quick-release clamps

Milk pipe union to DIN 11851 with threaded socket

- DN 25
- DN 32
- DN 40
- DN 50
- DN 65

Clamp connection to DIN 32676

- DN 25
- DN 32
- DN 40
- DN 50
- DN 65

Clamp connection to ISO 2852<sup>1)</sup>

- 1 inch
- 1½ inch
- 2 inch
- 2½ inch

Special version  
(add Order code and plain text)

#### Filling liquid

Food oil, FDA-listed

Special version  
(add Order code and plain text)

#### Output signal

4 ... 20 mA

Special version  
(add Order code and plain text)

<sup>1)</sup> Please note the internal diameter of the pipe. Please specify pipe classes (see "Further designs")

Article No. Ord. code

7MF8010 -

2

AD

AE

AF

AG

AH

CD

CE

CF

CG

CH

DM

DN

DP

DQ

ZA

J 1 Y

3

9

L 1 Y

1

M 1 Y

### Selection and Ordering data

**SITRANS P Compact pressure transmitters for pressure and absolute pressure with inline seal**

2-wire system  
Process temperature up to 140 °C (284 °F)  
Accuracy: 0.2 % of upper range value  
Output 4 ... 20 mA

#### Inline seal with aseptic connection

Aseptic screwed gland to DIN 11864-1, form A with threaded socket

- 1 inch
- 1½ inch
- 2 inch

Aseptic screwed NEUMO with threaded socket<sup>1)</sup>

- DN 25
- DN 32
- DN 40
- DN 50
- DN 65

Aseptic screwed NEUMO with clamp connection, form R<sup>1)</sup>

- DN 25
- DN 32
- DN 40
- DN 50

Aseptic screwed gland SÜDMO with threaded socket W 501<sup>1)</sup>

- 1 inch
- 1½ inch
- 2 inch

Aseptic screwed gland SÜDMO with clamp connection W 601<sup>1)</sup>

- 1 inch
- 1½ inch
- 2 inch

Special version  
(add Order code and plain text)

#### Filling liquid

Food oil, FDA-listed

Medicinal white oil

Special version  
(add Order code and plain text)

#### Output signal

4 ... 20 mA

Special version  
(add Order code and plain text)

<sup>1)</sup> Please specify as well: Connections for pipes: R01, R02 or R03, see table "Further designs" on next page

Article No. Ord. code

7MF8010 -

2

QM

QN

QP

SD

SE

SF

SG

SH

TD

TE

TF

TG

VM

VN

VP

WM

WN

WP

ZA

J 1 Y

3

2

9

L 1 Y

1

9

M 1 Y

Selection and Ordering data	Article No.	Ord. code	Selection and Ordering data	Article No.	Ord. code
<b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with inline seal</b>	7MF8010-		<b>SITRANS P Compact pressure transmitters for pressure and absolute pressure with inline seal</b>	7MF8010-	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA	2		2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA	2	
<b>Enclosure design (stainless steel mat. No. 1.4404/316L) / electr. connection</b>			<b>Measured range</b> <b>Overload pressure</b> (continued)		
Enclosure with angled plug to DIN 43650, IP65, union nut made of polyamide	1		-1 ... 9 bar (-14.5 ... 130.5 psi)	60 bar (870 psi)	GA
Enclosure with device plug M12, IP65, union nut made of polyamide	2		-1 ... 15 bar (-14.5 ... 217.6 psi)	60 bar (870 psi)	GB
Enclosure with device plug M12, IP65, union nut made of stainless steel	3		0 ... 1 bar a (0 ... 14.5 psi a)	3 bar a (43.5 psi a)	HA
Stainless steel field enclosure (small) with cable gland, IP65	4		0 ... 1.6 bar a (0 ... 23.2 psi a)	10 bar (145 psi)	HB
Stainless steel field enclosure (small) with cable gland, IP67	5		0 ... 2.5 bar a (0 ... 36.3 psi a)	10 bar a (145 psi a)	HC
Internal ventilation for measuring ranges < 16 bar (< 232 psi)			0 ... 4 bar a (0 ... 58 psi a)	10 bar a (145 psi a)	HD
			0 ... 6 bar a (0 ... 87 psi a)	60 bar a (870 psi a)	HE
<b>Measured range</b> <b>Overload pressure</b>			0 ... 10 bar a (0 ... 145 psi a)	60 bar a (870 psi a)	JA
0 ... 160 mbar (0 ... 2.32 psi)	1 bar (14.5 psi)	BB	Special version (add Order code and plain text)		ZA    P1Y
0 ... 250 mbar (0 ... 3.63 psi)	1 bar (14.5 psi)	BC	<b>Explosion protection</b>		
0 ... 400 mbar (0 ... 5.8 psi)	3 bar (43.5 psi)	BD	without	1	
0 ... 600 mbar (0 ... 8.7 psi)	3 bar (43.5 psi)	BE	with, to ATEX 100a, II 2 G, Ex ib IIC T6	2	
0 ... 1 bar (0 ... 14.5 psi)	3 bar (43.5 psi)	CA	<b>Further designs</b>	Order code	
0 ... 1.6 bar (0 ... 23.2 psi)	10 bar (145 psi)	CB	Please add "-Z" to Article No. and specify Order code		
0 ... 2.5 bar (0 ... 36.3 psi)	10 bar (145 psi)	CC	<b>Hygiene version</b>	P01	
0 ... 4 bar (0 ... 58 psi)	20 bar (290 psi)	CD	Roughness of process connection: Foil $R_a < 0.8 \mu\text{m}$ ( $3.15 \cdot 10^{-8}$ inch); Welded seams $R_a < 1.5 \mu\text{m}$ ( $5.9 \cdot 10^{-8}$ inch)		
0 ... 6 bar (0 ... 87 psi)	60 bar (870 psi)	CE	<b>Integral cooling element</b>	K01	
0 ... 10 bar (0 ... 145 psi)	60 bar (870 psi)	DA	Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)		
0 ... 16 bar (0 ... 232 psi)	60 bar (870 psi)	DB	<b>Connections for pipe</b>		
0 ... 25 bar (0 ... 363 psi)	60 bar (870 psi)	DC	Pipes to DIN 11850	R01	
0 ... 40 bar (0 ... 580 psi)	100 bar (1450 psi)	DD	ISO pipes to ISO 2463	R02	
			Pipes to O. D. Tubing "BS 4825 Part 1"	R03	
			<b>Certificates</b>		
-160 ... 0 mbar (-2.32 ... 0 psi)	1 bar (14.5 psi)	EB	Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11	
-250 ... 0 bar (-3.73 ... 0 psi)	1 bar (14.5 psi)	EC	Inspection certificate to EN 10204-3.1	C12	
-400 ... 0 bar (-5.8 ... 0 psi)	3 bar (43.5 psi)	ED	Use of FDA-listed remote seal filling liquids certified by factory certificate according to EN 10204-2.2	C17	
-600 ... 0 bar (-8.7 ... 0 psi)	3 bar (43.5 psi)	EE	Roughness depth measurement $R_a$ certified by factory certificate according to EN 10204-3.1	C18	
-1 ... 0 bar (-14.5 ... 0 psi)	3 bar (43.5 psi)	FA	Certification to EHEDG for inline seals with aseptic screwed gland to DIN 11864	C19	
-1 ... 0.6 bar (-14.5 ... 8.7 psi)	10 bar (145 psi)	FB			
-1 ... 1.5 bar (-14.5 ... 21.8 psi)	10 bar (145 psi)	FC			
-1 ... 3 bar (-14.5 ... 43.5 psi)	20 bar (290 psi)	FD			
-1 ... 5 bar (-14.5 ... 72.5 psi)	20 bar (290 psi)	FE			

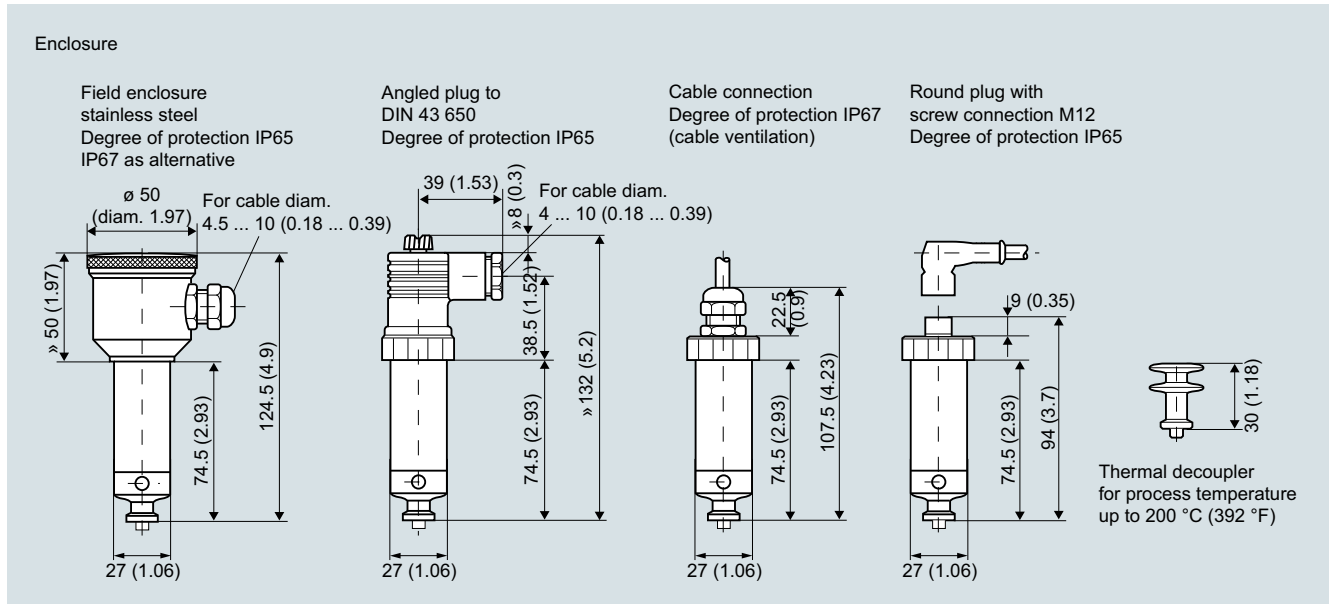
# Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

## SITRANS P Compact for gauge and absolute pressure

### Dimensional drawings



SITRANS P Compact, dimenclosureensions in mm (inch)

### Process connections

Diaphragm seal with quick-release clamp

**Milk pipe union to DIN 11851 with slotted union nut**

DN	PN	H mm (inch)	G
25	40	24 (0.95)	Rd. 52 x 1/6"
32	40	24 (0.95)	Rd. 58 x 1/6"
40	40	24 (0.95)	Rd. 65 x 1/6"
50	25	25.1 (0.99)	Rd. 78 x 1/6"
65	25	28.6 (1.13)	Rd. 95 x 1/6"

**Milk pipe union to DIN 11851 with threaded socket**

DN	PN	H mm (inch)	G
25	40	-	Rd. 52 x 1/6"
32	40	20 (0.79)	Rd. 58 x 1/6"
40	40	20 (0.79)	Rd. 65 x 1/6"
50	25	20 (0.79)	Rd. 78 x 1/6"
65	25	22 (0.87)	Rd. 95 x 1/6"

**Clamp connection to DIN 32676**

DN	PN	H mm (inch)	D mm (inch)
25	16	14 (0.55)	50.5 (2)
40	16	14 (0.55)	50.5 (2)
50	16	14 (0.55)	64 (2.52)

**Clamp connection to ISO 2852**

DN	PN	H mm (inch)	D mm (inch)
1"	16	14 (0.55)	50.5 (2)
1½"	16	12 (0.47)	50.5 (2)
2"	16	14 (0.55)	64 (2.52)
2½"	16	14 (0.55)	77.5 (3.05)

**IDF standard with slotted union nut**

DN	PN	H mm (inch)	G inch (IDF thread)
1"	40	21 (0.83)	1"
1½"	40	13.5 (0.53)	1½"
2"	25	15 (0.59)	2"

**IDF standard with threaded socket**

DN	PN	H mm (inch)	G inch (IDF thread)
1"	40	21 (0.83)	1"
1½"	40	13.5 (0.53)	1½"
2"	25	15 (0.59)	2"

**SMS standard with slotted union nut**

DN	PN	H mm (inch)	G
1"	40	16 (0.63)	Rd 40 x 1.6"
1½"	40	16 (0.63)	Rd 60 x 1.6"
2"	25	16 (0.63)	Rd 70 x 1.6"

**SMS standard with threaded socket**

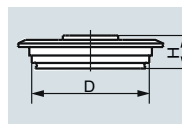
DN	PN	H mm (inch)	G
1"	40	16 (0.63)	Rd 40 x 1.6"
1½"	40	20 (0.79)	Rd 60 x 1.6"
2"	25	20 (0.79)	Rd 70 x 1.6"

**DRD flange, without welding-type flange**

DN	PN	H mm (inch)	D mm (inch)
50	40	16.7 (0.66)	65.5 (2.58)



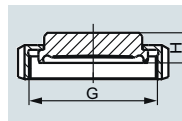
## Varivent connection



DN	PN	H mm (inch)	D mm (inch)
25	25	19 (0.75)	50 (1.97)
40 ... 125	25/10	19 (0.75)	68 (2.68)

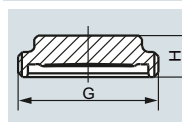
## Diaphragm seal with aseptic connection

## Aseptic screwed gland to DIN 11864-1, form A, with slotted union nut



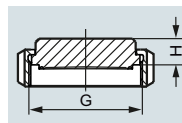
DN	PN	H mm (inch)	G
1"	40	20 (0.79)	Rd 52 x 1/6"
1½"	40	20 (0.79)	Rd 58 x 1/6"
2"	25	20 (0.79)	Rd 65 x 1/6"
2½"	25	20 (0.79)	Rd 78 x 1/6"

## Aseptic screwed gland to DIN 11864-1, form A, with threaded socket



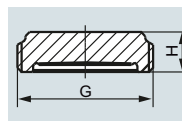
DN	PN	H mm (inch)	G
1"	40	15 (0.59)	Rd 52 x 1/6"
1½"	40	15 (0.59)	Rd 58 x 1/6"
2"	25	15 (0.59)	Rd 65 x 1/6"
2½"	25	15 (0.59)	Rd 78 x 1/6"

## Aseptic screwed NEUMO BioConnect with slotted union nut



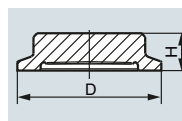
DN	PN	H mm (inch)	G
25	16	15 (0.59)	M 42 x 2
32	16	15 (0.59)	M 52 x 2
40	16	15 (0.59)	M 56 x 2
50	16	15 (0.59)	M 68 x 2

## Aseptic screwed NEUMO BioConnect with threaded socket



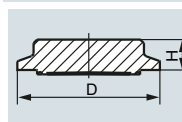
DN	PN	H mm (inch)	G
25	16	20 (0.79)	M 42 x 2
32	16	20 (0.79)	M 52 x 2
40	16	20 (0.79)	M 56 x 2
50	16	20 (0.79)	M 68 x 2

## Aseptic screwed NEUMO BioConnect with clamp connection, form R



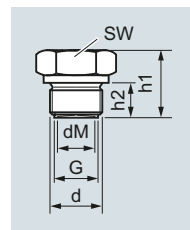
DN	PN	H mm (inch)	D mm (inch)
25	40	20 (0.79)	50.5 (2)
32	40	20 (0.79)	50.5 (2)
40	40	20 (0.79)	64 (2.52)
50	25	20 (0.79)	77.4 (3.05)

## Aseptic screwed NEUMO BioConnect with clamp connection, form V



DN	PN	H mm (inch)	D mm (inch)
25	40	15 (0.59)	50.5 (2)
32	40	15 (0.59)	50.5 (2)
40	40	15 (0.59)	64 (2.52)
50	25	15 (0.59)	77.4 (3.05)

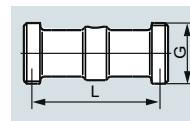
## Male thread DIN 3852, form A



G	d mm (inch)	d <sub>M</sub> mm (inch)	h <sub>1</sub> mm (inch)	h <sub>2</sub> mm (inch)	SW mm (inch)
G½A	26 (1.02)	17.5 (0.69)	27 (1.06)	14 (0.55)	27 (1.06)
G¾A	32 (1.26)	22.6 (0.89)	31 (1.22)	16 (0.63)	32 (1.26)
G1A	39 (1.54)	27 (1.06)	33 (1.30)	18 (0.71)	51 (2.01)
G1½A	55 (2.17)	40 (1.57)	40 (1.57)	22 (0.87)	55 (2.17)
G2A	68 (2.68)	51 (2.00)	42 (1.65)	24 (0.94)	70 (2.76)

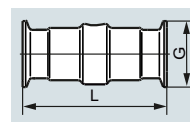
## Inline seal (screwed gland at both ends) with quick-release clamps

## Milk pipe union to DIN 11851 with threaded socket



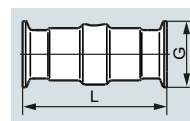
DN	PN	L mm (inch)	G
25	40	110 (4.33)	Rd 52 x 1/6"
32	40	110 (4.33)	Rd 58 x 1/6"
40	40	110 (4.33)	Rd 65 x 1/6"
50	25	110 (4.33)	Rd 78 x 1/6"
65	25	110 (4.33)	Rd 95 x 1/6"

## Clamp connection to DIN 32676



DN	PN	L mm (inch)	D mm (inch)
25	16	110 (4.33)	50.5 (2)
32	16	110 (4.33)	50.5 (2)
40	16	110 (4.33)	50.5 (2)
50	16	110 (4.33)	64 (2.52)
65	10	110 (4.33)	91 (3.58)

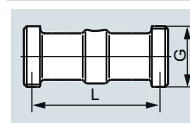
## Clamp connection to ISO 2852



DN	PN	L mm (inch)	D mm (inch)
1"	16	110 (4.33)	50.5 (2)
1½"	16	110 (4.33)	50.5 (2)
2"	16	110 (4.33)	64 (2.52)
2½"	16	110 (4.33)	91 (3.58)

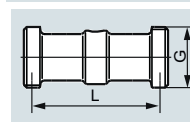
## Inline seal with aseptic connection

## Aseptic screwed gland to DIN 11864-1, form A, with threaded socket



DN	PN	L mm (inch)	G
1"	40	110 (4.33)	Rd 52 x 1/6"
1½"	40	110 (4.33)	Rd 65 x 1/6"
2"	25	110 (4.33)	Rd 78 x 1/6"

## Aseptic screwed NEUMO BioConnect with threaded socket



DN	PN	L mm (inch)	G
25	16	110 (4.33)	M 42 x 2
32	16	110 (4.33)	M 52 x 2
40	16	110 (4.33)	M 56 x 2
50	16	110 (4.33)	M 68 x 2
65	16	110 (4.33)	M 90 x 3

## Pressure Measurement

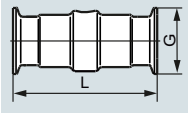
Pressure transmitters

Single-range transmitters for general applications

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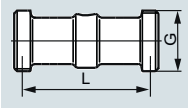
### SITRANS P Compact for gauge and absolute pressure

#### Aseptic screwed NEUMO BioConnect with clamp connection, form R



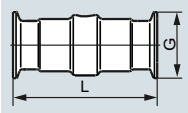
DN	PN	L mm (inch)	D mm (inch)
25	16	110 (4.33)	50.4 (2)
32	16	110 (4.33)	50.4 (2)
40	16	110 (4.33)	64 (2.52)
50	16	110 (4.33)	77.4 (3.05)

#### Aseptic screwed gland SÜDMO with threaded socket W 501



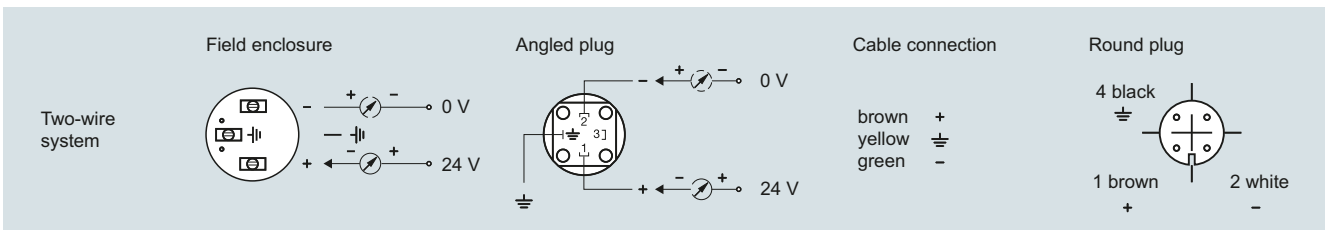
DN	PN	L mm (inch)	G
1"	25	110 (4.33)	Rd 44 x 1/6"
1½"	25	110 (4.33)	Rd 58 x 1/6"
2"	20	110 (4.33)	Rd 78 x 1/6"

#### Aseptic screwed gland SÜDMO with threaded socket W 601



DN	PN	L mm (inch)	D mm (inch)
1"	16	110 (4.33)	50.5 (2)
1½"	16	110 (4.33)	64 (2.52)
2"	16	110 (4.33)	77.5 (3.05)

### Schematics



SITRANS P Compact, connection diagram

## Overview



The SITRANS P300 is a digital pressure transmitter for relative and absolute pressure. The conventional thread versions are available as process connections, as are flush-mounted versions. A large number of the flush-mounted versions are suitable for food and pharmaceutical applications, and satisfy the EHEDG and 3A hygiene requirements.

The output signal is a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION signal, which is linearly proportional to the input pressure. Communication is via HART protocol or PROFIBUS PA interface. Convenient buttons for easy local operation of the basic settings of the pressure transmitter.

The SITRANS P300 has a single-chamber stainless steel enclosure. The pressure transmitter is approved with "intrinsically safe" type of protection. It can be used in zone 1 or zone 0.

## Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- Extensive diagnosis and simulation functions
- Minimum conformity error
- Small long-term drift
- Wetted parts made of high-grade materials (such as stainless steel, Hastelloy)
- Measuring range 0.008 bar to 400 bar (0.1 psi to 5802 psi)
- High measuring accuracy
- Parameterization over control keys and HART or PROFIBUS PA or FOUNDATION Fieldbus

## Application

The pressure transmitter is available in versions for gauge pressure and for absolute pressure. The output signal is always a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION Fieldbus signal, which is linearly proportional to the input pressure. The pressure transmitter measures aggressive, non-aggressive and hazardous gases, as well as vapors and liquids.

It can be used for the following measurement types:

- Gauge pressure
- Absolute pressure

With appropriate parameter settings, it can also be used for the following additional measurement types:

- Level
- Volume
- Mass

The "intrinsically-safe" Ex version of the transmitter can be installed in hazardous areas (zone 1). The transmitters are provided with an EC type examination certificate and comply with the respective harmonized European standards of ATEX.

### Gauge pressure

This variant measures aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest measuring span is 0.01 bar (0.15 psi), the largest is 400 bar (5802 psi).

### Level

With appropriate parameter settings, the gauge pressure variant measures the level of aggressive, non-aggressive and hazardous liquids.

For measuring the level in an open container you require one device; for measuring the level in a closed container, you require two devices and a process control system.

### Absolute pressure

This variant measures the absolute pressure of aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest measuring span is 0.008 bar a (0.12 psi a), the largest is 30 bar a (435 psi a).

## Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

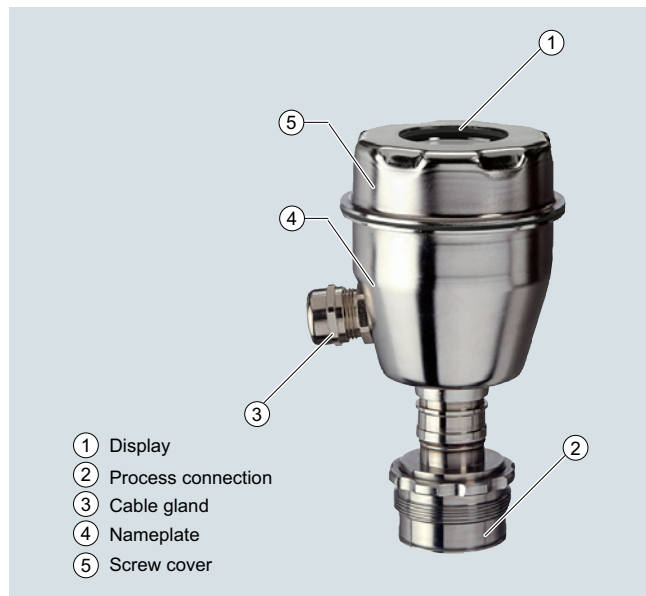
### SITRANS P300 for gauge and absolute pressure

1

#### Design

The device comprises:

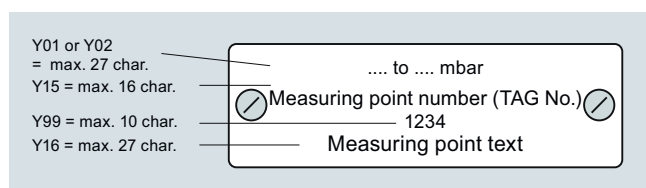
- Electronics
- Enclosure
- Measuring cell



Perspective view of SITRANS P300

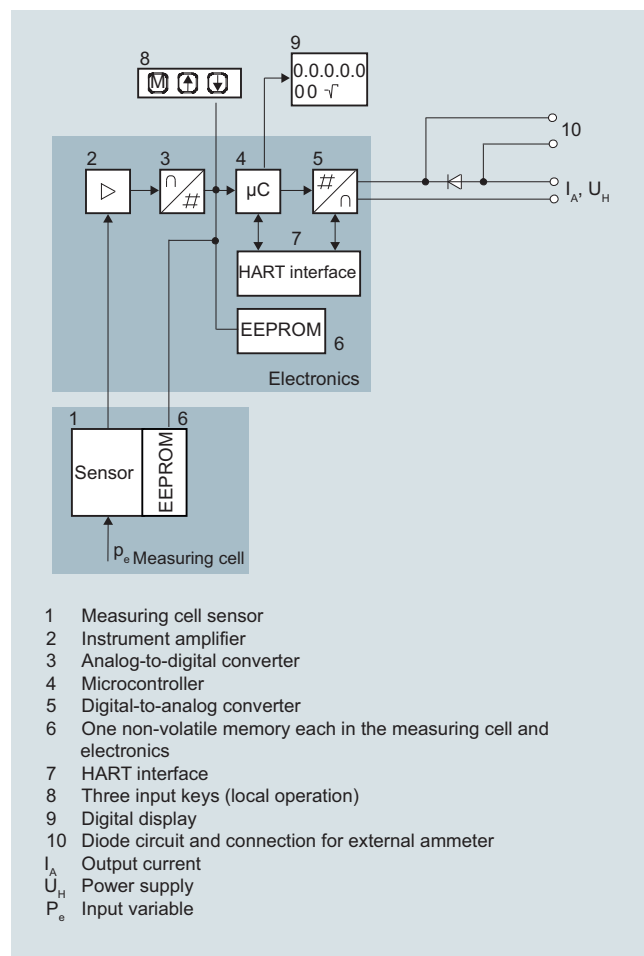
The enclosure has a screw-on lid (5) and, depending on the version, is with or without an inspection window. The electrical terminal enclosure, the buttons for operation of the device are located under this lid and, depending on the version, the display. The connections for the auxiliary power  $U_H$  and the shield are in the terminal enclosure. The cable gland is mounted on the side of the enclosure. The measuring cell with the process connection (2) is located on the bottom of the enclosure. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device version.

#### Example of attached measuring points sign



#### Function

##### Operation of electronics with HART communication



Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitalized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected according to linearity and thermal characteristics. In a digital-to-analog converter (5) it is then converted into the output current of 4 to 20 mA. A diode circuit provides reverse polarity protection. You can make an uninterrupted current measurement with a low-ohm ammeter at the connection (10). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked to the measuring cell, the second to the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a display (9), you can use this to track mode settings and other messages. The basic mode settings can be changed with a computer via the HART modem (7).

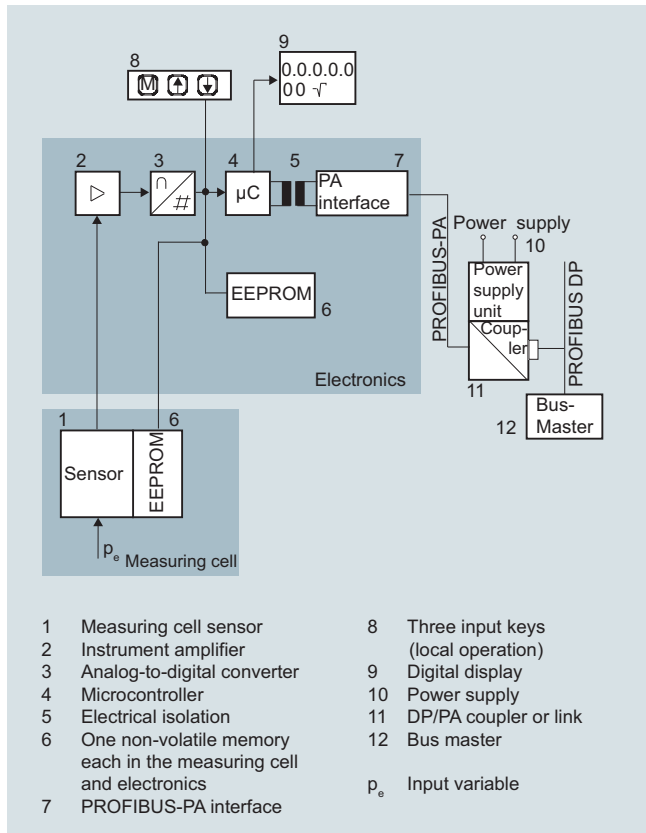
# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

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### Operation of electronics with PROFIBUS PA communication

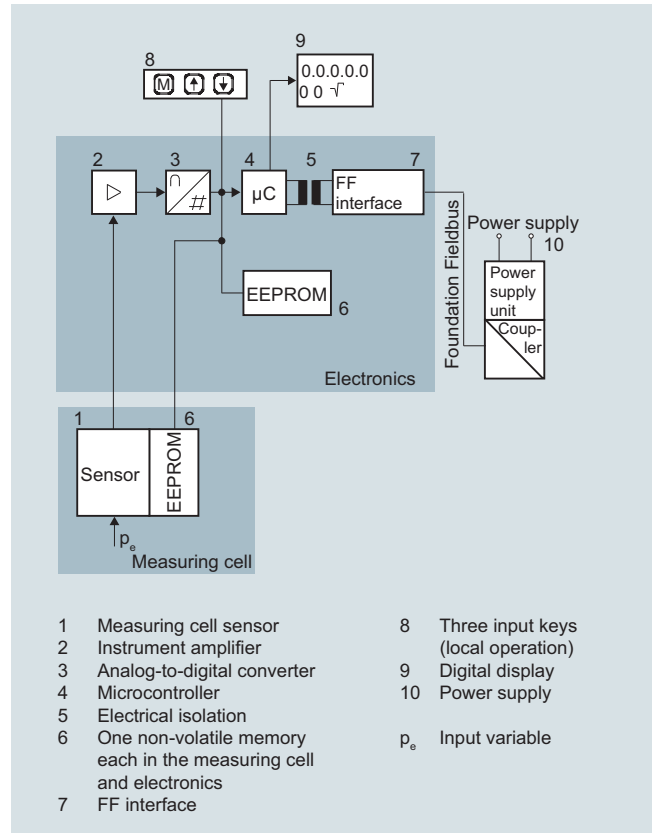


Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitalized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected according to linearity and thermal characteristics. It is then made available at the PROFIBUS PA over an electrically isolated PROFIBUS PA interface (7). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked to the measuring cell, the second to the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a display (9), you can use this to track mode settings and other messages. The basic mode settings (12) can be changed with a computer over the bus master.

### Operation of electronics with FOUNDATION Fieldbus communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") amplified by the measuring amplifier (2) and digitalized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

#### Mode of operation of the measuring cells

The process connections available include the following:

- G $\frac{1}{2}$
- $\frac{1}{2}$ -14 NPT
- Flush-mounted diaphragm:
  - Flanges to EN
  - Flanges to ASME
  - NuG and pharmaceutical connections

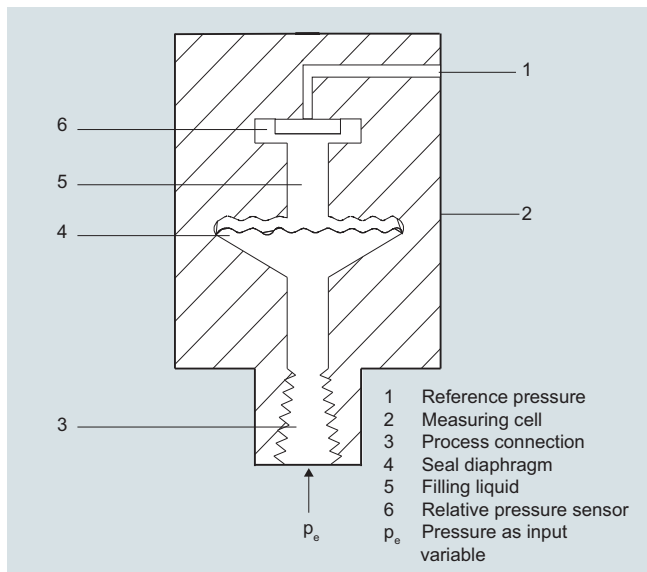
## Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

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### SITRANS P300 for gauge and absolute pressure

#### Measuring cell for gauge pressure

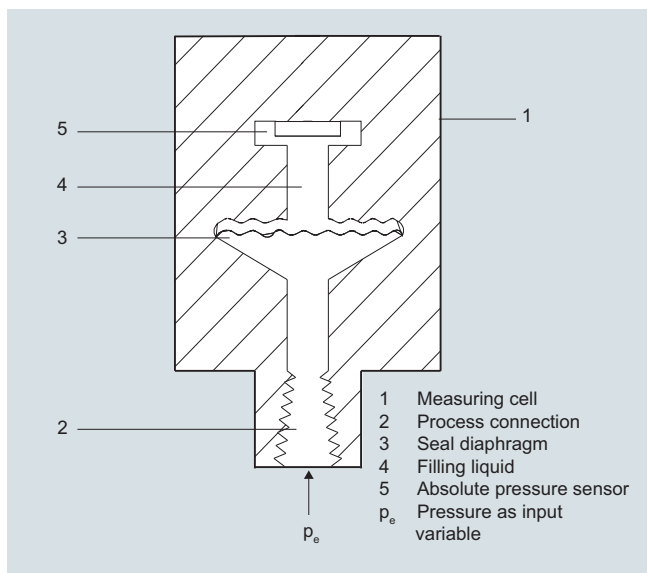


Measuring cell for gauge pressure, function diagram

The input pressure ( $p_e$ ) is transferred to the gauge pressure sensor (6) via the seal diaphragm (4) and the filling liquid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Transmitters with measuring spans  $\leq 63$  bar ( $\leq 926.1$  psi) measure the input pressure compared to atmospheric, transmitters with measuring spans of  $\geq 160$  bar ( $\geq 2352$  psi) compared to a vacuum.

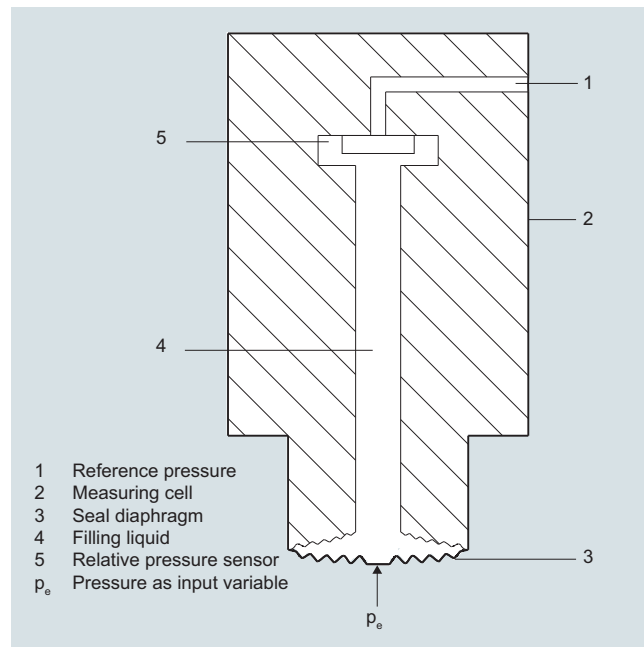
#### Measuring cell for absolute pressure



Measuring cell for absolute pressure, function diagram

The input pressure ( $p_e$ ) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

#### Measuring cell for gauge pressure, front-flush diaphragm

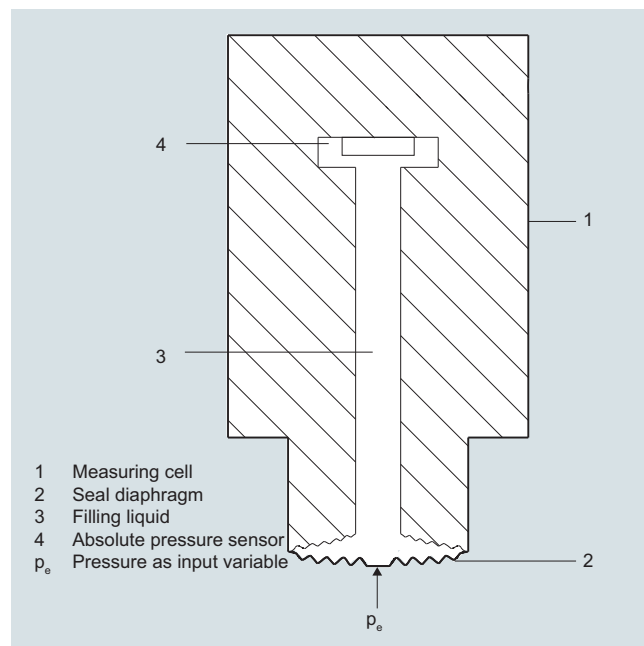


Measuring cell for gauge pressure, front-flush diaphragm, function diagram

The input pressure ( $p_e$ ) is transferred to the gauge pressure sensor (6) via the seal diaphragm (4) and the filling liquid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Transmitters with measuring spans  $\leq 63$  bar ( $\leq 926.1$  psi) measure the input pressure compared to atmospheric, transmitters with measuring spans of  $\geq 160$  bar ( $\geq 2352$  psi) compared to a vacuum.

#### Measuring cell for absolute pressure, front-flush diaphragm



Measuring cell for absolute pressure, front-flush diaphragm, function diagram

# Pressure Measurement

## Pressure transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

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The input pressure ( $p_e$ ) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

#### Parameterization

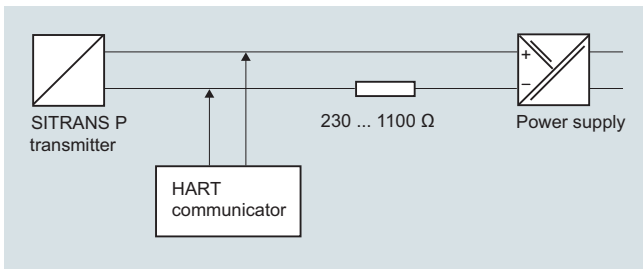
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

#### Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

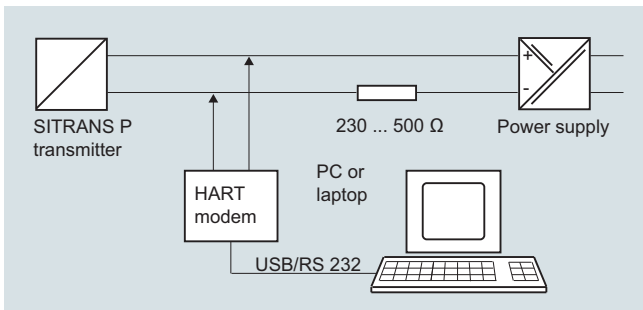
#### Parameterization using HART communication

Parameterization using HART communication is performed with a HART communicator or a PC.



Communication between a HART communicator and a pressure transmitter

When parameterizing with the HART communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

#### Adjustable parameters on SITRANS P300 with HART communication

Parameters	Input keys	HART communication
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Lower range value without application of a pressure ("Blind setting")	x	x
Upper range value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
Current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x <sup>1)</sup>
Type of dimension and actual dimension	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

<sup>1)</sup> Cancel apart from write protection

#### Diagnostic functions for SITRANS P300 with HART communication

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

#### Available physical units of display for SITRANS P300 with HART communication

Table style: Technical specifications 2

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

## Pressure Measurement

Pressure transmitters  
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### SITRANS P300 for gauge and absolute pressure

#### Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. The PROFIBUS connects the SITRANS P300 PA to a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

#### Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the P300 is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

#### Adjustable parameters for SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

Adjustable parameters	Input keys	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

#### Diagnostic functions for SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

#### Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Mass	g, kg, t, lb, Ston, Lton, oz
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
volume flow	m <sup>3</sup> /s, m <sup>3</sup> /min, m <sup>3</sup> /h, m <sup>3</sup> /d, l/s, l/min, l/h, l/d, Ml/d, ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d
Mass flow	g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d
Total mass flow	t, kg, g, lb, oz, LTon, STon
Temperature	K, °C, °F, °R
Miscellaneous	%

#### Hygiene version

In the case of the SITRANS P300 with 7MF812-... front-flush diaphragm, selected connections comply with the requirements of the EHEDG or 3A. You will find further details in the order form. Please note in particular that the seal materials used must comply with the requirements of 3A. Similarly, the filling liquids used must be FDA-compliant.



## Technical specifications

### SITRANS P300 for gauge and absolute pressure

#### Gauge pressure input

Measured variable

Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

(for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
8.3 ... 250 mbar 0.83 ... 25 kPa 0.12 ... 3.6 psi	250 mbar 25 kPa 3.6 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7 MPa 972 psi	100 bar 10 MPa 1450 psi
1.6 ... 160 bar 0.16 ... 16 MPa 23 ... 2321 psi	160 bar 16 MPa 2321 psi	167 bar 16.7 MPa 2422 psi	250 bar 2.5 MPa 3626 psi
4 ... 400 bar 0.4 ... 40 kPa 58 ... 5802 psi	400 bar 40 kPa 5802 psi	400 bar 40 MPa 5802 psi	600 bar 60 MPa 8700 psi

Lower measuring limit

(for 250mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.)

- Measuring cell with silicone oil
- Measuring cell with inert filling liquid

Upper measuring limit

30 mbar a/3 kPa a/0.44 psi a

30 mbar a/3 kPa a/0.44 psi a

100 % of max. measuring span

(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 ° (140 °F) ambient temperature/temperature of medium)

#### Absolute pressure input

Measured variable

Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

Absolute pressure

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
8.34 ... 250 mbar a 0.83 ... 25 kPa a 3.35 ... 100 inH <sub>2</sub> O a 0.13 ... 3.63 psi a	250 mbar a 25 kPa a 100 inH <sub>2</sub> O a	1.5 bar a 150 kPa a 21.8 psi a	6 bar a 600 kPa a 87 psi a
43.34 ... 1300 mbar a 4.33 ... 130 kPa a 17.42 ... 522.4 inH <sub>2</sub> O a 0.63 ... 18.86 psi a	1300 mbar a 130 kPa a 525 inH <sub>2</sub> O	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
0.17 ... 5 bar a 17 ... 500 kPa a 2.43 ... 72.5 psi a	5000 mbar a 500 kPa a 72.5 psi a	10 bar a 1 MPa a 145 psi a	30 bar a 3 MPa a 435 psi a
1 ... 30 bar a 0.1 ... 3 MPa a 14.6 ... 435 psi a	30 bar a 3 MPa a 435 psi a	45 bar a 4.5 MPa a 653 psi a	100 bar a 10 MPa a 1450 psi a

# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

### SITRANS P300 for gauge and absolute pressure

Lower measuring limit	0 mbar a/0 kPa a /0 psi a
<ul style="list-style-type: none"> <li>Measuring cell with silicone oil</li> </ul>	0 mbar a/0 kPa a /0 psi a
<ul style="list-style-type: none"> <li>Measuring cell with inert filling liquid</li> <li>- for temperature of medium <math>-20\text{ °C} &lt; \vartheta \leq +60\text{ °C}</math> (<math>-4\text{ °F} &lt; \vartheta \leq +140\text{ °F}</math>)</li> <li>- for temperature of medium <math>60\text{ °C} &lt; \vartheta \leq +100\text{ °C}</math> (max. <math>85\text{ °C}</math> for measuring cell 30 bar) (<math>140\text{ °F} &lt; \vartheta \leq +212\text{ °F}</math> (max. <math>185\text{ °F}</math> for meas. cell 435 psi))</li> </ul>	30 mbar a/3 kPa a/0.44 psi a
Upper measuring limit	100 % of max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi und $60\text{ °C}$ ( $140\text{ °F}$ ) ambient temperature/temperature of medium)
Lower range value	Between the measuring limits (fully adjustable)

### Input of gauge pressure, with front-flush diaphragm

Measured variable	Gauge pressure, front-flush			
Measuring span (infinitely adjustable) or nominal measuring range, max. permissible operating pressure and max. test pressure	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>		
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi)
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
	0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7 MPa 972 psi	100 bar 10 MPa 1450 psi
Lower measuring limit	100 mbar a/10 kPa a/1.45 psi a			
<ul style="list-style-type: none"> <li>Measuring cell with silicone oil filling</li> </ul>	100 mbar a/10 kPa a/1.45 psi a			
<ul style="list-style-type: none"> <li>Measuring cell with inert filling liquid</li> </ul>	100 mbar a/10 kPa a/1.45 psi a			
<ul style="list-style-type: none"> <li>Measuring cell with Neobee</li> </ul>	100 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit	100% of max. measuring span			

### Input of absolute pressure, with front-flush diaphragm

Measured variable	Absolute pressure, front-flush			
Measuring span (infinitely adjustable) or nominal measuring range and max. permissible test pressure	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>		
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17 ... 525 inH <sub>2</sub> O a	1300 mbar a 130 kPa a 525 inH <sub>2</sub> O a	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
	160 ... 5000 mbar a 16 ... 500 kPa a 2.32 ... 72.5 psi a	5000 mbar a 500 kPa a 72.5 psi a	10 bar a 1 MPa a 145 psi a	30 bar a 3 MPa a 435 psi a
	1 ... 30 bar a 0.1 ... 3 MPa a 14.5 ... 435 psi a	30 bar a 3 MPa a 435 psi a	45 bar a 4.5 MPa a 653 psi a	100 bar a 10 MPa a 1450 psi a
	Depending on the process connection, the measuring span may differ from these values			
Lower measuring limit	0 mbar a/0 kPa a/0 psi a			
Upper measuring limit	100 % of max. measuring span			

<b>Output</b>	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>
Output signal	4 ... 20 mA	Digital PROFIBUS PA or FOUNDATION Fieldbus signal
Physical bus	-	IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)	

**SITRANS P300 for gauge and absolute pressure****Measuring accuracy for gauge pressure**

Reference conditions

According to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Measuring cell with silicone oil
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nominal measuring range}$ 

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

 $r \leq 1.25 : \leq 0.075 \%$   
 $1.25 < r \leq 30 : \leq (0.008 \cdot r + 0.065) \%$ 

- 1 bar/100 kPa/14.5 psi  
 4 bar/400 kPa/58 psi  
 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi

 $r \leq 5 : \leq 0.075 \%$   
 $5 < r \leq 100 : \leq (0.005 \cdot r + 0.05) \%$ 

- 400 bar/40 MPa/5802 psi

 $r \leq 3 : \leq 0.075 \%$   
 $3 < r \leq 10 : \leq (0.0029 \cdot r + 0.071) \%$   
 $10 < r \leq 100 : \leq (0.005 \cdot r + 0.05) \%$ 
Influence of ambient temperature  
(in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.16 \cdot r + 0.1) \%$ 

- 1 bar/100 kPa/14.5 psi  
 4 bar/400 kPa/58 psi  
 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi  
 400 bar/40 MPa/5802 psi

 $\leq (0.07 \cdot r + 0.08) \%$ Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.25 \cdot r) \%$  per year

- 1 bar/100 kPa/14.5 psi  
 4 bar/400 kPa/58 psi

 $\leq (0.25 \cdot r) \%$  in 5 years

- 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi  
 400 bar/40 MPa/5802 psi

 $\leq (0.125 \cdot r) \%$  in 5 years

Effect of mounting position

 $\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$  per 10° inclination  
 (zero point correction is possible with position error compensation)
Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and  
FOUNDATION Fieldbus $3 \cdot 10^{-5}$  of the nominal measuring range

# Pressure Measurement

Pressure transmitters  
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## SITRANS P300 for gauge and absolute pressure

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### SITRANS P300 for gauge and absolute pressure

#### Measuring accuracy for absolute pressure

Reference conditions

According to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Measuring cell with silicone oil
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

-  $r \leq 10$

$\leq 0.1 \%$

-  $10 < r \leq 30$

$\leq 0.2 \%$

Influence of ambient temperature  
(in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

$\leq (0.15 \cdot r + 0.1) \%$

- 1300 mbar a/130 kPa a/18.8 psi a  
5 bar a/500 kPa a/72.5 psi a  
30 bar a/3000 kPa a/435 psi a

$\leq (0.08 \cdot r + 0.16) \%$

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

$\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position (in pressure per change in angle)

$\leq 0.05$  mbar/0.005 kPa/0.000725 psi per 10° inclination  
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of the rated nominal measuring range

#### Measuring accuracy for gauge and absolute pressure, with front-flush diaphragm

According to IEC 60770-1

Reference conditions

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Measuring cell with silicone oil
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

-  $r \leq 5$

$\leq 0.075 \%$

-  $5 < r \leq 100$

$\leq (0.005 \cdot r + 0.05) \%$

-  $r \leq 10$

-

$\leq 0.2 \%$

-  $10 < r \leq 30$

-

$\leq 0.4 \%$

Influence of ambient temperature  
(as percentage per 28 °C (50 °F))

$\leq (0.08 \cdot r + 0.16) \%$

$\leq (0.16 \cdot r + 0.24) \%$

Effect of temperature of medium  
(in pressure per temperature change)

- Temperature difference between temperature of medium and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

$(0.25 \cdot r) \%$  in 5 years

Effect of mounting position (in pressure per change in angle)

0.4 mbar/0.04 kPa/0.006 per 10° inclination  
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of the nominal measuring range

#### Gauge pressure, with front-flush diaphragm

#### Absolute pressure, with front-flush diaphragm

## SITRANS P300 for gauge and absolute pressure

### Operating conditions

#### Installation conditions

Ambient temperature	Observe the temperature class in areas subject to explosion hazard.
• Measuring cell with silicone oil	-40 ... +85 °C (-40 ... +185 °F)
• Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)	-10 ... +85 °C (14 ... +185 °F)
• Measuring cell with inert liquid	-40 ... +85 °C (-40 ... +185 °F)
• Display readable	-30 ... +85 °C (-22 ... +185 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (for Neobee: -20 ... +85 °C (-4 ... +185 °F)) (for temperature oil: -10 ... +85 °C (14 ... +165 °F))
Climatic class	
Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics
Degree of protection	
• according to EN 60529	IP65, IP68
• according to NEMA 250	IP65, IP68, Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)
Electromagnetic Compatibility	
• Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21

#### Medium conditions

Temperature of medium	
• Measuring cell with silicone oil	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with silicone oil (FDA-compliant, with flush-mounted diaphragm)	-40 ... +150 °C (-40 ... +302 °F)
• Measuring cell with Neobee oil "Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)	-10 ... +150 °C (-14 ... +302 °F)
• Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)	-40 ... +200 °C (-40 ... +392 °F)
• Measuring cell with Neobee oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)	-10 ... +200 °C (14 ... +392 °F)
• Measuring cell with inert liquid	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with high-temperature oil (only for gauge pressure version with flush-mounted diaphragm)	-10 ... +250 °C (14 ... 482 °F)

### Design (standard version)

Weight (without options)	Approx. 800 g (1.8 lb)
Enclosure material	Stainless steel, mat. no. 1.4301/304
Material of parts in contact with the medium	
• Connection shank	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
• Oval flange	Stainless steel, mat. no. 1.4404/316L
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
• Measuring cell filling	<ul style="list-style-type: none"> <li>• Silicone oil</li> <li>• Inert filling liquid</li> </ul>
Process connection	<ul style="list-style-type: none"> <li>• G½B to EN 837-1</li> <li>• Female thread ½-14 NPT</li> <li>• Oval flange PN 160 (MAWP 2320 psi) with fastening thread:               <ul style="list-style-type: none"> <li>- 7/16 -20 UNF to IEC 61518/DIN EN 61518</li> <li>- M10 as per DIN 19213</li> </ul> </li> </ul>

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### SITRANS P300 for gauge and absolute pressure

#### SITRANS P300 for gauge and absolute pressure

##### Design (version with front-flush diaphragm)

Weight (without options)	approx. 1 ... 13 kg (2.2 ... 29 lb)
Enclosure material	Stainless steel, mat. no. 1.4301/304
Material of parts in contact with the medium	
• Process connection	Stainless steel, mat. no. 1.4404/316L
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L
• Measuring cell filling	<ul style="list-style-type: none"> <li>• Silicone oil</li> <li>• Inert filling liquid</li> <li>• FDA compliant fill fluid (Neobee oil)</li> </ul>
Process connection	<ul style="list-style-type: none"> <li>• Flanges as per EN and ASME</li> <li>• F&amp;B and pharmaceutical flanges</li> </ul>
Surface quality touched-by-media	$R_a$ -values $\leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$ )/welds $R_a \leq 1.6 \mu\text{m}$ (64 $\mu\text{-inch}$ ) (Process connections acc. to 3A; $R_a$ -values $\leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$ )/welds $R_a \leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$ ))

##### Power supply $U_H$

	HART	PROFIBUS PA/FOUNDATION Fieldbus
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	
Power supply	-	Supplied through bus
Separate supply voltage	-	Not necessary
Bus voltage		
• Without Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Max. basic current	-	12.5 mA
• Start-up current $\leq$ basic current	-	Yes
• Max. fault current in the event of a fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P300 for gauge and absolute pressure		
Certificates and approvals	HART	PROFIBUS PA/ FOUNDATION Fieldbus
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 4, paragraph 3 (sound engineering practice)	
Water, waste water	Pending	
<u>Explosion protection</u>		
Intrinsic safety "i"	PTB 05 ATEX 2048	
<ul style="list-style-type: none"> <li>• Marking</li> <li>• Permissible ambient temperature               <ul style="list-style-type: none"> <li>- Temperature class T4</li> <li>- Temperature class T5</li> <li>- Temperature class T6</li> </ul> </li> <li>• Connection</li> </ul>	II1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb  -40 ... +85 °C (-40 ... +185 °F) -40 ... +70 °C (-40 ... +158 °F) -40 ... +60 °C (-40 ... +140 °F)	To certified intrinsically-safe circuits with peak values: <u>FISCO supply unit:</u> $U_i = 17.5 \text{ V}$ , $I_i = 380 \text{ mA}$ , $P_i = 5.32 \text{ W}$  <u>Linear barrier:</u> $U_i = 24 \text{ V}$ , $I_i = 250 \text{ mA}$ , $P_i = 1.2 \text{ W}$ $C_i = 1.1 \text{ nF}$ $L_i \leq 7 \mu\text{H}$
<ul style="list-style-type: none"> <li>• Effective inner capacitance:</li> <li>• Effective internal inductance:</li> </ul> Explosion protection to FM for USA <u>and</u> Canada (cFM <sub>US</sub> )	$C_i = 6 \text{ nF}$ $L_i = 0.4 \text{ mH}$	
<ul style="list-style-type: none"> <li>• Identification (DIP) or (IS); (NI)</li> </ul>	Certificate of Compliance 3025099 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	
<ul style="list-style-type: none"> <li>• Identification (DIP) or (IS)</li> </ul>	Certificate of Compliance 3025099C CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	
Dust explosion protection for zone 20/21/22	PTB 05 ATEX 2048	
<ul style="list-style-type: none"> <li>• Marking</li> <li>• Permissible ambient temperature               <ul style="list-style-type: none"> <li>- Temperature class T4</li> <li>- Temperature class T5</li> <li>- Temperature class T6</li> </ul> </li> <li>• Connection</li> </ul>	II 1 D Ex ia IIC T120 °C Da II 1/2 D Ex ia IIC T120 °C Da/Db II 2 D Ex ib IIC T120 °C Db  -40 ... +85 °C (-40 ... +185 °F) (in the case of mineral glass windows only -20 ... +85 °C (-4 ... +185 °F)) -40 ... +70 °C (-40 ... +158 °F) (in the case of mineral glass windows only -20 ... +70 °C (-4 ... +158 °F)) -40 ... +60 °C (-40 ... +140 °F) (in the case of mineral glass windows only -20 ... +60 °C (-4 ... +140 °F))	
<ul style="list-style-type: none"> <li>• Effective inner capacitance:</li> <li>• Effective internal inductance:</li> </ul> Type of protection Ex nA/nL/ic (Zone 2)	$C_i = 6 \text{ nF}$ $L_i = 0.4 \mu\text{H}$	To certified intrinsically-safe circuits with peak values: $U_i = 24 \text{ V}$ , $I_i = 380 \text{ mA}$ , $P_i = 5.32 \text{ mW}$ $C_i = 5 \text{ nF}$ $L_i = 10 \mu\text{H}$
<ul style="list-style-type: none"> <li>• Marking</li> <li>• Permissible ambient temperature               <ul style="list-style-type: none"> <li>- Temperature class T4</li> <li>- Temperature class T5</li> <li>- Temperature class T6</li> </ul> </li> </ul>	PTB 05 ATEX 2048  II 2/3 G Ex ic IIC/IIB T4/T5/T6 Gb/Gc II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc  -40 ... +85 °C (-40 ... +185 °F) (in the case of mineral glass windows only -20 ... +85 °C (-4 ... +185 °F)) -40 ... +70 °C (-40 ... +158 °F) (in the case of mineral glass windows only -20 ... +70 °C (-4 ... +158 °F)) -40 ... +60 °C (-40 ... +140 °F) (in the case of mineral glass windows only -20 ... +60 °C (-4 ... +140 °F))	
<ul style="list-style-type: none"> <li>• Ex nA/nL connection</li> <li>• Ex ic connection</li> </ul>	To certified intrinsically-safe circuits with peak values: $U_m = 45 \text{ V}$ To certified intrinsically-safe circuits with peak values: $U_i = 45 \text{ V}$	To certified intrinsically-safe circuits with peak values: $U_m = 32 \text{ V}$ To certified intrinsically-safe circuits with peak values: $U_i = 32 \text{ V}$
<ul style="list-style-type: none"> <li>• Effective inner capacitance:</li> <li>• Effective internal inductance:</li> </ul>	$C_i = 6 \text{ nF}$ $L_i = 0.4 \text{ mH}$	$C_i = 5 \text{ nF}$ $L_i = 20 \mu\text{H}$

## Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

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#### HART Communication

HART communication	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM

#### PROFIBUS PA communication

Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting Address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0.1 or 2 (totalizer mode and reset function for dosing)
• Internal preprocessing	
Device profile	PROFIBUS PA Profile for Pro- cess Control Devices Version 3.0, class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure function	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a container characteristic with	Max. 30 nodes
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

#### FOUNDATION Fieldbus communication

Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function



# Pressure Measurement

## Pressure transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

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Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
<b>SITRANS P300 pressure transmitters for relative and absolute pressure</b> , single-chamber measuring enclosure, rating plate inscription in English			<b>SITRANS P300 pressure transmitters for relative and absolute pressure</b> , single-chamber measuring enclosure, rating plate inscription in English		
<b>4 ... 20 mA/HART</b>		<b>7 MF 8 0 2 3 -</b>	<b>4 ... 20 mA/HART</b>		<b>7 MF 8 0 2 3 -</b>
<b>PROFIBUS PA</b>		<b>7 MF 8 0 2 4 -</b>	<b>PROFIBUS PA</b>		<b>7 MF 8 0 2 4 -</b>
<b>FOUNDATION Fieldbus (FF)</b>		<b>7 MF 8 0 2 5 -</b>	<b>FOUNDATION Fieldbus (FF)</b>		<b>7 MF 8 0 2 5 -</b>
<a href="#">↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>					
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		<b>Display</b>		
Silicone oil	normal	1	• Without display, with keys, closed lid		1
Inert liquid	Cleanliness level 2 to DIN 25410	3	• With display and keys, closed lid <sup>11)</sup>		2
			• With display and keys, lid with polycarbonate disc		4
			• (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) <sup>11)</sup>		5
			• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc <sup>11)</sup>		6
			• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS and FOUNDATION Fieldbus equipment: pressure units) <sup>11)</sup>		7
			• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane <sup>11)</sup>		
<b>Measuring span (min. ... max.)</b>			<b>Power supply units</b> see Chap. 7 "Supplementary Components".		
8.3 ... 250 mbar	(0.12 ... 3.63 psi)	A	A quick-start guide is included in the scope of delivery of the device.		
0.01 ... 1 bar	(0.145 ... 14.5 psi)	B	1) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.		
0.04 ... 4 bar	(0.58 ... 58 psi)	C	2) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
0.16 ... 16 bar	(2.32 ... 232 psi)	D	3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF802-..Y.-..... and 7MF4900-1...-B		
0.63 ... 63 bar	(9.14 ... 914 psi)	E	4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
1.6 ... 160 bar	(23.2 ... 2320 psi)	F	5) Remote seal for direct mounting only available in combination with process connection 1/2-14 NPT.		
4 ... 400 bar	(58 ... 5802 psi)	G	6) M10 fastening thread: Max. measuring span 160 bar (2320 psi) 7/16-20 UNF and M12 fastening thread: Max. measuring span 400 bar (5802 psi)		
8.34 ... 250 mbar a	(0.13 ... 3.63 psi a)	Q	7) Only available together with electrical connection option A		
43.34 ... 1300 mbar a	(0.63 ... 18.86 psi a)	S	8) Only available together with electrical connection options B, C or G.		
0.17 ... 5 bar a	(2.43 ... 72.5 psi a)	T	9) Only together with HART electronics.		
1 ... 30 bar a	(14.6 ... 435 psi a)	U	10) Without cable gland.		
			11) Display cannot be turned.		
<b>Wetted parts materials</b>					
Seal diaphragm	Measuring cell				
Stainless steel	Stainless steel	A			
Hastelloy	Stainless steel	B			
Hastelloy	Hastelloy	C			
Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) 1) 2) 3) 4) 5)		Y			
<b>Process connection</b>					
• Connection shank G1/2B to EN 837-1		0			
• Female thread 1/2-14 NPT		1			
• Stainless steel oval flange with process connection (Oval flange has no female thread) 6)					
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		2			
- Mounting thread M10 to DIN 19213		3			
- Mounting thread M12 to DIN 19213		4			
• Male thread M20 x 1.5		5			
• Male thread 1/2 -14 NPT		6			
<b>Non-wetted parts materials</b>					
• Stainless steel, deep-drawn and electrolytically polished		4			
<b>Version</b>					
• Standard versions		1			
<b>Explosion protection</b>					
• None		A			
• With ATEX, Type of protection: - "Intrinsic safety (Ex ia)"		B			
• Zone 20/21/22 <sup>7)</sup>		C			
• Ex nA/nL (Zone 2) <sup>8)</sup>		E			
• with FM "intrinsic safety" (cFM <sub>US</sub> )		M			
<b>Electrical connection / cable entry</b>					
• Screwed gland M20x1.5 (polyamide) <sup>9)</sup>		A			
• Screwed gland M20x1.5 (metal)		B			
• Screwed gland M20x1.5 (stainless steel)		C			
• Device plug M12 (stainless steel), without cable socket		G			
• Screwed gland 1/2-14 NPT metal thread <sup>10)</sup>		H			
• Screwed gland 1/2-14 NPT stainless steel thread		J			

# Pressure Measurement

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## SITRANS P300 for gauge and absolute pressure

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Selection and Ordering data	Article No.
<b>SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane</b> , single-chamber measuring enclosure, rating plate inscription in English	
<b>4 ... 20 mA/HART</b>	7 MF 8 1 2 3 -
<b>PROFIBUS PA</b>	7 MF 8 1 2 4 -
<b>FOUNDATION Fieldbus (FF)</b>	7 MF 8 1 2 5 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
FDA compliant fill fluid	
• Neobee oil	4
<b>Measuring cell cleaning</b>	
normal	
<b>Measuring span (min. ... max.)</b>	
0.01 ... 1 bar (0.15 ... 14.5 psi)	B
0.04 ... 4 bar (0.58 ... 58 psi)	C
0.16 ... 16 bar (2.32 ... 232 psi)	D
0.63 ... 63 bar (9.14 ... 914 psi)	E
43.34 ... 1300 mbar a <sup>1)</sup> (0.63 ... 18.86 psi a <sup>1)</sup> )	S
0.17 ... 5 bar a <sup>1)</sup> (2.43 ... 72.5 psi a <sup>1)</sup> )	T
1 ... 30 bar a <sup>1)</sup> (14.6 ... 435 psi a <sup>1)</sup> )	U
<b>Wetted parts materials</b>	
Seal diaphragm	
Measuring cell	
Stainless steel	A
Hastelloy <sup>2)</sup>	B
<b>Process connection</b>	
• Flange version with Order code M., N., R.. or Q.. (see "Further designs")	7
<b>Non-wetted parts materials</b>	
• Stainless steel, deep-drawn and electrolytically polished	4
<b>Version</b>	
• Standard versions	1
<b>Explosion protection</b>	
• None	A
• With ATEX, Type of protection: - "Intrinsic safety (Ex ia)"	B
• Zone 20/21/22 <sup>3)</sup>	C
• Ex nA/nL (Zone 2) <sup>4)</sup>	E
• with FM "intrinsic safety" (cFM <sub>US</sub> )	M
<b>Electrical connection / cable entry</b>	
• Screwed gland M20x1.5 (polyamide) <sup>5)</sup>	A
• Screwed gland M20x1.5 (metal)	B
• Screwed gland M20x1.5 (stainless steel)	C
• Device plug M12 (stainless steel), without cable socket	G
• Screwed gland ½-14 NPT metal thread <sup>6)</sup>	H
• Screwed gland ½-14 NPT stainless steel thread <sup>6)</sup>	J

Selection and Ordering data	Article No.
<b>SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane</b> , single-chamber measuring enclosure, rating plate inscription in English	
<b>4 ... 20 mA/HART</b>	7 MF 8 1 2 3 -
<b>PROFIBUS PA</b>	7 MF 8 1 2 4 -
<b>FOUNDATION Fieldbus (FF)</b>	7 MF 8 1 2 5 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Display</b>	
• Without display, with keys, closed lid	1
• With display and keys, closed lid <sup>7)</sup>	2
• With display and keys, lid with polycarbonate disc (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) <sup>7)</sup>	4
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc <sup>7)</sup>	5
• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) <sup>7)</sup>	6
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane <sup>7)</sup>	7
<b>Power supply units</b> see Chap. 7 "Supplementary Components"	
A quick-start guide is included in the scope of delivery of the device.	
1) Not with temperature decoupler P00, not for process connections R01, R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.	
2) Only available for flanges with options M., N.. and Q..	
3) Only together with electrical connection option A.	
4) Only available together with electrical connection options B, C or G.	
5) Only together with HART electronics.	
6) Without cable gland.	
7) Display cannot be turned.	

# Pressure Measurement

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## SITRANS P300 for gauge and absolute pressure

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Selection and Ordering data	Order code			
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		HART	PA	FF
<b>Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) made of:</b> made completely of stainless steel, for wall or pipe mounting	A02	✓	✓	✓
<b>Cable socket for device plugs M12</b> • Stainless steel	A51	✓	✓	✓
<b>Rating plate inscription</b> (instead of English)				
• German	B10	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)<sup>1)</sup></b>	C11	✓	✓	✓
<b>Inspection certificate<sup>2)</sup></b> Acc. to EN 10204-3.1	C12	✓	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	✓
<b>Degree of protection IP65/IP68</b> (only for M20x1.5 and ½"-14 NPT)	D12	✓	✓	✓
<b>Degree of protection IP6k9k</b> (only for M20x1.5)	D46	✓	✓	✓
<b>CRN approval Canada</b> (Canadian Registration Number)	E22	✓	✓	✓
<b>Export approval Korea</b>	E11	✓	✓	✓
<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓	✓
<b>Ex Approval Ex ia/ib NEPSI</b>	E55	✓	✓	✓
<b>Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)</b>				
<b>Flange to EN 1092-1, Form B1</b> • DN 25, PN 40 <sup>3)</sup> • DN 40, PN 40 • DN 40, PN 100 • DN 50, PN 16 • DN 50, PN 40 • DN 80, PN 16 • DN 80, PN 40	M11 M13 M23 M04 M14 M06 M16	✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓
<b>Flanges to ASME B16.5</b> • 1", class 150 <sup>4)</sup> • 1½", class 150 • 2", class 150 • 3", class 150 • 4", class 150 • 1", class 300 <sup>4)</sup> • 1½", class 300 • 2", class 300 • 3", class 300 • 4", class 300	M40 M41 M42 M43 M44 M45 M46 M47 M48 M49	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
<b>Threaded connector to DIN 3852-2, form A, thread to ISO 228</b> • G ¾"-A, front-flush <sup>4)</sup> • G 1"-A, front-flush <sup>4)</sup> • G 2"-A, front-flush	R01 R02 R04	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
<b>Tank connection<sup>5)</sup></b> Sealing is included in delivery • TG 52/50, PN 40 • TG 52/150, PN 40	R10 R11	✓ ✓	✓ ✓	✓ ✓

Selection and Ordering data	Order code			
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		HART	PA	FF
<b>Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut)</b> • DN 50, PN 25 • DN 80, PN 25	N04 N06	✓ ✓	✓ ✓	✓ ✓
<b>Tri-Clamp connection according DIN 32676/ISO 2852</b> 3A compliant <sup>6)</sup> • DN 50/2", PN 16 • DN 65/2.5", PN 10 • Clamp 2" ISO 2852 PN 16 • Clamp 3" ISO 2852 PN 16	N14 N15 N22 N23	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓
<b>Varivent connection</b> 3A and EHEDG compliant <sup>6)</sup> • Type N = 68 for Varivent enclosure DN 40 ... 125 and 1½" ... 6", PN 40	N28	✓	✓	✓
<b>Temperature decoupler up to 200 °C<sup>7)</sup></b> for front-flush diaphragm version	P00	✓	✓	✓
<b>Sanitary process connection to DRD</b> • DN 50, PN 40	M32	✓	✓	✓
<b>SMS threaded socket</b> • 2" • 2½" • 3"	M73 M74 M75	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
<b>Sanitary process connection to NEUMO Bio-Connect screw connection</b> 3A and EHEDG compliant <sup>6)</sup> • DN 50, PN 16 • DN 65, PN 16 • DN 80, PN 16 • DN 100, PN 16 • DN 2", PN 16 • DN 2½", PN 16 • DN 3", PN 16 • DN 4", PN 16	Q05 Q06 Q07 Q08 Q13 Q14 Q15 Q16	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
<b>Sanitary process connection to NEUMO Bio-Connect S flange connection</b> • DN 2", PN 16	Q72	✓	✓	✓

# Pressure Measurement

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## SITRANS P300 for gauge and absolute pressure

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Selection and Ordering data	Order code			Selection and Ordering data	Order code				
<b>Further designs</b>		<b>HART</b>	<b>PA</b>	<b>FF</b>	<b>Additional data</b>		<b>HART</b>	<b>PA</b>	<b>FF</b>
Add "-Z" to Article No. and specify Order code.					Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Aseptic threaded socket to DIN 11864-1 Form A</b> 3A compliant <sup>6)</sup>					<b>Measuring range to be set</b> Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	<b>Y01</b>	✓	✓ <sup>8)</sup>	
• DN 50, PN 25	<b>N33</b>	✓	✓	✓	<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	<b>Y15</b>	✓	✓	✓
• DN 65, PN 25	<b>N34</b>	✓	✓	✓	<b>Measuring point text (entry in device variable)</b> Max. 27 characters, specify in plain text: Y16: .....	<b>Y16</b>	✓	✓	✓
• DN 80, PN 25	<b>N35</b>	✓	✓	✓	<b>Entry of HART TAG</b> Max. 8 characters, specify in plain text: Y17: .....	<b>Y17</b>	✓		
• DN 100, PN 25	<b>N36</b>	✓	✓	✓	<b>Setting of the display in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>1)</sup> , inH <sub>2</sub> O <sup>1)</sup> , ftH <sub>2</sub> O <sup>1)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % ) ref. temperature 20 °C	<b>Y21</b>	✓	✓	✓
<b>Aseptic flange with notch to DIN 11864-2 Form A</b> 3A compliant <sup>6)</sup>					<b>Setting of the display in non-pressure units<sup>9)</sup></b> Specify in plain text: Y22: .... up to .... l, m <sup>3</sup> , m, USg, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	<b>Y22 + Y01</b>	✓		
• DN 50, PN 16	<b>N43</b>	✓	✓	✓	<b>Preset bus address</b> (possible between 1 ... 126) Specify in plain text: Y25: .....	<b>Y25</b>		✓	✓
• DN 65, PN 16	<b>N44</b>	✓	✓	✓					
• DN 80, PN 16	<b>N45</b>	✓	✓	✓					
• DN 100, PN 16	<b>N46</b>	✓	✓	✓					
<b>Aseptic flange with groove to DIN 11864-2 Form A</b> 3A compliant <sup>6)</sup>									
• DN 50, PN 16	<b>N43 + P11</b>	✓	✓	✓					
• DN 65, PN 16	<b>N44 + P11</b>	✓	✓	✓					
• DN 80, PN 16	<b>N45 + P11</b>	✓	✓	✓					
• DN 100, PN 16	<b>N46 + P11</b>	✓	✓	✓					
<b>Aseptic clamp with groove to DIN 11864-3 Form A</b> 3A compliant <sup>6)</sup>									
• DN 50, PN 25	<b>N53</b>	✓	✓	✓					
• DN 65, PN 25	<b>N54</b>	✓	✓	✓					
• DN 80, PN 16	<b>N55</b>	✓	✓	✓					
• DN 100, PN 16	<b>N56</b>	✓	✓	✓					

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22 and Y25 can be factory preset

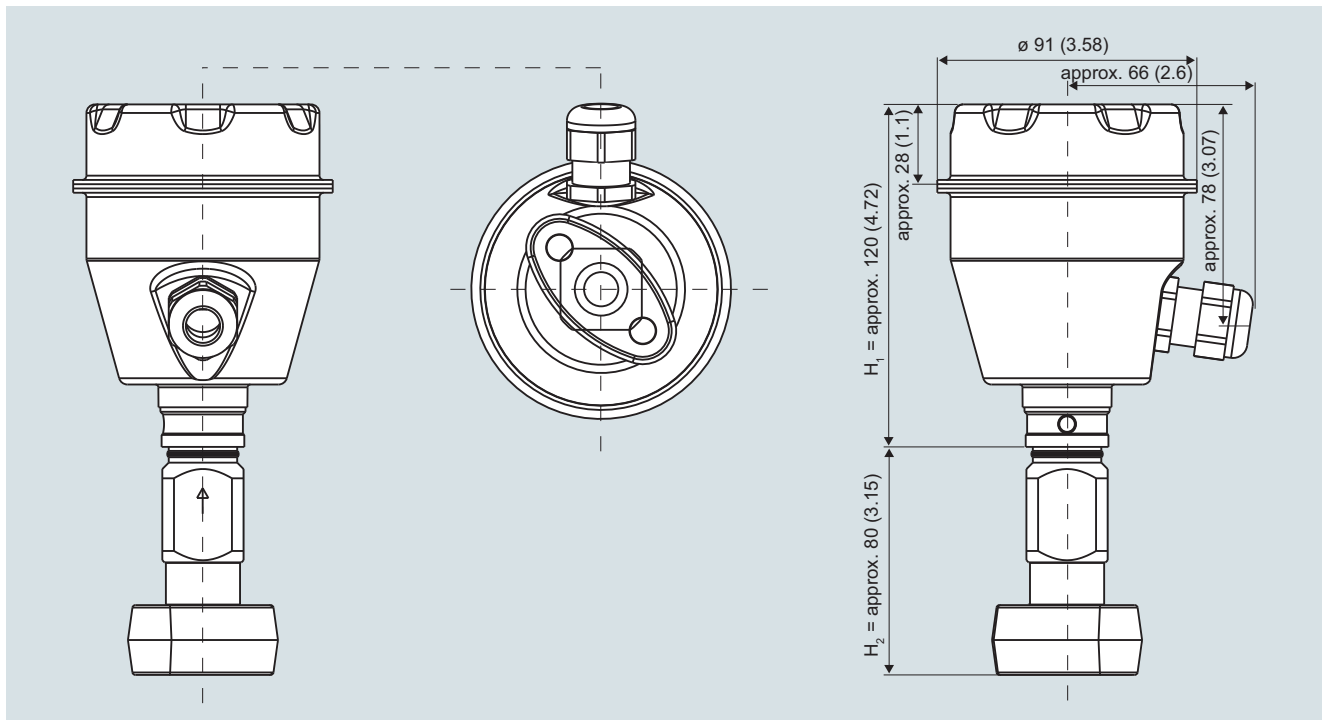
✓ = available

### Ordering example

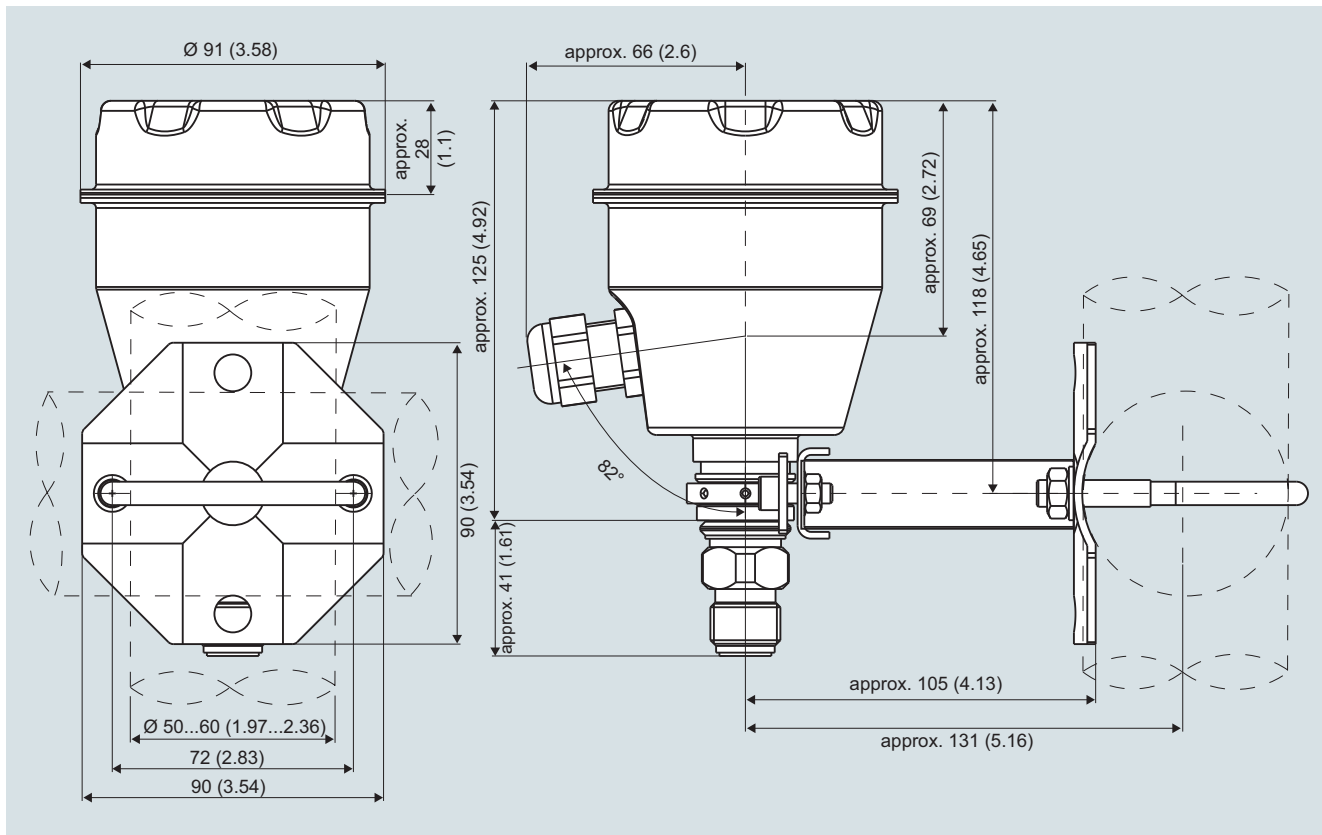
Item line: 7MF8023-1DB24-1AB7-Z  
B line: A02 + Y01 + Y21  
C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)  
C line: Y21: bar (psi)

- When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.
- If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- Special seal in Viton included in the scope of delivery (FKM; temperature range -20 ... +200 °C (-4 ... +392 °F))
- Cannot be combined with Order code P00. Can only be ordered with silicone oil measuring cell filling.
- The weldable socket can be ordered under accessories.
- 3A compliance ensured only when 3A compliant sealing rings are used.
- Conformity according to 3A and EHEDG. The maximum permissible temperatures of the medium depend on the respective cell fillings (see medium conditions).
- Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- Preset values can only be changed over SIMATIC PDM.

**Dimensional drawings**



SITRANS P300, with oval flange, dimensions in mm (inch)

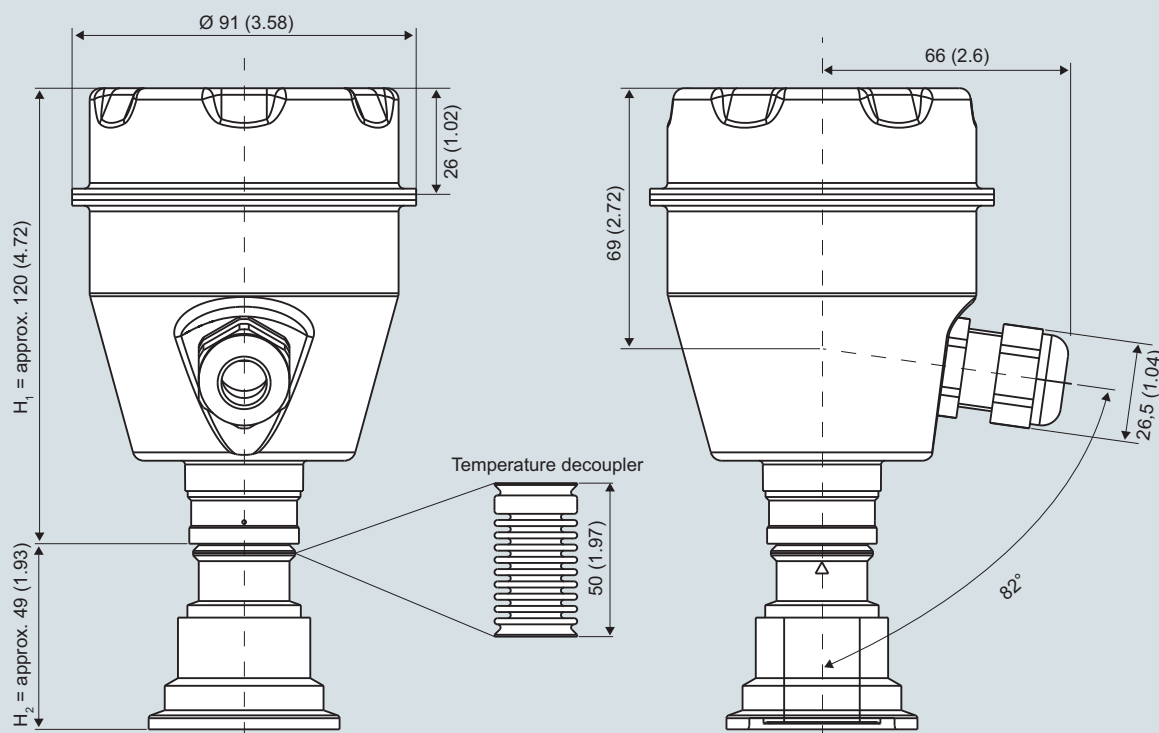


SITRANS P300, process connection M20 x 1.5, with mounted mounting bracket, dimensions in mm (inch)

## Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure



SITRANS P300, front-flush, dimensions in mm (inch)

The diagram shows a SITRANS P300 with an example of a flange. In this drawing the height is subdivided into  $H_1$  and  $H_2$ .

$H_1$  = Height of the SITRANS P300 up to a defined cross-section

$H_2$  = Height of the flange up to this defined cross-section

Only the height  $H_2$  is indicated in the dimensions of the flanges.

# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

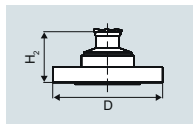
## SITRANS P300 for gauge and absolute pressure

1

### Flanges according to EN and ASME

#### Flange according to EN

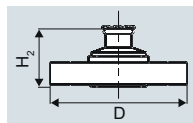
##### EN 1092-1



Order code	DN	PN	ØD	H <sub>2</sub>
M11	25	40	115 mm (4.5")	Approx. 52 mm (2")
M13	40	40	150 mm (5.9")	
M23	40	100	170 mm (6.7")	
M04	50	16	165 mm (6.5")	
M14	50	40	165 mm (6.5")	
M06	80	16	200 mm (7.9")	
M16	80	40	200 mm (7.9")	

#### Flanges according to ASME

##### ASME B16.5

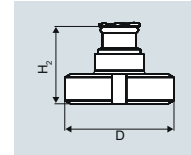


Order code	DN	PN	ØD	H <sub>2</sub>
M40	1"	150	110 mm (4.3")	Approx. 52 mm (2")
M41	1½"	150	130 mm (5.1")	
M42	2"	150	150 mm (5.9")	
M43	3"	150	190 mm (7.5")	
M44	4"	150	230 mm (9.1")	
M46	1½"	300	155 mm (6.1")	
M47	2"	300	165 mm (6.5")	
M48	3"	300	210 mm (8.1")	
M49	4"	300	255 mm (10.0")	

### NuG and pharmaceutical connections

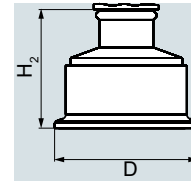
#### Connections to DIN

##### DIN 11851 (milk pipe union with slotted union nut)



Order code	DN	PN	ØD	H <sub>2</sub>
N04	50	25	92 mm (3.6")	Approx. 52 mm (2")
N06	80	25	127 mm (5.0")	

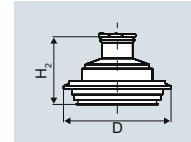
##### Tri-Clamp nach DIN 32676



Order code	DN	PN	ØD	H <sub>2</sub>
N14	50	16	64 mm (2.5")	Approx. 52 mm (2")
N15	65	10	91 mm (3.6")	

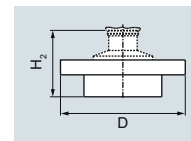
#### Other connections

##### Varivent connection



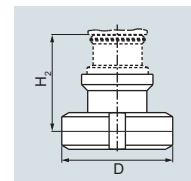
Order code	DN	PN	ØD	H <sub>2</sub>
N28	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

##### Sanitary process connection to DRD



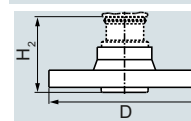
Order code	DN	PN	ØD	H <sub>2</sub>
M32	50	40	105 mm (4.1")	Approx. 52 mm (2")

##### Sanitary process screw connection to NEUMO Bio-Connect



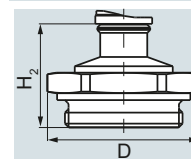
Order code	DN	PN	ØD	H <sub>2</sub>
Q05	50	16	82 mm (3.2")	Approx. 52 mm (2")
Q06	65	16	105 mm (4.1")	
Q07	80	16	115 mm (4.5")	
Q08	100	16	145 mm (5.7")	
Q13	2"	16	82 mm (3.2")	
Q14	2½"	16	105 mm (4.1")	
Q15	3"	16	105 mm (4.1")	
Q16	4"	16	145 mm (5.7")	

##### Sanitary process connection to NEUMO Bio-Connect S flange connection



Order code	DN	PN	ØD	H <sub>2</sub>
Q72	2"	16	125 mm (4.9")	Approx. 52 mm (2")

##### Threaded connection G¾", G1" and G2" acc. to DIN 3852



Order code	DN	PN	ØD	H <sub>2</sub>
R01	¾"	60	37 mm (1.5")	Approx. 45 mm (1.8")
R02	1"	60	48 mm (1.9")	Approx. 47 mm (1.9")
R04	2"	60	78 mm (3.1")	Approx. 52 mm (2")

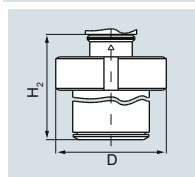
## Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

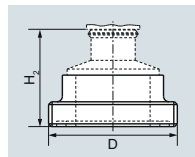
1

#### Tank connection TG 52/50 and TG52/150



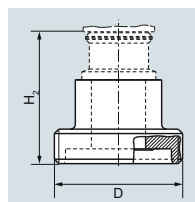
Order code	DN	PN	∅D	H <sub>2</sub>
R10	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
R11	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

#### SMS threaded socket



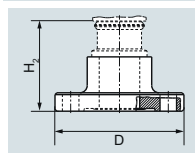
Order code	DN	PN	∅D	H <sub>2</sub>
M73	2"	25	70 x 1/6 mm	Approx. 52 mm (2")
M74	2½"	25	85 x 1/6 mm	
M75	3"	25	98 x 1/6 mm	

#### Aseptic threaded socket to DIN 11864-1 Form A



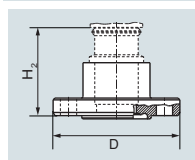
Order code	DN	PN	∅D	H <sub>2</sub>
N33	50	25	78 x 1/6"	Approx. 52 mm (2")
N34	65	25	95 x 1/6"	
N35	80	25	110 x ¼"	
N36	100	25	130 x ¼"	

#### Aseptic flange with notch to DIN 11864-2 Form A



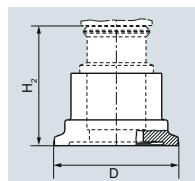
Order code	DN	PN	∅D	H <sub>2</sub>
N43	50	16	94	Approx. 52 mm (2")
N44	65	16	113	
N45	80	16	133	
N46	100	16	159	

#### Aseptic flange with groove to DIN 11864-2 Form A



Order code	DN	PN	∅D	H <sub>2</sub>
N43 + P11	50	16	94	Approx. 52 mm (2")
N44 + P11	65	16	113	
N45 + P11	80	16	133	
N46 + P11	100	16	159	

#### Aseptic clamp with groove to DIN 11864-3 Form A



Order code	DN	PN	∅D	H <sub>2</sub>
N53	50	25	77.5	Approx. 52 mm (2")
N54	65	25	91	
N55	80	16	106	
N56	100	16	130	



# Pressure Measurement

## Pressure transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 Accessories/Spare parts

1

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<i>Spare parts / Accessories</i>		<b>Documentation</b>	
<b>Mounting bracket and fastening parts kit</b> made of stainless steel	7MF8997-1AA	The entire documentation is available for download free-of-charge in various languages at: <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a>	
<b>Lid without window</b> gasket not included	7MF8997-1BA	Compact operating instructions	
<b>Lid with glass window</b> gasket not included	7MF8997-1BD	• English, German, Spanish, French, Italian, Dutch	A5E03434657
<b>NBR enclosure sealing</b>	7MF8997-1BG	<b>Certificates (order only via SAP)</b> instead of Internet download	
<b>Measuring point label</b> unlabeled	7MF8997-1CA	• hard copy (to order)	A5E03252406
<b>Cable gland</b> • metal • plastic (blue)	7MF8997-1EA 7MF8997-1EB	• on DVD (to order)	A5E03252407
<b>Weldable sockets for PMC connection</b> • PMC Style Standard: Thread 1½" • PMC Style Minibolt: front-flush 1"	7MF4997-2HA 7MF4997-2HB	<b>HART modem</b> with USB interface	7MF4997-1DB
<b>Gaskets for PMC connection</b> (packing unit = 5 units) • PTFE seal for PMC Style Standard: Thread 1½" • Gasket made of Viton for PMC Style Minibolt: front-flush 1"	7MF4997-2HC 7MF4997-2HD	Power supply units see Chap. 7 "Supplementary Components".	
<b>Weldable socket for TG 52/50 and TG 52/150 connection</b> • TG 52/50 connection • TG5 2/150 connection	7MF4997-2HE 7MF4997-2HF		
<b>Seals for TG 52/50 and TG 52/150 made of silicone</b>	7MF4997-2HG		
<b>Seals for flange connection with front-flush diaphragm</b> Material FKM (Viton); temperature range: -20 ... +200 °C (-4 ... +392 °F), 10 units • DN 25, PN 40 (M11) • 1", class 150 (M40)	7MF4997-2HH 7MF4997-2HK		

## Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

1

### SITRANS P300 - Factory-mounting of valve manifolds on transmitters

#### Overview

The SITRANS P300 transmitter for gauge and absolute pressure can be delivered factory-fitted with the following valve manifolds:

- 7MF9011-4EA and 7MF9011-4FA valve manifolds for gauge pressure and absolute pressure transmitters

#### Design

The 7MF9011-4EA valve manifolds are sealed with PTFE gaskets between the transmitter and the valve manifold as standard. Soft iron, stainless steel and copper gaskets are also available for sealing purposes if preferred.

The 7MF9011-4FA valve manifolds are sealed with PTFE sealing tape between the transmitter and the valve manifold.

The complete unit is checked for leaks under pressure after assembly (air pressure 6 bar (87 psi)) and certified with a factory certificate according to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the corresponding mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an inspection certificate 3.1 to EN 10204 after choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitter and for the valve manifold.

#### Selection and Ordering data

##### 7MF9011-4FA valve manifold on gauge and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P300 7MF802-...1.-...	<b>T03</b>
----------------------------------	------------

With process connection female thread ½-14 NPT in-sealed with PTFE sealing tape

Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2

##### Further designs:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	<b>A02</b>
--	------------

Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	<b>C12</b>
---	------------

##### 7MF9011-4EA valve manifold on gauge and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P300 7MF802-...0.-...	<b>T02</b>
----------------------------------	------------

with process connection collar G½ A to EN 837-1 with gasket made of PTFE between valve manifold and transmitter

##### Alternative sealing material:

- | • Soft iron                       | <b>A70</b> |
|-----------------------------------|------------|
| • Stainless steel, Mat. No. 14571 | <b>A71</b> |
| • copper                          | <b>A72</b> |

Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2

##### Further designs:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	<b>A02</b>
--	------------

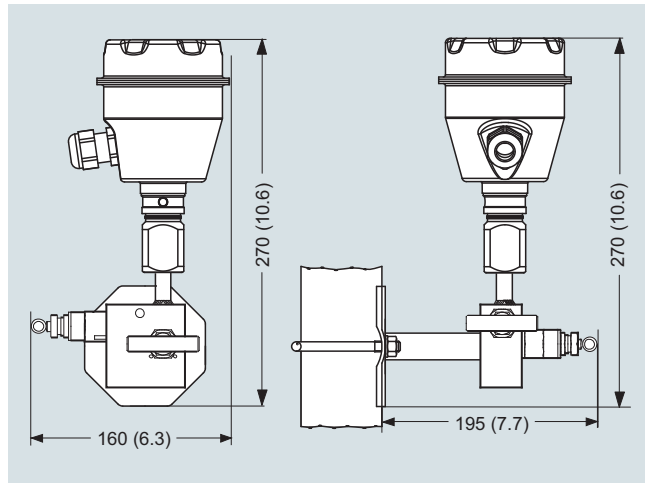
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	<b>C12</b>
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**Dimensional drawings**

**Valve manifolds mounted on SITRANS P300**



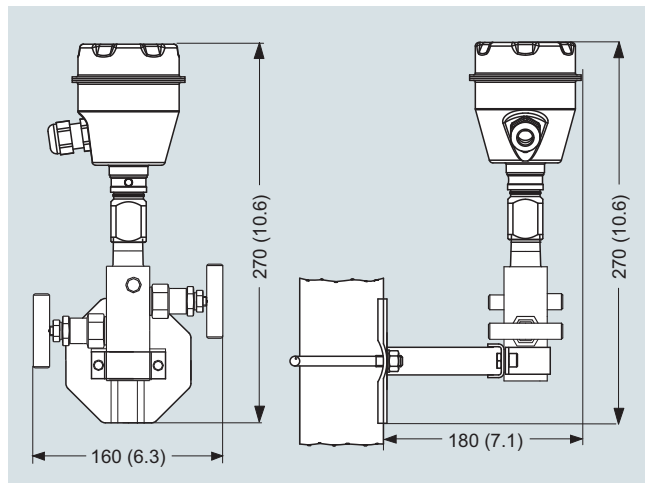
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)

## Pressure Measurement

Pressure transmitters  
for gauge pressure for the paper industry

1

### SITRANS P DS III and P300 with PMC connection - Technical description

#### Overview



The SITRANS P300 and DS III pressure transmitters have been fitted with special process connections for the paper industry. With the two process connection threads 1½" and 1" flush at the front, the SITRANS P300 and DS III transmitters can be used for all processes in the paper industry.

SITRANS P300 and SITRANS PDS III series pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys via HART, PROFIBUS-PA or FOUNDATION Fieldbus interface.

Extensive functionality enables the pressure transmitter to be precisely adapted to the plant's requirements. Operation is very simple in spite of the numerous setting options.

Transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Various versions of the pressure transmitters are available for measuring:

- Gauge pressure
- Level
- Mass level
- Volume level

#### Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads, e.g. abrasion.
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Minimum conformity error
- Small long-term drift
- Wetted parts made of Hastelloy
- Infinitely adjustable measuring spans from 0.03 bar to 16 bar (0.43 psi to 232 psi) for DS III with HART interface
- Nominal measuring range from 1 bar to 16 bar (14.5 psi to 232 psi) for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- Infinitely adjustable measuring spans from 0.03 bar to 16 bar (0.43 psi to 232 psi) for SITRANS P300 with HART interface
- Nominal measuring range from 1 bar to 16 bar (14.5 psi to 232 psi) for SITRANS P300 with PROFIBUS PA interface
- High measuring accuracy
- Parameterization over control keys and HART Communication, or over PROFIBUS PA or FOUNDATION Fieldbus interface (DS III only).

#### Application

The pressure transmitters of the DS III series, can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the DS III pressure transmitters suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 3 control keys or programmed externally over HART or over PROFIBUS-PA or FOUNDATION Fieldbus interface (only DS III).

#### **SITRANS P, DS III series**

Measured variable: Gauge pressure of aggressive and non-aggressive gases, vapors and liquids.

##### Measuring span (infinitely adjustable)

For DS III with HART: 0.03 ... 16 bar (0.433 ... 232 psi)

##### Nominal measuring range

For DS III with PROFIBUS PA or FOUNDATION Fieldbus: 1 ... 16 bar (14.5 ... 232 psi)

#### **SITRANS P300**

##### Measuring span (infinitely adjustable)

For DS III with HART: 0.03 ... 16 bar (0.433 ... 232 psi)

##### Nominal measuring range

For DS III with PROFIBUS PA or FOUNDATION Fieldbus: 1 ... 16 bar (14.5 ... 232 psi)

# Pressure Measurement

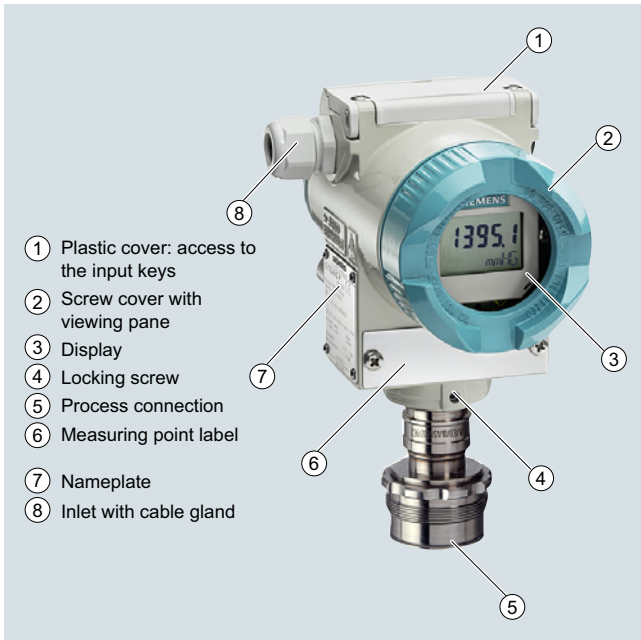
## Pressure transmitters for gauge pressure for the paper industry

### SITRANS P DS III and P300 with PMC connection - Technical description

1

#### Design

##### SITRANS P DS III



Device front view, SITRANS P DS III

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

The rating plate (7, Figure "Device front view") with the Article No. is located on the side of the enclosure. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

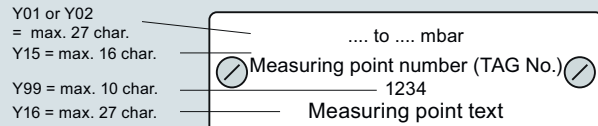
The approval label is located on the opposite side.

The enclosure is made of die-cast aluminium or stainless steel precision casting. A round cover is screwed on at the front and rear of the enclosure. The front cover (2) can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the enclosure.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the enclosure contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

At the top of the enclosure is a plastic cover (1), which hides the input keys.

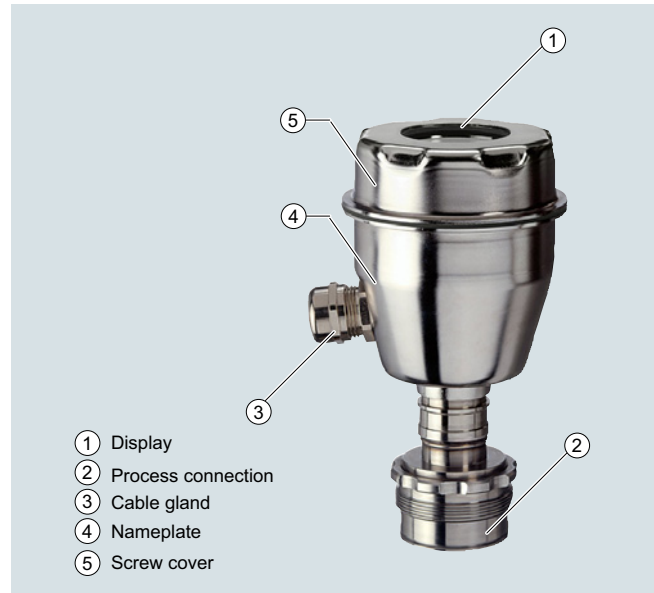
#### Example for an attached measuring point label



##### SITRANS P300

The device comprises:

- Electronics
- Enclosure
- Measuring cell



Perspective view of the SITRANS P300

The enclosure has a screw-on lid (5) and, depending on the version, is with or without an inspection window. The electrical terminal enclosure, the buttons for operation of the device are located under this lid and, depending on the version, the display. The connections for the auxiliary power UH and the shield are in the terminal enclosure. The cable gland is on the side of the enclosure. The measuring cell with the process connection (2) is located on the bottom of the enclosure. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device version.

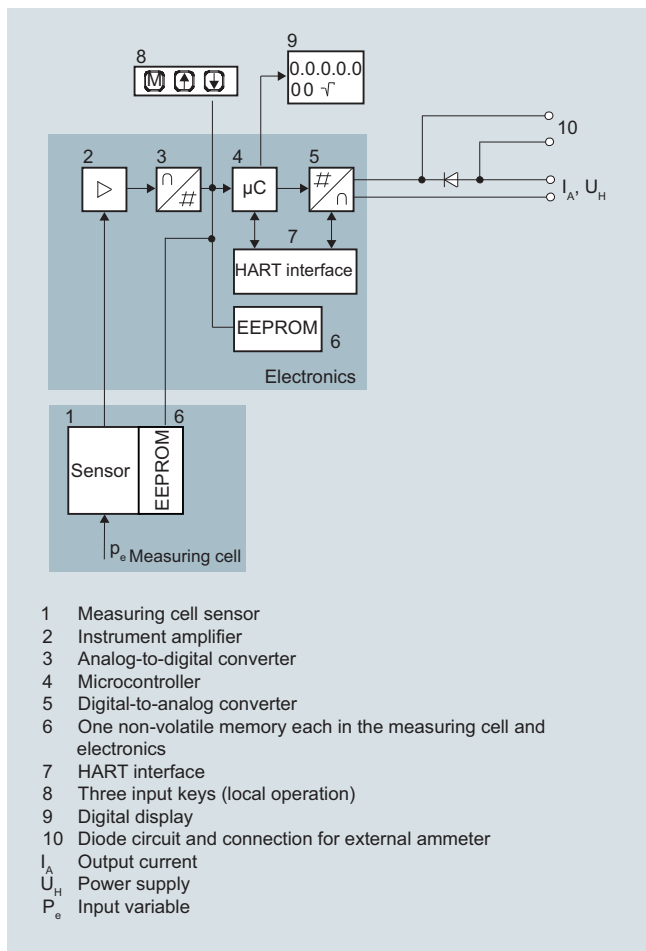
## Pressure Measurement

Pressure transmitters  
for gauge pressure for the paper industry

### SITRANS P DS III and P300 with PMC connection - Technical description

#### Function

##### Operation of electronics with HART communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

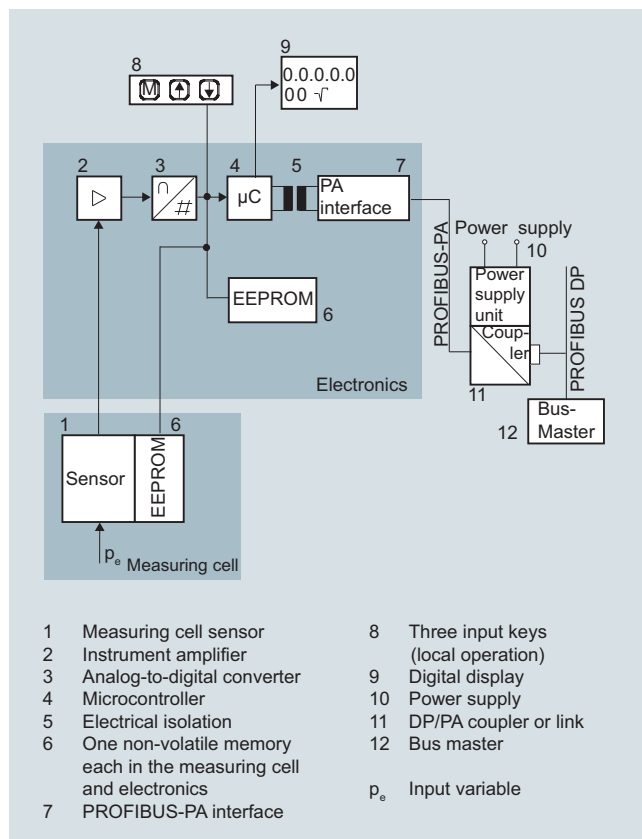
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with measuring measuring spans  $\leq 63$  bar (914 psi) measure the input pressure compared to atmosphere, the transmitters with measuring measuring spans 160 bar (2320 psi) measure compared to vacuum.

##### Operation of electronics with PROFIBUS PA communication



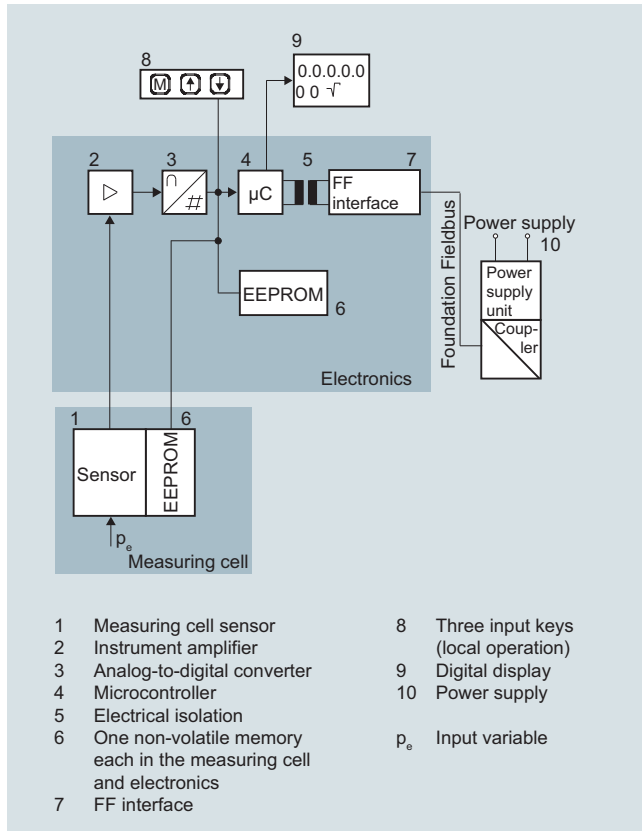
Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the PROFIBUS PA through an electrically isolated PA interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The first memory is linked with the measuring cell, the second with the electronics. This modular design means that the electronics and the measuring cell can be replaced separately from one another.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.

**Operation of electronics with FOUNDATION Fieldbus communication**

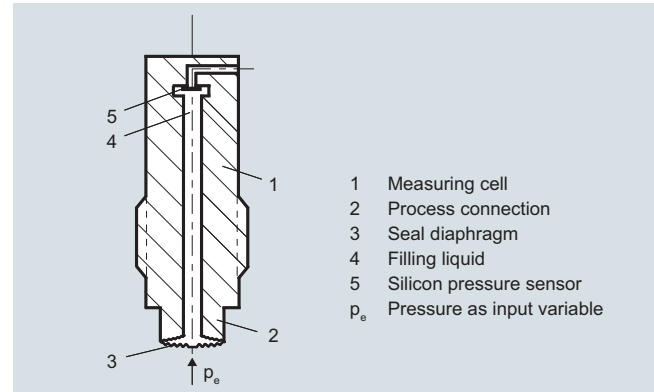
Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

**Mode of operation of the measuring cell**Measuring cell for gauge pressure with front-flush diaphragm

Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram

The pressure  $p_e$  is applied through the process connection (2, Figure "Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

**Parameterization**

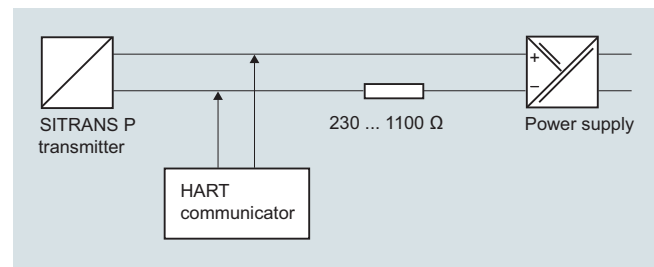
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

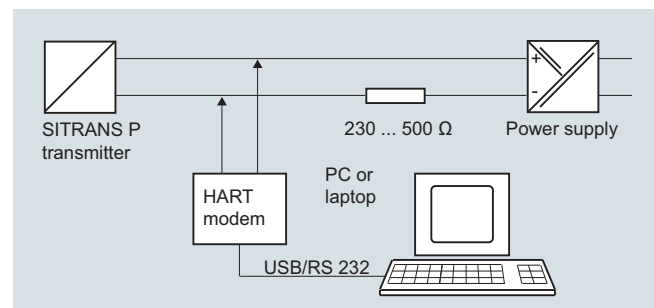
Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

## Pressure Measurement

Pressure transmitters  
for gauge pressure for the paper industry

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### SITRANS P DS III and P300 with PMC connection - Technical description

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

#### Adjustable parameter DS III with HART and P300 with HART

Parameters	Input keys	HART communication
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Lower range value without application of a pressure ("Blind setting")	x	x
Upper range value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x <sup>1)</sup>
Type of dimension and actual dimension	x	x
Characteristic (linear)	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

<sup>1)</sup> Cancel apart from write protection

#### Diagnostic functions for DS III with HART and P300 with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

#### Available physical units of display for DS III with HART and P300 with HART

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

#### Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. The PROFIBUS connects the DS III PA to a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

#### Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III with FOUNDATION Fieldbus is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

#### Adjustable parameters for DS III with PROFIBUS PA and FOUNDATION Fieldbus, and P300 with PROFIBUS PA and FOUNDATION Fieldbus

Adjustable parameters	Input keys	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

#### Diagnostic functions for DS III with PROFIBUS PA and FOUNDATION Fieldbus, and P300 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

#### Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, hPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O, mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Mass	g, kg, t, lb, Ston, Lton, oz
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Temperature	K, °C, °F, °R
Miscellaneous	%



### Technical specifications

#### SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry

Input		Gauge pressure			
		HART	PROFIBUS PA/ FOUNDATION Fieldbus		
		Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
Measured variable		0.01 ... 1 bar	1 bar	4 bar	6 bar
Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure and max. test pressure		1 ... 100 kPa	100 kPa	400 kPa	600 kPa
		0.15 ... 14.5 psi	14.5 psi	58 psi	87 psi
		0.04 ... 4 bar	4 bar	7 bar	10 bar
		4 ... 400 kPa	400 kPa	0.7 MPa	1 MPa
		0.58 ... 58 psi	58 psi	102 psi	145 psi
		0.16 ... 16 bar	16 bar	21 bar	32 bar
		16 ... 1600 kPa	1600 kPa	2.1 MPa	3.2 MPa
		2.3 ... 232 psi	232 psi	305 psi	464 psi
Lower measuring limit (For PMC-Style Minibolt no measuring span < 500 mbar adjustable)		100 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit		100% of max. measuring span			
Output		HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Output signal		4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal		
• Lower limit (infinitely adjustable)		3.55 mA, factory preset to 3.84 mA	-		
• Upper limit (infinitely adjustable)		23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-		
Load		$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$ $U_H$ : Power supply in V	-		
• Without HART communication			-		
• With HART communication		$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART-Communicator)	-		
Physical bus		-	IEC 61158-2		
Protection against polarity reversal		Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Electrical damping (step width 0.1 s)		Set to 2 s (0 ... 100 s)			
Measuring accuracy		Acc. to IEC 60770-1			
Reference conditions (All error data refer always refer to the set span)		<ul style="list-style-type: none"> <li>Increasing characteristic</li> <li>Lower range value 0 bar/kPa/psi</li> <li>Stainless steel seal diaphragm</li> <li>Silicone oil filling</li> <li>Room temperature 25 °C (77 °F)</li> </ul>			
Measuring span ratio r (spread, Turn-Down)		$r = \text{max. measuring span/set measuring span or nom. pressure range}$			
Error in measurement at limit setting incl. hysteresis and reproducibility		<ul style="list-style-type: none"> <li>Linear characteristic</li> <li>- <math>r \leq 5</math> <math>\leq 0.075 \%</math></li> <li>- <math>5 &lt; r \leq 100</math> <math>\leq (0.005 \cdot r + 0.05) \%</math></li> </ul>			
Influence of ambient temperature (in percent per 28 °C (50 °F))		$\leq (0.08 \cdot r + 0.16) \%$			
Long-term stability (temperature change $\pm 30 \text{ }^\circ\text{C}$ ( $\pm 54 \text{ }^\circ\text{F}$ ))		$\leq (0.25 \cdot r) \%$ in 5 years			
Effect of mounting position		$\leq 0.1 \text{ mbar}/0.01 \text{ kPa}/0.00145 \text{ psi}$ per 10° inclination (zero point correction is possible with position error compensation)			
Effect of auxiliary power supply (in percent per change in voltage)		0.005 % per 1 V			
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus		$3 \cdot 10^{-5}$ of nominal measuring range			

## Pressure Measurement

Pressure transmitters  
for gauge pressure for the paper industry

### SITRANS P DS III with PMC connection

1

SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry		
	HART	PROFIBUS PA and FOUNDATION Fieldbus
<b>Operating conditions</b>		
Degree of protection	IP66 (optional IP66/IP68)	
<ul style="list-style-type: none"> <li>• according to EN 60529</li> <li>• according to NEMA 250</li> </ul>	Type 4X	
Temperature of medium	-40 ... +100 °C (-40 ... +212 °F)	
Ambient conditions		
<ul style="list-style-type: none"> <li>• Ambient temperature</li> </ul>	-20 ... +85 °C (-4 ... +185 °F)	
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)	
<ul style="list-style-type: none"> <li>• Storage temperature</li> </ul>	-50 ... +85 °C (-58 ... +185 °F)	
<ul style="list-style-type: none"> <li>• Climatic class</li> </ul>	Relative humidity 0 ... 100 %	
- Condensation	Condensation permissible, suitable for use in the tropics	
<ul style="list-style-type: none"> <li>• Electromagnetic Compatibility</li> </ul>	Acc. to IEC 61326 and NAMUR NE 21	
- Emitted interference and interference immunity		
<b>Design</b>		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
<ul style="list-style-type: none"> <li>• Gasket (standard)</li> </ul>	PTFE flat gasket	
<ul style="list-style-type: none"> <li>• O-ring (minibolt)</li> </ul>	FPM (Viton) or optionally: FFPM or NBR	
Measuring cell filling	Silicone oil or inert filling liquid	
Process connection (standard)	Flush-mounted, 1½", PMC Standard design	
Process connection (minibolt)	Flush-mounted, 1", minibolt design	
<b>Power supply <math>U_H</math></b>		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply	-	Supplied through bus
Separate supply voltage	-	Not necessary
Bus voltage		
<ul style="list-style-type: none"> <li>• Not Ex</li> </ul>	-	9 ... 32 V
<ul style="list-style-type: none"> <li>• With intrinsically-safe operation</li> </ul>	-	9 ... 24 V
Current consumption		
<ul style="list-style-type: none"> <li>• Basic current (max.)</li> </ul>	-	12.5 mA
<ul style="list-style-type: none"> <li>• Start-up current ≤ basic current</li> </ul>	-	Yes
<ul style="list-style-type: none"> <li>• Max. current in event of fault</li> </ul>	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
<b>Certificates and approvals</b>		
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	

# Pressure Measurement

## Pressure transmitters for gauge pressure for the paper industry

### SITRANS P DS III with PMC connection

1

<b>HART communication</b>		<b>FOUNDATION Fieldbus communication</b>	
HART communication	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input /Output		
- Failure mode	parameterizable (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

# Pressure Measurement

Pressure transmitters  
for gauge pressure for the paper industry

## SITRANS P DS III with PMC connection

1

Selection and Ordering data	Article No.
<b>SITRANS P pressure transmitters for gauge pressure, with PMC connection series DS III with HART</b>	7 MF 4 1 3 3 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
<b>Measuring cell-cleaning</b>	
normal	
grease-free to cleanliness level 2	
<b>Measuring span (min. ... max.)</b>	
0.01 ... 1 bar <sup>1)</sup> (0.15 ... 14.5 psi) <sup>1)</sup>	B
0.04 ... 4 bar (0.58 ... 58 psi)	C
0.1.6 ... 16 bar (2.32 ... 232 psi)	D
<b>Wetted parts materials</b>	
Seal diaphragm	
Connection shank	
Hastelloy	B
Stainless steel	
<b>Process connection</b>	
• PMC Style Standard: Thread 1½"	2
• PMC Style Minibolt: front-flush 1" (not with minimum measuring span: 500 mbar (7.25 psi) - version "B")	3
<b>Non-wetted parts materials</b>	
• Enclosure made of die-cast aluminium	0
• Enclosure stainless steel precision casting	3
<b>Version</b>	
• Standard version, German plate inscription, setting for pressure unit: bar	1
• International version, English plate inscription, setting for pressure unit: bar	2
• Chinese version, English plate inscription, setting for pressure unit: Pascal	3
All versions include DVD with compact operating instructions in various EU languages.	
<b>Explosion protection</b>	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)" <sup>2)</sup>	D
- „Ex nA/ic (Zone 2)" <sup>3)</sup>	E
• FM + CSA intrinsic safe (is) <sup>4)</sup>	F
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>3)4)</sup>	NC
<b>Electrical connection / cable entry</b>	
• Female thread M20 x 1.5	B
• Female thread ½-14 NPT	C
• Device plugs M12 (stainless steel) <sup>5) 6)</sup>	F
<b>Display</b>	
• Without display	0
• Without visible display (display concealed, setting: mA)	1
• With visible display (setting: mA)	6
• With customer-specific display (setting as specified, Order code "Y21" required)	7

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Quick-start guide
- Sealing ring

- 1) Only with "PMC Style Standard" process connection
- 2) Without cable gland, with blanking plug
- 3) Configurations with device plugs M12 are only available in Ex ic.
- 4) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 5) Only in connection with Ex approval A, B, E or F.
- 6) M12 delivered without cable socket

Selection and Ordering data	Article No.
<b>SITRANS P pressure transmitter for gauge pressure, with PMC connection DS III with PROFIBUS PA (PA)</b>	7 MF 4 1 3 4 -
<b>DS III with FOUNDATION Fieldbus (FF)</b>	7 MF 4 1 3 5 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
<b>Meas. cell cleaning</b>	
normal	
grease-free to cleanliness level 2	
<b>Nominal measuring range</b>	
1 bar <sup>1)</sup> (14.5 psi) <sup>1)</sup>	B
4 bar (58 psi)	C
16 bar (232 psi)	D
<b>Wetted parts materials</b>	
Seal diaphragm	
Connection shank	
Hastelloy	B
Stainless steel	
<b>Process connection<sup>2)</sup></b>	
• PMC Style Standard: Thread 1½"	2
• PMC Style Minibolt: front-flush 1" (minimum measuring span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B))	3
<b>Non-wetted parts materials</b>	
• Enclosure made of die-cast aluminium	0
• Enclosure stainless steel precision casting	3
<b>Version</b>	
• Standard version, German plate inscription, setting for pressure unit: bar	1
• International version, English plate inscription, setting for pressure unit: bar	2
• Chinese version, English plate inscription, setting for pressure unit: Pascal	3
All versions include DVD with compact operating instructions in various EU languages.	
<b>Explosion protection</b>	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)" <sup>3)</sup>	D
- „Ex nA/ic (Zone 2)" <sup>4)</sup>	E
• FM + CSA intrinsic safe (is) <sup>5)</sup>	F
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>3)5)</sup>	NC
<b>Electrical connection / cable entry</b>	
• Female thread M20 x 1.5	B
• Female thread ½-14 NPT	C
• Device plugs M12 (stainless steel) <sup>6) 7)</sup>	F
<b>Display</b>	
• Without display	0
• Without visible display (display concealed, setting: bar)	1
• With visible display (setting: bar)	6
• With customer-specific display (setting as specified, Order code "Y21" required)	7

Included in delivery of the device:

- Quick-start guide
- Sealing ring

- 1) Only with "PMC Style Standard" process connection
- 2) Sealing is included in delivery.
- 3) Without cable gland, with blanking plug
- 4) Configurations with device plugs M12 are only available in Ex ic.
- 5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505
- 6) Only in connection with Ex approval A, B, E or F.
- 7) M12 delivered without cable socket

# Pressure Measurement

## Pressure transmitters for gauge pressure for the paper industry

## SITRANS P DS III with PMC connection

1

Selection and Ordering data	Order code			
<b>Further designs</b>		HART	PA	FF
Add "-Z" to Article No. and specify Order code.				
<b>Device plugs</b>				
• Angled	A32	✓		
• Han 8D (metal, gray)	A33	✓		
<b>M12 cable sockets (metal (CuZn))</b>	A50	✓	✓	✓
<b>Rating plate inscription</b> (instead of German)				
• English	B11	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
• Cyrillic (russian)	B16	✓	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)</b>	C11	✓	✓	✓
<b>Inspection certificate</b> Acc. to EN 10204-3.1	C12	✓	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	✓
<b>"Functional safety (SIL2)" certificate acc. to IEC 61508</b>	C20	✓		
<b>"Functional safety (SIL2/3)" certificate acc. to IEC 61508</b>	C23	✓		
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓	✓
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓	✓	✓
<b>Degree of protection IP66/IP68</b> (only for M20 x 1.5 and ½-14 NPT)	D12	✓	✓	✓
<b>Export approval Korea</b>	E11	✓	✓	✓
<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-...-B..)	E55 <sup>1)</sup>	✓	✓	✓
<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-...-D..)	E56 <sup>1)</sup>	✓	✓	✓
<b>Ex protection "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-...-E..)	E57 <sup>1)</sup>	✓	✓	✓
<b>Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-...-R..)	E58 <sup>1)</sup>	✓	✓	✓
<b>Mounting</b>				
• Weldable sockets for standard 1½" threaded connection	P01	✓	✓	✓
• Weldable socket for minibolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)	P02	✓	✓	✓

Selection and Ordering data	Order code			
<b>Additional data</b>		HART	PA	FF
Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Measuring range to be set</b> Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	✓ <sup>1)</sup>	
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 characters, specify in plain text: Y16: .....	Y16	✓	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 characters, specify in plain text: Y17: .....	Y17	✓		
<b>Setting of pressure indication in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>1)</sup> , inH <sub>2</sub> O <sup>1)</sup> , ftH <sub>2</sub> O <sup>1)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % *) ref. temperature 20 °C	Y21	✓	✓	✓
<b>Setting of pressure indication in non-pressure units<sup>2)</sup></b> Specify in plain text: Y22: ..... up to ..... l, m <sup>3</sup> , m, USg, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	Y22 + Y01	✓		
<b>Preset bus address</b> possible between 1 and 126 Max. 8 characters, specify in plain text: Y25: .....	Y25		✓	✓

Only "Y01" and "Y21" can be factory preset

✓ = available

**ordering example**

Item line: 7MF4133-1DB20-1AB7-Z  
B line: C11 + Y01 + Y21  
C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)  
C line: Y21: bar (psi)

<sup>1)</sup> Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.  
<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.

<sup>1)</sup> When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

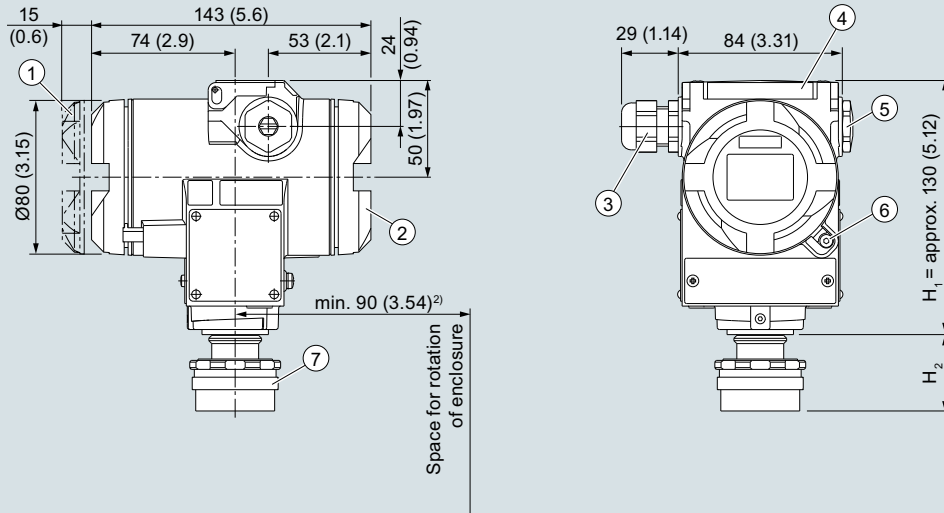
# Pressure Measurement

Pressure transmitters  
for gauge pressure for the paper industry

1

## SITRANS P DS III with PMC connection

### Dimensional drawings



- ① Electronics side, local display (longer overall length for cover with inspection window)<sup>1)</sup>
- ② Connection side<sup>1)</sup>
- ③ Electrical connection:
  - M20 x 1,5 screw gland
  - ½-14 NPT screw gland
  - M12 device plug
- ④ Cover over buttons
- ⑤ Blanking plug
- ⑥ Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
- ⑦ Process connection: PMC standard

<sup>1)</sup> In addition, allow approx. 20 mm (0.79 inch) for the thread length  
<sup>2)</sup> 92 mm (3.62 inch) minimum distance for rotating with indicator

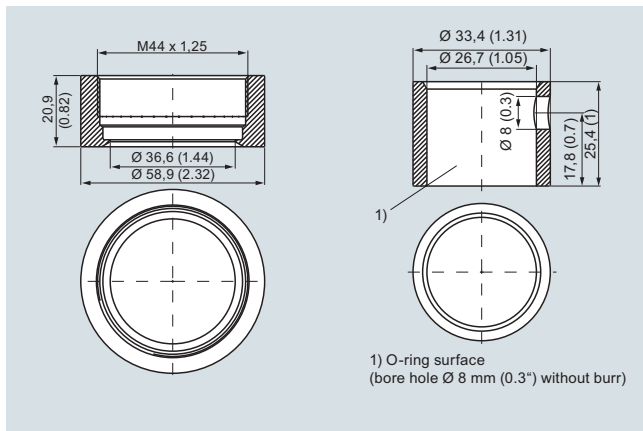
SITRANS P DS III pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into H<sub>1</sub> and H<sub>2</sub>.

H<sub>1</sub> = Height of the SITRANS P DS III up to a defined cross-section

H<sub>2</sub> = Height of the flange up to this defined cross-section

Only the height H<sub>2</sub> is indicated in the dimensions of the flanges.



PMC Style Standard (left) and PMC Style Minibolt (right) weldable sockets, dimensions in mm (inch)

Material: Stainless steel, Mat. No. 1.4404/316L

PMC Style standard				
	DN	PN	ØD	H <sub>2</sub>
			40.9 mm (1.6")	approx. 36.8 mm (1.4")

PMC Style minibolt				
	DN	PN	ØD	H <sub>2</sub>
			26.3 mm (1.0")	approx. 33.1 mm (1.3")

### Technical specifications

#### SITRANS P300 for gauge pressure with PMC connection for the paper industry

Input																					
Measured variable	Gauge pressure (front-flush)																				
Measuring span (infinitely adjustable) or nominal measuring range and max. permissible test pressure	<table border="1"> <thead> <tr> <th>HART</th> <th>PROFIBUS PA/ FOUNDATION Fieldbus</th> <th>Max. operating pressure MAWP (PS)</th> <th>Max. perm. test pressure</th> </tr> </thead> <tbody> <tr> <td>Measuring span</td> <td>Nominal measuring range</td> <td></td> <td></td> </tr> <tr> <td>0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi</td> <td>1 bar 100 kPa 14.5 psi</td> <td>4 bar 400 kPa 58 psi</td> <td>6 bar 600 kPa 87 psi</td> </tr> <tr> <td>0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi</td> <td>4 bar 400 kPa 58 psi</td> <td>7 bar 0.7 MPa 102 psi</td> <td>10 bar 1 MPa 145 psi</td> </tr> <tr> <td>0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi</td> <td>16 bar 1600 kPa 232 psi</td> <td>21 bar 2.1 MPa 305 psi</td> <td>32 bar 3.2 MPa 464 psi</td> </tr> </tbody> </table>	HART	PROFIBUS PA/ FOUNDATION Fieldbus	Max. operating pressure MAWP (PS)	Max. perm. test pressure	Measuring span	Nominal measuring range			0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
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0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi																		
Lower measuring limit (For PMC-Style Minibolt no measuring span < 500 mbar adjustable)	100 mbar a/10 kPa a/1.45 psi a																				
Upper measuring limit	100 % of max. measuring span																				
Output																					
Output signal	<table border="1"> <thead> <tr> <th>HART</th> <th>PROFIBUS PA/ FOUNDATION Fieldbus</th> </tr> </thead> <tbody> <tr> <td>4 ... 20 mA</td> <td>Digital PROFIBUS PA and FOUNDATION Fieldbus signal</td> </tr> <tr> <td>• Lower limit (infinitely adjustable)</td> <td>-</td> </tr> <tr> <td>• Upper limit (infinitely adjustable)</td> <td>-</td> </tr> <tr> <td>Load</td> <td></td> </tr> <tr> <td>• Without HART communication</td> <td>-</td> </tr> <tr> <td>• With HART communication</td> <td>-</td> </tr> <tr> <td>Physical bus</td> <td>IEC 61158-2</td> </tr> </tbody> </table>	HART	PROFIBUS PA/ FOUNDATION Fieldbus	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal	• Lower limit (infinitely adjustable)	-	• Upper limit (infinitely adjustable)	-	Load		• Without HART communication	-	• With HART communication	-	Physical bus	IEC 61158-2				
HART	PROFIBUS PA/ FOUNDATION Fieldbus																				
4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal																				
• Lower limit (infinitely adjustable)	-																				
• Upper limit (infinitely adjustable)	-																				
Load																					
• Without HART communication	-																				
• With HART communication	-																				
Physical bus	IEC 61158-2																				
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.																				
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)																				
Measuring accuracy																					
Reference conditions	Acc. to IEC 60770-1																				
	<ul style="list-style-type: none"> <li>Increasing characteristic</li> <li>Lower range value 0 bar/kPa/psi</li> <li>Stainless steel seal diaphragm</li> <li>Measuring cell with silicone oil</li> <li>Room temperature 25 °C (77 °F)</li> </ul>																				
Measuring span ratio r (spread, Turn-Down)	$r = \text{max. measuring span/set measuring span or nominal measuring range}$																				
Error in measurement at limit setting incl. hysteresis and reproducibility																					
Linear characteristic																					
- $r \leq 5$	$\leq 0.075 \%$																				
- $5 < r \leq 100$	$\leq (0.005 \cdot r + 0.05) \%$																				
Influence of ambient temperature (in percent per 28 °C (50 °F))	$\leq (0.08 \cdot r + 0.16) \%$																				
Long-term stability (temperature change $\pm 30$ °C ( $\pm 54$ °F))	$\leq (0.25 \cdot r) \%$ in 5 years																				
Effect of mounting position	$\leq 0.1 \text{ mbar}/0.01 \text{ kPa}/0.00145 \text{ psi}$ per 10° inclination (zero point correction is possible with position error compensation)																				
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V																				
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range																				

# Pressure Measurement

Pressure transmitters  
for gauge pressure for the paper industry

## SITRANS P300 with PMC connection

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### SITRANS P300 for gauge pressure with PMC connection for the paper industry

#### Operating conditions

##### Installation conditions

Ambient temperature	Observe the temperature class in areas subject to explosion hazard.
• Measuring cell with silicone oil	-40 ... +85 °C (-40 ... +185 °F)
• Display readable	-30 ... +85 °C (-22 ... +185 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
Climatic class	
Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics
Degree of protection	
• according to EN 60529	IP65, IP68
• according to NEMA 250	Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)
Electromagnetic Compatibility	
• Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21
<u>Medium conditions</u>	
Temperature of medium	
• Measuring cell with silicone oil	-40 ... +100 °C (-40 ... +212 °F)

#### Design

Weight (without options)	Approx. 1 kg (2.2 lb)
Enclosure material	Stainless steel, mat. no. 1.4301/304
Material of parts in contact with the medium	
• Seal diaphragm	Hastelloy C276, mat. no. 2.4819
• Measuring cell filling	Silicone oil
Surface quality touched-by-media	Ra-values ≤ 0.8 µm (32 µ inch)/welds Ra ≤ 1.6 µm (64 µ inch)

#### Power supply U<sub>H</sub>

	HART	PROFIBUS PA/ FOUNDATION Fieldbus
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	
Power supply		Supplied through bus
Separate supply voltage	-	Not necessary
Bus voltage		
• Without Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Max. basic current	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. fault current in the event of a fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes



# Pressure Measurement

## Pressure transmitters for gauge pressure for the paper industry

### SITRANS P300 with PMC connection

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SITRANS P300 for gauge pressure with PMC connection for the paper industry		
Certificates and approvals	HART	PROFIBUS PA/ FOUNDATION Fieldbus
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
Intrinsic safety "i"	PTB 05 ATEX 2048	
Marking	II 1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb	
Permissible ambient temperature		
• Temperature class T4	-40 ... +85 °C (-40 ... +185 °F)	
• Temperature class T5	-40 ... +70 °C (-40 ... +158 °F)	
• Temperature class T6	-40 ... +60 °C (-40 ... +140 °F)	
Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$	To certified intrinsically-safe circuits with peak values: FISCO supply unit: $U_i = 17.5 \text{ V}$ , $I_i = 380 \text{ mA}$ , $P_i = 5.32 \text{ W}$ Linear barrier: $U_i = 24 \text{ V}$ , $I_i = 250 \text{ mA}$ , $P_i = 1.2 \text{ W}$
Effective inner capacitance:	$C_i = 6 \text{ nF}$	$C_i = 1.1 \text{ nF}$
Effective internal inductance:	$L_i = 0.4 \text{ mH}$	$L_i \leq 7 \mu\text{H}$
Explosion protection to FM for USA <u>and</u> Canada (cFM <sub>US</sub> )		
• Identification (DIP) or (IS): (NI)	Certificate of Compliance 3025099 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	
• Identification (DIP) or (IS)	Certificate of Compliance 3025099C CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	

## Pressure Measurement

Pressure transmitters  
for gauge pressure for the paper industry

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### SITRANS P300 with PMC connection



HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool Local operation (standard setting Address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	One measured value: 5 bytes Two measured values: 10 bytes	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	Register operating mode: 1 bytes Reset function due to metering: 1 bytes	• PID	1 resource block
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Function blocks	2	Transducer blocks	
• Analog input		• Pressure transducer block	
- Adaptation to customer-specific process variables	Linearly rising or falling characteristic	- Can be calibrated by applying two pressures	Yes
- Electrical damping	0 ... 100 s adjustable	- Monitoring of sensor limits	Yes
- Simulation function	Input /Output	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset and preset Optional direction of counting Simulation function of the register output		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 31 nodes		
- Characteristic curve	Linear		
- Simulation function	Available		
• Transducer block "Electronic temperature"			
Simulation function	Available		

# Pressure Measurement

## Pressure transmitters for gauge pressure for the paper industry

### SITRANS P300 with PMC connection

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Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
<b>SITRANS P300 pressure transmitters with PMC connection</b> , single-chamber measuring enclosure, rating plate inscription in English			<b>SITRANS P300 pressure transmitters with PMC connection</b> , single-chamber measuring enclosure, rating plate inscription in English		
<b>with 4 ... 20 mA / HART</b>		7 MF 8 1 2 3 -	<b>with 4 ... 20 mA / HART</b>		7 MF 8 1 2 3 -
<b>with PROFIBUS PA</b>		7 MF 8 1 2 4 -	<b>with PROFIBUS PA</b>		7 MF 8 1 2 4 -
<b>with FOUNDATION Fieldbus (FF)</b>		7 MF 8 1 2 5 -	<b>with FOUNDATION Fieldbus (FF)</b>		7 MF 8 1 2 5 -
 ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		<b>Display</b>		
Silicone oil	normal	1	• Without display, with keys, closed lid		1
Inert liquid	Cleanliness level 2 to DIN 25410	3	• With display and keys, closed lid <sup>7)</sup>		2
			• With display and keys, lid with polycarbonate disc (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) <sup>7)</sup>		4
			• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc <sup>7)</sup>		5
			• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure unit) <sup>7)</sup>		6
			• With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass panel <sup>7)</sup>		7
<b>Measuring span</b>			<b>Power supply units</b> see Chap. 7 "Supplementary Components".		
1 bar <sup>1)</sup>	(14.5 psi)	B	Included in delivery of the device:		
4 bar	(58 psi)	C	• Quick-start guide		
16 bar	(232 psi)	D	• Sealing ring		
<b>Wetted parts materials</b>					
Seal diaphragm	Measuring cell				
Hastelloy	Stainless steel	B			
<b>Process connection</b>					
• PMC Style Standard: Thread 1½"		2			
• PMC Style Minibolt: front-flush 1" (minimum measuring span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B))		3			
<b>Non-wetted parts materials</b>					
• Stainless steel, deep-drawn and electrolytically polished		4			
<b>Version</b>					
• Standard versions		1			
<b>Explosion protection</b>					
• None		A			
• With ATEX, Type of protection:					
- "Intrinsic safety (Ex ia)"		B			
• Zone 20/21/22 <sup>2)</sup>		C			
• Ex nA/nL (Zone 2) <sup>3)</sup>		E			
• With FM + CSA, Type of protection:					
- "Intrinsic Safe (is)" (planned) <sup>4)</sup>		M			
<b>Electrical connection/cable entry</b>					
• Screwed gland M20 x .5 (polyamide) <sup>5)</sup>		A			
• Screwed gland M20 x 1.5 (metal)		B			
• Screwed gland M20 x 1.5 (stainless steel)		C			
• Device plug M12 (stainless steel), without cable socket)		G			
• ½-14 NPT metal thread <sup>6)</sup>		H			
• ½-14 NPT stainless steel thread <sup>6)</sup>		J			

# Pressure Measurement

Pressure transmitters  
for gauge pressure for the paper industry

## SITRANS P300 with PMC connection

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Selection and Ordering data	Order code				Selection and Ordering data	Order code			
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		HART	PA	FF	<b>Additional data</b> Please add "-Z" to Article No. and specify Order code(s) and plain text.		HART	PA	FF
<b>Cable socket for device plugs M12</b> • Stainless steel	A51	✓	✓	✓	<b>Measuring range to be set</b> Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	✓ <sup>1)</sup>	
<b>Rating plate inscription</b> (instead of English) • German • French • Spanish • Italian	B10 B12 B13 B14	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	✓	<b>Measuring point text (entry in device variable)</b> Max. 27 char., specify in plain text: Y16: .....	Y16	✓	✓	✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)</b>	C11	✓	✓	✓	<b>Entry of HART address (TAG)</b> Max. 8 char., specify in plain text: Y17: .....	Y17	✓		
<b>Inspection certificate</b> Acc. to EN 10204-3.1	C12	✓	✓	✓	<b>Setting of pressure indication in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>*)</sup> , inH <sub>2</sub> O <sup>*)</sup> , ftH <sub>2</sub> O <sup>*)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % ) ref. temperature 20 °C	Y21	✓	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	✓	<b>Setting of pressure indication in non-pressure units<sup>2)</sup></b> Specify in plain text: Y22: ..... up to ..... l, m <sup>3</sup> , m, USg, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	Y22 + Y01	✓		
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓	✓	✓	<b>Preset bus address</b> possible between 1 and 126 Specify in plain text: Y25: .....	Y25		✓	✓
<b>Degree of protection IP65/IP68</b> (only for M20x1.5 and ½-14 NPT)	D12	✓	✓	✓					
<b>Mounting</b> • Weldable sockets for standard 1½" threaded connection • Weldable socket for minibolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)	P01 P02	✓ ✓	✓ ✓	✓ ✓					

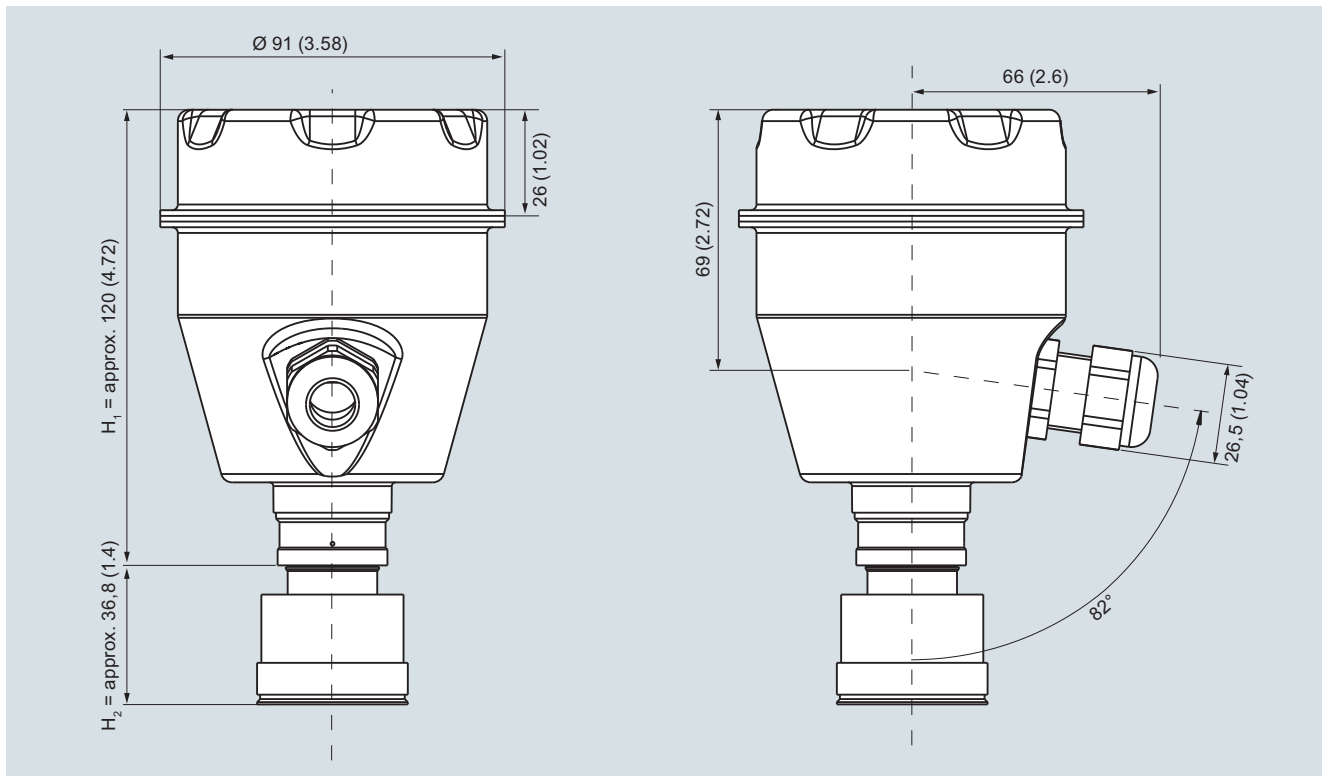
Only "Y01" and "Y21" can be factory preset

✓ = available

<sup>1)</sup> Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.

**Dimensional drawings**



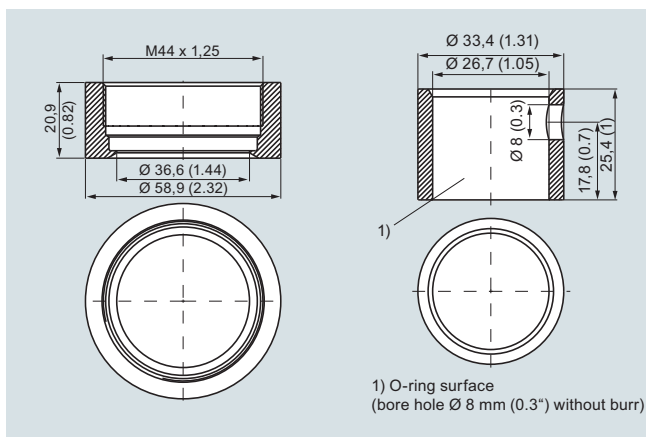
SITRANS P300 pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

The diagram shows a SITRANS P300 with an example of a flange. In this drawing the height is subdivided into H<sub>1</sub> and H<sub>2</sub>.

H<sub>1</sub> = Height of the SITRANS P300 up to a defined cross-section

H<sub>2</sub> = Height of the flange up to this defined cross-section

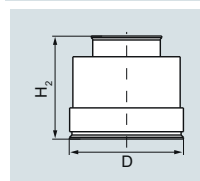
Only the height H<sub>2</sub> is indicated in the dimensions of the flanges.



PMC Style Standard (left) and PMC Style Minibolt (right) weldable sockets, dimensions in mm (inch)

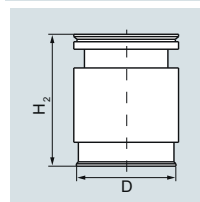
Material: Stainless steel, mat. No. 1.4404 / 316L

**PMC Style Standard**



DN	PN	ØD	H <sub>2</sub>
		40.4 mm (1.6")	Approx. 36.8 mm (1.4")

**PMC Style Mini bolt**



DN	PN	ØD	H <sub>2</sub>
		26.3 mm (1.0")	Approx. 33.1 mm (1.3")

## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

### Technical description

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#### Overview



SITRANS P320/P420 pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameter assignment is performed using input buttons or the HART interface.

The comprehensive functionality makes for precise adjustment of the pressure transmitter to the requirements of the plant. Operation is very user-friendly in spite of the numerous setting options.

Due to their advanced diagnostic functionalities according to NAMUR NE107, the SITRANS P320/P420 pressure transmitters are very suitable for use in chemical plants. Thanks to the advanced diagnostic functions and the process value storage, the SITRANS P420 is "Ready for Digitalization".

The "Remote Safety Handling" function saves customers significant amounts of time and money, because the SIL function can be switched on and validated remotely via SIMATIC PDM. This eliminates travel times and on-site operation via the local display or keyboard.

Parameter assignment using the HART protocol is very easy and quick thanks to the innovative EDD with integrated Quick Start wizard.

The transmitters can be equipped with various types of remote seals for special applications such as the measurement of highly viscous substances.

SITRANS P320/P420 pressure transmitters are available in various versions for measuring:

- Gauge pressure
- Absolute pressure
- Differential pressure
- Level
- Volume flow
- Mass flow

#### Benefits

- Diagnostic functions in accordance with NAMUR recommendation NE107
- SIL devices developed according to IEC 61508
- SIL validation on the device or remotely with SIMATIC PDM
- Reduction of internal inductance for Ex applications to LI = 0
- Step response time for pressure type T63 = 105 ms and for differential pressure type 135 ms.
- Minimal conformity error
- Very low temperature influence
- Very good long-term stability

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For corrosive and non-corrosive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Wetted parts made of high-grade materials (e.g., stainless steel, alloy, gold, Monel, tantalum)
- Infinitely adjustable spans from 0.01 bar to 700 bar (0.15 psi to 10153 psi)
- Convenient parameterization over 4 input buttons and HART interface

#### Application

SITRANS P320/P420 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads.

The pressure transmitters can be used in zone 1 or zone 0 with the corresponding Ex approval.

The pressure transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 4 input buttons or programmed externally over HART interface.

#### **Pressure transmitters for gauge pressure**

Measured variable:

- Gauge pressure of corrosive and non-corrosive gases, vapors and liquids.

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 0.01 bar to 700 bar (0.15 psi to 10153 psi)

There are two series:

- Gauge pressure series
- Differential pressure series

#### **Pressure transmitters for absolute pressure**

Measured variable:

- Absolute pressure of corrosive and non-corrosive gases, vapors and liquids.

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 8.3 mbar a to 160 bar a (0.12 to 2 321 psi a)

There are two series:

- Gauge pressure series
- Differential pressure series

#### Pressure transmitters for differential pressure and flow

Measured variables:

- Differential pressure
- Small positive or negative overpressure
- Flow  $q \sim \sqrt{\Delta p}$  (together with a primary differential pressure transducer (see section "Flowmeters"))

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 1 mbar to 160 bar (0.0145 to 2 321 psi)

#### Pressure transmitters for level

Measured variable:

- Level of corrosive and non-corrosive liquids in open and closed vessels.

Measuring span (infinitely adjustable)

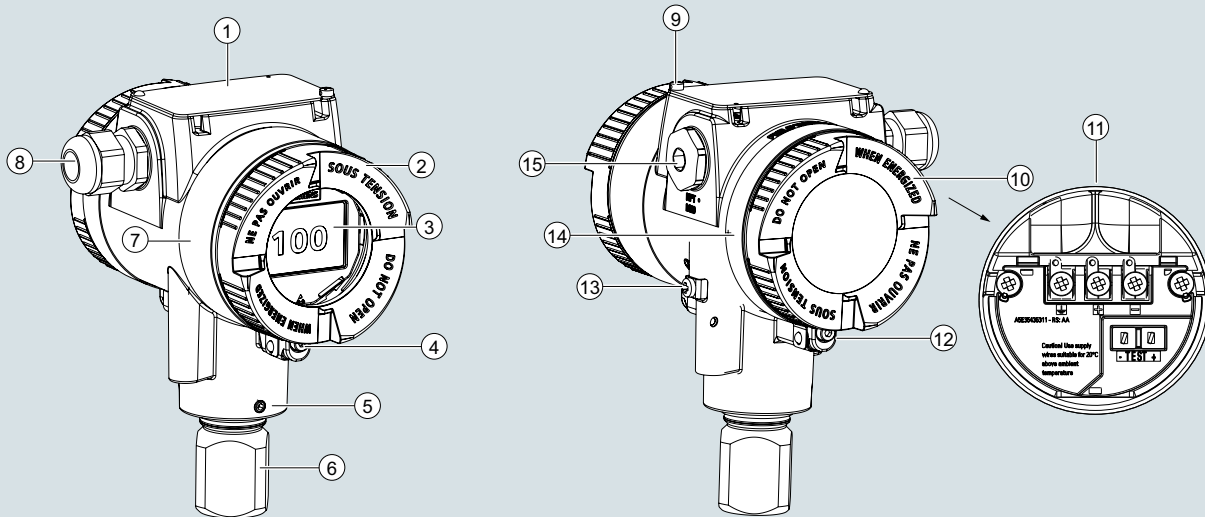
- For SITRANS P320/P420 with HART: 25 mbar to 5 bar (0.363 to 72.5 psi)

Type of the mounting flange:

- EN 1092-1 flanges
- ASME B16.5 flanges
- J.I.S. flanges
- Diverse range of sealing surface forms available

### Design

Depending on the customer-specific order, the device comprises different parts.



- ① Cover over buttons and nameplate with general information
- ② Cover (front) with glass pane (optional)
- ③ Display (optional)
- ④ Safety catch (front)
- ⑤ Locking screw for locking the enclosure
- ⑥ Process connection
- ⑦ Approval label with approval information
- ⑧ Cable inlet, optionally with cable gland

- ⑨ Locking screw for the cover over the buttons
- ⑩ Cover (rear) for electrical terminal compartment
- ⑪ Electrical terminal compartment
- ⑫ Safety catch (back)
- ⑬ Ground terminal
- ⑭ Nameplate with information on the remote seal
- ⑮ Blanking plug

Device front view

- The electronics enclosure is made of die cast aluminum or precision cast stainless steel.
- The enclosure has a removable cover at the front and the back.
- Depending on the device version, the front cover (2) may be designed with a glass pane.
- The cable inlet (8) to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug (15).
- The ground terminal (13) is located on the side.

- The electrical terminal compartment (11) for the auxiliary power and shield is accessible when you remove the back cover (10).
- The measuring cell with process connection (6) is located in the bottom part of the enclosure. The measuring cell is prevented from rotating by a locking screw (5).
- Thanks to the modular design of the pressure transmitter, the measuring cell and application electronics or terminal compartment can be replaced if required.
- The button cover (1), is located on the upper face of the enclosure. The nameplate with general information is located on the cover over the buttons.

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

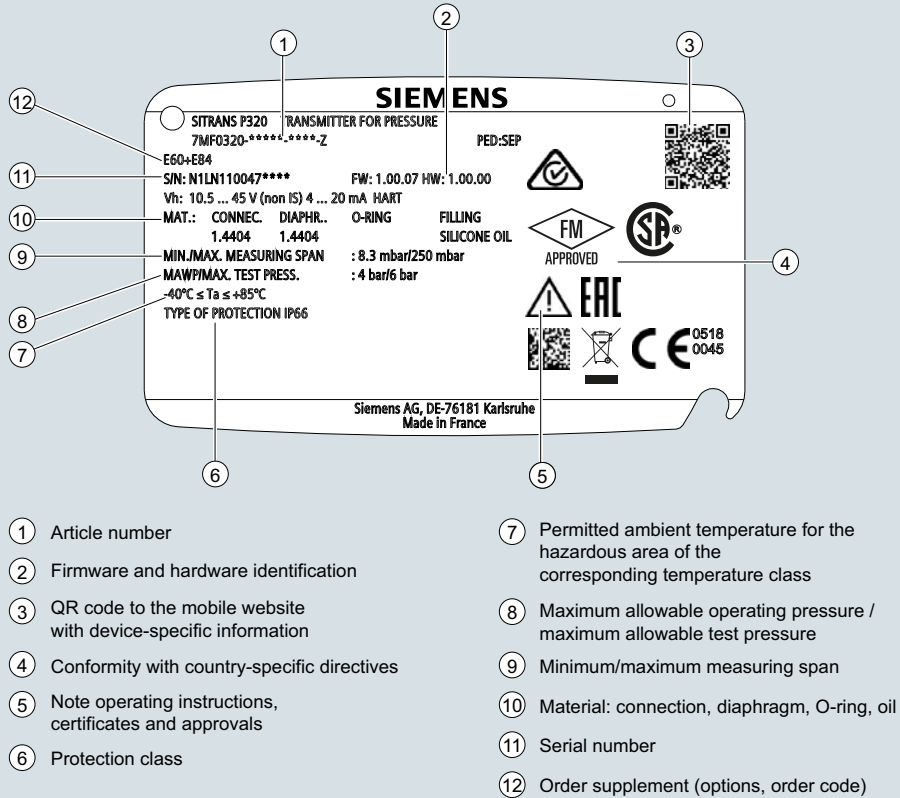
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## Technical description

### Nameplates

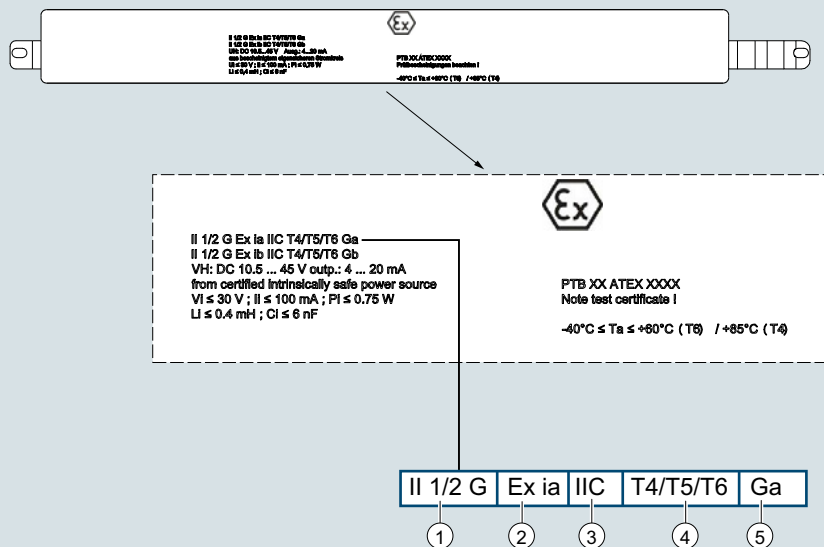
#### Nameplate

The nameplate with the article no. and other important information, such as design details and technical data, is located on the cover over the buttons.



#### Certification label with approval information

The certification label with approval information is located on the front of the enclosure.

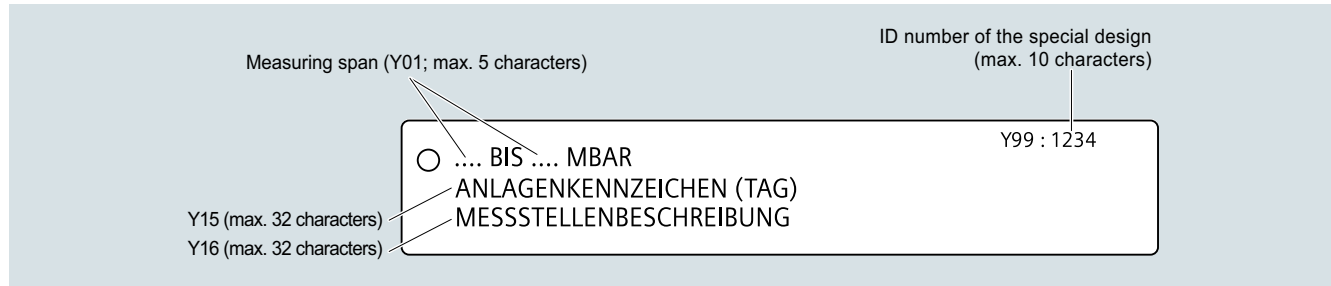


- ① Characteristics of the hazardous area
- ② Type of protection
- ③ Group (gas, dust)
- ④ Maximum surface temperature (temperature class)
- ⑤ Device protection level

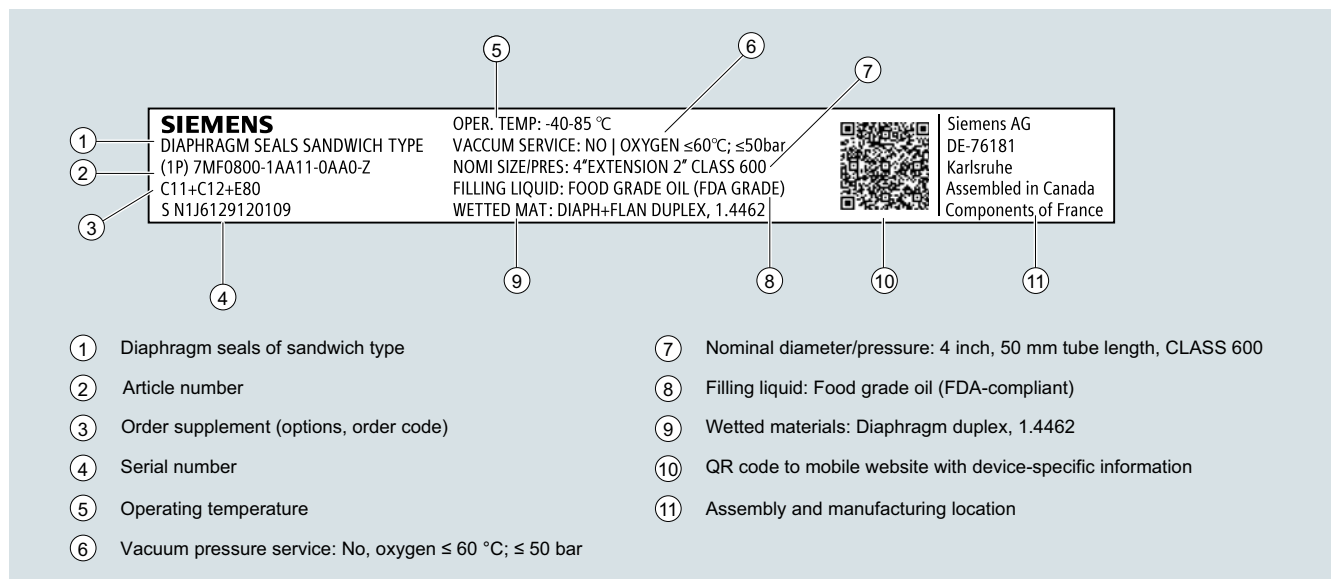


Tag plate

The tag plate is fastened with a wire under the front cover.

Nameplate with information on the remote seals

The nameplate with information on the remote seals is located on the back of the enclosure.



# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

## Technical description

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### Function

#### Adjustable parameters and diagnostics

SITRANS P320/P420 with HART communication

Parameters	Input buttons	SITRANS P320	SITRANS P420
Application, measurement type	x	x	x
Adjusting lower range value/upper range value	x	x	x
Setting lower range value/upper range value	x	x	x
Electrical damping	x	x	x
Zero adjustment	x	x	x
Fault current	x	x	x
Saturation limits	x	x	x
Scaling of the display	x	x	x
Characteristic curve selection	x	x	x
Temperature unit	x	x	x
Button lock	x	x	x
Change user PIN	x	x	x
Functional safety	x	x	x
Loop test	x	x	x
Start view	x	x	x
Pressure reference	x	x	x
Reset	x	x	x
<b>Diagnostics and trend log</b>			
Min/max pointer	–	x	x
Limit monitoring	–	2	2
Event counter (over-run/undershoot)	–	2	2
Maintenance and service timer	–	–	x
Trend log	–	–	2, max. 1 500 values
Diagnostic log	–	–	x
Parameters change log	–	–	x

Available physical units of display for SITRANS P320/P420

Physical variable	Physical units
Pressure (can also be preset in the factory)	Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), mH <sub>2</sub> O (4 °C), mmHg, inHg, atm, torr
Level (height data)	m, cm, mm, ft, in
Volumes (fill level)	m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI
Volume (flow)	m <sup>3</sup> /sec, m <sup>3</sup> /h, m <sup>3</sup> /d, l/sec, l/min, l/h, Ml/d, ft <sup>3</sup> /sec, ft <sup>3</sup> /h, ft <sup>3</sup> /d, SCF/min, SCF/h, NI/h, Nm <sup>3</sup> /hgal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK)/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d,
Mass (flow)	Kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d
Temperature	°C, °F
Other	%, mA, free text max. 12 characters

For more device information and technical specifications, refer to the individual device versions.

**Technical specifications****SITRANS P320/SITRANS P420 for gauge pressure (pressure series)**

<b>Input</b>			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. permissible test pressure (pursuant to DIN 16086) (for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar 0.83 ... 25 kPa 0.12 ... 3.6 psi	4 bar 0.4 MPa 58 psi	6 bar 0.6 MPa 87 psi
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	6 bar 0.6 MPa 87 psi	9 bar 0.9 MPa 130 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	20 bar 2 MPa 290 psi	30 bar 3 MPa 435 psi
	0.16 ... 16 bar 0.016 ... 1.6 MPa 2.3 ... 232 psi	45 bar 4.5 MPa 652 psi	70 bar 7 MPa 1015 psi
	0.63 ... 63 bar 0.063 ... 6.3 MPa 9.1 ... 914 psi	80 bar 8 MPa 1160 psi	120 bar 12 MPa 1740 psi
	1.6 ... 160 bar 0.16 ... 16 MPa 23 ... 2321 psi	240 bar 24 MPa 3481 psi	360 bar 36 MPa 5221 psi
	4 ... 400 bar 0.4 ... 40 MPa 58 ... 5802 psi	400 bar 40 MPa 5802 psi	600 bar 60 MPa 8702 psi
	7 ... 700 bar 0.7 ... 70 MPa 102 ... 10153 psi	800 bar 80 MPa 11603 psi	800 bar 80 MPa 11603 psi
Measuring limits	For 250 mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.		
• Lower measuring limit	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with FDA-compliant oil	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Upper measuring limit	Between the measuring limits (infinitely adjustable)		
• Lower range value			
<b>Output</b>			
Output signal	<b>HART</b> 4 ... 20 mA 3.55 mA, factory preset to 3.8 mA 22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA $I_{pp} \leq 0.5\%$ of max. output current		
• Lower saturation limit (infinitely adjustable)			
• Upper saturation limit (infinitely adjustable)			
• Ripple (without HART communication)			
Adjustable damping	0 ... 100 s, continuously adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA (factory preset to 3.55 mA)		
Load	Resistance R [ $\Omega$ ]		
• Without HART communication	$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ , $U_H$ : Power supply in V		
• With HART communication	$R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)		
Characteristic curve	<ul style="list-style-type: none"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>		
Physical bus	-		
Polarity-independent	-		

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (pressure series)

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## SITRANS P320/SITRANS P420 for gauge pressure (pressure series)

### Measuring accuracy

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span and nominal measuring range}$

- Linear characteristic curve
- 250 mbar/25 kPa/3.6 psi

$r \leq 1.25$ :  $\leq 0.075\%$  (SITRANS P320)  
 $\leq 0.065\%$  (SITRANS P420)

$1.25 < r \leq 30$ :  $\leq (0.008 \cdot r + 0.065)\%$   
 $r \leq 5$ :  $\leq 0.065\%$  (SITRANS P320)  
 $\leq 0.04\%$  (SITRANS P420)

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi
- 400 bar/40 MPa/5802 psi
- 700 bar/70 MPa/10152 psi

$5 < r \leq 100$ :  $\leq (0.004 \cdot r + 0.045)\%$

$r \leq 5$ :  $\leq 0.075\%$  (SITRANS P320)  
 $5 < r \leq 100$ :  $\leq (0.005 \cdot r + 0.05)\%$  (SITRANS P320)

$r \leq 5$ :  $\leq 0.075\%$  (SITRANS P420)  
 $5 < r \leq 100$ :  $\leq (0.005 \cdot r + 0.05)\%$  (SITRANS P420)

Influence of ambient temperature  
in % per 28 °C (50 °F)

- 250 mbar/25 kPa/3.6 psi
- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi
- 400 bar/40 MPa/5802 psi
- 700 bar/70 MPa/10152 psi

$\leq (0.16 \cdot r + 0.1)\%$   
 $\leq (0.05 \cdot r + 0.1)\%$   
 $\leq (0.025 \cdot r + 0.125)\%$

$\leq (0.08 \cdot r + 0.16)\%$

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- 250 mbar/25 kPa/3.6 psi
- 1 bar/100 kPa/14.5 psi

$\leq (0.25 \cdot r)\%$  per year  
 In 5 years  $\leq (0.25 \cdot r)\%$   
 In 10 years  $\leq (0.35 \cdot r)\%$   
 In 5 years  $\leq (0.125 \cdot r)\%$   
 In 10 years  $\leq (0.15 \cdot r)\%$

- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi
- 400 bar/40 MPa/5802 psi
- 700 bar/70 MPa/10152 psi

In 5 years  $\leq (0.25 \cdot r)\%$   
 In 10 years  $\leq (0.35 \cdot r)\%$

Step response time  $T_{63}$  (without electrical damping)

$\leq 0.105$  s

Effect of mounting position (in pressure per change of angle)

$\leq 0.05$  mbar/0.005 kPa/0.000725 psi per 10° incline  
 (zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

**SITRANS P320/SITRANS P420 for gauge pressure (pressure series)****Operating conditions**

## Medium temperature

- Measuring cell with silicone oil filling -40 ... +100 °C (-40 ... +212 °F)
- Measuring cell with inert oil
  - 1 bar/100 kPa/14.5 psi -40 ... +100 °C (-40 ... +212 °F)
  - 4 bar/400 kPa/58 psi
  - 16 bar/1.6 MPa/232 psi
  - 63 bar/6.3 MPa/914 psi
  - 160 bar/16 MPa/2321 psi -20 ... +100 °C (-4 ... +212 °F)
  - 400 bar/40 MPa/5802 psi
  - 700 bar/70 MPa/10152 psi
- Measuring cell with FDA-compliant oil -10 ... +100 °C (14 ... +212 °F)

## Ambient conditions

- Ambient temperature/enclosure
  - Observe the temperature class in hazardous areas.
  - Measuring cell with silicone oil filling -40 ... +85 °C (-40 ... +185 °F)
  - Measuring cell with inert oil for gauge pressure measuring cells: -40 ... +85 °C (-40 ... +185 °F)
  - 1 bar/100 kPa/14.5 psi
  - 4 bar/400 kPa/58 psi
  - 16 bar/1.6 MPa/232 psi
  - 63 bar/6.3 MPa/914 psi
  - Measuring cell with inert oil -40 ... +85 °C (-40 ... +185 °F)
  - Measuring cell with FDA-compliant oil -10 ... +85 °C (14 ... +185 °F)
  - Display -20 ... +80 °C (-4 ... +176 °F)
- Storage temperature -50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))
- Climatic class in accordance with IEC 60721-3-4 4K4H
- Degree of protection
  - According to IEC 60529 IP66, IP68
  - According to NEMA 250 Type 4X
- Electromagnetic compatibility
  - Emitted interference and interference immunity According to IEC 61326 and NAMUR NE 21

**Structural design**

## Weight

Approx. 1.8 kg (3.9 lb) with aluminum enclosure  
 Approx. 3.8 kg (8.3 lb) with stainless steel enclosure

## Material

- Wetted parts materials
  - Process connection Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602
  - Oval flange Stainless steel, mat. no. 1.4404/316L
  - Seal diaphragm Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
- Non-wetted parts materials
  - Electronics enclosure
    - Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
    - Standard: Powder coating with polyurethane
    - Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
    - Stainless steel nameplate (1.4404/316L)
  - Mounting bracket Zinc-plated steel or stainless steel

## Process connection

- Connection shank G1/2A according to EN 837-1
- Female thread ½-14 NPT
- Male thread M20 x 1.5 and ½-14 NPT
- Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread:
- Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:
  - 7/16-20 UNF according to EN 61518
  - M10 according to DIN 19213
- Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:
  - 7/16-20 UNF according to EN 61518
  - M12 according to DIN 19213
- Male thread M20 x 1.5 and ½-14 NPT

## Electrical connection

- Cable entry via the following screwed glands:
- M20 x 1.5
  - ½-14 NPT
  - Device plug Han 7D/Han 8D<sup>1)</sup>
  - Device plug M12

**Displays and controls**

## Buttons

4 buttons for operation directly on the device

## Display

- With or without integrated display (optional)
- Lid with inspection window (optional)

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

## for gauge pressure (pressure series)

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### SITRANS P320/SITRANS P420 for gauge pressure (pressure series)

#### Auxiliary power $U_H$

Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)
Noise	$U_{\text{eff}} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–

#### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values $U_n = 10.5 \text{ ... } 45 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To circuit with the operating values $U_n = 10.5 \text{ ... } 45 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: $U_n = 10.5 \text{ to } 30 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

**SITRANS P320/SITRANS P420 for gauge pressure (pressure series)**

## NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

Standardized Electrical Signals and Questions Relating to Engineering Technology  
 Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment  
 Extra Low Voltage Circuits with Safe Separation  
 Standardization of the Signal Level for the Failure Information of Digital Transmitters  
 Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics  
 The Application of the Pressure Equipment Directive to Process Control Devices  
 Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices  
 Self-Monitoring and Diagnosis of Field Devices  
 NAMUR Standard Device - Field Devices for Standard Applications

<sup>1)</sup> Han 8D is identical to Han 8U.

**Communication**

<b>HART</b>		<b>FOUNDATION Fieldbus</b>	
HART	230 ... 1 100 Ω	Device profile	FF ITK 6
Protocol	HART 7	Function blocks	3 function blocks analog input, 1 function block PID
Software for computer	SIMATIC PDM	<ul style="list-style-type: none"> <li>• Analog input               <ul style="list-style-type: none"> <li>- Adaptation to user-specific process variable</li> <li>- Electrical damping adjustable</li> <li>- Simulation function</li> </ul> </li> <li>- Response to failure</li> <li>- Limit monitoring</li> <li>- Square-rooted characteristic curve for flow measurement</li> <li>• PID</li> <li>• Physical block</li> </ul>	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input (can be locked within the device with a bridge) Parameterizable (last good value, substitute value, incorrect value) Yes, one upper and lower warning limit and one alarm limit respectively Yes Standard FOUNDATION Fieldbus function block 1 resource block
<b>PROFIBUS PA</b>		Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
Simultaneous communication with master class 2 (max.)	4	<ul style="list-style-type: none"> <li>• Pressure transducer block               <ul style="list-style-type: none"> <li>- Can be calibrated by applying two pressures</li> <li>- Monitoring of sensor limits</li> <li>- Simulation function: pressure measurement, sensor temperature and electronics temperature</li> </ul> </li> </ul>	Yes Yes Constant value or by means of parameterizable ramp function
The address can be set using	Configuration tool or local operation (standard setting address 126)		
Cyclic data usage			
• Output byte	≤ 35 (7 measured values)		
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)		
Internal preprocessing			
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX		
Number of function blocks	7		
• Analog input			
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve		
- Electrical damping adjustable	0 ... 100 s		
- Simulation function	Output/input		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	1		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a vessel characteristic with	Max. 30 nodes		
- Square-rooted characteristic curve for flow measurement	Yes		
- Tank characteristic curve for volume measurement	Yes		
- Low flow cut-off and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function		

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for gauge pressure (pressure series)

1

## Selection and ordering data

Article No.

### Pressure transmitters for gauge pressure (pressure series)

SITRANS P320

7MF030 - - - - -

SITRANS P420

7MF040 - - - - -

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

0  
1  
2

#### Measuring cell filling

Silicone oil

Inert liquid

Neobee oil

1  
3  
4

#### Maximum measuring span

250 mbar (3.6 psi)

1 000 mbar (14.5 psi)

4 000 mbar (58 psi)

16 bar (232 psi)

63 bar (914 psi)

160 bar (2 321 psi)

400 bar (5 802 psi)

700 bar (10 153 psi)

F  
J  
N  
Q  
T  
V  
W  
X

#### Process connection

Male thread M20 x 1.5

Male thread G½ (DIN EN 837-1)

Female thread ½-14 NPT

Male thread ½-14 NPT

Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)

Oval flange, mounting thread: M10 (DIN 19213)

Oval flange, mounting thread: M12 (DIN 19213)

Version for diaphragm seal pressure

B  
D  
E  
F  
G  
H  
J  
U

#### Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404

Stainless steel 316L/1.4404, alloy C276/2.4819

Alloy C22/2.4602, alloy C276/2.4819

0  
1  
2

#### Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

1  
2

#### Enclosure

Dual chamber device

5

#### Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

A  
B  
C  
D  
L  
M  
S  
T

#### Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

• 2 x ½-14 NPT

F  
M

#### Local operation/display

Without display (lid closed)

With display (lid closed)

With display (lid with glass pane)

0  
1  
2



# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P320/420

for gauge pressure (pressure series)

1

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Cable glands included</b>	
Plastic	<b>A00</b>
Metal	<b>A01</b>
Stainless steel	<b>A02</b>
Stainless steel 316L/1.4404	<b>A03</b>
CMP, for XP devices	<b>A10</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>
<b>Device plug Han mounted left</b>	
Device plug Han 7D (plastic, straight)	<b>A30</b>
Device plug Han 7D (plastic, angled)	<b>A31</b>
Device plug Han 7D (metal, straight)	<b>A32</b>
Device plug Han 7D (metal, angled)	<b>A33</b>
Device plug Han 8D (plastic, straight)	<b>A34</b>
Device plug Han 8D (plastic, angled)	<b>A35</b>
Device plug Han 8D (metal, straight)	<b>A36</b>
Device plug Han 8D (metal, angled)	<b>A37</b>
<b>Cable socket included</b>	
Plastic, for device plug Han 7D and Han 8D	<b>A40</b>
Metal, for device plug Han 7D and Han 8D	<b>A41</b>
<b>Device plug M12 mounted left</b>	
Stainless steel, without cable socket	<b>A62</b>
Stainless steel, with cable socket	<b>A63</b>
<b>Cable entry/device plug mounting</b>	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>
Cable gland/device plug mounted left	<b>A97</b>
Cable gland/device plug mounted right	<b>A99</b>
<b>Nameplate labeling (standard labeling: English, unit bar)</b>	
German (bar)	<b>B11</b>
French (bar)	<b>B12</b>
Spanish (bar)	<b>B13</b>
Italian (bar)	<b>B14</b>
Chinese (bar)	<b>B15</b>
Russian (bar)	<b>B16</b>
English (psi)	<b>B20</b>
English (Pa)	<b>B30</b>
Chinese (Pa)	<b>B35</b>
<b>Certificates</b>	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	<b>C11</b>
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>
Factory certificate (EN 10204-2.2) - Wetted parts	<b>C14</b>
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>
<b>Certificates for functional safety</b>	
Functional Safety (IEC 61508) - SIL2/3	<b>C20</b>

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	<b>D30</b>
Unlabeled TAG plate	<b>D40</b>
Without labeling of the measuring range on the TAG plate	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Overvoltage protection up to 6 kV (internal)	<b>D70</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Labels on transport packaging (provided by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA (USA and Canada)	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada) <sup>1)</sup>	<b>E21</b>
FM (USA and Canada) <sup>1)</sup>	<b>E22</b>
IECEX (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
RMR (Russian Maritime Register)	<b>E55</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual Seal	<b>E81</b>
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

## for gauge pressure (pressure series)

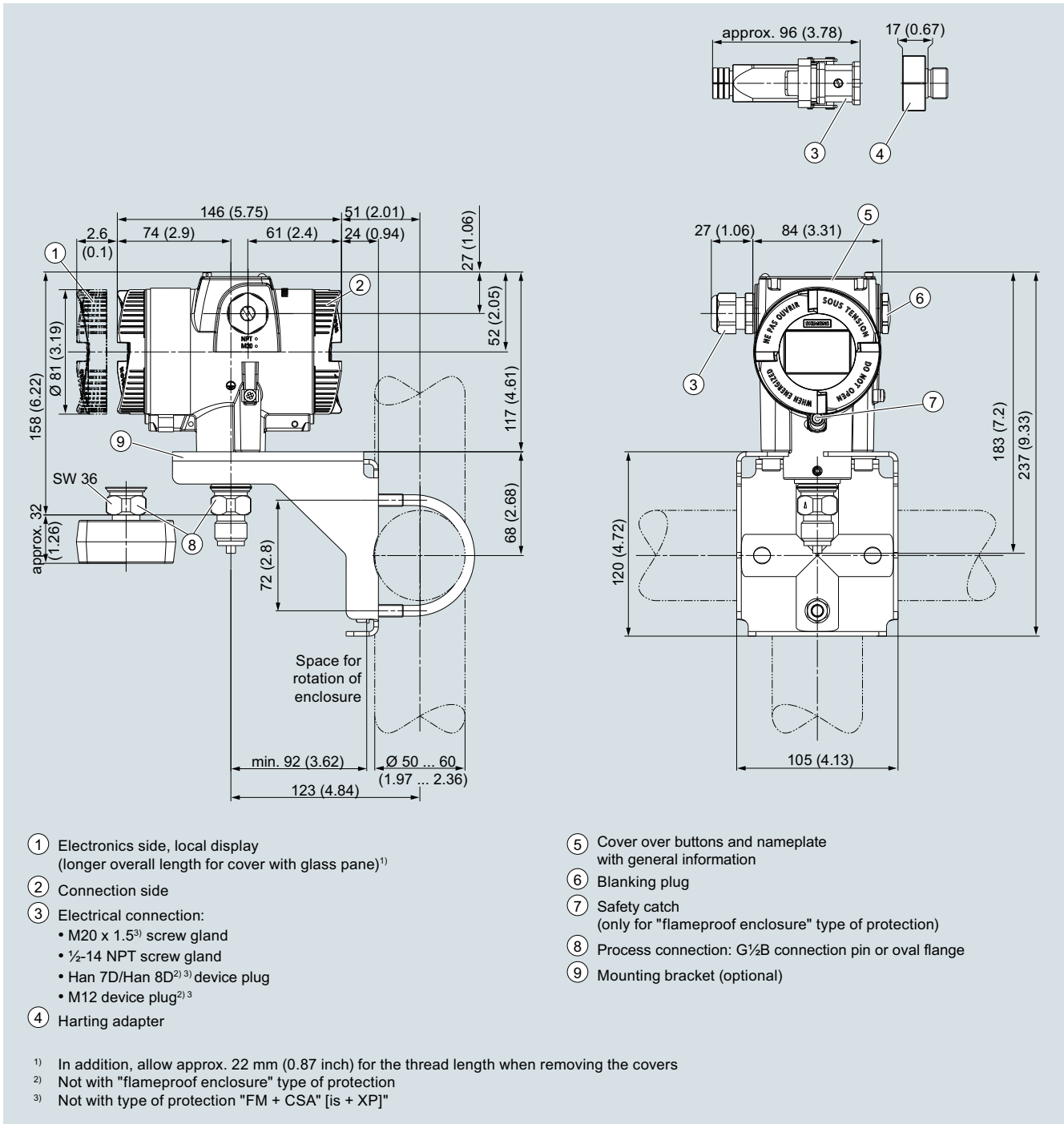
1

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Mounting bracket</b>	
Steel, zinc-plated	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Flange connections with flange EN 1092-1</b>	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J80</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J81</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J82</b>
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J83</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J84</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J85</b>
• DN 25 PN 100, stainless steel 1.4571/316Ti	<b>J86</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
Seal (EN 837-1) material Fe (soft iron)	<b>K60</b>
Seal (EN 837-1) material 1.4571	<b>K61</b>
Seal (EN 837-1) material Cu	<b>K62</b>
<b>Process connection</b>	
Process connection male thread G½, bore hole 11 mm	<b>K80</b>
<b>Shut-off valves, valve manifolds</b>	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	<b>T02</b>
With mounted valve manifold 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	<b>T03</b>
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	<b>T05</b>
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	<b>T06</b>

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Device settings</b>	
Measuring span	<b>Y01</b>
Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr	
TAG (on stainless steel plate and device parameters, max. 32 characters)	<b>Y15</b>
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	<b>Y16</b>
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	<b>Y17</b>
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	<b>Y21</b>
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m <sup>3</sup> /s, l/s, m, inch, ...], example 1 ... 5 m	<b>Y22</b>
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	<b>Y23</b>
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Input field 3: Free text, max. 8 characters	
Set PROFIBUS PA device address (1 ... 126)	<b>Y25</b>
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	<b>Y30</b>
Drop-down list 1: 3.9, 4	
Drop-down list 2: 20.8, 22	
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	<b>Y31</b>
Drop-down list: 3.75; 21.75; 22.5; 22.6	
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	<b>Y32</b>
Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	
ID number of special design	<b>Y99</b>
Input field: max. 4 characters and only natural numbers from 0 ... 9999	

<sup>1)</sup> Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

## Dimensional drawings



SITRANS P320/P420 pressure transmitter for gauge pressure (pressure series), dimensions in mm (inch)

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (differential pressure series)

1

## Technical specifications

### SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)

#### Input

Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar 0.1 ... 2 kPa 0.4019 ... 8.037 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	1 ... 60 mbar 0.1 ... 6 kPa 0.4019 ... 24.11 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	2.5 ... 250 mbar 0.2 ... 25 kPa 1.005 ... 100.5 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 ... 241.1 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	16 ... 1 600 mbar 1.6 ... 160 kPa 6.43 ... 643 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	50 ... 5 000 mbar 5 ... 500 kPa 20.09 ... 2 009 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	8 ... 160 bar 0.8 ... 16 MPa 116 ... 2 320 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit			
	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		

#### Output

	HART
Output signal	4 ... 20 mA
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current
Adjustable damping	0 ... 100 s, continuously adjustable over remote operation
	0 ... 100 s, in increments of 0.1 s, adjustable over display
• Current transmitter	3.55 ... 22.8 mA
• Failure signal	3.55 ... 22.8 mA
Load	Resistance R [ $\Omega$ ]
• Without HART communication	$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ , $U_H$ : Power supply in V
• With HART communication	$R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)
Characteristic curve	<ul style="list-style-type: none"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>
Physical bus	-
Polarity-independent	-

#### Measuring accuracy

Reference conditions	<ul style="list-style-type: none"> <li>• According to IEC 62828-1</li> <li>• Rising characteristic curve</li> <li>• Lower range value 0 bar/kPa/psi</li> <li>• Seal diaphragm stainless steel</li> <li>• Measuring cell with silicone oil filling</li> <li>• Room temperature 25 °C (77 °F)</li> </ul>
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	$r = \text{max. measuring span/set measuring span and nominal measuring range}$
• Linear characteristic curve	
- 20 mbar/2 kPa/8.031 inH <sub>2</sub> O	$r \leq 5:$ $\leq 0.075\%$
	$5 < r \leq 20:$ $\leq (0.005 \cdot r + 0.05)\%$

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)		
- 60 mbar/6 kPa/24.09 inH <sub>2</sub> O	r ≤ 5:	≤ 0.075%
- 250 mbar/25 kPa/3.6 psi	5 < r ≤ 60:	≤ (0.005 · r + 0.05)%
600 mbar/60 kPa/240.9 inH <sub>2</sub> O	r ≤ 5:	≤ 0.065% (SITRANS P320)
1 600 mbar/160 kPa/642.4 inH <sub>2</sub> O		≤ 0.04% (SITRANS P420)
5 000 mbar/500 kPa/2008 inH <sub>2</sub> O	5 < r ≤ 100:	≤ (0.004 · r + 0.045)%
30 bar/3 MPa/435 psi		
- 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.065% (SITRANS P320)
		≤ 0.04% (SITRANS P420)
	5 < r ≤ 20:	≤ (0.004 · r + 0.045)%
Influence of ambient temperature in % per 28 °C (50 °F)		
• 20 mbar/2 kPa/8.031 inH <sub>2</sub> O		≤ (0.15 · r + 0.1)%
• 60 mbar/6 kPa/24.09 inH <sub>2</sub> O		≤ (0.075 · r + 0.1)%
• 250 mbar/25 kPa/3.6 psi		≤ (0.025 · r + 0.125)% (SITRANS P320)
600 mbar/60 kPa/240.9 inH <sub>2</sub> O		
1 600 mbar/160 kPa/642.4 inH <sub>2</sub> O		
5 000 mbar/500 kPa/2008 inH <sub>2</sub> O		
30 bar/3 MPa/435 psi		
160 bar/16 MPa/2 320 psi		
• 250 mbar/25 kPa/3.6 psi		≤ (0.025 · r + 0.0625)% (SITRANS P420)
5 000 mbar/500 kPa/2008 inH <sub>2</sub> O		
• 600 mbar/60 kPa/240.9 inH <sub>2</sub> O		≤ (0.0125 · r + 0.0625)% (SITRANS P420)
1 600 mbar/160 kPa/642.4 inH <sub>2</sub> O		
30 bar/3 MPa/435 psi		
160 bar/16 MPa/2 320 psi		
Long-term stability at ±30 °C (±54 °F)		
• 20 mbar/2 kPa/8.031 inH <sub>2</sub> O		≤ (0.2 · r)% per year
• 60 mbar/6 kPa/24.09 inH <sub>2</sub> O		In 5 years ≤ (0.25 · r)%
• 250 mbar/25 kPa/3.6 psi		In 5 years ≤ (0.125 · r)%
600 mbar/60 kPa/240.9 inH <sub>2</sub> O		In 10 years ≤ (0.15 · r)%
1 600 mbar/160 kPa/642.4 inH <sub>2</sub> O		
5 000 mbar/500 kPa/2008 inH <sub>2</sub> O		
30 bar/3 MPa/435 psi		
160 bar/16 MPa/2 320 psi		
Step response time T <sub>63</sub> (without electrical damping)		
• 20 mbar/2 kPa/8.031 inH <sub>2</sub> O		Approx. 0.160 s
• 60 mbar/6 kPa/24.09 inH <sub>2</sub> O		Approx. 0.150 s
• 250 mbar/25 kPa/3.6 psi		Approx. 0.135 s
600 mbar/60 kPa/240.9 inH <sub>2</sub> O		
1 600 mbar/160 kPa/642.4 inH <sub>2</sub> O		
5 000 mbar/500 kPa/2008 inH <sub>2</sub> O		
30 bar/3 MPa/435 psi		
160 bar/16 MPa/2 320 psi		
Effect of mounting position (in pressure per change of angle)		≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)		0.005% per 1 V
<b>Operating conditions</b>		
Medium temperature		
• Measuring cell with silicone oil filling		-40 ... +100 °C (-40 ... +212 °F)
- Measuring cell 30 bar (435 psi)		-20 ... +100 °C (-4 ... +212 °F)
- Measuring cell 160 bar (2 320 psi)		-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with inert oil		-20 ... +100 °C (-4 ... +212 °F)
• In conjunction with dust explosion protection		-40 ... +85 °C (-4 ... +185 °F)
Ambient conditions		
• Ambient temperature/enclosure		Observe the temperature class in hazardous areas.
- Measuring cell with silicone oil filling		-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil		-40 ... +85 °C (-40 ... +185 °F)
- Display		-20 ... +80 °C (-4 ... +176 °F)
• Storage temperature		-50 ... +85 °C (-58 ... +185 °F)
• Climatic class in accordance with IEC 60721-3-4		4K4H
• Degree of protection		
- According to IEC 60529		IP66, IP68
- According to NEMA 250		Type 4X
• Electromagnetic compatibility		
- Emitted interference and interference immunity		According to IEC 61326 and NAMUR NE 21
<b>Structural design</b>		
Weight		Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.9 kg (13 lb) with stainless steel enclosure
Material		
• Wetted parts materials		
- Seal diaphragm		Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges and sealing plugs		Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

## for gauge pressure (differential pressure series)

### SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)

<ul style="list-style-type: none"> <li>- O-ring</li> <li>• Non-wetted parts materials             <ul style="list-style-type: none"> <li>- Electronics enclosure</li> </ul> </li> <li>- Process flange screws</li> <li>- Mounting bracket</li> </ul>	<p>FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR</p> <ul style="list-style-type: none"> <li>• Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M</li> <li>• Standard: Powder coating with polyurethane             <ul style="list-style-type: none"> <li>Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane</li> </ul> </li> <li>• Stainless steel nameplate (1.4404/316L)</li> </ul> <p>Stainless steel ISO 3506-1 A4-70 Steel, zinc-plated steel, or stainless steel</p>
Process connection	1/4-18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6092 psi))
Electrical connection	<p>Screw terminals</p> <p>Cable entry via the following screwed glands:</p> <ul style="list-style-type: none"> <li>• M20 x 1.5</li> <li>• 1/2-14 NPT</li> <li>• Device plug Han 7D/Han 8D<sup>1)</sup></li> <li>• Device plug M12</li> </ul>
<b>Displays and controls</b>	
Buttons	4 buttons for operation directly on the device
Display	<ul style="list-style-type: none"> <li>• With or without integrated display (optional)</li> <li>• Lid with inspection window (optional)</li> </ul>
<b>Auxiliary power U<sub>H</sub></b>	
Terminal voltage on pressure transmitter	<p>10.5 ... 45 V DC</p> <p>10.5 ... 30 V DC in intrinsically safe mod</p>
Ripple	$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)
Noise	$U_{\text{eff}} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)
Auxiliary power	-
Separate supply voltage	-
<b>Certificates and approvals</b>	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
<ul style="list-style-type: none"> <li>• WRAS (England)</li> <li>• ACS (France)</li> <li>• NSF (USA)</li> </ul>	<p>No.: 1903094 (option E83)</p> <p>No.: 18 ACC LY 277 (option E85)</p> <p>No.: 20180920-MH61350 (option E84)</p>
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
<ul style="list-style-type: none"> <li>• Intrinsic safety "i"             <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible medium temperature</li> <li>- Connection</li> </ul> </li> </ul>	<p>II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4</p> <p>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>-40 ... +100 °C (-40 ... +212 °F) temperature class T4</p> <p>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To certified intrinsically safe circuits with peak values:</p> <p><math>U_i = 30 \text{ V}</math>, <math>I_i = 101 \text{ mA}</math>, <math>P_i = 760 \text{ mW}</math></p> <p><math>U_i = 29 \text{ V}</math>, <math>I_i = 110 \text{ mA}</math>, <math>P_i = 800 \text{ mW}</math></p> <p><math>L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}</math></p>
<ul style="list-style-type: none"> <li>• Flameproof enclosure "d"             <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible medium temperature</li> <li>- Connection</li> </ul> </li> </ul>	<p>Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4</p> <p>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>-40 ... +100 °C (-40 ... +212 °F) temperature class T4</p> <p>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To circuit with the operating values: <math>U_n = 10.5 \dots 45 \text{ V}</math>, 4 ... 20 mA</p>
<ul style="list-style-type: none"> <li>• Dust explosion protection for Zones 21, 22             <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible medium temperature</li> <li>- Max. surface temperature</li> <li>- Connection</li> </ul> </li> </ul>	<p>Ex II 2D Ex tb IIIC T120 °C Db</p> <p>Ex II 3D Ex tc IIIC T120 °C Dc</p> <p>-40 ... +80 °C (-40 ... +176 °F)</p> <p>-40 ... +100 °C (-40 ... +212 °F)</p> <p>120 °C (248 °F)</p> <p>To circuit with the operating values: <math>U_n = 10.5 \dots 45 \text{ V}</math>, 4 ... 20 mA</p>
<ul style="list-style-type: none"> <li>• Dust explosion protection for Zones 20, 21, 22             <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible medium temperature</li> <li>- Connection</li> </ul> </li> <li>- Effective internal inductance/capacitance</li> </ul>	<p>Ex II 1D Ex ia IIIC T120 °C Da</p> <p>Ex II 2D Ex ib IIIC T120 °C Db</p> <p>-40 ... +80 °C (-40 ... +176 °F)</p> <p>-40 ... +100 °C (-40 ... +212 °F)</p> <p>To certified intrinsically safe circuits with peak values:</p> <p><math>U_i = 30 \text{ V}</math>, <math>I_i = 101 \text{ mA}</math>, <math>P_i = 760 \text{ mW}</math></p> <p><math>U_i = 29 \text{ V}</math>, <math>I_i = 110 \text{ mA}</math>, <math>P_i = 800 \text{ mW}</math></p> <p><math>L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}</math></p>

# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P320/420

for gauge pressure (differential pressure series)

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**SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)**

<ul style="list-style-type: none"> <li>• Type of protection for Zone 2           <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature "ec"</li> </ul> </li> <li>- Permissible medium temperature</li> <li>- "ec" connection</li> <li>• Explosion protection acc. to FM           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or IS; NI; S</li> </ul> </li> <li>• Explosion protection according to CSA           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or (IS)</li> </ul> </li> </ul> <p>NAMUR recommendations</p> <ul style="list-style-type: none"> <li>• NE 06</li> <li>• NE 21</li> <li>• NE 23</li> <li>• NE 43</li> <li>• NE 53</li> <li>• NE 80</li> <li>• NE 105</li> <li>• NE 107</li> <li>• NE 131</li> </ul>	<p>Ex II 3G Ex ec IIC T4/T6 Gc</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4          -40 ... +40 °C (-40 ... +104 °F) temperature class T6</p> <p>-40 ... +100 °C (-40 ... +212 °F) temperature class T4          -40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To circuit with the operating values:  <math>U_n = 10.5 \dots 30 \text{ V}, 4 \dots 20 \text{ mA}</math></p> <p>Available soon</p> <p>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> <p>Available soon</p> <p>CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> <p>Standardized Electrical Signals and Questions Relating to Engineering Technology          Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment          Extra Low Voltage Circuits with Safe Separation          Standardization of the Signal Level for the Failure Information of Digital Transmitters          Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics          The Application of the Pressure Equipment Directive to Process Control Devices          Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices          Self-Monitoring and Diagnosis of Field Devices          NAMUR Standard Device - Field Devices for Standard Applications</p>
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1) Han 8D is identical to Han 8U.

**Communication**

<b>PROFIBUS PA</b>		<b>FOUNDATION Fieldbus</b>	
Simultaneous communication with master class 2 (max.)	4	Device profile	FF ITK 6
The address can be set using	Configuration tool or local operation (standard setting address 126)	Function blocks	3 function blocks analog input, 1 function block PID
Cyclic data usage		• Analog input	
• Output byte	≤ 35 (7 measured values)	- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)	- Electrical damping adjustable	0 ... 100 s
Internal preprocessing		- Simulation function	Output/input (can be locked within the device with a bridge)
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX	- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
Number of function blocks	7	- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Analog input		- Square-rooted characteristic curve for flow measurement	Yes
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve	• PID	Standard FOUNDATION Fieldbus function block
- Electrical damping adjustable	0 ... 100 s	• Physical block	1 resource block
- Simulation function	Output/input	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively	• Pressure transducer block	
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output	- Can be calibrated by applying two pressures	Yes
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively	- Monitoring of sensor limits	Yes
• Physical block	1	- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function
Transducer blocks	1	<b>HART</b>	
• Pressure transducer block		HART	230 ... 1 100 Ω
- Can be calibrated by applying two pressures	Yes	Protocol	HART 7
- Monitoring of sensor limits	Yes	Software for computer	SIMATIC PDM
- Specification of a vessel characteristic with	Max. 30 nodes		
- Square-rooted characteristic curve for flow measurement	Yes		
- Tank characteristic curve for volume measurement	Yes		
- Low flow cut-off and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function		

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for gauge pressure (differential pressure series)

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## Selection and ordering data

Article No.

### Pressure transmitters for gauge pressure (differential pressure series)

SITRANS P320

7MF031 - - - - -

SITRANS P420

7MF041 - - - - -

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

0  
1  
2

#### Measuring cell filling

Silicone oil

Inert filling liquid

1  
3

#### Maximum measuring span

20 mbar (8.037 inH<sub>2</sub>O)60 mbar (24.11 inH<sub>2</sub>O)250 mbar (1005 inH<sub>2</sub>O)600 mbar (241.1 inH<sub>2</sub>O)1 600 mbar (643 inH<sub>2</sub>O)5 000 mbar (2009 inH<sub>2</sub>O)

30 bar (435 psi)

160 bar (2 320 psi)

B  
D  
G  
H  
M  
P  
R  
Y

#### Process connection

Oval flange, mounting thread:  $\frac{7}{16}$ -20 UNF (IEC 61518)

Oval flange, mounting thread: M10 (PN 160), (DIN 19213)

Oval flange, mounting thread:  $\frac{7}{16}$ -20 UNF (IEC 61518) with lateral ventilation

Oval flange, mounting thread: M10 (PN 160) (DIN 19213) with lateral ventilation

L  
M  
N  
P

#### Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408

Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408

Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408

Tantalum/tantalum, process flange stainless steel 316/1.4408

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

0  
1  
2  
4  
6  
8

#### Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

1  
2

#### Enclosure

Dual chamber device

5

#### Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

A  
B  
C  
D  
L  
M  
S  
T

#### Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

• 2 x  $\frac{1}{2}$ -14 NPTF  
M

#### Local operation/display

Without display (lid closed)

With display (lid closed)

With display (lid with glass pane)

0  
1  
2



# Pressure Measurement

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#### SITRANS P320/420

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Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Cable glands included</b>	
Plastic	<b>A00</b>
Metal	<b>A01</b>
Stainless steel	<b>A02</b>
Stainless steel 316L/1.4404	<b>A03</b>
CMP, for XP devices	<b>A10</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>
<b>Device plug Han mounted left</b>	
Device plug Han 7D (plastic, straight)	<b>A30</b>
Device plug Han 7D (plastic, angled)	<b>A31</b>
Device plug Han 7D (metal, straight)	<b>A32</b>
Device plug Han 7D (metal, angled)	<b>A33</b>
Device plug Han 8D (plastic, straight)	<b>A34</b>
Device plug Han 8D (plastic, angled)	<b>A35</b>
Device plug Han 8D (metal, straight)	<b>A36</b>
Device plug Han 8D (metal, angled)	<b>A37</b>
<b>Cable socket included</b>	
Plastic, for device plug Han 7D and Han 8D	<b>A40</b>
Metal, for device plug Han 7D and Han 8D	<b>A41</b>
<b>Device plug M12 mounted left</b>	
Stainless steel, without cable socket	<b>A62</b>
Stainless steel, with cable socket	<b>A63</b>
<b>Cable entry/device plug mounting</b>	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>
Cable gland/device plug mounted left	<b>A97</b>
Cable gland/device plug mounted right	<b>A99</b>
<b>Nameplate labeling (standard labeling: English, unit bar)</b>	
German (bar)	<b>B11</b>
French (bar)	<b>B12</b>
Spanish (bar)	<b>B13</b>
Italian (bar)	<b>B14</b>
Chinese (bar)	<b>B15</b>
Russian (bar)	<b>B16</b>
English (psi)	<b>B20</b>
English (Pa)	<b>B30</b>
Chinese (Pa)	<b>B35</b>
<b>Certificates</b>	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	<b>C11</b>
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>
Factory certificate (EN 10204-2.2) - Wetted parts	<b>C14</b>
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>
<b>Certificates for functional safety</b>	
Functional Safety (IEC 61508) - SIL2/3	<b>C20</b>

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	<b>D30</b>
Unlabeled TAG plate	<b>D40</b>
Without labeling of the measuring range on the TAG plate	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Overvoltage protection up to 6 kV (internal)	<b>D70</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Labels on transport packaging (provided by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA (USA and Canada)	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada) <sup>1)</sup>	<b>E21</b>
FM (USA and Canada) <sup>1)</sup>	<b>E22</b>
IECEx (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
RMR (Russian Maritime Register)	<b>E55</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

## for gauge pressure (differential pressure series)

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Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual Seal	<b>E81</b>
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>
<b>Mounting bracket</b>	
Steel, zinc-plated	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Process flanges; screw plug with vent valve</b>	
Welded in on right	<b>J08</b>
Welded in on left	<b>J09</b>
Glued in on right	<b>J10</b>
Glued in on left	<b>J11</b>
<b>Flange connections with flange EN 1092-1</b>	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J70</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J71</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J72</b>
• DN 15 PN 40, stainless steel 1.4571/316Ti	<b>J78</b>
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J73</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J74</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J75</b>
<b>Flange connection options</b>	
Flange connection and temperature extension	<b>J76</b>
Flange connection with epoxy resin coating	<b>J77</b>
<b>Process flanges; special materials</b>	
Reserved for 7MF7: without process flanges, without screws, without gaskets	<b>K00</b>
Process flange material alloy C22/2.4602	<b>K01</b>
Process flange material Monel 400/2.4360	<b>K02</b>
Process connection material PVDF, on the side ½-14 NPT	<b>K05</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	<b>K06</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	<b>K07</b>
<b>Process flanges; process connection option</b>	
Process flange with process connection G½ welded on	<b>K20</b>
Process connection NAM (ASTAVA)	<b>K21</b>
<b>Process flanges chambered with gaskets</b>	
1x chambered, graphite	<b>K40</b>
1x chambered, PTFE	<b>K41</b>
2x chambered, PTFE	<b>K42</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
O-ring, process flanges, PTFE	<b>K50</b>
O-ring, process flanges, FEP (with silicone core, approved for food)	<b>K51</b>
O-ring, process flanges, FFKM (FFPM)	<b>K52</b>
O-ring, process flanges, NBR	<b>K53</b>
O-ring, process flanges, EPDM	<b>K54</b>

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Process flange options</b>	
Process flanges for vertical differential pressure lines (half process flange)	<b>K81</b>
Process flanges (+) - side front	<b>K82</b>
Process flange screws, process flange nuts, material Monel 400/2.4360	<b>K83</b>
Valve ¼-18 NPT, material same as process flanges	<b>K84</b>
Valve mounted on the side, measured medium: Gas	<b>K85</b>
Oval flange attached, PTFE seal + fastening screws	<b>K86</b>
<b>Valve manifolds</b>	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U01</b>
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U02</b>
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U03</b>
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U04</b>

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for gauge pressure (differential pressure series)

1

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Device settings</b>	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr	<b>Y01</b>
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	<b>Y15</b>
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	<b>Y16</b>
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	<b>Y17</b>
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	<b>Y21</b>
Local display Scaling with standard units [m <sup>3</sup> /s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.	<b>Y22</b>
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	<b>Y23</b>
Set PROFIBUS PA device address (1 ... 126)	<b>Y25</b>
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	<b>Y30</b>
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	<b>Y31</b>
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	<b>Y32</b>
ID number of special design Input field: max. 4 characters and only natural numbers from 0 ... 9999	<b>Y99</b>

<sup>1)</sup> Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

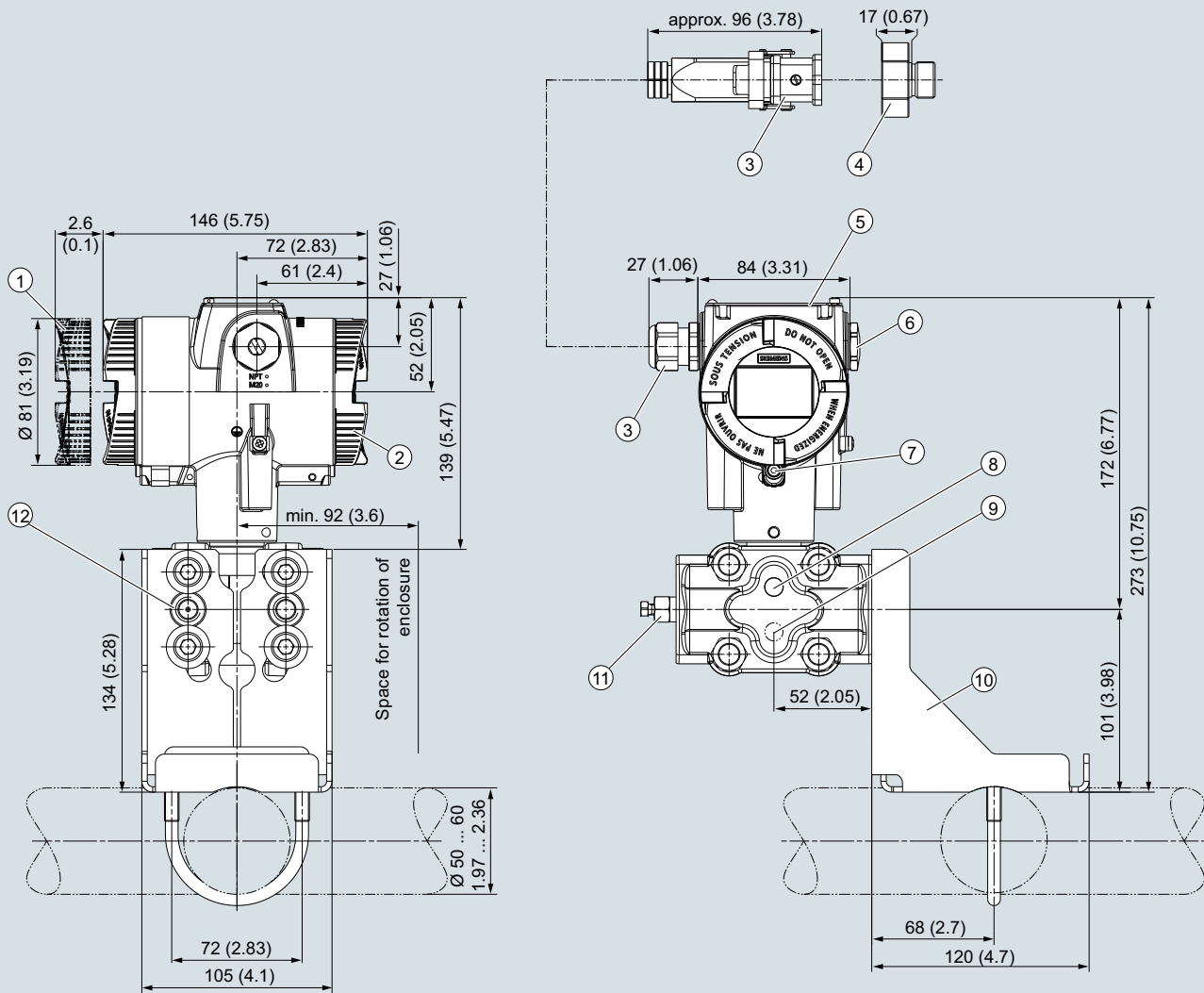
# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for gauge pressure (differential pressure series)

1

## Dimensional drawings



- |   |   |
|---|---|
| <p>① Electronics side, local display<br/>(longer overall length for cover with glass pane)<sup>1)</sup></p> <p>② Connection side</p> <p>③ Electrical connection:<br/> <ul style="list-style-type: none"> <li>• M20 x 1,5<sup>3)</sup> screw gland</li> <li>• ½-14 NPT screw gland</li> <li>• Han 7D/Han 8D<sup>2)3)</sup> device plug</li> <li>• M12 device plug<sup>2)3)</sup></li> </ul> </p> <p>④ Harting adapter</p> <p>⑤ Cover over buttons and nameplate with general information</p> | <p>⑥ Blanking plug</p> <p>⑦ Safety catch<br/>(only for "flameproof enclosure" type of protection)</p> <p>⑧ Lateral ventilation for liquid measurement (Standard)</p> <p>⑨ Lateral ventilation for gas measurement (order option K85)</p> <p>⑩ Mounting bracket (optional)</p> <p>⑪ Sealing plug with valve (optional)</p> <p>⑫ Process connection: ¼-18 NPT (IEC 61518)</p> |
|---|---|

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with "flameproof enclosure" type of protection

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for gauge pressure (differential pressure series), dimensions in mm (inch)

### Technical specifications

#### SITRANS P320/SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm

##### Input of gauge pressure with front-flush diaphragm

Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure and max. permissible test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange <sup>1)</sup>	
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi		
	0.16 ... 16 bar 0.016 ... 1.6 MPa 2.3 ... 232 psi		
	0.6 ... 63 bar 0.063 ... 6.3 MPa 9.1 ... 914 psi		
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with inert oil	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of max. measuring span		

##### Input of absolute pressure, with flush-mounted diaphragm

Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure and max. permissible test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17 ... 525 inH <sub>2</sub> O a	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange <sup>1)</sup>	
	166 ... 5000 mbar a 16.6 ... 500 kPa a 2.41 ... 72.5 psi a		
	1 ... 30 bar a 0.1 ... 3 MPa a 14.5 ... 435 psi a		
	Depending on the process connection, the measuring span may differ from these values.		
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	0 bar a/0 kPa a/0 psi a		
• Upper measuring limit	100% of max. measuring span		
Lower range value	Between the measuring limits (infinitely adjustable)		

##### Output

Output signal	<b>HART</b> 4 ... 20 mA
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current
Adjustable damping	0 ... 100 s, continuously adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over display
• Current transmitter	3.55 ... 22.8 mA
• Failure signal	3.55 ... 22.8 mA
Load	Resistance R [ $\Omega$ ]
• Without HART communication	$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ , $U_H$ : Power supply in V
• With HART communication	$R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)
Characteristic curve	<ul style="list-style-type: none"> <li>Linearly increasing or linearly decreasing</li> <li>Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>
Physical bus	-
Polarity-independent	-

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

## for gauge and absolute pressure, flush-mounted diaphragm

1

### SITRANS P320/SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm

#### Gauge pressure measuring accuracy, with front-flush diaphragm

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

$r$  = maximum measuring span/set measuring span or nominal measuring range

• Linear characteristic curve

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

$r \leq 5$ :  $\leq 0.075\%$   
 $5 < r \leq 100$ :  $\leq (0.005 \cdot r + 0.05)\%$

Influence of ambient temperature  
in % per 28 °C (50 °F)

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

$\leq (0.08 \cdot r + 0.16)\%$

Influence of the medium temperature  
(in pressure per temperature unit)

- Temperature difference between medium temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

In 5 years  $\leq (0.25 \cdot r)\%$

In 5 years  $\leq (0.125 \cdot r)\%$

Step response time  $T_{63}$  (without electrical damping)

$\leq 0.105$  s

Effect of mounting position (in pressure per change of angle)

0.4 mbar/0.04 kPa/0.006 per 10° incline  
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

#### Absolute pressure measuring accuracy with flush diaphragm

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

$r$  = maximum measuring span/set measuring span or nominal measuring range

• Linear characteristic curve

- All measuring cells

$r \leq 10$ :  $\leq 0.2\%$   
 $10 < r \leq 30$ :  $\leq 0.4\%$

Influence of ambient temperature  
in % per 28 °C (50 °F)

- All measuring cells

$\leq (0.16 \cdot r + 0.24)\%$

Influence of the medium temperature  
(in pressure per temperature unit)

- Temperature difference between medium temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- All measuring cells

In 5 years  $\leq (0.25 \cdot r)\%$

Step response time  $T_{63}$  (without electrical damping)

$\leq 0.105$  s

Effect of mounting position (in pressure per change of angle)

0.4 mbar/0.04 kPa/0.006 per 10° incline  
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

**SITRANS P320/SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm****Operating conditions**Medium temperature<sup>2)</sup>

• Measuring cell with silicone oil filling	-40 ... +150 °C (-40 ... +302 °F) -40 ... +200 °C (-40 ... +392 °F) with cooling extension
• Measuring cell with inert oil	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with FDA-compliant oil	-10 ... +150 °C (14 ... 302 °F)

Ambient conditions

• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert fill oil (different pressure classes)	1 bar/100 kPa/14.5 psi      -40 ... +85 °C (-40 ... +185 °F) 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 ps
- Measuring cell with FDA-compliant oil	-10 ... +85 °C (14 ... +185 °F)
- Display	-20 ... +80 °C (-4 ... +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21

**Structural design**

Weight (pressure transmitter without mounting flange)	Approx. 1.8 kg (3.5 lb) with aluminum enclosure Approx. 3.8 kg (8.3 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Process connection	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L)
- Mounting bracket	Steel, zinc-plated steel, or stainless steel
Process connection	• Flanges according to EN and ASME • F&B and pharmaceutical flanges • BioConnect/BioControl • PMC style
Electrical connection	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D <sup>3)</sup> • Device plug M12

**Displays and controls**

Buttons	4 buttons for operation directly on the device
Display	• With or without integrated display (optional) • Lid with inspection window (optional)

**Auxiliary power  $U_H$** 

Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)
Auxiliary power	-
Separate supply voltage	-

**Certificates and approvals**

Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

## for gauge and absolute pressure, flush-mounted diaphragm

### SITRANS P320/SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm

#### Explosion protection

##### • Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Permissible medium temperature
- Connection

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb  
-40 ... +80 °C (-40 ... +176 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6  
-40 ... +100 °C (-40 ... +212 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6  
To certified intrinsically safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$   
 $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

##### • Flameproof enclosure "d"

- Marking
- Permissible ambient temperature
- Permissible medium temperature
- Connection

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb  
-40 ... +80 °C (-40 ... +176 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6  
-40 ... +100 °C (-40 ... +212 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6  
To circuit with the operating values  
 $U_n = 10.5 \dots 45 \text{ V}$ ,  $4 \dots 20 \text{ mA}$

##### • Dust explosion protection for Zones 21, 22

- Marking
- Permissible ambient temperature
- Permissible medium temperature
- Max. surface temperature
- Connection

Ex II 2D Ex tb IIIC T120 °C Db  
Ex II 3D Ex tc IIIC T120 °C Dc  
-40 ... +80 °C (-40 ... +176 °F)  
-40 ... +100 °C (-40 ... +212 °F)  
120 °C (248 °F)  
To circuit with the operating values  
 $U_n = 10.5 \dots 45 \text{ V}$ ,  $4 \dots 20 \text{ mA}$

##### • Dust explosion protection for Zones 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible medium temperature
- Connection

Ex II 1D Ex ia IIIC T120 °C Da  
Ex II 2D Ex ib IIIC T120 °C Db  
-40 ... +80 °C (-40 ... +176 °F)  
-40 ... +100 °C (-40 ... +212 °F)  
To certified intrinsically safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$   
 $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

##### • Type of protection for Zone 2

- Marking
- Permissible ambient temperature "ec"
- Permissible medium temperature
- "ec" connection

Ex II 3G Ex ec IIC T4/T6 Gc  
-40 ... +80 °C (-40 ... +176 °F) temperature class T4  
-40 ... +40 °C (-40 ... +104 °F) temperature class T6  
-40 ... +100 °C (-40 ... +212 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6  
To circuit with the operating values  
 $U_n = 10.5 \dots 30 \text{ V}$ ,  $4 \dots 20 \text{ mA}$

##### • Explosion protection acc. to FM

- Marking (XP/DIP) or IS; NI; S

Available soon  
CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

##### • Explosion protection according to CSA

- Marking (XP/DIP) or (IS)

Available soon  
CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

#### NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

Standardized Electrical Signals and Questions Relating to Engineering Technology  
Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment  
Extra Low Voltage Circuits with Safe Separation  
Standardization of the Signal Level for the Failure Information of Digital Transmitters  
Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics  
The Application of the Pressure Equipment Directive to Process Control Devices  
Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices  
Self-Monitoring and Diagnosis of Field Devices  
NAMUR Standard Device - Field Devices for Standard Applications

- 1) The MAWP value of the pressure transmitter can be lower than the PN value of the mounting flange and vice versa.  
To determine the maximum permissible operating pressure and the maximum permissible test pressure, use the lowest value as reference.
- 2) Observe the temperature limits in the process connection standards (e.g. DIN 32676 and DIN 11851) for the maximum medium temperature for flush-mounted process connections.
- 3) Han 8D is identical to Han 8U.



**Communication**

<b>HART</b>	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
<b>PROFIBUS PA</b>	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

<b>FOUNDATION Fieldbus</b>	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for gauge and absolute pressure, flush-mounted diaphragm

1

## Selection and ordering data

Article No.

### Pressure transmitter for gauge and absolute pressure, with flush-mounted diaphragm

SITRANS P320 for gauge pressure

7MF030 - - - - -

SITRANS P420 for gauge pressure

7MF040 - - - - -

SITRANS P320 for absolute pressure

7MF032 - - - - -

SITRANS P420 for absolute pressure

7MF042 - - - - -

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

### Communication

HART, 4 ... 20 mA

0

PROFIBUS PA

1

FOUNDATION Fieldbus (FF)

2

### Measuring cell filling

Silicone oil

1

Inert filling liquid

3

Neobee oil

4

### Maximum measuring span

1 000 mbar (14.5 psi)

0

J

4 000 mbar (58 psi)

0

N

16 bar (232 psi)

0

Q

63 bar (914 psi)

0

T

1 300 mbar a (18.9 psi a)

2

L

5 000 mbar a (72.5 psi a)

2

P

30 bar a (435 psi a)

2

R

### Process connection

Flush-mounted diaphragm

K

### Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404

0

Stainless steel 316L/1.4404, alloy C276/2.4819

1

Alloy C22/2.4602, alloy C276/2.4819

2

### Non-wetted parts materials

Die-cast aluminum

1

Stainless steel precision casting CF3M/1.4409 similar to 316L

2

### Enclosure

Dual chamber device

5

### Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

A  
B  
C  
D  
L  
M  
S  
T

### Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

• 2 x ½-14 NPT

F  
M

### Local operation/display

Without display (lid closed)

0

With display (lid closed)

1

With display (lid with glass pane)

2

# Pressure Measurement

## Pressure transmitters

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Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Cable glands included</b>	
Plastic	<b>A00</b>
Metal	<b>A01</b>
Stainless steel	<b>A02</b>
Stainless steel 316L/1.4404	<b>A03</b>
CMP, for XP devices	<b>A10</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>
<b>Device plug Han mounted left</b>	
Device plug Han 7D (plastic, straight)	<b>A30</b>
Device plug Han 7D (plastic, angled)	<b>A31</b>
Device plug Han 7D (metal, straight)	<b>A32</b>
Device plug Han 7D (metal, angled)	<b>A33</b>
Device plug Han 8D (plastic, straight)	<b>A34</b>
Device plug Han 8D (plastic, angled)	<b>A35</b>
Device plug Han 8D (metal, straight)	<b>A36</b>
Device plug Han 8D (metal, angled)	<b>A37</b>
<b>Cable socket included</b>	
Plastic, for device plug Han 7D and Han 8D	<b>A40</b>
Metal, for device plug Han 7D and Han 8D	<b>A41</b>
<b>Device plug M12 mounted left</b>	
Stainless steel, without cable socket	<b>A62</b>
Stainless steel, with cable socket	<b>A63</b>
<b>Cable entry/device plug mounting</b>	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>
Cable gland/device plug mounted left	<b>A97</b>
Cable gland/device plug mounted right	<b>A99</b>
<b>Nameplate labeling (standard labeling: English, unit bar)</b>	
German (bar)	<b>B11</b>
French (bar)	<b>B12</b>
Spanish (bar)	<b>B13</b>
Italian (bar)	<b>B14</b>
Chinese (bar)	<b>B15</b>
Russian (bar)	<b>B16</b>
English (psi)	<b>B20</b>
English (Pa)	<b>B30</b>
Chinese (Pa)	<b>B35</b>
<b>Certificates</b>	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	<b>C11</b>
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>
Factory certificate (EN 10204-2.2) - Wetted parts	<b>C14</b>
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>
<b>Certificates for functional safety</b>	
Functional Safety (IEC 61508) - SIL2/3	<b>C20</b>

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	<b>D30</b>
Unlabeled TAG plate	<b>D40</b>
Without labeling of the measuring range on the TAG plate	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Overvoltage protection up to 6 kV (internal)	<b>D70</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Labels on transport packaging (provided by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA (USA and Canada)	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada) <sup>1)</sup>	<b>E21</b>
FM (USA and Canada) <sup>1)</sup>	<b>E22</b>
IECEx (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
RMR (Russian Maritime Register)	<b>E55</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

## for gauge and absolute pressure, flush-mounted diaphragm

1

Options	Order code	Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.		Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Special approvals</b>		<b>Sanitary connections manufacturer-specific</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>	Varivent type N for pipes DN 40 ... DN 125 PN 40	<b>P06</b>
Dual Seal	<b>E81</b>	<b>Sanitary connections special design</b>	
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	<b>E83</b>	Tank connection	
NSF61 (drinking water)	<b>E84</b>	• TG 52/50 PN 40 with seal	<b>Q00</b>
ACS (drinking water)	<b>E85</b>	• TG 52/150 PN 40 with seal	<b>Q01</b>
3A (hygiene)	<b>E86</b>	DRD flange D = 65 mm DN 50 PN 40	<b>Q15</b>
EHEDG (hygiene)	<b>E87</b>	SMS socket	
		• with thread 2" PN 25	<b>Q28</b>
		• with thread 2 ½" PN 25	<b>Q29</b>
		• with thread 3" PN 25	<b>Q30</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>		<b>Weldable sockets for tank connection</b>	
Seal (EN 837-1) material Fe (soft iron)	<b>K60</b>	Weldable piece for TG52/50	<b>Q90</b>
Seal (EN 837-1) material 1.4571	<b>K61</b>	Weldable piece for TG52/150	<b>Q91</b>
Seal (EN 837-1) material Cu	<b>K62</b>	<b>Connections for the paper industry</b>	
<b>Process connection</b>		Process connection PMC Style Standard	<b>R00</b>
Process connection male thread G½, bore hole 11 mm	<b>K80</b>	Process connection PMC Style Minibolt	<b>R01</b>
<b>Flanges according to EN 1092-1 Form B1 and ASME standard B16.5</b>		Weldable sockets for PMC Style Standard	<b>R02</b>
EN 1092-1 Form B1		Weldable sockets for PMC Style Minibolt	<b>R03</b>
• DN 50 PN 16	<b>M03</b>	<b>Threaded connection</b>	
• DN 80 PN 16	<b>M05</b>	Male thread G¾-A DIN 3852	<b>R11</b>
• DN 25 PN 40	<b>M10</b>	Male thread G1-A DIN 3852	<b>R12</b>
• DN 40 PN 40	<b>M12</b>	Male thread G2-A DIN 3852	<b>R14</b>
• DN 50 PN 40	<b>M13</b>	<b>Special options front-flush</b>	
• DN 80 PN 40	<b>M15</b>	Temperature decoupler (media temperature up to 200 °C)	<b>R85</b>
• DN 40 PN 100	<b>M22</b>	Mating connector including seal	<b>R90</b>
ASME B16.5			
• 1" Class 150 RF	<b>M30</b>		
• 1 ½" Class 150 RF	<b>M31</b>		
• 2" Class 150 RF	<b>M32</b>		
• 3" Class 150 RF	<b>M33</b>		
• 4" Class 150 RF	<b>M34</b>		
• 1 ½" Class 300 RF	<b>M36</b>		
• 2" Class 300 RF	<b>M37</b>		
• 3" Class 300 RF	<b>M38</b>		
• 4" Class 300 RF	<b>M39</b>		
<b>Sanitary connections in accordance with the standard</b>			
Sanitary flange DIN 11851			
• with slotted union nut DN 50 PN 25	<b>N03</b>		
• with slotted union nut DN 80 PN 25	<b>N05</b>		
Tri-Clamp			
• DIN 32676 DN 50 PN 16	<b>N14</b>		
• DIN 32676 DN 65 PN 10	<b>N15</b>		
• ISO 2852 2" PN 40	<b>N22</b>		
• ISO 2852 3" PN 40	<b>N23</b>		
Aseptic threaded socket			
• DIN 11864-1 Form A DN 50 PN 25	<b>N33</b>		
• DIN 11864-1 Form A DN 65 PN 25	<b>N34</b>		
• DIN 11864-1 Form A DN 80 PN 25	<b>N35</b>		
• DIN 11864-1 Form A DN100 PN 25	<b>N36</b>		
Aseptic flange with notch			
• DIN 11864-2 Form A DN 50 PN 16	<b>N43</b>		
• DIN 11864-2 Form A DN 65 PN 16	<b>N44</b>		
• DIN 11864-2 Form A DN 80 PN 16	<b>N45</b>		
• DIN 11864-2 Form A DN100 PN 16	<b>N46</b>		
Aseptic clamp with groove			
• DIN 11864-3 Form A DN 50 PN 25	<b>N53</b>		
• DIN 11864-3 Form A DN 65 PN 25	<b>N54</b>		
• DIN 11864-3 Form A DN 80 PN 16	<b>N55</b>		
• DIN 11864-3 Form A DN100 PN 16	<b>N56</b>		

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Device settings</b>	
<p>Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm<sup>2</sup>, kg/cm<sup>2</sup>, kgf/cm<sup>2</sup>, inH<sub>2</sub>O, inH<sub>2</sub>O (4°C), ftH<sub>2</sub>O, mmH<sub>2</sub>O, mmH<sub>2</sub>O (4°C), mH<sub>2</sub>O (4°C), mmHg, inHg, atm, torr</p>	<b>Y01</b>
<p>TAG (on stainless steel plate and device parameters, max. 32 characters)</p> <p>Input field: Free text, max. 32 characters</p>	<b>Y15</b>
<p>Measuring point description (on stainless steel plate and device parameters, max. 32 characters)</p> <p>Input field: Free text, max. 32 characters</p>	<b>Y16</b>
<p>TAG short (device parameters, max. 8 characters)</p> <p>Input field: Free text, max. 8 characters</p>	<b>Y17</b>
<p>Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge</p> <p>Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge</p>	<b>Y21</b>
<p>Local display Scaling with standard units [m<sup>3</sup>/s, l/s, m, inch, ...], example 1 ... 5 m</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Drop-down list: m, cm, mm, in, ft, m<sup>3</sup>, l, hl, in<sup>3</sup>, ft<sup>3</sup>, yd<sup>3</sup>, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm<sup>3</sup>, NI.</p>	<b>Y22</b>
<p>Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Input field 3: Free text, max. 8 characters</p>	<b>Y23</b>
Set PROFIBUS PA device address (1 ... 126)	<b>Y25</b>
<p>Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA</p> <p>Drop-down list 1: 3.9, 4</p> <p>Drop-down list 2: 20.8, 22</p>	<b>Y30</b>
<p>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</p> <p>Drop-down list: 3.75; 21.75; 22.5; 22.6</p>	<b>Y31</b>
<p>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</p> <p>Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.</p>	<b>Y32</b>
<p>ID number of special design</p> <p>Input field: max. 4 characters and only natural numbers from 0 ... 9999</p>	<b>Y99</b>

<sup>1)</sup> Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

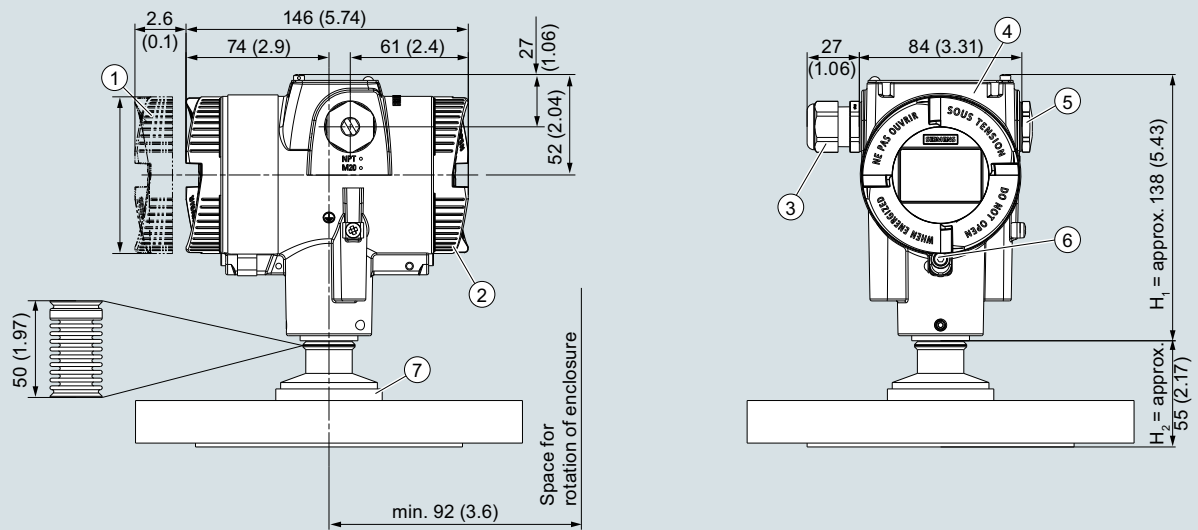
## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for gauge and absolute pressure, flush-mounted diaphragm

1

### Dimensional drawings



- |  |  |
|--|--|
| <p>① Electronics side, local display<br/>(longer overall length for cover with glass pane)<sup>1)</sup></p> <p>② Connection side</p> <p>③ Electrical connection:<br/> <ul style="list-style-type: none"> <li>• M20 x 1,5<sup>3)</sup> screw gland</li> <li>• ½-14 NPT screw gland</li> <li>• Han 7D/Han 8D<sup>2)</sup> device plug</li> <li>• M12 device plug<sup>2)</sup><sup>3)</sup></li> </ul> </p> <p><sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers</p> <p><sup>2)</sup> Not with "flameproof enclosure" type of protection</p> <p><sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"</p> | <p>④ Cover over buttons and nameplate<br/>with general information</p> <p>⑤ Blanking plug</p> <p>⑥ Safety catch<br/>(only for "flameproof enclosure" type of protection)</p> <p>⑦ Process connection</p> |
|--|--|

SITRANS P320/P420 pressure transmitter, with flush-mounted diaphragm, dimensions in mm (inch)

This figure consists of a SITRANS P320/P420 with an example flange.  
In this figure, the height is divided into H<sub>1</sub> and H<sub>2</sub>.

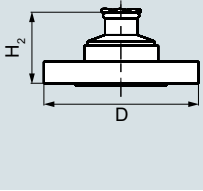
H<sub>1</sub> = Height of the SITRANS P320/P420 up to a defined cross-section

H<sub>2</sub> = Height of the flange up to this defined cross-section

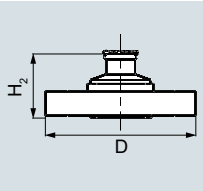
Only the height H<sub>2</sub> is indicated in the dimensions of the flanges.

**Flanges according to EN and ASME**

## Flange according to EN

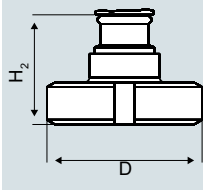
EN 1092-1					
	Order code	DN	PN	∅D	H <sub>2</sub>
	M03	50	16	165 mm (6.5 inch)	Approx. 52 mm (2 inch)
	M05	80	16	200 mm (7.9 inch)	
	M10	25	40	115 mm (4.5 inch)	
	M12	40	40	150 mm (5.9 inch)	
	M13	50	40	165 mm (6.5 inch)	
	M15	80	40	200 mm (7.9 inch)	
	M22	40	100	170 mm (6.7 inch)	

## Flange according to ASME

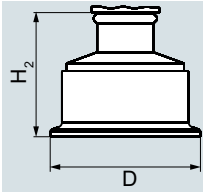
ASME B16.5					
	Order code	DN	Class	∅D	H <sub>2</sub>
	M30	1 inch	150	110 mm (4.3 inch)	Approx. 52 mm (2 inch)
	M31	1½ inch	150	125 mm (4.9 inch)	
	M32	2 inch	150	150 mm (5.9 inch)	
	M33	3 inch	150	190 mm (7.5 inch)	
	M34	4 inch	150	230 mm (9.1 inch)	
	M36	1½ inch	300	155 mm (6.1 inch)	
	M37	2 inch	300	165 mm (6.5 inch)	
	M38	3 inch	300	210 mm (8.1 inch)	
	M39	4 inch	300	255 mm (10.0 inch)	

**NuG and pharmaceutical connections**

## Connections to DIN

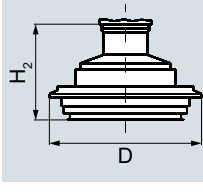
DIN 11851 (milk pipe union with slotted union nut)					
	Order code	DN	PN	∅D	H <sub>2</sub>
	N03	50	25	92 mm (3.6 inch)	Approx. 52 mm (2 inch)
	N05	80	25	127 mm (5.0 inch)	

## Tri-Clamp according to DIN 32676

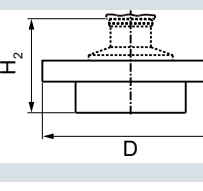
	Order code	DN	PN	∅D	H <sub>2</sub>
	N14	50	16	64 mm (2.5 inch)	Approx. 52 mm (2 inch)
	N15	65	16	91 mm (3.6 inch)	
	N22	2 inch	16	64 mm (2.5 inch)	Approx. 52 mm (2 inch)
	N23	3 inch	10	91 mm (3.6 inch)	

## Other connections

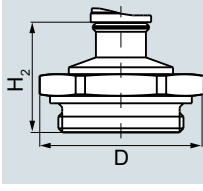
## Varivent connection

	Order code	DN	PN	∅D	H <sub>2</sub>
	P06	40 ... 125	40	84 mm (3.3 inch)	Approx. 52 mm (2 inch)

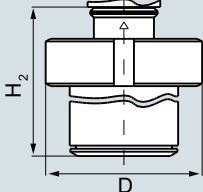
## Sanitary process connection according to DRD

	Order code	DN	PN	∅D	H <sub>2</sub>
	Q15	65	40	105 mm (4.1 inch)	Approx. 52 mm (2 inch)

## Threaded connection G¾", G1" and G2" acc. to DIN 3852

	Order code	DN	PN	∅D	H <sub>2</sub>
	R11	¾ inch	60	37 mm (1.5 inch)	Approx. 45 mm (1.8 inch)
	R12	1 inch	60	48 mm (1.9 inch)	Approx. 47 mm (1.9 inch)
	R14	2 inch	60	78 mm (3.1 inch)	Approx. 52 mm (2 inch)

## Tank connection TG 52/50 and TG52/150

	Order code	DN	PN	∅D	H <sub>2</sub>
	Q00	25	40	63 mm (2.5 inch)	Approx. 63 mm (2.5 inch)
	Q01	25	40	63 mm (2.5 inch)	Approx. 170 mm (6.7 inch)

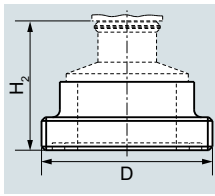
# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

## for gauge and absolute pressure, flush-mounted diaphragm

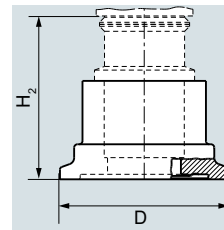
1

### SMS threaded socket



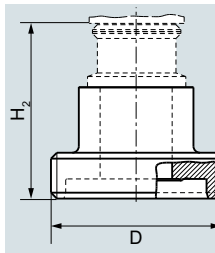
Order code	DN	PN	∅D	H <sub>2</sub>
Q28	2 inch	25	70 x 1/6 mm	Approx. 52 mm (2.1 inch)
Q29	2½ inch	25	85 x 1/6 mm	
Q30	3 inch	25	98 x 1/6 mm	

### Aseptic clamp with groove according to DIN 11864-3 Form A



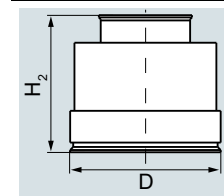
Order code	DN	PN	∅D	H <sub>2</sub>
N53	50	25	77.5 (3.1 inch)	Approx. 52 mm (2.1 inch)
N54	65	25	91 (3.6 inch)	
N55	80	16	106 (4.2 inch)	
N56	100	16	130 (5.1 inch)	

### Aseptic threaded socket according to DIN 11864-1 Form A



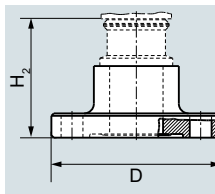
Order code	DN	PN	∅D	H <sub>2</sub>
N33	50	25	78 x 1/6 inch	Approx. 52 mm (2.1 inch)
N34	65	25	95 x 1/6 inch	
N35	80	25	110 x ¼ inch	
N36	100	25	130 x ¼ inch	

### Process connection PMC Style Standard



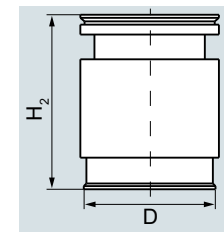
Order code	DN	PN	∅D	H <sub>2</sub>
R00	-	-	40.9 mm (1.6 inch)	Approx. 36.8 mm (1.4 inch)

### Aseptic flange with notch to DIN 11864-2 Form A



Order code	DN	PN	∅D	H <sub>2</sub>
N43	50	16	94 (3.7 inch)	Approx. 52 mm (2.1 inch)
N44	65	16	113 (4.4 inch)	
N45	80	16	133 (5.2 inch)	
N46	100	16	159 (6.3 inch)	

### Process connection PMC Style Minibolt



Order code	DN	PN	∅D	H <sub>2</sub>
R01	-	-	26.3 mm (1.0 inch)	Approx. 33.1 mm (1.3 inch)



**Technical specifications****SITRANS P320/SITRANS P420 for absolute pressure (pressure series)****Input**

Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a 0.83 ... 25 kPa a 3.3 ... 100.5 inH <sub>2</sub> O a	4 bar a 0.4 MPa a 58 psi a	6 bar a 0.6 MPa a 87 psi a
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17.3 ... 522 inH <sub>2</sub> O a	6.6 bar a 0.66 MPa a 95 psi a	10 bar a 1 MPa a 145 psi a
	166 ... 5000 mbar a 16.6 ... 500 kPa a 2.41 ... 72.5 psi a	20 bar a 2 MPa a 290 psi a	30 bar a 3 MPa a 435 psi a
	1 ... 30 bar a 0.1 ... 3 MPa a 14.5 ... 435 psi a	65 bar a 6.5 MPa a 942 psi a	100 bar a 10 MPa a 1450 psi a
	5.3 ... 160 bar a 0.53 ... 16 MPa a 77 ... 2321 psi a	240 bar 24 MPa 3481 psi	380 bar a 38 MPa a 5511 psi a
	13.3 ... 400 bar a 1.3 ... 40 MPa a 192 ... 5802 psi a	400 bar a 40 MPa a 5802 psi a	600 bar a 60 MPa a 8702 psi a
	23.3 ... 700 bar a 2.3 ... 70 MPa a 337 ... 10153 psi a	800 bar a 80 MPa a 11603 psi a	800 bar a 80 MPa a 11603 psi a
Measuring limits	0 mbar a/kPa a/psi a		
• Lower measuring limit	For medium temperature $-20\text{ °C} < \vartheta \leq +60\text{ °C}$ ( $-4\text{ °F} < \vartheta \leq +140\text{ °F}$ )		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	For medium temperature $60\text{ °C} < \vartheta \leq +100\text{ °C}$ (max. $85\text{ °C}$ for measuring cell 30 bar) ( $140\text{ °F} < \vartheta \leq +212\text{ °F}$ (max. $185\text{ °F}$ for measuring cell 435 psi))		
	30 mbar a + 20 mbar a · ( $\vartheta - 60\text{ °C}$ )/ $^{\circ}\text{C}$ 3 kPa a + 2 kPa a · ( $\vartheta - 60\text{ °C}$ )/ $^{\circ}\text{C}$ 0.44 psi a + 0.29 psi a · ( $\vartheta - 140\text{ °F}$ )/ $^{\circ}\text{F}$		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and $60\text{ °C}$ ( $140\text{ °F}$ ) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
<b>Output</b>	<b>HART</b>		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 ... 100 s, continuously adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA (factory preset to 3.55 mA)		
Load	Resistance R [ $\Omega$ ]		
• Without HART communication	$R = (U_H - 10.5\text{ V})/22.8\text{ mA}$ , $U_H$ : Power supply in V		
• With HART communication	$R = 230 \dots 1100\ \Omega$ (HART communicator (handheld)) $R = 230 \dots 500\ \Omega$ (SIMATIC PDM)		
Characteristic curve	<ul style="list-style-type: none"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>		
Physical bus	-		
Polarity-independent	-		

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for absolute pressure (pressure series)

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## SITRANS P320/SITRANS P420 for absolute pressure (pressure series)

### Measuring accuracy

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

$r$  = maximum measuring span/set measuring span or nominal measuring range

• Linear characteristic curve (all measuring cells)

-  $r \leq 10$

$\leq 0.1\%$

-  $10 < r \leq 30$

$\leq 0.2\%$

Influence of ambient temperature  
(in % per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a
- 1300 mbar a/130 kPa a/18.8 psi a
- 5 bar a/500 kPa a/72.5 psi a
- 30 bar a/3000 kPa a/435 psi a
- 160 bar a/16 MPa a/2321 psi a
- 400 bar a/40 MPa a/5802 psi a
- 700 bar a/70 MPa a/10153 psi a

$\leq (0.15 \cdot r + 0.1)\%$

$\leq (0.08 \cdot r + 0.16)\%$

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

In 5 years  $\leq (0.25 \cdot r)\%$

Step response time  $T_{63}$  (without electrical damping)

Approx. 0.105 s

Effect of mounting position (in pressure per change of angle)

$\leq 0.05$  mbar/0.005 kPa/0.000725 psi per 10° incline  
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

### Operating conditions

Medium temperature

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

Ambient conditions

- Ambient temperature/enclosure
  - Measuring cell with silicone oil filling
  - Measuring cell with inert filling liquid
  - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
  - According to IEC 60529
  - According to NEMA 250
- Electromagnetic compatibility
  - Emitted interference and interference immunity

Observe the temperature class in hazardous areas.

-40 ... +85 °C (-40 ... +185 °F)

-40 ... +85 °C (-40 ... +185 °F)

-20 ... +80 °C (-4 ... +176 °F)

-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))

4K4H

IP66, IP68

Type 4X

According to IEC 61326 and NAMUR NE 21

### Structural design

Weight

Approx. 1.8 kg (3.9 lb) with aluminum enclosure  
Approx. 3.9 kg (8.3 lb) with stainless steel enclosure

Material

- Wetted parts materials
  - Process connection
  - Oval flange
  - Seal diaphragm
- Non-wetted parts materials
  - Electronics enclosure

Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602

Stainless steel, mat. no. 1.4404/316L

Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819

- Mounting bracket

- Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M

- Standard: Powder coating with polyurethane

Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane

- Stainless steel nameplate (1.4404/316L)

Zinc-plated steel or stainless steel

Process connection

- Connection shank G1/2A according to EN 837-1
- Female thread ½-14 NPT
- Male thread M20 x 1.5 and ½-14 NPT
- Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread:
- Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:
  - 7/16-20 UNF according to EN 61518
  - M10 according to DIN 19213
- Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:
  - 7/16-20 UNF according to EN 61518
  - M12 according to DIN 19213
- Male thread M20 x 1.5 and ½-14 NPT

Electrical connection

Cable entry via the following screwed glands:

- M20 x 1.5
- ½-14 NPT
- Device plug Han 7D/Han 8D<sup>1)</sup>
- Device plug M12

**SITRANS P320/SITRANS P420 for absolute pressure (pressure series)****Displays and controls**

Buttons	4 buttons for operation directly on the device
Display	<ul style="list-style-type: none"> <li>• With or without integrated display (optional)</li> <li>• Lid with inspection window (optional)</li> </ul>

**Auxiliary power  $U_H$** 

Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2$ V (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–

**Certificates and approvals**

Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
<ul style="list-style-type: none"> <li>• WRAS (England)</li> <li>• ACS (France)</li> <li>• NSF (USA)</li> </ul>	No.: 1903094 (option E83) No.: 18 ACC LY 277 (option E85) No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
<ul style="list-style-type: none"> <li>• Intrinsic safety "i"           <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible medium temperature</li> <li>- Connection</li> </ul> </li> </ul>	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To certified intrinsically safe circuits with peak values: $U_i = 30$ V, $I_i = 101$ mA, $P_i = 760$ mW $U_i = 29$ V, $I_i = 110$ mA, $P_i = 800$ mW $L_i = 0.24$ $\mu$ H/ $C_i = 3.29$ nF
<ul style="list-style-type: none"> <li>• Flameproof enclosure "d"           <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible medium temperature</li> <li>- Connection</li> </ul> </li> </ul>	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To circuit with the operating values $U_n = 10.5$ ... 45 V, 4 ... 20 mA
<ul style="list-style-type: none"> <li>• Dust explosion protection for Zones 21, 22           <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible medium temperature</li> <li>- Max. surface temperature</li> <li>- Connection</li> </ul> </li> </ul>	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) 120 °C (248 °F) To circuit with the operating values $U_n = 10.5$ ... 45 V, 4 ... 20 mA
<ul style="list-style-type: none"> <li>• Dust explosion protection for Zones 20, 21, 22           <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible medium temperature</li> <li>- Connection</li> </ul> </li> </ul>	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) To certified intrinsically safe circuits with peak values: $U_i = 30$ V, $I_i = 101$ mA, $P_i = 760$ mW $U_i = 29$ V, $I_i = 110$ mA, $P_i = 800$ mW $L_i = 0.24$ $\mu$ H/ $C_i = 3.29$ nF
<ul style="list-style-type: none"> <li>- Effective internal inductance/capacitance</li> </ul>	
<ul style="list-style-type: none"> <li>• Type of protection for Zone 2           <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature "ec"</li> <li>- Permissible medium temperature</li> <li>- "ec" connection</li> </ul> </li> </ul>	Ex II 3G Ex ec IIC T4/T6 Gc -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To circuit with the operating values $U_n = 10.5$ ... 30 V, 4 ... 20 mA
<ul style="list-style-type: none"> <li>• Explosion protection acc. to FM           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or IS; NI; S</li> </ul> </li> </ul>	Available soon CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
<ul style="list-style-type: none"> <li>• Explosion protection according to CSA           <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or (IS)</li> </ul> </li> </ul>	Available soon CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for absolute pressure (pressure series)

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## SITRANS P320/SITRANS P420 for absolute pressure (pressure series)

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

Standardized Electrical Signals and Questions Relating to Engineering Technology  
Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment  
Extra Low Voltage Circuits with Safe Separation  
Standardization of the Signal Level for the Failure Information of Digital Transmitters  
Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics  
The Application of the Pressure Equipment Directive to Process Control Devices  
Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices  
Self-Monitoring and Diagnosis of Field Devices  
NAMUR Standard Device - Field Devices for Standard Applications

<sup>1)</sup> Han 8D is identical to Han 8U.

### Communication

HART		FOUNDATION Fieldbus	
HART	230 ... 1 100 Ω	Device profile	FF ITK 6
Protocol	HART 7	Function blocks	3 function blocks analog input, 1 function block PID
Software for computer	SIMATIC PDM	<ul style="list-style-type: none"> <li>• Analog input               <ul style="list-style-type: none"> <li>- Adaptation to user-specific process variable</li> <li>- Electrical damping adjustable</li> <li>- Simulation function</li> </ul> </li> <li>- Response to failure</li> <li>- Limit monitoring</li> <li>- Square-rooted characteristic curve for flow measurement</li> <li>• PID</li> <li>• Physical block</li> </ul>	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input (can be locked within the device with a bridge) Parameterizable (last good value, substitute value, incorrect value) Yes, one upper and lower warning limit and one alarm limit respectively Yes Standard FOUNDATION Fieldbus function block 1 resource block
<b>PROFIBUS PA</b>		Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
Simultaneous communication with master class 2 (max.)	4	<ul style="list-style-type: none"> <li>• Pressure transducer block               <ul style="list-style-type: none"> <li>- Can be calibrated by applying two pressures</li> <li>- Monitoring of sensor limits</li> <li>- Simulation function: pressure measurement, sensor temperature and electronics temperature</li> </ul> </li> </ul>	Yes Yes Constant value or by means of parameterizable ramp function
The address can be set using	Configuration tool or local operation (standard setting address 126)		
Cyclic data usage			
<ul style="list-style-type: none"> <li>• Output byte</li> <li>• Input byte</li> </ul>	≤ 35 (7 measured values) 0, 1, or 2 (register operating mode and reset function for dosing)		
Internal preprocessing			
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX		
Number of function blocks	7		
<ul style="list-style-type: none"> <li>• Analog input               <ul style="list-style-type: none"> <li>- Adaptation to user-specific process variable</li> <li>- Electrical damping adjustable</li> <li>- Simulation function</li> <li>- Limit monitoring</li> </ul> </li> <li>• Register (totalizer)               <ul style="list-style-type: none"> <li>- Limit monitoring</li> </ul> </li> <li>• Physical block</li> </ul>	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input Yes, one upper and lower warning limit and one alarm limit respectively Can be reset, preset, optional direction of counting, simulation function of register output One upper and lower warning limit and one alarm limit respectively 1		
Transducer blocks	1		
<ul style="list-style-type: none"> <li>• Pressure transducer block               <ul style="list-style-type: none"> <li>- Can be calibrated by applying two pressures</li> <li>- Monitoring of sensor limits</li> <li>- Specification of a vessel characteristic with</li> <li>- Square-rooted characteristic curve for flow measurement</li> <li>- Tank characteristic curve for volume measurement</li> <li>- Low flow cut-off and implementation point of square-root extraction</li> <li>- Simulation function for measured pressure value and sensor temperature</li> </ul> </li> </ul>	Yes Yes Max. 30 nodes Yes Yes Parameterizable Constant value or by means of parameterizable ramp function		

## Selection and ordering data

	Article No.
<b>Pressure transmitters for absolute pressure (pressure series)</b>	
<b>SITRANS P320</b>	7MF032 - - - - -
<b>SITRANS P420</b>	7MF042 - - - - -
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>	
<b>Communication</b>	
HART, 4 ... 20 mA	0
PROFIBUS PA	1
FOUNDATION Fieldbus (FF)	2
<b>Measuring cell filling</b>	
Silicone oil	1
Inert filling liquid	3
<b>Maximum measuring span</b>	
250 mbar a (100.5 inH <sub>2</sub> O a)	F
1 300 mbar a (522 inH <sub>2</sub> O a)	L
5 000 mbar a (72.5 psi a)	P
30 bar a (435 psi a)	R
160 bar a (2 321 psi a)	V
400 bar a (5 802 psi a)	W
700 bar a (10 153 psi a)	X
<b>Process connection</b>	
Male thread M20 x 1.5	B
Male thread G½ (DIN EN 837-1)	D
Female thread ½-14 NPT	E
Male thread ½-14 NPT	F
Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)	G
Oval flange, mounting thread: M10 (DIN 19213)	H
Oval flange, mounting thread: M12 (DIN 19213)	J
Version for diaphragm seal pressure	U
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	0
Stainless steel 316L/1.4404, alloy C276/2.4819	1
Alloy C22/2.4602, alloy C276/2.4819	2
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Flameproof enclosure, intrinsic safety	D
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	L
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	M
Combination of options B, C and L (zone model)	S
Combination of options B, C and M (zone model, Class Division)	T
<b>Electrical connections/cable entries</b>	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M
<b>Local operation/display</b>	
Without display (lid closed)	0
With display (lid closed)	1
With display (lid with glass pane)	2

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (pressure series)

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Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Cable glands included</b>	
Plastic	<b>A00</b>
Metal	<b>A01</b>
Stainless steel	<b>A02</b>
Stainless steel 316L/1.4404	<b>A03</b>
CMP, for XP devices	<b>A10</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>
<b>Device plug Han mounted left</b>	
Device plug Han 7D (plastic, straight)	<b>A30</b>
Device plug Han 7D (plastic, angled)	<b>A31</b>
Device plug Han 7D (metal, straight)	<b>A32</b>
Device plug Han 7D (metal, angled)	<b>A33</b>
Device plug Han 8D (plastic, straight)	<b>A34</b>
Device plug Han 8D (plastic, angled)	<b>A35</b>
Device plug Han 8D (metal, straight)	<b>A36</b>
Device plug Han 8D (metal, angled)	<b>A37</b>
<b>Cable socket included</b>	
Plastic, for device plug Han 7D and Han 8D	<b>A40</b>
Metal, for device plug Han 7D and Han 8D	<b>A41</b>
<b>Device plug M12 mounted left</b>	
Stainless steel, without cable socket	<b>A62</b>
Stainless steel, with cable socket	<b>A63</b>
<b>Cable entry/device plug mounting</b>	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>
Cable gland/device plug mounted left	<b>A97</b>
Cable gland/device plug mounted right	<b>A99</b>
<b>Nameplate labeling (standard labeling: English, unit bar)</b>	
German (bar)	<b>B11</b>
French (bar)	<b>B12</b>
Spanish (bar)	<b>B13</b>
Italian (bar)	<b>B14</b>
Chinese (bar)	<b>B15</b>
Russian (bar)	<b>B16</b>
English (psi)	<b>B20</b>
English (Pa)	<b>B30</b>
Chinese (Pa)	<b>B35</b>
<b>Certificates</b>	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	<b>C11</b>
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>
Factory certificate (EN 10204-2.2) - Wetted parts	<b>C14</b>
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>
<b>Certificates for functional safety</b>	
Functional Safety (IEC 61508) - SIL2/3	<b>C20</b>

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	<b>D30</b>
Unlabeled TAG plate	<b>D40</b>
Without labeling of the measuring range on the TAG plate	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Overvoltage protection up to 6 kV (internal)	<b>D70</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Labels on transport packaging (provided by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA (USA and Canada)	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada) <sup>1)</sup>	<b>E21</b>
FM (USA and Canada) <sup>1)</sup>	<b>E22</b>
IECEx (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
RMR (Russian Maritime Register)	<b>E55</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>

# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P320/420

for absolute pressure (pressure series)

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Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual Seal	<b>E81</b>
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>
<b>Mounting bracket</b>	
Steel, zinc-plated	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Flange connections with flange EN 1092-1</b>	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J80</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J81</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J82</b>
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J83</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J84</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J85</b>
• DN 25 PN 100, stainless steel 1.4571/316Ti	<b>J86</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
Seal (EN 837-1) material Fe (soft iron)	<b>K60</b>
Seal (EN 837-1) material 1.4571	<b>K61</b>
Seal (EN 837-1) material Cu	<b>K62</b>
<b>Process connection</b>	
Process connection male thread G½, bore hole 11 mm	<b>K80</b>
<b>Shut-off valves, valve manifolds</b>	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	<b>T02</b>
With mounted valve manifold 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	<b>T03</b>
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	<b>T05</b>
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	<b>T06</b>

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Device settings</b>	
Measuring span	<b>Y01</b>
Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr	
TAG (on stainless steel plate and device parameters, max. 32 characters)	<b>Y15</b>
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	<b>Y16</b>
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	<b>Y17</b>
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	<b>Y21</b>
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m <sup>3</sup> /s, l/s, m, inch, ...], example 1 ... 5 m	<b>Y22</b>
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	<b>Y23</b>
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Input field 3: Free text, max. 8 characters	
Set PROFIBUS PA device address (1 ... 126)	<b>Y25</b>
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	<b>Y30</b>
Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	<b>Y31</b>
Drop-down list: 3.75; 21.75; 22.5; 22.6	
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	<b>Y32</b>
Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	
ID number of special design	<b>Y99</b>
Input field: max. 4 characters and only natural numbers from 0 ... 9999	

<sup>1)</sup> Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

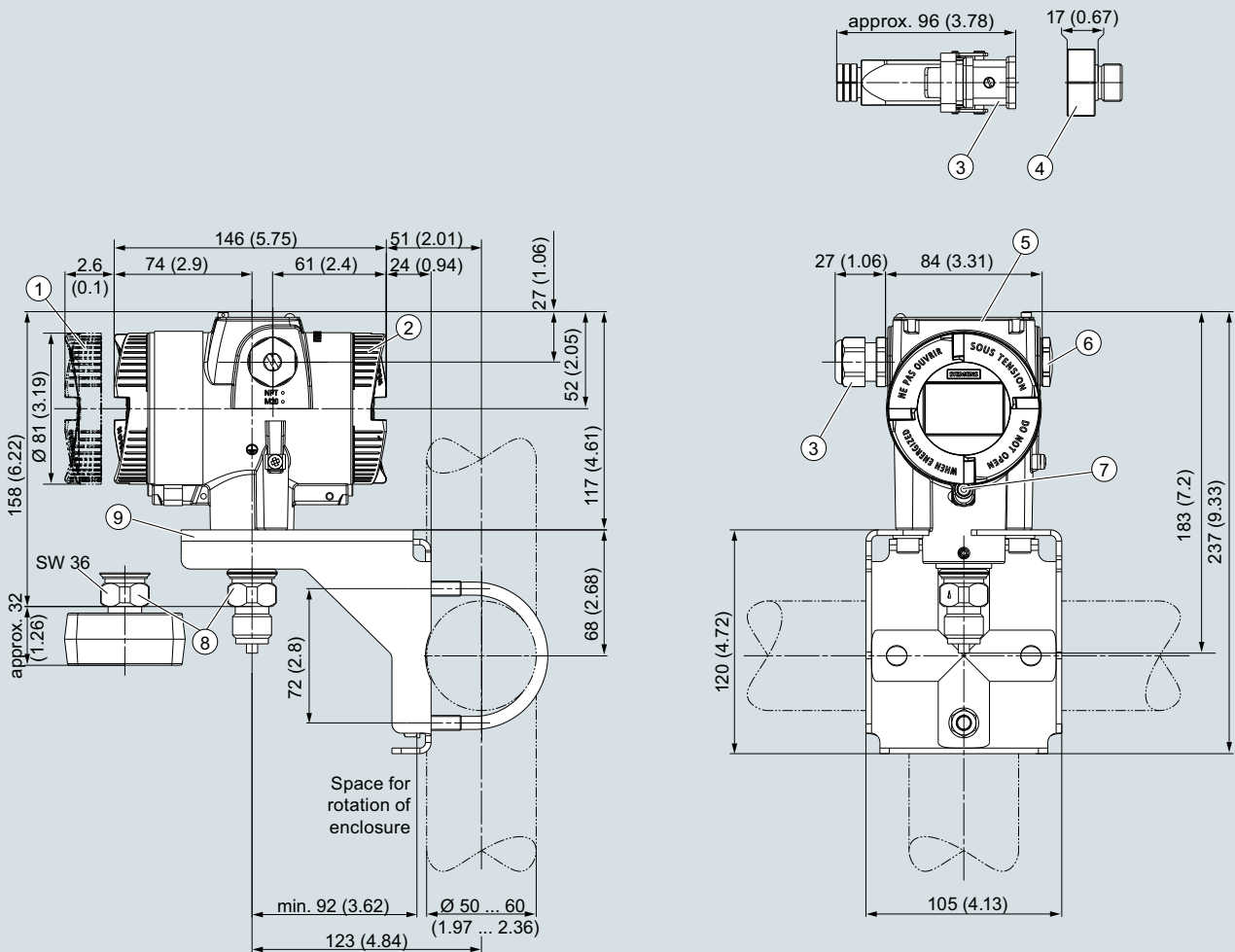
# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for absolute pressure (pressure series)

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## Dimensional drawings



① Electronics side, local display  
(longer overall length for cover with glass pane)<sup>1)</sup>

② Connection side

③ Electrical connection:  
• M20 x 1.5<sup>3)</sup> screw gland  
• ½-14 NPT screw gland  
• Han 7D/Han 8D<sup>2)</sup> device plug  
• M12 device plug<sup>2)</sup>

④ Harting adapter

⑤ Cover over buttons and nameplate  
with general information

⑥ Blanking plug

⑦ Safety catch  
(only for "flameproof enclosure" type of protection)

⑧ Process connection: G½B connection pin or oval flange

⑨ Mounting bracket (optional)

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with "flameproof enclosure" type of protection

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for absolute pressure (pressure series), dimensions in mm (inch)



## Technical specifications

### SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)

Input			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a	160 bar a	240 bar a
	0.83 ... 25 kPa a	16 MPa a	24 MPa a
	3.3 ... 100.5 inH <sub>2</sub> O a	2 320 psi a	3 481 psi a
	43 ... 1300 mbar a	160 bar a	240 bar a
	4.3 ... 130 kPa a	16 MPa a	24 MPa a
	17.3 ... 522 inH <sub>2</sub> O a	2 320 psi a	3 481 psi a
	166 ... 5 000 mbar a	160 bar a	240 bar a
	16.6 ... 500 kPa a	16 MPa a	24 MPa a
	2.41 ... 72.5 psi a	2 320 psi a	3 481 psi a
Measuring limits	1 ... 30 bar a	160 bar a	240 bar a
	0.1 ... 3 MPa a	16 MPa a	24 MPa a
	14.5 ... 435 psi a	2 320 psi a	3 481 psi a
	8 ... 160 bar	160 bar a	240 bar a
	0.8 ... 16 MPa	16 MPa a	24 MPa a
	116 ... 2 320 psi	2 320 psi a	3 481 psi a
	• Lower measuring limit	0 mbar a/kPa a/psi a	
	- Measuring cell with silicone oil filling	For medium temperature -20 °C < $\vartheta$ ≤ +60 °C (-4 °F < $\vartheta$ ≤ +140 °F)	
	- Measuring cell with inert liquid	For medium temperature 60 °C < $\vartheta$ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < $\vartheta$ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))	
	• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)	
• Lower range value	Between the measuring limits (infinitely adjustable)		
<b>Output</b>			
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 ... 100 s, continuously adjustable over remote operation		
	0 ... 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA		
Load	Resistance R [ $\Omega$ ]		
• Without HART communication	$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ , $U_H$ : Power supply in V		
• With HART communication	$R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)		
Characteristic curve	<ul style="list-style-type: none"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>		
Physical bus	-		
Polarity-independent	-		
<b>Measuring accuracy</b>			
Reference conditions	<ul style="list-style-type: none"> <li>• According to IEC 62828-1</li> <li>• Rising characteristic curve</li> <li>• Lower range value 0 bar/kPa/psi</li> <li>• Seal diaphragm stainless steel</li> <li>• Measuring cell with silicone oil filling</li> <li>• Room temperature 25 °C (77 °F)</li> </ul>		
Conformity error at limit point setting, including hysteresis and repeatability			
Measuring span ratio r (spread, Turn-Down)	$r = \text{max. measuring span/set measuring span and nominal measuring range}$		

# Pressure Measurement

## Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (differential pressure series)

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### SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)

<ul style="list-style-type: none"> <li>Linear characteristic curve               <ul style="list-style-type: none"> <li>- 250 mbar/25 kPa/3.63 psi</li> <li>- 1 300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a</li> <li>- 160 bar/16 MPa/2 320 psi</li> </ul> </li> </ul>	$r \leq 5:$ $5 < r \leq 30:$ $r \leq 5:$ $5 < r \leq 30:$ $r \leq 5:$ $5 < r \leq 20:$	$\leq 0.075\%$ $\leq (0.02 \cdot r + 0.05)\%$ $\leq 0.075\%$ $\leq (0.005 \cdot r + 0.05)\%$ $\leq 0.075\%$ $\leq (0.005 \cdot r + 0.05)\%$
Influence of ambient temperature (in % per 28 °C (50 °F)) <ul style="list-style-type: none"> <li>• 250 mbar a/25 kPa a/3.6 psi a</li> <li>• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a</li> </ul>	$\leq (0.1 \cdot r + 0.1)\%$ $\leq (0.0025 \cdot r + 0.125)\%$	
Long-term stability at $\pm 30$ °C ( $\pm 54$ °F) <ul style="list-style-type: none"> <li>• 250 mbar a/25 kPa a/3.6 psi a</li> <li>• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a</li> </ul>	In 5 years $\leq (0.2 \cdot r)\%$ In 5 years $\leq (0.1 \cdot r)\%$ In 10 years $\leq (0.15 \cdot r)\%$	
Step response time $T_{63}$ (without electrical damping) <ul style="list-style-type: none"> <li>• 250 mbar a/25 kPa a/3.6 psi a</li> <li>• 1300 mbar a/130 kPa a/18.8 psi a</li> <li>• 5 bar a/500 kPa a/72.5 psi a</li> <li>• 30 bar a/3000 kPa a/435 psi a</li> <li>• 160 bar a/16 MPa a/2 320 psi a</li> </ul>	Every 0.135 s	
Effect of mounting position (in pressure per change of angle)	$\leq 0.7$ mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
<b>Operating conditions</b>		
Medium temperature <ul style="list-style-type: none"> <li>• Measuring cell with silicone oil filling               <ul style="list-style-type: none"> <li>- Measuring cell 30 bar (435 psi)</li> <li>- Measuring cell 160 bar (2 320 psi)</li> </ul> </li> <li>• Measuring cell with inert oil</li> <li>• In conjunction with dust explosion protection</li> </ul>	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -40 ... +85 °C (-4 ... +185 °F)	
Ambient conditions <ul style="list-style-type: none"> <li>• Ambient temperature/enclosure               <ul style="list-style-type: none"> <li>- Measuring cell with silicone oil filling</li> <li>- Measuring cell with inert oil</li> <li>- Display</li> </ul> </li> <li>• Storage temperature</li> <li>• Climatic class in accordance with IEC 60721-3-4</li> <li>• Degree of protection               <ul style="list-style-type: none"> <li>- According to IEC 60529</li> <li>- According to NEMA 250</li> </ul> </li> <li>• Electromagnetic compatibility               <ul style="list-style-type: none"> <li>- Emitted interference and interference immunity</li> </ul> </li> </ul>	Observe the temperature class in hazardous areas. -40 ... +85 °C (-40 ... +185 °F) -40 ... +85 °C (-40 ... +185 °F) -20 ... +80 °C (-4 ... +176 °F) -50 ... +85 °C (-58 ... +185 °F); with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F) 4K4H  IP66, IP68 Type 4X  According to IEC 61326 and NAMUR NE 21	
<b>Structural design</b>		
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.8 kg (12.7 lb) with stainless steel enclosure	
Material <ul style="list-style-type: none"> <li>• Wetted parts materials               <ul style="list-style-type: none"> <li>- Seal diaphragm</li> <li>- Process flanges and sealing plugs</li> <li>- O-ring</li> </ul> </li> <li>• Non-wetted parts materials               <ul style="list-style-type: none"> <li>- Electronics enclosure</li> <li>- Process flange screws</li> <li>- Mounting bracket</li> </ul> </li> </ul>	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360 FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR  • Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L) Stainless steel ISO 3506-1 A4-70 Steel, zinc-plated steel, or stainless steel	
Process connection	$\frac{1}{4}$ -18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6092 psi))	
Electrical connection	Screw terminals Cable entry via the following screwed glands: <ul style="list-style-type: none"> <li>• M20 x 1.5</li> <li>• <math>\frac{1}{2}</math>-14 NPT</li> <li>• Device plug Han 7D/Han 8D<sup>1)</sup></li> <li>• Device plug M12</li> </ul>	

**SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)****Displays and controls**

Buttons	4 buttons for operation directly on the device
Display	<ul style="list-style-type: none"> <li>• With or without integrated display (optional)</li> <li>• Lid with inspection window (optional)</li> </ul>

**Auxiliary power  $U_H$** 

Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)
Noise	$U_{\text{eff}} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–

**Certificates and approvals**

Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values $U_n = 10.5 \dots 45 \text{ V}$ , $4 \dots 20 \text{ mA}$
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: $U_n = 10.5 \text{ to } 45 \text{ V}$ , $4 \dots 20 \text{ mA}$
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To circuit with the operating values $U_n = 10.5 \dots 30 \text{ V}$ , $4 \dots 20 \text{ mA}$
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for absolute pressure (differential pressure series)

1

## SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

Standardized Electrical Signals and Questions Relating to Engineering Technology  
Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment  
Extra Low Voltage Circuits with Safe Separation  
Standardization of the Signal Level for the Failure Information of Digital Transmitters  
Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics  
The Application of the Pressure Equipment Directive to Process Control Devices  
Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices  
Self-Monitoring and Diagnosis of Field Devices  
NAMUR Standard Device - Field Devices for Standard Applications

<sup>1)</sup> Han 8D is identical to Han 8U.

### Communication

HART		FOUNDATION Fieldbus	
HART	230 ... 1 100 Ω	Device profile	FF ITK 6
Protocol	HART 7	Function blocks	3 function blocks analog input, 1 function block PID
Software for computer	SIMATIC PDM	<ul style="list-style-type: none"> <li>• Analog input               <ul style="list-style-type: none"> <li>- Adaptation to user-specific process variable</li> <li>- Electrical damping adjustable</li> <li>- Simulation function</li> </ul> </li> <li>- Response to failure</li> <li>- Limit monitoring</li> <li>- Square-rooted characteristic curve for flow measurement</li> </ul>	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input (can be locked within the device with a bridge) Parameterizable (last good value, substitute value, incorrect value) Yes, one upper and lower warning limit and one alarm limit respectively Yes
<b>PROFIBUS PA</b>		<ul style="list-style-type: none"> <li>• PID</li> <li>• Physical block</li> </ul>	Standard FOUNDATION Fieldbus function block 1 resource block
Simultaneous communication with master class 2 (max.)	4	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
The address can be set using	Configuration tool or local operation (standard setting address 126)	<ul style="list-style-type: none"> <li>• Pressure transducer block               <ul style="list-style-type: none"> <li>- Can be calibrated by applying two pressures</li> <li>- Monitoring of sensor limits</li> <li>- Simulation function: pressure measurement, sensor temperature and electronics temperature</li> </ul> </li> </ul>	Yes Yes Constant value or by means of parameterizable ramp function
Cyclic data usage			
<ul style="list-style-type: none"> <li>• Output byte</li> <li>• Input byte</li> </ul>	≤ 35 (7 measured values) 0, 1, or 2 (register operating mode and reset function for dosing)		
Internal preprocessing			
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX		
Number of function blocks	7		
<ul style="list-style-type: none"> <li>• Analog input               <ul style="list-style-type: none"> <li>- Adaptation to user-specific process variable</li> <li>- Electrical damping adjustable</li> <li>- Simulation function</li> <li>- Limit monitoring</li> </ul> </li> <li>• Register (totalizer)               <ul style="list-style-type: none"> <li>- Limit monitoring</li> </ul> </li> <li>• Physical block</li> </ul>	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input Yes, one upper and lower warning limit and one alarm limit respectively Can be reset, preset, optional direction of counting, simulation function of register output One upper and lower warning limit and one alarm limit respectively 1		
Transducer blocks	1		
<ul style="list-style-type: none"> <li>• Pressure transducer block               <ul style="list-style-type: none"> <li>- Can be calibrated by applying two pressures</li> <li>- Monitoring of sensor limits</li> <li>- Specification of a vessel characteristic with</li> <li>- Square-rooted characteristic curve for flow measurement</li> <li>- Tank characteristic curve for volume measurement</li> <li>- Low flow cut-off and implementation point of square-root extraction</li> <li>- Simulation function for measured pressure value and sensor temperature</li> </ul> </li> </ul>	Yes Yes Max. 30 nodes Yes Yes Parameterizable Constant value or by means of parameterizable ramp function		

## Selection and ordering data

	Article No.
<b>Pressure transmitters for absolute pressure (differential pressure series)</b>	
<b>SITRANS P320</b>	7MF033 - - - - -
<b>SITRANS P420</b>	7MF043 - - - - -
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>	
<b>Communication</b>	
HART, 4 ... 20 mA	0
PROFIBUS PA	1
FOUNDATION Fieldbus (FF)	2
<b>Measuring cell filling</b>	
Silicone oil	1
Inert filling liquid	3
<b>Maximum measuring span</b>	
250 mbar a (100.5 inH <sub>2</sub> O a)	G
1 300 mbar a (522 inH <sub>2</sub> O a)	L
5 000 mbar a (72.5 psi a)	P
30 bar a (435 psi a)	R
160 bar (2 320 psi)	Y
<b>Process connection</b>	
Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518)	Q
Oval flange, mounting thread: M10 (DIN 19213)	R
Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518) with lateral ventilation	S
Oval flange, mounting thread: M10 (DIN 19213) with lateral ventilation	T
Version for diaphragm seal with mounting thread 7/16"-20 UNF (IEC 61518)	V
Version for diaphragm seal with mounting thread M10 (DIN 19213)	W
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	0
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	1
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	2
Tantalum/tantalum, process flange stainless steel 316/1.4408	4
Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408	6
Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408	8
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Flameproof enclosure, intrinsic safety	D
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	L
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	M
Combination of options B, C and L (zone model)	S
Combination of options B, C and M (zone model, Class Division)	T
<b>Electrical connections/cable entries</b>	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	F
• 2 x 1/2-14 NPT	M
<b>Local operation/display</b>	
Without display (lid closed)	0
With display (lid closed)	1
With display (lid with glass pane)	2

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (differential pressure series)

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Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Cable glands included</b>	
Plastic	<b>A00</b>
Metal	<b>A01</b>
Stainless steel	<b>A02</b>
Stainless steel 316L/1.4404	<b>A03</b>
CMP, for XP devices	<b>A10</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>
<b>Device plug Han mounted left</b>	
Device plug Han 7D (plastic, straight)	<b>A30</b>
Device plug Han 7D (plastic, angled)	<b>A31</b>
Device plug Han 7D (metal, straight)	<b>A32</b>
Device plug Han 7D (metal, angled)	<b>A33</b>
Device plug Han 8D (plastic, straight)	<b>A34</b>
Device plug Han 8D (plastic, angled)	<b>A35</b>
Device plug Han 8D (metal, straight)	<b>A36</b>
Device plug Han 8D (metal, angled)	<b>A37</b>
<b>Cable socket included</b>	
Plastic, for device plug Han 7D and Han 8D	<b>A40</b>
Metal, for device plug Han 7D and Han 8D	<b>A41</b>
<b>Device plug M12 mounted left</b>	
Stainless steel, without cable socket	<b>A62</b>
Stainless steel, with cable socket	<b>A63</b>
<b>Cable entry/device plug mounting</b>	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>
Cable gland/device plug mounted left	<b>A97</b>
Cable gland/device plug mounted right	<b>A99</b>
<b>Nameplate labeling (standard labeling: English, unit bar)</b>	
German (bar)	<b>B11</b>
French (bar)	<b>B12</b>
Spanish (bar)	<b>B13</b>
Italian (bar)	<b>B14</b>
Chinese (bar)	<b>B15</b>
Russian (bar)	<b>B16</b>
English (psi)	<b>B20</b>
English (Pa)	<b>B30</b>
Chinese (Pa)	<b>B35</b>
<b>Certificates</b>	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	<b>C11</b>
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>
Factory certificate (EN 10204-2.2) - Wetted parts	<b>C14</b>
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>
<b>Certificates for functional safety</b>	
Functional Safety (IEC 61508) - SIL2/3	<b>C20</b>

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	<b>D30</b>
Unlabeled TAG plate	<b>D40</b>
Without labeling of the measuring range on the TAG plate	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Overvoltage protection up to 6 kV (internal)	<b>D70</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Labels on transport packaging (provided by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA (USA and Canada)	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada) <sup>1)</sup>	<b>E21</b>
FM (USA and Canada) <sup>1)</sup>	<b>E22</b>
IECEx (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
RMR (Russian Maritime Register)	<b>E55</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>

# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P320/420

for absolute pressure (differential pressure series)

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Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual Seal	<b>E81</b>
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>
<b>Mounting bracket</b>	
Steel, zinc-plated	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Process flanges; screw plug with vent valve</b>	
Welded in on right	<b>J08</b>
Welded in on left	<b>J09</b>
Glued in on right	<b>J10</b>
Glued in on left	<b>J11</b>
<b>Flange connections with flange EN 1092-1</b>	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J70</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J71</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J72</b>
• DN 15 PN 40, stainless steel 1.4571/316Ti	<b>J78</b>
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J73</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J74</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J75</b>
<b>Flange connection options</b>	
Flange connection and temperature extension	<b>J76</b>
Flange connection with epoxy resin coating	<b>J77</b>
<b>Process flanges; special materials</b>	
Reserved for 7MF7: without process flanges, without screws, without gaskets	<b>K00</b>
Process flange material alloy C22/2.4602	<b>K01</b>
Process flange material Monel 400/2.4360	<b>K02</b>
Process connection material PVDF, on the side ½-14 NPT	<b>K05</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	<b>K06</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	<b>K07</b>
<b>Process flanges; process connection option</b>	
Process flange with process connection G½ welded on	<b>K20</b>
Process connection NAM (ASTAVA)	<b>K21</b>
<b>Process flanges chambered with gaskets</b>	
1x chambered, graphite	<b>K40</b>
1x chambered, PTFE	<b>K41</b>
2x chambered, PTFE	<b>K42</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
O-ring, process flanges, PTFE	<b>K50</b>
O-ring, process flanges, FEP (with silicone core, approved for food)	<b>K51</b>
O-ring, process flanges, FFKM (FFPM)	<b>K52</b>
O-ring, process flanges, NBR	<b>K53</b>
O-ring, process flanges, EPDM	<b>K54</b>

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Process flange options</b>	
Process flanges for vertical differential pressure lines (half process flange)	<b>K81</b>
Process flanges (+) - side front	<b>K82</b>
Process flange screws, process flange nuts, material Monel 400/2.4360	<b>K83</b>
Valve ¼-18 NPT, material same as process flanges	<b>K84</b>
Valve mounted on the side, measured medium: Gas	<b>K85</b>
Oval flange attached, PTFE seal + fastening screws	<b>K86</b>
<b>Valve manifolds</b>	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U01</b>
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U02</b>
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U03</b>
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U04</b>

# Pressure Measurement

## Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

### for absolute pressure (differential pressure series)

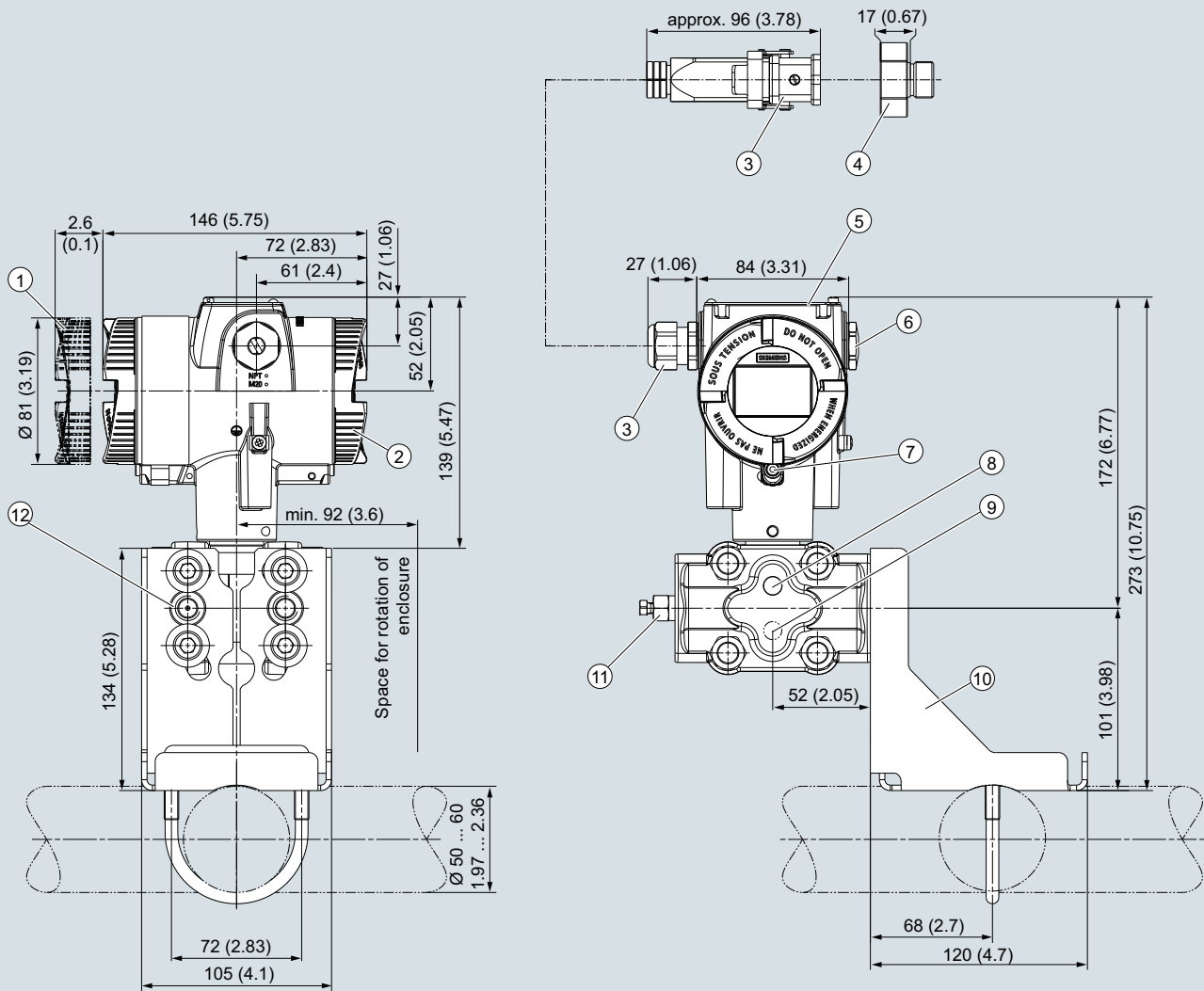
1

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Device settings</b>	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr	<b>Y01</b>
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	<b>Y15</b>
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	<b>Y16</b>
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	<b>Y17</b>
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	<b>Y21</b>
Local display Scaling with standard units [m <sup>3</sup> /s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.	<b>Y22</b>
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	<b>Y23</b>
Set PROFIBUS PA device address (1 ... 126)	<b>Y25</b>
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	<b>Y30</b>
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	<b>Y31</b>
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	<b>Y32</b>
ID number of special design Input field: max. 4 characters and only natural numbers from 0 ... 9999	<b>Y99</b>

<sup>1)</sup> Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.



### Dimensional drawings



- |  |   |
|--|---|
| <p>① Electronics side, local display<br/>(longer overall length for cover with glass pane)<sup>1)</sup></p> <p>② Connection side</p> <p>③ Electrical connection:<br/>         • M20 x 1,5<sup>3)</sup> screw gland<br/>         • ½-14 NPT screw gland<br/>         • Han 7D/Han 8D<sup>2)3)</sup> device plug<br/>         • M12 device plug<sup>2)3)</sup></p> <p>④ Harting adapter</p> <p>⑤ Cover over buttons and nameplate with general information</p> | <p>⑥ Blanking plug</p> <p>⑦ Safety catch<br/>(only for "flameproof enclosure" type of protection)</p> <p>⑧ Lateral ventilation for liquid measurement (Standard)</p> <p>⑨ Lateral ventilation for gas measurement (order option K85)</p> <p>⑩ Mounting bracket (optional)</p> <p>⑪ Sealing plug with valve (optional)</p> <p>⑫ Process connection: ¼-18 NPT (IEC 61518)</p> |
|--|---|

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with "flameproof enclosure" type of protection

<sup>3)</sup> Not with type of protection "FM + CSA" [is + Xp]"

SITRANS P320/P420 pressure transmitter for absolute pressure (differential pressure series), dimensions in mm (inch)

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

1

## Technical specifications

### SITRANS P320 / SITRANS P420 for differential pressure and flow

#### Input

Measured variable	Differential pressure and flow		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar 0.1 ... 2 kPa 0.4019 ... 8.037 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	1 ... 60 mbar 0.1 ... 6 kPa 0.4019 ... 24.11 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	2.5 ... 250 mbar 0.2 ... 25 kPa 1.005 ... 100.5 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 ... 241.1 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	16 ... 1600 mbar 1.6 ... 160 kPa 6.43 ... 643 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	50 ... 5000 mbar 5 ... 500 kPa 20.09 ... 2009 inH <sub>2</sub> O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	0.08 ... 160 bar 0.8 ... 16 MPa 116 ... 2 320 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	2.5 ... 250 mbar 0.25 ... 25 kPa 1.005 ... 100.5 inH <sub>2</sub> O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 ... 241.1 inH <sub>2</sub> O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	16 ... 1600 mbar 1.6 ... 160 kPa 6.43 ... 643 inH <sub>2</sub> O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	50 ... 5000 mbar 5 ... 500 kPa 20.09 ... 2009 inH <sub>2</sub> O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
Measuring limits	All measuring cells:		
• Lower measuring limit	• -100% of max. measuring range or 30 mbar a /3 kPa a /0.44 psi a		
- Measuring cell with silicone oil filling	Measuring cell 160 bar/16 MPa/2 320 psi: • -25% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a		
- Measuring cell with inert liquid	For medium temperature -20 °C < $\vartheta$ ≤ +60 °C (-4 °F < $\vartheta$ ≤ +140 °F) -100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a		
	For medium temperature 60 °C < $\vartheta$ ≤ +100 °C (max. 85 °C for measuring cell 30 bar with PN 420) (140 °F < $\vartheta$ ≤ +212 °F (max. 185 °F for measuring cell 435 psi)) -100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a		
- Measuring cell with FDA-compliant oil	30 mbar a + 20 mbar a · ( $\vartheta$ - 60 °C)/°C 3 kPa a + 2 kPa a · ( $\vartheta$ - 60 °C)/°C 0.44 psi a + 0.29 psi a · ( $\vartheta$ - 140 °F)/°F		
• Upper measuring limit	For medium temperature -10 °C < $\vartheta$ ≤ +100 °C (-14 °F < $\vartheta$ ≤ +212 °F) -100% of maximum measuring range or 100 mbar a /10 kPa a /14.5 psi a		
• Lower range value	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature) Between the measuring limits (infinitely adjustable)		

**SITRANS P320 / SITRANS P420 for differential pressure and flow**

<b>Output</b>	<b>HART</b>
Output signal	4 ... 20 mA
<ul style="list-style-type: none"> <li>Lower saturation limit (infinitely adjustable)</li> <li>Upper saturation limit (infinitely adjustable)</li> <li>Ripple (without HART communication)</li> </ul>	3.55 mA, factory preset to 3.8 mA 22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA $I_{pp} \leq 0.5\%$ of max. output current
Adjustable damping	0 ... 100 s, continuously adjustable over remote operation
<ul style="list-style-type: none"> <li>Current transmitter</li> <li>Failure signal</li> </ul>	0 ... 100 s, in increments of 0.1 s, adjustable over display 3.55 ... 22.8 mA 3.55 ... 22.8 mA
Load	Resistance R [ $\Omega$ ]
<ul style="list-style-type: none"> <li>Without HART communication</li> <li>With HART communication</li> </ul>	$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ , $U_H$ : Power supply in V $R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)
Characteristic curve	<ul style="list-style-type: none"> <li>Linearly increasing or linearly decreasing</li> <li>Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>
Physical bus	-
Polarity-independent	-
<b>Measuring accuracy</b>	
Reference conditions	<ul style="list-style-type: none"> <li>According to IEC 62828-1</li> <li>Rising characteristic curve</li> <li>Lower range value 0 bar/kPa/psi</li> <li>Seal diaphragm stainless steel</li> <li>Measuring cell with silicone oil filling</li> <li>Room temperature 25 °C (77 °F)</li> </ul>
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range
<ul style="list-style-type: none"> <li>Linear characteristic curve</li> </ul>	
- 20 mbar/2 kPa/0.29 psi	$r \leq 5$ : $\leq 0.075\%$ $5 < r \leq 20$ : $\leq (0.005 \cdot r + 0.05)\%$ $r \leq 5$ : $\leq 0.075\%$
- 60 mbar/6 kPa/0.87 psi	$5 < r \leq 60$ : $\leq (0.005 \cdot r + 0.05)\%$ $r \leq 5$ : $\leq 0.065\%$ (SITRANS P320)
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$5 < r \leq 100$ : $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P320)
- 160 bar/16 MPa/2 320 psi	$r \leq 5$ : $\leq 0.065\%$ (SITRANS P320) $5 < r \leq 20$ : $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P320) $r \leq 5$ : $\leq 0.04\%$ (SITRANS P420)
- 250 mbar/25 kPa/3.63 psi (PN 160) 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$5 < r \leq 100$ : $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P420)
- 160 bar/16 MPa/2 320 psi	$r \leq 5$ : $\leq 0.04\%$ (SITRANS P420) $5 < r \leq 20$ : $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P420) $r \leq 5$ : $\leq 0.065\%$ (SITRANS P420)
- 250 mbar/25 kPa/3.63 psi (PN 420)	
<ul style="list-style-type: none"> <li>Square-rooted characteristic curve (flow &gt; 50%)</li> </ul>	
- 20 mbar/2 kPa/0.29 psi	$r \leq 5$ : $\leq 0.075\%$ $5 < r \leq 20$ : $\leq (0.005 \cdot r + 0.05)\%$ $r \leq 5$ : $\leq 0.075\%$
- 60 mbar/6 kPa/0.87 psi	$5 < r \leq 60$ : $\leq (0.005 \cdot r + 0.05)\%$ $r \leq 5$ : $\leq 0.065\%$ (SITRANS P320)
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$5 < r \leq 100$ : $\leq 0.04\%$ (SITRANS P420)
- 160 bar/16 MPa/2 320 psi	$r \leq 5$ : $\leq 0.065\%$ (SITRANS P320) $5 < r \leq 20$ : $\leq 0.04\%$ (SITRANS P420)
	$5 < r \leq 20$ : $\leq (0.004 \cdot r + 0.045)\%$

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

## for differential pressure and flow

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### SITRANS P320 / SITRANS P420 for differential pressure and flow

<ul style="list-style-type: none"> <li>• Square-rooted characteristic curve (flow 25 ... 50%)               <ul style="list-style-type: none"> <li>- 20 mbar/2 kPa/0.29 psi</li> <li>- 60 mbar/6 kPa/0.87 psi</li> <li>- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi</li> <li>- 160 bar/16 MPa/2 320 psi</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><math>r \leq 5</math>: <math>\leq 0.15\%</math></li> <li><math>5 &lt; r \leq 20</math>: <math>\leq (0.01 \cdot r + 0.1)\%</math></li> <li><math>r \leq 5</math>: <math>\leq 0.15\%</math></li> <li><math>5 &lt; r \leq 60</math>: <math>\leq (0.01 \cdot r + 0.1)\%</math></li> <li><math>r \leq 5</math>: <math>\leq 0.13\%</math> (SITRANS P320) <math>\leq 0.08\%</math> (SITRANS P420)</li> <li><math>5 &lt; r \leq 100</math>: <math>\leq (0.008 \cdot r + 0.09)\%</math></li> <li><math>r \leq 5</math>: <math>\leq 0.13\%</math> (SITRANS P320) <math>\leq 0.08\%</math> (SITRANS P420)</li> <li><math>5 &lt; r \leq 20</math>: <math>\leq (0.008 \cdot r + 0.09)\%</math></li> </ul>
Influence of ambient temperature (in % per 28 °C (50 °F)) <ul style="list-style-type: none"> <li>- 20 mbar/2 kPa/0.29 psi</li> <li>- 60 mbar/6 kPa/0.87 psi</li> <li>- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi</li> <li>- 250 mbar/25 kPa/3.63 psi 5 bar/500 kPa/72.5 psi</li> <li>- 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi</li> </ul>	<ul style="list-style-type: none"> <li><math>\leq (0.15 \cdot r + 0.1)\%</math></li> <li><math>\leq (0.075 \cdot r + 0.1)\%</math></li> <li><math>\leq (0.025 \cdot r + 0.125)\%</math> (SITRANS P320)</li> <li><math>\leq (0.025 \cdot r + 0.0625)\%</math> (SITRANS P420)</li> <li><math>\leq (0.0125 \cdot r + 0.0625)\%</math> (SITRANS P420)</li> </ul>
Effect of static pressure <ul style="list-style-type: none"> <li>• At the lower range value               <ul style="list-style-type: none"> <li>- 20 mbar/2 kPa/0.29 psi</li> <li>- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi</li> <li>- 5 bar/500 kPa/72.5 psi</li> </ul> </li> <li>• on the measuring span               <ul style="list-style-type: none"> <li>- 20 mbar/2 kPa/0.29 psi</li> <li>- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi</li> </ul> </li> </ul>	Zero-point correction is possible with position error compensation <ul style="list-style-type: none"> <li><math>\leq (0.3 \cdot r)\%</math> per 70 bar (SITRANS P320)</li> <li><math>\leq (0.2 \cdot r)\%</math> per 70 bar (SITRANS P420)</li> <li><math>\leq (0.1 \cdot r)\%</math> per 70 bar</li> <li><math>\leq (0.15 \cdot r)\%</math> per 70 bar</li> <li><math>\leq 0.2\%</math> per 70 bar</li> <li><math>\leq 0.1\%</math> per 70 bar</li> </ul>
Long-term stability at $\pm 30$ °C ( $\pm 54$ °F) <ul style="list-style-type: none"> <li>• 20 mbar/2 kPa/0.29 psi</li> <li>• 60 mbar/6 kPa/0.87 psi</li> <li>• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 160 bar/16 MPa/2 320 psi</li> <li>• 30 bar/3 MPa/435 psi</li> </ul>	Static pressure max. 70 bar/7 MPa/1015 psi <ul style="list-style-type: none"> <li><math>\leq (0.2 \cdot r)\%</math> per year</li> <li>In 5 years <math>\leq (0.25 \cdot r)\%</math></li> <li>In 5 years <math>\leq (0.125 \cdot r)\%</math></li> <li>In 10 years <math>\leq (0.15 \cdot r)\%</math></li> <li>In 5 years <math>\leq (0.25 \cdot r)\%</math></li> <li>In 10 years <math>\leq (0.35 \cdot r)\%</math></li> </ul>
Step response time $T_{63}$ (without electrical damping for pressure rating PN 160) <ul style="list-style-type: none"> <li>• 20 mbar/2 kPa/0.29 psi</li> <li>• 60 mbar/6 kPa/0.87 psi</li> <li>• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi</li> </ul>	<ul style="list-style-type: none"> <li>Approx. 0.160 s</li> <li>Approx. 0.150 s</li> <li>Approx. 0.135 s</li> </ul>
Effect of mounting position (in pressure per change of angle)	$\leq 0.7$ mbar/0.07 kPa/0.028 inH <sub>2</sub> O per 10° incline (zero point correction is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V

**SITRANS P320 / SITRANS P420 for differential pressure and flow****Operating conditions**

## Medium temperature

• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
- Measuring cell 30 bar (435 psi)	-20 ... +100 °C (-4 ... +212 °F)
- Measuring cell 160 bar (2 320 psi)	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with inert oil	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with FDA-compliant oil	-10 ... +100 °C (14 ... +212 °F)
• In conjunction with dust explosion protection	-40 ... +85 °C (-4 ... +185 °F)

## Ambient conditions

• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with FDA-compliant oil	-10 ... +85 °C (14 ... +185 °F)
- Display	-20 ... +80 °C (-4 ... +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21

**Structural design**

## Weight

Approx. 3.9 kg (8.5 lb) with aluminum enclosure  
Approx. 5.9 kg (13 lb) with stainless steel enclosure

## Material

• Wetted parts materials	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges and sealing plugs	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Non-wetted parts materials	
- Electronics enclosure	<ul style="list-style-type: none"> <li>• Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M</li> <li>• Standard: Powder coating with polyurethane</li> <li>Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane</li> <li>• Stainless steel nameplate (1.4404/316L)</li> </ul>
- Process flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, zinc-plated steel, or stainless steel
Process connection	1/4-18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6 092 psi))
Electrical connection	Screw terminals Cable entry via the following screwed glands: <ul style="list-style-type: none"> <li>• M20 x 1.5</li> <li>• 1/2-14 NPT</li> <li>• Device plug Han 7D/Han 8D<sup>1)</sup></li> <li>• Device plug M12</li> </ul>

**Displays and controls**

Buttons	4 buttons for operation directly on the device
Display	<ul style="list-style-type: none"> <li>• With or without integrated display (optional)</li> <li>• Lid with inspection window (optional)</li> </ul>

**Auxiliary power U<sub>H</sub>**

Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	U <sub>SS</sub> ≤ 0.2 V (47 ... 125 Hz)
Noise	U <sub>eff</sub> ≤ 1.2 mV (0.5 ... 10 kHz)
Auxiliary power	-
Separate supply voltage	-

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for differential pressure and flow

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## SITRANS P320 / SITRANS P420 for differential pressure and flow

### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)

Drinking water

- WRAS (England)
- ACS (France)
- NSF (USA)

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

Explosion protection

- Intrinsic safety "i"
  - Marking
  - Permissible ambient temperature
  - Permissible medium temperature
  - Connection
- Effective internal inductance/capacitance
- Flameproof enclosure "d"
  - Marking
  - Permissible ambient temperature
  - Permissible medium temperature
  - Connection
- Dust explosion protection for Zones 21, 22
  - Marking
  - Permissible ambient temperature
  - Permissible medium temperature
  - Max. surface temperature
  - Connection

- Dust explosion protection for Zones 20, 21, 22
  - Marking
  - Permissible ambient temperature
  - Permissible medium temperature
  - Connection

- Effective internal inductance/capacitance
- Type of protection for Zone 2
  - Marking
  - Permissible ambient temperature "ec"
  - Permissible medium temperature
  - "ec" connection

- Explosion protection acc. to FM
  - Marking (XP/DIP) or IS; NI; S

- Explosion protection according to CSA
  - Marking (XP/DIP) or (IS)

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

### For flow only

For gases of fluid group 1 and liquids of fluid group 1; fulfills the basic safety requirements as per article 3, paragraph 1 (appendix 1); classified as category III, module H conformity evaluation by TÜV Nord

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

No.: 0F9863.5C (option E60)

No.: GYJ19.1058X (option E27)

No.: BRA-18-GE-0035X (option E25)

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To circuit with the operating values

$U_n = 10.5 \dots 45 \text{ V}$ ,  $4 \dots 20 \text{ mA}$

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

120 °C (248 °F)

To circuit with the operating values

$U_n = 10.5 \dots 45 \text{ V}$ ,  $4 \dots 20 \text{ mA}$

Ex II 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 3G Ex ec IIC T4/T6 Gc

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +40 °C (-40 ... +104 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To circuit with the operating values

$U_n = 10.5 \dots 30 \text{ V}$ ,  $4 \dots 20 \text{ mA}$

Available soon

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2,

GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Available soon

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2,

GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Standardized Electrical Signals and Questions Relating to Engineering Technology

Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment

Extra Low Voltage Circuits with Safe Separation

Standardization of the Signal Level for the Failure Information of Digital Transmitters

Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics

The Application of the Pressure Equipment Directive to Process Control Devices

Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices

Self-Monitoring and Diagnosis of Field Devices

NAMUR Standard Device - Field Devices for Standard Applications

### Communication

<b>HART</b>	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
<b>PROFIBUS PA</b>	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

<b>FOUNDATION Fieldbus</b>	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for differential pressure and flow

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## Selection and ordering data

Article No.

### Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)

SITRANS P320

7MF034 - - - - -

SITRANS P420

7MF044 - - - - -

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

0  
1  
2

#### Measuring cell filling

Silicone oil

Inert liquid

Neobee oil

1  
3  
4

#### Maximum measuring span

20 mbar (8.037 inH<sub>2</sub>O)60 mbar (24.11 inH<sub>2</sub>O)250 mbar (100.5 inH<sub>2</sub>O)600 mbar (241.1 inH<sub>2</sub>O)1 600 mbar (643 inH<sub>2</sub>O)5 000 mbar (2009 inH<sub>2</sub>O)

30 bar (435 psi)

160 bar (2 320 psi)

B  
D  
G  
H  
M  
P  
R  
Y

#### Process connection

Oval flange, mounting thread:  $\frac{7}{16}$ -20 UNF (IEC 61518)

Oval flange, mounting thread: M12 (PN 420) (DIN 19213)

Oval flange, mounting thread:  $\frac{7}{16}$ -20 UNF (IEC 61518) with lateral ventilation

Oval flange, mounting thread: M12 (PN 420) (DIN 19213) with lateral ventilation

Version for diaphragm seal with mounting thread  $\frac{7}{16}$ -20 UNF (IEC 61518)

Version for diaphragm seal with mounting thread M12 (PN 420) (DIN 19213)

Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread  $\frac{7}{16}$ -20 UNF (IEC 61518)L  
M  
N  
P  
V  
W  
X

#### Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408

Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408

Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408

Tantalum/tantalum, process flange stainless steel 316/1.4408

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

0  
1  
2  
4  
6  
8

#### Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

1  
2

#### Enclosure

Dual chamber device

5

#### Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

A  
B  
C  
D  
L  
M  
S  
T



	Article No.
<p><b>Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)</b></p>	
<p><b>SITRANS P320</b></p>	<p>7MF034 - - - - -</p>
<p><b>SITRANS P420</b></p>	<p>7MF044 - - - - -</p>
<p><b>Electrical connections/cable entries</b></p>	
<p>Thread for cable gland: Cable gland must be ordered separately as option (Axx)</p>	
<ul style="list-style-type: none"> <li>• 2 x M20 x 1.5</li> <li>• 2 x 1/2-14 NPT</li> </ul>	<p>F M</p>
<p><b>Local operation/display</b></p>	
<p>Without display (lid closed)</p>	<p>0</p>
<p>With display (lid closed)</p>	<p>1</p>
<p>With display (lid with glass pane)</p>	<p>2</p>

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for differential pressure and flow

1

Article No.

## Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)

### SITRANS P320

7MF035 - - - - -

### SITRANS P420

7MF045 - - - - -

Click the article number for online configuration in the PIA Life Cycle Portal.

### Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

### Measuring cell filling

Silicone oil

Inert liquid

Neobee oil

### Maximum measuring span

250 mbar (100.5 inH<sub>2</sub>O)600 mbar (241.1 inH<sub>2</sub>O)1 600 mbar (643 inH<sub>2</sub>O)5 000 mbar (2009 inH<sub>2</sub>O)

30 bar (435 psi)

### Process connection

Oval flange, mounting thread:  $\frac{7}{16}$ -20 UNF (IEC 61518)

Oval flange, mounting thread: M12 (PN 420) (DIN 19213)

Oval flange, mounting thread:  $\frac{7}{16}$ -20 UNF (IEC 61518) with lateral ventilation

Oval flange, mounting thread: M12 (PN 420) (DIN 19213) with lateral ventilation

Version for diaphragm seal with mounting thread  $\frac{7}{16}$ -20 UNF (IEC 61518)

Version for diaphragm seal with mounting thread M10 (DIN 19213)

Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread  $\frac{7}{16}$ -20 UNF (IEC 61518)

### Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408

Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408

Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408

### Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

### Enclosure

Dual chamber device

### Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

### Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

- 2 x M20 x 1.5
- 2 x  $\frac{1}{2}$ -14 NPT

### Local operation/display

Without display (lid closed)

With display (lid closed)

With display (lid with glass pane)

0

1

2

1

3

4

G

H

M

P

R

L

M

N

P

V

W

X

0

1

8

1

2

5

A

B

C

D

L

M

S

T

F

M

0

1

2

# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P320/420

for differential pressure and flow

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Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Cable glands included</b>	
Plastic	<b>A00</b>
Metal	<b>A01</b>
Stainless steel	<b>A02</b>
Stainless steel 316L/1.4404	<b>A03</b>
CMP, for XP devices	<b>A10</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>
<b>Device plug Han mounted left</b>	
Device plug Han 7D (plastic, straight)	<b>A30</b>
Device plug Han 7D (plastic, angled)	<b>A31</b>
Device plug Han 7D (metal, straight)	<b>A32</b>
Device plug Han 7D (metal, angled)	<b>A33</b>
Device plug Han 8D (plastic, straight)	<b>A34</b>
Device plug Han 8D (plastic, angled)	<b>A35</b>
Device plug Han 8D (metal, straight)	<b>A36</b>
Device plug Han 8D (metal, angled)	<b>A37</b>
<b>Cable socket included</b>	
Plastic, for device plug Han 7D and Han 8D	<b>A40</b>
Metal, for device plug Han 7D and Han 8D	<b>A41</b>
<b>Device plug M12 mounted left</b>	
Stainless steel, without cable socket	<b>A62</b>
Stainless steel, with cable socket	<b>A63</b>
<b>Cable entry/device plug mounting</b>	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>
Cable gland/device plug mounted left	<b>A97</b>
Cable gland/device plug mounted right	<b>A99</b>
<b>Nameplate labeling (standard labeling: English, unit bar)</b>	
German (bar)	<b>B11</b>
French (bar)	<b>B12</b>
Spanish (bar)	<b>B13</b>
Italian (bar)	<b>B14</b>
Chinese (bar)	<b>B15</b>
Russian (bar)	<b>B16</b>
English (psi)	<b>B20</b>
English (Pa)	<b>B30</b>
Chinese (Pa)	<b>B35</b>
<b>Certificates</b>	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	<b>C11</b>
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>
Factory certificate (EN 10204-2.2) - Wetted parts	<b>C14</b>
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>
<b>Certificates for functional safety</b>	
Functional Safety (IEC 61508) - SIL2/3	<b>C20</b>

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	<b>D30</b>
Unlabeled TAG plate	<b>D40</b>
Without labeling of the measuring range on the TAG plate	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Increase of pressure rating from PN 420 to PN 500 (Tested according to IEC 61010. Only permissible for process media of fluid group 2 acc. to DGRL. Not suitable for use with hazardous process media.)	<b>D50</b>
Overvoltage protection up to 6 kV (internal)	<b>D70</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Labels on transport packaging (provided by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA (USA and Canada)	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada) <sup>1)</sup>	<b>E21</b>
FM (USA and Canada) <sup>1)</sup>	<b>E22</b>
IECEx (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
RMR (Russian Maritime Register)	<b>E55</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

1

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual Seal	<b>E81</b>
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>
<b>Mounting bracket</b>	
Steel, zinc-plated	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Process flanges; screw plug with vent valve</b>	
Welded in on right	<b>J08</b>
Welded in on left	<b>J09</b>
Glued in on right	<b>J10</b>
Glued in on left	<b>J11</b>
<b>Flange connections with flange EN 1092-1</b>	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J70</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J71</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J72</b>
• DN 15 PN 40, stainless steel 1.4571/316Ti	<b>J78</b>
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J73</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J74</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J75</b>
<b>Flange connection options</b>	
Flange connection and temperature extension	<b>J76</b>
Flange connection with epoxy resin coating	<b>J77</b>
<b>Process flanges; special materials</b>	
Reserved for 7MF7: without process flanges, without screws, without gaskets	<b>K00</b>
Process flange material alloy C22/2.4602	<b>K01</b>
Process flange material Monel 400/2.4360	<b>K02</b>
Process connection material PVDF, on the side ½-14 NPT	<b>K05</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	<b>K06</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	<b>K07</b>
<b>Process flanges; process connection option</b>	
Process flange with process connection G½ welded on	<b>K20</b>
Process connection NAM (ASTAVA)	<b>K21</b>
<b>Process flanges chambered with gaskets</b>	
1x chambered, graphite	<b>K40</b>
1x chambered, PTFE	<b>K41</b>
2x chambered, PTFE	<b>K42</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
O-ring, process flanges, PTFE	<b>K50</b>
O-ring, process flanges, FEP (with silicone core, approved for food)	<b>K51</b>
O-ring, process flanges, FFKM (FFPM)	<b>K52</b>
O-ring, process flanges, NBR	<b>K53</b>
O-ring, process flanges, EPDM	<b>K54</b>

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Process flange options</b>	
Process flanges for vertical differential pressure lines (half process flange)	<b>K81</b>
Process flanges (+) - side front	<b>K82</b>
Process flange screws, process flange nuts, material Monel 400/2.4360	<b>K83</b>
Valve ¼-18 NPT, material same as process flanges	<b>K84</b>
Valve mounted on the side, measured medium: Gas	<b>K85</b>
Oval flange attached, PTFE seal + fastening screws	<b>K86</b>
<b>Valve manifolds</b>	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U01</b>
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U02</b>
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U03</b>
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	<b>U04</b>

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Device settings</b>	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi  Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).  Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr	<b>Y01</b>
Square-rooted characteristic curve [VSLN2, MSLN2], example: VSLN2  Drop-down list: VSLN2, MSLN2	<b>Y02</b>
TAG (on stainless steel plate and device parameters, max. 32 characters)  Input field: Free text, max. 32 characters	<b>Y15</b>
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)  Input field: Free text, max. 32 characters	<b>Y16</b>
TAG short (device parameters, max. 8 characters)  Input field: Free text, max. 8 characters	<b>Y17</b>
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge  Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	<b>Y21</b>
Local display Scaling with standard units [m <sup>3</sup> /s, l/s, m, inch, ...], example 1 ... 5 m <sup>3</sup> /s  Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).  Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI, m <sup>3</sup> /sec, m <sup>3</sup> /h, m <sup>3</sup> /d, l/sec, l/min, l/h, Ml/d, ft <sup>3</sup> /sec, ft <sup>3</sup> /h, ft <sup>3</sup> /d, SCF/min, SCF/h, NI/h, Nm <sup>3</sup> /h, gal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK)/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d, kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d.	<b>Y22</b>
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m  Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).  Input field 3: Free text, max. 8 characters	<b>Y23</b>
Set PROFIBUS PA device address (1 ... 126)	<b>Y25</b>
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA  Drop-down list 1: 3.9, 4  Drop-down list 2: 20.8, 22	<b>Y30</b>
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]  Drop-down list: 3.75; 21.75; 22.5; 22.6	<b>Y31</b>
Damping in seconds instead of 2 s (0.0 ... 100.0 s)  Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	<b>Y32</b>
ID number of special design  Input field: max. 4 characters and only natural numbers from 0 ... 9999	<b>Y99</b>

<sup>1)</sup> Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

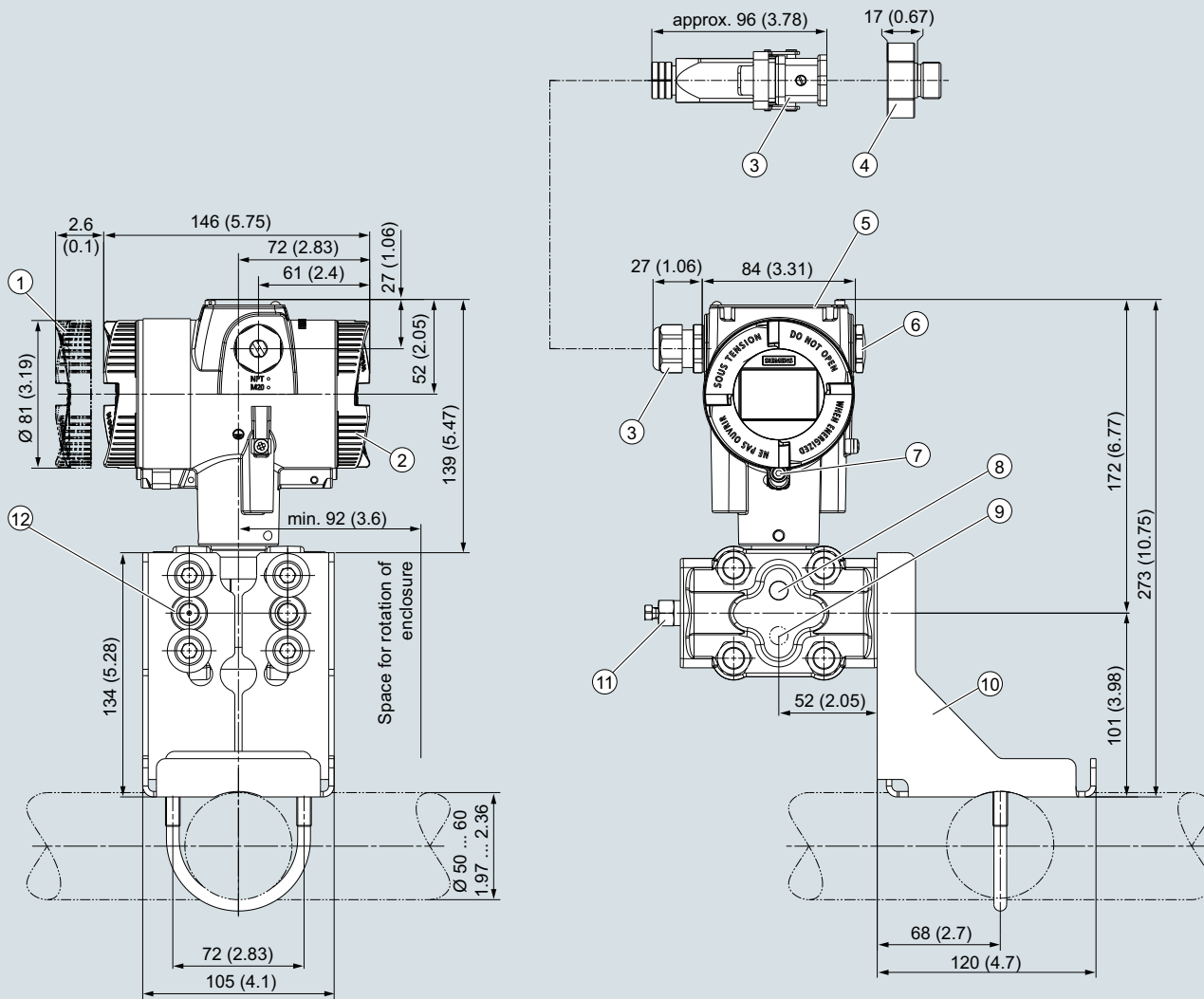
# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for differential pressure and flow

1

## Dimensional drawings



① Electronics side, local display  
(longer overall length for cover with glass pane)<sup>1)</sup>

② Connection side

③ Electrical connection:  
• M20 x 1,5<sup>3)</sup> screw gland  
• ½-14 NPT screw gland  
• Han 7D/Han 8D<sup>2)3)</sup> device plug  
• M12 device plug<sup>2)3)</sup>

④ Harting adapter

⑤ Cover over buttons and nameplate with general information

⑥ Blanking plug

⑦ Safety catch  
(only for "flameproof enclosure" type of protection)

⑧ Lateral ventilation for liquid measurement (Standard)

⑨ Lateral ventilation for gas measurement (order option K85)

⑩ Mounting bracket (optional)

⑪ Sealing plug with valve (optional)

⑫ Process connection: ¼-18 NPT (IEC 61518)

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with "flameproof enclosure" type of protection

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

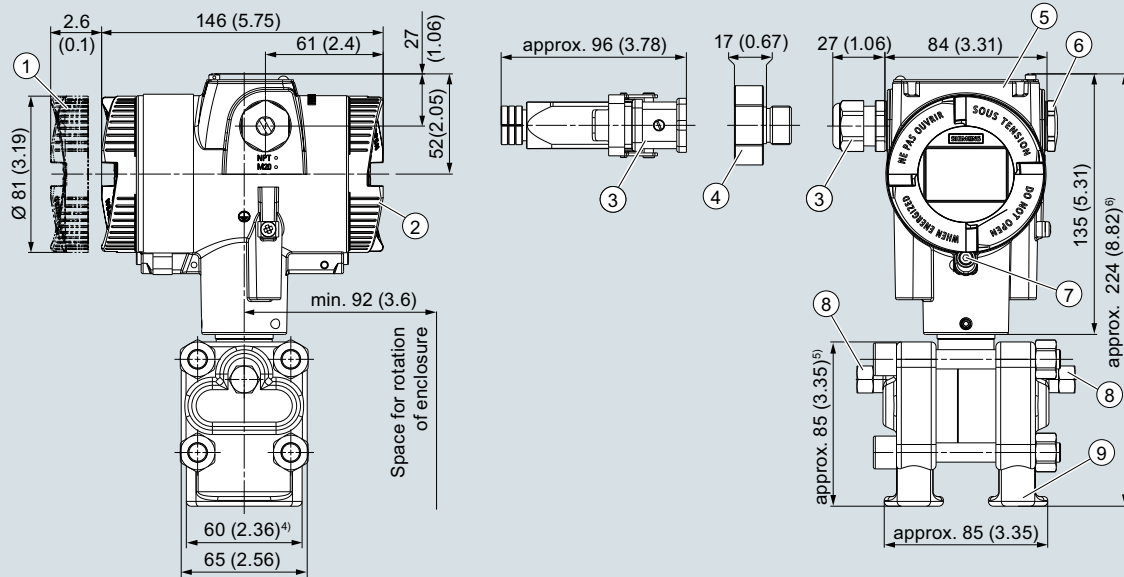
SITRANS P320/P420 pressure transmitter for differential pressure and flow, dimensions in mm (inch)

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

for differential pressure and flow

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- ① Electronics side, local display (longer overall length for cover with inspection window)<sup>1)</sup>
- ② Connection side
- ③ Electrical connection:
  - M20 x 1.5<sup>3)</sup> screw gland
  - ½-14 NPT screw gland
  - Han 7D/Han 8D<sup>2) 3)</sup> device plug
  - M12 device plug<sup>2) 3)</sup>
- ④ Harting adapter

- ⑤ Cover over buttons and nameplate with general information
- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection)
- ⑧ Sealing plug with valve (option)
- ⑨ Process connection: ¼-18 NPT (IEC 61518)

- 1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
- 2) Not with "flameproof enclosure" type of protection
- 3) Not with type of protection "FM + CSA" [is + XP]"
- 4) 74 mm (2.9 inches) for PN  $\geq$  420 (MAWP  $\geq$  6092 psi)
- 5) 91 mm (3.6 inches) for PN  $\geq$  420 (MAWP  $\geq$  6092 psi)
- 6) 226 mm (8.9 inches) for PN  $\geq$  420 (MAWP  $\geq$  6092 psi)

SITRANS P320/P420 pressure transmitter for differential pressure and flow with process covers for vertical differential pressure lines (option "K81"), dimensions in mm (inch)

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for level

1

## Technical specifications

### SITRANS P320 / SITRANS P420 for level

#### Input

Measured variable

Level

Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)

Measuring span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

25 ... 250 mbar  
2.5 ... 25 kPa  
10 ... 100.5 inH<sub>2</sub>O

See "Mounting flange"

25 ... 600 mbar  
2.5 ... 60 kPa  
10 ... 241 inH<sub>2</sub>O

53 ... 1600 mbar  
5.3 ... 160 kPa  
21 ... 643 inH<sub>2</sub>O

166 ... 5 000 mbar  
16.6 ... 500 kPa  
2.41 ... 72.5 psi

Measuring limits

- Lower measuring limit
  - Measuring cell with silicone oil filling
  - Measuring cell with inert oil
  - Measuring cell with FDA-compliant oil
- Upper measuring limit
- Lower range value

-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange  
-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange  
-100% of max. measuring range or 100 mbar a/10 kPa a/1.45 psi a  
100% of max. measuring span  
Between the measuring limits (infinitely adjustable)

#### Output

#### HART

Output signal

4 ... 20 mA

- Lower saturation limit (infinitely adjustable)
- Upper saturation limit (infinitely adjustable)
- Ripple (without HART communication)

3.55 mA, factory preset to 3.8 mA  
22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA  
 $I_{pp} \leq 0.5\%$  of max. output current

Adjustable damping

0 ... 100 s, continuously adjustable over remote operation  
0 ... 100 s, in increments of 0.1 s, adjustable over display

- Current transmitter
- Failure signal

3.55 ... 22.8 mA  
3.55 ... 22.8 mA

Load

Resistance R [ $\Omega$ ]

- Without HART communication

$R = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$ ,  
 $U_H$ : Power supply in V

- With HART communication

$R = 230 \dots 1100 \Omega$  (HART communicator (handheld))

$R = 230 \dots 500 \Omega$  (SIMATIC PDM)

Characteristic curve

- Linearly increasing or linearly decreasing
- Linear increase or decrease or according to the square root (only for differential pressure and flow)

Physical bus

-

Polarity-independent

-

#### Measuring accuracy

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)



**SITRANS P320 / SITRANS P420 for level**

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

- Linear characteristic curve
  - 250 mbar/25 kPa/3.6 psi
  - 600 mbar/60 kPa/8.7 psi
  - 1600 mbar/160 kPa/23.21 psi
  - 5 bar/500 kPa/72.5 psi

$r$  = maximum measuring span/set measuring span or nominal measuring range

$$r \leq 5: \leq 0.125\%$$

$$5 < r \leq 10: \leq (0.007 \cdot r + 0.09)\%$$

Influence of ambient temperature in % per 28 °C (50 °F)

- SITRANS P320
  - 250 mbar/25 kPa/3.6 psi
  - 600 mbar/60 kPa/8.7 psi
  - 1600 mbar/160 kPa/23.21 psi
  - 5 bar/500 kPa/72.5 psi
- SITRANS P420
  - 250 mbar/25 kPa/3.6 psi
  - 5 bar/500 kPa/72.5 psi
  - 600 mbar/60 kPa/8.7 psi
  - 1600 mbar/160 kPa/23.21 psi

$$\leq (0.025 \cdot r + 0.125)\%$$

$$\leq (0.025 \cdot r + 0.0625)\%$$

$$\leq (0.125 \cdot r + 0.0625)\%$$

Effect of static pressure

- At the lower range value
  - 250 mbar/25 kPa/3.63 psi
  - 600 mbar/60 kPa/8.7 psi
  - 1.6 bar/160 kPa/23.21 psi
  - 5 bar/500 kPa/72.52 psi

$$\leq (0.3 \cdot r) \% \text{ per nominal pressure}$$

$$\leq (0.15 \cdot r) \% \text{ per nominal pressure}$$

- on the measuring span

$$\leq (0.1 \cdot r) \% \text{ per nominal pressure}$$

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- all measuring cells

In 5 years  $\leq (0.25 \cdot r) \%$  static pressure max. 70 bar/7 MPa/1015 psi

Step response time  $T_{63}$  (without electrical damping)

Depending on the installed remote seal

Influence of mounting position

Depends on the filling liquid in the mounting flange

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

**Operating conditions**

Medium temperature

Measuring cell with silicone oil filling

- High side: See "Mounting flange"
- Low side: -40 ... +100 °C (-40 ... +212 °F)

Ambient conditions

- Ambient temperature/enclosure

Always consider the assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection.

- Measuring cell with silicone oil filling
- Display

-40 ... +85 °C (-40 ... +185 °F)  
-20 ... +80 °C (-4 ... +176 °F)  
-50 ... +85 °C (-58 ... +185 °F)

- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
  - According to IEC 60529
  - According to NEMA 250
- Electromagnetic compatibility
  - Emitted interference and interference immunity

4K4H

IP66, IP68  
Type 4X

According to IEC 61326 and NAMUR NE 21

Vibration resistance

- Reference conditions
- General operating conditions
  - Oscillations (sine) IEC 60068-2-6

Specifications apply to devices without mounting bracket

- Continuous shocks (half-sine) IEC 60068-2-27

10 ... 58 Hz, 0.3 mm (0.01 inch)  
58 ... 500 Hz, 20 m/s<sup>2</sup> (65.62 ft/s<sup>2</sup>)  
1 octave/min  
5 cycles/axis  
250 m/s<sup>2</sup> (820 ft/s<sup>2</sup>)  
6 ms  
2000 shocks/axis  
10 ... 200 Hz; 1 (m/s<sup>2</sup>)/Hz (3.28 (ft/s<sup>2</sup>)/Hz)  
200 ... 500 Hz; 0.3 (m/s<sup>2</sup>)/Hz (0.98 (ft/s<sup>2</sup>)/Hz)  
4 hours/axle

- Operating conditions for marine applications
  - IEC 60068-2-6
  - DNVGL-CG-0339, clause 6
  - Lloyd's Register Test Specification Number 1, section 12
  - Bureau Veritas Pt C, Ch 3, Sec 6, Table 1, No 7

2 ... 25 Hz, 1.6 mm (0.06 inch)  
25 ... 100 Hz, 40 m/s<sup>2</sup> (131.23 ft/s<sup>2</sup>)  
1 octave/min

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/420

## for level

1

### SITRANS P320 / SITRANS P420 for level

#### Structural design

##### Weight

- According to EN
- According to ASME

##### Material

- Wetted parts materials
  - High side

- Gasket material in the process flanges

- Low side

- Non-wetted parts materials
  - Electronics enclosure

##### Process flange screws

##### Measuring cell filling

- Mounting flange filling liquid

##### Process connection

- High side
- Low side

##### Electrical connection

Pressure transmitter with mounting flange, without tube

- Aluminum enclosure: approx. 11 ... 13 kg (24.2 ... 28.7 lb)
- Stainless steel enclosure: approx. 13 ... 15 kg (28.7 ... 33 lb)
- Aluminum enclosure: approx. 11 ... 18 kg (24.2 ... 39.7 lb)
- Stainless steel enclosure: approx. 13 ... 20 kg (28.7 ... 44 lb)

Seal diaphragm of mounting flange

Stainless steel, mat. no. 1.4404/316L, Monel 400, mat. no. 2.4360, Alloy B2, mat. no. 2.4617, Alloy C276, mat. no. 2.4819, Alloy C22, mat. no. 2.4602, tantalum, PTFE, PFA, ECTFE

Sealing surface

Smooth according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA for stainless steel 316L, EN 2092-1 form B2 or ASME B16.5 RFSF for the remaining materials

For standard applications

Viton

For negative pressure applications on the mounting flange

Copper

Seal diaphragm

Stainless steel, mat. no. 1.4404/316L

Process flanges

Stainless steel, mat. no. 1.4408/316

Process flange screw

Stainless steel ISO 3506-1 A4-70

O-ring

FPM (Viton)

- Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
- Standard: Powder coating with polyurethane
  - Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
- Stainless steel nameplate (1.4404/316L)

Stainless steel ISO 3506-1 A4-70

Silicone oil

Silicone oil or other material

Flange according to EN and ASME

1/4-18 NPT female thread and flange connection with M10 fastening screw thread according to DIN 19213 (M12 for PN 420 (MWP 6092 psi)) or 7/16-20 UNF according to EN 61518

Screw terminals

Cable entry via the following screwed glands:

- M20 x 1.5
- 1/2-14 NPT
- Device plug Han 7D/Han 8D<sup>1)</sup>
- Device plug M12

#### Displays and controls

##### Buttons

4 buttons for operation directly on the device

##### Display

- With or without integrated display (optional)
- Lid with inspection window (optional)

#### Auxiliary power $U_H$

##### Terminal voltage on pressure transmitter

10.5 ... 45 V DC  
10.5 ... 30 V DC in intrinsically safe mod

##### Ripple

$U_{SS} \leq 0.2$  V (47 ... 125 Hz)

##### Noise

$U_{eff} \leq 1.2$  mV (0.5 ... 10 kHz)

##### Auxiliary power

–

##### Separate supply voltage

–

**SITRANS P320 / SITRANS P420 for level****Certificates and approvals**

Classification according to pressure equipment directive (PED 2014/68/EU)

Drinking water

- WRAS (England)
- ACS (France)
- NSF (USA)

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

Explosion protection

- Intrinsic safety "i"
  - Marking
  - Permissible ambient temperature
  - Permissible medium temperature
  - Connection
- Effective internal inductance/capacitance
- Flameproof enclosure "d"
  - Marking
  - Permissible ambient temperature
  - Permissible medium temperature
  - Connection

- Dust explosion protection for Zones 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible medium temperature
- Max. surface temperature
- Connection

- Dust explosion protection for Zones 21, 22

- Marking
- Permissible ambient temperature
- Permissible medium temperature
- Connection

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking
- Permissible ambient temperature "ec"
- Permissible medium temperature
- "ec" connection

- Explosion protection acc. to FM

- Marking (XP/DIP) or IS; NI; S

- Explosion protection according to CSA

- Marking (XP/DIP) or (IS)

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

No.: 0F9863.5C (option E60)

No.: GYJ19.1058X (option E27)

No.: BRA-18-GE-0035X (option E25)

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6  
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \mu\text{H}/C_i = 3.29 \text{ nF}$

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6  
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6

To circuit with the operating values

$U_n = 10.5 \dots 45 \text{ V}$ ,  $4 \dots 20 \text{ mA}$

Ex II 1D Ex tb IIIC T120 °C Da

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

120 °C (248 °F)

To circuit with the operating values

$U_n = 10.5 \dots 45 \text{ V}$ ,  $4 \dots 20 \text{ mA}$

Ex II 2D Ex ib IIIC T120 °C Db

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

$L_i = 0.24 \mu\text{H}/C_i = 3.29 \text{ nF}$

Ex II 3G Ex ec IIC T4/T6 Gc

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +40 °C (-40 ... +104 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 30 \text{ V}$ ,  $4 \dots 20 \text{ mA}$

Available soon

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2,

GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Available soon

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2,

GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Standardized Electrical Signals and Questions Relating to Engineering Technology

Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment

Extra Low Voltage Circuits with Safe Separation

Standardization of the Signal Level for the Failure Information of Digital Transmitters

Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics

The Application of the Pressure Equipment Directive to Process Control Devices

Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices

Self-Monitoring and Diagnosis of Field Devices

NAMUR Standard Device - Field Devices for Standard Applications

<sup>1)</sup> Han 8D is identical to Han 8U.

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for level

1

## Mounting flange

Nominal diameter	Nominal pressure
<ul style="list-style-type: none"> <li>• Acc. to EN 1092-1           <ul style="list-style-type: none"> <li>- DN 80</li> <li>- DN100</li> </ul> </li> <li>• According to ASME B16.5           <ul style="list-style-type: none"> <li>- 3 inch</li> <li>- 4 inch</li> </ul> </li> </ul>	PN 40 PN 16, PN 40  Class 150, class 300 Class 150, class 300

## Communication

### HART

HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

### PROFIBUS PA

Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
<ul style="list-style-type: none"> <li>• Output byte</li> <li>• Input byte</li> </ul>	≤ 35 (7 measured values) 0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
<ul style="list-style-type: none"> <li>• Analog input           <ul style="list-style-type: none"> <li>- Adaptation to user-specific process variable</li> <li>- Electrical damping adjustable</li> <li>- Simulation function</li> <li>- Limit monitoring</li> </ul> </li> </ul>	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input Yes, one upper and lower warning limit and one alarm limit respectively
<ul style="list-style-type: none"> <li>• Register (totalizer)           <ul style="list-style-type: none"> <li>- Limit monitoring</li> </ul> </li> </ul>	Can be reset, preset, optional direction of counting, simulation function of register output  One upper and lower warning limit and one alarm limit respectively
<ul style="list-style-type: none"> <li>• Physical block</li> </ul>	1
Transducer blocks	1
<ul style="list-style-type: none"> <li>• Pressure transducer block           <ul style="list-style-type: none"> <li>- Can be calibrated by applying two pressures</li> <li>- Monitoring of sensor limits</li> <li>- Specification of a vessel characteristic with</li> <li>- Square-rooted characteristic curve for flow measurement</li> <li>- Tank characteristic curve for volume measurement</li> <li>- Low flow cut-off and implementation point of square-root extraction</li> <li>- Simulation function for measured pressure value and sensor temperature</li> </ul> </li> </ul>	Yes Yes Max. 30 nodes Yes Yes Parameterizable Constant value or by means of parameterizable ramp function

### FOUNDATION Fieldbus

Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
<ul style="list-style-type: none"> <li>• Analog input           <ul style="list-style-type: none"> <li>- Adaptation to user-specific process variable</li> <li>- Electrical damping adjustable</li> <li>- Simulation function</li> </ul> </li> <li>- Response to failure</li> <li>- Limit monitoring</li> <li>- Square-rooted characteristic curve for flow measurement</li> </ul>	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input (can be locked within the device with a bridge) Parameterizable (last good value, substitute value, incorrect value) Yes, one upper and lower warning limit and one alarm limit respectively Yes
<ul style="list-style-type: none"> <li>• PID</li> </ul>	Standard FOUNDATION Fieldbus function block
<ul style="list-style-type: none"> <li>• Physical block</li> </ul>	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
<ul style="list-style-type: none"> <li>• Pressure transducer block           <ul style="list-style-type: none"> <li>- Can be calibrated by applying two pressures</li> <li>- Monitoring of sensor limits</li> <li>- Simulation function: pressure measurement, sensor temperature and electronics temperature</li> </ul> </li> </ul>	Yes Yes Constant value or by means of parameterizable ramp function

## Selection and ordering data

Article No.

## Pressure transmitters for level

## SITRANS P320

7MF036 - - - - -

## SITRANS P420

7MF046 - - - - -

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

## Communication

HART, 4 ... 20 mA

0

PROFIBUS PA

1

FOUNDATION Fieldbus (FF)

2

## Measuring cell filling

Silicone oil

1

## Maximum measuring span

250 mbar (100.5 inH<sub>2</sub>O)

G

600 mbar (241 inH<sub>2</sub>O)

H

1 600 mbar (643 inH<sub>2</sub>O)

M

5 000 mbar (72.5 psi)

P

## Process connection

Version for diaphragm seal with fastening thread  $7/16$ -20 UNF (IEC 61518):  
Remote seal 7MF0814 must be ordered separately.

V

## Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408

0

## Non-wetted parts materials

Die-cast aluminum

1

Stainless steel precision casting CF3M/1.4409 similar to 316L

2

## Enclosure

Dual chamber device

5

## Type of protection

Without Ex

A

Intrinsic safety

B

Flameproof enclosure

C

Flameproof enclosure, intrinsic safety

D

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

L

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

M

Combination of options B, C and L (zone model)

S

Combination of options B, C and M (zone model, Class Division)

T

## Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

• 2 x 1/2-14 NPT

F

M

## Local operation/display

Without display (lid closed)

0

With display (lid closed)

1

With display (lid with glass pane)

2

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for level

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Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Cable glands included</b>	
Plastic	<b>A00</b>
Metal	<b>A01</b>
Stainless steel	<b>A02</b>
Stainless steel 316L/1.4404	<b>A03</b>
CMP, for XP devices	<b>A10</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>
<b>Device plug Han mounted left</b>	
Device plug Han 7D (plastic, straight)	<b>A30</b>
Device plug Han 7D (plastic, angled)	<b>A31</b>
Device plug Han 7D (metal, straight)	<b>A32</b>
Device plug Han 7D (metal, angled)	<b>A33</b>
Device plug Han 8D (plastic, straight)	<b>A34</b>
Device plug Han 8D (plastic, angled)	<b>A35</b>
Device plug Han 8D (metal, straight)	<b>A36</b>
Device plug Han 8D (metal, angled)	<b>A37</b>
<b>Cable socket included</b>	
Plastic, for device plug Han 7D and Han 8D	<b>A40</b>
Metal, for device plug Han 7D and Han 8D	<b>A41</b>
<b>Device plug M12 mounted left</b>	
Stainless steel, without cable socket	<b>A62</b>
Stainless steel, with cable socket	<b>A63</b>
<b>Cable entry/device plug mounting</b>	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>
Cable gland/device plug mounted left	<b>A97</b>
Cable gland/device plug mounted right	<b>A99</b>
<b>Nameplate labeling (standard labeling: English, unit bar)</b>	
German (bar)	<b>B11</b>
French (bar)	<b>B12</b>
Spanish (bar)	<b>B13</b>
Italian (bar)	<b>B14</b>
Chinese (bar)	<b>B15</b>
Russian (bar)	<b>B16</b>
English (psi)	<b>B20</b>
English (Pa)	<b>B30</b>
Chinese (Pa)	<b>B35</b>
<b>Certificates</b>	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	<b>C11</b>
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>
Factory certificate (EN 10204-2.2) - Wetted parts	<b>C14</b>
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>
<b>Certificates for functional safety</b>	
Functional Safety (IEC 61508) - SIL2/3	<b>C20</b>

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	<b>D30</b>
Unlabeled TAG plate	<b>D40</b>
Without labeling of the measuring range on the TAG plate	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Overvoltage protection up to 6 kV (internal)	<b>D70</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Labels on transport packaging (provided by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA (USA and Canada)	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada) <sup>1)</sup>	<b>E21</b>
FM (USA and Canada) <sup>1)</sup>	<b>E22</b>
IECEX (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) <sup>1)</sup>	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
RMR (Russian Maritime Register)	<b>E55</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>

Options	Order code
Add <b>"-Z"</b> to article number, specify order code and plain text or entry from drop-down list.	
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual Seal	<b>E81</b>
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>
<b>Device settings</b>	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	<b>Y01</b>
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr	
TAG (on stainless steel plate and device parameters, max. 32 characters)	<b>Y15</b>
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	<b>Y16</b>
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	<b>Y17</b>
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	<b>Y21</b>
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m <sup>3</sup> /s, l/s, m, inch, ...], example 1 ... 5 m	<b>Y22</b>
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: m, cm, mm, in, ft, m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	<b>Y23</b>
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Input field 3: Free text, max. 8 characters	
Set PROFIBUS PA device address (1 ... 126)	<b>Y25</b>
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	<b>Y30</b>
Drop-down list 1: 3.9, 4	
Drop-down list 2: 20.8, 22	
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	<b>Y31</b>
Drop-down list: 3.75; 21.75; 22.5; 22.6	
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	<b>Y32</b>
Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	
ID number of special design	<b>Y99</b>
Input field: max. 4 characters and only natural numbers from 0 ... 9999	

<sup>1)</sup> Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P320/P420

for level

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		Article No.	Order-code			Article No.	Order-code
<b>Diaphragm seal</b>		<b>7MF0814 -</b>		<b>Diaphragm seal</b>		<b>7MF0814 -</b>	
In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		<b>03 - 0</b>		In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		<b>03 - 0</b>	
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>				<b>Filling liquid</b>			
<b>Standard of process connection EN 1092-1</b>				Silicone oil M50			<b>B</b>
<b>Nominal diameter</b>	<b>Nominal pressure</b>			High-temperature oil			<b>C</b>
DN 40	PN 10/16/25/40	<b>0DD</b>		Silicone oil M5			<b>A</b>
	PN 63/100	<b>0DF</b>		Food oil (FDA-listed)			<b>E</b>
	PN 160	<b>0DG</b>		Halocarbon oil			<b>D</b>
DN 50	PN 10/16/25/40	<b>0ED</b>		Other version			<b>Z</b>
	PN 63/100	<b>0EE</b>		Add order code and plain text.			<b>P 1 Y</b>
	PN 160	<b>0EF</b>		<b>Wetted parts materials</b>			
DN 80	PN 10/16/25/40	<b>0GD</b>		316L stainless steel			
	PN 100	<b>0GF</b>		• Without coating			<b>A</b>
DN 100	PN 10/16	<b>0HB</b>		• With PFA coating			<b>D</b>
	PN 25/40	<b>0HD</b>		• With PTFE coating			<b>E 0</b>
DN 125	PN 16	<b>0JB</b>		• With ECTFE coating			<b>F</b>
	PN 40	<b>0JD</b>		Monel 400, 2.4360			<b>G</b>
<b>Standard of process connection ASME B16.5</b>				Hastelloy C276, 2.4819			<b>J</b>
<b>Nominal diameter</b>	<b>Nominal pressure</b>			Tantalum			<b>K</b>
1½ inch	Class 150	<b>1 LA</b>		Titanium, 3.7035			<b>L 0</b>
	Class 300	<b>1 LB</b>		Nickel 201			<b>M 0</b>
	Class 400/600	<b>1 LD</b>		Diaphragm Duplex, 1.4462			<b>Q</b>
	Class 900/1500	<b>1 LF</b>		Diaphragm and flange Duplex, 1.4462			<b>R</b>
2 inch	Class 150	<b>1 MA</b>		Stainless steel 316 with gold coating			<b>S 0</b>
	Class 300	<b>1 MB</b>		Hastelloy C4, 2.4610			<b>U 0</b>
	Class 400/600	<b>1 MD</b>		Hastelloy C22, 2.4602			<b>V 0</b>
	Class 900/1500	<b>1 MF</b>		Other version			<b>Z</b>
3 inch	Class 150	<b>1 PA</b>		Add order code and plain text.			<b>Q 1 Y</b>
	Class 300	<b>1 PB</b>		<b>Tube length</b>			
	Class 600	<b>1 PD</b>		None			<b>0</b>
	Class 1500	<b>1 PF</b>		50 mm (2 inch)			<b>1</b>
4 inch	Class 150	<b>1 QA</b>		100 mm (4 inch)			<b>2</b>
	Class 300	<b>1 QB</b>		150 mm (6 inch)			<b>3</b>
	Class 400	<b>1 QD</b>		200 mm (8 inch)			<b>4</b>
	Class 1500	<b>1 QF</b>		250 mm (10 inch)			<b>5</b>
5 inch	Class 150	<b>1 RA</b>		Other version			<b>Z 8</b>
	Class 300	<b>1 RB</b>		Add order code and plain text.			<b>R 1 Y</b>
	Class 400	<b>1 RC</b>					
<b>Process connection standard J.I.S.</b>							
<b>Nominal diameter</b>	<b>Nominal pressure</b>						
DN 50	10K	<b>2 ES</b>					
	20k	<b>2 ET</b>					
	40K	<b>2 EU</b>					
DN 80	10K	<b>2 GS</b>					
	20k	<b>2 GT</b>					
	40K	<b>2 GU</b>					
DN 100	10K	<b>2 HS</b>					
	20k	<b>2 HT</b>					
	40K	<b>2 HU</b>					
Other version		<b>9 ZA</b>	<b>H 1 Y</b>				
Add order code and plain text.							



		Article No.	Order-code
<b>Diaphragm seal</b>		<b>7MF0814 -</b>	
In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		<b>03 - 0</b>	
<b>Customer-specific tube length</b>			
• Wetted parts: Stainless steel without coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>A 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>A 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>A 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>A 4</b>
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		<b>A 5</b>
• Wetted parts: Stainless steel with ECTFE coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>F 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>F 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>F 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>F 4</b>
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		<b>F 5</b>
• Wetted parts: Stainless steel with PFA coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>D 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>D 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>D 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>D 4</b>
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		<b>D 5</b>
• Wetted parts: Monel 400			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>G 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>G 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>G 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>G 4</b>
• Wetted parts: Hastelloy C276			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>J 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>J 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>J 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>J 4</b>

		Article No.	Order-code
<b>Diaphragm seal</b>		<b>7MF0814 -</b>	
In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		<b>03 - 0</b>	
• Wetted parts: Tantalum			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>K 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>K 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>K 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>K 4</b>

# Pressure Measurement

## Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

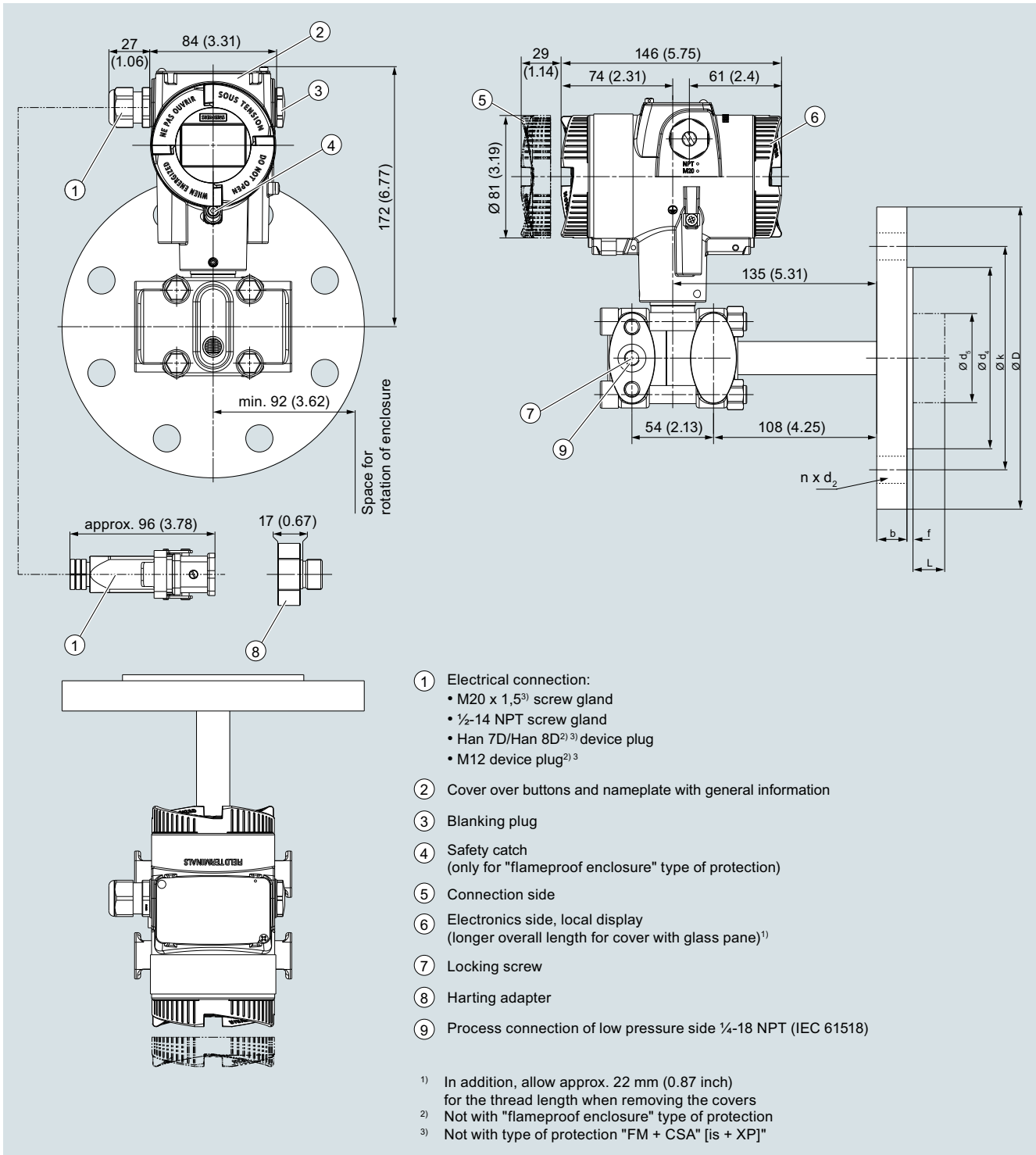
### for level

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Options	Order code	Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.		Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
<b>Factory certificates</b>		<b>Sealing surface</b>	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	<b>C11</b>	Sealing surface smooth, Form B2/EN1092-1 or RFSF/ANSI 16.5 (only for wetted parts made of stainless steel 316L)	<b>M50</b>
Inspection certificate according to EN 10204-3.1 for main body and diaphragm	<b>C12</b>	Sealing surface groove according to EN 1092-1, Form D (instead of sealing surface B1, only for wetted parts made of stainless steel 316L)	<b>M54</b>
Manufacturer code according to NACE (MR 0103-2012 and MR 0175-2009) (only in combination with wetted parts made of stainless steel 316 L and Hastelloy)	<b>C13</b>	Sealing surface RJF (groove) according to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, only for wetted parts made of stainless steel 316L)	<b>M64</b>
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	<b>C15</b>	Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	<b>M71</b> <b>M72</b> <b>M73</b> <b>M74</b> <b>M75</b>
Test report on the FDA listing of the oil according to EN 10204-2.2	<b>C17</b>	• DN 40	
Factory certificate functional safety (SIL2/3), suitability of devices for use according to IEC 61508 and IEC 61511 (contains SIL declaration of conformity)	<b>C20</b>	• DN 50	
		• DN 80	
		• DN 100	
		• DN 125	
<b>Accessories</b>		Sealing surface male face according to EN 1092-1, Form C (only for wetted parts made of stainless steel 316L)	<b>M77</b> <b>M78</b> <b>M79</b> <b>M80</b> <b>M81</b>
Epoxy resin coating	<b>D15</b>	• DN 40	
Color: transparent, coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter.		• DN 50	
• Not possible with negative pressure service		• DN 80	
Remote seal nameplate	<b>D42</b>	• DN 100	
Attached, made of stainless steel, contains Article No. and order number of the remote seal		• DN 125	
Volume deflagration flame arrester (VDEF) for differential pressure transmitter	<b>D62</b>	Sealing surface female face according to EN 1092-1, Form F (only for wetted parts made of stainless steel 316L)	<b>M84</b> <b>M85</b> <b>M86</b> <b>M87</b>
<b>Negative pressure service</b>		• DN 50	
Negative pressure service for differential pressure transmitters	<b>D83</b>	• DN 80	
Extended negative pressure service for differential pressure transmitters	<b>D88</b>	• DN 100	
		• DN 125	
<b>Approvals and certificates</b>		<b>Remote seal connection</b>	
Country-specific approval	<b>E60</b>	Elongated pipe, 150 mm (5.9 inch) instead of 100 mm (3.9 inch)	<b>S05</b>
CRN approval Canada (Canadian Registration Number)		Elongated pipe, 200 mm (7.9 inch) instead of 100 mm (3.9 inch)	<b>S06</b>
Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!		<b>Desired remote seal supplier</b>	
Oil-free and grease-free cleaned version for oxygen application including EN 10204-2.2 certificates (only with filling liquid halocarbon oil and at max. temperature 60 °C and max. pressure 50 bar)	<b>E80</b>	Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Oil-free and grease-free cleaned version not for oxygen application, including EN 10204-2.2 certificates (only with filling liquid halocarbon oil)	<b>E87</b>	Company WIKA, Klingenberg	<b>W01</b>
		Company Labom, Hude	<b>W02</b>
		<b>Special design</b>	
		Welded filling hole	<b>X01</b>
		<b>Customer-specific tube length</b>	
		Customer-specific tube length (specify in plain text in mm)	<b>Y44</b>
		<b>Specification of process conditions<sup>1)</sup></b>	
		Ambient temperature range	
		• -10 ... +50 °C (14 ... +122 °F) preset	<b>D66</b>
		• -40 ... +50 °C (-40 ... +122 °F)	<b>D67</b>
		• -10 ... +85 °C (14 ... +185 °F)	<b>D68</b>
		Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>

<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/337.

## Dimensional drawings



SITRANS P320/P420 pressure transmitter for level, including mounting flange, dimensions in mm (inch)

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for level

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> Without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	0, 50, 100, 150 or 200
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

Connection according to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> Without tube	f	k	n	L
		lb/sq.in.	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)
1½ inch	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inch	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inch	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inch	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inch	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

Process connection according to J.I.S

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> Without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	(0, 2, 3.94, 5.94 or 7.87)
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Internal diameter of seal according to DIN 2690

d<sub>M</sub>: Effective diaphragm diameter

## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

### Technical description

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#### Overview



SITRANS P DS III pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys or via HART, PROFIBUS-PA or FOUNDATION Fieldbus interface.

Extensive functionality enables the pressure transmitter to be precisely adapted to the plant's requirements. Operation is very simple in spite of the numerous setting options.

Transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

Various versions of the DS III pressure transmitters are available for measuring:

- Gauge pressure
- Absolute pressure
- Differential pressure
- Level
- Volume level
- Mass level
- Volume flow
- Mass flow

#### Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Minimum conformity error
- Good long-term stability
- Wetted parts made of high-grade materials (e.g. stainless steel, Hastelloy, gold, Monel, tantalum)

- Infinitely adjustable measuring spans from 0.01 bar to 700 bar (0.15 psi to 10153 psi) for DS III with HART interface
- Nominal measuring range from 1 bar to 700 bar (14.5 psi to 10153 psi) for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- High measuring accuracy
- Parameterization over control keys and HART or PROFIBUS PA, or FOUNDATION Fieldbus interface.

#### Application

The pressure transmitters of the DS III series, can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the DS III pressure transmitters suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be programmed locally using the 3 control buttons or externally via HART or PROFIBUS PA or FOUNDATION Fieldbus interface.

**Pressure transmitter for gauge pressure**

Measured variable: Gauge pressure of aggressive and non-aggressive gases, vapors and liquids.

Measuring span (infinitely adjustable)

for DS III with HART: 0.01 bar to 700 bar (0.15 psi to 10153 psi)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:  
1 bar to 700 bar (14.5 psi to 10153 psi)

**Pressure transmitters for absolute pressure**

Measured variable: Absolute pressure of aggressive and non-aggressive gases, vapors and liquids.

Measuring span (infinitely adjustable)

for DS III with HART: 8.3 mbar a ... 100 bar a (0.12 ... 1450 psi a)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:  
250 mbar a ... 100 bar a (3.6 ... 1450 psi a)

There are two series:

- Gauge pressure series
- Differential pressure series

**Pressure transmitters for differential pressure and flow**

Measured variables:

- Differential pressure
- Small positive or negative pressure
- Flow  $q \sim \sqrt{\Delta p}$  (together with a primary differential pressure device (see Chapter "Flow Meters"))

Measuring span (infinitely adjustable)

for DS III with HART: 1 mbar ... 30 bar (0.0145 ... 435 psi)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:  
20 mbar ... 30 bar (0.29 ... 435 psi)

**Pressure transmitters for level**

Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.

Measuring span (infinitely adjustable)

for DS III with HART: 25 mbar ... 5 bar (0.363 ... 72.5 psi)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:  
250 mbar ... 5 bar (3.63 ... 72.5 psi)

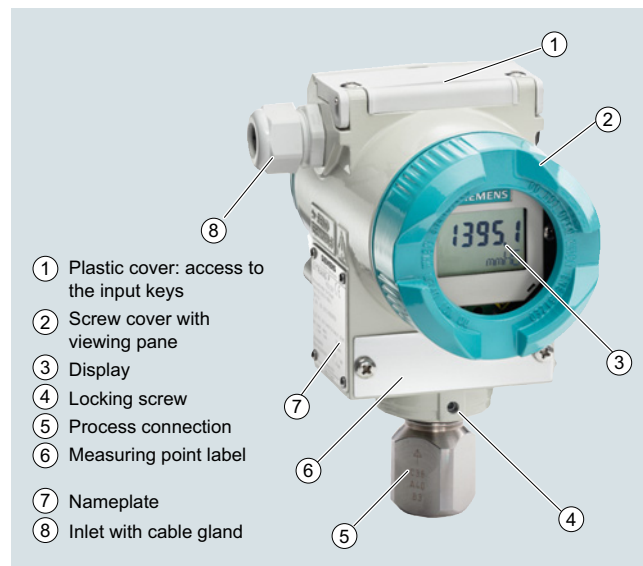
Nominal diameter of the mounting flange

- DN 80 or DN 100
- 3 inch or 4 inch

In the case of level measurements in open containers, the low-pressure connection of the measuring cell remains open (measurement "compared to atmospheric").

In the case of measurements in closed containers, the lower-pressure connection has to be connected to the container in order to compensate the static pressure.

The wetted parts are made from a variety of materials, depending on the degree of corrosion resistance required.

**Design**

Front view

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

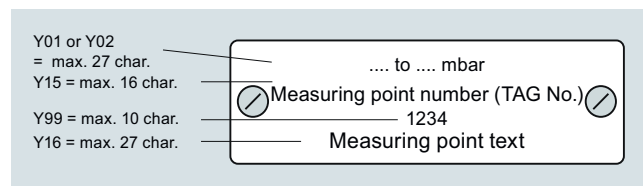
The rating plate (7, Figure "Front view") with the Article No. is located on the side of the enclosure. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

The approval label is located on the opposite side.

The enclosure is made of die-cast aluminium or stainless steel precision casting. A round cover (6) is screwed on at the front and rear of the enclosure. The front cover can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the enclosure.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the enclosure contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

At the top of the enclosure is a plastic cover (1), which hides the input keys.

**Example for an attached measuring point label**

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

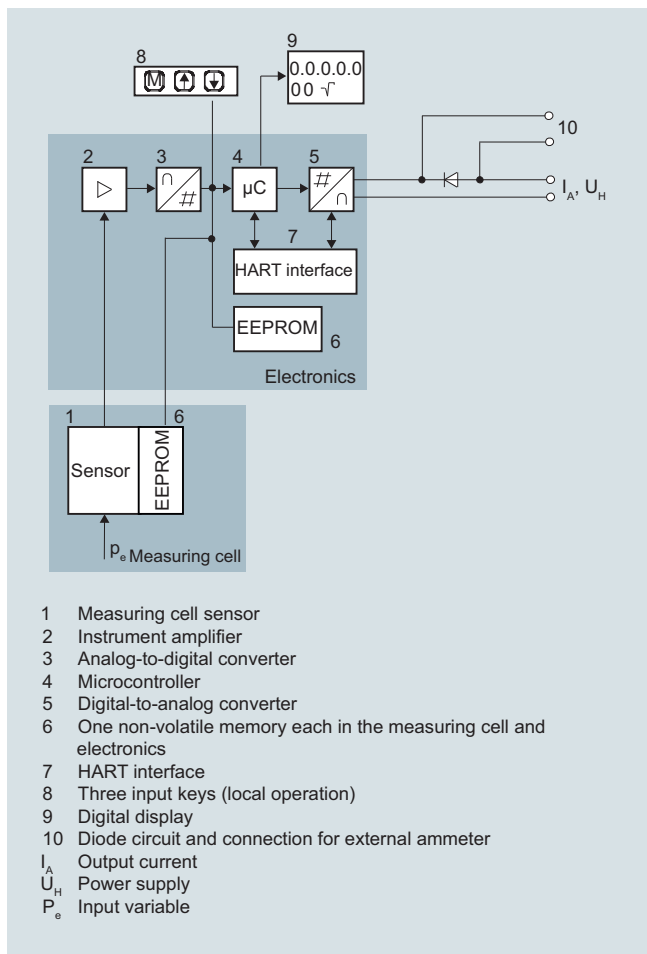
SITRANS P DS III

## Technical description

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### Function

#### Operation of electronics with HART communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

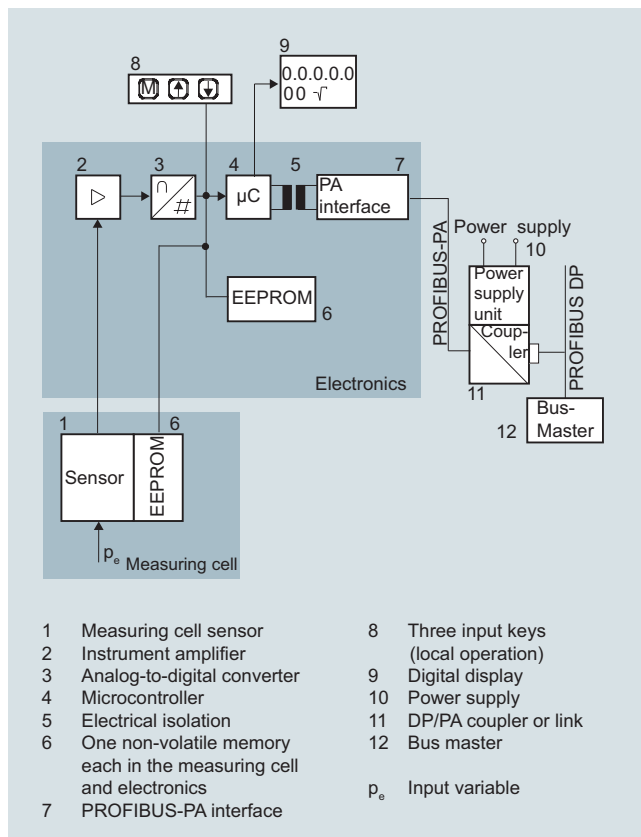
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with measuring spans  $\leq 63$  bar measure the input pressure compared to atmosphere, transmitters with measuring spans  $\geq 160$  bar compared to vacuum.

#### Operation of electronics with PROFIBUS PA communication



Function diagram of electronics

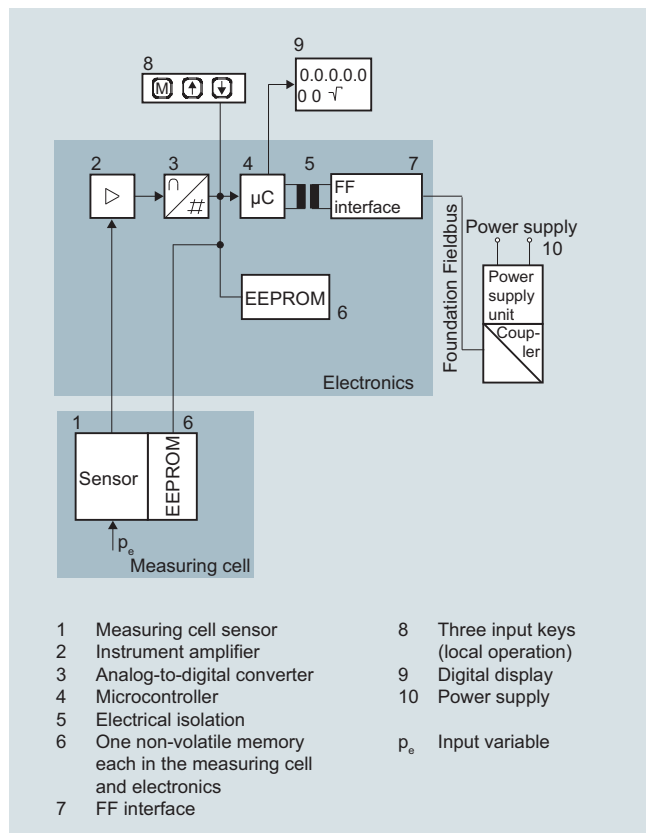
The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the PROFIBUS PA through an electrically isolated PA interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.



**Operation of electronics with FOUNDATION Fieldbus communication**

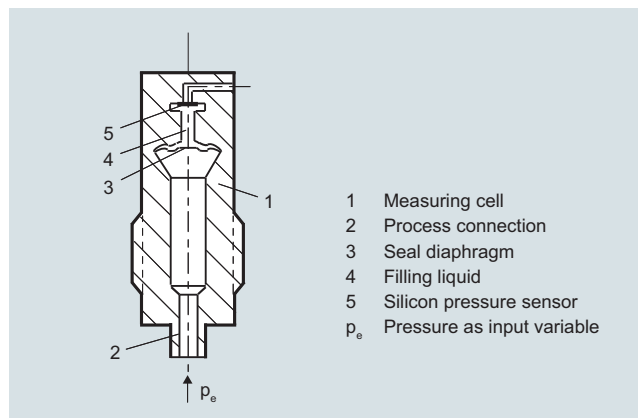
Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

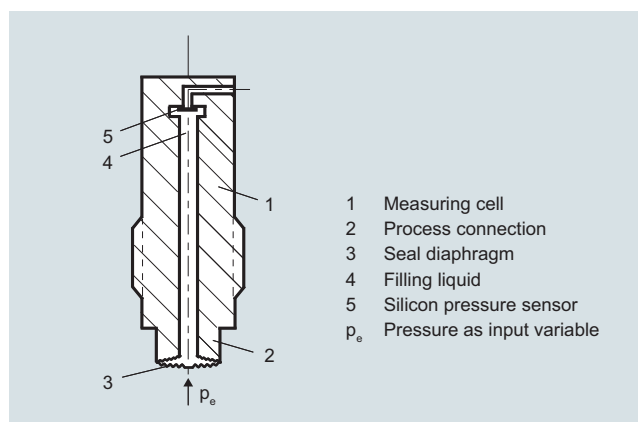
Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

**Mode of operation of the measuring cells**Measuring cell for gauge pressure

Measuring cell for gauge pressure, function diagram

The pressure  $p_e$  is applied through the process connection (2, Figure "Measuring cell for gauge pressure, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

Measuring cell for gauge pressure with front-flush diaphragm

Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram

The pressure  $p_e$  is applied through the process connection (2, Figure "Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

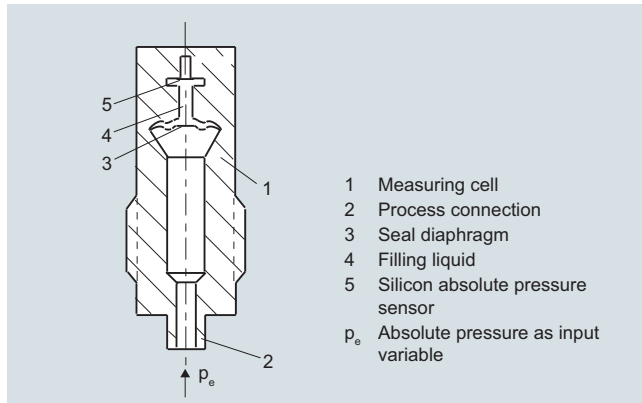
## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

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### Technical description

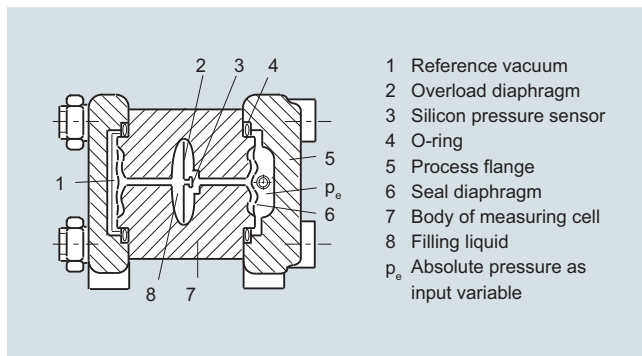
#### Measuring cell for absolute pressure from gauge pressure series



Measuring cell for absolute pressure from the pressure series, function diagram

The absolute pressure  $p_e$  is transmitted through the seal diaphragm (3, Figure "Measuring cell for absolute pressure from pressure series, gauge pressure, function diagram") and the filling liquid (4) to the silicon absolute pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

#### Measuring cell for absolute pressure from differential pressure series



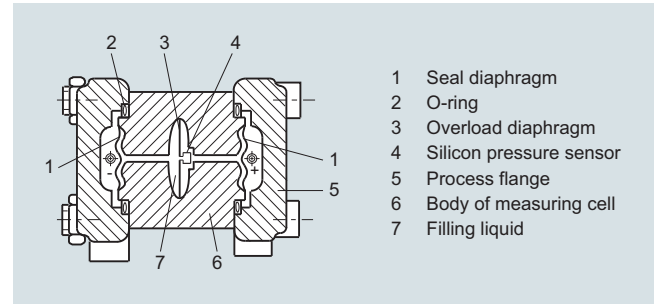
Measuring cell for absolute pressure from differential pressure series, function diagram

The input pressure  $p_e$  is transmitted through the seal diaphragm (6, Figure "Measuring cell for absolute pressure from differential pressure series, function diagram") and the filling liquid (8) to the silicon pressure sensor (3).

The difference in pressure between the input pressure  $p_e$  and the reference vacuum (1) on the low-pressure side of the measuring cell flexes the measuring diaphragm. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the seal diaphragm rests on the body of the measuring cell (7), thus protecting the silicon pressure sensor from overloads.

#### Measuring cell for differential pressure and flow



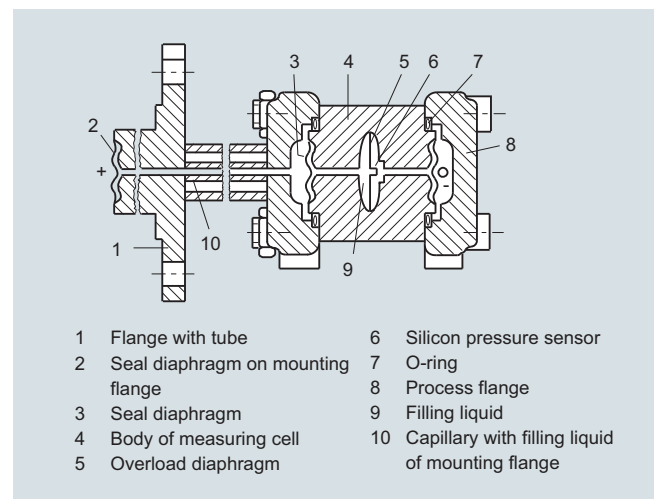
Measuring cell for differential pressure and flow, function diagram

The differential pressure is transmitted through the seal diaphragms (1, Figure "Measuring cell for differential pressure and flow, function diagram") and the filling liquid (7) to the silicon pressure sensor (4).

The measuring diaphragm is flexed by the applied differential pressure. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (3) is flexed until the seal diaphragm rests on the body of the measuring cell (6), thus protecting the silicon pressure sensor from overloads.

#### Measuring cell for level



Measuring cell for level, function diagram

The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell through the seal diaphragm on the mounting flange (2, Figure "Measuring cell for level, function diagram"). This differential pressure is subsequently transmitted further through the measuring cell (3) and the filling liquid (9) to the silicon pressure sensor (6) whose measuring diaphragm is then flexed.

This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit.

This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (5) is flexed until the seal diaphragm rests on the body of the measuring cell (4), thus protecting the silicon pressure sensor from overloads.

## Parameterization DS III

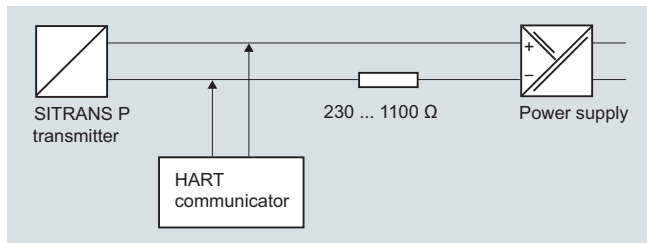
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

### Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

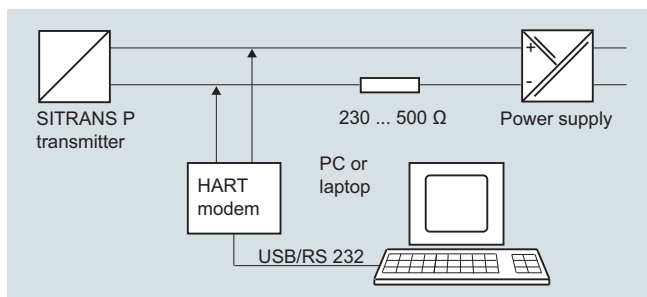
### Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

### Adjustable parameters, DS III with HART

Parameters	Input keys (DS III HART)	HART communication
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Lower range value without application of a pressure ("Blind setting")	x	x
Upper range value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
Current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x <sup>1)</sup>
Type of dimension and actual dimension	x	x
Characteristic (linear / square-rooted)	x <sup>2)</sup>	x <sup>2)</sup>
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

<sup>1)</sup> Cancel apart from write protection

<sup>2)</sup> Only differential pressure

### Diagnostic functions for DS III with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

### Available physical units of display for DS III with HART

Table style: Technical specifications 2

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
volume flow	m <sup>3</sup> /d, m <sup>3</sup> /h, m <sup>3</sup> /s, l/min, l/s, ft <sup>3</sup> /d, ft <sup>3</sup> /min, ft <sup>3</sup> /s, US gallon/min, US gallon/s
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, Lton/d, Lton/h, STon/d, STon/h, STon/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

### Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. Through the PROFIBUS the DS III with PROFIBUS PA is connected to a process control system, e. g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

### Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III with FOUNDATION Fieldbus is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

### Adjustable parameters for DS III with PROFIBUS PA and FOUNDATION Fieldbus

Parameters	Input keys	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostics functions		x

## Pressure Measurement

Pressure transmitters  
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Diagnostic functions for DS III with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
volume flow	m <sup>3</sup> /s, m <sup>3</sup> /min, m <sup>3</sup> /h, m <sup>3</sup> /d, l/s, l/min, l/h, l/d, Ml/d, ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d
Mass flow	g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d
Total mass flow	t, kg, g, lb, oz, LTon, STon
Temperature	K, °C, °F, °R
Miscellaneous	%

**Technical specifications****SITRANS P, DS III series for gauge pressure****Input**

Measured variable

Gauge pressure

Measuring span (fully adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

(for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)

**HART****PROFIBUS PA/  
FOUNDATION  
Fieldbus**

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

Max. perm. test pressure

8.3 ... 250 mbar  
0.83 ... 25 kPa  
0.12 ... 3.6 psi

250 mbar  
25 kPa  
3.6 psi

4 bar  
400 kPa  
58 psi

6 bar  
600 kPa  
87 psi

0.01 ... 1 bar  
1 ... 100 kPa  
0.15 ... 14.5 psi

1 bar  
100 kPa  
14.5 psi

4 bar  
400 kPa  
58 psi

6 bar  
600 kPa  
87 psi

0.04 ... 4 bar  
4 ... 400 kPa  
0.58 ... 58 psi

4 bar  
400 kPa  
58 psi

7 bar  
0.7 MPa  
102 psi

10 bar  
1 MPa  
145 psi

0.16 ... 16 bar  
16 ... 1600 kPa  
2.3 ... 232 psi

16 bar  
1600 kPa  
232 psi

21 bar  
2.1 MPa  
305 psi

32 bar  
3.2 MPa  
464 psi

0.63 ... 63 bar  
63 ... 6300 kPa  
9.1 ... 914 psi

63 bar  
6300 kPa  
914 psi

67 bar  
6.7 MPa  
972 psi

100 bar  
10 MPa  
1450 psi

1.6 ... 160 bar  
0.16 ... 16 MPa  
23 ... 2321 psi

160 bar  
16 MPa  
2321 psi

167 bar  
16.7 MPa  
2422 psi

250 bar  
25 MPa  
3626 psi

4 ... 400 bar  
0.4 ... 40 MPa  
58 ... 5802 psi

400 bar  
40 MPa  
5802 psi

400 bar  
40 MPa  
5802 psi

600 bar  
60 MPa  
8702 psi

7 ... 700 bar  
0.7 ... 70 MPa  
102 ... 10153 psi

700 bar  
70 MPa  
10153 psi

800 bar  
80 MPa  
11603 psi

800 bar  
80 MPa  
11603 psi

Lower measuring limit

(for 250mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.)

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

30 mbar a/3 kPa a/0.44 psi a

30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit

100% of max. measuring span (max. 100 bar/10 MPa/1450 psi for oxygen measurement) ambient temperature/temperature of medium 60 °C (140 °F)

**Output****HART****PROFIBUS PA/FOUNDATION Fieldbus**

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

-

Load

- Without HART

$$R_B \leq (U_H - 10.5 \text{ V}) / 0.023 \text{ A in } \Omega$$

$$U_H: \text{ Power supply in V}$$

-

- With HART

$$R_B = 230 \dots 500 \Omega \text{ (SIMATIC PDM) bzw.}$$

$$R_B = 230 \dots 1100 \Omega \text{ (HART-Communicator)}$$

-

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal.  
Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

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## SITRANS P, DS III series for gauge pressure

### Measuring accuracy

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

$r \leq 1.25 :$   $\leq 0.065 \%$   
 $1.25 < r \leq 30 :$   $\leq (0.008 \cdot r + 0.055) \%$

- 1 bar/100 kPa/14.5 psi  
 4 bar/400 kPa/58 psi  
 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi

$r \leq 5 :$   $\leq 0.065 \%$   
 $5 < r \leq 100 :$   $\leq (0.004 \cdot r + 0.045) \%$

- 400 bar/40 MPa/5802 psi  
 700 bar/70 MPa/10152 psi

$r \leq 3 :$   $\leq 0.075 \%$   
 $3 < r \leq 10 :$   $\leq (0.0029 \cdot r + 0.071) \%$   
 $10 < r \leq 100 :$   $\leq (0.005 \cdot r + 0.05) \%$

Influence of ambient temperature  
 (in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.16 \cdot r + 0.1) \%$

- 1 bar/100 kPa/14.5 psi

$\leq (0.05 \cdot r + 0.1) \%$

- 4 bar/400 kPa/58 psi  
 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi  
 400 bar/40 MPa/5802 psi

$\leq (0.025 \cdot r + 0.125) \%$

- 700 bar/70 MPa/10152 psi

$\leq (0.08 \cdot r + 0.16) \%$

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.25 \cdot r) \%$  per year

- 1 bar/100 kPa/14.5 psi  
 4 bar/400 kPa/58 psi

$\leq (0.25 \cdot r) \%$  in 5 years

- 16 bar/1.6 MPa/232 psi  
 63 bar/6.3 MPa/914 psi  
 160 bar/16 MPa/2321 psi  
 400 bar/40 MPa/5802 psi

$\leq (0.125 \cdot r) \%$  in 5 years

- 700 bar/70 MPa/10152 psi

$\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position

$\leq 0.05$  mbar/0.005 kPa/0.000725 psi per 10° inclination  
 (zero point correction is possible with position error compensation)

Effect of auxiliary power supply  
 (in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and  
 FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of nominal measuring range

**SITRANS P, DS III series for gauge pressure****Operating conditions**

Degree of protection	IP66 (optional IP66/IP68) Type 4X
• according to EN 60529	
• according to NEMA 250	
Temperature of medium	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with inert filling liquid	
- 1 bar/100 kPa/14.5 psi	-40 ... +85 °C (-40 ... +185 °F)
4 bar/400 kPa/58 psi	
16 bar/1.6 MPa/232 psi	
63 bar/6.3 MPa/914 psi	
- 160 bar/16 MPa/2321 psi	-20 ... +100 °C (-4 ... +212 °F)
400 bar/40 MPa/5802 psi	
700 bar/70 MPa/10152 psi	
• Measuring cell with Neobee fill fluid (FDA-compliant)	-10 ... +100 °C (+14 ... +212 °F)
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)
Ambient conditions	
• Ambient temperature (silicone oil and inert oil)	
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)
- Display readable	-30 ... +85 °C (-22 ... +185 °F)
• Ambient temperature (Neobee fill fluid)	
- Transmitter	-10 ... +85 °C (+14 ... +185 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class	
- Condensation	Relative humidity 0 ... 100 %/Condensation permissible, suitable for use in the tropics
• Electromagnetic Compatibility	
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21

**Design**

Weight (without options)	Die-cast aluminum: ≈ 2.0 kg (≈ 4.4 lb) Stainless steel precision casting: ≈ 4.6 kg (≈ 10.1 lb)
Enclosure material	Low-copper die-cast aluminum, GD-AISI 12 or stainless steel precision casting, mat. no. 1.4408
Wetted parts materials	
• Connection shank	Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602
• Oval flange	Stainless steel, mat. no. 1.4404/316L
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))
Process connection	Connection shank G $\frac{1}{2}$ B to DIN EN 837-1, female thread $\frac{1}{2}$ -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518
Material of mounting bracket	
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)

**Power supply  $U_H$** 

	<b>HART</b>	<b>PROFIBUS PA/FOUNDATION Fieldbus</b>
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply	-	Supplied through bus
Separate supply voltage	-	Not necessary
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current $\leq$ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

## for gauge pressure

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SITRANS P, DS III series for gauge pressure	HART	PROFIBUS PA/ FOUNDATION Fieldbus
<b>Certificates and approvals</b>		
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 174 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	Ex II 2 D Ex tb IIIC T120°C Db	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ ; $P_{\max} = 1 \text{ W}$
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	$U_m = 45 \text{ V}$	$U_m = 32 \text{ V}$
- Connections (Ex ic)	To circuits with values: $U_i = 45 \text{ V}$	FISCO supply unit ic: $U_o = 17.5 \text{ V}$ , $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$ , $I_o = 132 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion protection acc. to FM	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	



HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input /Output		
- Failure mode	parameterizable (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for gauge pressure

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Selection and Ordering data		Article No.	Selection and Ordering data		Article No.		
<b>Pressure transmitter for gauge pressure, SITRANS P DS III with HART</b>		<b>7MF4033-</b>	<b>Pressure transmitter for gauge pressure, SITRANS P DS III with HART</b>		<b>7MF4033-</b>		
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			<b>Explosion protection</b>				
<b>Measuring cell filling</b>			<ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)<sup>8)</sup>"</li> <li>"Intrinsic safety and flameproof enclosure (Ex ia + Ex d)<sup>9)</sup>"</li> <li>"Ex nA/ic (Zone 2)<sup>10)</sup>"</li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)<sup>9)11)</sup>"</li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>12)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>9)11)12)</sup></li> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)<sup>8)12)</sup>"</li> </ul> </li> </ul>				
<b>Measuring cell cleaning</b>			<b>Electrical connection / cable entry</b>				
Silicone oil normal Inert liquid <sup>1)</sup> grease-free to cleanliness level 2		1 3	<ul style="list-style-type: none"> <li>Screwed gland M20 x1 .5</li> <li>Screwed gland ½-14 NPT</li> <li>Device plug Han 7D (plastic enclosure) incl. mating connector<sup>13)</sup></li> <li>Device plugs M12 (stainless steel)<sup>13)14)</sup></li> </ul>		A B D P E R F S NC		
FDA compliant fill fluid <sup>2)</sup> <ul style="list-style-type: none"> <li>Neobee oil normal</li> </ul>		4	<b>Display</b>				
<b>Measuring span (min. ... max.)</b>			<ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: mA)</li> <li>With visible display (setting: mA)</li> <li>with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)</li> </ul>		0 1 6 7		
8.3 ... 250 mbar (0.12 ... 3.6 psi) 0.01 ... 1 bar (0.15 ... 14.5 psi) 0.04 ... 4 bar (0.58 ... 58 psi) 0.16 ... 16 bar (2.32 ... 232 psi) 0.63 ... 63 bar (9.14 ... 914 psi) 1.6 ... 160 bar (23.2 ... 2320 psi) 4.0 ... 400 bar (58.0 ... 5802 psi) 7.0 ... 700 bar (102.0 ... 10153 psi)		A B C D E F G J	<b>Power supply units</b> see Chap. 7 "Supplementary Components". A quick-start guide is included in the scope of delivery of the device.				
<b>Wetted parts materials</b>			<ol style="list-style-type: none"> <li>For oxygen application, add Order code E10.</li> <li>Available for measuring ranges 1 ... 63 bar.</li> <li>When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.</li> <li>If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.</li> <li>The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-..Y.-... and 7MF4900-1...-B</li> <li>The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.</li> <li>Not in conjunction with Electrical connection "Device plug Han 7D".</li> <li>Without cable gland, with blanking plug</li> <li>With enclosed cable gland Ex ia and blanking plug</li> <li>Configurations with device plugs Han and M12 are only available in Ex ic.</li> <li>Only in connection with IP66.</li> <li>Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.</li> <li>Only in connection with Ex approval A, B or E.</li> <li>M12 delivered without cable socket</li> </ol>				
Seal diaphragm Process connection							
Stainless steel Stainless steel Hastelloy Stainless steel Hastelloy Hastelloy		A B C					
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" (recommended version) <sup>3) 4) 5) 6)</sup>		Y 1					
Version for diaphragm seals in conjunction with process connector "G½B connection shank" <sup>3) 4) 5) 6)</sup>		Y 0					
<b>Process connection</b>							
<ul style="list-style-type: none"> <li>Connection shank G½B to EN 837-1</li> <li>Female thread ½-14 NPT</li> <li>Stainless steel oval flange with process connection (Oval flange has no female thread)               <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213</li> <li>Mounting thread M12 to DIN 19213</li> </ul> </li> <li>Male thread M20 x 1.5</li> <li>Male thread ½ -14 NPT</li> </ul>		0 1 2 3 4 5 6					
<b>Non-wetted parts materials</b>							
<ul style="list-style-type: none"> <li>Enclosure made of die-cast aluminium</li> <li>Enclosure stainless steel precision casting<sup>7)</sup></li> </ul>		0 3					
<b>Version</b>							
<ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul> All versions include DVD with compact operating instructions in various EU languages.		1 2 3					

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<b>Pressure transmitter for gauge pressure</b>		<b>Pressure transmitter for gauge pressure</b>	
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>	<b>7 MF 4 0 3 4 -</b>	<b>SITRANS P DS III with PROFIBUS PA (PA)</b>	<b>7 MF 4 0 3 4 -</b>
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>	<b>7 MF 4 0 3 5 -</b>	<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>	<b>7 MF 4 0 3 5 -</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			
<b>Measuring cell filling</b>		<b>Explosion protection</b>	
<b>Measuring cell cleaning</b>		<ul style="list-style-type: none"> <li>None</li> </ul>	<b>A</b>
Silicone oil	normal	<ul style="list-style-type: none"> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)<sup>8)</sup>"</li> <li>"Intrinsic safety and flameproof enclosure (Ex ia + Ex d)<sup>9)</sup>"</li> <li>"Ex nA/ic (Zone 2)<sup>10)</sup>"</li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)<sup>9) 11)</sup>"</li> </ul> </li> </ul>	<b>B</b> <b>D</b> <b>P</b>
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	<ul style="list-style-type: none"> <li>FM + CSA intrinsic safe (is)<sup>12)</sup></li> </ul>	<b>E</b> <b>R</b>
FDA compliant fill fluid <sup>2)</sup>		<ul style="list-style-type: none"> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>9) 11) 12)</sup></li> </ul>	<b>F</b> <b>S</b>
• Neobee oil	normal	<ul style="list-style-type: none"> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)<sup>8) 12)</sup>"</li> </ul> </li> </ul>	<b>NC</b>
<b>Nominal measuring range</b>		<b>Electrical connection/cable entry</b>	
250 mbar (3.6 psi)		<ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> <li>Screwed gland ½-14 NPT</li> <li>Device plugs M12 (stainless steel)<sup>13) 14)</sup></li> </ul>	<b>B</b> <b>C</b> <b>F</b>
1 bar (14.5 psi)		<b>Display</b>	
4 bar (58 psi)		<ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: bar)</li> <li>With visible display (setting: bar)</li> <li>with customer-specific display (setting as specified, Order code "Y21" required)</li> </ul>	<b>0</b> <b>1</b> <b>6</b> <b>7</b>
16 bar (232 psi)			
63 bar (914 psi)			
160 bar (2320 psi)			
400 bar (5802 psi)			
700 bar (10153 psi)			
<b>Wetted parts materials</b>			
Seal diaphragm	Process connection		
Stainless steel	Stainless steel		
Hastelloy	Stainless steel		
Hastelloy	Hastelloy		
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" (recommended version) <sup>3) 4) 5) 6)</sup>			<b>Y 1</b>
Version for diaphragm seals in conjunction with process connector "G½B connection shank" <sup>3) 4) 5) 6)</sup>			<b>Y 0</b>
<b>Process connection</b>			
<ul style="list-style-type: none"> <li>Connection shank G½B to EN 837-1</li> <li>Female thread ½-14 NPT</li> <li>Stainless steel oval flange with process connection (Oval flange has no female thread)<sup>7)</sup> <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213</li> <li>Mounting thread M12 to DIN 19213</li> </ul> </li> <li>Male thread M20 x 1.5</li> <li>Male thread ½-14 NPT</li> </ul>			<b>0</b> <b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b>
<b>Non-wetted parts materials</b>			
<ul style="list-style-type: none"> <li>Enclosure made of die-cast aluminium</li> <li>Enclosure stainless steel precision casting</li> </ul>			<b>0</b> <b>3</b>
<b>Version</b>			
<ul style="list-style-type: none"> <li>Standard version, German label inscription, setting of pressure unit: bar</li> <li>International version, English label inscription, setting of pressure unit: psi</li> <li>Chinese version, English label inscription, setting of pressure unit: kPa</li> </ul>			<b>1</b> <b>2</b> <b>3</b>
All versions include DVD with compact operating instructions in various EU languages.			

A quick-start guide is included in the scope of delivery of the device.

- For oxygen application, add Order code E10.
- Available for measuring ranges 1 ... 63 bar.
- When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.
- If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y... and 7MF4900-1...-B
- The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- M10 fastening thread:  
Max. measuring span 160 bar (2320 psi) 7/16-20 UNF and M12 fastening thread: Max. measuring span 400 bar (5802 psi)
- Without cable gland, with blanking plug.
- With enclosed cable gland Ex ia and blanking plug.
- Configurations with device plugs Han and M12 are only available in Ex ic.
- Only in connection with IP66.
- Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- M12 delivered without cable socket.
- Only in connection with Ex approval A, B, E or F.

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

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Selection and Ordering data	Order code				Selection and Ordering data	Order code			
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.		HART	PA	FF	<i>Further designs</i> Add "-Z" to Article No. and specify Order code.		HART	PA	FF
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>					<b>CRN approval Canada</b> (Canadian Registration Number)	E22 <sup>6)</sup>	✓	✓	✓
• Steel	A01	✓	✓	✓	<b>Dual seal</b>	E24	✓	✓	✓
• Stainless steel 304	A02	✓	✓	✓	<b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-B..)	E25 <sup>7)</sup>	✓	✓	✓
• Stainless steel 316L	A03	✓	✓	✓	<b>"Flameproof" explosion protection according to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-D..)	E26 <sup>7)</sup>	✓	✓	✓
<b>Device plugs<sup>1)</sup></b>					<b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-P..)	E28 <sup>7)</sup>	✓	✓	
• Han 7D (metal)	A30	✓			<b>Ex Approval IEC Ex (Ex ia)</b> (only for transmitter 7MF4...-.....-B..)	E45 <sup>7)</sup>	✓	✓	✓
• Han 8D (instead of Han 7D)	A31	✓			<b>Ex Approval IEC Ex (Ex d)</b> (only for transmitter 7MF4...-.....-D..)	E46 <sup>7)</sup>	✓	✓	✓
• Angled	A32	✓			<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E5 <sup>7)</sup>	✓	✓	✓
• Han 8D (metal)	A33	✓			<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>7)</sup>	✓	✓	✓
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	✓	<b>Ex protection "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>7)</sup>	✓	✓	✓
<b>Rating plate inscription</b> (instead of German)					<b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>7)</sup>	✓	✓	✓
• English	B11	✓	✓	✓	<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 <sup>7)</sup>	✓	✓	✓
• French	B12	✓	✓	✓	<b>Ex-protection Ex ia according to EAC Ex (Russia)</b> (only for transmitter 7MF4...-.....-B..)	E80	✓	✓	✓
• Spanish	B13	✓	✓	✓	<b>Ex-protection Ex d according to EAC Ex (Russia)</b> (only for transmitter 7MF4...-.....-D..)	E81	✓	✓	✓
• Italian	B14	✓	✓	✓	<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b> (only for transmitter 7MF4...-.....-E..)	E82	✓	✓	✓
• Cyrillic (russian)	B16	✓	✓	✓	<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b> (only for transmitter 7MF4...-.....-R..)	E83	✓	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	✓	<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	G10	✓	✓	✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)<sup>2)</sup></b>	C11	✓	✓	✓	<b>Transient protector 6 kV (lightning protection)</b>	J01	✓	✓	✓
<b>Inspection certificate<sup>3)</sup></b> Acc. to EN 10204-3.1	C12	✓	✓	✓	<b>Process connection Astava</b>	J06	✓	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	✓					
<b>Inspection certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓	✓					
<b>Functional safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓							
<b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>	C21 <sup>4)</sup>		✓						
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓							
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓	✓					
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓							
<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>	D07	✓	✓	✓					
<b>Degree of protection IP66/IP68</b> (only for M20x1.5 and ½-14 NPT)	D12	✓	✓	✓					
<b>Supplied with oval flange</b> (1 item), PTFE packing and screws in thread of oval flange	D37	✓	✓	✓					
<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓	✓					
<b>Use in or on zone 1D/2D<sup>5)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)	E01	✓	✓	✓					
<b>Oxygen application</b> (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	E10	✓	✓	✓					
<b>Export approval Korea</b>	E11	✓	✓	✓					

# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P DS III

for gauge pressure

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<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		HART	PA	FF
<b>Marine approvals</b>				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
• Lloyds Register (LR)	S11	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
• American Bureau of Shipping (ABS)	S14	✓	✓	✓
• Russian Maritime Register (RMR)	S16	✓	✓	✓
• Korean Register of Shipping (KR)	S17	✓	✓	✓
1) Device plug Han IP65				
2) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.				
3) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.				
4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H				
5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.				
6) Cannot be ordered with remote seal.				
7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.				

Selection and Ordering data	Order code			
<b>Additional data</b> Please add "-Z" to Article No. and specify Order code(s) and plain text.		HART	PA	FF
<b>Measuring range to be set</b> Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	✓ <sup>1)</sup>	
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15 <sup>2)</sup>	✓	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 characters, specify in plain text: Y16: .....	Y16	✓	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 characters, specify in plain text: Y17: .....	Y17	✓		
<b>Setting of pressure indication in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % *) ref. temperature 20 °C	Y21	✓	✓	✓
<b>Setting of pressure indication in non-pressure units<sup>3)</sup></b> Specify in plain text: Y22: .... up to .... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	Y22 + Y01	✓		
<b>Preset bus address</b> possible between 1 and 126 Specify in plain text: Y25: .....	Y25		✓	✓
<b>Damping adjustment in seconds (0 ... 100 s)</b>	Y30	✓	✓	✓

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

**Ordering example**

Item line: 7MF4033-1EA00-1AA7-Z  
 B line: A01 + Y01 + Y21  
 C line: Y01: 10 ... 20 bar (145 ... 290 psi)  
 C line: Y21: bar (psi)

- 1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- 2) If you do not wish to have any text engraved for Y15, then do not make any further text entries as "Y15:".
- 3) Preset values can only be changed over SIMATIC PDM.

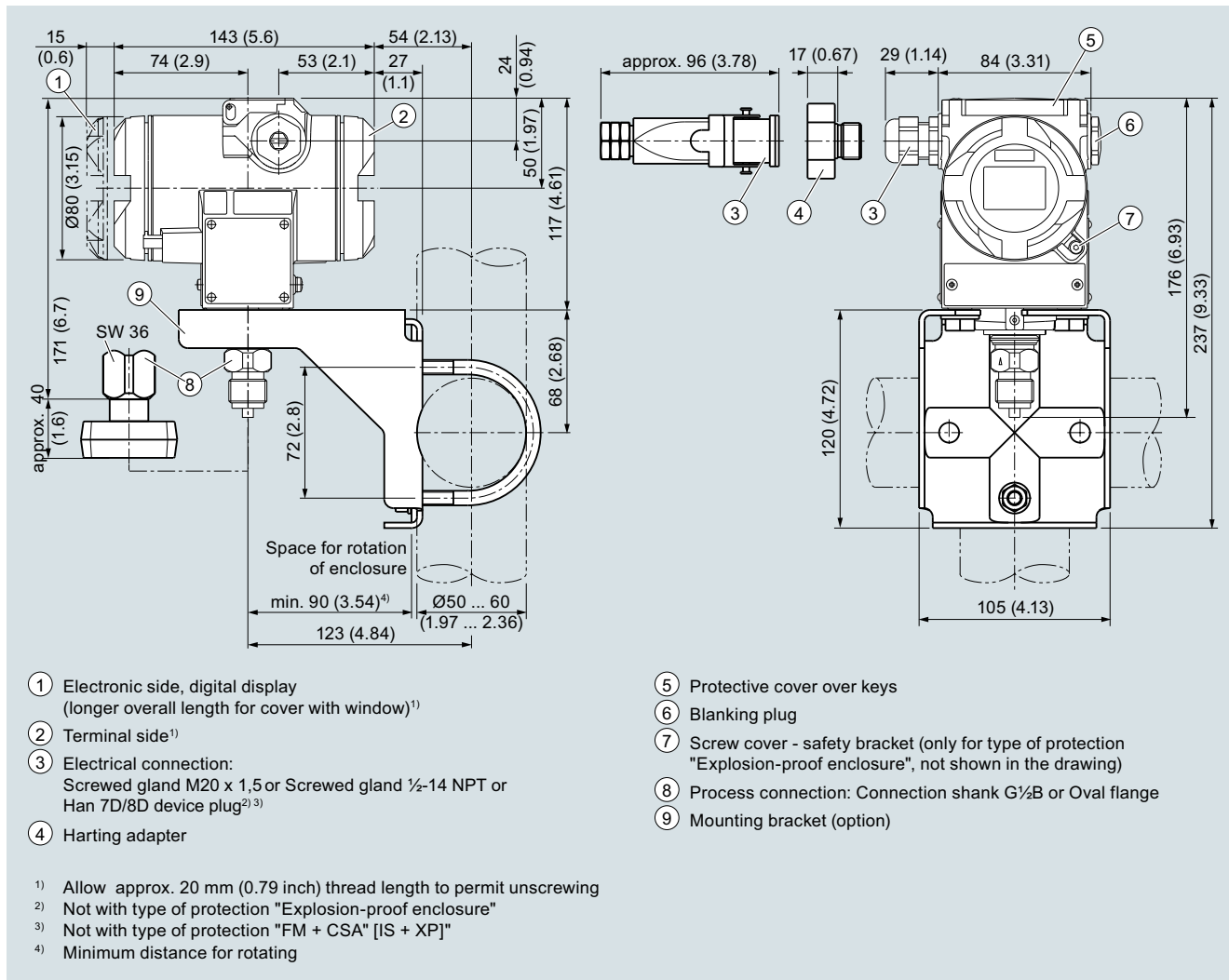
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## Dimensional drawings



SITRANS P DS III pressure transmitters for gauge pressure, dimensions in mm (inch)

## Technical specifications

## SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm

## Input of gauge pressure, with front-flush diaphragm

Measured variable

Measuring span (continuously adjustable) or nominal measuring range, max. operating pressure and max. test pressure

Gauge pressure, front-flush

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi)
0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7 MPa 972 psi	100 bar 10 MPa 1450 psi

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- Measuring cell with Neobee

Upper measuring limit

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 % of max. measuring span

## Input of absolute pressure, with front-flush diaphragm

Measured variable

Measuring span (continuously adjustable) or nominal measuring range, max. operating pressure and max. test pressure

Absolute pressure, front-flush

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
43.34 ... 1300 mbar a 4.33 ... 130 kPa a 17 ... 525 inH <sub>2</sub> O a	1300 mbar a 130 kPa a 525 inH <sub>2</sub> O a	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
160 ... 5000 mbar a 16 ... 500 kPa a 2.32 ... 72.5 psi a	5000 mbar a 500 kPa a 72.5 psi a	10 bar a 1 MPa a 145 psi a	30 bar a 3 MPa a 435 psi a
1 ... 30 bar a 0.1 ... 3 MPa a 14.6 ... 435 psi a	30 bar a 3 MPa a 435 psi a	45 bar a 4.5 MPa a 653 psi a	100 bar a 10 MPa a 1450 psi a

Depending on the process connection, the measuring span may differ from these values

Lower measuring limit

0 mbar a/0 kPa a/0 psi a

Upper measuring limit

100 % of max. measuring span

## Output

Output signal

HART

4 ... 20 mA

PROFIBUS PA/FOUNDATION Fieldbus

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

Load

- Without HART

 $R_B \leq (U_H - 10.5 V)/0.023 A$  in  $\Omega$ ,  
 $U_H$ : Power supply in V

- With HART

 $R_B = 230 \dots 500 \Omega$  (SIMATIC PDM) or  
 $R_B = 230 \dots 1100 \Omega$  (HART Communicator)

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

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## SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm

### Measuring accuracy

Reference conditions

(All error data refer always refer to the set span)

Measuring span ratio  $r$  (spread, Turn-Down)

Error in measurement at limit setting incl. hysteresis and reproducibility

• Linear characteristic

-  $r \leq 5$

-  $5 < r \leq 100$

-  $r \leq 10$

-  $10 < r \leq 30$

Influence of ambient temperature (in percent per 28 °C (50 °F))  $\leq (0.08 \cdot r + 0.16) \%$

Effect of ambient temperature (in pressure per temperature change)

• Temperature difference between medium temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))  $\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position (in pressure per change in angle) 0.4 mbar/0.04 kPa/0.006 per 10° inclination (zero point correction is possible with position error compensation)

Effect of auxiliary power supply (in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of nominal measuring range

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

$r = \max.$  measuring span/set measuring span or nominal measuring range

### Gauge pressure, front-flush

### Absolute pressure, front-flush

$\leq 0.075 \%$

-

$\leq (0.005 \cdot r + 0.05) \%$

-

-

$\leq 0.2 \%$

-

$\leq 0.4 \%$

$\leq (0.08 \cdot r + 0.16) \%$

$\leq (0.16 \cdot r + 0.24) \%$

### Operating conditions

#### Installation conditions

Ambient temperature

Observe the temperature class in areas subject to explosion hazard.

• Measuring cell with silicone oil

-40 ... +85 °C (-40 ... +185 °F)

• Measuring cell with Neobee oil (with front-flush diaphragm)

-10 ... +85 °C (14 ... +185 °F)

• Measuring cell with inert liquid

-40 ... +85 °C (-40 ... +185 °F)

• Transmitter

-40 ... +85 °C (-40 ... +185 °F)

• Display readable

-30 ... +85 °C (-22 ... +185 °F)

• Storage temperature

-50 ... +85 °C (-58 ... +185 °F)  
(in the case of Neobee: -20 ... +85 °C (-4 ... +185 °F))  
(for high temperature oil: -10 ... +85 °C (14 ... 185 °F))

Climatic class

• Condensation

Relative humidity 0 ... 100 %  
Condensation permissible, suitable for use in the tropics

Degree of protection

• according to EN 60529

IP66 (optional IP66/IP68)

• according to NEMA 250

Type 4X

Electromagnetic Compatibility

• Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

#### Medium conditions

The max. medium temperature of the front-flush process connections is to be taken into account in accordance with the relevant connection standards (e. g. DIN 32676, DIN 11851 etc.).

Temperature of medium

• Measuring cell with silicone oil

-40 ... +100 °C (-40 ... +212 °F)

• Measuring cell with silicone oil (with front-flush diaphragm)

-40 ... +150 °C (-40 ... +302 °F)

• Measuring cell with Neobee oil (with front-flush diaphragm)

-10 ... +150 °C (14 ... 302 °F)

• Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with front-flush diaphragm)

-40 ... +200 °C (-40 ... +392 °F)

• Measuring cell with Neobee oil, with temp. decoupler (only for gauge pressure version with flush-mounted diaphragm)

-10 ... +200 °C (14 ... 392 °F)

• Measuring cell with inert filling liquid

-20 ... +100 °C (-4 ... +212 °F)

• Measuring cell with high-temperature oil (only for gauge pressure version with front-flush diaphragm)

-10 ... +250 °C (14 ... 482 °F)



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for gauge/absolute pressure, with front-flush diaphragm

## SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm

### Design

Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)
Enclosure material	Low-copper die-cast aluminum, GD-AISi12 or stainless steel precision casting, mat. no. 1.4408
Wetted parts materials	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
Measuring cell filling	Silicone oil or inert filling liquid
Process connection	<ul style="list-style-type: none"> <li>• Flanges as per EN and ASME</li> <li>• F&amp;B and pharmaceutical flanges</li> </ul>
Surface quality touched-by-media	$R_a$ -values ≤ 0.8 μm (32 μ-inch)/welds $R_a$ ≤ 1.6 μm (64 μ-inch) (Process connections acc. to 3A; $R_a$ -values ≤ 0.8 μm (32 μ-inch)/welds $R_a$ ≤ 0.8 μm (32 μ-inch))

### Power supply $U_H$

	HART	PROFIBUS PA/FOUNDATION Fieldbus
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply	-	Supplied through bus
Separate supply voltage	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

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## SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm

### Certificates and approvals

Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection	PTB 13 ATEX 2007 X	
• Intrinsic safety "i"	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Marking	-40 ... +85 °C (-40 ... +185 °F) temperature class T4;	
- Permissible ambient temperature	-40 ... +70 °C (-40 ... +158 °F) temperature class T5;	
	-40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4;	
	-40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	Ex II 2 D Ex tb IIIC T120°C Db	
- Marking	Ex II 2 D IP65 T 120 °C	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ ; $P_{\max} = 1 \text{ W}$
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	$U_m = 45 \text{ V}$	$U_m = 32 \text{ V}$
- Connections (Ex ic)	To circuits with values: $U_i = 45 \text{ V}$	FISCO supply unit ic: $U_o = 17.5 \text{ V}$ , $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$ , $I_o = 132 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion protection acc. to FM	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

### Hygiene version

In the case of SITRANS P DSIII with 7MF413x front-flush diaphragm, selected connections comply with the requirements of EHEDG.

HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input /Output		
- Failure mode	parameterizable (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<b>Pressure transmitter for gauge and absolute pressure, front-flush diaphragm, SITRANS P DS III HART</b>	<b>7MF4133-</b> 	<b>Pressure transmitter for gauge and absolute pressure, front-flush diaphragm, SITRANS P DS III HART</b>	<b>7MF4133-</b> 
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		<b>Display</b>	
<b>Measuring cell filling</b> <b>Measuring cell cleaning</b>		<ul style="list-style-type: none"> <li>Without display <b>0</b></li> <li>Without visible display (display concealed, setting: mA) <b>1</b></li> <li>With visible display (setting: mA) <b>6</b></li> <li>With customer-specific display (setting as specified, Order code "Y21" or "Y22" required) <b>7</b></li> </ul>	
Silicone oil    normal Inert liquid FDA compliant fill fluid • Neobee oil    normal	1 3 4	<b>Power supply units</b> see Chap. 7 "Supplementary Components". A quick-start guide is included in the scope of delivery of the device.	
<b>Measuring span (min. ... max.)</b>	B C D E S T U	<ol style="list-style-type: none"> <li>Not with temperature decoupler P00, not for process connections R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.</li> <li>Only available for flanges with options M.., N.. and Q..</li> <li>Without cable gland, with blanking plug</li> <li>Configurations with device plugs Han and M12 are only available in Ex ic.</li> <li>Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.</li> <li>Only in connection with IP66.</li> <li>With enclosed cable gland Ex ia and blanking plug.</li> <li>Only in connection with Ex approval A, B or E.</li> <li>Only in connection with Ex approval A, B, E or F.</li> <li>M12 delivered without cable socket</li> </ol>	
<b>Wetted parts materials</b>			
Seal diaphragm    Connection shank			
Stainless steel    Stainless steel Hastelloy <sup>2)</sup> Stainless steel	A B		
<b>Process connection</b>			
<ul style="list-style-type: none"> <li>Flange version with Order code M.., N.., R.. or Q..</li> </ul>	7		
<b>Non-wetted parts materials</b>			
<ul style="list-style-type: none"> <li>Enclosure made of die-cast aluminium</li> <li>Enclosure stainless steel precision casting</li> </ul>	0 3		
<b>Version</b>			
<ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul> All versions include DVD with compact operating instructions in various EU languages.	1 2 3		
<b>Explosion protection</b>			
<ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>3)</sup></li> <li>„Ex nA/ic (Zone 2)"<sup>4)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>5)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>5)6)7)</sup></li> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>3)5)</sup></li> </ul> </li> </ul>	A B D E F S NC		
<b>Electrical connection/cable entry</b>			
<ul style="list-style-type: none"> <li>Inner thread M20 x 1.5</li> <li>Female thread ½-14 NPT</li> <li>Device plug Han 7D (plastic enclosure) incl. mating connector<sup>8)</sup></li> <li>Device plugs M12 (stainless steel)<sup>9) 10)</sup></li> </ul>	B C D F		

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<b>Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:</b>		<b>Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:</b>	
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>	7 M F 4 1 3 4 -	<b>SITRANS P DS III with PROFIBUS PA (PA)</b>	7 M F 4 1 3 4 -
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>	7 M F 4 1 3 5 -	<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>	7 M F 4 1 3 5 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
<b>Measuring cell filling</b>		<b>Display</b>	
<b>Measuring cell cleaning</b>		• Without display	0
Silicone oil	1	• Without visible display (display concealed, setting: bar)	1
Inert liquid	3	• With visible display (setting: bar)	6
FDA compliant fill fluid		• With customer-specific display (setting as specified, Order code "Y21" required)	7
• Neobee oil	4		
<b>Nominal measuring range</b>		A quick-start guide is included in the scope of delivery of the device.	
1 bar (14.5 psi)	B	1) Not with temperature decoupler P00, not for process connections R01, R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.	
4 bar (58 psi)	C	2) Only available for flanges with options M.., N.. and Q.	
16 bar (232 psi)	D	3) Without cable gland, with blanking plug	
63 bar (914 psi)	E	4) Configurations with device plugs Han and M12 are only available in Ex ic.	
1300 mbar a <sup>1)</sup> (18.86 psi a <sup>1)</sup> )	S	5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.	
5 bar a <sup>1)</sup> (72.5 psi a <sup>1)</sup> )	T	6) Only in connection with IP66.	
30 bar a <sup>1)</sup> (435 psi a <sup>1)</sup> )	U	7) With enclosed cable gland Ex ia and blanking plug.	
<b>Wetted parts materials</b>		8) Only in connection with Ex approval A, B, E or F.	
Seal diaphragm		9) M12 delivered without cable socket	
Stainless steel	A		
Hastelloy <sup>2)</sup>	B		
<b>Process connection</b>			
• Flange version with Order code M.., N.., R.. or Q..	7		
<b>Non-wetted parts materials</b>			
• Enclosure made of die-cast aluminium	0		
• Enclosure stainless steel precision casting	3		
<b>Version</b>			
• Standard version, German plate inscription, setting for pressure unit: bar	1		
• International version, English plate inscription, setting for pressure unit: bar	2		
• Chinese version, English plate inscription, setting for pressure unit: Pascal	3		
All versions include DVD with compact operating instructions in various EU languages.			
<b>Explosion protection</b>			
• None	A		
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"	B		
- "Explosion-proof (Ex d)" <sup>3)</sup>	D		
- „Ex nA/ic (Zone 2)" <sup>4)</sup>	E		
• FM + CSA intrinsic safe (is) <sup>5)</sup>	F		
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>5)6)7)</sup>	S		
• With FM + CSA, Type of protection:			
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>3)5)</sup> (available soon)	NC		
<b>Electrical connection/cable entry</b>			
• Screwed gland M20 x 1.5	B		
• Screwed gland ½-14 NPT	C		
• Device plugs M12 (stainless steel) <sup>8) 9)</sup>	F		

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF	<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF
<b>Device plugs<sup>1)</sup></b>				<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E55 <sup>4)</sup>	✓	✓
• Han 7D (metal)	A30	✓		<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>4)</sup>	✓	✓
• Han 8D (instead of Han 7D)	A31	✓		<b>Ex protection "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>4)</sup>	✓	✓
• Angled	A32	✓		<b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>4)</sup>	✓	✓
• Han 8D (metal)	A33	✓		<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 <sup>4)</sup>	✓	✓
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓
<b>Rating plate inscription</b> (instead of German)				<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	E81	✓	✓
• English	B11	✓	✓	<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓
• French	B12	✓	✓	<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓
• Spanish	B13	✓	✓	<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	G10	✓	✓
• Italian	B14	✓	✓	<b>Transient protector 6 kV (lightning protection)</b>	J01	✓	✓
• Cyrillic (russian)	B16	✓	✓	<b>Flanges to EN 1092-1, Form B1</b>			
<b>English rating plate</b>	B21	✓	✓	• DN 25, PN 40 <sup>5)</sup>	M11	✓	✓
Pressure units in inH <sub>2</sub> O and/or psi				• DN 40, PN 40	M13	✓	✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)</b>	C11	✓	✓	• DN 40, PN 100	M23	✓	✓
<b>Inspection certificate</b> Acc. to EN 10204-3.1	C12	✓	✓	• DN 50, PN 16	M04	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	• DN 50, PN 40	M14	✓	✓
<b>Functional safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓		• DN 80, PN 16	M06	✓	✓
<b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>	C21 <sup>2)</sup>		✓	• DN 80, PN 40	M16	✓	✓
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓		<b>Flanges to ASME B16.5</b>			
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓	• Stainless steel flange 1" class 150 <sup>5)</sup>	M40	✓	✓
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓		• Stainless steel flange 1½" class 150	M41	✓	✓
<b>Degree of protection IP66/IP68</b> (only for M20x1.5 and ½-14 NPT)	D12	✓	✓	• Stainless steel flange 2" class 150	M42	✓	✓
<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓	• Stainless steel flange 3" class 150	M43	✓	✓
<b>Oxygen application</b> (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	E10	✓	✓	• Stainless steel flange 4" class 150	M44	✓	✓
<b>Export approval Korea</b>	E11	✓	✓	• Stainless steel flange 1½" class 300	M46	✓	✓
<b>CRN approval Canada</b> (Canadian Registration Number)	E22 <sup>3)</sup>	✓	✓	• Stainless steel flange 2" class 300	M47	✓	✓
<b>Dual seal</b>	E24	✓	✓	• Stainless steel flange 3" class 300	M48	✓	✓
<b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-B..)	E25 <sup>4)</sup>	✓	✓	• Stainless steel flange 4" class 300	M49	✓	✓
<b>"Flameproof" explosion protection according to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-D..)	E26 <sup>4)</sup>	✓	✓	<b>Threaded connector to DIN 3852-2, form A, thread to ISO 228</b>			
<b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-P..)	E28 <sup>4)</sup>	✓	✓	• G ¾"-A, front-flush <sup>6)</sup>	R01	✓	✓
<b>Ex Approval IEC Ex (Ex ia)</b> (only for transmitter 7MF4...-.....-B..)	E45 <sup>4)</sup>	✓	✓	• G 1"-A, front-flush <sup>6)</sup>	R02	✓	✓
<b>Ex Approval IEC Ex (Ex d)</b> (only for transmitter 7MF4...-.....-D..)	E46 <sup>4)</sup>	✓	✓	• G 2"-A, front-flush	R04	✓	✓
				<b>Tank connection<sup>7)</sup></b> Sealing is included in delivery			
				• TG 52/50, PN 40	R10	✓	✓
				• TG 52/150, PN 40	R11	✓	✓

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

Selection and Ordering data	Order code		
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF
<b>Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut)</b>			
• DN 50, PN 25	N04	✓	✓
• DN 80, PN 25	N06	✓	✓
<b>Tri-Clamp connection according DIN 32676/ISO 2852</b>			
• DN 50/2", PN 16	N14	✓	✓
• DN 65/2.5", PN 10	N15	✓	✓
• Clamp 2" ISO 2852 PN 16	N22	✓	✓
• Clamp 3" ISO 2852 PN 16	N23	✓	✓
<b>Varivent connection</b> EHEDG compliant			
• Type N = 68 for Varivent enclosure DN 40 ... 125 and 1½" ... 6", PN 40	N28	✓	✓
<b>Temperature decoupler up to 200 °C<sup>B)</sup></b> for version with front-flush diaphragm	P00	✓	✓
<b>Sanitary process connection to DRD</b>			
• DN 50, PN 40	M32	✓	✓
<b>SMS socket with union nut</b>			
• 2"	M67	✓	✓
• 2½"	M68	✓	✓
• 3"	M69	✓	✓
<b>SMS threaded socket</b>			
• 2"	M73	✓	✓
• 2½"	M74	✓	✓
• 3"	M75	✓	✓
<b>IDF socket with union nut ISO 2853</b>			
• 2"	M82	✓	✓
• 2½"	M83	✓	✓
• 3"	M84	✓	✓
<b>IDF threaded socket ISO 2853</b>			
• 2"	M92	✓	✓
• 2½"	M93	✓	✓
• 3"	M94	✓	✓
<b>Sanitary process connection to NEUMO Bio-Connect screw connection</b> EHEDG compliant			
• DN 50, PN 16	Q05	✓	✓
• DN 65, PN 16	Q06	✓	✓
• DN 80, PN 16	Q07	✓	✓
• DN 100, PN 16	Q08	✓	✓
• DN 2", PN 16	Q13	✓	✓
• DN 2½", PN 16	Q14	✓	✓
• DN 3", PN 16	Q15	✓	✓
• DN 4", PN 16	Q16	✓	✓
<b>Sanitary process connection to NEUMO Bio-Connect flange connection</b> EHEDG compliant			
• DN 50, PN 16	Q23	✓	✓
• DN 65, PN 16	Q24	✓	✓
• DN 80, PN 16	Q25	✓	✓
• DN 100, PN 16	Q26	✓	✓
• DN 2", PN 16	Q31	✓	✓
• DN 2½", PN 16	Q32	✓	✓
• DN 3", PN 16	Q33	✓	✓
• DN 4", PN 16	Q34	✓	✓
Selection and Ordering data	Order code		
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF
<b>Sanitary process connection to NEUMO Bio-Connect clamp connection</b> EHEDG compliant			
• DN 50, PN 16	Q39	✓	✓
• DN 65, PN 10	Q40	✓	✓
• DN 80, PN 10	Q41	✓	✓
• DN 100, PN 10	Q42	✓	✓
• DN 2½", PN 16	Q48	✓	✓
• DN 3", PN 10	Q49	✓	✓
• DN 4", PN 10	Q50	✓	✓
<b>Bio-Control sanitary process connection</b>			
• DN 50, PN 16	Q53	✓	✓
• DN 65, PN 16	Q54	✓	✓
<b>Sanitary process connection to NEUMO Bio-Connect S flange connection</b>			
• DN 2", PN 16	Q72	✓	✓
<b>Aseptic threaded socket to DIN 11864-1 Form A</b>			
• DN 50, PN 25	N33	✓	✓
• DN 65, PN 25	N34	✓	✓
• DN 80, PN 25	N35	✓	✓
• DN 100, PN 25	N36	✓	✓
<b>Aseptic flange with notch to DIN 11864-2 Form A</b>			
• DN 50, PN 16	N43	✓	✓
• DN 65, PN 16	N44	✓	✓
• DN 80, PN 16	N45	✓	✓
• DN 100, PN 16	N46	✓	✓
<b>Aseptic flange with groove to DIN 11864-2 Form A</b>			
• DN 50, PN 16	N43 + P11	✓	✓
• DN 65, PN 16	N44 + P11	✓	✓
• DN 80, PN 16	N45 + P11	✓	✓
• DN 100, PN 16	N46 + P11	✓	✓
<b>Aseptic clamp with groove to DIN 11864-3 Form A</b>			
• DN 50, PN 25	N53	✓	✓
• DN 65, PN 25	N54	✓	✓
• DN 80, PN 16	N55	✓	✓
• DN 100, PN 16	N56	✓	✓

1) Device plug Han IP65

2) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H.

3) Cannot be ordered with remote seal.

4) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

5) Special seal in Viton included in the scope of delivery.  
FKM; temperature range -20 ... +200 °C (-4 ... +392 °C)

6) Cannot be combined with Order code P00. Can only be ordered with silicone oil measuring cell filling.

7) The weldable socket can be ordered under accessories.

8) 3A and EHEDG compliant. The maximum permissible temperatures of the medium depend on the respective cell fillings (see medium conditions).

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

Selection and Ordering data	Order code		
<i>Additional data</i>	HART	PA	FF
Please add "-Z" to Article No. and specify Order code(s) and plain text.			
<b>Measuring range to be set</b> Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	✓ <sup>1)</sup>
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 characters, specify in plain text: Y16: .....	Y16	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 characters, specify in plain text: Y17: .....	Y17	✓	
<b>Setting of pressure indicator in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>1)</sup> , inH <sub>2</sub> O <sup>1)</sup> , ftH <sub>2</sub> O <sup>1)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % <sup>1)</sup> ref. temperature 20 °C	Y21	✓	✓
<b>Setting of pressure indication in non-pressure units<sup>2)</sup></b> Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	Y22 + Y01	✓	
<b>Preset bus address</b> possible between 1 and 126 Specify in plain text: Y25: .....	Y25		✓
<b>Damping adjustment in seconds (0 ... 100 s)</b>	Y30	✓	✓

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

### ordering example

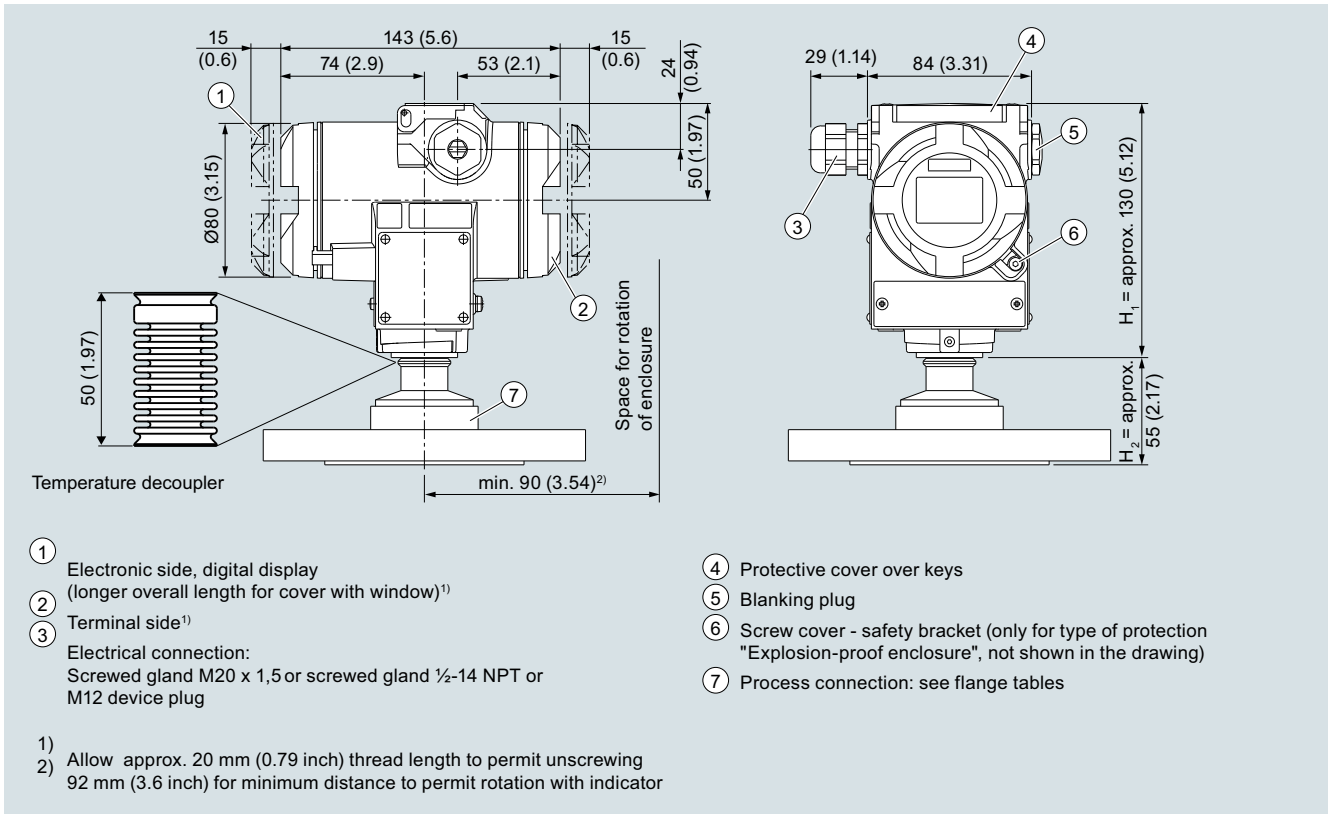
Item line: 7MF4133-1DB20-1AB7-Z  
B line: A22 + Y01 + Y21  
C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)  
C line: Y21: bar (psi)

<sup>1)</sup> Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.



## Dimensional drawings



SITRANS P pressure transmitters, DS III series for gauge pressure, with front-flush diaphragm, dimensions in mm (inch)

The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into  $H_1$  and  $H_2$ .

$H_1$  = Height of the SITRANS P300 up to a defined cross-section

$H_2$  = Height of the flange up to this defined cross-section

Only the height  $H_2$  is indicated in the dimensions of the flanges.

# Pressure Measurement

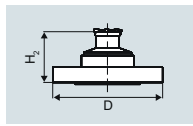
Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

## Flanges according to EN and ASME

Flange according to EN

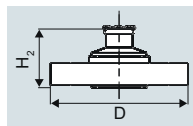
### EN 1092-1



Order code	DN	PN	ØD	H <sub>2</sub>
M11	25	40	115 mm (4.5")	Approx. 52 mm (2")
M13	40	40	150 mm (5.9")	
M23	40	100	170 mm (6.7")	
M04	50	16	165 mm (6.5")	
M14	50	40	165 mm (6.5")	
M06	80	16	200 mm (7.9")	
M16	80	40	200 mm (7.9")	

Flanges according to ASME

### ASME B16.5

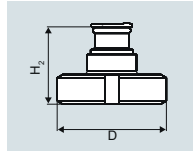


Order code	DN	PN	ØD	H <sub>2</sub>
M40	1"	150	110 mm (4.3")	Approx. 52 mm (2")
M41	1½"	150	130 mm (5.1")	
M42	2"	150	150 mm (5.9")	
M43	3"	150	190 mm (7.5")	
M44	4"	150	230 mm (9.1")	
M46	1½"	300	155 mm (6.1")	
M47	2"	300	165 mm (6.5")	
M48	3"	300	210 mm (8.1")	
M49	4"	300	255 mm (10.0")	

## NuG and pharmaceutical connections

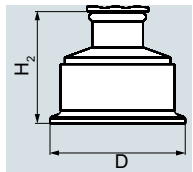
Connections to DIN

### DIN 11851 (milk pipe union with slotted union nut)



Order code	DN	PN	ØD	H <sub>2</sub>
N04	50	25	92 mm (3.6")	Approx. 52 mm (2")
N06	80	25	127 mm (5.0")	

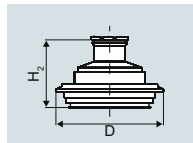
### Tri-Clamp nach DIN 32676



Order code	DN	PN	ØD	H <sub>2</sub>
N14	50	16	64 mm (2.5")	Approx. 52 mm (2")
N15	65	10	91 mm (3.6")	

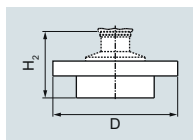
Other connections

### Varivent connection



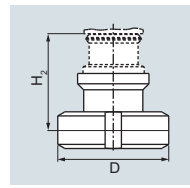
Order code	DN	PN	ØD	H <sub>2</sub>
N28	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

### Sanitary process connection to DRD



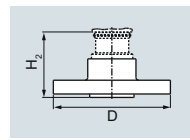
Order code	DN	PN	ØD	H <sub>2</sub>
M32	50	40	105 mm (4.1")	Approx. 52 mm (2")

### Sanitary process screw connection to NEUMO Bio-Connect



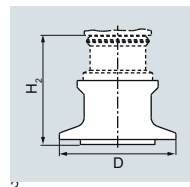
Order code	DN	PN	ØD	H <sub>2</sub>
Q05	50	16	82 mm (3.2")	Approx. 52 mm (2")
Q06	65	16	105 mm (4.1")	
Q07	80	16	115 mm (4.5")	
Q08	100	16	145 mm (5.7")	
Q13	2"	16	82 mm (3.2")	
Q14	2½"	16	105 mm (4.1")	
Q15	3"	16	105 mm (4.1")	
Q16	4"	16	145 mm (5.7")	

### Sanitary process connection to NEUMO Bio-Connect flange connection



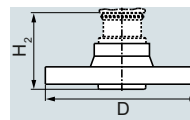
Order code	DN	PN	ØD	H <sub>2</sub>
Q23	50	16	110 mm (4.3")	Approx. 52 mm (2")
Q24	65	16	140 mm (5.5")	
Q25	80	16	150 mm (5.9")	
Q26	100	16	175 mm (6.9")	
Q31	2"	16	100 mm (3.9")	
Q32	2½"	16	110 mm (4.3")	
Q33	3"	16	140 mm (5.5")	
Q34	4"	16	175 mm (6.9")	

### Sanitary process connection to NEUMO Bio-Connect clamp connection



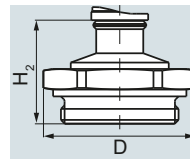
Order code	DN	PN	ØD	H <sub>2</sub>
Q39	50	16	77.4 mm (3.0")	Approx. 52 mm (2")
Q40	65	10	90.9 mm (3.6")	
Q41	80	10	106 mm (4.2")	
Q42	100	10	119 mm (4.7")	
Q48	2½"	16	90.9 mm (3.6")	
Q49	3"	10	106 mm (4.2")	
Q50	4"	10	119 mm (4.7")	

### Sanitary process connection to NEUMO Bio-Connect S flange connection



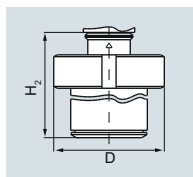
Order code	DN	PN	ØD	H <sub>2</sub>
Q72	2"	16	125 mm (4.9")	Approx. 52 mm (2")

### Threaded connection G¾", G1" and G2" acc. to DIN 3852



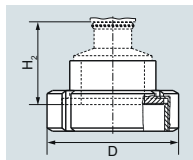
Order code	DN	PN	ØD	H <sub>2</sub>
R01	¾"	60	37 mm (1.5")	Approx. 45 mm (1.8")
R02	1"	60	48 mm (1.9")	Approx. 47 mm (1.9")
R04	2"	60	78 mm (3.1")	Approx. 52 mm (2")

## Tank connection TG 52/50 and TG52/150



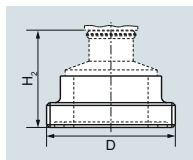
Order code	DN	PN	ØD	H <sub>2</sub>
R10	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
R11	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

## SMS socket with union nut



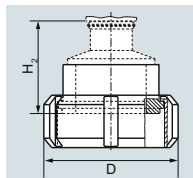
Order code	DN	PN	ØD	H <sub>2</sub>
M67	2"	25	84 mm (3.3")	Approx. 52 mm (2")
M68	2½"	25	100 mm (3.9")	
M69	3"	25	114 mm (4.5")	

## SMS threaded socket



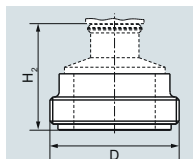
Order code	DN	PN	ØD	H <sub>2</sub>
M73	2"	25	70 x 1/6 mm	Approx. 52 mm (2")
M74	2½"	25	85 x 1/6 mm	
M75	3"	25	98 x 1/6 mm	

## IDF socket with union nut



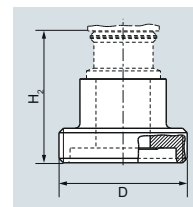
Order code	DN	PN	ØD	H <sub>2</sub>
M82	2"	25	77 mm (3")	Approx. 52 mm (2")
M83	2½"	25	91 mm (3.6")	
M84	3"	25	106 mm (4.2")	

## IDF threaded socket



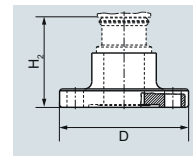
Order code	DN	PN	ØD	H <sub>2</sub>
M92	2"	25	64 mm (2.5")	Approx. 52 mm (2")
M93	2½"	25	77.5 mm (3.1")	
M94	3"	25	91 mm (3.6")	

## Aseptic threaded socket to DIN 11864-1 Form A



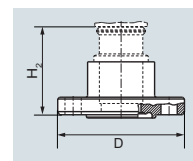
Order code	DN	PN	ØD	H <sub>2</sub>
N33	50	25	78 x 1/6"	Approx. 52 mm (2")
N34	65	25	95 x 1/6"	
N35	80	25	110 x 1/4"	
N36	100	25	130 x 1/4"	

## Aseptic flange with notch to DIN 11864-2 Form A



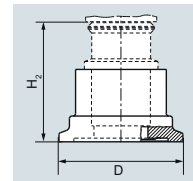
Order code	DN	PN	ØD	H <sub>2</sub>
N43	50	16	94	Approx. 52 mm (2")
N44	65	16	113	
N45	80	16	133	
N46	100	16	159	

## Aseptic flange with groove to DIN 11864-2 Form A



Order code	DN	PN	ØD	H <sub>2</sub>
N43 + P11	50	16	94	Approx. 52 mm (2")
N44 + P11	65	16	113	
N45 + P11	80	16	133	
N46 + P11	100	16	159	

## Aseptic clamp with groove to DIN 11864-3 Form A



Order code	DN	PN	ØD	H <sub>2</sub>
N53	50	25	77.5	Approx. 52 mm (2")
N54	65	25	91	
N55	80	16	106	
N56	100	16	130	

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from gauge pressure series)

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## Technical specifications

### SITRANS P DS III series for absolute pressure (from the gauge pressure series)

#### Input

Measured variable

Absolute pressure

Measuring span (fully adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

#### HART

#### PROFIBUS PA/ FOUNDATION Fieldbus

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

Max. perm. test pressure

8.34 ... 250 mbar a  
0.83 ... 25 kPa a  
3.35 ... 100 inH<sub>2</sub>O a

250 mbar a  
25 kPa a  
100 inH<sub>2</sub>O a

1.5 bar a  
150 kPa a  
21.8 psi a

6 bar a  
600 kPa a  
87 psi a

43.34 ... 1300 mbar a  
4.33 ... 130 kPa a  
17.42 ... 522.4 inH<sub>2</sub>O a

1300 mbar a  
130 kPa a  
525 inH<sub>2</sub>O a

2.6 bar a  
260 kPa a  
37.7 psi a

10 bar a  
1 MPa a  
145 psi a

170 ... 5000 mbar a  
17 ... 500 kPa a  
2.43 ... 72.5 psi a

5000 mbar a  
500 kPa a  
72.5 psi a

10 bar a  
1 MPa a  
145 psi a

30 bar a  
3 MPa a  
435 psi a

1 ... 30 bar a  
0.1 ... 3 MPa a  
14.6 ... 435 psi a

30 bar a  
3 MPa a  
435 psi a

45 bar a  
4.5 MPa a  
653 psi a

100 bar a  
10 MPa a  
1450 psi a

5.34 ... 160 bar a  
0.53 ... 16 MPa a  
77.4 ... 2321 psi a

160 bar a  
16 MPa a  
2321 psi

167 bar a  
16.7 MPa a  
2422 psi

250 bar a  
25 MPa a  
3626 psi

13.34 ... 400 bar a  
1.3 ... 40 MPa a  
193.4 ... 5802 psi a

400 bar a  
40 MPa a  
5802 psi a

400 bar a  
40 MPa a  
5802 psi a

600 bar a  
60 MPa a  
8702 psi a

23.34 ... 700 bar a  
2.33 ... 70 MPa a  
338.43 ... 10153 psi a

700 bar a  
70 MPa a  
10153 psi a

800 bar a  
80 MPa a  
11603 psi a

800 bar a  
80 MPa a  
11603 psi a

Lower measuring limit

- Measuring cell with silicone oil filling

0 mbar a/0 kPa a/0 psi a

- Measuring cell with inert filling liquid

- for temperature of medium -20 °C <  $\vartheta$  ≤ +60 °C (-4 °F <  $\vartheta$  ≤ +140 °F)

30 mbar a/3 kPa a/0.44 psi a

- for temperature of medium 60 °C <  $\vartheta$  ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F <  $\vartheta$  ≤ +212 °F (max. 185 °F for measuring cell 435 psi))

30 mbar a + 20 mbar a · ( $\vartheta$  - 60 °C)/°C  
3 kPa a + 2 kPa a · ( $\vartheta$  - 60 °C)/°C  
0.44 psi a + 0.29 psi a · ( $\vartheta$  - 140 °F)/°F

Upper measuring limit

100 % of max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)

Lower range value

Between the measuring limits (fully adjustable)

#### Output

#### HART

#### PROFIBUS PA/FOUNDATION Fieldbus

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

- Upper limit (infinitely adjustable)

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

-

Load

- Without HART

$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$  in  $\Omega$ ,  
 $U_H$ : Power supply in V

-

- With HART

$R_B = 230 \dots 500 \Omega$  (SIMATIC PDM) or  
 $R_B = 230 \dots 1100 \Omega$  (HART Communicator)

-

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

**SITRANS P DS III series for absolute pressure (from the gauge pressure series)**

<b>Measuring accuracy</b>	Acc. to IEC 60770-1
Reference conditions (All error data refer always refer to the set span)	<ul style="list-style-type: none"> <li>Increasing characteristic</li> <li>Lower range value 0 bar/kPa/psi</li> <li>Stainless steel seal diaphragm</li> <li>Silicone oil filling</li> <li>Room temperature 25 °C (77 °F)</li> </ul>
Measuring span ratio r (spread, Turn-Down)	$r = \text{max. measuring span/set measuring span or nominal measuring range}$
Error in measurement at limit setting incl. hysteresis and reproducibility	
<ul style="list-style-type: none"> <li>Linear characteristic</li> </ul>	
- $r \leq 10$	$\leq 0.1 \%$
- $10 < r \leq 30$	$\leq 0.2 \%$
Influence of ambient temperature (in percent per 28 °C (50 °F))	
<ul style="list-style-type: none"> <li>250 mbar a/25 kPa a/3.6 psi a</li> </ul>	$\leq (0.15 \cdot r + 0.1) \%$
<ul style="list-style-type: none"> <li>1300 mbar a/130 kPa a/18.8 psi a</li> <li>5 bar a/500 kPa a/72.5 psi a</li> <li>30 bar a/3000 kPa a/435 psi a</li> <li>100 bar a/10 MPa a/1450 psi a</li> <li>160 bar a/16 MPa a/2321 psi a</li> <li>400 bar a/40 MPa a/5802 psi a</li> <li>700 bar a/50 MPa a/10152 psi a</li> </ul>	$\leq (0.08 \cdot r + 0.16) \%$
Long-term stability (temperature change $\pm 30 \text{ °C}$ ( $\pm 54 \text{ °F}$ ))	$\leq (0.25 \cdot r) \%$ in 5 years
Effect of mounting position (in pressure per change in angle)	$\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$ per 10° inclination (zero point correction is possible with position error compensation)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range
<b>Operating conditions</b>	
Degree of protection	
<ul style="list-style-type: none"> <li>according to EN 60529</li> </ul>	IP66 (optional IP66/IP68)
<ul style="list-style-type: none"> <li>according to NEMA 250</li> </ul>	Type 4X
Temperature of medium	
<ul style="list-style-type: none"> <li>Measuring cell with silicone oil filling</li> </ul>	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) with 30 bar a measuring cell
<ul style="list-style-type: none"> <li>Measuring cell with inert filling liquid</li> </ul>	-20 ... +100 °C (-4 ... +212 °F)
<ul style="list-style-type: none"> <li>In conjunction with dust explosion protection</li> </ul>	-20 ... +60 °C (-4 ... +140 °F)
Ambient conditions	
<ul style="list-style-type: none"> <li>Ambient temperature</li> </ul>	
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)
- Display readable	-30 ... +85 °C (-22 ... +185 °F)
<ul style="list-style-type: none"> <li>Storage temperature</li> </ul>	-50 ... +85 °C (-58 ... +185 °F)
<ul style="list-style-type: none"> <li>Climatic class</li> </ul>	
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics
<ul style="list-style-type: none"> <li>Electromagnetic Compatibility</li> </ul>	
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21

## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for absolute pressure (from gauge pressure series)

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### SITRANS P DS III series for absolute pressure (from the gauge pressure series)

#### Design

Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)
Enclosure material	Low-copper die-cast aluminum, GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4408
Wetted parts materials	
• Connection shank	Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602
• Oval flange	Stainless steel, mat. no. 1.4404/316L
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))
Process connection	Connection shank G $\frac{1}{2}$ B to EN 837-1, female thread $\frac{1}{2}$ -14 NPT or oval flange (PN 160 (MAWP 2320 psi a)) to DIN 19213 with mounting thread M10 or $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518
Material of mounting bracket	
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)

#### Power supply $U_H$

	HART	PROFIBUS PA/FOUNDATION Fieldbus
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current $\leq$ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P DS III series for absolute pressure (from the gauge pressure series)		
Certificates and approvals	HART	PROFIBUS PA/ FOUNDATION Fieldbus
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"		
- Marking	PTB 13 ATEX 2007 X	
- Permissible ambient temperature	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Connection	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Effective internal inductance/capacitance	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1.2 \text{ W}$
• Explosion-proof "d"		
- Marking	PTB 99 ATEX 1160	
- Permissible ambient temperature	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Connection	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
• Dust explosion protection for zone 20		
- Marking	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	
- Permissible ambient temperature	PTB 01 ATEX 2055	
- Max. surface temperature	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Connection	-40 ... +85 °C (-40 ... +185 °F)	
- Effective internal inductance/capacitance	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1.2 \text{ W}$
• Dust explosion protection for zone 21/22		
- Marking	PTB 01 ATEX 2055	
- Connection	Ex II 2 D Ex tb IIIC T120°C Db	
• Type of protection "n" (zone 2)		
- Marking	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\max} = 1.2 \text{ W}$	
- Connection (Ex nA)	PTB 13 ATEX 2007 X	
- Connection (Ex ic)	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Effective internal inductance/capacitance	$U_m = 45 \text{ V}$	$U_m = 32 \text{ V}$
• Explosion protection acc. to FM		
- Identification (XP/DIP) or (IS); (NI)	To circuits with values: $U_i = 45 \text{ V}$	
• Explosion protection to CSA		
- Identification (XP/DIP) or (IS)	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	
	Certificate of Compliance 3008490	
	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
	Certificate of Compliance 1153651	
	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

# Pressure Measurement

Pressure transmitters  
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HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 to 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input /Output		
- Failure mode	parameterizable (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		



# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P DS III

for absolute pressure (from gauge pressure series)

1

Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
<b>Pressure transmitters for absolute pressure from gauge pressure series SITRANS P DS III with HART</b>		<b>7 MF 4 2 3 3 -</b>	<b>Pressure transmitters for absolute pressure from gauge pressure series SITRANS P DS III with HART</b>		<b>7 MF 4 2 3 3 -</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			<b>Electrical connection/cable entry</b>		
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		<ul style="list-style-type: none"> <li>Screwed gland M20x1.5</li> <li>Screwed gland 1/2-14 NPT</li> <li>Device plug Han 7D (plastic enclosure) incl. mating connector<sup>14)</sup></li> <li>Device plugs M12 (stainless steel)<sup>15) 16)</sup></li> </ul>		<b>B</b>
Silicone oil	normal	<b>1</b>			<b>C</b>
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	<b>3</b>			<b>D</b>
<b>Measuring span (min. ... max.)</b>			<b>Display</b>		
8.34 ... 250 mbar a	(0.13 ... 3.63 psi a)	<b>D</b>	<ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: mA)</li> <li>With visible display (setting: mA)</li> <li>with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)</li> </ul>		<b>0</b>
43.34 ... 1300 mbar a	(0.63 ... 18.86 psi a)	<b>F</b>			<b>1</b>
0.17 ... 5 bar a	(2.43 ... 72.5 psi a)	<b>G</b>			<b>6</b>
1 ... 30 bar a	(14.6 ... 435 psi a)	<b>H</b>			<b>7</b>
5.34 ... 160 bar a <sup>2)</sup>	(77.4 ... 2 321 psi a)	<b>L</b>			
13.34 ... 400 bar a <sup>2)</sup>	(193.4 ... 5 802 psi a)	<b>M</b>			
23.34 ... 700 bar a <sup>2)</sup>	(338.43 ... 10 153 psi a)	<b>N</b>			
<b>Wetted parts materials</b>			<b>Power supply units</b> see Chap. 7 "Supplementary Components".		
Seal diaphragm	Process connection		A quick-start guide is included in the scope of delivery of the device.		
Stainless steel	Stainless steel	<b>A</b>	1) For oxygen application, add Order code E10.		
Hastelloy	Stainless steel	<b>B</b>	2) Available soon		
Hastelloy	Hastelloy	<b>C</b>	3) Version 7MF4233-1DY... only up to max. measuring span 200 mbar a (80 inH <sub>2</sub> O a).		
Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) <sup>3) 4) 5) 6) 7)</sup>		<b>Y 1</b>	4) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.		
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" <sup>3) 4) 5) 6) 7)</sup>		<b>Y 0</b>	5) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
<b>Process connection</b>			6) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF423-...Y... and 7MF4900-1...-B		
<ul style="list-style-type: none"> <li>Connection shank G1/2B to EN 837-1</li> <li>Female thread 1/2-14 NPT</li> <li>Stainless steel oval flange with process connection (Oval flange has no female thread) <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213</li> <li>Mounting thread M12 to DIN 19213</li> </ul> </li> <li>Male thread M20 x 1.5</li> <li>Male thread 1/2-14 NPT</li> </ul>		<b>0</b>	7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
<b>Non-wetted parts materials</b>		<b>1</b>	8) Not in conjunction with Electrical connection "device plug Han 7D".		
<ul style="list-style-type: none"> <li>Enclosure made of die-cast aluminium</li> <li>Enclosure stainless steel precision casting<sup>8)</sup></li> </ul>		<b>3</b>	9) Without cable gland, with blanking plug.		
<b>Version</b>			10) With enclosed cable gland Ex ia and blanking plug.		
<ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>		<b>1</b>	11) Configurations with device plugs Han and M12 are only available in Ex ic.		
All versions include DVD with compact operating instructions in various EU languages.		<b>2</b>	12) Only in connection with IP66.		
<b>Explosion protection</b>		<b>3</b>	13) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
<ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>9)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"<sup>10)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>11)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>10)12)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>13)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>10)12)13)</sup></li> <li>With FM + CSA, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>9)13)</sup></li> </ul> </li> </ul>		<b>A</b>	14) Only in connection with Ex approval A, B or E.		
		<b>B</b>	15) Only in connection with Ex approval A, B, E or F.		
		<b>D</b>	16) M12 delivered without cable socket		
		<b>P</b>			
		<b>E</b>			
		<b>R</b>			
		<b>F</b>			
		<b>S</b>			
		<b>NC</b>			

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from gauge pressure series)

1

Selection and Ordering data		Article No.
<b>Pressure transmitters for absolute pressure from gauge pressure series</b>		
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>		7 M F 4 2 3 4 -
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>		7 M F 4 2 3 5 -
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>	
Silicone oil	normal	1
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	3
<b>Nominal measuring range</b>		
250 mbar a	(3.63 psi a)	D
1300 mbar a	(18.86 psi a)	F
5 bar a	(72.5 psi a)	G
30 bar a	(435 psi a)	H
160 bar a <sup>2)</sup>	(2 321 psi a)	L
400 bar a <sup>2)</sup>	(5 802 psi a)	M
700 bar a <sup>2)</sup>	(10 153 psi a)	N
<b>Wetted parts materials</b>		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) <sup>3) 4) 5) 6) 7)</sup>		Y 1
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" <sup>3) 4) 5) 6) 7)</sup>		Y 0
<b>Process connection</b>		
• Connection shank G1/2B to EN 837-1		0
• Female thread 1/2-14 NPT		1
• Stainless steel oval flange with process connection (Oval flange has no female thread)		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213		3
- Mounting thread M12 to DIN 19213		4
• Male thread M20 x 1.5		5
• Male thread 1/2 -14 NPT		6
<b>Non-wetted parts materials</b>		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting		3
<b>Version</b>		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data		Article No.
<b>Pressure transmitters for absolute pressure from gauge pressure series</b>		
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>		7 M F 4 2 3 4 -
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>		7 M F 4 2 3 5 -
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Explosion protection</b>		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)" <sup>8)</sup>		D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) <sup>9)</sup>		P
- "Ex nA/ic (Zone 2)" <sup>10)</sup>		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>9) 11)</sup>		R
• FM + CSA intrinsic safe (is) <sup>12)</sup>		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>9) 11) 12)</sup>		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>8) 12)</sup>		NC
<b>Electrical connection/cable entry</b>		
• Screwed gland M20 x 1.5		B
• Screwed gland 1/2-14 NPT		C
• Device plugs M12 (stainless steel) <sup>13) 14)</sup>		F
<b>Display</b>		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)		7
A quick-start guide is included in the scope of delivery of the device.		
1) For oxygen application, add Order code E10.		
2) Available soon		
3) Version 7MF4233-1DY... only up to max. measuring span 200 mbar a (2.9 psi a).		
4) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.		
5) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
6) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF423.-.Y.-... and 7MF4900-1...-B		
7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
8) Without cable gland, with blanking plug.		
9) With enclosed cable gland Ex ia and blanking plug.		
10) Configurations with device plugs Han and M12 are only available in Ex ic.		
11) Only in connection with IP66.		
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
13) Only in connection with Ex approval A, B, E or F.		
14) M12 delivered without cable socket.		

Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF	<i>Further designs</i>	HART	PA	FF
Add "-Z" to Article No. and specify Order code.				Add "-Z" to Article No. and specify Order code.			
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>				<b>CRN approval Canada</b> (Canadian Registration Number)	E22 <sup>6)</sup>	✓	✓
• Steel	A01	✓	✓	<b>Dual seal</b>	E24	✓	✓
• Stainless steel 304	A02	✓	✓	<b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-B..)	E25 <sup>7)</sup>	✓	✓
• Stainless steel 316L	A03	✓	✓	<b>"Flameproof" explosion protection according to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-D..)	E26 <sup>7)</sup>	✓	✓
<b>Device plugs<sup>1)</sup></b>				<b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-P..)	E28 <sup>7)</sup>	✓	✓
• Han 7D (metal)	A30	✓		<b>Ex Approval IEC Ex (Ex ia)</b> (only for transmitter 7MF4...-.....-B..)	E45 <sup>7)</sup>	✓	✓
• Han 8D (instead of Han 7D)	A31	✓		<b>Ex Approval IEC Ex (Ex d)</b> (only for transmitter 7MF4...-.....-D..)	E46 <sup>7)</sup>	✓	✓
• Angled	A32	✓		<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E55 <sup>7)</sup>	✓	✓
• Han 8D (metal)	A33	✓		<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>7)</sup>	✓	✓
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	<b>Explosion-proof "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>7)</sup>	✓	✓
<b>Rating plate inscription</b> (instead of German)				<b>Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>7)</sup>	✓	✓
• English	B11	✓	✓	<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 <sup>7)</sup>	✓	✓
• French	B12	✓	✓	<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓
• Spanish	B13	✓	✓	<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	E81	✓	✓
• Italian	B14	✓	✓	<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓
• Cyrillic (russian)	B16	✓	✓	<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓
<b>English rating plate</b>	B21	✓	✓	<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	G10	✓	✓
Pressure units in inH <sub>2</sub> O and/or psi				<b>Transient protector 6 kV (lightning protect.)</b>	J01	✓	✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)<sup>2)</sup></b>	C11	✓	✓	<b>Oval flange NAM (ASTAVA)</b>	J06	✓	✓
<b>Inspection certificate<sup>3)</sup></b> Acc. to EN 10204-3.1	C12	✓	✓	<b>Marine approvals</b>			
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓
<b>Inspection certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓	• Lloyds Register (LR)	S11	✓	✓
<b>Functional safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓		• French marine classification society Bureau Veritas (BV)	S12	✓	✓
<b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>	C21 <sup>4)</sup>		✓	• American Bureau of Shipping (ABS)	S14	✓	✓
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓		• Russian Maritime Register (RMR)	S16	✓	✓
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓	• Korean Register of Shipping (KR)	S17	✓	✓
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓					
<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>	D07	✓	✓				
<b>Degree of protection IP66/IP68</b> (only for M20 x 1.5 and ½-14 NPT)	D12	✓	✓				
<b>Supplied with oval flange</b> (1 item), PTFE packing and screws in thread of oval flange	D37	✓	✓				
<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓				
<b>Use in or on zone 1D/2D<sup>5)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP65)	E01	✓	✓				
<b>Oxygen application</b> (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	E10	✓	✓				
<b>Export approval Korea</b>	E11	✓	✓				

1) Device plug Han IP65

2) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

3) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H.

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for absolute pressure (from gauge pressure series)

1

Selection and Ordering data	Order code		
<i>Additional data</i>	HART	PA	FF
Please add "-Z" to Article No. and specify Order code(s) and plain text.			
<b>Measuring range to be set</b> Specify in plain text (max. 5 characters): Y01: ... up to ... mbar a, bar a, kPa <sub>abs</sub> , MPa <sub>abs</sub> , psi a <sup>2)</sup>	Y01	✓	✓ <sup>1)</sup>
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 characters, specify in plain text: Y16: .....	Y16	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 characters, specify in plain text: Y17: .....	Y17	✓	
<b>Setting of pressure indication in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % *) ref. temperature 20 °C	Y21	✓	✓
<b>Setting of pressure indication in non-pressure units<sup>3)</sup></b> Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	Y22 + Y01	✓	
<b>Preset bus address</b> possible between 1 and 126 Specify in plain text: Y25: .....	Y25		✓
<b>Damping adjustment in seconds (0 ... 100 s)</b>	Y30	✓	✓

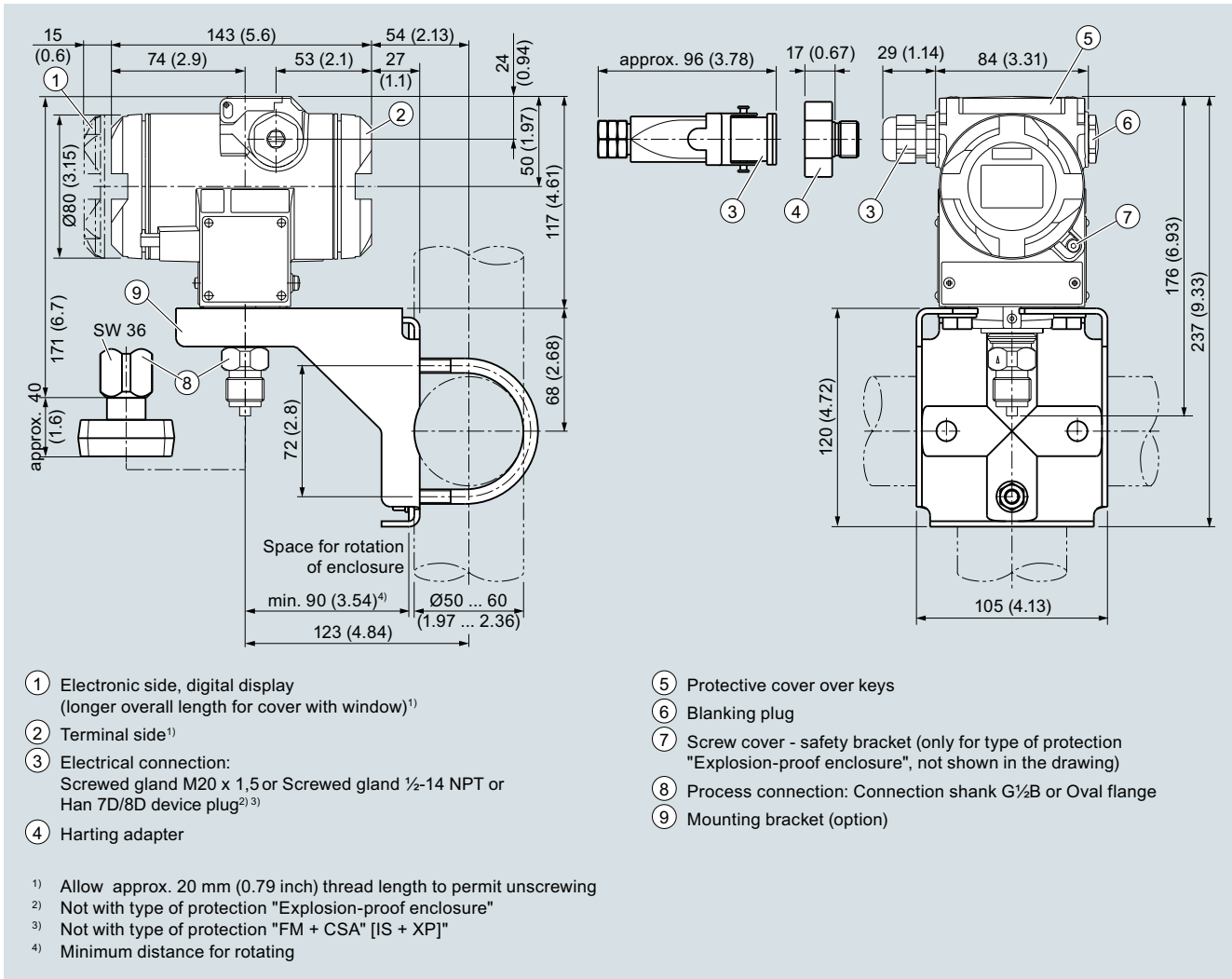
Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

- 1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- 2) Only absolute pressure units selectable. Negative pressure values not permitted.
- 3) Preset values can only be changed over SIMATIC PDM.

## Dimensional drawings



SITRANS P DS III pressure transmitters for absolute pressure, from the pressure series, dimensions in mm (inch)

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

1

## Technical specifications

### SITRANS P, DS III for absolute pressure (from the differential pressure series)

#### Input

Measured variable

Absolute pressure

Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure (in accordance with 97/23/EC Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

#### HART

#### PROFIBUS PA/ FOUNDATION Fieldbus

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

8.34 ... 250 mbar a  
0.834 ... 25 kPa a  
3 ... 100 inH<sub>2</sub>O a

250 mbar a  
25 kPa a  
100 inH<sub>2</sub>O a

32 bar a  
3.2 MPa a  
464 psi a

43.34 ... 1300 mbar a  
4.33 ... 130 kPa a  
17 ... 525 inH<sub>2</sub>O a

1300 mbar a  
130 kPa a  
525 inH<sub>2</sub>O a

32 bar a  
3.2 MPa a  
464 psi a

170 ... 5000 mbar a  
17 ... 500 kPa a  
2.43 ... 72.5 psi a

5000 mbar a  
500 kPa a  
72.5 psi a

32 bar a  
3.2 MPa a  
464 psi a

1 ... 30 bar a  
0.1 ... 3 MPa a  
14.6 ... 435 psi a

30 bar a  
3 MPa a  
435 psi a

160 bar a  
16 MPa a  
2320 psi a

5.3 ... 100 bar a  
0.5 ... 10 MPa a  
76.9 ... 1450 psi a

100 bar a  
10 MPa a  
1450 psi a

160 bar a  
16 MPa a  
2320 psi a

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

0 mbar a/0 kPa a/0 psi a

- for temperature of medium  $-20\text{ °C} < \vartheta \leq +60\text{ °C}$   
( $-4\text{ °F} < \vartheta \leq +140\text{ °F}$ )

30 mbar a/3 kPa a/0.44 psi a

- for temperature of medium  
 $60\text{ °C} < \vartheta \leq +100\text{ °C}$  (max.  $85\text{ °C}$  for measuring cell 30 bar)  
( $140\text{ °F} < \vartheta \leq +212\text{ °F}$  (max.  $185\text{ °F}$  for measuring cell  
435 psi))

$30\text{ mbar a} + 20\text{ mbar a} \cdot (\vartheta - 60\text{ °C})/\text{°C}$   
 $3\text{ kPa a} + 2\text{ kPa a} \cdot (\vartheta - 60\text{ °C})/\text{°C}$   
 $0.44\text{ psi a} + 0.29\text{ psi a} \cdot (\vartheta - 140\text{ °F})/\text{°F}$

Upper measuring limit

100 % of max. measuring span  
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and  $60\text{ °C}$  ( $140\text{ °F}$ )  
ambient temperature/temperature of medium)

Lower range value

Between the measuring limits (fully adjustable)

#### Output

#### HART

#### PROFIBUS PA/ FOUNDATION Fieldbus

Output signal

4 ... 20 mA

Digital PROFIBUS PA and  
FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

-

Load

- Without HART

$R_B \leq (U_H - 10.5\text{ V})/0.023\text{ A}$  in  $\Omega$ ,  
 $U_H$ : Power supply in V

-

- With HART

$R_B = 230 \dots 500\ \Omega$  (SIMATIC PDM) or  
 $R_B = 230 \dots 1100\ \Omega$  (HART Communicator)

-

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal.  
Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

**SITRANS P, DS III for absolute pressure (from the differential pressure series)****Measuring accuracy**

Reference conditions

(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nominal measuring range}$ 

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

-  $r \leq 10$  $\leq 0.1 \%$ -  $10 < r \leq 30$  $\leq 0.2 \%$ 

Influence of ambient temperature (in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

 $\leq (0.15 \cdot r + 0.1) \%$ 

- 1300 mbar a/130 kPa a/18.8 psi a

5 bar a/500 kPa a/72.5 psi a

30 bar a/3000 kPa a/435 psi a

100 bar a/10 MPa a/1450 psi a

 $\leq (0.08 \cdot r + 0.16) \%$ 

Long-term stability

(temperature change  $\pm 30$  °C ( $\pm 54$  °F)) $\leq (0.25 \cdot r) \%$  in 5 years

Effect of mounting position (in pressure per change in angle)

 $\leq 0.7$  mbar/0.07 kPa/0.010 psi per 10° inclination  
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply (in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

 $3 \cdot 10^{-5}$  of nominal measuring range**Operating conditions**

Degree of protection

- according to EN 60529

IP66 (optional IP66/IP68)

- according to NEMA 250

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

-40 ... +100 °C (-40 ... +212 °F)

- Measuring cell with inert filling liquid

-20 ... +100 °C (-4 ... +212 °F)

- In conjunction with dust explosion protection

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %  
Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

1

## SITRANS P, DS III for absolute pressure (from the differential pressure series)

### Design

Weight (without options)	≈ 4.5 kg (≈ 9.9 (lb))
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408
Wetted parts materials	
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
• Process flanges and sealing screw	Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602 or Monel, mat. no. 2.4360
• O-Ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))
Process connection	1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518
Material of mounting bracket	
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)

### Power supply $U_H$

	HART	PROFIBUS PA/FOUNDATION Fieldbus
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes



SITRANS P, DS III for absolute pressure (from the differential pressure series)		
Certificates and approvals	HART	PROFIBUS PA/ FOUNDATION Field-bus
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection	PTB 13 ATEX 2007 X	
• Intrinsic safety "i"	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Marking	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Permissible ambient temperature		
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	Ex II 2 D Ex tb IIIC T120°C Db	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ ; $P_{\max} = 1 \text{ W}$
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	$U_m = 45 \text{ V}$	$U_m = 32 \text{ V}$
- Connection (Ex ic)	To circuits with values: $U_i = 45 \text{ V}$	FISCO supply unit ic: $U_o = 17.5 \text{ V}$ , $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$ , $I_o = 132 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion protection acc. to FM	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for absolute pressure (from differential pressure series)

1

HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 to 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	Standard FOUNDATION Fieldbus function block
Internal preprocessing		• Physical block	1 resource block
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input /Output		
- Failure mode	parameterizable (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
<b>Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART</b>		<b>7MF4333-</b>	<b>Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART</b>		<b>7MF4333-</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			<b>Electrical connection/cable entry</b>		
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		<ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> <li>Screwed gland ½-14 NPT</li> <li>Device plug Han 7D (plastic enclosure) incl. mating connector<sup>14)</sup></li> <li>Device plugs M12 (stainless steel)<sup>15) 16)</sup></li> </ul>		<b>B</b>
Silicone oil	normal	1			<b>C</b>
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	3			<b>D</b>
<b>Measuring span (min. ... max.)</b>			<b>Display</b>		
8.34 ... 250 mbar a	(0.13 ... 3.63 psi a)	<b>D</b>	<ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: mA)</li> <li>With visible display (setting: mA)</li> <li>with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)</li> </ul>		<b>0</b>
43.34 ... 1300 mbar a	(0.63 ... 18.86 psi a)	<b>F</b>			<b>1</b>
0.17 ... 5 bar a	(2.43 ... 72.5 psi a)	<b>G</b>			<b>6</b>
1 ... 30 bar a	(14.6 ... 435 psi a)	<b>H</b>			<b>7</b>
5.3 ... 100 bar a	(76.9 ... 1450 psi a)	<b>KE</b>			
<b>Wetted parts materials</b>			Power supply units see Chap. 7 "Supplementary Components".		
Seal diaphragm	Parts of measuring cell		Included in delivery of the device:		
Stainless steel	Stainless steel	<b>A</b>	<ul style="list-style-type: none"> <li>Quick-start guide</li> <li>Sealing plug(s) or sealing screw(s) for the process flanges(s)</li> </ul>		
Hastelloy	Stainless steel	<b>B</b>	<ol style="list-style-type: none"> <li>For oxygen applications, add Order code E10.</li> <li>Version 7MF4333-1DY... only up to max. measuring span 200 mbar a (2.9 psi a).</li> <li>When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.</li> <li>If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.</li> <li>The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF433-..Y... and 7MF4900-1...-B</li> <li>The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.</li> <li>Not for measuring span "5.3 ... 100 bar a (76.9 ... 1450 psi a)". Position of the top vent valve in the process flange (see dimensional drawing).</li> <li>Not in conjunction with Electrical connection "device plug Han 7D".</li> <li>Without cable gland, with blanking plug</li> <li>With enclosed cable gland Ex ia and blanking plug</li> <li>Configurations with device plugs Han and M12 are only available in Ex ic.</li> <li>Only in connection with IP66.</li> <li>Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.</li> <li>Only in connection with Ex approval A, B or E.</li> <li>Only in connection with Ex approval A, B, E or F.</li> <li>M12 delivered without cable socket.</li> </ol>		
Hastelloy	Hastelloy	<b>C</b>			
Tantalum	Tantalum	<b>E</b>			
Monel	Monel	<b>H</b>			
Gold	Gold	<b>L</b>			
Version for diaphragm seal <sup>2) 3) 4) 5) 6)</sup>		<b>Y</b>			
<b>Process connection</b>					
Female thread ¼-18 NPT with flange connection					
<ul style="list-style-type: none"> <li>Sealing screw opposite process connection</li> <li>Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul>		<b>2</b>			
<ul style="list-style-type: none"> <li>Vent on side of process flange<sup>7)</sup></li> <li>Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul>		<b>0</b>			
		<b>6</b>			
		<b>4</b>			
<b>Non-wetted parts materials</b>					
process flange screws	Electronics enclosure				
Stainless steel	Die-cast aluminum	<b>2</b>			
Stainless steel	Stainless steel precision casting <sup>8)</sup>	<b>3</b>			
<b>Version</b>					
<ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>		<b>1</b>			
All versions include DVD with compact operating instructions in various EU languages.		<b>2</b>			
		<b>3</b>			
<b>Explosion protection</b>					
<ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>9)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"<sup>10)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>11)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"<sup>10)12)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>13)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>10)12)13)</sup></li> <li>With FM + CSA, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)"<sup>9)13)</sup></li> </ul> </li> </ul>		<b>A</b>			
		<b>B</b>			
		<b>D</b>			
		<b>P</b>			
		<b>E</b>			
		<b>R</b>			
		<b>F</b>			
		<b>S</b>			
		<b>NC</b>			

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

1

Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
<b>Pressure transmitter for absolute pressure from differential pressure series</b>			<b>Pressure transmitter for absolute pressure from differential pressure series</b>		
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>		7MF4334-	<b>SITRANS P DS III with PROFIBUS PA (PA)</b>		7MF4334-
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>		7MF4335-	<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>		7MF4335-
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>					
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		<b>Electrical connection/cable entry</b>		
Silicone oil	normal	1	<ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> <li>Screwed gland ½-14 NPT</li> <li>Device plugs M12 (stainless steel)<sup>13)14)</sup></li> </ul>		B C F
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	3			
<b>Nominal measuring range</b>			<b>Display</b>		
250 mbar a	(3.63 psi a)	D	<ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: bar)</li> <li>With visible display (setting: bar)</li> <li>With customer-specific display (setting as specified, Order code "Y21" required)</li> </ul>		0 1 6 7
1300 mbar a	(18.86 psi a)	F			
5 bar a	(72.5 psi a)	G			
30 bar a	(435 psi a)	H			
100 bar a	(1450 psi a)	KE			
<b>Wetted parts materials</b>			Included in delivery of the device:		
Seal diaphragm	Parts of measuring cell		<ul style="list-style-type: none"> <li>Quick-start guide</li> <li>Sealing plug(s) or sealing screw(s) for the process flanges(s)</li> </ul>		
Stainless steel	Stainless steel	A			
Hastelloy	Stainless steel	B			
Hastelloy	Hastelloy	C			
Tantalum	Tantalum	E			
Monel	Monel	H			
Gold	Gold	L			
Version as diaphragm seal 2) 3) 4) 5) 6)		Y			
<b>Process connection</b>					
Female thread ¼-18 NPT with flange connection					
<ul style="list-style-type: none"> <li>Sealing screw opposite process connection               <ul style="list-style-type: none"> <li>Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul> </li> <li>Vent on side of process flange <sup>7)</sup> <ul style="list-style-type: none"> <li>Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul> </li> </ul>	2 0 6 4				
<b>Non-wetted parts materials</b>					
process flange screws	Electronics enclosure				
Stainless steel	Die-cast aluminum	2			
Stainless steel	Stainless steel precision casting	3			
<b>Version</b>					
<ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>	1 2 3				
All versions include DVD with compact operating instructions in various EU languages.					
<b>Explosion protection</b>					
<ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)<sup>8)</sup>"</li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>9)</sup></li> <li>"Ex nA/ic (Zone 2)<sup>10)</sup>"</li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)<sup>9)11)</sup>"</li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>12)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>9)11)12)</sup></li> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)<sup>8)12)</sup>"</li> </ul> </li> </ul>	A B D P E R F S NC				

Selection and Ordering data	Order code				Selection and Ordering data	Order code			
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.		HART	PA	FF	<i>Further designs</i> Add "-Z" to Article No. and specify Order code.		HART	PA	FF
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>					<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓		
• Steel	A01	✓	✓	✓	<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>	D07	✓	✓	✓
• Stainless steel 304	A02	✓	✓	✓	(only together with seal diaphragm made of Hastelloy and stainless steel)				
• Stainless steel 316L	A03	✓	✓	✓	<b>Degree of protection IP66/IP68</b>	D12	✓	✓	✓
<b>O-rings for process flanges</b> (instead of FPM (Viton))					(only for M20 x 1.5 and ½-14 NPT)				
• PTFE (Teflon)	A20	✓	✓	✓	<b>Supplied with oval flange</b>	D37	✓	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	✓	(1 item), PTFE packing and screws in thread of process flange				
• FFP (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓	<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓					
<b>Device plugs<sup>1)</sup></b>									
• Han 7D (metal)	A30	✓							
• Han 8D (instead of Han 7D)	A31	✓							
• Angled	A32	✓							
• Han 8D (metal)	A33	✓							
<b>Sealing screw</b>	A40	✓	✓	✓					
¼-18 NPT, with vent valve in mat. of process flanges									
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	✓					
<b>Rating plate inscription</b> (instead of German)									
• English	B11	✓	✓	✓					
• French	B12	✓	✓	✓					
• Spanish	B13	✓	✓	✓					
• Italian	B14	✓	✓	✓					
• Cyrillic (russian)	B16	✓	✓	✓					
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	✓					
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)<sup>2)</sup></b>	C11	✓	✓	✓					
<b>Inspection certificate<sup>3)</sup></b> Acc. to EN 10204-3.1	C12	✓	✓	✓					
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	✓					
<b>Inspection certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓	✓					
<b>Functional safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓							
<b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>	C21 <sup>4)</sup>		✓						
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓							
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓	✓					

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

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Selection and Ordering data	Order code				Selection and Ordering data	Order code			
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.		HART	PA	FF	<i>Further designs</i> Add "-Z" to Article No. and specify Order code.		HART	PA	FF
<b>Use in or on zone 1D/2D<sup>5)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-...-B.. Ex ia)" and IP66)	E01	✓	✓	✓	<b>Transient protector 6 kV (lightning protection)</b>	J01	✓	✓	✓
<b>Oxygen application</b> (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	E10	✓	✓	✓	<b>Chambered graphite gasket for process flange</b>	J02	✓	✓	✓
<b>Export approval Korea</b>	E11	✓	✓	✓	<b>Chambered PTFE graphite gasket</b>	J03	✓	✓	✓
<b>CRN approval Canada</b> (Canadian Registration Number)	E22 <sup>6)</sup>	✓	✓	✓	<b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>	J05	✓	✓	✓
<b>Dual seal</b>	E24	✓	✓	✓	<b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>9)</sup></b>	J08	✓	✓	✓
<b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-...-B..)	E25 <sup>7)</sup>	✓	✓	✓	<b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>9)</sup></b>	J09	✓	✓	✓
<b>"Flameproof" explosion protection according to INMETRO (Brazil)</b> (only for transmitter 7MF4...-...-D..)	E26 <sup>7)</sup>	✓	✓	✓	<b>Process flange</b>				
<b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-...-P..)	E28 <sup>7)</sup>	✓	✓	✓	• Hastelloy	K01	✓	✓	✓
<b>Ex Approval IEC Ex (Ex ia)</b> (only for transmitter 7MF4...-...-B..)	E45 <sup>7)</sup>	✓	✓	✓	• Monel	K02	✓	✓	✓
<b>Ex Approval IEC Ex (Ex d)</b> (only for transmitter 7MF4...-...-D..)	E46 <sup>7)</sup>	✓	✓	✓	• Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F) For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	K04	✓	✓	✓
<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-...-B..)	E55 <sup>7)</sup>	✓	✓	✓	<b>Marine approvals</b>				
<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-...-D..)	E56 <sup>7)</sup>	✓	✓	✓	• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
<b>Explosion-proof "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-...-E..)	E57 <sup>7)</sup>	✓	✓	✓	• Lloyds Register (LR)	S11	✓	✓	✓
<b>Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-...-R..)	E58 <sup>7)</sup>	✓	✓	✓	• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (only for transmitter 7MF4...-...-[B, D]..-Z + E11)	E70 <sup>7)</sup>	✓	✓	✓	• American Bureau of Shipping (ABS)	S14	✓	✓	✓
<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓	✓	• Russian Maritime Register (RMR)	S16	✓	✓	✓
<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	E81	✓	✓	✓	• Korean Register of Shipping (KR)	S17	✓	✓	✓
<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓	✓					
<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓	✓					
<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	G10	✓	✓	✓					
<b>Interchanging of process connection side</b>	H01	✓	✓	✓					
<b>Vent on side for gas measurements</b>	H02	✓	✓	✓					
<b>Stainless steel process flanges for vertical differential pressure lines</b> (not together with K01, K02 and K04) <sup>8)</sup>	H03	✓	✓	✓					

1) Device plug Han IP65

2) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

3) If the inspection certificate 3.1.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

8) Not suitable for connection of remote seals.

9) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

Selection and Ordering data	Order code			
Additional data		HART	PA	FF
Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Measuring range to be set</b> Specify in plain text (max. 5 characters): Y01: ... up to ... mbar a, bar a, kPa <sub>abs</sub> , MPa <sub>abs</sub> , psi a <sup>2</sup> )	Y01	✓	✓ <sup>1)</sup>	
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 characters, specify in plain text: Y16: .....	Y16	✓	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 characters, specify in plain text: Y17: .....	Y17	✓		
<b>Setting of pressure indication in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % ) ref. temperature 20 °C	Y21	✓	✓	✓
<b>Setting of pressure indication in non-pressure units<sup>3)</sup></b> Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	Y22 + Y01	✓		
<b>Preset bus address</b> possible between 1 and 126 Specify in plain text: Y25: .....	Y25		✓	✓
<b>Damping adjustment in seconds (0 ... 100 s)</b>	Y30	✓	✓	✓

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

- 1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- 2) Only absolute pressure units selectable. Negative pressure values not permitted.
- 3) Preset values can only be changed over SIMATIC PDM.

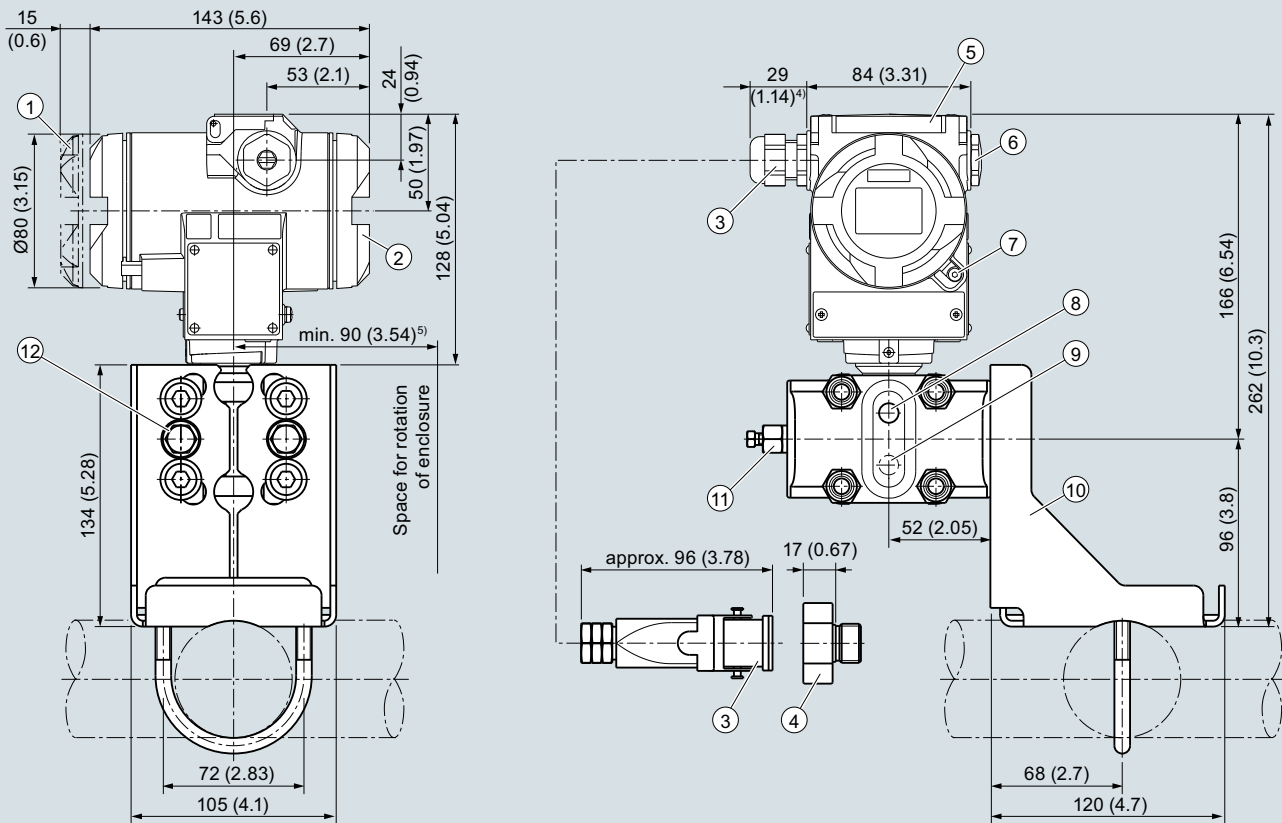
## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for absolute pressure (from differential pressure series)

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### Dimensional drawings



- ① Electronics side, local display  
(longer overall length for cover with inspection window)<sup>1)</sup>
- ② Connection side<sup>1)</sup>
- ③ Electrical connection:
  - Pg 13.5 screw gland (adapter)<sup>2) 3)</sup>
  - M20 x 1,5 screw gland
  - ½-14 NPT screw gland
  - Han 7D/Han 8D<sup>2) 3)</sup> device plug
- ④ Harting adapter
- ⑤ Cover over buttons

- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
- ⑧ Lateral ventilation for liquid measurement (Standard)
- ⑨ Lateral ventilation for gas measurement (order option H02)
- ⑩ Mounting bracket (optional)
- ⑪ Sealing plug with valve (optional)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

- <sup>1)</sup> In addition, allow approx. 20 mm (0.79 inch) for the thread length
- <sup>2)</sup> Not with "flameproof enclosure" type of protection
- <sup>3)</sup> Not for type of protection "FM + CSA" [is + XP]"
- <sup>4)</sup> For Pg 13.5 with adapter, approx. 45 mm (1.77 inch)
- <sup>5)</sup> 92 mm (3.62 inch) minimum distance for rotating with indicator

SITRANS P DS III pressure transmitters for absolute pressure, from the differential pressure series, dimensions in mm (inch)



**Technical specifications****SITRANS P, DS III for differential pressure and flow****Input**

Measured variable

Differential pressure and flow

Measuring span (infinitely adjustable) or nominal measuring range and maximum operating pressure (pursuant to 2014/68/EU Pressure Equipment Directive)

**HART****PROFIBUS PA/  
FOUNDATION  
Fieldbus**

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

1 ... 20 mbar  
0.1 ... 2 kPa  
0.4 ... 8 inH<sub>2</sub>O20 mbar  
2 kPa  
8 inH<sub>2</sub>O32 bar  
3.2 MPa  
464 psi1 ... 60 mbar  
0.1 ... 6 kPa  
0.4 ... 24 inH<sub>2</sub>O60 mbar  
6 kPa  
24.1 inH<sub>2</sub>O160 bar  
16 MPa  
2320 psi2.5 ... 250 mbar  
0.2 ... 25 kPa  
1 ... 100 inH<sub>2</sub>O250 mbar  
25 kPa  
100 inH<sub>2</sub>O6 ... 600 mbar  
0.6 ... 60 kPa  
2.4 ... 240 inH<sub>2</sub>O600 mbar  
60 kPa  
240 inH<sub>2</sub>O16 ... 1600 mbar  
1.6 ... 160 kPa  
6.4 ... 642 inH<sub>2</sub>O1600 mbar  
160 kPa  
642 inH<sub>2</sub>O50 ... 5000 mbar  
5 ... 500 kPa  
20 ... 2000 inH<sub>2</sub>O5000 mbar  
500 kPa  
2000 inH<sub>2</sub>O0.3 ... 30 bar  
0.03 ... 3 MPa  
4.35 ... 435 psi30 bar  
3 MPa  
435 psi2.5 ... 250 mbar  
0.2 ... 25 kPa  
1 ... 100 inH<sub>2</sub>O250 mbar  
25 kPa  
100 inH<sub>2</sub>O420 bar  
42 MPa  
6091 psi6 ... 600 mbar  
0.6 ... 60 kPa  
2.4 ... 240 inH<sub>2</sub>O600 mbar  
60 kPa  
240 inH<sub>2</sub>O(500 bar/50 MPa/7250 psi  
can be ordered optionally with Order  
Code D56)16 ... 1600 mbar  
1.6 ... 160 kPa  
6.4 ... 642 inH<sub>2</sub>O1600 mbar  
160 kPa  
642 inH<sub>2</sub>O50 ... 5000 mbar  
5 ... 500 kPa  
20 ... 2000 inH<sub>2</sub>O5000 mbar  
500 kPa  
2000 inH<sub>2</sub>O0.3 ... 30 bar  
0.03 ... 3 MPa  
4.35 ... 435 psi30 bar  
3 MPa  
435 psi

Lower measuring limit

- Measuring cell with silicone oil filling

-100 % of max. measuring span (-33 % with measuring cell 30 bar/3 MPa/435 psi)  
or 30 mbar a/3 kPa a/0.44 psi a

- Measuring cell with inert filling liquid

- for temperature of medium -20 °C <  $\vartheta$  ≤ +60 °C  
(-4 °F <  $\vartheta$  ≤ +140 °F)-100 % of max. measuring span (-33 % with measuring cell 30 bar/3 MPa/435 psi)  
or 30 mbar a/3 kPa a/0.44 psi a

- for temperature of medium

60 °C <  $\vartheta$  ≤ +100 °C (max. 85 °C for measuring cell 30 bar)  
(140 °F <  $\vartheta$  ≤ +212 °F (max. 185 °F for measuring cell  
435 psi))30 mbar a + 20 mbar a · ( $\vartheta$  - 60 °C)/°C  
3 kPa a + 2 kPa a · ( $\vartheta$  - 60 °C)/°C  
0.44 psi a + 0.29 psi a · ( $\vartheta$  - 140 °F)/°F

Upper measuring limit

100 % of max. measuring span  
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F)  
ambient temperature/temperature of medium)

Lower range value

Between the measuring limits (fully adjustable)

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for differential pressure and flow

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## SITRANS P, DS III for differential pressure and flow

Output	HART	PROFIBUS PA/FOUNDATION Fieldbus
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
<ul style="list-style-type: none"> <li>Lower limit (infinitely adjustable)</li> <li>Upper limit (infinitely adjustable)</li> </ul>	3.55 mA, factory preset to 3.84 mA  23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA (with order code D05)	-
Load		
<ul style="list-style-type: none"> <li>Without HART</li> <li>With HART</li> </ul>	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$ $U_H$ : Power supply in V  $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-
Physical bus	-	IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)	
<b>Measuring accuracy</b>	Acc. to IEC 60770-1	
Reference conditions (All error data refer always refer to the set span)	<ul style="list-style-type: none"> <li>Increasing characteristic</li> <li>Lower range value 0 bar/kPa/psi</li> <li>Stainless steel seal diaphragm</li> <li>Silicone oil filling</li> <li>Room temperature 25 °C (77 °F)</li> </ul>	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range	
Error in measurement at limit setting incl. hysteresis and reproducibility		
<ul style="list-style-type: none"> <li>Linear characteristic</li> </ul>		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $\leq 0.075 \%$ $5 < r \leq 10 :$ $\leq (0.0029 \cdot r + 0.071) \%$ $10 < r \leq 20 :$ $\leq (0.0045 \cdot r + 0.071) \%$	
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $\leq 0.075 \%$ $5 < r \leq 60 :$ $\leq (0.005 \cdot r + 0.05) \%$	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5 :$ $\leq 0.065 \%$ $5 < r \leq 100 :$ $\leq (0.004 \cdot r + 0.045) \%$	
<ul style="list-style-type: none"> <li>Square-rooted characteristic (flow &gt; 50 %)</li> </ul>		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $\leq 0.075 \%$ $5 < r \leq 10 :$ $\leq (0.0029 \cdot r + 0.071) \%$ $10 < r \leq 20 :$ $\leq (0.0045 \cdot r + 0.071) \%$	
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $\leq 0.075 \%$ $5 < r \leq 60 :$ $\leq (0.005 \cdot r + 0.05) \%$	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5 :$ $\leq 0.065 \%$ $5 < r \leq 100 :$ $\leq (0.004 \cdot r + 0.045) \%$	
<ul style="list-style-type: none"> <li>Square-rooted characteristic (flow &gt; 25 ... 50 %)</li> </ul>		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $\leq 0.15 \%$ $5 < r \leq 10 :$ $\leq (0.0058 \cdot r + 0.142) \%$ $10 < r \leq 20 :$ $\leq (0.009 \cdot r + 0.142) \%$	
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $\leq 0.015 \%$ $5 < r \leq 60 :$ $\leq (0.01 \cdot r + 0.1) \%$	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5 :$ $\leq 0.13 \%$ $5 < r \leq 100 :$ $\leq (0.008 \cdot r + 0.09) \%$	

**SITRANS P, DS III for differential pressure and flow**

<b>Measuring accuracy</b> (continued)	Acc. IEC 60770-1
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 20 mbar/2 kPa/0.29 psi	$\leq (0.15 \cdot r + 0.1) \%$
• 60 mbar/6 kPa/0.87 psi	$\leq (0.075 \cdot r + 0.1) \%$
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$\leq (0.025 \cdot r + 0.125) \%$
Influence of static pressure	
• on the lower range value	
- 20 mbar/2 kPa/0.29 psi	$\leq (0.15 \cdot r) \%$ per 32 bar (zero offset is possible with position error adjustment)
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi	$\leq (0.1 \cdot r) \%$ per 70 bar (zero offset is possible with position error adjustment)
- 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$\leq (0.2 \cdot r) \%$ per 70 bar (zero offset is possible with position error adjustment)
• on the measuring span	
- 20 mbar/2 kPa/0.29 psi	$\leq 0.2 \%$ per 32 bar
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$\leq 0.14 \%$ per 70 bar
Long-term stability (temperature change $\pm 30$ °C ( $\pm 54$ °F))	Static pressure max. 70 bar/7 MPa/ 1015 psi
• 20 mbar/2 kPa/0.29 psi	$\leq (0.2 \cdot r) \%$ per year
• 60 mbar/6 kPa/0.87 psi 30 bar/3 MPa/435 psi	$\leq (0.25 \cdot r) \%$ in 5 years
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi	$\leq (0.125 \cdot r) \%$ in 5 years
Effect of mounting position (in pressure per change in angle)	$\leq 0.7$ mbar/0.07 kPa/0.028 inH <sub>2</sub> O per 10° inclination (zero offset is possible with position error adjustment)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

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## SITRANS P, DS III for differential pressure and flow

### Operating conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F)  
with 30 bar measuring cell

- Measuring cell with inert filling liquid
- Measuring cell with Neobee fill fluid (FDA-compliant)
- In conjunction with dust explosion protection

-20 ... +100 °C (-4 ... +212 °F)

-10 ... +100 °C (+14 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature (silicone oil and inert oil)

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

-20 ... +85 °C (-4 ... +185 °F) with 30 bar measuring cell

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Ambient temperature (Neobee fill fluid)

- Transmitter

-10 ... +85 °C (+14 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

### Design

Weight (without options)

Die-cast aluminum: ≈ 4.5 kg (≈ 9.9 lb)  
Stainless steel precision casting: ≈ 7.1 kg (≈ 15.6 lb)

Enclosure material

Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold

- Process flanges and sealing screw

Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602 or Monel, mat. no. 2.4360

- O-Ring

FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR

Measuring cell filling

Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))

Process connection

Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

### Power supply $U_H$

Terminal voltage on transmitter

#### HART

10.5 ... 45 V DC  
10.5 ... 30 V DC in intrinsically-safe mode

#### PROFIBUS PA/ FOUNDATION Fieldbus

-

Power supply

-

Supplied through bus

Separate supply voltage

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

**SITRANS P, DS III for differential pressure and flow****Certificates and approvals**

Classification according to PED 2014/68/EU

## Explosion protection

## • Intrinsic safety "i"

- Marking
- Permissible ambient temperature

## - Connection

## - Effective internal inductance/capacitance

## • Explosion-proof "d"

- Marking
- Permissible ambient temperature

## - Connection

## • Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature

## - Max. surface temperature

## - Connection

## - Effective internal inductance/capacitance

## • Dust explosion protection for zone 21/22

- Marking
- Connection

## • Type of protection "n" (zone 2)

## - Marking

## - Connection (Ex nA)

## - Connection (Ex ic)

## - Effective internal inductance/capacitance

## • Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

## • Explosion protection to CSA

- Identification (XP/DIP) or (IS)

**HART**

- PN 32/160 (MAWP 464/2320 psi) for gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
- PN 420 (MAWP 6092) for gases of fluid group 1 and liquids of fluid group 1; complies with basic safety requirements of Article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord.

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ;  
 $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:

 $U_H = 10.5 \dots 45 \text{ V DC}$ 

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V DC}$ ;  $P_{\max} = 1.2 \text{ W}$ 

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

 $U_m = 45 \text{ V}$ 

To circuits with values:

 $U_i = 45 \text{ V}$  $L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$ 

Certificate of Compliance 3008490

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

Certificate of Compliance 1153651

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

**PROFIBUS PA/ FOUNDATION Fieldbus**FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$ Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1.2 \text{ W}$  $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ 

To circuits with values:

 $U_H = 9 \dots 32 \text{ V DC}$ FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$ Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1 \text{ W}$  $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$ To circuits with values:  $U_H = 9 \dots 32 \text{ V DC}$ ;  
 $P_{\max} = 1 \text{ W}$  $U_m = 32 \text{ V}$ FISCO supply unit ic:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 570 \text{ mA}$ Linear barrier:  
 $U_o = 32 \text{ V}$ ,  $I_o = 132 \text{ mA}$ ,  $P_o = 1 \text{ W}$  $L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

## for differential pressure and flow

1

HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for PC	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input /Output		
- Failure mode	parameterizable (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)</b>	<b>7 MF 4 4 3 3 -</b>	<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)</b>	<b>7 MF 4 4 3 3 -</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			
<b>Measuring cell filling</b> Silicone oil Inert liquid <sup>1)</sup> FDA compliant fill fluid <sup>2)</sup> • Neobee oil	<b>Measuring cell cleaning</b> normal grease-free to cleanliness level 2 normal	<b>Explosion protection</b> • None • With ATEX, Type of protection: - "Intrinsic safety (Ex ia)" - "Explosion-proof (Ex d)" <sup>10)</sup> - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" <sup>11)</sup> - "Ex nA/ic (Zone 2)" <sup>12)</sup> - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>11)13)</sup> • FM + CSA intrinsic safe (is) <sup>14)</sup> • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>11)13)14)</sup> • With FM + CSA, Type of protection: - "Intrinsic Safe and Explosion Proof (is + xp)" <sup>10)14)</sup>	<b>Explosion protection</b> A B D P E R F S NC
<b>Measuring span (min. ... max.)</b> PN 32 (MAWP 464 psi) 1 ... 20 mbar <sup>3)</sup> (0.4 ... 8 inH <sub>2</sub> O) PN 160 (MAWP 2320 psi) 1 ... 60 mbar (0.4 ... 24 inH <sub>2</sub> O) 2.5 ... 250 mbar (1.004 ... 100.4 inH <sub>2</sub> O) 6 ... 600 mbar (2.4 ... 240 inH <sub>2</sub> O) 16 ... 1600 mbar (6.4 ... 642 inH <sub>2</sub> O) 50 ... 5000 mbar (20 ... 2000 inH <sub>2</sub> O) 0.3 ... 30 bar (4.35 ... 435 psi)	1 3 4 B C D E F G H	<b>Electrical connection/cable entry</b> • Screwed gland M20 x 1.5 • Screwed gland ½-14 NPT • Device plug Han 7D (plastic enclosure) incl. mating connector <sup>15)16)</sup> • Device plugs M12 (stainless steel) <sup>17)18)</sup>	B C D F
<b>Wetted parts materials</b> (stainless steel process flanges) Seal diaphragm Parts of measuring cell Stainless steel Stainless steel Hastelloy Stainless steel Hastelloy Hastelloy Tantalum <sup>4)</sup> Tantalum Monel <sup>4)</sup> Monel Gold <sup>4)</sup> Gold Version for diaphragm seal <sup>5) 6) 7) 8)</sup>	A B C E H L Y	<b>Display</b> • Without display • Without visible display (display concealed, setting: mA) • With visible display (setting: mA) • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	0 1 6 7
<b>Process connection</b> Female thread ¼-18 NPT with flange connection • Sealing screw opposite process connection - Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518 - Mounting thread M10 to DIN 19213 (only for replacement requirement) • Vent on side of process flange <sup>3)</sup> - Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518 - Mounting thread M10 to DIN 19213 (only for replacement requirement)	2 0 6 4	<b>Power supply units</b> see Chap. 7 "Supplementary Components". Included in delivery of the device: • Quick-start guide • Sealing plug(s) or sealing screw(s) for the process flanges(s)	
<b>Non-wetted parts materials</b> process flange screws Electronics enclosure Stainless steel Die-cast aluminum Stainless steel Stainless steel precision casting <sup>9)</sup>	2 3	1) For oxygen application, add Order code E10. 2) Available for measuring ranges 250 mbar ... 5 bar. 3) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing). 4) Not in conjunction with max. measuring span 20 and 60 mbar (8.03 and 24.09 inH <sub>2</sub> O)) 5) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here. 6) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. 7) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-..Y.-... and 7MF4900-1...-B 8) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. 9) Not in conjunction with Electrical connection "device plug Han 7D". 10) Without cable gland, with blanking plug 11) With enclosed cable gland Ex ia and blanking plug 12) Configurations with device plugs Han and M12 are only available in Ex ic. 13) Only in connection with IP66. 14) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505. 15) Only in connection with Ex approval A, B or E. 16) Permissible only for crimp-contact of conductor cross-section 1 mm <sup>2</sup> 17) Only in connection with Ex approval A, B, E or F. 18) M12 delivered without cable socket.	
<b>Version</b> • Standard version, German plate inscription, setting for pressure unit: bar • International version, English plate inscription, setting for pressure unit: bar • Chinese version, English plate inscription, setting for pressure unit: Pascal All versions include DVD with compact operating instructions in various EU languages.	1 2 3		

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data		Article No.
<b>Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi)</b>		
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>		7 MF 4 4 3 4 -
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>		7 MF 4 4 3 5 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■ ■ ■ ■ - ■ ■ ■ ■
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>	
Silicone oil	normal	1
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	3
FDA compliant fill fluid <sup>2)</sup>		
• Neobee oil	normal	4
<b>Nominal measuring range</b>		
PN 32 (MAWP 464 psi)		
20 mbar <sup>3)</sup>	(8.03 inH <sub>2</sub> O)	B
PN 160 (MAWP 2320 psi)		
60 mbar	(24 inH <sub>2</sub> O)	C
250 mbar	(100 inH <sub>2</sub> O)	D
600 mbar	(240 inH <sub>2</sub> O)	E
1600 mbar	(642 inH <sub>2</sub> O)	F
5 bar	(2000 inH <sub>2</sub> O)	G
30 bar	(435 psi)	H
<b>Wetted parts materials</b>		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum <sup>4)</sup>	Tantalum	E
Monel <sup>4)</sup>	Monel	H
Gold <sup>4)</sup>	Gold	L
Version as diaphragm seal <sup>5) 6) 7) 8)</sup>		Y
<b>Process connection</b>		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		2
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
• Venting on side of process flanges <sup>3)</sup>		6
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		4
<b>Non-wetted parts materials</b>		
process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
<b>Version</b>		
• Standard versions		1
• International version, English label inscriptions, documentation in 5 languages on DVD (no Order code selectable)		2
<b>Version</b>		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data		Article No.
<b>Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi)</b>		
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>		7 MF 4 4 3 4 -
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>		7 MF 4 4 3 5 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■ ■ ■ ■ - ■ ■ ■ ■
<b>Explosion protection</b>		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)" <sup>9)</sup>		D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) <sup>10)</sup>		P
- "Ex nA/ic (Zone 2)" <sup>11)</sup>		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>10)12)</sup>		R
• FM + CSA intrinsic safe (is) <sup>13)</sup>		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D <sup>10)12)13)</sup>		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>9)13)</sup>		NC
<b>Electrical connection/cable entry</b>		
• Screwed gland M20 x 1.5		B
• Screwed gland 1/2-14 NPT		C
• Device plugs M12 (stainless steel) <sup>14) 15)</sup>		F
<b>Display</b>		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• With customer-specific display (setting as specified, Order code "Y21" required)		7
Included in delivery of the device:		
• Quick-start guide		
• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
1) For oxygen application, add Order code E10.		
2) Available for measuring ranges 250 mbar ... 5 bar.		
3) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).		
4) Not in conjunction with max. measuring span 20 and 60 mbar (8.03 and 24.09 inH <sub>2</sub> O))		
5) When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.		
6) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
7) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-.Y.-... and 7MF4900-1...-B		
8) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
9) Without cable gland, with blanking plug.		
10) With enclosed cable gland Ex ia and blanking plug.		
11) Configurations with device plugs Han and M12 are only available in Ex ic.		
12) Only in connection with IP66.		
13) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
14) Only in connection with Ex approval A, B, E or F.		
15) M12 delivered without cable socket		



Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF	<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>				<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓	
• Steel	A01	✓	✓	<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b> (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓
• Stainless steel 304	A02	✓	✓	<b>Degree of protection IP66/IP68</b> (only for M20 x 1.5 and ½-14 NPT)	D12	✓	✓
• Stainless steel 316L	A03	✓	✓	<b>Process flange screws made of Monel</b> (max. nominal pressure PN20)	D34	✓	✓
<b>O-rings for process flanges</b> (instead of FPM (Viton))				<b>Supplied with oval flange set</b> (2 items), PTFE packings and screws in thread of process flanges	D37	✓	✓
• PTFE (Teflon)	A20	✓	✓	<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	<b>Use in or on zone 1D/2D<sup>5)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)	E01	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	<b>Overfilling safety device for flammable and non-flammable liquids</b> (max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex ia)", to WHG and VbF, not together with measuring cell filling "inert liquid")	E08	✓	
• NBR (Buna N)	A23	✓	✓	<b>Oxygen application</b> (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	E10	✓	✓
<b>Device plugs<sup>1)</sup></b>				<b>Export approval Korea</b>	E11	✓	✓
• Han 7D (metal)	A30	✓		<b>CRN approval Canada</b> (Canadian Registration Number)	E22 <sup>6)</sup>	✓	✓
• Han 8D (instead of Han 7D)	A31	✓		<b>Dual seal</b>	E24	✓	✓
• Angled	A32	✓		<b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-B..)	E25 <sup>7)</sup>	✓	✓
• Han 8D (metal)	A33	✓		<b>"Flameproof" explosion protection according to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-D..)	E26 <sup>7)</sup>	✓	✓
<b>Sealing screws (2 units)</b> ¼-18 NPT, with vent valve in mat. of process flanges	A40	✓	✓	<b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-P..)	E28 <sup>7)</sup>	✓	✓
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	<b>Ex Approval IEC Ex (Ex ia)</b> (only for transmitter 7MF4...-.....-B..)	E45 <sup>7)</sup>	✓	✓
<b>Rating plate inscription</b> (instead of German)				<b>Ex Approval IEC Ex (Ex d)</b> (only for transmitter 7MF4...-.....-D..)	E46 <sup>7)</sup>	✓	✓
• English	B11	✓	✓	<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E55 <sup>7)</sup>	✓	✓
• French	B12	✓	✓	<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>7)</sup>	✓	✓
• Spanish	B13	✓	✓	<b>Explosion-proof "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>7)</sup>	✓	✓
• Italian	B14	✓	✓	<b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>7)</sup>	✓	✓
• Cyrillic (russian)	B16	✓	✓	<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 <sup>7)</sup>	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓				
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)<sup>2)</sup></b>	C11	✓	✓				
<b>Inspection certificate<sup>3)</sup> to EN 10204-3.1</b>	C12	✓	✓				
<b>Factory certificate to EN 10204-2.2</b>	C14	✓	✓				
<b>Inspection certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓				
<b>Functional safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓					
<b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>	C21 <sup>4)</sup>		✓				
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓					
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓				

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data	Order code	HART	PA	FF
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.				
<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	<b>E80</b>	✓	✓	✓
<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	<b>E81</b>	✓	✓	✓
<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	<b>E82</b>	✓	✓	✓
<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	<b>E83</b>	✓	✓	✓
<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	<b>G10</b>	✓	✓	✓
<b>Interchanging of process connection side</b>	<b>H01</b>	✓	✓	✓
<b>Vent on side for gas measurements</b>	<b>H02</b>	✓	✓	✓
<b>Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04<sup>8</sup>)</b>	<b>H03</b>	✓	✓	✓
<b>Transient protector 6 kV (lightning protection)</b>	<b>J01</b>	✓	✓	✓
<b>Chambered graphite gasket for process flange</b>	<b>J02</b>	✓	✓	✓
<b>Chambered PTFE graphite gasket</b>	<b>J03</b>	✓	✓	✓
<b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>	<b>J05</b>	✓	✓	✓
<b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display<sup>9</sup>)</b>	<b>J08</b>	✓	✓	✓
<b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display<sup>9</sup>)</b>	<b>J09</b>	✓	✓	✓
<b>Process flange</b>				
• Hastelloy	<b>K01</b>	✓	✓	✓
• Monel	<b>K02</b>	✓	✓	✓
• Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F), for ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	<b>K04</b>	✓	✓	✓
<b>Marine approvals</b>				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	<b>S10</b>	✓	✓	✓
• Lloyds Register (LR)	<b>S11</b>	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	<b>S12</b>	✓	✓	✓
• American Bureau of Shipping (ABS)	<b>S14</b>	✓	✓	✓
• Russian Maritime Register (RMR)	<b>S16</b>	✓	✓	✓
• Korean Register of Shipping (KR)	<b>S17</b>	✓	✓	✓

Factory mounting of valve manifolds, see accessories.

✓ = available

- Device plug Han IP65
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H
- Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.
- Cannot be ordered with remote seal.
- When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.
- Not suitable for connection of remote seal.
- Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

Selection and Ordering data	Order code	HART	PA	FF
<b>Additional data</b> Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Measuring range to be set</b> Specify in plain text: • in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	<b>Y01</b> <b>Y02</b>	✓ ✓	✓ <sup>1)</sup> ✓	
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	<b>Y15</b>	✓	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 char., specify in plain text: Y16: .....	<b>Y16</b>	✓	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 char., specify in plain text: Y17: .....	<b>Y17</b>	✓		
<b>Setting of pressure indicator in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % *) ref. temperature 20 °C	<b>Y21</b>	✓	✓	✓
<b>Setting of pressure indicator in non-pressure units<sup>2)</sup></b> Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)	<b>Y22<sup>3)</sup></b> <b>+ Y01 or Y02</b>	✓		
<b>Preset bus address</b> possible between 1 and 126 Specify in plain text: Y25: .....	<b>Y25</b>		✓	✓
<b>Damping adjustment in seconds (0 ... 100 s)</b>	<b>Y30</b>	✓	✓	✓

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

- Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- Preset values can only be changed over SIMATIC PDM.
- Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		<b>7 MF 4 5 3 3 -</b>	<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		<b>7 MF 4 5 3 3 -</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			<b>Electrical connection/cable entry</b>		
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		<ul style="list-style-type: none"> <li>Screwed gland M20x1.5</li> <li>Screwed gland ½-14 NPT</li> <li>Device plug Han 7D (plastic enclosure) incl. mating connector<sup>13)14)</sup></li> <li>Device plugs M12 (stainless steel)<sup>15) 16)</sup></li> </ul>		<b>B</b> <b>C</b> <b>D</b>  <b>F</b>
Silicone oil	normal	1	<b>Display</b>		
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	3	<ul style="list-style-type: none"> <li>Without display</li> <li>Without visible display (display concealed, setting: mA)</li> <li>With visible display (setting: mA)</li> <li>with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)</li> </ul>		<b>0</b> <b>1</b>  <b>6</b> <b>7</b>
<b>Measuring span (min. ... max.)</b>			<b>Power supply units</b> see Chap. 7 "Supplementary Components".		
2.5 ... 250 mbar	(1.004 ... 100 inH <sub>2</sub> O)	D	<b>Scope of delivery:</b> Pressure transmitter as ordered (Instruction Manual is extra ordering item)		
6 ... 600 mbar	(2.4 ... 240 inH <sub>2</sub> O)	E	<ol style="list-style-type: none"> <li>For oxygen application, add Order code E10.</li> <li>Not in conjunction with max. measuring span 600 mbar (240.9 inH<sub>2</sub>O)</li> <li>When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.</li> <li>If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.</li> <li>The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453.-.Y.-..... and 7MF4900-1.....-B</li> <li>The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.</li> <li>Not in conjunction with Electrical connection "device plug Han 7D".</li> <li>Without cable gland, with blanking plug</li> <li>With enclosed cable gland Ex ia and blanking plug</li> <li>Configurations with device plugs Han and M12 are only available in Ex ic.</li> <li>Only in connection with IP66.</li> <li>Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.</li> <li>Only in connection with Ex approval A, B or E.</li> <li>Permissible only for crimp-contact of conductor cross-section 1 mm<sup>2</sup></li> <li>Only in connection with Ex approval A, B, E or F.</li> <li>M12 delivered without cable socket.</li> </ol>		
16 ... 1600 mbar	(6.4 ... 642 inH <sub>2</sub> O)	F			
50 ... 5000 mbar	(20 ... 2000 inH <sub>2</sub> O)	G			
0.3 ... 30 bar	(4.35 ... 435 psi)	H			
<b>Wetted parts materials</b>					
(stainless steel process flanges)					
Seal diaphragm	Parts of measuring cell				
Stainless steel	Stainless steel	A			
Hastelloy	Stainless steel	B			
Gold <sup>2)</sup>	Gold	L			
Version for diaphragm seal <sup>3) 4) 5) 6)</sup>		Y			
<b>Process connection</b>					
Female thread ¼-18 NPT with flange connection					
• Sealing screw opposite process connection					
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		3			
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		1			
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing)					
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		7			
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5			
<b>Non-wetted parts materials</b>					
process flange screws	Electronics enclosure				
Stainless steel	Die-cast aluminum	2			
Stainless steel	Stainless steel precision casting <sup>7)</sup>	3			
<b>Version</b>					
• Standard version, German plate inscription, setting for pressure unit: bar		1			
• International version, English plate inscription, setting for pressure unit: bar		2			
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3			
All versions include DVD with compact operating instructions in various EU languages.					
<b>Explosion protection</b>					
• None		A			
• With ATEX, Type of protection:					
- "Intrinsic safety (Ex ia)"		B			
- "Explosion-proof (Ex d)" <sup>8)</sup>		D			
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) <sup>9)</sup>		P			
- "Ex nA/ic (Zone 2)" <sup>10)</sup>		E			
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" <sup>9)11)</sup>		R			
• FM + CSA intrinsic safe (is) <sup>12)</sup>		F			
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>9)11)12)</sup>		S			
• With FM + CSA, Type of protection:					
- "Intrinsic safety and explosion-proof (is + xp)" <sup>8)12)</sup> , max PN 360		NC			

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data		Article No.
<b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>		7MF4534-
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>		7MF4535-
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>	
Silicone oil	normal	1
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	3
<b>Nominal measuring range</b>		
250 mbar	(100 inH <sub>2</sub> O)	D
600 mbar	(240 inH <sub>2</sub> O)	E
1600 mbar	(642 inH <sub>2</sub> O)	F
5 bar	(2000 inH <sub>2</sub> O)	G
30 bar	(435 psi)	H
<b>Wetted parts materials</b>		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Gold <sup>2)</sup>	Gold	L
Version for diaphragm seal <sup>3) 4) 5) 6)</sup>		Y
<b>Process connection</b>		
Female thread 1/4-18 NPT with flange connection		
<ul style="list-style-type: none"> <li>Sealing screw opposite process connection</li> <li>Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M12 to DIN 19213 (only for replacement requirement)</li> </ul>		3
<ul style="list-style-type: none"> <li>Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing).</li> <li>Mounting thread 7/16"-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M12 to DIN 19213 (only for replacement requirement)</li> </ul>		1
		7
		5
<b>Non-wetted parts materials</b>		
Process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
<b>Version</b>		
<ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul>		1
		2
		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data		Article No.
<b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>		7MF4534-
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>		7MF4535-
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Explosion protection</b>		
<ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>7)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>8)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>9)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>8) 10)</sup></li> </ul> </li> <li>FM + CSA intrinsic safe (is)<sup>11)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D<sup>9) 10) 11)</sup></li> <li>With FM + CSA, Type of protection: <ul style="list-style-type: none"> <li>"Intrinsic safety and explosion-proof (is + xp)"<sup>7) 11)</sup>, max PN 360</li> </ul> </li> </ul>		A B D P E R F S NC
<b>Electrical connection/cable entry</b>		
<ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> <li>Screwed gland 1/2-14 NPT</li> <li>Device plugs M12 (stainless steel)<sup>12) 13)</sup></li> </ul>		B C F
<b>Display</b>		
<ul style="list-style-type: none"> <li>Without (display hidden)</li> <li>Without visible display (display concealed, setting: bar)</li> <li>With visible display (setting: bar)</li> <li>With customer-specific display (setting as specified, Order code "Y21" required)</li> </ul>		0 1 6 7
Included in delivery of the device:		
<ul style="list-style-type: none"> <li>Quick-start guide</li> <li>Sealing plug(s) or sealing screw(s) for the process flanges(s)</li> </ul>		
<sup>1)</sup> For oxygen application, add Order code E10. <sup>2)</sup> Not in conjunction with max. measuring span 600 mbar (240.9 inH <sub>2</sub> O) <sup>3)</sup> When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. <sup>4)</sup> If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. <sup>5)</sup> The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-...Y-... and 7MF4900-1-...-B <sup>6)</sup> The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. <sup>7)</sup> Without cable gland, with blanking plug. <sup>8)</sup> With enclosed cable gland Ex ia and blanking plug. <sup>9)</sup> Configurations with device plugs Han and M12 are only available in Ex ic. <sup>10)</sup> Only in connection with IP66. <sup>11)</sup> Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505. <sup>12)</sup> Only in connection with Ex approval A, B, E or F. <sup>13)</sup> M12 delivered without cable socket		

Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<b>Further designs</b>		<b>HART</b>	<b>PA</b>	<b>FF</b>			
Add "-Z" to Article No. and specify Order code.							
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>							
• Steel	<b>A01</b>	✓	✓	✓	<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	<b>D05</b>	✓
• Stainless steel 304	<b>A02</b>	✓	✓	✓	<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>	<b>D07</b>	✓ ✓ ✓
• Stainless steel 316L	<b>A03</b>	✓	✓	✓	(only together with seal diaphragm made of Hastelloy and stainless steel)		
<b>O-rings for process flanges</b>					<b>Degree of protection IP66/IP68</b>	<b>D12</b>	✓ ✓ ✓
(instead of FPM (Viton))					(only for M20 x 1.5 and ½-14 NPT)		
• PTFE (Teflon)	<b>A20</b>	✓	✓	✓	<b>Nominal pressure rating PN 500 (MAWP 7250 psi)</b>	<b>D56</b>	✓
• FEP (with silicone core, approved for food)	<b>A21</b>	✓	✓	✓	(Only for measuring cell 600 mbar ... 30 bar (240 inH <sub>2</sub> O ... 435 psi), SIL- and Ex-options not possible) <sup>3)</sup>		
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	<b>A22</b>	✓	✓	✓	<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	<b>D59</b>	✓ ✓ ✓
• NBR (Buna N)	<b>A23</b>	✓	✓	✓	<b>Use in or on zone 1D/2D<sup>4)</sup></b>	<b>E01</b>	✓ ✓ ✓
<b>Device plugs<sup>1)</sup></b>					(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)		
• Han 7D (metal)	<b>A30</b>	✓			<b>Export approval Korea</b>	<b>E11</b>	✓ ✓ ✓
• Han 8D (instead of Han 7D)	<b>A31</b>	✓			<b>CRN approval Canada</b>	<b>E22<sup>5)</sup></b>	✓ ✓ ✓
• Angled	<b>A32</b>	✓			(Canadian Registration Number)		
• Han 8D (metal)	<b>A33</b>	✓			<b>Dual seal</b>	<b>E24</b>	✓ ✓ ✓
<b>Sealing screws (2 units)</b>	<b>A40</b>	✓	✓	✓	<b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b>	<b>E25<sup>6)</sup></b>	✓ ✓ ✓
¼-18 NPT, with valve in mat. of process flanges					(only for transmitter 7MF4...-.....-B..)		
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	<b>A50</b>	✓	✓	✓	<b>"Flameproof" explosion protection according to INMETRO (Brazil)</b>	<b>E26<sup>6)</sup></b>	✓ ✓ ✓
<b>Rating plate inscription</b> (instead of German)					(only for transmitter 7MF4...-.....-D..)		
• English	<b>B11</b>	✓	✓	✓	<b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b>	<b>E28<sup>6)</sup></b>	✓ ✓
• French	<b>B12</b>	✓	✓	✓	(only for transmitter 7MF4...-.....-P..)		
• Spanish	<b>B13</b>	✓	✓	✓	<b>Ex Approval IEC Ex (Ex ia)</b>	<b>E45<sup>6)</sup></b>	✓ ✓ ✓
• Italian	<b>B14</b>	✓	✓	✓	(only for transmitter 7MF4...-.....-B..)		
• Cyrillic (russian)	<b>B16</b>	✓	✓	✓	<b>Ex Approval IEC Ex (Ex d)</b>	<b>E46<sup>6)</sup></b>	✓ ✓ ✓
<b>English rating plate</b>	<b>B21</b>	✓	✓	✓	(only for transmitter 7MF4...-.....-D..)		
Pressure units in inH <sub>2</sub> O and/or psi					<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b>	<b>E55<sup>6)</sup></b>	✓ ✓ ✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)</b>	<b>C11</b>	✓	✓	✓	<b>Ex prot. "Explosion-proof" to NEPSI (China)</b>	<b>E56<sup>6)</sup></b>	✓ ✓ ✓
<b>Inspection certificate</b>	<b>C12</b>	✓	✓	✓	(only for transmitter 7MF4...-.....-E..)		
Acc. to EN 10204-3.1					<b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b>	<b>E58<sup>6)</sup></b>	✓ ✓ ✓
<b>Factory certificate</b>	<b>C14</b>	✓	✓	✓	(only for transmitter 7MF4...-.....-R..)		
Acc. to EN 10204-2.2					<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b>	<b>E70<sup>6)</sup></b>	✓ ✓ ✓
<b>Inspection certificate (EN 10204-3.1)</b>	<b>C15</b>	✓	✓	✓	(only for transmitter 7MF4...-.....-[B, D]..-Z + E11)		
PMI test of parts in contact with medium					<b>Ex-protection Ex ia acc. to EAC Ex (Russia)</b>	<b>E80</b>	✓ ✓ ✓
<b>Functional safety (SIL2)</b>	<b>C20</b>	✓			<b>Ex-protection Ex d acc. to EAC Ex (Russia)</b>	<b>E81</b>	✓ ✓ ✓
Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration					<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	<b>E82</b>	✓ ✓ ✓
<b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>	<b>C21<sup>2)</sup></b>		✓		<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	<b>E83</b>	✓ ✓ ✓
<b>Functional safety (SIL2/3)</b>	<b>C23</b>	✓					
Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration							
<b>PED for Russia with initial calibration mark</b>	<b>C99</b>	✓	✓	✓			

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF
Add "-Z" to Article No. and specify Order code.			
<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	<b>G10</b>	✓	✓
<b>Interchanging of process connection side</b>	<b>H01</b>	✓	✓
<b>Stainless steel process flanges for vertical differential pressure lines</b>	<b>H03</b>	✓	✓
<b>Transient protector 6 kV (lightning protection)</b>	<b>J01</b>	✓	✓
<b>Chambered graphite gasket for process flange</b>	<b>J02</b>	✓	✓
<b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>	<b>J05</b>	✓	✓
<b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>7)</sup></b>	<b>J08</b>	✓	✓
<b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>7)</sup></b>	<b>J09</b>	✓	✓
<b>Marine approvals</b>			
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	<b>S10</b>	✓	✓
• Lloyds Register (LR)	<b>S11</b>	✓	✓
• French marine classification society Bureau Veritas (BV)	<b>S12</b>	✓	✓
• American Bureau of Shipping (ABS)	<b>S14</b>	✓	✓
• Russian Maritime Register (RMR)	<b>S16</b>	✓	✓
• Korean Register of Shipping (KR)	<b>S17</b>	✓	✓

1) Device plug Han IP65

2) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

3) Tested according to IEC 61010. Only for media of the group of fluids 2 in accordance with PED permissible. Not for use with dangerous media suitable.

4) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

5) Cannot be ordered with remote seal.

6) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

7) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

Selection and Ordering data	Order code		
<i>Additional data</i>	HART	PA	FF
Please add "-Z" to Article No. and specify Order code(s) and plain text.			
<b>Measuring range to be set</b>			
Specify in plain text:			
• in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	<b>Y01</b>	✓	✓ <sup>1)</sup>
• in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	<b>Y02</b>	✓	
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b>	<b>Y15</b>	✓	✓
Max. 16 characters, specify in plain text: Y15: .....			
<b>Measuring point text (entry in device variable)</b>	<b>Y16</b>	✓	✓
Max. 27 char., specify in plain text: Y16: .....			
<b>Entry of HART address (TAG)</b>	<b>Y17</b>	✓	
Max. 8 char., specify in plain text: Y17: .....			
<b>Setting of pressure indication in pressure units</b>	<b>Y21</b>	✓	✓
Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ...			
Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>1)</sup> , inH <sub>2</sub> O <sup>1)</sup> , ftH <sub>2</sub> O <sup>1)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % ) ref. temperature 20 °C			
<b>Setting of pressure indication in non-pressure units<sup>2)</sup></b>	<b>Y22 + Y01 or Y02</b>	✓	
Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)			
<b>Preset bus address</b>	<b>Y25</b>	✓	✓
possible between 1 and 126 Specify in plain text: Y25: .....			
<b>Damping adjustment in seconds (0 ... 100 s)</b>	<b>Y30</b>	✓	✓

Factory mounting of valve manifolds, see accessories.

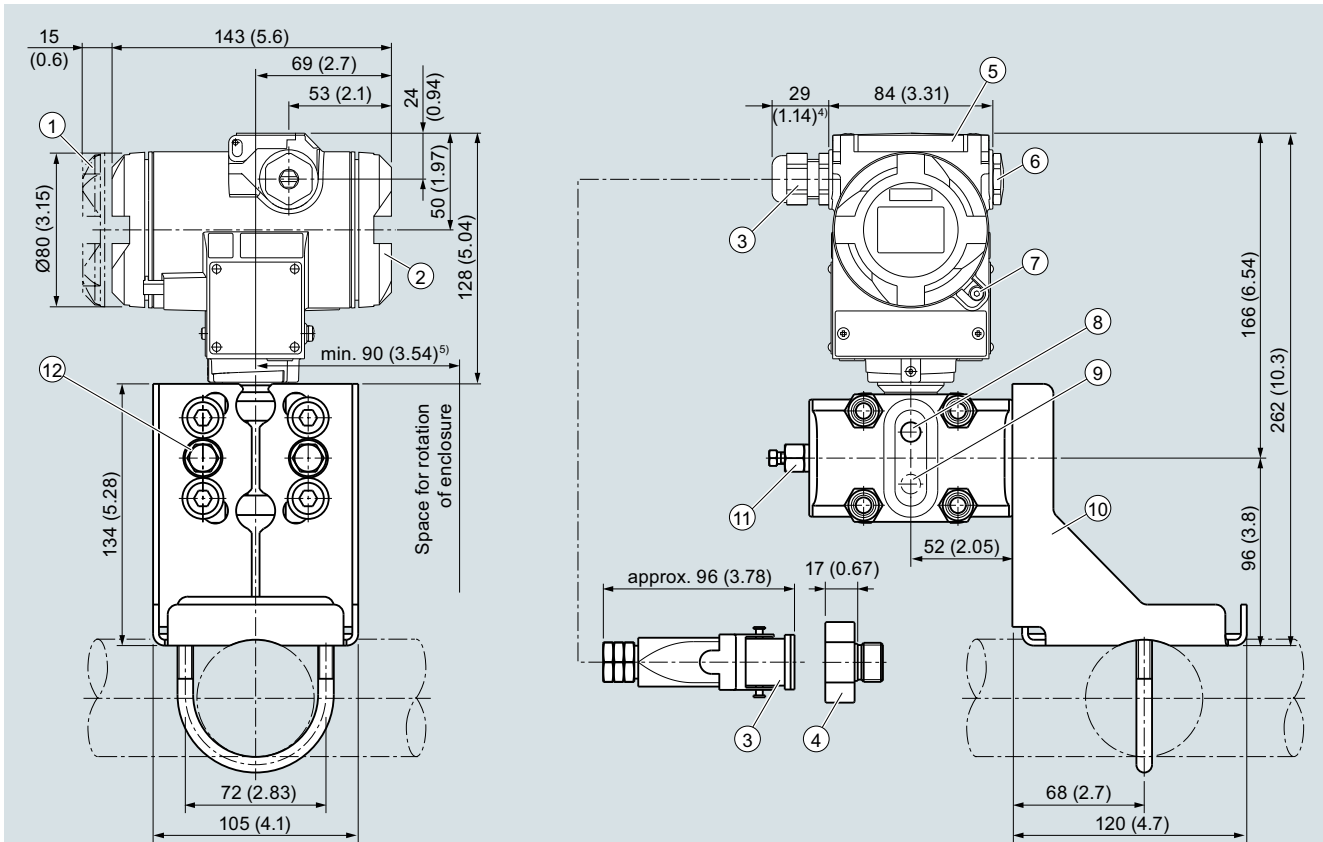
Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset.

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) Preset values can only be changed over SIMATIC PDM.

## Dimensional drawings



- ① Electronics side, local display (longer overall length for cover with inspection window)<sup>1)</sup>
- ② Connection side<sup>1)</sup>
- ③ Electrical connection:
  - Pg 13.5 screw gland (adapter)<sup>2) 3)</sup>
  - M20 x 1,5 screw gland
  - ½-14 NPT screw gland
  - Han 7D/Han 8D<sup>2) 3)</sup> device plug
- ④ Harting adapter
- ⑤ Cover over buttons

- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
- ⑧ Lateral ventilation for liquid measurement (Standard)
- ⑨ Lateral ventilation for gas measurement (order option H02)
- ⑩ Mounting bracket (optional)
- ⑪ Sealing plug with valve (optional)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

- <sup>1)</sup> In addition, allow approx. 20 mm (0.79 inch) for the thread length
- <sup>2)</sup> Not with "flameproof enclosure" type of protection
- <sup>3)</sup> Not for type of protection "FM + CSA" [is + XP]"
- <sup>4)</sup> For Pg 13.5 with adapter, approx. 45 mm (1.77 inch)
- <sup>5)</sup> 92 mm (3.62 inch) minimum distance for rotating with indicator

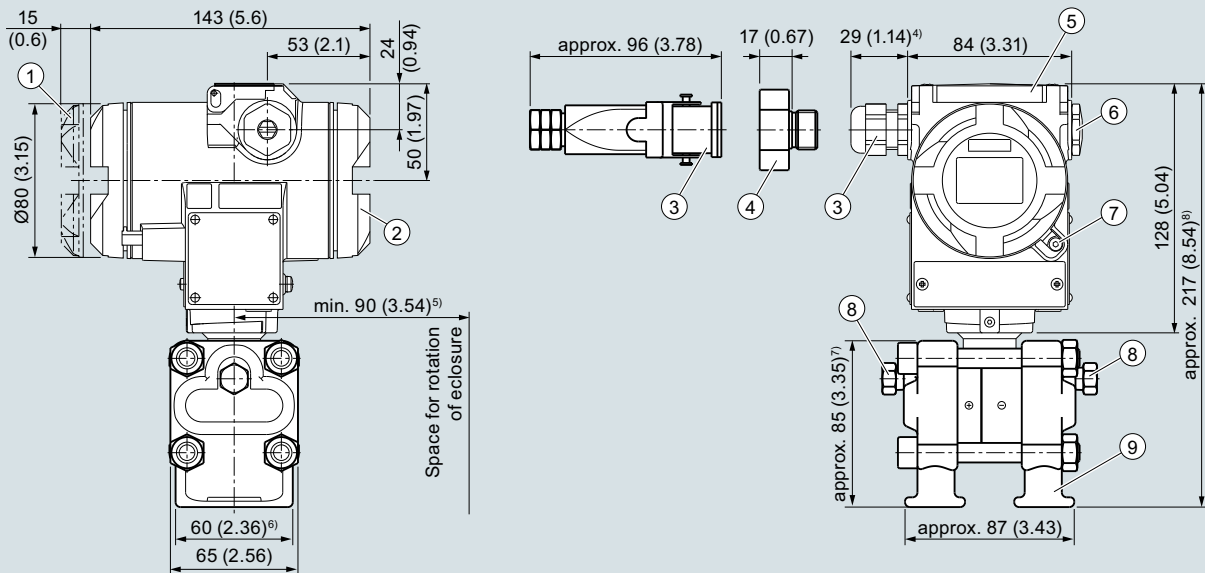
SITRANS P DS III pressure transmitters for differential pressure and flow, dimensions in mm (inch)

## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for differential pressure and flow

1



- ① Electronics side, local display (longer overall length for cover with inspection window)<sup>1)</sup>
- ② Connection side<sup>1)</sup>
- ③ Electrical connection:
  - Pg 13.5 screw gland (adapter)<sup>2)3)</sup>
  - M20 x 1,5 screw gland
  - ½-14 NPT screw gland
  - Han 7D/Han 8D<sup>2)3)</sup> device plug
- ④ Harting adapter

- ⑤ Cover over buttons
- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
- ⑧ Sealing plug with valve (optional)
- ⑨ Process connection: ¼-18 NPT (IEC 61518)

- <sup>1)</sup> In addition, allow approx. 20 mm (0.79 inch) for the thread length
- <sup>2)</sup> Not with "flameproof enclosure" type of protection
- <sup>3)</sup> Not for type of protection "FM + CSA" [is + XP]"
- <sup>4)</sup> For Pg 13.5 with adapter, approx. 45 mm (1.77 inch)
- <sup>5)</sup> 92 mm (3.62 inch) minimum distance for rotating with indicator
- <sup>6)</sup> 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- <sup>7)</sup> 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- <sup>8)</sup> 219 mm (8.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

SITRANS P DS III pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines, optional "H03", dimensional drawing, dimensions in mm (inch)



SITRANS P DS III pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines



**Technical specifications****SITRANS P DS III for level**

<b>Input</b>		<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>	
Measured variable	Level			
Measuring span (infinitely adjustable) or nominal measuring range and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)		Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)
		25 ... 250 mbar 2.5 ... 25 kPa 10 ... 100 inH <sub>2</sub> O	250 mbar 25 kPa 100 inH <sub>2</sub> O	See "Mounting flange"
		25 ... 600 mbar 2.5 ... 60 kPa 10 ... 240 inH <sub>2</sub> O	600 mbar 60 kPa 240 inH <sub>2</sub> O	
		53 ... 1600 mbar 5.3 ... 160 kPa 21 ... 640 inH <sub>2</sub> O	1600 mbar 160 kPa 642 inH <sub>2</sub> O	
		160 ... 5000 mbar 16 ... 500 kPa 2.32 ... 72.5 psi	5000 mbar 500 kPa 72.5 psi	
Lower measuring limit				
• Measuring cell with silicone oil filling				-100 % of max. measuring span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange
• Measuring cell with inert filling liquid				-100 % of max. measuring span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange
Upper measuring limit				100 % of max. measuring span
Lower range value				Between the measuring limits (fully adjustable)
<b>Output</b>		<b>HART</b>	<b>PROFIBUS PA/FOUNDATION Fieldbus</b>	
Output signal		4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)		3.55 mA, factory preset to 3.84 mA		-
• Upper limit (infinitely adjustable)		23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-
Load				
• Without HART		$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$ $U_H$ : Power supply in V		-
• With HART		$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)		-
Physical bus				IEC 61158-2
Protection against polarity reversal				Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.
Electrical damping (step width 0.1 s)				Set to 2 s (0 ... 100 s)

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for level

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## SITRANS P DS III for level

### Measuring accuracy

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

$r \leq 5$  :  $\leq 0.125\%$   
 $5 < r \leq 10$  :  $\leq (0.007 \cdot r + 0.09)\%$

- 600 mbar/60 kPa/8.7 psi

$r \leq 5$  :  $\leq 0.125\%$   
 $5 < r \leq 25$  :  $\leq (0.007 \cdot r + 0.09)\%$

- 1600 mbar/160 kPa/23.21 psi  
5 bar/500 kPa/72.5 psi

$r \leq 5$  :  $\leq 0.125\%$   
 $5 < r \leq 30$  :  $\leq (0.007 \cdot r + 0.09)\%$

Influence of ambient temperature (in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.4 \cdot r + 0.16)\%$

- 600 mbar/60 kPa/8.7 psi

$\leq (0.24 \cdot r + 0.16)\%$

- 1600 mbar/160 kPa/23.21 psi  
5 bar/500 kPa/72.5 psi

$\leq (0.2 \cdot r + 0.16)\%$

Influence of static pressure

- on the lower range value

- 250 mbar/25 kPa/3.6 psi

$\leq (0.3 \cdot r)\%$  per nominal pressure

- 600 mbar/60 kPa/8.7 psi

$\leq (0.15 \cdot r)\%$  per nominal pressure

- 1600 mbar/160 kPa/23.21 psi  
5 bar/500 kPa/72.5 psi

$\leq (0.1 \cdot r)\%$  per nominal pressure

- on the measuring span

$\leq (0.1 \cdot r)\%$  per nominal pressure

Long-term stability

(temperature change  $\pm 30$  °C ( $\pm 54$  °F))

$\leq (0.25 \cdot r)\%$  in 5 years  
static pressure max. 70 bar/7 MPa/1015 psi

Effect of mounting position

Depending on filling liquid of mounting flange

Effect of auxiliary power supply (in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of nominal measuring range

### Operating conditions

Degree of protection

- according to EN 60529

IP66 (optional IP66/IP68)

- according to NEMA 250

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

- High-pressure side

**Note:** Always take into account assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection!

-40 ... +100<sup>1)</sup> °C (-40 ... +212<sup>1)</sup> °F)

$p_{\text{abs}} \geq 1$  bar: -40 ... +175 °C (-40 ... +347 °F)

$p_{\text{abs}} < 1$  bar: -40 ... +80 °C (-40 ... +176 °F)

- Low-pressure side

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F) in conjunction with dust explosion protection

Ambient conditions

- Ambient temperature

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %, condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

**SITRANS P DS III for level****Design**

Weight (without options)

- To EN (pressure transmitter with mounting flange, without tube)
- To ASME (pressure transmitter with mounting flange, without tube)

≈ 11 ... 13 kg (≈ 24.2 ... 28.7 (lb))

≈ 11 ... 18 kg (≈ 24.2 ... 39.7 (lb))

Enclosure material

Low-copper die-cast aluminum, GD-ALSi12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

High-pressure side

- Seal diaphragm of mounting flange

- Stainless steel, W.-Nr. 1.4404/316L
  - coated with PFA
  - coated with PTFE
  - coated with ECTFE
  - gold plated
- Monel 400, mat. no. 2.4360
- Hastelloy C276, mat. no. 2.4619
- Hastelloy C4, mat. no. 2.4602
- Hastelloy C22, mat. no. 2.4602
- Tantalum
- Titanium, mat. no. 3.7035
- Nickel 201
- Duplex 2205, mat. no. 1.4462

Measuring cell filling

Silicone oil

Process connection

- High-pressure side

Flange to EN and ASME

- Low-pressure side

Female thread 1/4"-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16"-20 UNF to IEC 61518/DIN EN 61518

**Power supply  $U_H$** 

Terminal voltage on transmitter

**HART**10.5 ... 45 V DC  
10.5 ... 30 V DC in intrinsically-safe mode**PROFIBUS PA/FOUNDATION Fieldbus**

-

Power supply

Supplied through bus

Separate supply voltage

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

for level

1

## SITRANS P DS III for level

### Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

- Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

- Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

- Dust explosion protection for zone 21/22

- Marking
- Connection

- Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

- Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

- Explosion protection to CSA

- Identification (XP/DIP) or (IS)

### HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
-40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ;  $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:  
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:  
 $U_H = 10.5 \dots 45 \text{ V DC}$ ;  $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

$U_m = 45 \text{ V}$

To circuits with values:  
 $U_i = 45 \text{ V}$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

Certificate of Compliance 1153651

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

### PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

To circuits with values:  
 $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

To circuits with values:  $U_H = 9 \dots 32 \text{ V DC}$ ;  $P_{\max} = 1 \text{ W}$

$U_m = 32 \text{ V}$

FISCO supply unit ic:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 570 \text{ mA}$

Linear barrier:  
 $U_o = 32 \text{ V}$ ,  $I_o = 132 \text{ mA}$ ,  $P_o = 1 \text{ W}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

<sup>1)</sup> This value may be increased if the process connection is sufficiently insulated.

<b>HART communication</b>		<b>FOUNDATION Fieldbus communication</b>	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Yes
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	Standard FOUNDATION Fieldbus function block
Internal preprocessing		• Physical block	1 resource block
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input/Output	<b>Mounting flange</b>	
- Failure mode	parameterizable (last good value, substitute value, incorrect value)	Nominal diameter	Nominal pressure
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively	• Acc. to EN 1092-1	
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output	- DN 80	PN 40
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)	- DN100	PN16, PN40
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively	• To ASME B16.5	
• Physical block	1	- 3 inch	class 150, class 300
Transducer blocks	2	- 4 inch	class 150, class 300
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

## Selection and Ordering data

Article No.

### Pressure transmitter for level, SITRANS P DS III with HART

7MF4633-

Y - - - -

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

### Measuring cell filling Measuring cell cleaning

Silicone oil normal

1

### Measuring span (min. ... max.)

25 ... 250 mbar (10 ... 100 inH<sub>2</sub>O)

25 ... 600 mbar (10 ... 240 inH<sub>2</sub>O)

53 ... 1600 mbar (21 ... 642 inH<sub>2</sub>O)

0.16 ... 5 bar (64.3 ... 2000 inH<sub>2</sub>O)

D  
E  
F  
G

### Process connection of low-pressure side

Female thread 1/4-18 NPT with flange connection

• Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518

• Mounting thread M10 to DIN 19213 (only for replacement requirement)

2  
0

### Non-wetted parts materials

process flange screws Electronics enclosure

Stainless steel Die-cast aluminum

Stainless steel Stainless steel precision casting<sup>1)</sup>

2  
3

### Version

• Standard version, German plate inscription, setting for pressure unit: bar

• International version, English plate inscription, setting for pressure unit: bar

• Chinese version, English plate inscription, setting for pressure unit: Pascal

All versions include DVD with compact operating instructions in various EU languages.

1  
2  
3

### Explosion protection

• None

• With ATEX, Type of protection:

- "Intrinsic safety (Ex ia)"

- "Explosion-proof (Ex d)"<sup>2)</sup>

- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"<sup>3)</sup>

- "Ex nA/ic (Zone 2)"<sup>4)</sup>

- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"<sup>3)5)</sup>

• FM + CSA intrinsic safe (is)<sup>6)</sup>

• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>3)5)6)</sup>

• With FM + CSA, Type of protection:

- "Intrinsic Safe and Explosion Proof (is + xp)"<sup>1)6)</sup>

A  
B  
D  
P  
E  
R  
F  
S  
NC

### Electrical connection/cable entry

• Screwed gland M20x1.5

• Screwed gland 1/2-14 NPT

• Device plug Han 7D (plastic enclosure) incl. mating connector<sup>7)</sup>

• Device plugs M12 (stainless steel)<sup>8) 9)</sup>

B  
C  
D  
F

### Display

• Without display

• Without visible display (display concealed, setting: mA)

• With visible display (setting mA)

• With customer-specific display (setting as specified, Order code "Y21" or "Y22" required)

0  
1  
6  
7

## Ordering information

1st order item: Pressure transmitter 7MF4633-...

2nd order item: Mounting flange 7MF4912-3...

### ordering example

Item line 1: 7MF4633-1EY20-1AA1-Z

B line: Y01

C line: Y01: 80 to 143 mbar (1.16 to 2.1 psi)

Item line 2: 7MF4912-3GE01

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- 1) Not in conjunction with Electrical connection "device plug Han 7D".
- 2) Without cable gland, with blanking plug.
- 3) With enclosed cable gland Ex ia and blanking plug.
- 4) Configurations with device plugs Han and M12 are only available in Ex ic.
- 5) Only in connection with IP66.
- 6) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 7) Only in connection with Ex approval A, B or E.
- 8) M12 delivered without cable socket
- 9) Only in connection with Ex approval A, B, E or F.

Selection and Ordering data	Article No.
<b>Pressure transmitters for level</b>	
<b>SITRANS P DS III with PROFIBUS PA (PA)</b>	<b>7MF4634-</b>
<b>SITRANS P DS III with FOUNDATION Fieldbus (FF)</b>	<b>7MF4635-</b>
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	<b>1 Y - - - -</b>
<b>Nominal measuring range</b>	
250 mbar (100 inH <sub>2</sub> O)	<b>D</b>
600 mbar (240 inH <sub>2</sub> O)	<b>E</b>
1600 mbar (642 inH <sub>2</sub> O)	<b>F</b>
5 bar (2000 inH <sub>2</sub> O)	<b>G</b>
<b>Process connection of low-pressure side</b>	
Female thread 1/4-18 NPT with flange connection	
• Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518	<b>2</b>
• Mounting thread M10 to DIN 19213 (only for replacement requirement)	<b>0</b>
<b>Non-wetted parts materials</b>	
process flange screws Electronics enclosure	
Stainless steel Die-cast aluminum	<b>2</b>
Stainless steel Stainless steel precision casting	<b>3</b>
<b>Version</b>	
• Standard version, German plate inscription, setting for pressure unit: bar	<b>1</b>
• International version, English plate inscription, setting for pressure unit: bar	<b>2</b>
• Chinese version, English plate inscription, setting for pressure unit: Pascal	<b>3</b>
All versions include DVD with compact operating instructions in various EU languages.	
<b>Explosion protection</b>	
• None	<b>A</b>
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	<b>B</b>
- "Explosion-proof (Ex d)" <sup>1)</sup>	<b>D</b>
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) <sup>2)</sup>	<b>P</b>
- "Ex nA/ic (Zone 2)" <sup>3)</sup>	<b>E</b>
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>2)4)</sup>	<b>R</b>
• FM + CSA intrinsic safe (is) <sup>5)</sup>	<b>F</b>
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>2)4)5)</sup>	<b>S</b>
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>1)5)</sup>	<b>NC</b>
<b>Electrical connection/cable entry</b>	
• Screwed gland M20 x 1.5	<b>B</b>
• Screwed gland 1/2-14 NPT	<b>C</b>
• Device plugs M12 (stainless steel) <sup>6) 7)</sup>	<b>F</b>
<b>Display</b>	
• Without display	<b>0</b>
• Without visible display (display concealed, setting: bar)	<b>1</b>
• With visible display (setting: bar)	<b>6</b>
• With customer-specific display (setting as specified, Order code "Y21" required)	<b>7</b>

**Ordering information**

1st order item: Pressure transmitter 7MF4634-...

2nd order item: Mounting flange 7MF4912-...

**ordering example**

Item line 1: 7MF4634-1EY20-1AA1

Item line 2: 7MF4912-3GE01

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- 1) Without cable gland, with blanking plug.
- 2) With enclosed cable gland Ex ia and blanking plug.
- 3) Configurations with device plugs Han and M12 are only available in Ex ic.
- 4) Only in connection with IP66.
- 5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 6) M12 delivered without cable socket
- 7) Only in connection with Ex approval A, B, E or F.

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF	<i>Further designs</i>	HART	PA	FF
Add "-Z" to Article No. and specify Order code.				Add "-Z" to Article No. and specify Order code.			
<b>O-rings for process flanges on low-pressure side</b> (instead of FPM (Viton))				<b>Use on zone 1D / 2D<sup>3)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)	E01	✓	✓
• PTFE (Teflon)	A20	✓	✓	<b>Overfilling safety device for flammable and non-flammable liquids</b> (max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex ia)", to WHG and VbF, not together with measuring cell filling "inert liquid")	E08	✓	
• FEP (with silicone core, approved for food)	A21	✓	✓	<b>Export approval Korea</b>	E11	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	<b>Dual seal</b>	E24	✓	✓
• NBR (Buna N)	A23	✓	✓	<b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-B..)	E25 <sup>4)</sup>	✓	✓
<b>Device plugs<sup>1)</sup></b>				<b>"Flameproof" explosion protection according to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-D..)	E26 <sup>4)</sup>	✓	✓
• Han 7D (metal)	A30	✓		<b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-P..)	E28 <sup>4)</sup>	✓	✓
• Han 8D (instead of Han 7D)	A31	✓		<b>Ex Approval IEC Ex (Ex ia)</b> (only for transmitter 7MF4...-.....-B..)	E45 <sup>4)</sup>	✓	✓
• Angled	A32	✓		<b>Ex Approval IEC Ex (Ex d)</b> (only for transmitter 7MF4...-.....-D..)	E46 <sup>4)</sup>	✓	✓
• Han 8D (metal)	A33	✓		<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E55 <sup>4)</sup>	✓	✓
<b>Sealing screw</b>				<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>4)</sup>	✓	✓
¼-18 NPT, with vent valve in mat. of process flanges	A40	✓	✓	<b>Ex protection "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>4)</sup>	✓	✓
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	<b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>4)</sup>	✓	✓
<b>Rating plate inscription</b> (instead of German)				<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 <sup>4)</sup>	✓	✓
• English	B11	✓	✓	<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓
• French	B12	✓	✓	<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	E81	✓	✓
• Spanish	B13	✓	✓	<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓
• Italian	B14	✓	✓	<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓
• Cyrillic (russian)	B16	✓	✓	<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	G10	✓	✓
<b>English rating plate</b>	B21	✓	✓	<b>Replacement of process connection side</b>	H01	✓	✓
Pressure units in inH <sub>2</sub> O and/or psi							
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)</b>	C11	✓	✓				
<b>Inspection certificate</b> Acc. to EN 10204-3.1	C12	✓	✓				
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓				
<b>Inspection certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓				
<b>Functional safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓					
<b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>	C21 <sup>2)</sup>		✓				
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓					
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓				
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓					
<b>Degree of protection IP66/IP68</b> (only for M20x1.5 and ½-14 NPT)	D12	✓	✓				
<b>Supplied with oval flange</b> (1 item), PTFE packing and screws in thread of process flange	D37	✓	✓				
<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓				



Selection and Ordering data		Order code			Selection and Ordering data		Order code		
<i>Further designs</i>		HART	PA	FF	<i>Additional data</i>		HART	PA	FF
Add "-Z" to Article No. and specify Order code.					Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Transient protector 6 kV (lightning protection)</b>	<b>J01</b>	✓	✓	✓	<b>Measuring range to be set</b>	<b>Y01</b>	✓	✓ <sup>1)</sup>	
<b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>5)</sup></b>	<b>J08</b>	✓	✓	✓	Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
<b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>5)</sup></b>	<b>J09</b>	✓	✓	✓	<b>Stainless steel tag plate and entry in device variable (measuring point description)</b>	<b>Y15</b>	✓	✓	✓
					Max. 16 characters, specify in plain text: Y15: .....				
					<b>Measuring point text (entry in device variable)</b>	<b>Y16</b>	✓	✓	✓
					Max. 27 characters, specify in plain text: Y16: .....				
					<b>Entry of HART address (TAG)</b>	<b>Y17</b>	✓		
					Max. 8 characters, specify in plain text: Y17: .....				
					<b>Setting of pressure indicator in pressure units</b>	<b>Y21</b>	✓	✓	✓
					Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ...				
					Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>*)</sup> , inH <sub>2</sub> O <sup>*)</sup> , ftH <sub>2</sub> O <sup>*)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % *) ref. temperature 20 °C				
					<b>Setting of pressure indicator in non-pressure units<sup>2)</sup></b>	<b>Y22<sup>3)</sup> + Y01</b>	✓		
					Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)				
					<b>Preset bus address</b>	<b>Y25</b>		✓	✓
					possible between 1 and 126 Specify in plain text: Y25: .....				
					<b>Damping adjustment in seconds (0 ... 100 s)</b>	<b>Y30</b>	✓	✓	✓

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

<sup>1)</sup> Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.

<sup>3)</sup> Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

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## Selection and Ordering data

Article No. Order code

### Mounting flange

Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

### Connection to EN 1092-1

#### Nominal diameter Nominal pressure

Nominal diameter	Nominal pressure	Article No.	Order code
DN 25	PN 10/16/25/40	Z	J 0 A
	PN 63/100/160	Z	J 0 B
	PN 10/16/25/40	Z	J 0 C
DN 40	PN 63/100	Z	J 0 D
	PN 160	Z	J 0 E
	PN 10/16/25/40	A	
DN 50	PN 100	B	
	PN 10/16/25/40	D	
DN 80	PN 10/16	G	
DN 100	PN 25/40	H	

### Connection to ASME B16.5

#### Nominal diameter Nominal pressure

Nominal diameter	Nominal pressure	Article No.	Order code
1 inch	class 150	Z	J 6 A
	class 300	Z	J 6 B
	class 400/600	Z	J 6 C
	class 900/1500	Z	J 6 D
	class 150	Z	J 6 E
1½ inch	class 300	Z	J 6 F
	class 400/600	Z	J 6 G
	class 900/1500	Z	J 6 H
2 inch	class 150	L	
	class 300	M	
	class 400/600	N	
3 inch	class 900/1500	P	
	class 150	Q	
	class 300	R	
4 inch	class 150	T	
	class 300	U	

### Flange acc. to JIS

#### Nominal diameter Nominal pressure

Nominal diameter	Nominal pressure	Article No.	Order code
JIS DN 50	10 K 316L	Z	J 7 A
	20 K 316L	Z	J 7 B
JIS DN 80	10 K 316L	Z	J 7 C
	20 K 316L	Z	J 7 D

Other version, add Order code and plain text:  
Nominal diameter: ...; Nominal press.: ...

### Wetted parts materials

- Stainless steel 316L
  - Coated with PFA
  - Coated with PTFE
  - Coated with ECTFE<sup>1)</sup>
- Monel 400, mat. no. 2.4360
- Hastelloy C276, mat. no. 2.4819
- Hastelloy C4, mat. no. 2.4602
- Hastelloy C22, mat. no. 2.4602
- Tantalum
- Titanium, mat. no. 3.7035 (max. 150 °C (302 °F))
- Nickel 201 (max. 260 °C (500 °F))
- Duplex 2205, mat. no. 1.4462
- Duplex 2205, mat. no. 1.4462, incl. main body
- Stainless steel 316L, gold plated, thickness approx. 25 µm

### Tube length

- without tube

Other version: add Order code and plain text:  
material of parts in contact with medium: .....,  
tubus length: .....

## Selection and Ordering data

Article No. Order code

### Mounting flange

Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series

### Customer-specific tubus length

Specify customer-specific length with Y44, see Order Code

- Wetted parts materials: Stainless steel without foil

Range	Standard length	Order code
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	A 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	A 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	A 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	A 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	A 5

- Wetted parts materials: Stainless steel coated with ECTFE

Range	Standard length	Order code
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	F 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	F 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	F 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	F 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	F 5

- Wetted parts materials: Stainless steel coated with PFA

Range	Standard length	Order code
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	D 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	D 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	D 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	D 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	D 5

- Wetted parts materials: Monel 400

Range	Standard length	Order code
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	G 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	G 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	G 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	G 4

- Wetted parts materials: Hastelloy C276

Range	Standard length	Order code
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	J 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	J 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	J 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	J 4

- Wetted parts materials: Tantalum

Range	Standard length	Order code
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	K 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	K 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	K 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	K 4

### Filling liquid

- Silicone oil M5
- Silicone oil M50
- High-temperature oil
- Halocarbon oil (for O<sub>2</sub>-measurement)<sup>2)</sup>
- Food oil (FDA-listed)

Other version, add  
Order code and plain text:  
filling liquid: ...

<sup>1)</sup> For vacuum on request

<sup>2)</sup> Oil and grease-free cleaning according to DIN 25410, level 2, and packaging included in scope of delivery. Refer to "Further designs" C10 and E10.

Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF
Add "-Z" to Article No. and specify Order code.			
<b>Customer-specific tubus length</b> Select range, enter desired length in plain text (No entry = standard length)	Y44	✓	✓
<b>Spark arrester</b> For mounting on zone 0 (incl. documentation)	A01	✓	✓
<b>Remote seal nameplate</b> attached out of stainless steel, contains Article No. and order number of the remote seal supplier	B20	✓	✓
<b>Oil- and grease-free cleaned version</b> Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2	C10	✓	✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)</b>	C11	✓	✓
<b>Inspection certificate</b> Acc. to EN 10204-3.1	C12	✓	✓
<b>2.2 Certificate of FDA approval of fill oil</b> Only in conjunction with filling liquid "Food oil" (FDA listed)"	C17	✓	✓
<b>"Functional safety (SIL2)" certificate to IEC 61508</b> (only for conjunction with the Order code "C20" in the case of SITRANS P DS III transmitter)	C20	✓	✓
<b>"Functional safety (SIL2/3)" certificate to IEC 61508</b> (only for conjunction with the Order code "C23" in the case of SITRANS P DS III transmitter)	C23	✓	✓
<b>Certification acc. to NACE MR-0175</b> Includes inspection certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D07	✓	✓
<b>Certification acc. to NACE MR-0103</b> Includes inspection certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D08	✓	✓
<b>Oil- and grease-free cleaned version</b> Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2	E10	✓	✓
<b>Epoxy painting</b> Not possible with negative pressure service Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42..., only possible with process connection G½B according to EN 837-1.	E15	✓	✓

Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF
Add "-Z" to Article No. and specify Order code.			
<b>One sided-mounting, sealing surface below</b>	H20		
<b>Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)</b> previously DIN 2501, form E	J11	✓	✓
<b>Sealing surface groove, EN 1092-1, form D</b> instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	J14	✓	✓
<b>Sealing surface with spring according to EN 1092-1, form F, (previously DIN 2512, form F) in stainless steel 316L</b>	J30	✓	✓
DN 25	J31	✓	✓
DN 40	J32	✓	✓
DN 50	J33	✓	✓
DN 80	J34	✓	✓
DN 100	J35	✓	✓
DN 125			
<b>Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L</b>	J40	✓	✓
DN 25	J41	✓	✓
DN 40	J42	✓	✓
DN 50	J43	✓	✓
DN 80	J44	✓	✓
DN 100	J45	✓	✓
DN 125			
<b>Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L</b>	J50	✓	✓
DN 25	J51	✓	✓
DN 40	J52	✓	✓
DN 50	J53	✓	✓
DN 80	J54	✓	✓
DN 100	J55	✓	✓
DN 125			
<b>Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA</b> instead of sealing surface B2 or RFSF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80)	J12	✓	✓
<b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b> instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)	J24	✓	✓
<b>Elongated pipe, 150 mm instead of 100 mm,</b> max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid.	R15	✓	✓
<b>Elongated pipe, 200 mm instead of 100 mm,</b> max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R20	✓	✓
<b>Negative pressure service</b> for use in the low-pressure measuring range for transmitter for level Note: suffix "Y01" required with pressure transmitter	V04	✓	✓
<b>Extended negative pressure service</b> for use in the low-pressure measuring range for transmitter for level Note: suffix "Y01" required with pressure transmitter ✓ = available	V54	✓	✓

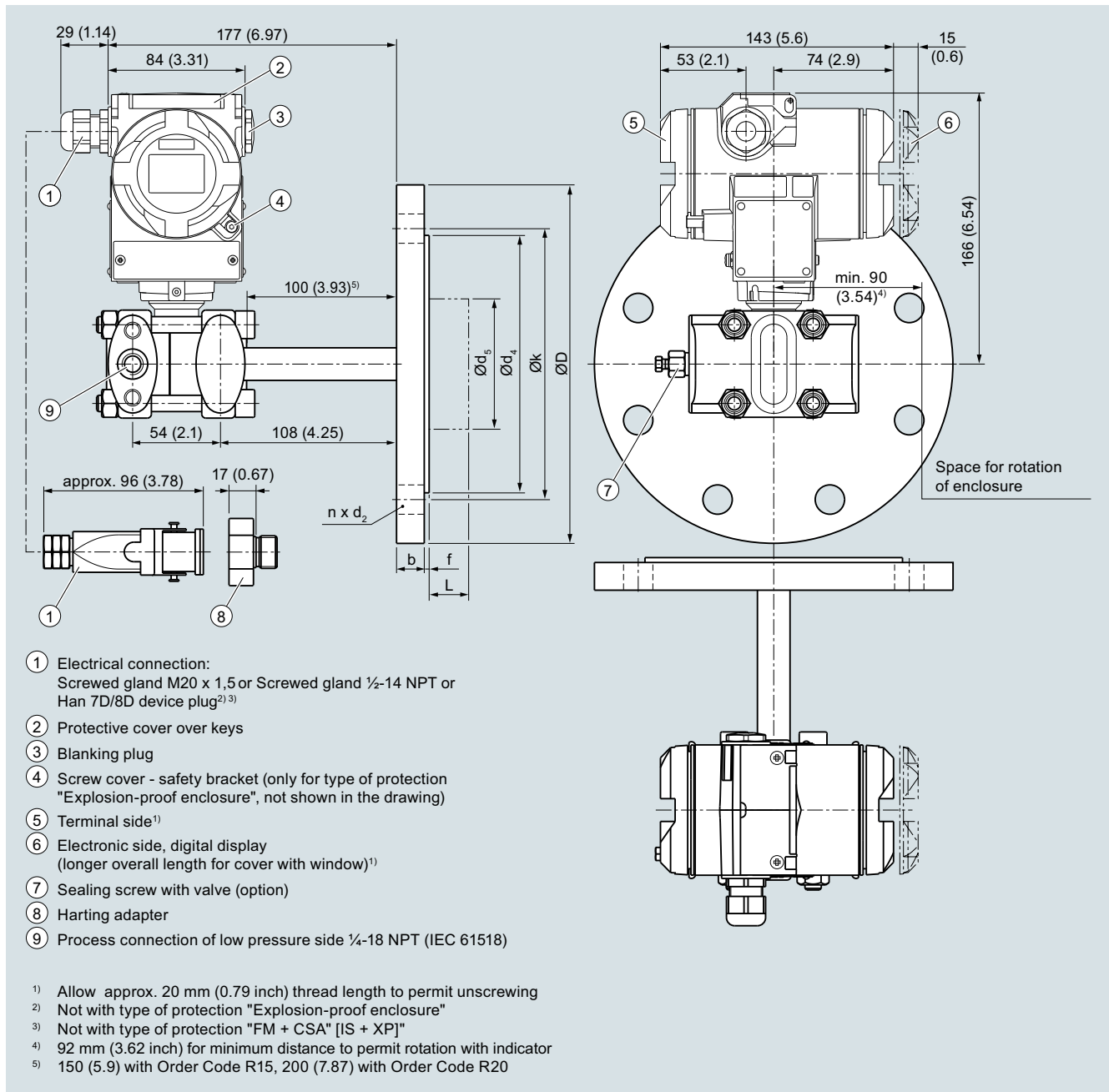
## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

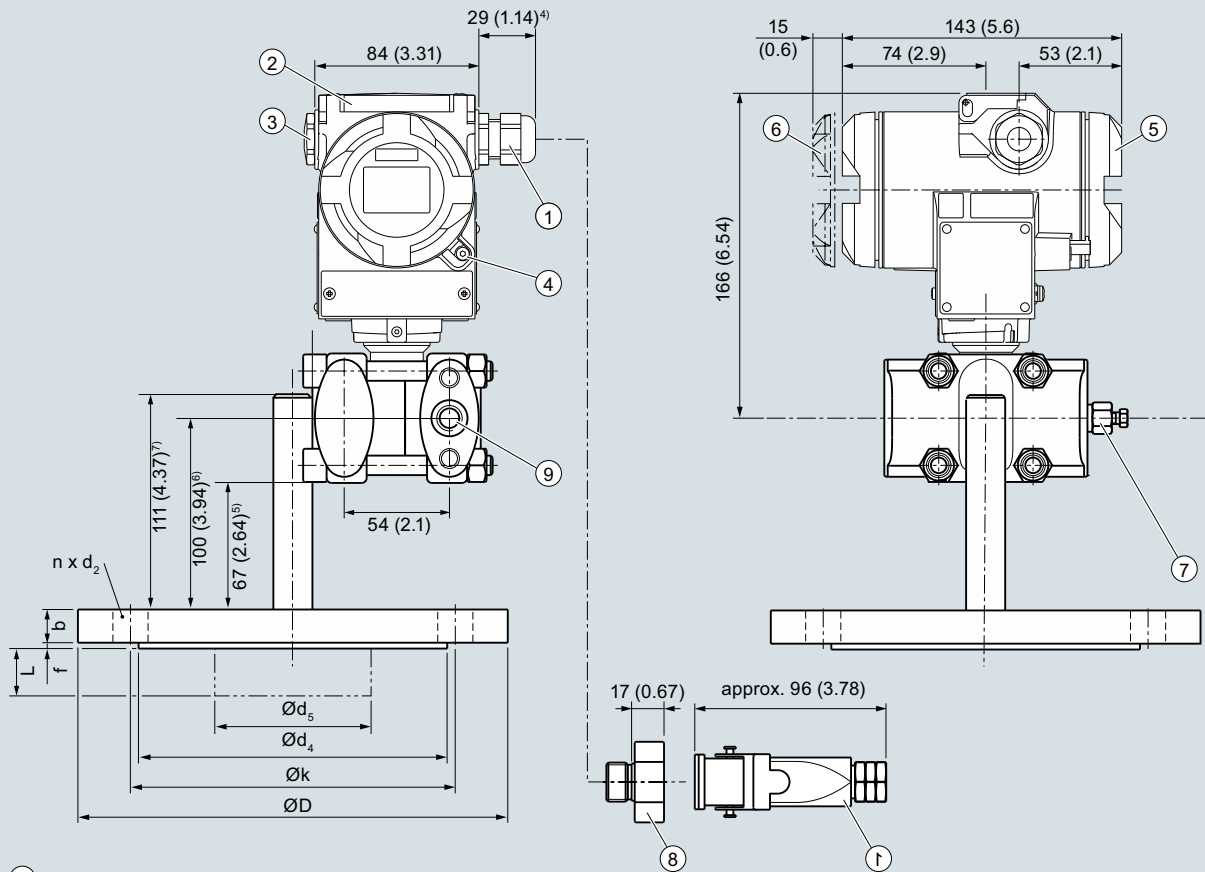
for level

1

### Dimensional drawings



SITRANS P DS III with HART pressure transmitters for level, including mounting flange, dimensions in mm (inch)



- 1) Electrical connection:  
Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/8D device plug<sup>2) 3)</sup>
- 2) Protective cover over keys
- 3) Blanking plug
- 4) Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- 5) Terminal side<sup>1)</sup>
- 6) Electronic side, digital display (longer overall length for cover with window)<sup>1)</sup>
- 7) Sealing screw with valve (option)
- 8) Harting adapter
- 9) Process connection of low pressure side ¼-18 NPT (IEC 61518)

<sup>1)</sup> Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [IS + XP]"

<sup>4)</sup> For Pg 13,5 with adapter approx. 45 mm (1.77 inch)

<sup>5)</sup> 117 (4.61) with Order Code R15, 167 (6.57) with Order Code R20

<sup>6)</sup> 150 (5.91) with Order Code R15, 200 (7.87) with Order Code R20

<sup>7)</sup> 161 (6.34) with Order Code R15, 211 (8.31) with Order Code R20

SITRANS P DS III with HART pressure transmitters for level, including mounting flange, one sided-mounting, sealing surface below (order code H20), dimensions in mm (inch)

## Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub>	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 50	PN 10/16/25/40	20	165	90	18	102	48.3	45 <sup>1)</sup>	2	125	4	0, 50, 100, 150 or 200
	PN 100	28	195	90	26	102	48.3	45 <sup>1)</sup>	2	145	8	
DN 80	PN 10/16/25/40	24	200	90	18	138	76	72 <sup>2)</sup>	2	160	8	
	PN 100	32	230	90	26	138	76	72 <sup>2)</sup>	2	180	8	
DN 100	PN 10/16	20	220	115	18	158	94	89	2	180	8	
	PN 25/40	24	235	115	22	162	94	89	2	190	8	

Connection to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub>	f	k	n	L
		lb./sq.in	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)
2 inch	150	0.77 (19.5)	5.91 (150)	0.79 (20)	3.62 (92)	1.9 (48.3)	1.77 <sup>1)</sup> (45)	0.08 (2)	4.74 (120.5)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.89 (22.7)	6.5 (165)	0.79 (20)	3.62 (92)	1.9 (48.3)	1.77 <sup>1)</sup> (45)	0.08 (2)	5 (127)	8	
	400/600	1.28 (32.4)	6.5 (165)	0.79 (20)	3.62 (92)	1.9 (48.3)	1.77 <sup>1)</sup> (45)	0.28 (7)	5 (127)	8	
	900/1500	1.78 (45.1)	8.46 (215)	1.02 (26)	5 (127)	1.9 (48.3)	1.77 <sup>1)</sup> (45)	0.28 (7)	6.5 (165)	8	
3 inch	150	0.96 (24.3)	7.48 (190)	0.79 (20)	5 (127)	3 (76)	2.83 <sup>2)</sup> (72)	0.08 (2)	6 (152.5)	4	
	300	1.14 (29)	8.27 (210)	0.87 (22)	5 (127)	3 (76)	2.83 <sup>2)</sup> (72)	0.08 (2)	6.63 (168.5)	8	
	600	1.53 (38.8)	8.27 (210)	0.87 (22)	5 (127)	3 (76)	2.83 <sup>2)</sup> (72)	0.28 (7)	6.63 (168.5)	8	
4 inch	150	0.96 (24.3)	9.06 (230)	0.79 (20)	6.22 (158)	3.69 (94)	3.5 (89)	0.08 (2)	7.5 (190.5)	8	
	300	1.27 (32.2)	10.04 (255)	0.87 (22)	6.22 (158)	3.69 (94)	3.5 (89)	0.08 (2)	7.87 (200)	8	
	400	1.65 (42)	10.04 (255)	1.02 (26)	6.22 (158)	3.69 (94)	3.5 (89)	0.28 (7)	7.87 (200)	8	

d: Internal diameter of gasket to DIN 2690

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L=0.

<sup>2)</sup> 89 mm = 3½ inch with tube length L=0.

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<b>Replacement measuring cell for pressure for SITRANS P DS III</b>	<b>7MF4990 -</b> 0 - 0 DB 0	<b>Replacement measuring cell for absolute pressure for SITRANS P DS III (from the pressure series)</b>	<b>7MF4992 -</b> 0 - 0 DB 0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Measuring cell filling Measuring cell cleaning</b>		<b>Measuring cell filling Measuring cell cleaning</b>	
Silicone oil Normal	1	Silicone oil Normal	1
Inert liquid grease-free to cleanliness level 2	3	Inert liquid grease-free to cleanliness level 2	3
<b>Measured span (min. ... max.)</b>		<b>Measured span (min. ... max.)</b>	
8.3 ... 250 mbar (0.12 ... 3.6 psi)	A	8.3 ... 250 mbar a (0.12 ... 3.63 psi a)	D
0.01 ... 1 bar (0.15 ... 14.5 psi)	B	43 ... 1300 mbar a (0.62 ... 18.86 psi a)	F
0.04 ... 4 bar (0.6 ... 58 psi)	C	0.16 ... 5 bar a (2.32 ... 72.5 psi a)	G
0.16 ... 16 bar (2.32 ... 232 psi)	D	1 ... 30 bar a (14.5 ... 435 psi a)	H
0.63 ... 63 bar (9.14 ... 914 psi)	E		
1.6 ... 160 bar (23.2 ... 2 320 psi)	F	<b>Wetted parts materials</b>	
4.0 ... 400 bar (58.0 ... 5 802 psi)	G	Seal diaphragm Process connection	
7.0 ... 700 bar (102.0 ... 10 153 psi)	J		
<b>Wetted parts materials</b>		Stainless steel Stainless steel	A
Seal diaphragm Process connection		Hastelloy Stainless steel	B
Stainless steel Stainless steel	A	Hastelloy Hastelloy	C
Hastelloy Stainless steel	B		
Hastelloy Hastelloy	C	<b>Process connection</b>	
<b>Process connection</b>		• Connection shank G $\frac{1}{2}$ B to EN 837-1	0
• Connection shank G $\frac{1}{2}$ B to EN 837-1	0	• Female thread $\frac{1}{2}$ -14 NPT	1
• Female thread $\frac{1}{2}$ -14 NPT	1	• Oval flange made of stainless steel, max. measuring span 160 bar (2320 psi)	
• Oval flange made of stainless steel, max. measuring span 160 bar (2320 psi)		- Mounting thread $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518	2
- Mounting thread $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518	2	- Mounting thread M10 to DIN 19213	3
- Mounting thread M10 to DIN 19213	3	<b>Further designs</b>	Order code
<b>Further designs</b>	Order code	Please add "-Z" to Article No. and specify Order code.	
Please add "-Z" to Article No. and specify Order code.		<b>Inspection certificate</b>	<b>C12</b>
<b>Inspection certificate</b>	<b>C12</b>	to EN 10204-3.1	
to EN 10204-3.1			

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

## Accessories/Spare Parts

1

Selection and Ordering data	Article No.
<b>Replacement measuring cell for absolute pressure (from the differential pressure series)</b> for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series	<b>7MF4993 -</b> - 0 DC 0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Measuring cell filling Measuring cell cleaning</b>	
Silicone oil Normal	1
Inert liquid grease-free to cleanliness level 2	3
<b>Measured span (min. ... max.)</b>	
8.3 ... 250 mbar a (0.12 ... 3.63 psi a)	D
43 ... 1300 mbar a (0.62 ... 18.86 psi a)	F
0.16 ... 5 bar a (2.32 ... 72.5 psi a)	G
1 ... 30 bar a (14.5 ... 435 psi a)	H
5.3 ... 100 bar a (76.9 ... 1450 psi a)	KE
<b>Wetted parts materials</b>	
Seal diaphragm Parts of measuring cell	
Stainless steel Stainless steel	A
Hastelloy Stainless steel	B
Hastelloy Hastelloy	C
Tantalum Tantalum	E
Monel Monel	H
Gold Gold	L
<b>Process connection</b>	
Female thread 1/4-18 NPT with flange connection	
• Sealing screw opposite process connection	
- Mounting thread M10 to DIN 19213	0
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518	2
• Vent on side of process flange <sup>1)</sup>	
- Mounting thread M10 to DIN 19213	4
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518	6
<b>Non-wetted parts materials</b>	
• Stainless steel process flange screws	2
<b>Further designs</b>	Order code
Please add "-Z" to Article No. and specify Order code.	
<b>O-rings for process flanges</b> (instead of FPM (Viton))	
• PTFE (Teflon)	A20
• FEP (with silicone core, approved for food)	A21
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22
• NBR (Buna N)	A23
<b>Inspection certificate</b> to EN 10204-3.1	C12
<b>Process connection G1/2B</b>	D16
<b>Remote seal flanges</b> (not together with K01, K02 and K04)	D20
<b>Vent on side for gas measurements</b>	H02
<b>Process flanges</b>	
• without	K00
• with process flange made of	
- Hastelloy	K01
- Monel	K02
- Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi) max. temperature of medium 90 °C (194 °F) For 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	K04


<sup>1)</sup> Not for measuring span 5.3 ... 100 bar (76.9 ... 1450 psi)

Selection and Ordering data	Article No.
<b>Replacement measuring cell for differential pressure and PN 32/160 (MAWP 464/2320 psi)</b> for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series	<b>7MF4994 -</b> - 0 DC 0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Measuring cell filling Measuring cell cleaning</b>	
Silicone oil Normal	1
Inert liquid grease-free to cleanliness level 2	3
<b>Measured span (min. ... max.)</b>	
<b>PN 32 (MAWP 464 psi)</b>	
1 ... 20 mbar <sup>1)</sup> (0.4 ... 8 inH <sub>2</sub> O)	B
<b>PN 160 (MAWP 2320 psi)</b>	
1 ... 60 mbar (0.4 ... 24 inH <sub>2</sub> O)	C
2.5 ... 250 mbar (1 ... 100 inH <sub>2</sub> O)	D
6 ... 600 mbar (2.4 ... 240 inH <sub>2</sub> O)	E
16 ... 1600 mbar (6.4 ... 642 inH <sub>2</sub> O)	F
50 ... 5000 mbar (20 ... 2000 inH <sub>2</sub> O)	G
0.3 ... 30 bar (4.35 ... 435 psi)	H
<b>Wetted parts materials</b> (stainless steel process flanges)	
Seal diaphragm Parts of measuring cell	
Stainless steel Stainless steel	A
Hastelloy Stainless steel	B
Hastelloy Hastelloy	C
Tantalum <sup>2)</sup> Tantalum	E
Monel <sup>2)</sup> Monel	H
Gold <sup>2)</sup> Gold	L
<b>Process connection</b>	
Female thread 1/4-18 NPT with flange connection	
• Sealing screw opposite process connection	
- Mounting thread M10 to DIN 19213	0
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518	2
• Vent on side of process flange	
- Mounting thread M10 to DIN 19213	4
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518	6
<b>Non-wetted parts materials</b>	
Stainless steel process flange screws	2
<b>Further designs</b>	Order code
Please add "-Z" to Article No. and specify Order code.	
<b>O-rings for process flanges</b> (instead of FPM (Viton))	
• PTFE (Teflon)	A20
• FEP (with silicone core, approved for food)	A21
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22
• NBR (Buna N)	A23
<b>Inspection certificate</b> to EN 10204-3.1	C12
<b>Remote seal flanges</b> (not together with K01, K02 and K04)	D20
<b>Vent on side for gas measurements</b>	H02
<b>Stainless steel process flanges for vertical differential pressure lines</b> (not together with K01, K02 and K04)	H03
<b>Process flanges</b>	
• without	K00
• with process flange made of	
- Hastelloy	K01
- Monel	K02
- Stainless steel with PVDF insert, max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F). For 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	K04

<sup>1)</sup> Not suitable for connection of remote seal

<sup>2)</sup> Only together with max. measuring span 250, 1600, 5000 and 30000 mbar (100 inH<sub>2</sub>O, 642 inH<sub>2</sub>O, 2000 inH<sub>2</sub>O and 435 psi).



Selection and Ordering data	Article No.
<b>Replacement measuring cell for differential pressure and PN 420 (MAWP 6092 psi)</b> for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series  ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	<b>7MF4995 -</b>  <b>- 0 DC 0</b>
<b>Measuring cell filling</b> <b>Measuring cell cleaning</b> Silicone oil                      Normal	1
<b>Measured span (min. ... max.)</b> 2.5 ... 250 mbar              (1 ... 100 inH <sub>2</sub> O) 6 ... 600 mbar                (2.4 ... 240 inH <sub>2</sub> O) 16 ... 1600 mbar              (6.4 ... 642 inH <sub>2</sub> O) 50 ... 5000 mbar              (20 ... 2000 inH <sub>2</sub> O) 0.3 ... 30 bar                 (4.35 ... 435 psi)	D E F G H
<b>Wetted parts materials</b> (stainless steel process flanges)  Seal diaphragm              Parts of measuring cell  Stainless steel                Stainless steel Hastelloy                      Stainless steel Gold <sup>1)</sup> Gold	A B L
<b>Process connection</b> Female thread 1/4-18 NPT with flange connection • Sealing screw opposite process connection - Mounting thread M12 to DIN 19213 - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 • Vent on side of process flange - Mounting thread M12 to DIN 19213 - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518	1 3  5 7
<b>Non-wetted parts materials</b> • Stainless steel process flange screws	2
<b>Further designs</b>  Please add "-Z" to Article No. and specify Order code.	Order code
<b>O-rings for process flanges</b> (instead of FPM (Viton)) • PTFE (Teflon) • FEP (with silicone core, approved for food) • FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F)) • NBR (Buna N)	A20 A21 A22  A23
<b>Inspection certificate</b> to EN 10204-3.1	C12
<b>Stainless steel process flanges for vertical differential pressure lines</b>	H03
<b>without process flanges</b>	K00

<sup>1)</sup> Not together with max. measuring span 600 mbar (240 inH<sub>2</sub>O)

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

## Accessories/Spare Parts

1

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<i>Spare parts/Accessories</i>			
<b>Mounting bracket and fastening parts</b> for pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF403-.....-..C.) For absolute pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF423-.....-..C.) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AB</b> <b>7MF4997-1AH</b> <b>7MF4997-1AP</b>	<b>Digital indicator</b> Including mounting material for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus	<b>7MF4997-1BR</b>
<b>Mounting bracket and fastening parts</b> for pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF403-.....-..A., ..B., ..D. and ..F.) For absolute pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF423-.....-..A., ..B., ..D. and ..F.) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AC</b> <b>7MF4997-1AJ</b> <b>7MF4997-1AQ</b>	<b>Measuring point label</b> <ul style="list-style-type: none"> <li>without inscription (5 units)</li> <li>Printed (1 unit)                Data according to Y01 or Y02, Y15, Y16 and Y99 (see "Pressure transmitters")</li> </ul>	<b>7MF4997-1CA</b> <b>7MF4997-1CB-Z</b> <b>Y... ..</b>
<b>Mounting and fastening brackets</b> For differential pressure transmitters with flange thread M10 SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF433-.... and 7MF443-....) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AD</b> <b>7MF4997-1AK</b> <b>7MF4997-1AR</b>	<b>Mounting screws</b> For measuring point label, grounding and connection terminals or for display (50 units)	<b>7MF4997-1CD</b>
<b>Mounting and fastening brackets</b> For differential pressure transmitters with flange thread M12 SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF453-....) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AE</b> <b>7MF4997-1AL</b> <b>7MF4997-1AS</b>	<b>Sealing screws</b> (1 set = 2 units) for process flange <ul style="list-style-type: none"> <li>made of stainless steel</li> <li>made of Hastelloy</li> </ul>	<b>7MF4997-1CG</b> <b>7MF4997-1CH</b>
<b>Mounting and fastening brackets</b> For differential and absolute pressure transmitters with flange thread 7/16 -20 UNF SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF433-...., 7MF443-.... and 7MF453-....) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AF</b> <b>7MF4997-1AM</b> <b>7MF4997-1AT</b>	<b>Sealing screws with vent valve</b> Complete (1 set = 2 units) <ul style="list-style-type: none"> <li>made of stainless steel</li> <li>made of Hastelloy</li> </ul>	<b>7MF4997-1CP</b> <b>7MF4997-1CQ</b>
<b>Cover</b> Made of die-cast aluminum, including gasket, for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus. Compatible for Ex and non-Ex transmitters <ul style="list-style-type: none"> <li>without window</li> <li>with window</li> </ul>	<b>7MF4997-1BB</b> <b>7MF4997-1BE</b>	<b>Application electronics</b> <ul style="list-style-type: none"> <li>for SITRANS P DS III with HART</li> <li>for SITRANS P DS III with PROFIBUS PA</li> <li>for SITRANS P DS III with FOUNDATION Fieldbus</li> </ul>	<b>7MF4997-1DK</b> <b>7MF4997-1DL</b> <b>7MF4997-1DM</b>
<b>Cover</b> Made of stainless steel, including gasket, for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus. Compatible for Ex and non-Ex transmitters <ul style="list-style-type: none"> <li>without window</li> <li>with window</li> </ul>	<b>7MF4997-1BC</b> <b>7MF4997-1BF</b>	<b>Connection board</b> <ul style="list-style-type: none"> <li>for SITRANS P DS III</li> <li>for SITRANS P DS III PROFIBUS PA and FOUNDATION Fieldbus</li> </ul>	<b>7MF4997-1DN</b> <b>7MF4997-1DP</b>
		<b>O-rings for process flanges made of:</b> <ul style="list-style-type: none"> <li>FPM (Viton)</li> <li>PTFE (Teflon)</li> <li>FEP (with silicone core, approved for food)</li> <li>FFPM (Kalrez)</li> <li>NBR (Buna N)</li> </ul>	<b>7MF4997-2DA</b> <b>7MF4997-2DB</b> <b>7MF4997-2DC</b> <b>7MF4997-2DD</b> <b>7MF4997-2DE</b>
		<b>Sealing ring</b> for process connection	see "Fittings"
		<b>Weldable sockets for PMC connection</b> <ul style="list-style-type: none"> <li>PMC Style Standard: Thread 1½"</li> <li>PMC Style Minibolt: front-flush 1"</li> </ul>	<b>7MF4997-2HA</b> <b>7MF4997-2HB</b>
		<b>Gaskets for PMC connection</b> (packing unit = 5 units) <ul style="list-style-type: none"> <li>PTFE seal for PMC Style Standard: Thread 1½"</li> <li>Gasket made of Viton for PMC Style Minibolt: front-flush 1"</li> </ul>	<b>7MF4997-2HC</b> <b>7MF4997-2HD</b>
		<b>Weldable socket for TG52/50 and TG52/150 connection</b> <ul style="list-style-type: none"> <li>TG52/50 connection</li> <li>TG52/150 connection</li> </ul>	<b>7MF4997-2HE</b> <b>7MF4997-2HF</b>
		<b>Seals for TG 52/50 and TG 52/150 made of silicone (FDA compliant)</b>	<b>7MF4997-2HG</b>
		<b>Seals for flange connection with front-flush diaphragm</b> Material FKM (Viton); temperature range: -20 ... +200 °C (-4 ... +392 °F), 10 units <ul style="list-style-type: none"> <li>DN 25, PN 40 (M11)</li> <li>1", class 150 (M40)</li> </ul>	<b>7MF4997-2HH</b> <b>7MF4997-2HK</b>

Selection and Ordering data	Article No.
<p><b>Documentation</b></p> <p>The entire documentation is available for download free-of-charge in various languages at: <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a></p> <p>Compact operating instructions SITRANS P DS III/P410</p> <ul style="list-style-type: none"> <li>English, German, Spanish, French, Italian, Dutch</li> </ul>	<b>A5E03434626</b>
<p><b>Certificates (order only via SAP)</b> instead of Internet download</p> <ul style="list-style-type: none"> <li>hard copy (to order)</li> <li>on DVD (to order)</li> </ul>	<b>A5E03252406</b> <b>A5E03252407</b>
<p><b>HART modem</b> with USB interface</p>	<b>7MF4997-1DB</b>

Power supply units see Chap. 7 "Supplementary Components".

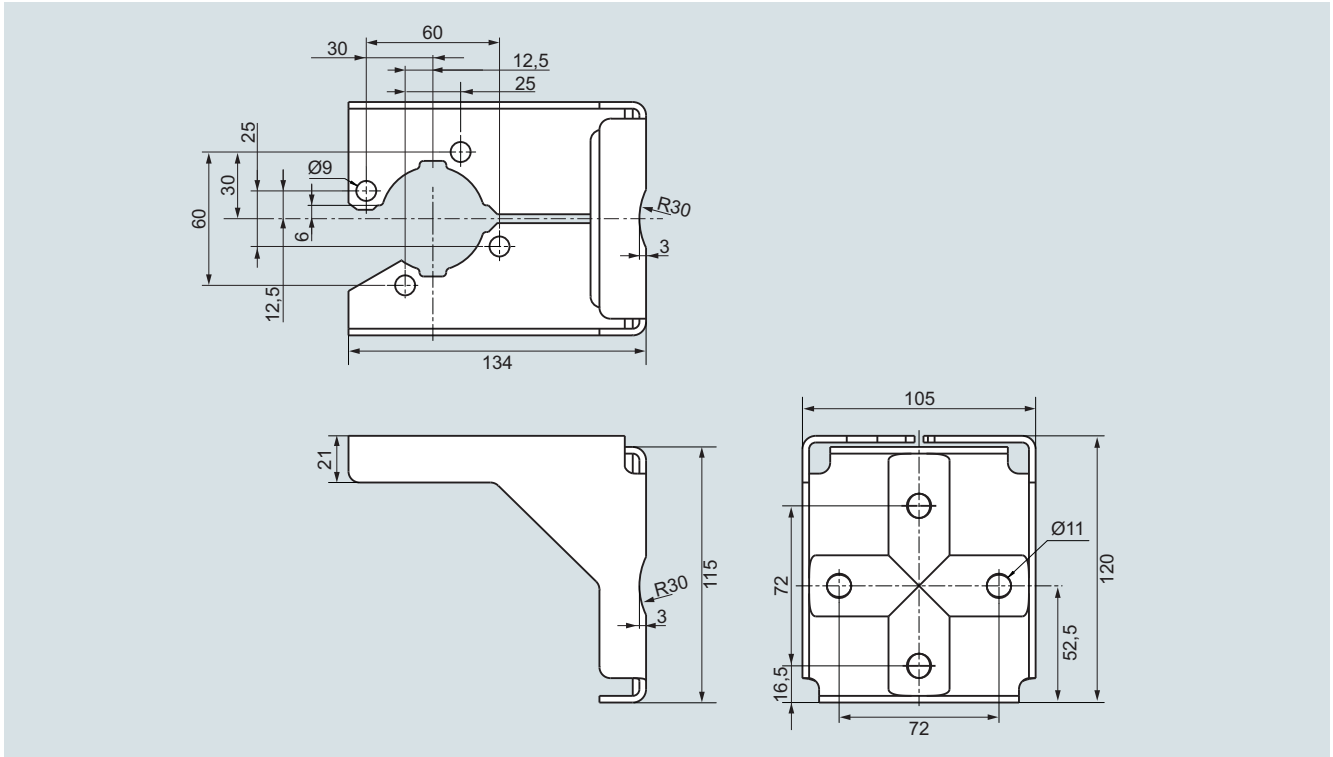
## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

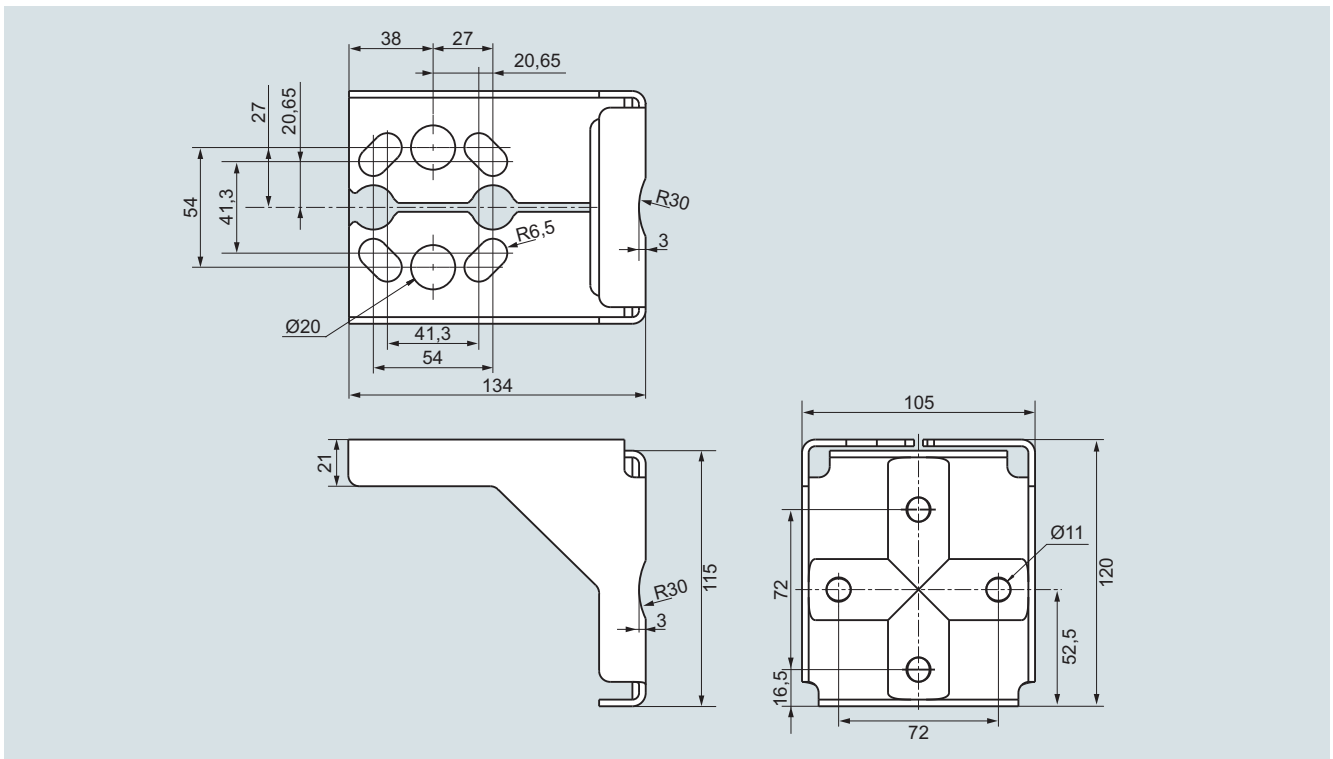
### Accessories/Spare Parts

1

### Dimensional drawings



Mounting bracket for SITRANS P DS III, SITRANS P410 gauge and absolute pressure-transmitters, dimensions in mm  
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



Mounting bracket for SITRANS P DS III and SITRANS P410 differential pressure transmitter, dimensions in mm  
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)

## Factory-mounting of valve manifolds on transmitters

## Overview

SITRANS P transmitters

- DS III for relative and absolute pressure (both designs) and
- DS III for differential pressure

can be delivered factory-fitted with the following valve manifolds:

- 7MF9011-4EA and 7MF9011-4FA valve manifolds for gauge pressure and absolute pressure transmitters
- 7MF9411-5BA and 7MF9411-5CA valve manifolds for absolute pressure and differential pressure transmitters

## Design

The 7MF9011-4EA valve manifolds are sealed with PTFE gaskets between the transmitter and the valve manifold as standard. Soft iron, stainless steel and copper gaskets are also available for sealing purposes if preferred.

The 7MF9011-4FA valve manifolds are sealed with PTFE sealing tape between the transmitter and the valve manifold.

The 7MF9411-5BA and 7MF9411-5CA valve manifolds are sealed with PTFE gaskets between the transmitter and the valve manifold.

The complete unit is checked for leaks under pressure after assembly (air pressure 6 bar (87 psi)) and certified with a factory certificate according to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the corresponding mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an inspection certificate 3.1 according to EN 10204 after choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitter and for the valve manifold.

## Selection and Ordering data

**7MF9411-5AA**  
 valve manifold for relative and absolute pressure transmitters


Add „**Z**“ to the Article No. of the transmitter and add order codes.

Order code

SITRANS P DSIII  
 7MF403-...2-..., 7MF423-...2-... ,  
 7MF403-...3-..., 7MF423-...3-... ,  
 7MF403-...4-..., 7MF423-...4-...

**T05**

With process connection oval flange with PTFE gasket and **steel** mounting screws.

Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2

**Additional versions:**

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

**A02**

Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold

**C12**

With manufacturer declaration according to NACE, MR-0175

**D07**

**7MF9411-5AA**  
 valve manifold for relative and absolute pressure transmitters


Add „**Z**“ to the Article No. of the transmitter and add order codes.

Order code

SITRANS P DSIII  
 7MF403-...2-..., 7MF423-...2-... ,  
 7MF403-...3-..., 7MF423-...3-... ,  
 7MF403-...4-..., 7MF423-...4-...

**T06**

With process connection oval flange with PTFE gasket and **stainless steel** mounting screws.

Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2

**Additional versions:**

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

**A02**

Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold

**C12**

With manufacturer declaration according to NACE, MR-0175

**D07**

## Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

### Factory-mounting of valve manifolds on transmitters

1

#### 7MF9011-4FA valve manifold on relative and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII  
7MF403-...1.-..., 7MF423-...1.-... **T03**

With process connection female thread 1/2-14 NPT in-sealed with PTFE sealing tape  
Delivery incl. high-pressure test certified by factory certificate according to EN 10204-2.2

##### Further designs:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter) **A02**

Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold **C12**

With manufacturer declaration according to NACE, MR-0175 **D07**

#### 7MF9011-4EA valve manifold on relative and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII  
7MF403-...0.-..., 7MF423-...0.-... **T02**

with process connection collar G 1/2 A to EN 837-1 with gasket made of PTFE between valve manifold and transmitter

##### Alternative sealing material:

- Soft iron **A70**
- Stainless steel, Mat. No. 14571 **A71**
- copper **A72**

Delivery incl. high-pressure test certified by factory certificate according to EN 10204-2.2

##### Further designs:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter) **A02**

Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold **C12**

With manufacturer declaration according to NACE, MR-0175 **D07**

#### 7MF9411-5BA valve manifold on absolute and differential pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII  
7MF433-..., 7MF443-... and 7MF453-...<sup>1)</sup>

mounted with gaskets made of PTFE and screws made of

- chromized steel **U01**
- made of stainless steel **U02**

Delivery incl. high-pressure test certified by factory certificate according to EN 10204-2.2

##### Further designs:

Delivery includes mounting bracket and mounting clips made of

- Steel **A01**
  - Stainless steel **A02**
- (instead of the mounting bracket supplied with the transmitter)

Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold **C12**

With manufacturer declaration according to NACE, MR-0175 **D07**

#### 7MF9411-5CA valve manifold on differential pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII  
7MF443-... and 7MF453-...<sup>1)</sup>

mounted with gaskets made of PTFE and screws made of

- chromized steel **U03**
- Stainless steel **U04**

Delivery incl. high-pressure test certified by factory certificate according to EN 10204-2.2

##### Further designs:

Delivery includes mounting bracket and mounting clips made of

- Steel **A01**
  - Stainless steel **A02**
- (instead of the mounting bracket supplied with the transmitter)

Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold **C12**

With manufacturer declaration according to NACE, MR-0175 **D07**

<sup>1)</sup> For 7MF453-... transmitters, you require a 7/10-20 UNF connection thread in the process flange

**Dimensional drawings**

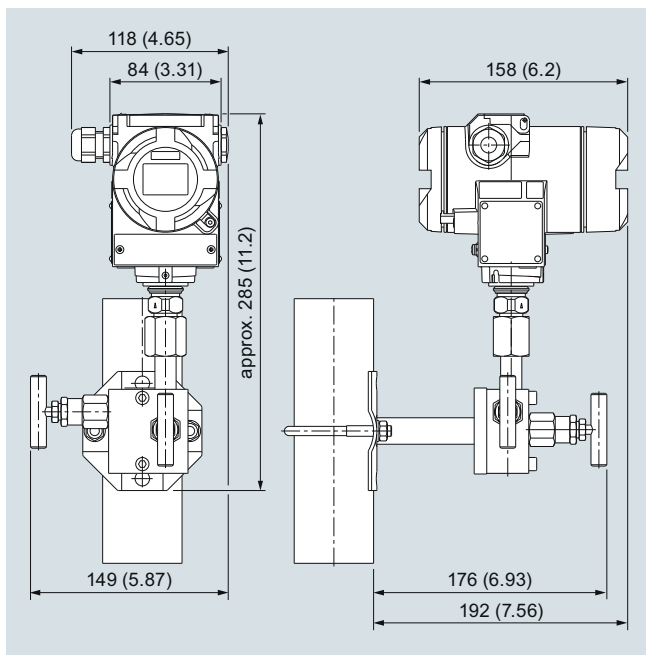
**Valve manifolds mounted on SITRANS P DS III**



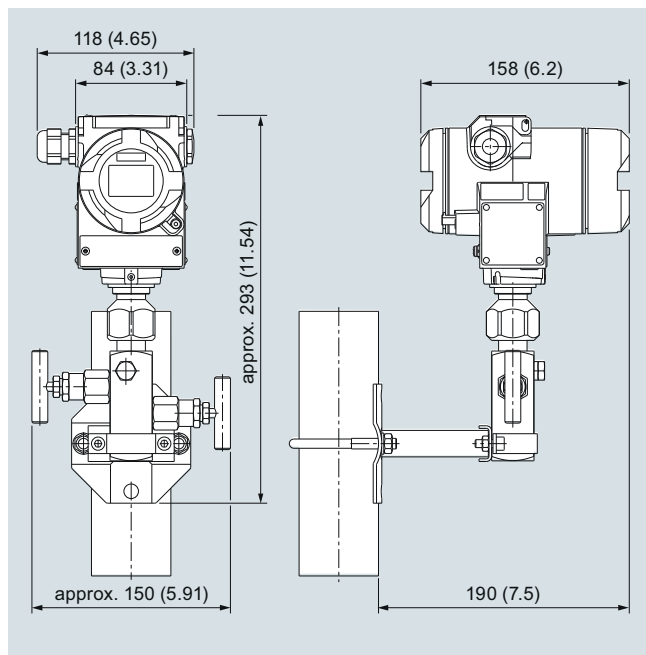
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)

# Pressure Measurement

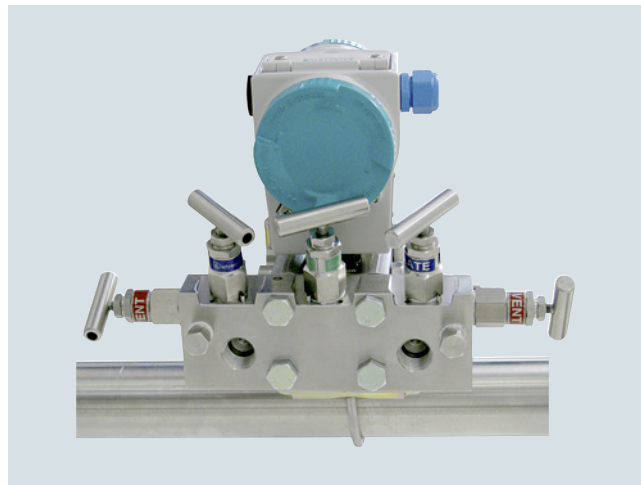
Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P DS III

1

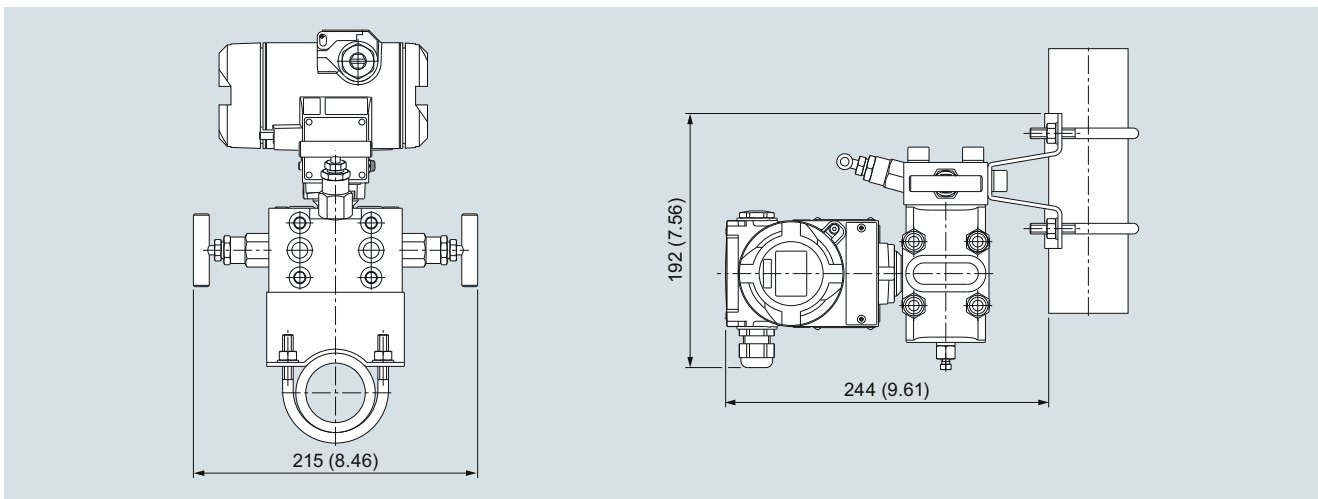
## Factory-mounting of valve manifolds on transmitters



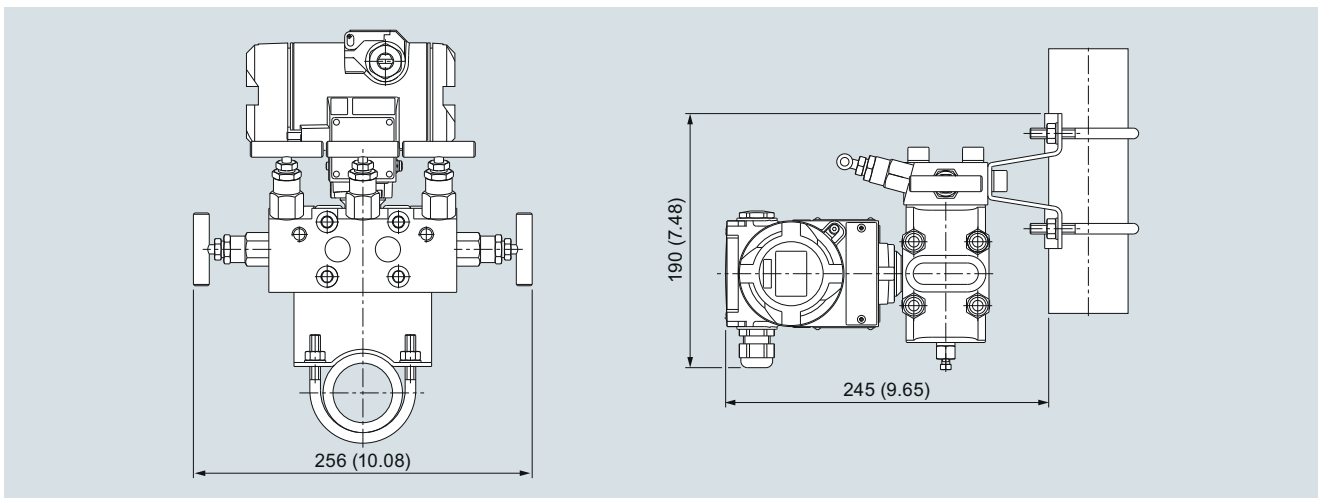
7MF9411-5BA valve manifold with mounted differential pressure transmitter



7MF9411-5CA valve manifold with mounted differential pressure transmitter



7MF9411-5BA valve manifold with mounted differential pressure transmitter, dimensions in mm (inch)



7MF9411-5CA valve manifold with mounted differential pressure transmitter, dimensions in mm (inch)



## Overview



SITRANS P410 pressure transmitters are digital pressure transmitters with a high level of operating convenience. Technically, they are based on the SITRANS P DS III but offer an increased measuring accuracy of 0.04%. This means the SITRANS P 410 is perfectly suited for measuring tasks with increased accuracy requirements. The parameterization is performed using input buttons or via HART or via PROFIBUS PA or FOUNDATION Fieldbus interface.

The comprehensive functionality makes for precise adjustment of the pressure transmitter to the requirements of the plant. Operation is very simple, despite the variety of setting options.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed in hazardous areas (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the respective harmonized European standards (ATEX).

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

SITRANS P410 pressure transmitters are available in various versions for measuring:

- Gauge pressure
- Differential pressure
- Volume flow
- Mass flow

## Benefits

- High quality and service life
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Minimal conformity error
- Good long-term stability
- Wetted parts made of high-grade materials (e.g., stainless steel, Hastelloy)
- Infinitely adjustable measuring spans from 0.01 bar to 160 bar (0.15 psi to 2321 psi) for P410 with HART interface
- Nominal measuring ranges from 1 bar to 160 bar (14.5 psi to 2321 psi) for P410 with PROFIBUS PA and FOUNDATION Fieldbus interface
- High measuring accuracy
- Parameterization over input buttons and HART, PROFIBUS PA or FOUNDATION Fieldbus interface.

## Application

SITRANS P410 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the P410 suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Flameproof enclosure" may be installed in hazardous areas (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 3 input buttons or programmed externally over HART or over PROFIBUS PA or FOUNDATION Fieldbus interface.

### **Pressure transmitter for gauge pressure**

Measured variable: Gauge pressure of aggressive and non-aggressive gases, vapors and liquids.

Measuring span (infinitely adjustable)

for P410 with HART: 0.01 bar to 160 bar (0.15 psi to 2321 psi)

Nominal measuring range

for P410 with PROFIBUS PA and FOUNDATION Fieldbus:  
1 bar to 160 bar (14.5 psi to 2321 psi)

### **Pressure transmitters for differential pressure and flow**

Measured variables:

- Differential pressure
- Small positive or negative pressure
- Flow  $q \sim \sqrt{\Delta p}$  (together with a primary differential pressure device (see Chapter "Flow Meters"))

Measuring span (infinitely adjustable)

for P410 with HART: 1 mbar ... 30 bar (0.0145 ... 435 psi)

Nominal measuring range

for P410 with PROFIBUS PA and FOUNDATION Fieldbus:  
20 mbar ... 30 bar (0.29 ... 435 psi)

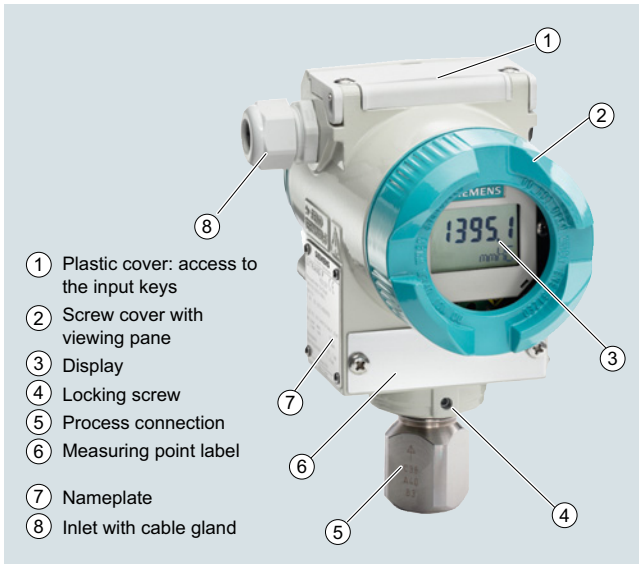
# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P410

## Technical description

1

### Design



Front view

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

The rating plate (7, Figure "Front view") with the Article No. is located on the side of the enclosure. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

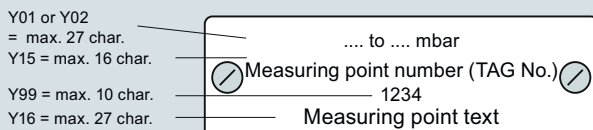
The approval label is located on the opposite side.

The enclosure is made of die-cast aluminium or stainless steel precision casting. A round cover (6) is screwed on at the front and rear of the enclosure. The front cover can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the enclosure.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the enclosure contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

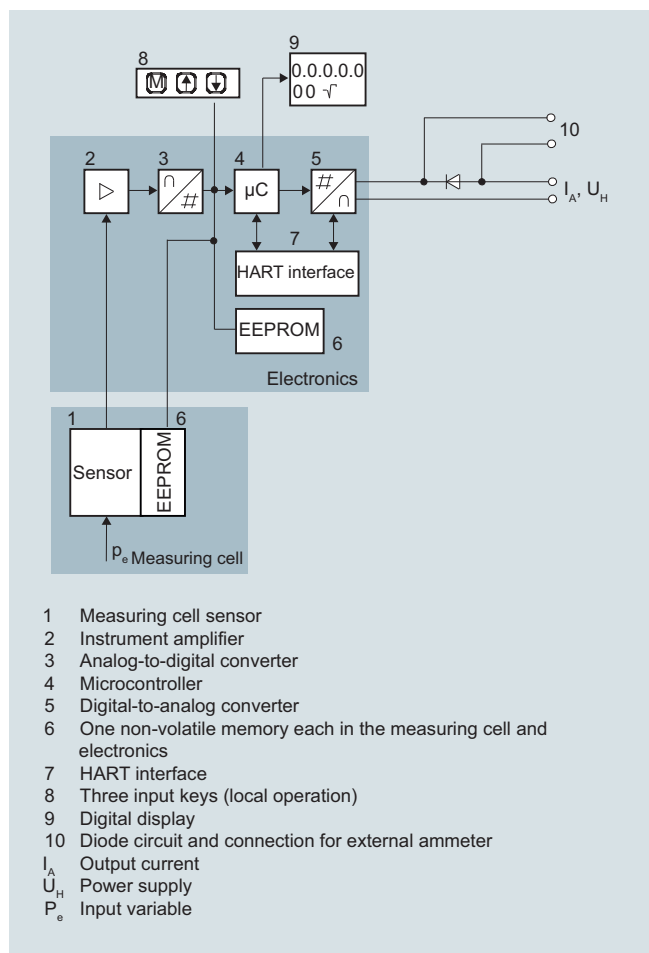
At the top of the enclosure is a plastic cover (1), which hides the input keys.

#### Example for an attached measuring point label



## Function

## Operation of electronics with HART communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

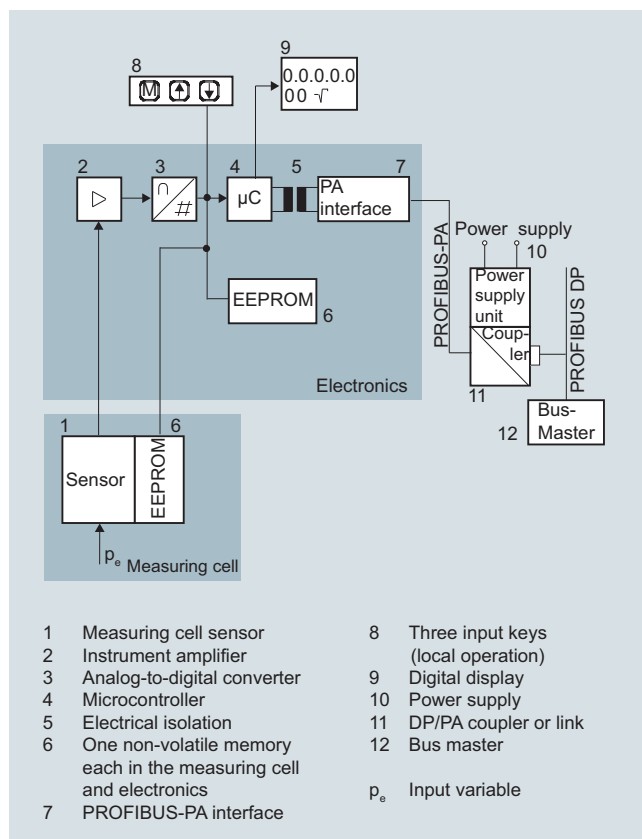
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with measuring spans  $\leq 63$  bar measure the input pressure compared to atmosphere, transmitters with measuring spans  $\geq 160$  bar compared to vacuum.

## Operation of electronics with PROFIBUS PA communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the PROFIBUS PA through an electrically isolated PA interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

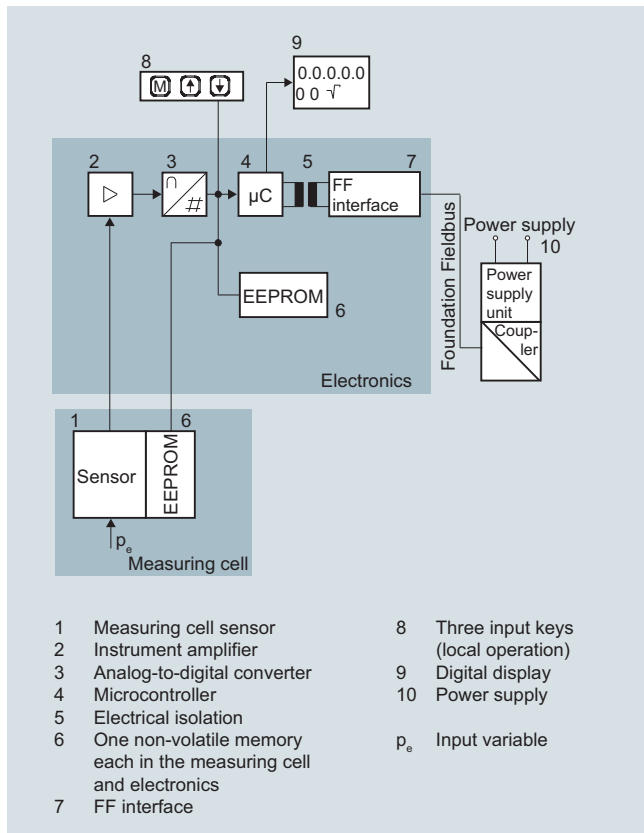
The results with status values and diagnostic values are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.

## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P410

### Technical description

#### Operation of electronics with FOUNDATION Fieldbus communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

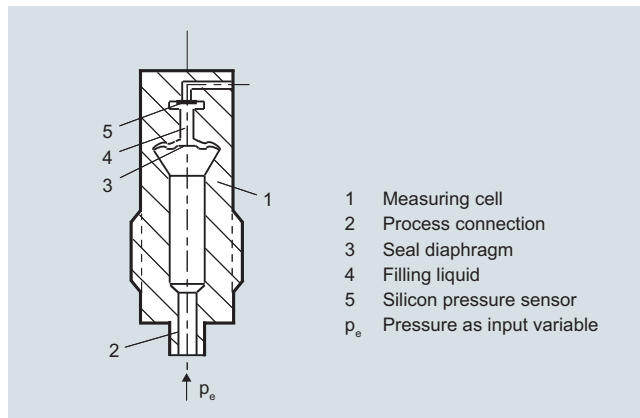
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

#### Mode of operation of the measuring cells

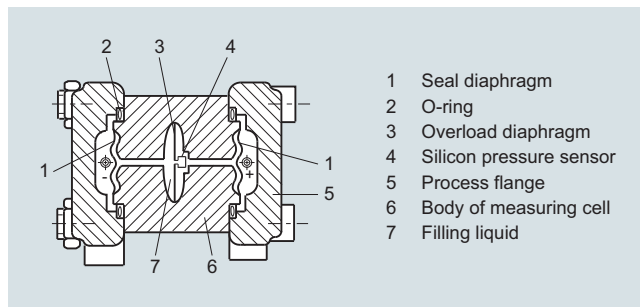
##### Measuring cell for gauge pressure



Measuring cell for gauge pressure, function diagram

The pressure  $p_e$  is applied through the process connection (2, Figure "Measuring cell for gauge pressure, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the differential pressure.

##### Measuring cell for differential pressure and flow



Measuring cell for differential pressure and flow, function diagram

The differential pressure is transmitted through the seal diaphragms (1, Figure "Measuring cell for differential pressure and flow, function diagram") and the filling liquid (7) to the silicon pressure sensor (4).

The measuring diaphragm is flexed by the applied differential pressure. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (3) is flexed until the seal diaphragm rests on the body of the measuring cell (6), thus protecting the silicon pressure sensor from overloads.

**Parameterization SITRANS P410**

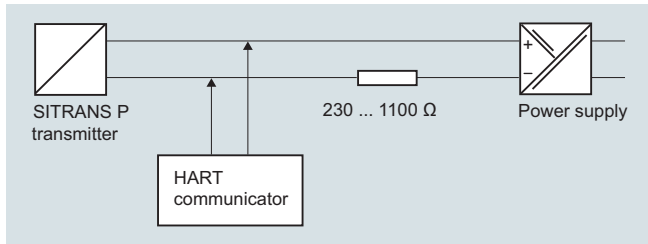
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

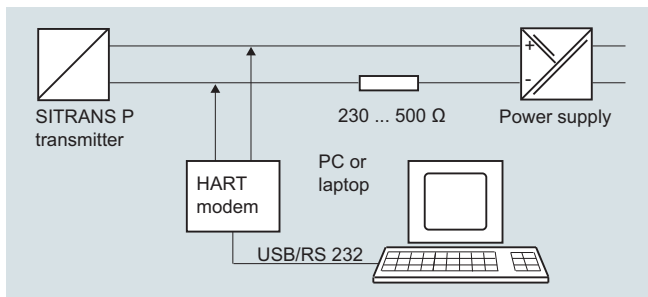
Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

Adjustable parameters, SITRANS P410 with HART

Parameters	Input keys (DS III HART)	HART communication
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Lower range value without application of a pressure ("Blind setting")	x	x
Upper range value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x <sup>1)</sup>
Type of dimension and actual dimension	x	x
Characteristic (linear / square-rooted)	x <sup>2)</sup>	x <sup>2)</sup>
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

<sup>1)</sup> Cancel apart from write protection  
<sup>2)</sup> Only differential pressure

Diagnostic functions for SITRANS P410 with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

Available physical units of display for SITRANS P410 with HART

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
volume flow	m <sup>3</sup> /d, m <sup>3</sup> /h, m <sup>3</sup> /s, l/min, l/s, ft <sup>3</sup> /d, ft <sup>3</sup> /min, ft <sup>3</sup> /s, US gallon/min, US gallon/s
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. Through the PROFIBUS the DS III with PROFIBUS PA is connected to a process control system, e. g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III with FOUNDATION Fieldbus is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

Adjustable parameters for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

Parameters	Input keys	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostics functions		x

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

1

## Technical description

Diagnostic functions for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
volume flow	m <sup>3</sup> /s, m <sup>3</sup> /min, m <sup>3</sup> /h, m <sup>3</sup> /d, l/s, l/min, l/h, l/d, Ml/d, ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d
Mass flow	g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d
Total mass flow	t, kg, g, lb, oz, LTon, STon
Temperature	K, °C, °F, °R
Miscellaneous	%

## Technical specifications

## SITRANS P410 for gauge pressure

## Input

Measured variable

Gauge pressure

Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure (in accordance with 97/23/EC Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

## HART

PROFIBUS PA/  
FOUNDATION  
Fieldbus

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

Max. perm. test pressure

0.01 ... 1 bar  
1 ... 100 kPa  
0.15 ... 14.5 psi

1 bar  
100 kPa  
14.5 psi

4 bar  
400 kPa  
58 psi

6 bar  
600 kPa  
87 psi

0.04 ... 4 bar  
4 ... 400 kPa  
0.58 ... 58 psi

4 bar  
400 kPa  
58 psi

7 bar  
0.7 MPa  
102 psi

10 bar  
1 MPa  
145 psi

0.16 ... 16 bar  
16 ... 1600 kPa  
2.3 ... 232 psi

16 bar  
1600 kPa  
232 psi

21 bar  
2.1 MPa  
305 psi

32 bar  
3.2 MPa  
464 psi

0.63 ... 63 bar  
63 ... 6300 kPa  
9.1 ... 914 psi

63 bar  
6300 kPa  
914 psi

67 bar  
6.7 MPa  
972 psi

100 bar  
10 MPa  
1450 psi

1.6 ... 160 bar  
0.16 ... 16 MPa  
23 ... 2321 psi

160 bar  
16 MPa  
2321 psi

167 bar  
16.7 MPa  
2422 psi

250 bar  
2.5 MPa  
3626 psi

Lower measuring limit

- Measuring cell with silicone oil filling

30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit

100 % of max. measuring span

## Output

## HART

## PROFIBUS PA/FOUNDATION Fieldbus

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

- Upper limit (infinitely adjustable)

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

-

Load

- Without HART

$$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$$

$$U_H: \text{ Power supply in V}$$

-

- With HART

$$R_B = 230 \dots 500 \Omega \text{ (SIMATIC PDM) or}$$

$$R_B = 230 \dots 1100 \Omega \text{ (HART Communicator)}$$

-

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

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## SITRANS P410 for gauge pressure

### Measuring accuracy

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio  $r$  (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi

$r \leq 5$  :  $\leq 0.04$  %  
 $5 < r \leq 100$  :  $\leq (0.004 \cdot r + 0.045)$  %

Influence of ambient temperature  
(in percent per 28 °C (50 °F))

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi

$\leq (0.05 \cdot r + 0.1)$  %  
 $\leq (0.025 \cdot r + 0.125)$  %

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi

$\leq (0.25 \cdot r)$  % in 5 years  
 $\leq (0.125 \cdot r)$  % in 5 years

Effect of mounting position

$\leq 0.05$  mbar/0.005 kPa/0.000725 psi per 10° inclination  
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

$3 \cdot 10^{-5}$  of nominal measuring range



**SITRANS P410 for gauge pressure****Operating conditions**

Degree of protection	IP66 (optional IP66/IP68) Type 4X
• according to EN 60529	
• according to NEMA 250	
Temperature of medium	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)
Ambient conditions	
• Ambient temperature	
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)
- Display readable	-30 ... +85 °C (-22 ... +185 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class	
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics
• Electromagnetic Compatibility	
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21

**Design**

Weight (without options)	Die-cast aluminum: ≈ 2.0 kg (≈ 4.4 lb) Stainless steel precision casting: ≈ 4.6 kg (≈ 10.1 lb)
Enclosure material	Low-copper die-cast aluminum, GD-AISI 12 or stainless steel precision casting, mat. no. 1.4408
Wetted parts materials	
• Connection shank	Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602
• Oval flange	Stainless steel, mat. no. 1.4404/316L
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))
Process connection	Connection shank G $\frac{1}{2}$ B to DIN EN 837-1, female thread $\frac{1}{2}$ -14 NPT or oval flange (PN 160 (MAWP 2320 psi) to DIN 19213 with mounting thread M10 or $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518)
Material of mounting bracket	
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)

**Power supply  $U_H$** 

	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P410

## for gauge pressure

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### SITRANS P410 for gauge pressure

#### Certificates and approvals

Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 174 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20 (pending)	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22 (pending)	PTB 01 ATEX 2055	
- Marking	Ex II 2 D Ex tb IIIC T120°C Db	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\text{max}} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ ; $P_{\text{max}} = 1 \text{ W}$
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	$U_m = 45 \text{ V}$	$U_m = 32 \text{ V}$
- Connections (Ex ic)	To circuits with values: $U_i = 45 \text{ V}$	FISCO supply unit ic: $U_o = 17.5 \text{ V}$ , $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$ , $I_o = 132 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion protection acc. to FM (pending)	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA (pending)	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Yes
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	Standard FOUNDATION Fieldbus function block
Internal preprocessing		• Physical block	1 resource block
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input /Output		
- Failure mode	parameterizable (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

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Selection and Ordering data	Article No.	Order code
<b>Pressure transmitter for gauge pressure, SITRANS P410 with HART</b>	<b>7MF4033-</b>	<b>-Z C41</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Measuring cell filling</b> <b>Measuring cell cleaning</b> Silicone oil                  normal	1	
<b>Measuring span (min. ... max.)</b> 0.01 ... 1 bar    (0.15 ... 14.5 psi) 0.04 ... 4 bar    (0.58 ... 58 psi) 0.16 ... 16 bar    (2.32 ... 232 psi) 0.63 ... 63 bar    (9.14 ... 914 psi) 1.6 ... 160 bar    (23.2 ... 2320 psi)	B C D E F	
<b>Wetted parts materials</b> Seal diaphragm          Process connection Stainless steel            Stainless steel Hastelloy                  Stainless steel Hastelloy                  Hastelloy Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" <b>(recommended version)</b> <sup>1) 2) 3) 4)</sup> Version for diaphragm seals in conjunction with process connector "G½B connection shank" <sup>1) 2) 3) 4)</sup>	A B C Y 1 Y 0	
<b>Process connection</b> <ul style="list-style-type: none"> <li>• Connection shank G½B to EN 837-1</li> <li>• Female thread ½-14 NPT</li> <li>• Stainless steel oval flange with process connection (Oval flange has no female thread)               <ul style="list-style-type: none"> <li>- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>- Mounting thread M10 to DIN 19213</li> <li>- Mounting thread M12 to DIN 19213</li> </ul> </li> <li>• Male thread M20 x 1.5</li> <li>• Male thread ½ -14 NPT</li> </ul>	0 1 2 3 4 5 6	
<b>Non-wetted parts materials</b> <ul style="list-style-type: none"> <li>• Enclosure made of die-cast aluminium</li> <li>• Enclosure stainless steel precision casting<sup>5)</sup></li> </ul>	0 3	
<b>Version</b> <ul style="list-style-type: none"> <li>• Standard version, German plate inscription, setting for pressure unit: bar</li> <li>• International version, English plate inscription, setting for pressure unit: bar</li> <li>• Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul> All versions include DVD with compact operating instructions in various EU languages.	1 2 3	
<b>Explosion protection</b> <ul style="list-style-type: none"> <li>• None</li> <li>• With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>- "Intrinsic safety (Ex ia)"</li> <li>- "Explosion-proof (Ex d)"<sup>6)</sup></li> <li>- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>7)</sup></li> <li>- "Ex nA/ic (Zone 2)"<sup>8)</sup></li> <li>- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>7)9)</sup></li> </ul> </li> <li>• FM + CSA intrinsic safe (is) (pending)<sup>10)</sup></li> <li>• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>7)9)10)</sup></li> <li>• With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>- "Intrinsic Safe and Explosion Proof (is + xp)"<sup>6)10)</sup></li> </ul> </li> </ul>	A B D P E R F S NC	
<b>Electrical connection / cable entry</b> <ul style="list-style-type: none"> <li>• Screwed gland M20 x1 .5</li> <li>• Screwed gland ½-14 NPT</li> <li>• Device plug Han 7D (plastic enclosure) incl. mating connector<sup>11)</sup></li> <li>• Device plugs M12 (stainless steel)<sup>11)12)</sup></li> </ul>	B C D F	

# Pressure Measurement



## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P410

for gauge pressure

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Selection and Ordering data	Article No.	Order code
<b>Pressure transmitter for gauge pressure, SITRANS P410 with HART</b>	<b>7MF4033-</b>  <b>-</b>  <b>-Z C41</b>	
<b>Display</b>		
• Without display		0
• Without visible display (display concealed, setting: mA)		1
• With visible display (setting: mA)		6
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)		7

Power supply units see Chap. 7 "Supplementary Components".

A quick-start guide is included in the scope of delivery of the device.

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y.-... and 7MF4900-1...-B
- 4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- 5) Not in conjunction with Electrical connection "device plug Han 7D".
- 6) Without cable gland, with blanking plug
- 7) With enclosed cable gland Ex ia and blanking plug
- 8) Configurations with device plugs Han and M12 are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) Only in connection with Ex approval A, B or E.
- 12) M12 delivered without cable socket

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

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Selection and Ordering data		Article No.	Order code
<b>Pressure transmitter for gauge pressure</b>			
<b>SITRANS P410 with PROFIBUS PA (PA)</b>		7MF4034-	-Z C41
<b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>		7MF4035-	-Z C41
<a href="#">↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		
Silicone oil	normal		
<b>Nominal measuring range</b>			
1 bar	(14.5 psi)		
4 bar	(58 psi)		
16 bar	(232 psi)		
63 bar	(914 psi)		
160 bar	(2320 psi)		
<b>Wetted parts materials</b>			
Seal diaphragm	Process connection		
Stainless steel	Stainless steel		
Hastelloy	Stainless steel		
Hastelloy	Hastelloy		
Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" <b>(recommended version)</b> <sup>1) 2) 3) 4)</sup>			
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" <sup>1) 2) 3) 4)</sup>			
<b>Process connection</b>			
<ul style="list-style-type: none"> <li>• Connection shank G1/2B to EN 837-1</li> <li>• Female thread 1/2-14 NPT</li> <li>• Stainless steel oval flange with process connection (Oval flange has no female thread) <sup>5)</sup> <ul style="list-style-type: none"> <li>- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>- Mounting thread M10 to DIN 19213</li> <li>- Mounting thread M12 to DIN 19213</li> </ul> </li> <li>• Male thread M20 x 1.5</li> <li>• Male thread 1/2 -14 NPT</li> </ul>			
<b>Non-wetted parts materials</b>			
<ul style="list-style-type: none"> <li>• Enclosure made of die-cast aluminium</li> <li>• Enclosure stainless steel precision casting</li> </ul>			
<b>Version</b>			
<ul style="list-style-type: none"> <li>• Standard version, German label inscription, setting of pressure unit: bar</li> <li>• International version, English label inscription, setting of pressure unit: psi</li> <li>• Chinese version, English label inscription, setting of pressure unit: kPa</li> </ul> All versions include DVD with compact operating instructions in various EU languages.			
<b>Explosion protection</b>			
<ul style="list-style-type: none"> <li>• None</li> <li>• With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>- "Intrinsic safety (Ex ia)"</li> <li>- "Explosion-proof (Ex d)"<sup>6)</sup></li> <li>- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>7)</sup></li> <li>- "Ex nA/ic (Zone 2)"<sup>8)</sup></li> <li>- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>7) 9)</sup></li> </ul> </li> <li>• FM + CSA intrinsic safe (is)<sup>10)</sup></li> <li>• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>7)9)10)</sup></li> <li>• With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>- "Intrinsic Safe and Explosion Proof (is + xp)"<sup>6)10)</sup></li> </ul> </li> </ul>			
<b>Electrical connection/cable entry</b>			
<ul style="list-style-type: none"> <li>• Screwed gland M20 x 1.5</li> <li>• Screwed gland 1/2-14 NPT</li> <li>• Device plugs M12 (stainless steel)<sup>11) 12)</sup></li> </ul>			

# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P410

for gauge pressure

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Selection and Ordering data	Article No.	Order code
<b>Pressure transmitter for gauge pressure</b>		
<b>SITRANS P410 with PROFIBUS PA (PA)</b>	<b>7MF4034-</b>	<b>-Z C41</b>
<b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>	<b>7MF4035-</b>	<b>-Z C41</b>
<b>Display</b>		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• with customer-specific display (setting as specified, Order code "Y21" required)		7

A quick-start guide is included in the scope of delivery of the device.

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y... and 7MF4900-1...-B
- 4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- 5) M10 fastening thread: Max. measuring span 160 bar (2320 psi)  
7/16-20 UNF and M12 fastening thread: Max. measuring span 400 bar (5802 psi)
- 6) Without cable gland, with blanking plug.
- 7) With enclosed cable gland Ex ia and blanking plug.
- 8) Configurations with device plugs Han and M12 are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) M12 delivered without cable socket.
- 12) Only in connection with Ex approval A, B, E or F.

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

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Selection and Ordering data	Order code			Selection and Ordering data	Order code			
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF	<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF	
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>				<b>Use in or on zone 1D/2D<sup>4)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)	E01	✓	✓	✓
• Steel	A01	✓	✓	<b>CRN approval Canada</b> (Canadian Registration Number)	E22 <sup>5)</sup>	✓	✓	✓
• Stainless steel 304	A02	✓	✓	<b>Dual seal</b>	E24	✓	✓	✓
• Stainless steel 316L	A03	✓	✓	<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E55 <sup>6)</sup>	✓	✓	✓
<b>Device plugs<sup>1)</sup></b>				<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>6)</sup>	✓	✓	✓
• Han 7D (metal)	A30	✓		<b>Ex protection "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>6)</sup>	✓	✓	✓
• Han 8D (instead of Han 7D)	A31	✓		<b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>6)</sup>	✓	✓	✓
• Angled	A32	✓		<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (pending)	E70 <sup>6)</sup>	✓	✓	✓
• Han 8D (metal)	A33	✓		(only for transmitter 7MF4...-.....-[B, D]..-Z + E11)				
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓	✓
<b>Rating plate inscription</b> (instead of German)				<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	E81	✓	✓	✓
• English	B11	✓	✓	<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓	✓
• French	B12	✓	✓	<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓	✓
• Spanish	B13	✓	✓	<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	G10	✓	✓	✓
• Italian	B14	✓	✓	<b>Transient protector 6 kV (lightning protection)</b>	J01	✓	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	<b>Oval flange NAM (ASTAVA)</b>	J06	✓	✓	✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)<sup>2)</sup></b>	C11	✓	✓	<b>Marine approvals</b>				
<b>Inspection certificate<sup>3)</sup></b> Acc. to EN 10204-3.1	C12	✓	✓	• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	• Lloyds Register (LR)	S11	✓	✓	✓
<b>Inspection certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓	• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
<b>Functional safety (SIL2) (pending)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓		• American Bureau of Shipping (ABS)	S14	✓	✓	✓
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓		• Russian Maritime Register (RMR)	S16	✓	✓	✓
<b>Increased measuring accuracy</b> (mandatory specification for SITRANS P410)	C41	✓	✓	• Korean Register of Shipping (KR)	S17	✓	✓	✓
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓					
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓						
<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>	D07	✓	✓					
<b>Degree of protection IP66/IP68</b> (only for M20x1.5 and ½"-14 NPT)	D12	✓	✓					
<b>Supplied with oval flange</b> (1 item), PTFE packing and screws in thread of oval flange	D37	✓	✓					
<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓					
<b>TAG plate empty (no inscription)</b>	D61	✓	✓					

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/253).

1) Device plug Han IP65

2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

3) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

4) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

5) Cannot be ordered with remote seal.

6) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.



Selection and Ordering data	Order code			
		HART	PA	FF
<b>Additional data</b> Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Measuring range to be set</b> Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	✓ <sup>1)</sup>	
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 characters, specify in plain text: Y16: .....	Y16	✓	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 characters, specify in plain text: Y17: .....	Y17	✓		
<b>Setting of pressure indication in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % *) ref. temperature 20 °C	Y21	✓	✓	✓
<b>Setting of pressure indication in non-pressure units<sup>2)</sup></b> Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	Y22 + Y01	✓		

✓ = available

**Ordering example**

Item line: 7MF4033-1EA00-1AA7-Z C41  
 B line: A01 + Y01 + Y21  
 C line: Y01: 10 ... 20 bar (145 ... 290 psi)  
 C line: Y21: bar (psi)

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) Preset values can only be changed over SIMATIC PDM.

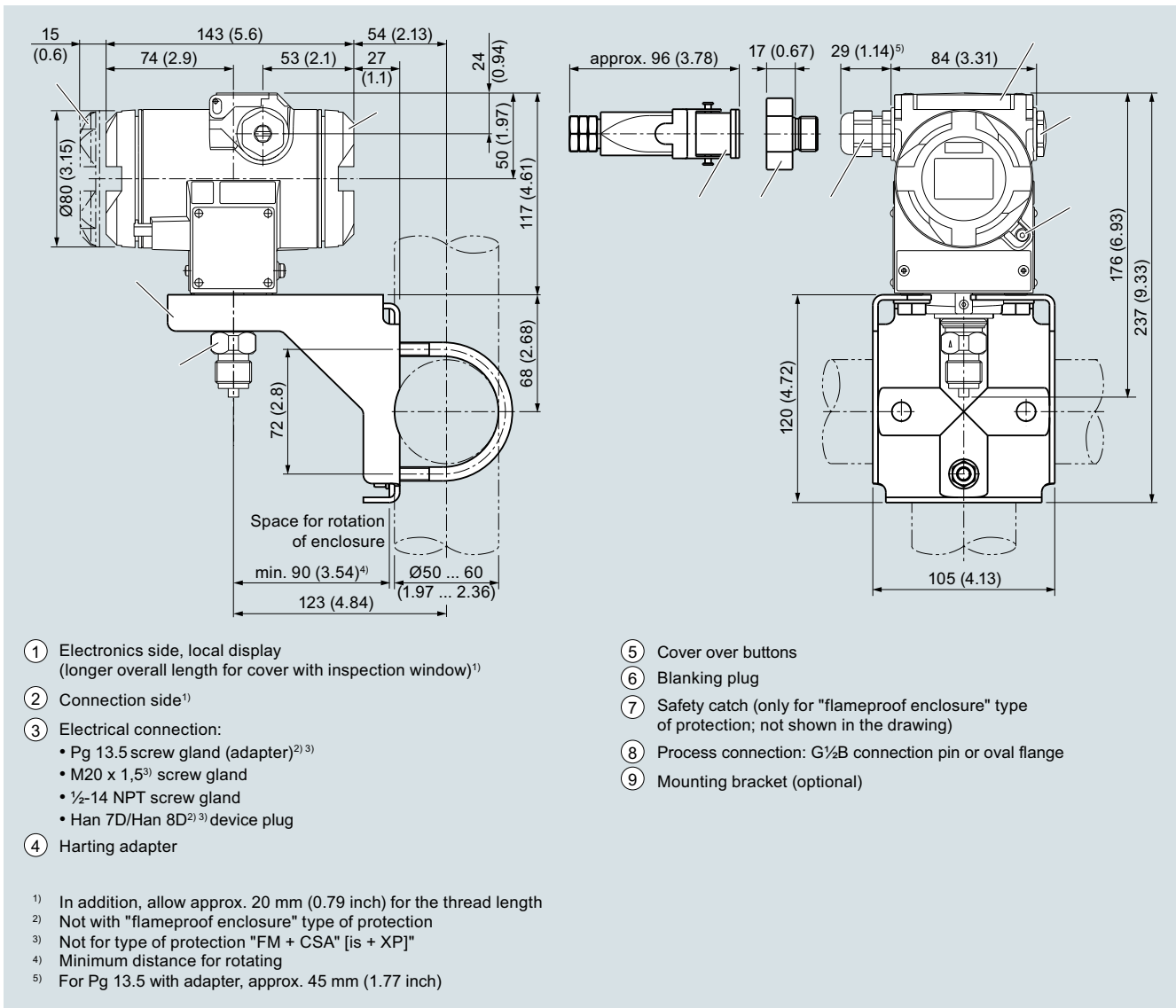
# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P410

for gauge pressure

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## Dimensional drawings



SITRANS P410 pressure transmitters for gauge pressure, dimensions in mm (inch)

**Technical specifications****SITRANS P410 for differential pressure and flow**

<b>Input</b>		<b>Differential pressure and flow</b>	
Measured variable		Differential pressure and flow	
Measuring span (infinitely adjustable) or nominal measuring range and maximum operating pressure (pursuant to 2014/68/EU Pressure Equipment Directive)		<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>
		Measuring span	Nominal measuring range
		Max. operating pressure MAWP (PS)	
		2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH <sub>2</sub> O	250 mbar 25 kPa 100 inH <sub>2</sub> O
		6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH <sub>2</sub> O	600 mbar 60 kPa 240 inH <sub>2</sub> O
		16 ... 1600 mbar 1.6 ... 160 kPa 6.4 ... 642 inH <sub>2</sub> O	1600 mbar 160 kPa 642 inH <sub>2</sub> O
		50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH <sub>2</sub> O	5000 mbar 500 kPa 2000 inH <sub>2</sub> O
		0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi
		6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH <sub>2</sub> O	600 mbar 60 kPa 240 inH <sub>2</sub> O
		16 ... 1600 mbar 1.6 ... 160 kPa 6.4 ... 642 inH <sub>2</sub> O	1600 mbar 160 kPa 642 inH <sub>2</sub> O
		50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH <sub>2</sub> O	5000 mbar 500 kPa 2000 inH <sub>2</sub> O
		0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi
Lower measuring limit		-100 % of max. measuring span (-33 % with measuring cell 30 bar/3 MPa/435 psi) or 30 mbar a/3 kPa a/0.44 psi a	
<ul style="list-style-type: none"> <li>Measuring cell with silicone oil filling</li> </ul>			
Upper measuring limit		100 % of max. measuring span	
Lower range value		Between the measuring limits (fully adjustable)	
<b>Output</b>		<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>
Output signal		4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
<ul style="list-style-type: none"> <li>Lower limit (infinitely adjustable)</li> <li>Upper limit (infinitely adjustable)</li> </ul>		3.55 mA, factory preset to 3.84 mA 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	- -
Load		$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$ $U_H$ : Power supply in V	-
<ul style="list-style-type: none"> <li>Without HART</li> <li>With HART</li> </ul>		$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	- -
Physical bus		-	IEC 61158-2
Protection against polarity reversal		Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)		Set to 2 s (0 ... 100 s)	

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

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## SITRANS P410 for differential pressure and flow

### Measuring accuracy

Reference conditions	Acc. to IEC 60770-1
	<ul style="list-style-type: none"> <li>Increasing characteristic</li> <li>Lower range value 0 bar/kPa/psi</li> <li>Stainless steel seal diaphragm</li> <li>Silicone oil filling</li> <li>Room temperature 25 °C (77 °F)</li> </ul>
Measuring span ratio $r$ (spread, Turn-Down)	$r = \text{max. measuring span/set measuring span or nominal measuring range}$
Error in measurement at limit setting incl. hysteresis and reproducibility	
<ul style="list-style-type: none"> <li>Linear characteristic</li> </ul>	
<ul style="list-style-type: none"> <li>- 250 mbar/25 kPa/3.63 psi</li> <li>600 mbar/60 kPa/8.7 psi</li> <li>1600 mbar/160 kPa/23.21 psi</li> <li>5 bar/500 kPa/72.5 psi</li> <li>30 bar/3 MPa/435 psi</li> </ul>	$r \leq 5 :$ $\leq 0.04 \%$ $5 < r \leq 100 :$ $\leq (0.004 \cdot r + 0.045) \%$
<ul style="list-style-type: none"> <li>Square-rooted characteristic (flow &gt; 50 %)</li> </ul>	
<ul style="list-style-type: none"> <li>- 250 mbar/25 kPa/3.63 psi</li> <li>600 mbar/60 kPa/8.7 psi</li> <li>1600 mbar/160 kPa/23.21 psi</li> <li>5 bar/500 kPa/72.5 psi</li> <li>30 bar/3 MPa/435 psi</li> </ul>	$r \leq 5 :$ $\leq 0.04 \%$ $5 < r \leq 100 :$ $\leq (0.004 \cdot r + 0.045) \%$
<ul style="list-style-type: none"> <li>Square-rooted characteristic (flow &gt; 25 ... 50 %)</li> </ul>	
<ul style="list-style-type: none"> <li>- 250 mbar/25 kPa/3.63 psi</li> <li>600 mbar/60 kPa/8.7 psi</li> <li>1600 mbar/160 kPa/23.21 psi</li> <li>5 bar/500 kPa/72.5 psi</li> <li>30 bar/3 MPa/435 psi</li> </ul>	$r \leq 5 :$ $\leq 0.08 \%$ $5 < r \leq 100 :$ $\leq (0.008 \cdot r + 0.09) \%$
Influence of ambient temperature (in percent per 28 °C (50 °F))	
<ul style="list-style-type: none"> <li>250 mbar/25 kPa/3.63 psi</li> <li>600 mbar/60 kPa/8.7 psi</li> <li>1600 mbar/160 kPa/23.21 psi</li> <li>5 bar/500 kPa/72.5 psi</li> <li>30 bar/3 MPa/435 psi</li> </ul>	$\leq (0.025 \cdot r + 0.125) \%$
Influence of static pressure	
<ul style="list-style-type: none"> <li>on the lower range value</li> </ul>	
<ul style="list-style-type: none"> <li>- 250 mbar/25 kPa/3.63 psi</li> <li>600 mbar/60 kPa/8.7 psi</li> <li>1600 mbar/160 kPa/23.21 psi</li> </ul>	$\leq (0.1 \cdot r) \%$ per 70 bar (zero offset is possible with position error adjustment)
<ul style="list-style-type: none"> <li>- 5 bar/500 kPa/72.5 psi</li> <li>30 bar/3 MPa/435 psi</li> </ul>	$\leq (0.2 \cdot r) \%$ per 70 bar (zero offset is possible with position error adjustment)
<ul style="list-style-type: none"> <li>on the measuring span</li> </ul>	
<ul style="list-style-type: none"> <li>- 250 mbar/25 kPa/3.63 psi</li> <li>600 mbar/60 kPa/8.7 psi</li> <li>1600 mbar/160 kPa/23.21 psi</li> <li>5 bar/500 kPa/72.5 psi</li> <li>30 bar/3 MPa/435 psi</li> </ul>	$\leq 0.14 \%$ per 70 bar
Long-term stability (temperature change $\pm 30$ °C ( $\pm 54$ °F))	Static pressure max. 70 bar/7 MPa/1015 psi
<ul style="list-style-type: none"> <li>250 mbar/25 kPa/3.63 psi</li> <li>600 mbar/60 kPa/8.7 psi</li> <li>1600 mbar/160 kPa/23.21 psi</li> <li>5 bar/500 kPa/72.5 psi</li> </ul>	$\leq (0.125 \cdot r) \%$ in 5 years
<ul style="list-style-type: none"> <li>30 bar/3 MPa/435 psi</li> </ul>	$\leq (0.25 \cdot r) \%$ in 5 years
Effect of mounting position (in pressure per change in angle)	$\leq 0.7$ mbar/0.07 kPa/0.028 inH <sub>2</sub> O per 10° inclination (zero offset is possible with position error adjustment)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

**SITRANS P410 for differential pressure and flow****Operating conditions**

Degree of protection	IP66 (optional IP66/IP68)
<ul style="list-style-type: none"> <li>• according to EN 60529</li> <li>• according to NEMA 250</li> </ul>	Type 4X
Temperature of medium	
<ul style="list-style-type: none"> <li>• Measuring cell with silicone oil filling</li> </ul>	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) with 30 bar measuring cell
<ul style="list-style-type: none"> <li>• In conjunction with dust explosion protection</li> </ul>	-20 ... +60 °C (-4 ... +140 °F)
Ambient conditions	
<ul style="list-style-type: none"> <li>• Ambient temperature</li> </ul>	
<ul style="list-style-type: none"> <li>- Transmitter</li> <li>- Display readable</li> </ul>	-40 ... +85 °C (-40 ... +185 °F) -30 ... +85 °C (-22 ... +185 °F)
<ul style="list-style-type: none"> <li>• Storage temperature</li> </ul>	-50 ... +85 °C (-58 ... +185 °F)
<ul style="list-style-type: none"> <li>• Climatic class</li> </ul>	
<ul style="list-style-type: none"> <li>- Condensation</li> </ul>	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics
<ul style="list-style-type: none"> <li>• Electromagnetic Compatibility</li> </ul>	
<ul style="list-style-type: none"> <li>- Emitted interference and interference immunity</li> </ul>	Acc. to IEC 61326 and NAMUR NE 21

**Design**

Weight (without options)	Die-cast aluminum: ≈ 4.5 kg (≈ 9.9 lb) Stainless steel precision casting: ≈ 7.1 kg (≈ 15.6 lb)
Enclosure material	Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408
Wetted parts materials	
<ul style="list-style-type: none"> <li>• Seal diaphragm</li> <li>• Process flanges and sealing screw</li> <li>• O-Ring</li> </ul>	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819 Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602 FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))
Process connection	Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518
Material of mounting bracket	
<ul style="list-style-type: none"> <li>• Steel</li> <li>• Stainless steel 304</li> <li>• Stainless steel 316L</li> </ul>	Sheet-steel, Mat. No. 1.0330, chrome-plated Sheet stainless steel, mat. no. 1.4301 (SS 304) Sheet stainless steel, mat. no. 1.4404 (SS 316L)

**Power supply  $U_H$** 

	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	No
Bus voltage		
<ul style="list-style-type: none"> <li>• Not Ex</li> </ul>	-	9 ... 32 V
<ul style="list-style-type: none"> <li>• With intrinsically-safe operation</li> </ul>	-	9 ... 24 V
Current consumption		
<ul style="list-style-type: none"> <li>• Basic current (max.)</li> <li>• Start-up current ≤ basic current</li> <li>• Max. current in event of fault</li> </ul>	- - -	12.5 mA Yes 15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

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## SITRANS P410 for differential pressure and flow

### Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

- Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

- Dust explosion protection for zone 20 (pending)

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

- Dust explosion protection for zone 21/22 (pending)

- Marking
- Connection

- Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

- Explosion protection acc. to FM (pending)

- Identification (XP/DIP) or (IS); (NI)

- Explosion protection to CSA (pending)

- Identification (XP/DIP) or (IS)

### HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
-40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ;  
 $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V}$  DC

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:  $U_H = 10.5 \dots 45 \text{ V}$  DC;  $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

$U_m = 45 \text{ V}$

To circuits with values:  
 $U_i = 45 \text{ V}$

$L_i = 0.4 \text{ mH}$ ,  $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

Certificate of Compliance 1153651

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

### PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

To circuits with values:  $U_H = 9 \dots 32 \text{ V}$  DC

FISCO supply unit:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 380 \text{ mA}$ ,  $P_o = 5.32 \text{ W}$

Linear barrier:  
 $U_o = 24 \text{ V}$ ,  $I_o = 250 \text{ mA}$ ,  $P_o = 1 \text{ W}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

To circuits with values:  $U_H = 9 \dots 32 \text{ V}$  DC;  
 $P_{\max} = 1 \text{ W}$

$U_m = 32 \text{ V}$

FISCO supply unit ic:  
 $U_o = 17.5 \text{ V}$ ,  $I_o = 570 \text{ mA}$

Linear barrier:  
 $U_o = 32 \text{ V}$ ,  $I_o = 132 \text{ mA}$ ,  $P_o = 1 \text{ W}$

$L_i = 7 \mu\text{H}$ ,  $C_i = 1.1 \text{ nF}$

# Pressure Measurement

## Pressure transmitters for applications with advanced requirements (Advanced) SITRANS P410

for differential pressure and flow

1

<b>HART communication</b>		<b>FOUNDATION Fieldbus communication</b>	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for PC	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<b>PROFIBUS PA communication</b>		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Simulation function	Input /Output		
- Failure mode	parameterizable (last good value, substitute value, incorrect value)		
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Can be calibrated by applying two pressures	Yes		
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 30 nodes		
- Square-rooted characteristic for flow measurement	Yes		
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable		
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function		

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

## Selection and Ordering data

Article No.

Order Code

**SITRANS P410 with HART pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)**

7MF4433-

-Z C41

[Click on the Article No. for the online configuration in the PIA Life Cycle Portal.](#)

### Measuring cell filling

Silicone oil

### Measuring cell cleaning

normal

### Measuring span (min. ... max.)

2.5 ... 250 mbar (1.004 ... 100.4 inH<sub>2</sub>O)

6 ... 600 mbar (2.409 ... 240.9 inH<sub>2</sub>O)

16 ... 1600 mbar (6.424 ... 642.4 inH<sub>2</sub>O)

50 ... 5000 mbar (20.08 ... 2008 inH<sub>2</sub>O)

0.3 ... 30 bar (4.35 ... 435 psi)

### Wetted parts materials

(stainless steel process flanges)

Seal diaphragm Parts of measuring cell

Stainless steel Stainless steel

Hastelloy Stainless steel

Hastelloy Hastelloy

Version for diaphragm seal<sup>1) 2) 3) 4)</sup>

### Process connection

Female thread 1/4-18 NPT with flange connection

• Sealing screw opposite process connection

- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518

- Mounting thread M10 to DIN 19213 (only for replacement requirement)

• Vent on side of process flange<sup>5)</sup>

- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518

- Mounting thread M10 to DIN 19213 (only for replacement requirement)

### Non-wetted parts materials

process flange screws Electronics enclosure

Stainless steel Die-cast aluminum

Stainless steel Stainless steel precision casting<sup>6)</sup>

### Version

• Standard version, German plate inscription, setting for pressure unit: bar

• International version, English plate inscription, setting for pressure unit: bar

• Chinese version, English plate inscription, setting for pressure unit: Pascal

All versions include DVD with compact operating instructions in various EU languages.

### Explosion protection

• None

• With ATEX, Type of protection:

- "Intrinsic safety (Ex ia)"

- "Explosion-proof (Ex d)"<sup>7)</sup>

- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"<sup>8)</sup>

- "Ex nA/ic (Zone 2)"<sup>9)</sup>

- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"<sup>8)10)</sup>

• FM + CSA intrinsic safe (is) (pending)<sup>11)</sup>

• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>8)10)11)</sup>

• With FM + CSA, Type of protection:

- "Intrinsic Safe and Explosion Proof (is + xp)"<sup>7)11)</sup>

1

D  
E  
F  
G  
H

A  
B  
C  
Y

2  
0

6  
4

2  
3

1  
2  
3

A  
B  
D  
P  
E  
R  
F  
S  
NC



# Pressure Measurement



## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P410

for differential pressure and flow

1

Selection and Ordering data	Article No.	Order Code
<b>SITRANS P410 with HART pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)</b>	<b>7MF4433-</b>  <b>-</b>  <b>-Z C41</b>	
<b>Electrical connection/cable entry</b>		<b>B</b>
• Screwed gland M20 x 1.5		<b>C</b>
• Screwed gland ½-14 NPT		<b>D</b>
• Device plug Han 7D (plastic enclosure) incl. mating connector <sup>12)13)</sup>		<b>F</b>
• Device plugs M12 (stainless steel) <sup>14)15)</sup>		
<b>Display</b>		<b>0</b>
• Without display		<b>1</b>
• Without visible display (display concealed, setting: mA)		<b>6</b>
• With visible display (setting: mA)		<b>7</b>
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)		

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443.-.Y.-..... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).
- Not in conjunction with Electrical connection "device plug Han 7D".
- Without cable gland, with blanking plug
- With enclosed cable gland Ex ia and blanking plug
- Configurations with device plugs Han and M12 are only available in Ex ic.
- Only in connection with IP66.
- Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- Only in connection with Ex approval A, B or E.
- Permissible only for crimp-contact of conductor cross-section 1 mm<sup>2</sup>
- Only in connection with Ex approval A, B, E or F.
- M12 delivered without cable socket.

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

Selection and Ordering data		Article No.	Order code
<b>Pressure transmitters for differential pressure and flow PN 160 (MAWP 2320 psi)</b>			
<b>SITRANS P410 with PROFIBUS PA (PA)</b>		7MF4434-	-Z C41
<b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>		7MF4435-	-Z C41
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		
Silicone oil	normal		
<b>Nominal measuring range</b>			
250 mbar (100.4 inH <sub>2</sub> O)			
600 mbar (240.9 inH <sub>2</sub> O)			
1600 mbar (642.4 inH <sub>2</sub> O)			
5 bar (2008 inH <sub>2</sub> O)			
30 bar (435 psi)			
<b>Wetted parts materials</b>			
(stainless steel process flanges)			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel		
Hastelloy	Stainless steel		
Hastelloy	Hastelloy		
Version as diaphragm seal 1) 2) 3) 4)			
<b>Process connection</b>			
Female thread 1/4-18 NPT with flange connection			
<ul style="list-style-type: none"> <li>Sealing screw opposite process connection               <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul> </li> <li>Venting on side of process flanges 5)               <ul style="list-style-type: none"> <li>Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>Mounting thread M10 to DIN 19213 (only for replacement requirement)</li> </ul> </li> </ul>			
<b>Non-wetted parts materials</b>			
process flange screws	Electronics enclosure		
Stainless steel	Die-cast aluminum		
Stainless steel	Stainless steel precision casting		
<b>Version</b>			
<ul style="list-style-type: none"> <li>Standard version, German plate inscription, setting for pressure unit: bar</li> <li>International version, English plate inscription, setting for pressure unit: bar</li> <li>Chinese version, English plate inscription, setting for pressure unit: Pascal</li> </ul> All versions include DVD with compact operating instructions in various EU languages.			
<b>Explosion protection</b>			
<ul style="list-style-type: none"> <li>None</li> <li>With ATEX, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic safety (Ex ia)"</li> <li>"Explosion-proof (Ex d)"<sup>6)</sup></li> <li>"Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>7)</sup></li> <li>"Ex nA/ic (Zone 2)"<sup>8)</sup></li> <li>"Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)<sup>7) 9)</sup> (not for DS III FF)</li> </ul> </li> <li>FM + CSA intrinsic safe (is) (pending)<sup>10)</sup></li> <li>FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>7)9)10)</sup></li> <li>With FM + CSA, Type of protection:               <ul style="list-style-type: none"> <li>"Intrinsic Safe and Explosion Proof (is + xp)<sup>8)10)</sup></li> </ul> </li> </ul>			
<b>Electrical connection/cable entry</b>			
<ul style="list-style-type: none"> <li>Screwed gland M20 x 1.5</li> <li>Screwed gland 1/2-14 NPT</li> <li>Device plugs M12 (stainless steel)<sup>11) 12)</sup></li> </ul>			

# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P410

for differential pressure and flow

1

**Selection and Ordering data**

Article No.

Order code

**Pressure transmitters for differential pressure and flow PN 160 (MAWP 2320 psi)****SITRANS P410 with PROFIBUS PA (PA)**

7MF4434- - - - -Z C41

**SITRANS P410 with FOUNDATION Fieldbus (FF)**

7MF4435- - - - -Z C41

**Display**

- Without display
- Without visible display (display concealed, setting: bar)
- With visible display (setting: bar)
- With customer-specific display (setting as specified, Order code "Y21" required)

0  
1  
6  
7

Included in delivery of the device:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-...Y... and 7MF4900-1...-B
- 4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- 5) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).
- 6) Without cable gland, with blanking plug.
- 7) With enclosed cable gland Ex ia and blanking plug.
- 8) Configurations with device plugs Han and M12 are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) Only in connection with Ex approval A, B, E or F.
- 12) M12 delivered without cable socket

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF	<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>				<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓	
• Steel	A01	✓	✓	<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b> (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓
• Stainless steel 304	A02	✓	✓	<b>Degree of protection IP66/IP68</b> (only for M20 x 1.5 and ½-14 NPT)	D12	✓	✓
• Stainless steel 316L	A03	✓	✓	<b>Supplied with oval flange set</b> (2 items), PTFE packings and screws in thread of process flanges	D37	✓	✓
<b>O-rings for process flanges</b> (instead of FPM (Viton))				<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓
• PTFE (Teflon)	A20	✓	✓	<b>TAG plate empty (no inscription)</b>	D61	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	<b>Use in or on zone 1D/2D<sup>4)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)	E01	✓	✓
• FFBM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	<b>Dual seal</b>	E24	✓	✓
• NBR (Buna N)	A23	✓	✓	<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E55 <sup>5)</sup>	✓	✓
<b>Device plugs<sup>1)</sup></b>				<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>5)</sup>	✓	✓
• Han 7D (metal)	A30	✓		<b>Explosion-proof "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>5)</sup>	✓	✓
• Han 8D (instead of Han 7D)	A31	✓		<b>Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>5)</sup>	✓	✓
• Angled	A32	✓		<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (pending) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 <sup>5)</sup>	✓	✓
• Han 8D (metal)	A33	✓		<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓
<b>Sealing screws (2 units)</b> ¼-18 NPT, with vent valve in mat. of process flanges	A40	✓	✓	<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	E81	✓	✓
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓
<b>Rating plate inscription</b> (instead of German)				<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓
• English	B11	✓	✓	<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	G10	✓	✓
• French	B12	✓	✓	<b>Interchanging of process connection side</b>	H01	✓	✓
• Spanish	B13	✓	✓	<b>Vent on side for gas measurements</b>	H02	✓	✓
• Italian	B14	✓	✓	<b>Stainless steel process flanges for vertical differential pressure lines</b> (not together with K01, K02 and K04 <sup>6)</sup> )	H03	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓				
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)<sup>2)</sup></b>	C11	✓	✓				
<b>Inspection certificate<sup>3)</sup> to EN 10204-3.1</b>	C12	✓	✓				
<b>Factory certificate to EN 10204-2.2</b>	C14	✓	✓				
<b>Inspection certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓				
<b>Functional safety (SIL2) (pending)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓					
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓					
<b>Increased measuring accuracy</b> (mandatory specification for SITRANS P410)	C41	✓	✓				
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓				

# Pressure Measurement

## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P410

for differential pressure and flow

1

Selection and Ordering data	Order code			
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		HART	PA	FF
<b>Transient protector 6 kV (lightning protection)</b>	J01	✓	✓	✓
<b>Chambered graphite gasket for process flange</b>	J02	✓	✓	✓
<b>Chambered PTFE graphite gasket</b>	J03	✓	✓	✓
<b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>	J05	✓	✓	✓
<b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>7)</sup></b>	J08	✓	✓	✓
<b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>7)</sup></b>	J09	✓	✓	✓
<b>Marine approvals</b>				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
• Lloyds Register (LR)	S11	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
• American Bureau of Shipping (ABS)	S14	✓	✓	✓
• Russian Maritime Register (RMR)	S16	✓	✓	✓
• Korean Register of Shipping (KR)	S17	✓	✓	✓
Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/253).				
✓ = available				
1) Device plug Han IP65				
2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.				
3) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.				
4) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D				
5) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.				
6) Not suitable for connection of remote seal.				
7) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.				

Selection and Ordering data	Order code			
<b>Additional data</b> Please add "-Z" to Article No. and specify Order code(s) and plain text.		HART	PA	FF
<b>Measuring range to be set</b> Specify in plain text: • in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y01 Y02	✓ ✓	✓ <sup>1)</sup> ✓	
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 char., specify in plain text: Y16: .....	Y16	✓	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 char., specify in plain text: Y17: .....	Y17	✓		
<b>Setting of pressure indicator in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % *) ref. temperature 20 °C	Y21	✓	✓	✓
<b>Setting of pressure indicator in non-pressure units<sup>2)</sup></b> Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)	Y22 <sup>3)</sup> + Y01 or Y02	✓		
<b>Preset bus address</b> possible between 1 and 126 Specify in plain text: Y25: .....	Y25		✓	✓
<b>Damping adjustment in seconds (0 ... 100 s)</b>	Y30	✓	✓	✓

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) Preset values can only be changed over SIMATIC PDM.

3) Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1



Selection and Ordering data		Article No.	Order code
<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		<b>7MF4533-</b>	<b>-Z C41</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			
<b>Measuring cell filling</b> Silicone oil	<b>Measuring cell cleaning</b> normal	1	
<b>Measuring span (min. ... max.)</b>			
6 ... 600 mbar	(2.4 ... 240 inH <sub>2</sub> O)	E	
16 ... 1600 mbar	(6.4 ... 642 inH <sub>2</sub> O)	F	
50 ... 5000 mbar	(20 ... 2000 inH <sub>2</sub> O)	G	
0.3 ... 30 bar	(4.35 ... 435 psi)	H	
<b>Wetted parts materials</b> (stainless steel process flanges)			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel	A	
Hastelloy	Stainless steel	B	
Version for diaphragm seal <sup>1) 2) 3) 4)</sup>		Y	
<b>Process connection</b>			
Female thread 1/4-18 NPT with flange connection			
• Sealing screw opposite process connection			
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		3	
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		1	
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing)			
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		7	
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5	
<b>Non-wetted parts materials</b>			
process flange screws	Electronics enclosure		
Stainless steel	Die-cast aluminum	2	
Stainless steel	Stainless steel precision casting <sup>5)</sup>	3	
<b>Version</b>			
• Standard version, German plate inscription, setting for pressure unit: bar			1
• International version, English plate inscription, setting for pressure unit: bar			2
• Chinese version, English plate inscription, setting for pressure unit: Pascal			3
All versions include DVD with compact operating instructions in various EU languages.			
<b>Explosion protection</b>			
• None			A
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"			B
- "Explosion-proof (Ex d)" <sup>6)</sup>			D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" <sup>7)</sup>			P
- "Ex nA/ic (Zone 2)" <sup>8)</sup>			E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" <sup>7)9)</sup>			R
• FM + CSA intrinsic safe (is) (pending) <sup>10)</sup>			F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>7)9)10)</sup>			S
• With FM + CSA, Type of protection:			
- "Intrinsic safety and explosion-proof (is + xp)" <sup>6)10)</sup> , max PN 360			NC
<b>Electrical connection/cable entry</b>			
• Screwed gland M20x1.5			B
• Screwed gland 1/2-14 NPT			C
• Device plug Han 7D (plastic enclosure) incl. mating connector <sup>11) 12)</sup>			D
• Device plugs M12 (stainless steel) <sup>13)14)</sup>			F

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P410

for differential pressure and flow

1

Selection and Ordering data	Article No.	Order code
<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>	<b>7MF4533-</b>  <b>-</b>  <b>-Z C41</b>	
<b>Display</b>		
• Without display		0
• Without visible display (display concealed, setting: mA)		1
• With visible display (setting: mA)		6
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)		7

Power supply units see Chap. 7 "Supplementary Components".

Scope of delivery: Pressure transmitter as ordered (Instruction Manual is extra ordering item)

- 1) When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-...Y.-... and 7MF4900-1...-B
- 4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- 5) Not in conjunction with Electrical connection "device plug Han 7D".
- 6) Without cable gland, with blanking plug
- 7) With enclosed cable gland Ex ia and blanking plug
- 8) Configurations with device plugs Han and M12 are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) Only in connection with Ex approval A, B or E.
- 12) Permissible only for crimp-contact of conductor cross-section 1 mm<sup>2</sup>
- 13) Only in connection with Ex approval A, B, E or F.
- 14) M12 delivered without cable socket.

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

## Selection and Ordering data

Article No.

Order Code

**Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)**

**SITRANS P410 with PROFIBUS PA (PA)**

7MF4534- - - -Z C41

**SITRANS P410 with FOUNDATION Fieldbus (FF)**

7MF4535- - - -Z C41

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

### Measuring cell filling

Silicone oil

### Measuring cell cleaning

normal

### Nominal measuring range

600 mbar	(240 inH <sub>2</sub> O)
1600 mbar	(642 inH <sub>2</sub> O)
5 bar	(2000 inH <sub>2</sub> O)
30 bar	(435 psi)

### Wetted parts materials

(stainless steel process flanges)

Seal diaphragm	Parts of measuring cell
----------------	-------------------------

Stainless steel	Stainless steel
-----------------	-----------------

Hastelloy	Stainless steel
-----------	-----------------

Version for diaphragm seal <sup>1) 2) 3) 4)</sup>

### Process connection

Female thread 1/4-18 NPT with flange connection

- Sealing screw opposite process connection
  - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518
  - Mounting thread M12 to DIN 19213 (only for replacement requirement)
- Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing).
  - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518
  - Mounting thread M12 to DIN 19213 (only for replacement requirement)

### Non-wetted parts materials

Process flange screws	Electronics enclosure
-----------------------	-----------------------

Stainless steel	Die-cast aluminum
-----------------	-------------------

Stainless steel	Stainless steel precision casting
-----------------	-----------------------------------

### Version

- Standard version, German plate inscription, setting for pressure unit: bar
  - International version, English plate inscription, setting for pressure unit: bar
  - Chinese version, English plate inscription, setting for pressure unit: Pascal
- All versions include DVD with compact operating instructions in various EU languages.

### Explosion protection

- None
- With ATEX, Type of protection:
  - "Intrinsic safety (Ex ia)"
  - "Explosion-proof (Ex d)<sup>5)</sup>
  - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>6)</sup>
  - "Ex nA/ic (Zone 2)"<sup>7)</sup>
  - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)<sup>6)8)</sup>
- FM + CSA intrinsic safe (is) (pending)<sup>9)</sup>
- FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>6)7)9)</sup>
- With FM + CSA, Type of protection:
  - "Intrinsic safety and explosion-proof (is + xp)<sup>6)9)</sup>, max PN 360

### Electrical connection/cable entry

- Screwed gland M20 x 1.5
- Screwed gland 1/2-14 NPT
- Device plugs M12 (stainless steel)<sup>10) 11)</sup>

1

E  
F  
G  
HA  
B  
Y3  
17  
52  
31  
2  
3A  
B  
D  
P  
E  
R  
F  
S  
NCB  
C  
F



# Pressure Measurement



## Pressure transmitters

### for applications with advanced requirements (Advanced)

#### SITRANS P410

for differential pressure and flow

1

Selection and Ordering data	Article No.	Order Code
<b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		
<b>SITRANS P410 with PROFIBUS PA (PA)</b>	<b>7MF4534-</b>  <b>-Z C41</b>	
<b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>	<b>7MF4535-</b>  <b>-Z C41</b>	
<b>Display</b>		
• Without (display hidden)		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• With customer-specific display (setting as specified, Order code "Y21" required)		7
Included in delivery of the device:		
• Quick-start guide		
• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.		
2) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-...Y... and 7MF4900-1...-B		
4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
5) Without cable gland, with blanking plug.		
6) With enclosed cable gland Ex ia and blanking plug.		
7) Configurations with device plugs Han and M12 are only available in Ex ic.		
8) Only in connection with IP66.		
9) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
10) Only in connection with Ex approval A, B, E or F.		
11) M12 delivered without cable socket		

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF	<i>Further designs</i>	HART	PA	FF
Add "-Z" to Article No. and specify Order code.				Add "-Z" to Article No. and specify Order code.			
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>				<b>Use in or on zone 1D/2D<sup>2)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)	E01	✓	✓
• Steel	A01	✓	✓	<b>Dual seal</b>	E24	✓	✓
• Stainless steel 304	A02	✓	✓	<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E55 <sup>3)</sup>	✓	✓
• Stainless steel 316L	A03	✓	✓	<b>Ex prot. "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>3)</sup>	✓	✓
<b>O-rings for process flanges</b> (instead of FPM (Viton))				<b>Explosion-proof "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>3)</sup>	✓	✓
• PTFE (Teflon)	A20	✓	✓	<b>Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>3)</sup>	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (pending) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 <sup>3)</sup>	✓	✓
• FPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓
• NBR (Buna N)	A23	✓	✓	<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	E81	✓	✓
<b>Device plugs<sup>1)</sup></b>				<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓
• Han 7D (metal)	A30	✓		<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓
• Han 8D (instead of Han 7D)	A31	✓		<b>Two coats of lacquer on enclosure and cover (PU on epoxy)</b>	G10	✓	✓
• Angled	A32	✓		<b>Interchanging of process connection side</b>	H01	✓	✓
• Han 8D (metal)	A33	✓		<b>Vent on side for gas measurements</b>	H02	✓	✓
<b>Sealing screws (2 units)</b> ¼-18 NPT, with vent valve in mat. of process flanges	A40	✓	✓	<b>Stainless steel process flanges for vertical differential pressure lines</b>	H03	✓	✓
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	<b>Transient protector 6 kV (lightning protection)</b>	J01	✓	✓
<b>Rating plate inscription</b> (instead of German)				<b>Chambered graphite gasket for process flange</b>	J02	✓	✓
• English	B11	✓	✓	<b>Chambered PTFE graphite gasket</b>	J03	✓	✓
• French	B12	✓	✓	<b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>	J05	✓	✓
• Spanish	B13	✓	✓	<b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>4)</sup></b>	J08	✓	✓
• Italian	B14	✓	✓	<b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>4)</sup></b>	J09	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	<b>Marine approvals</b>			
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)</b>	C11	✓	✓	• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓
<b>Inspection certificate</b> Acc. to EN 10204-3.1	C12	✓	✓	• Lloyds Register (LR)	S11	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	• French marine classification society Bureau Veritas (BV)	S12	✓	✓
<b>Functional safety (SIL2) (pending)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓		• American Bureau of Shipping (ABS)	S14	✓	✓
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓		• Russian Maritime Register (RMR)	S16	✓	✓
<b>Increased measuring accuracy</b> (mandatory specification for SITRANS P410)	C41	✓	✓	• Korean Register of Shipping (KR)	S17	✓	✓
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓				
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓					
<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b> (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓				
<b>Degree of protection IP66/IP68</b> (only for M20 x 1.5 and ½-14 NPT)	D12	✓	✓				
<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓				
<b>TAG plate empty (no inscription)</b>	D61	✓	✓				

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/253).

- 1) Device plug Han IP65
- 2) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.
- 3) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.
- 4) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

Selection and Ordering data	Order code		
Additional data	HART	PA	FF
Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.			
<b>Measuring range to be set</b> Specify in plain text: • in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y01 Y02	✓ ✓	✓ <sup>1)</sup> ✓
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 char., specify in plain text: Y16: .....	Y16	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 char., specify in plain text: Y17: .....	Y17	✓	
<b>Setting of pressure indication in pressure units</b> Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H <sub>2</sub> O <sup>1)</sup> , inH <sub>2</sub> O <sup>1)</sup> , ftH <sub>2</sub> O <sup>1)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % ) ref. temperature 20 °C	Y21	✓	✓
<b>Setting of pressure indication in non-pressure units<sup>2)</sup></b> Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)	Y22 + Y01 or Y02	✓	
<b>Preset bus address</b> possible between 1 and 126 Specify in plain text: Y25: .....	Y25		✓
<b>Damping adjustment in seconds (0 ... 100 s)</b>	Y30	✓	✓

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset.

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) Preset values can only be changed over SIMATIC PDM.

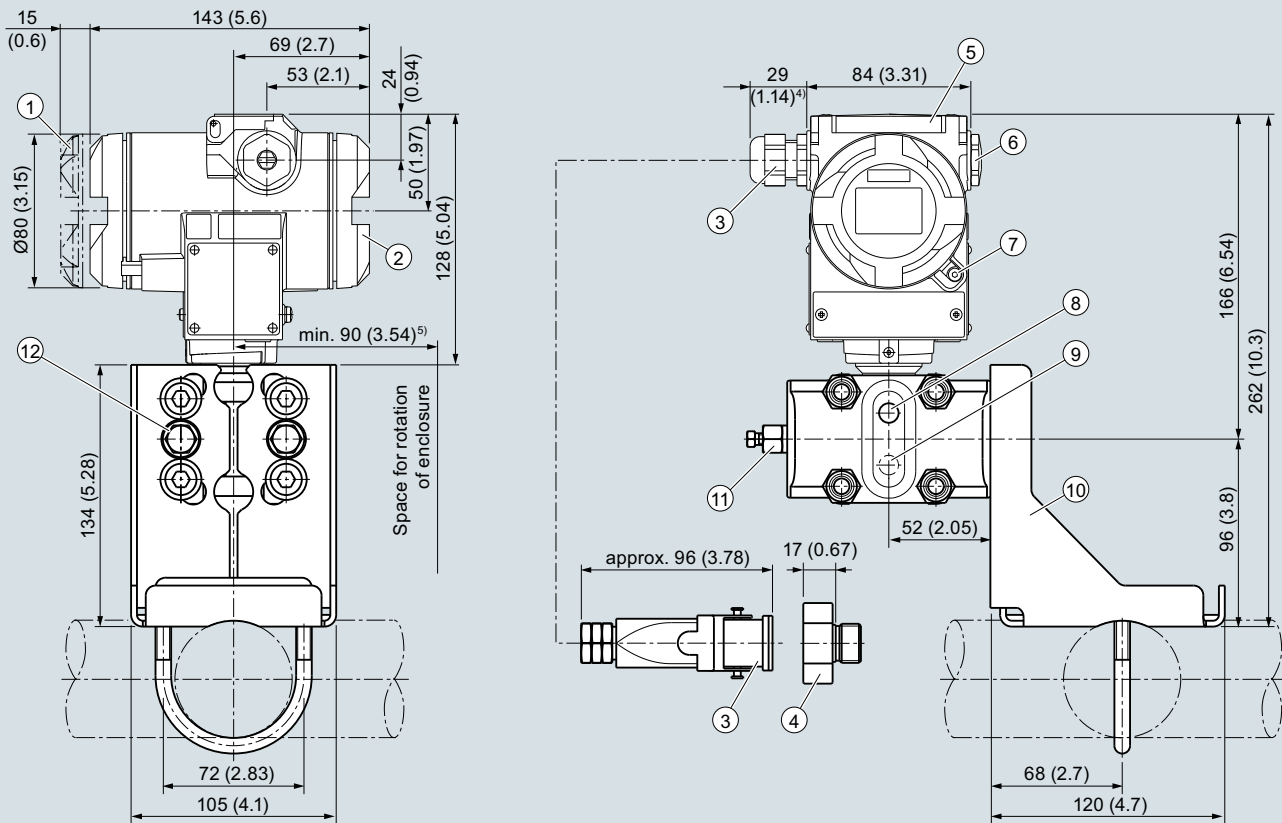
# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P410

for differential pressure and flow

1

## Dimensional drawings

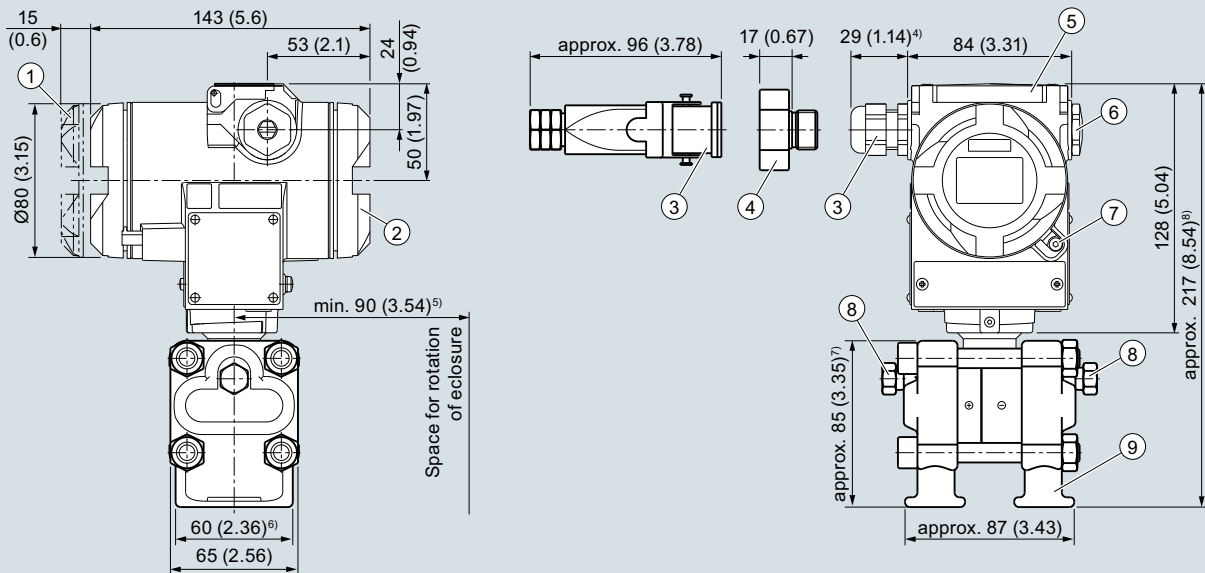


- ① Electronics side, local display  
(longer overall length for cover with inspection window)<sup>1)</sup>
- ② Connection side<sup>1)</sup>
- ③ Electrical connection:
  - Pg 13.5 screw gland (adapter)<sup>2) 3)</sup>
  - M20 x 1,5 screw gland
  - ½-14 NPT screw gland
  - Han 7D/Han 8D<sup>2) 3)</sup> device plug
- ④ Harting adapter
- ⑤ Cover over buttons

- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
- ⑧ Lateral ventilation for liquid measurement (Standard)
- ⑨ Lateral ventilation for gas measurement (order option H02)
- ⑩ Mounting bracket (optional)
- ⑪ Sealing plug with valve (optional)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

- <sup>1)</sup> In addition, allow approx. 20 mm (0.79 inch) for the thread length
- <sup>2)</sup> Not with "flameproof enclosure" type of protection
- <sup>3)</sup> Not for type of protection "FM + CSA" [is + XP]"
- <sup>4)</sup> For Pg 13.5 with adapter, approx. 45 mm (1.77 inch)
- <sup>5)</sup> 92 mm (3.62 inch) minimum distance for rotating with indicator

SITRANS P410 pressure transmitters for differential pressure and flow, dimensions in mm (inch)



- ① Electronics side, local display (longer overall length for cover with inspection window)<sup>1)</sup>
- ② Connection side<sup>1)</sup>
- ③ Electrical connection:
  - Pg 13.5 screw gland (adapter)<sup>2)</sup>
  - M20 x 1,5 screw gland
  - ½-14 NPT screw gland
  - Han 7D/Han 8D<sup>2)</sup> device plug
- ④ Harting adapter

- ⑤ Cover over buttons
- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
- ⑧ Sealing plug with valve (optional)
- ⑨ Process connection: ¼-18 NPT (IEC 61518)

- <sup>1)</sup> In addition, allow approx. 20 mm (0.79 inch) for the thread length
- <sup>2)</sup> Not with "flameproof enclosure" type of protection
- <sup>3)</sup> Not for type of protection "FM + CSA" [is + XPJ]"
- <sup>4)</sup> For Pg 13.5 with adapter, approx. 45 mm (1.77 inch)
- <sup>5)</sup> 92 mm (3.62 inch) minimum distance for rotating with indicator
- <sup>6)</sup> 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- <sup>7)</sup> 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- <sup>8)</sup> 219 mm (8.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

SITRANS P410 pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines, optional "H03", dimensional drawing, dimensions in mm (inch)



SITRANS P410 pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

## Accessories/Spare parts

1

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<i>Accessories/Spare parts</i>			
<b>Mounting bracket and fastening parts</b> for pressure transmitters SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF403-.....-..C.) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AB</b> <b>7MF4997-1AH</b> <b>7MF4997-1AP</b>	<b>Mounting screws</b> For measuring point label, grounding and connection terminals or for display (50 units)	<b>7MF4997-1CD</b>
<b>Mounting bracket and fastening parts</b> for pressure transmitters SITRANS P410 with HART, P410 with PROFIBUS PA and P10with FOUNDATION Fieldbus (7MF403-.....-..A., ..B., ..D. and ..F.) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AC</b> <b>7MF4997-1AJ</b> <b>7MF4997-1AQ</b>	<b>Sealing screws</b> (1 set = 2 units) for process flange <ul style="list-style-type: none"> <li>made of stainless steel</li> <li>made of Hastelloy</li> </ul>	<b>7MF4997-1CG</b> <b>7MF4997-1CH</b>
<b>Mounting and fastening brackets</b> For differential pressure transmitters with flange thread M10 SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF443-....) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AD</b> <b>7MF4997-1AK</b> <b>7MF4997-1AR</b>	<b>Sealing screws with vent valve</b> Complete (1 set = 2 units) <ul style="list-style-type: none"> <li>made of stainless steel</li> <li>made of Hastelloy</li> </ul>	<b>7MF4997-1CP</b> <b>7MF4997-1CQ</b>
<b>Mounting and fastening brackets</b> For differential pressure transmitters with flange thread M12 SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF453-....) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AE</b> <b>7MF4997-1AL</b> <b>7MF4997-1AS</b>	<b>Connection board</b> <ul style="list-style-type: none"> <li>for SITRANS P410</li> <li>for SITRANS P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus</li> </ul>	<b>7MF4997-1DN</b> <b>7MF4997-1DP</b>
<b>Mounting and fastening brackets</b> For differential pressure transmitters with flange thread 7/16 -20 UNF SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF443-.... and 7MF453-....) <ul style="list-style-type: none"> <li>made of steel</li> <li>made of stainless steel 304/1.4301</li> <li>made of stainless steel 316L/1.4404</li> </ul>	<b>7MF4997-1AF</b> <b>7MF4997-1AM</b> <b>7MF4997-1AT</b>	<b>O-rings for process flanges made of:</b> <ul style="list-style-type: none"> <li>FPM (Viton)</li> <li>PTFE (Teflon)</li> <li>FEP (with silicone core, approved for food)</li> <li>FFPM (Kalrez)</li> <li>NBR (Buna N)</li> </ul>	<b>7MF4997-2DA</b> <b>7MF4997-2DB</b> <b>7MF4997-2DC</b> <b>7MF4997-2DD</b> <b>7MF4997-2DE</b>
<b>Cover</b> Made of die-cast aluminum, including gasket, for SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus. Compatible for Ex and non-Ex transmitters <ul style="list-style-type: none"> <li>without window</li> <li>with window</li> </ul>	<b>7MF4997-1BB</b> <b>7MF4997-1BE</b>	<b>Sealing ring</b> for process connection	<b>see "Fittings"</b>
<b>Cover</b> Made of stainless steel, including gasket, or SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus. Compatible for Ex and non-Ex transmitters <ul style="list-style-type: none"> <li>without window</li> <li>with window</li> </ul>	<b>7MF4997-1BC</b> <b>7MF4997-1BF</b> <b>7MF4997-1BR</b>		
<b>Digital indicator</b> Including mounting material, for SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus			
<b>Measuring point label</b> <ul style="list-style-type: none"> <li>without inscription (5 units)</li> <li>Printed (1 unit) Data according to Y01 or Y02, Y15, Y16 and Y99 (see "Pressure transmitters")</li> </ul>	<b>7MF4997-1CA</b> <b>7MF4997-1CB-Z</b> <b>Y..: .....</b>		

Selection and Ordering data	Article No.
<p><b>Documentation</b></p> <p>The entire documentation is available for download free-of-charge in various languages at: <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a></p> <p>Compact operating instructions SITRANS P DS III/P410</p> <ul style="list-style-type: none"> <li>• English, German, Spanish, French, Italian, Dutch</li> </ul>	<b>A5E03434626</b>
<p><b>Certificates (order only via SAP)</b> instead of Internet download</p> <ul style="list-style-type: none"> <li>• hard copy (to order)</li> <li>• on DVD (to order)</li> </ul>	<b>A5E03252406</b> <b>A5E03252407</b>
<p><b>HART modem</b> with USB interface</p>	<b>7MF4997-1DB</b>

Power supply units see Chap. 7 "Supplementary Components".

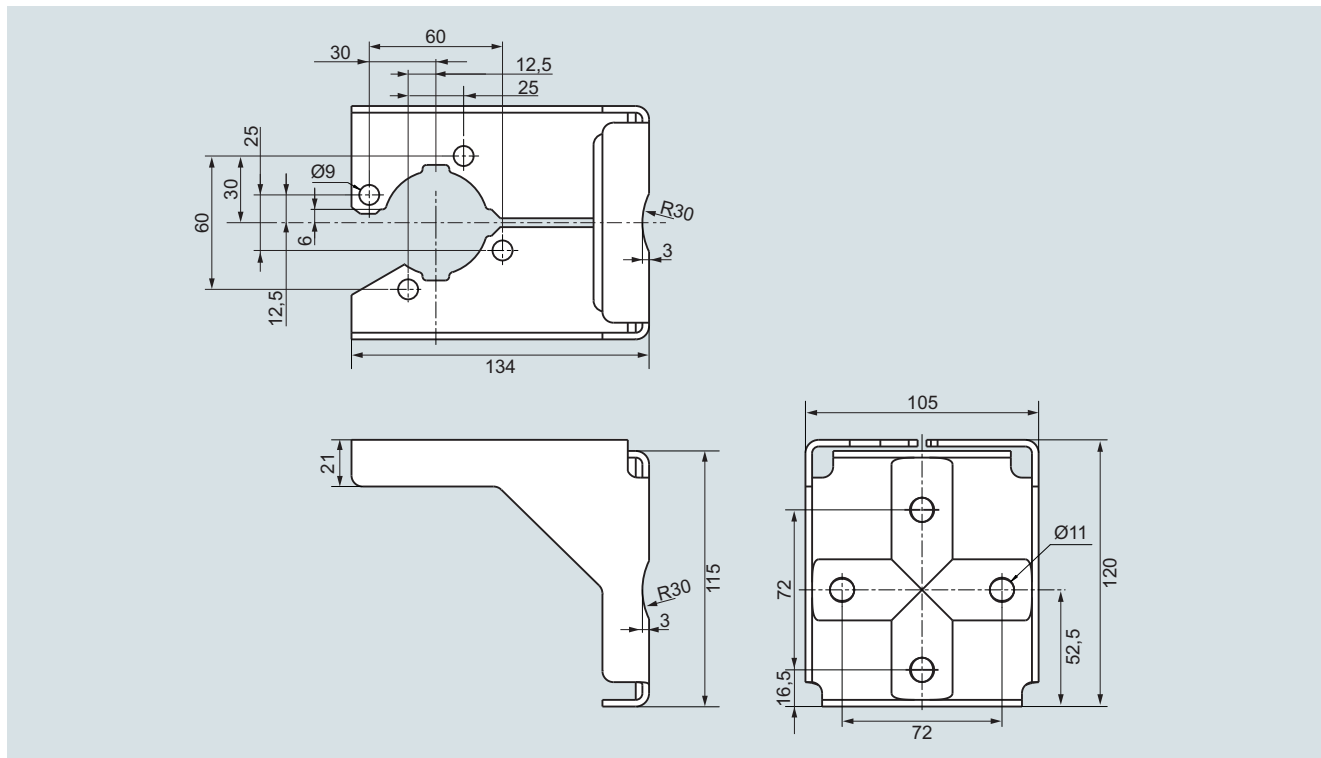
## Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P410

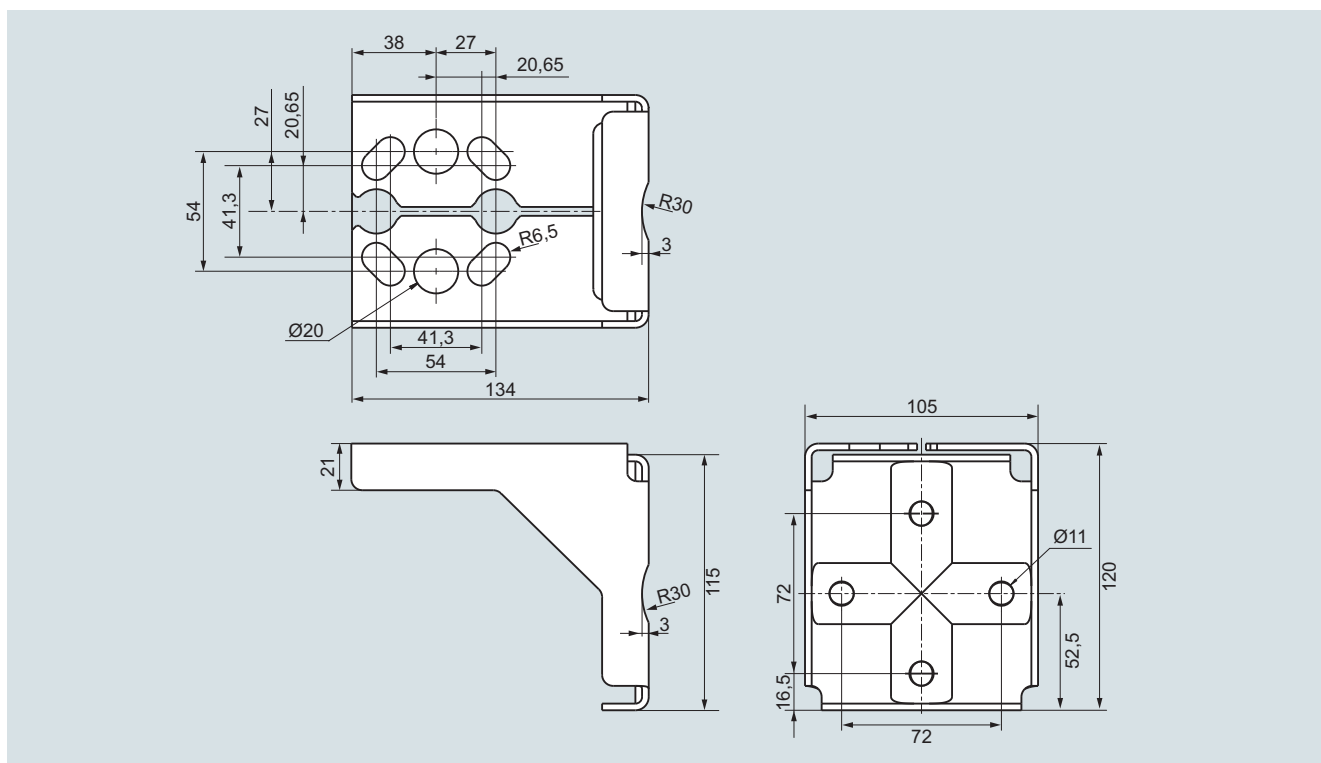
### Accessories/Spare parts

1

### Dimensional drawings



Mounting bracket for SITRANS P410 gauge pressure-transmitters, dimensions in mm  
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



Mounting bracket for SITRANS P410 differential pressure transmitter, dimensions in mm  
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



## Overview



SITRANS P500 pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and which fulfil the most stringent demands of accuracy, long-term stability, speed and lots more.

Extensive functionality allows you to set the pressure transmitter specifically to your own requirements. Despite their many settings options, local set-up is easy. A multi-lingual menu with clear text instructions guides you through the process. There are also help texts available.

The innovative EDD with integrated QuickStart assistance is also quick and easy to configure by computer using the HART protocol.

Extensive diagnostic functions, e.g. min/max pointer for pressure and temperature, or limit value indicator, make sure you always have the process under control. You can also display additional process values such as temperature or static pressure. The simultaneous display of mass, resulting from a volume, is also easy.

The SITRANS P500 pressure transmitters can be configured to measure:

- Differential pressure
- Level
- Volume
- Mass
- Volume flow
- Mass flow

## Benefits

- High measuring accuracy
- Very fast response time
- Extremely good long-term stability
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions which can be used both on site as well as via HART.
- Optional separate replacement of measuring cell and electronics without recalibration.
- Extremely low conformity error values

- Infinitely adjustable measuring spans of 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH<sub>2</sub>O)
- Extremely good total performance and conformity error values with no loss of performance up to a turndown of 10 guaranteed.
- Additional integrated sensor for static pressure
- Parameterization via on-site control keys or HART
- Short process flanges enable space-saving installation.

## Application

The SITRANS P500 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes them suitable for locations with high electromagnetic emissions.

Pressure transmitters with ratings "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitter comes with a CE-declaration of conformity and fulfils the corresponding unified European directives (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

With newly designed measuring cell, it is possible to work with temperature of mediums of -40 to 125 °C (-40 to +257 °F) without having to use a remote seal.

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous fluids.

The pressure transmitter can be fully parameterized locally via the three operating keys and externally via HART.

## Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

### Technical description

#### Pressure transmitters for differential pressure and flow

- Measured variables:
  - Differential pressure
  - Small positive or negative pressure
  - Flow  $q \sim \sqrt{\Delta p}$  (together with a primary element (see Chapter "Flow Meters"))
- Measuring span (freely adjustable)  
for SITRANS P500: 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH<sub>2</sub>O)

#### Pressure transmitters for level

- Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.
- Measuring span (freely adjustable)  
for SITRANS P500: 1.25 to 6250 mbar (0.5 to 2509 inH<sub>2</sub>O)

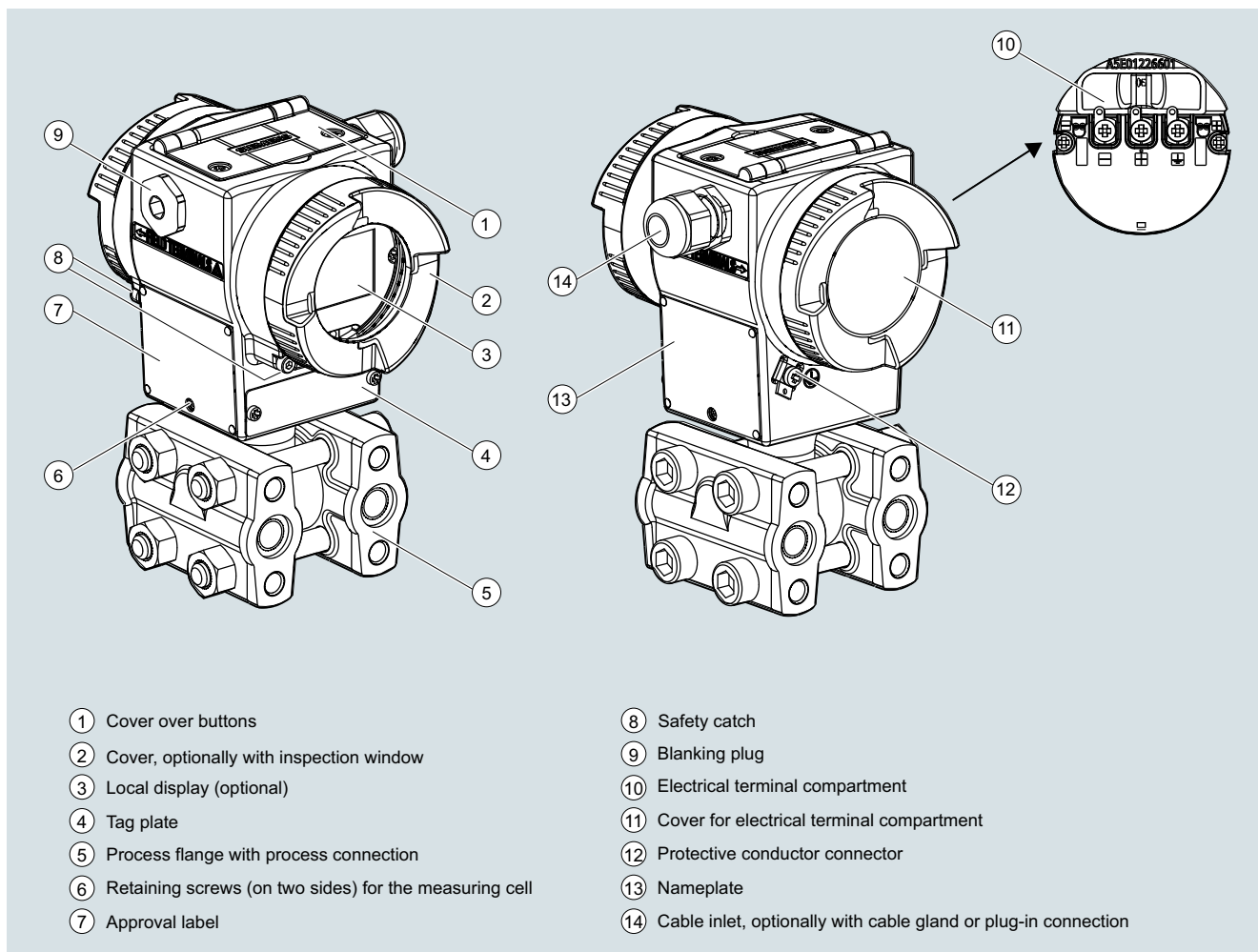
- Nominal diameter of the mounting flange
  - DN 50 / PN 40
  - DN 80 / PN 40
  - DN 100/ PN 16, PN 40
  - 2 inch/class 150, class 300
  - 3 inch/class 150, class 300
  - 4 inch/ class 150, class 300
  - customized special version

In the case of level measurements in open vessels, the low-pressure connection of the measuring cell remains open (measurement "compared to atmospheric").

In the case of measurements in closed vessels, the lower-pressure connection has to be connected to the vessel in order to compensate the static pressure.

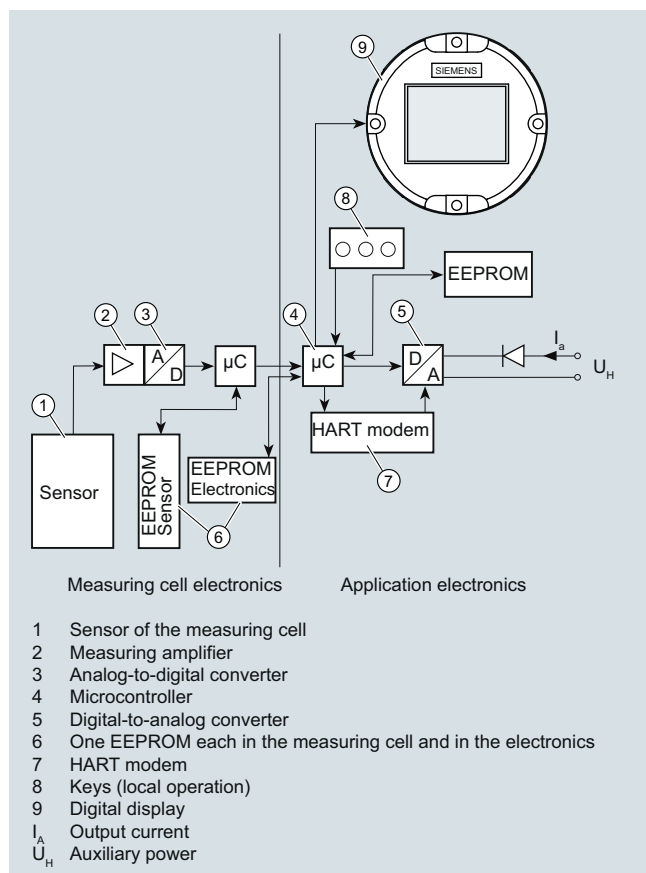
The wetted parts are made from a variety of materials, depending on the degree of corrosion resistance required.

### Design



View of transmitter

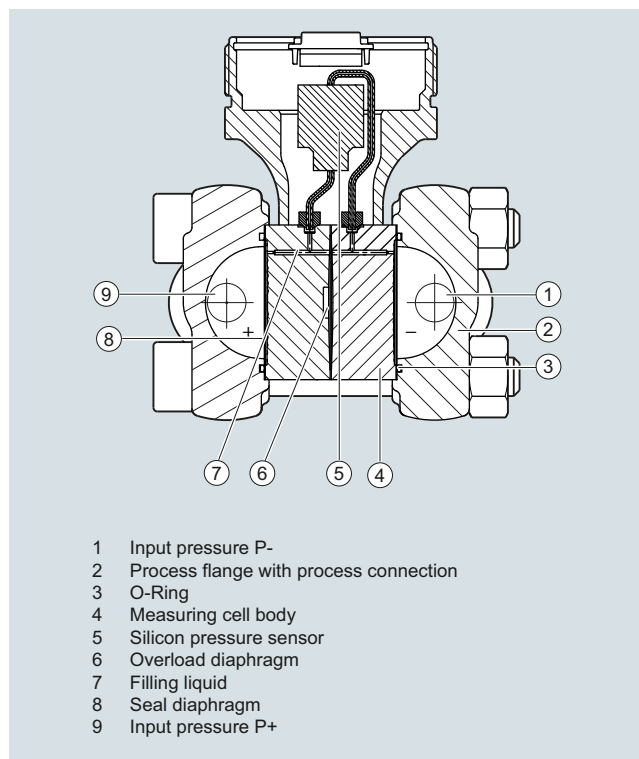
- The electronics enclosure is made of coated die-cast aluminum.
- The enclosure has round screwed covers front and back.
- Depending on the design the front cover is fitted with an inspection window. You can read off the measured value directly from the optional display through the window.
- The inlet to the terminal compartment is located either on the left or right side. The unused opening in each case is sealed by a blanking plug.
- The PE/ground terminal is on the back of the enclosure.
- Access to the terminal compartment for auxiliary power and shielding by unscrewing the cover.
- Beneath the electronic enclosure is the measuring cell with its process flanges at which the process connections are available. The modular design of the pressure transmitter lets you replace the measuring cell, electronics and connection board as required.
- On the top of the enclosure you can see the screwed cover of the three local pushbuttons of the transmitter.

**Function****Operation of electronics with HART communication****Function diagram of electronics**

- The input pressure is converted into an electrical signal by the sensor.
- This signal is amplified by the measuring amplifier and digitalized in an analog-to-digital converter.
- The digital signal is analyzed in a microcontroller and corrected according to linearity and thermal characteristics.
- In a digital-to-analog converter it is then converted into the output current of 4 to 20 mA. When connected to supply lines, a diode circuit provides reverse polarity protection.
- The measuring cell-specific data, the electronic data and the parameterization data is held in two EEPROMs. One EEPROM is incorporated into the measuring cell electronics, the other is incorporated into the application electronics.

**Operation**

- The three local pushbuttons enable you both to navigate and carry out configuration and to visually track messages and process values, provided a display is available.
- If you have a device without a display, you can carry out zero adjustment using the three local pushbuttons. It is possible to retrofit a display at any time.
- You can also carry out settings by computer via a HART modem.

**Mode of operation of the measuring cells****Measuring cell for differential pressure and flow****Measuring cell for differential pressure and flow, function diagram**

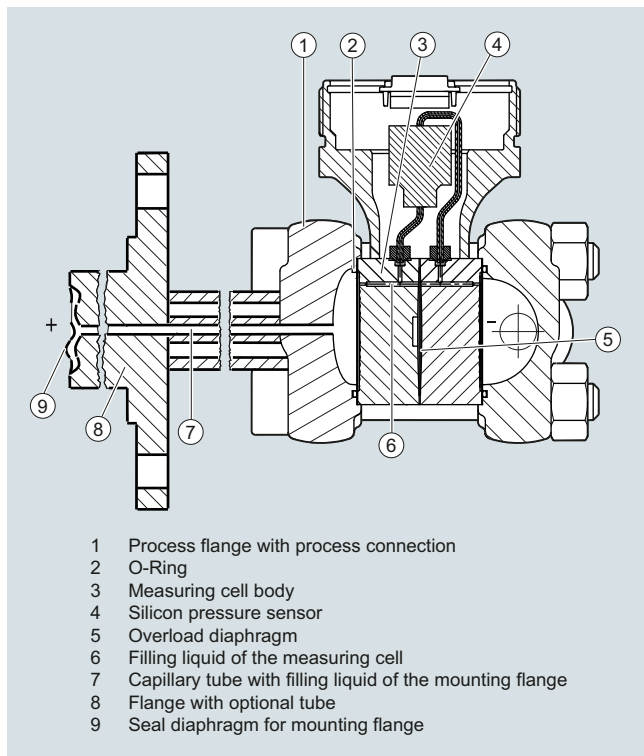
- The differential pressure is transmitted via the seal diaphragm and the filling liquid to the silicon pressure sensor.
- If the measuring limits are exceeded, the overload diaphragm flexes until the seal diaphragm touches the body of the measuring cell. This protects the sensor module from overload.
- The differential pressure causes the measuring diaphragm of the silicon pressure sensor to flex.
- The displacement changes the resistance value of the 4 piezo resistors in the measuring diaphragm in a bridge circuit.
- The change in the resistance causes a bridge output voltage proportional to the input pressure.

## Pressure Measurement

Pressure transmitters  
for applications with highest requirements (Premium)  
SITRANS P500

### Technical description

#### Measuring cell for level



Measuring cell for level, function diagram

- The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell via the seal diaphragm on the mounting flange.
- The differential pressure applied to the measuring cell is transmitted via the seal diaphragm and the filling liquid to the silicon pressure sensor.
- If the measuring limits are exceeded, the overload diaphragm flexes until the seal diaphragm touches the body of the measuring cell. This protects the sensor module from overload.
- The differential pressure causes the measuring diaphragm of the silicon pressure sensor to flex.
- The displacement changes the resistance value of the 4 piezo resistors in the measuring diaphragm in a bridge circuit.
- The change in the resistance causes a differential pressure proportional to the input pressure.

#### Configuration of SITRANS P500 HART

Depending on the version, there are a range of options for configuring the pressure transmitter and for setting or reading the parameters.

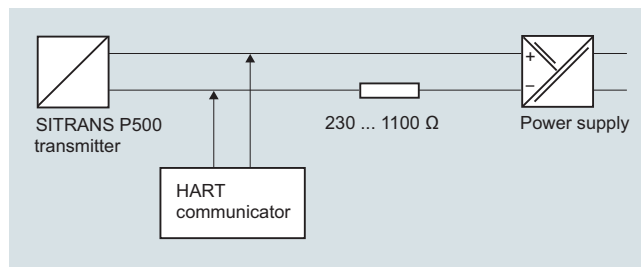
##### Configuration using the pushbuttons (local operation)

You can configure the transmitter in situ using the three keys provided a display is available. If you have no display, you can only carry out zero adjustment.

It is possible to retrofit a display. See accessories.

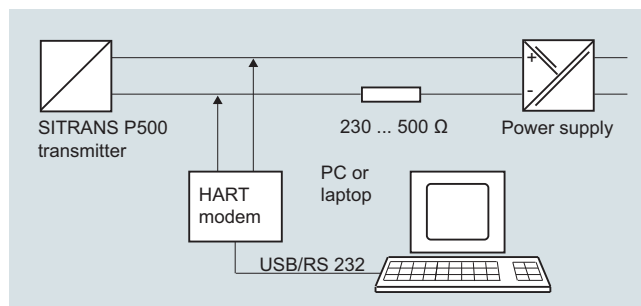
#### Configuration using HART

Parameterization using HART is carried out using a HART Communicator or a PC in conjunction with a HART modem.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

For configuring via PC a HART modem is used which connects the transmitter to the PC.

The signals needed for communication in conformity with the HART 6.0 protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

The necessary device files are available for download on the Internet.

#### SITRANS P500 configuration options

The transmission offers you full configuring options both via HART as well as in situ provided the optional display is available.

For simple parameterizing we also offer the easy to understand QuickStart function with guided commissioning.

#### SITRANS P500 diagnostic functions

- Maintenance timer
- Min/Max pointer (both resetable and non-resetable)
  - Pressure (incl. time and temperature stamp)
  - Static pressure (incl. time and temperature stamp)
  - Sensor temperature (incl. time stamp)
  - Electronic temperature (incl. time stamp)
- Limit monitor block
- Diagnostic warning
- Diagnostic alarm
- Simulation functions
- Display of trends and histograms
- Operating hours meter

Physical dimensions available for the SITRANS P500 HART display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O (4 °C), inH <sub>2</sub> O (20 °C), mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O (20 °C), inHg, mmHg, hPA
Level	m, cm, mm, ft, in
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , gallon, Imp. gallon, bushel, barrel, barrel liquid, l; Norm (standard) l; Norm (standard) m <sup>3</sup> , Norm (standard) feet <sup>3</sup>
Mass	g, kg, t (metric), lb, Ston, Lton, oz
Volume flow	m <sup>3</sup> /d, m <sup>3</sup> /h, m <sup>3</sup> /s, l/min, l/s, ft <sup>3</sup> /d, ft <sup>3</sup> /min, ft <sup>3</sup> /s, US gallon/min, gallon/s, l/h, milL/d, gallon/d, gallon/h, milgallon/d, Imp.gallon/s, Imp.gallon/m, Imp.gallon/h, Imp.gallon/d, Norm (standard) m <sup>3</sup> /h, Norm (standard) l/h, Norm (standard) ft <sup>3</sup> /h, Norm (standard) ft <sup>3</sup> /m, barrel liquid/s, barrel liquid/m, barrel liquid/h
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/h, g/min, g/s, lb/d, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

# Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

for differential pressure and flow

1

## Technical specifications

Input		Measuring accuracy																						
Measured variable	Differential pressure and flow	Reference conditions (in accordance with IEC 60770-1)	<ul style="list-style-type: none"> <li>• Rising characteristic curve</li> <li>• Lower range value 0 bar</li> <li>• Stainless steel seal diaphragm</li> <li>• Measuring cell with silicone oil filling</li> <li>• Room temperature (25 °C (77 °F))</li> </ul>																					
Measuring span (infinitely adjustable)	<table border="1"> <thead> <tr> <th>Measuring span (min. ... max.)</th> <th>Maximum operating pressure (static pressure)</th> </tr> </thead> <tbody> <tr> <td>1.00 ... 50 mbar (0.4 ... 20 inH<sub>2</sub>O)</td> <td rowspan="5">160 bar (2320 psi)</td> </tr> <tr> <td>1.25 ... 250 mbar (0.5 ... 100 inH<sub>2</sub>O)</td> </tr> <tr> <td>6.25 ... 1250 mbar (2.5 ... 502 inH<sub>2</sub>O)</td> </tr> <tr> <td>31.25 ... 6250 mbar (12.54 ... 2509 inH<sub>2</sub>O)</td> </tr> <tr> <td>0.16 ... 32 bar (2.33 ... 465 psi)</td> </tr> </tbody> </table>	Measuring span (min. ... max.)		Maximum operating pressure (static pressure)	1.00 ... 50 mbar (0.4 ... 20 inH <sub>2</sub> O)	160 bar (2320 psi)	1.25 ... 250 mbar (0.5 ... 100 inH <sub>2</sub> O)	6.25 ... 1250 mbar (2.5 ... 502 inH <sub>2</sub> O)	31.25 ... 6250 mbar (12.54 ... 2509 inH <sub>2</sub> O)	0.16 ... 32 bar (2.33 ... 465 psi)	All error information always refers to the set measuring span.													
Measuring span (min. ... max.)	Maximum operating pressure (static pressure)																							
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Lower range limit	-100 % of max. measuring span and/or 30 mbar a (0.44 psi a)	Error in measurement at limit setting incl. hysteresis and reproducibility																						
Upper range limit	100 % of max. measuring span	r: measuring span ratio (r: measuring span ratio (r = max. measuring span / set span))																						
Lower range value	Between measuring limits (freely adjustable)	Linear characteristic	<table border="1"> <thead> <tr> <th></th> <th>r ≤ 10</th> <th>r ≥ 10</th> </tr> </thead> <tbody> <tr> <td>• 50 mbar (20 inH<sub>2</sub>O)</td> <td>≤ 0.06 %</td> <td>≤ (0.006 · r) %</td> </tr> <tr> <td>• 250 mbar (100 inH<sub>2</sub>O) 1250 mbar (502 inH<sub>2</sub>O) 6250 mbar (2509 inH<sub>2</sub>O) 32 bar (465 psi)</td> <td>≤ 0.03 %</td> <td>≤ (0.003 · r) %</td> </tr> </tbody> </table>		r ≤ 10	r ≥ 10	• 50 mbar (20 inH <sub>2</sub> O)	≤ 0.06 %	≤ (0.006 · r) %	• 250 mbar (100 inH <sub>2</sub> O) 1250 mbar (502 inH <sub>2</sub> O) 6250 mbar (2509 inH <sub>2</sub> O) 32 bar (465 psi)	≤ 0.03 %	≤ (0.003 · r) %												
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Output		Square-rooted characteristic	<table border="1"> <thead> <tr> <th></th> <th>r ≤ 10</th> <th>r ≥ 10</th> </tr> </thead> <tbody> <tr> <td>• Flow &gt; 50 %</td> <td>≤ 0.06 %</td> <td>≤ (0.006 · r) %</td> </tr> <tr> <td>- 50 mbar (20 inH<sub>2</sub>O)</td> <td>≤ 0.03 %</td> <td>≤ (0.003 · r) %</td> </tr> <tr> <td>- 250 mbar (100 inH<sub>2</sub>O) 1250 mbar (502 inH<sub>2</sub>O) 6250 mbar (2509 inH<sub>2</sub>O) 32 bar (465 psi)</td> <td></td> <td></td> </tr> <tr> <td>• Flow 25 % ... 50 %</td> <td>≤ 0.12 %</td> <td>≤ (0.012 · r) %</td> </tr> <tr> <td>- 50 mbar (20 inH<sub>2</sub>O)</td> <td>≤ 0.06 %</td> <td>≤ (0.006 · r) %</td> </tr> <tr> <td>- 250 mbar (100 inH<sub>2</sub>O) 1250 mbar (502 inH<sub>2</sub>O) 6250 mbar (2509 inH<sub>2</sub>O) 32 bar (465 psi)</td> <td></td> <td></td> </tr> </tbody> </table>		r ≤ 10	r ≥ 10	• Flow > 50 %	≤ 0.06 %	≤ (0.006 · r) %	- 50 mbar (20 inH <sub>2</sub> O)	≤ 0.03 %	≤ (0.003 · r) %	- 250 mbar (100 inH <sub>2</sub> O) 1250 mbar (502 inH <sub>2</sub> O) 6250 mbar (2509 inH <sub>2</sub> O) 32 bar (465 psi)			• Flow 25 % ... 50 %	≤ 0.12 %	≤ (0.012 · r) %	- 50 mbar (20 inH <sub>2</sub> O)	≤ 0.06 %	≤ (0.006 · r) %	- 250 mbar (100 inH <sub>2</sub> O) 1250 mbar (502 inH <sub>2</sub> O) 6250 mbar (2509 inH <sub>2</sub> O) 32 bar (465 psi)		
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Output current signal	4 ... 20 mA	Influence of ambient temperature per 28 °C (50 °F)	<table border="1"> <tbody> <tr> <td>• 50 mbar (20 inH<sub>2</sub>O)</td> <td>≤ (0.04 · r + 0.05) %</td> </tr> <tr> <td>• 250 mbar (100 inH<sub>2</sub>O)</td> <td>≤ (0.025 · r + 0.014) %</td> </tr> <tr> <td>• 1250 mbar (502 inH<sub>2</sub>O) 6250 mbar (2509 inH<sub>2</sub>O) 32 bar (465 psi)</td> <td>≤ (0.006 · r + 0.03) %</td> </tr> </tbody> </table>	• 50 mbar (20 inH <sub>2</sub> O)	≤ (0.04 · r + 0.05) %	• 250 mbar (100 inH <sub>2</sub> O)	≤ (0.025 · r + 0.014) %	• 1250 mbar (502 inH <sub>2</sub> O) 6250 mbar (2509 inH <sub>2</sub> O) 32 bar (465 psi)	≤ (0.006 · r + 0.03) %															
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• Lower current limit (freely adjustable)	3.55 mA, factory setting 3.8 mA	Influence of static pressure	<ul style="list-style-type: none"> <li>• At the lower range value (PKN)</li> </ul> <table border="1"> <tbody> <tr> <td>- 50 mbar (20 inH<sub>2</sub>O)</td> <td>≤ (0.1 · r) % per 70 bar (1015 psi) correction via zero point correction</td> </tr> <tr> <td>- 250 mbar (100 inH<sub>2</sub>O)</td> <td>≤ (0.035 · r) % per 70 bar (1015 psi) correction via zero point correction</td> </tr> <tr> <td>- 1250 mbar (502 inH<sub>2</sub>O) 6250 mbar (2509 inH<sub>2</sub>O) 32 bar (465 psi)</td> <td>≤ (0.007 · r) % per 70 bar (1015 psi) correction via zero point correction</td> </tr> </tbody> </table>	- 50 mbar (20 inH <sub>2</sub> O)	≤ (0.1 · r) % per 70 bar (1015 psi) correction via zero point correction	- 250 mbar (100 inH <sub>2</sub> O)	≤ (0.035 · r) % per 70 bar (1015 psi) correction via zero point correction	- 1250 mbar (502 inH <sub>2</sub> O) 6250 mbar (2509 inH <sub>2</sub> O) 32 bar (465 psi)	≤ (0.007 · r) % per 70 bar (1015 psi) correction via zero point correction															
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• Upper current limit (freely adjustable)	23 mA, factory setting 20.5 mA	• On the measuring span (PKS)	<table border="1"> <tbody> <tr> <td>- 50 mbar (20 inH<sub>2</sub>O)</td> <td>≤ 0.13 % per 70 bar (1015 psi)</td> </tr> <tr> <td>- 250 mbar (100 inH<sub>2</sub>O) 1250 mbar (502 inH<sub>2</sub>O)</td> <td>≤ 0.03 % per 70 bar (1015 psi)</td> </tr> <tr> <td>- 6250 mbar (2509 inH<sub>2</sub>O)</td> <td>≤ 0.09 % per 70 bar (1015 psi)</td> </tr> <tr> <td>- 32 bar (465 psi)</td> <td>≤ 0.05 % per 70 bar (1015 psi)</td> </tr> </tbody> </table>	- 50 mbar (20 inH <sub>2</sub> O)	≤ 0.13 % per 70 bar (1015 psi)	- 250 mbar (100 inH <sub>2</sub> O) 1250 mbar (502 inH <sub>2</sub> O)	≤ 0.03 % per 70 bar (1015 psi)	- 6250 mbar (2509 inH <sub>2</sub> O)	≤ 0.09 % per 70 bar (1015 psi)	- 32 bar (465 psi)	≤ 0.05 % per 70 bar (1015 psi)													
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- 32 bar (465 psi)	≤ 0.05 % per 70 bar (1015 psi)																							
• Ripple (without HART communication)	I <sub>pp</sub> ≤ 0.4 % of max. output current																							
• adjustable damping	0... 100 s in steps of 0.1 s, factory-setting: 2 s																							
• current transmitter	3.55 ... 23 mA																							
• Failure signal	adjustable within limits:: <ul style="list-style-type: none"> <li>• Bottom: 3.55 ... 3.7 mA (default value: 3.6 mA)</li> <li>• Top: 21.0 ... 23 mA (default value: 22.8 mA)</li> </ul>																							
Load																								
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V}) / 0.023 \text{ A}$ in $\Omega$ , $U_H$ : Power supply in V																							
• With HART communication																								
- HART Communicator	$R_B = 230 \dots 1100 \Omega$																							
- HART modem	$R_B = 230 \dots 500 \Omega$																							
Characteristic curve	Linearly rising, linearly falling, square rooted characteristic rising, bidirectional square rooted characteristic and user-specific																							

# Pressure Measurement

## Pressure transmitters for applications with highest requirements (Premium) SITRANS P500

for differential pressure and flow

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Total Performance <sup>1)</sup>		Design	
<ul style="list-style-type: none"> <li>Linear characteristic</li> <li>- 50 mbar (20 inH<sub>2</sub>O)</li> <li>- 250 mbar (100 inH<sub>2</sub>O)</li> <li>- 1250 mbar (502 inH<sub>2</sub>O)</li> <li>6250 mbar (2509 inH<sub>2</sub>O)</li> <li>32 bar (465 psi)</li> </ul>	$r \leq 5$	$5 < r \leq 10$	<b>Weight</b> (without options) Approx. 3.3 kg (7.3 lb)
<ul style="list-style-type: none"> <li>Square rooted characteristic</li> <li>• Flow &gt; 50 %</li> <li>- 50 mbar (20 inH<sub>2</sub>O)</li> <li>- 250 mbar (100 inH<sub>2</sub>O)</li> <li>- 1250 mbar (502 inH<sub>2</sub>O)</li> <li>6250 mbar (2509 inH<sub>2</sub>O)</li> <li>32 bar (465 psi)</li> <li>• Flow 25 % ... 50 %</li> <li>- 50 mbar (20 inH<sub>2</sub>O)</li> <li>- 250 mbar (100 inH<sub>2</sub>O)</li> <li>- 1250 mbar (502 inH<sub>2</sub>O)</li> <li>6250 mbar (2509 inH<sub>2</sub>O)</li> <li>32 bar (465 psi)</li> </ul>	$r \leq 5$	$5 < r \leq 10$	<b>Material of parts in contact with the medium</b> <ul style="list-style-type: none"> <li>• Seal diaphragm</li> <li>Stainless steel, mat. no. 1.4404/316L, Hastelloy C276, Monel 400</li> <li>• Process connection and sealing screw</li> <li>PN 160: stainless steel, mat.-No. 1.4404/316L</li> <li>• Sealing material in the process connections</li> <li>- O-Ring</li> <li>• Standard: Viton (FKM (FPM))</li> <li>• Optional: NBR</li> <li>PTFE (virginal)</li> <li>PTFE (glass fiber-reinforced)</li> <li>FFPM (Kalrez)<sup>2)</sup></li> <li>Graphite</li> </ul>
<ul style="list-style-type: none"> <li>Step response time T<sub>63</sub> without electrical damping</li> <li>• 50 mbar (20 inH<sub>2</sub>O)</li> <li>≤ 140 ms, contains a dead time of ≤ 45 ms</li> <li>• 250 mbar (100 inH<sub>2</sub>O)</li> <li>1250 mbar (502 inH<sub>2</sub>O)</li> <li>6250 mbar (2509 inH<sub>2</sub>O)</li> <li>32 bar (465 psi)</li> <li>≤ 88 ms, contains a dead time of ≤ 45 ms</li> <li>Long-term stability</li> <li>≤ (0.05 · r) % per 5 years</li> <li>≤ (0.08 · r) % per 10 years</li> <li>Influence of power supply</li> <li>≤ 0.005 %/1 V</li> </ul>	$r \leq 5$	$5 < r \leq 10$	<b>Material of parts not in contact with media</b> Die-cast aluminum enclosure <ul style="list-style-type: none"> <li>• Low copper die-cast aluminum AC-AISI12 (Fe) or AC-AISI 10 Mg (Fe) to DIN EN 1706</li> <li>• Lacquer on polyurethane base, optional epoxy-based primer</li> <li>• Stainless steel name plates (mat. no. 1.4404/316L)</li> </ul> Stainless steel precision cast enclosure Stainless steel, mat. no. 1.4404/316L Process connection screws Stainless steel, mat. no. 1.4404/316L Mounting bracket Steel or stainless steel mat. no. 1.4301 Measuring cell filling Silicone oil Process connection 1/4-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518/DIN EN 61518
<b>Operating conditions</b> Mounting position Any Ambient conditions <ul style="list-style-type: none"> <li>• Ambient temperature (Note: Observe the temperature class in areas subject to explosion hazard.)</li> <li>- Total device</li> <li>-40 ... +85 °C (-40 ... +185 °F)</li> <li>- Readable display</li> <li>-20 ... +85 °C (-4 ... +185 °F)</li> <li>- Storage temperature</li> <li>-50 ... +90 °C (-58 ... +194 °F)</li> </ul> Climatic class <ul style="list-style-type: none"> <li>• Condensation</li> <li>Relative humidity 0 ... 100 % (condensation permissible)</li> </ul> Degree of protection (to IEC 60529) IP66/IP 68 and NEMA 4X (with corresponding cable gland) Electromagnetic Compatibility <ul style="list-style-type: none"> <li>• Emitted interference and interference immunity</li> <li>Acc. to IEC 61326 and NAMUR NE 21</li> </ul> Permissible pressures According to 2014/68/EU pressure equipment directive Temperature of medium <ul style="list-style-type: none"> <li>• Measuring cell with silicone oil filling</li> <li>-40 ... +125 °C (-40 ... +257 °F)</li> </ul>			Electrical connection <ul style="list-style-type: none"> <li>• Screw terminals</li> <li>• Cable entry via the following screwed glands:               <ul style="list-style-type: none"> <li>- M20 x 1.5</li> <li>- 1/2-14 NPT</li> <li>- Device plug Han 7D/Han 8D</li> <li>- Device plug M12</li> </ul> </li> </ul> Displays and controls Pushbuttons 3 for local programming directly on transmitter Display <ul style="list-style-type: none"> <li>• With or without integrated display</li> <li>• Cover with or without window</li> </ul>
			<b>Auxiliary power supply</b> Terminal voltage on transmitter <ul style="list-style-type: none"> <li>• DC 10.6 ... 44 V</li> <li>• With intrinsically-safe operation DC 10.6 ... 30 V</li> </ul>

# Pressure Measurement

Pressure transmitters  
for applications with highest requirements (Premium)  
SITRANS P500

for differential pressure and flow

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## Certificates and approvals

Classification according to PED  
2014/68/EU

- PN 160 (MAWP 2320 psi) For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Explosion protection

Explosion protection for Europe  
(to ATEX)

- Intrinsic safety "i"
  - Marking PTB 09 ATEX 2004 X
  - Permissible ambient temperature Ex II 1/2 G Ex ia/ib IIC T4
  - Connection -40 ... +85 °C (-40 ... +185 °F)
  - Effective internal inductance: To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ;  $R_i = 300 \Omega$
  - Effective inner capacitance:  $L_i = 400 \mu\text{H}$
- Explosion-proof "d"
  - Marking BVS 09 ATEX E 027
  - Permissible ambient temperature Ex II 1/2 G Ex db ia IIC T4/T6 Ga/Gb
  - Connection -40 ... +85 °C (-40 ... +185 °F)
  - Effective internal inductance: -40 ... +60 °C (-40 ... +140 °F)
  - Effective inner capacitance: temperature class T6
- Dust explosion protection for zone 20
  - Marking To circuits with values:  
 $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
  - Permissible ambient temperature BVS 09 ATEX E 027
  - Max. surface temperature Ex II 1 D Ex ta ia IIIC T120°C Da
  - Connection -40 ... +85 °C (-40 ... +185 °F)
  - Effective internal inductance: 120 °C (248 °F)
  - Effective inner capacitance: To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$
- Dust explosion protection for zone 21/22
  - Marking Ex II 2D Ex tb ia IIIC T120°C Db
  - Connection To circuits with values:  
 $U_m = 10.5 \dots 45 \text{ V DC}$ ;  $P_{\text{max}} = 1.2 \text{ W}$
- Type of protection "n" (zone 2)
  - Marking PTB 09 ATEX 2004 X
  - "nA" connection Ex II 3 G Ex nA II T4/T6
  - "nL, ic" connection Ex II 2/3 G Ex ib/nL IIC T4/T6
  - Effective internal inductance: Ex II 2/3 G Ex ib/ic IIC T4/T6
  - Effective inner capacitance:  $U_m = 45 \text{ V DC}$
  - "nL, ic" connection  $U_i = 45 \text{ V}$
  - Effective internal inductance:  $L_i = 400 \mu\text{H}$
  - Effective inner capacitance:  $C_i = 6 \text{ nF}$

Explosion protection for USA  
(to FM)

Certificate of Compliance

- Identification (XP/DIP) or (IS)

- Permissible Ambient Temperature

- Entity parameters

- Marking (NI/NO)

- Permissible Ambient Temperature

- (NI/S) parameters

Explosion protection for  
Canada (to cCSAUS)

Certificate of Compliance

- Marking (XP/DIP)

- Permissible ambient temperature

- Entity parameters

- Marking (ia/ib)

- Permissible ambient temperature

- Entity parameters

- Marking (NI/n)

- Permissible ambient temperature

- NI/nA parameters

- nL parameters

No. 3033013

XP CL I, DIV 1, GP ABCDEFG T4 / T6  
DIP CL II, III, DIV1, GP EFG T4/T6  
IS CL I, II, III, DIV1, GP ABCDEFG T4  
CL I, Zone 0, AEx ia IIC T4  
CL I, Zone 1, AEx ib IIC T4

$T_a = T4: -40 \dots +85 \text{ °C}$   
(-40 ... +185 °F)  
 $T_a = T6: -40 \dots +60 \text{ °C}$   
(-40 ... +140 °F)

According to "control drawing":  
A5E02189134N  
 $U_m = 30 \text{ V}$ ,  $I_m = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $L_i = 400 \mu\text{H}$ ,  $C_i = 6 \text{ nF}$

NI CL I, DIV 2, GP ABCD T4/T6  
NI CL I, Zone 2, GP IIC T4/T6  
S CL II, III, GPFG T4/T6  
NI CL I, DIV 2, GP ABCD T4/T6, NIFW  
NI CL I, Zone 2, GP IIC T4/T6, NIFW  
NI CLII, III, DIV 2, GP FG T4/T6, NIFW

$T_a = T4: -40 \dots +85 \text{ °C}$   
(-40 ... +185 °F)  
 $T_a = T6: -40 \dots +60 \text{ °C}$   
(-40 ... +140 °F)

According to "control drawing":  
A5E02189134N  
 $U_m = 45 \text{ V}$ ,  $L_i = 400 \mu\text{H}$ ,  $C_i = 6 \text{ nF}$ ,

No. 2280963

CL I, DIV 1, GP ABCD T4 /T6;  
CL II, DIV 1, GP EFG T4/T6

$T_a = T4: -40 \dots +85 \text{ °C}$  (-40 ... +185 °F)  
 $T_a = T6: -40 \dots +60 \text{ °C}$  (-40 ... +140 °F)

According to "control drawing":  
A5E02189134N  
 $U_m = 45 \text{ V}$

CL I, Ex ia/Ex ib IIC, T4  
CL II, III, Ex ia/Ex ib, GP EFG, T4  
CL I, AEx ia/AEx ib IIC, T4  
CL II, III, AEx ia/ AEx ib, GP EFG, T4

$T_a = T4: -40 \dots +85 \text{ °C}$   
(-40 ... +185 °F)

$U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ,  
 $R_i = 300 \Omega$ ,  $L_i = 400 \mu\text{H}$ ,  $C_i = 6 \text{ nF}$

CL I, DIV 2, GP ABCD T4/T6  
CL II, III, DIV 2, GP FG T4/T6  
Ex nA IIC T4/T6  
AEx nA IIC T4/T6  
Ex nL IIC T4/T6  
AEx nL IIC T4/T6

$T_a = T4: -40 \dots +85 \text{ °C}$  (-40 ... +185 °F)  
 $T_a = T6: -40 \dots +60 \text{ °C}$  (-40 ... +140 °F)

According to "control drawing":  
A5E02189134N  
 $U_m = 45 \text{ V}$

According to "control drawing":  
A5E02189134N  
 $U_i = 45 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $L_i = 400 \mu\text{H}$ ,  
 $C_i = 6 \text{ nF}$



<u>Explosion protection for China (acc. to NEPSI)</u>	
• Intrinsic safety "i"	GYJ111111X
- Marking	Ex ia/ib IIB/IIC T4
- Perm. ambient temperature	40 ... +85 °C (-40 ... +185 °F)
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$
• Explosion-proof "d"	GYJ111112
- Marking	Ex dia IIC T4/T6
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6
- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Dust explosion protection for zone 21/22	GYJ111112
- Marking	DIP A21 TA,T120 °C IP68 D21
- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Type of protection "n" (zone 2)	GYJ111111X
- Marking	Ex nL IIB/IIC T4/T6 Ex nA II T4/T6
- Connection	$U_i = 45 \text{ V DC}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$

1) The total performance includes the errors caused by temperature effects, static pressure effects and conformity error, including hysteresis and repeatability.

2) Not in combination with measuring span "G".

<b>HART communication</b>	
Load with connection of	
• HART communicator	$R_B = 230 \dots 1100 \Omega$
• HART modem	$R_B = 230 \dots 500 \Omega$
Cable	2 wire shielded: $\leq 3.0 \text{ km}$ (1.86 miles), multiwire shielded: $\leq 1.5 \text{ km}$ (0.93 miles)
Protocol	HART Version 6.0
PC/laptop requirements	IBM compatible, RAM > 32 MByte, hard disk > 70 MByte, depending on modem type: RS 232-interface or USB connection, VGA graphics
Software for computer	SIMATIC PDM 6.0

# Pressure Measurement

Pressure transmitters  
for applications with highest requirements (Premium)  
SITRANS P500

for differential pressure and flow

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## Selection and Ordering data

Article No.

**Pressure transmitters for differential pressure and flow,  
SITRANS P500 HART, PN 160 (MAWP 2320 psi)**

7MF54 - - - 0

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

### Enclosure

Die-cast aluminum, dual chamber enclosure

### Thread for cable gland<sup>1)</sup>

M20x1.5

Die-cast aluminum, dual chamber enclosure

½-14 NPT

Stainless steel precision casting, dual chamber enclosure

M20x1.5

Stainless steel precision casting, dual chamber enclosure

½-14 NPT

### Output

4 ... 20 mA, HART

### Measuring cell filling

Silicone oil

### Measuring cell cleaning

normal

### Measuring span

1.00 ... 50 mbar (0.4 ... 20 inH<sub>2</sub>O)1.25 ... 250 mbar (0.5 ... 100.4 inH<sub>2</sub>O)6.25 ... 1250 mbar (2.5 ... 502 inH<sub>2</sub>O)31.25 ... 6250 mbar (12.54 ... 2509 inH<sub>2</sub>O)

0.16 ... 32 bar (2.33 ... 465 psi)

### Wetted parts materials

Seal diaphragm

Process flange

Stainless steel 1.4404/316L

Stainless steel 1.4404/316L

Hastelloy C276<sup>2)</sup>

Stainless steel 1.4404/316L

Monel 400<sup>2)</sup>

Stainless steel 1.4404/316L

Hastelloy

Hastelloy

### Process connection

Female thread ¼-18 NPT

#### • Sealing screw opposite process connection

- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518
- Mounting thread M10 to DIN 19213

#### • Vent on side of process flange<sup>3)</sup>

- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518
- Mounting thread M10 to DIN 19213

<sup>1)</sup> Cable glands must be ordered separately from "Further designs" (add "-Z" to Article No. and specify order code).

<sup>2)</sup> Not together with Measuring span "C".

<sup>3)</sup> Not in conjunction with remote seals (option V00).

0

1

2

3

3

1

C

D

E

F

G

A

B

C

R

0

1

4

5

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		<b>Further designs</b> Add "-Z" to Article No. and specify Order code.	
<b>Attachments</b>		<b>Degree of protection approvals: Ex ia/ib (intrinsic safety)</b>	
Mounting bracket made of steel	<b>A01</b>	Ex ia/ib protection (ATEX) (T4)	<b>E00</b>
Mounting bracket made of stainless steel 304	<b>A02</b>	Ex IS protection (FM) (T4)	<b>E01</b>
Mounting bracket made of stainless steel 316L	<b>A03</b>	Ex IS protection (cCSA <sub>US</sub> ) (T4)	<b>E02</b>
<b>Display</b> (Standard: no display, cover closed)		Ex ia/ib protection (NEPSI) (T4)	<b>E06</b>
With display and blanking cover	<b>A10</b>	<b>Degree of protection approvals: Ex d (flameproof)</b>	
With display and glass cover	<b>A11</b>	Ex d explosion-proof (ATEX)(T4/T6)	<b>E20</b>
<b>Special enclosure / cover version</b>		Ex XP explosion-proof and DIP (FM)(T4/T6)	<b>E21</b>
Two coats of lacquer on enclosure, cover (PU on epoxy)	<b>A20</b>	Ex XP explosion-proof and DIP (cCSA <sub>US</sub> )(T4/T6)	<b>E22</b>
<b>Electrical connection and cable entry</b> (Standard: no cable gland, only dust protection caps)		Ex d explosion-proof (NEPSI)(T4/T6)	<b>E26</b>
Cable gland made of plastic (IP66/68) <sup>4)</sup>	<b>A50</b>	<b>Degree of protection approvals: n/NI</b>	
Cable glands made of metal (IP66/68)	<b>A51</b>	Zone 2 (nA, nL, ic) (ATEX) (T4/T6)	<b>E40</b>
Cable glands made of stainless steel (IP66/68)	<b>A52</b>	Div2 NI, Div2 NI-field wiring (FM) (T4/T6)	<b>E41</b>
Device plug M12 without cable socket (IP66/67) <sup>4)</sup>	<b>A60</b>	Zone 2 (nA, nL), Div2 NI (cCSA <sub>US</sub> ) (T4/T6)	<b>E42</b>
Device plug M12 complete with cable socket (IP66/67) <sup>4)</sup>	<b>A61</b>	Zone 2 (nA, nL) (NEPSI) (T4/T6)	<b>E46</b>
Device plug Han 7D, plastic, straight (with cable socket) (IP65) <sup>4)</sup>	<b>A71</b>	<b>Degree of protection approvals: Dust Zone 20/21/22</b>	
Device plug Han 7D, plastic, angled (with cable socket) (IP65) <sup>4)</sup>	<b>A72</b>	Use in Zone 21/22 (Ex tD) (ATEX) Ex tb	<b>E60</b>
Device plug Han 7D, metal enclosure, straight (with cable socket) (IP65) <sup>4)</sup>	<b>A73</b>	Use in Zone 20/21/22 (Ex iaD) (ATEX) Ex ta	<b>E61</b>
Device plug Han 7D, metal enclosure, angled (with cable socket) (IP65) <sup>4)</sup>	<b>A74</b>	Use in Zone 21/22 (Ex DIP) (NEPSI)	<b>E66</b>
Device plug Han 8D, plastic, straight (with cable socket) (IP65) <sup>4)7)</sup>	<b>A75</b>	<b>Degree of protection approvals: Combinations</b>	
Device plug Han 8D, plastic, angled (with cable socket) (IP65) <sup>4)7)</sup>	<b>A76</b>	IS protection and XP and DIP (FM)	<b>E71</b>
Device plug Han 8D, metal enclosure, straight (with cable socket) (IP65) <sup>4)7)</sup>	<b>A77</b>	IS protection and XP and DIP (cCSA <sub>US</sub> )	<b>E72</b>
Device plug Han 8D, metal enclosure, angled (with cable socket) (IP65) <sup>4)7)</sup>	<b>A78</b>	IS protection and XP and DIP (FM/cCSA <sub>US</sub> )	<b>E73</b>
PG 13.5 adapters <sup>4)</sup>	<b>A82</b>	<b>Supplementary approvals/degree of protection</b>	
<b>Language for labels, quick-start guide, menu language default</b> <sup>9)</sup> (instead of English as standard)		Ex-protection Ex ia according to EAC Ex (Russia)	<b>E80</b>
German	<b>B10</b>	Ex-protection Ex d according to EAC Ex (Russia)	<b>E81</b>
French	<b>B12</b>	Dual Seal approval <sup>5)</sup>	<b>E85</b>
Spanish	<b>B13</b>	Export approval Korea	<b>E86</b>
Italian	<b>B14</b>	<b>Special process connection versions (diff. pressure)</b>	
Chinese	<b>B15</b>	Side vents for gas measurements <sup>9)</sup>	<b>L32</b>
Russian	<b>B16</b>	Swap process connection: high-pressure side at front	<b>L33</b>
Japanese	<b>B17</b>	<b>Mosquito protection</b>	
English with units psi/inH <sub>2</sub> O/°F	<b>B21</b>	4 pcs. for ¼-18 NPT thread	<b>L36</b>
<b>Special version: Supplementary menu languages</b> (Standard: English, German, French, Spanish, Italian)		<b>Process flanges, O-rings, special material</b> <b>Standard: Viton (FKM) (FPM)</b>	
Asia language package (in addition: Chinese, Japanese, Russian)	<b>B80</b>	Process connection sealing rings made of FFPM (Kalrez) <sup>10)</sup>	<b>L62</b>
<b>Certificates</b> (available online for downloading) <sup>1)</sup>		Process connection sealing rings made of NBR	<b>L63</b>
Quality test certificate, 5-point factory calibration (IEC 60770-2) <sup>2)</sup>	<b>C11</b>	Process connection sealing rings made of graphite	<b>L64</b>
Inspection certificate according to EN 10204-3.1 <sup>3)</sup>	<b>C12</b>	<b>Drain/Vent valve</b> (1 set = 2 units)	
Inspection certificate (EN 10204-3.1); PMI test of parts in contact with medium	<b>C15</b>	2 ventilation valves ¼- 18 NPT, in material of process flanges)	<b>L80</b>
<b>Functional Safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	<b>C20</b>	<b>Remote seals</b>	
		Transmitters with connection of remote seal <sup>6)</sup> (For premounted valve manifolds see page 1/321)	<b>V00</b>

<sup>1)</sup> Enclosed in print or as DVD: see page 1/319.

<sup>2)</sup> When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

<sup>3)</sup> When also ordering the inspection certificate according to EN 10204-3.1 for transmitters with mounted diaphragm seals: Order this certificate as well in addition to the respective remote seals.

<sup>4)</sup> Not together with types of protection "Explosion-proof", "Ex nA" and "Intrinsic safety and explosion-proof"

<sup>5)</sup> Only in conjunction with FM and/or cCSA<sub>US</sub>

<sup>6)</sup> Please select a remote seal separately. Also refer to the information under footnote 2). Remote seals see page 1/401.

<sup>7)</sup> The device plug Han 8D is identical with the former Han 8U version.

<sup>8)</sup> For option B15, B16 and B17 the menu language default is english. Otherwise the Option B80 (Asia language package) is necessary.

<sup>9)</sup> Only in conjunction with process connection "Vent on side".

<sup>10)</sup>Not together with measuring span "G".

# Pressure Measurement

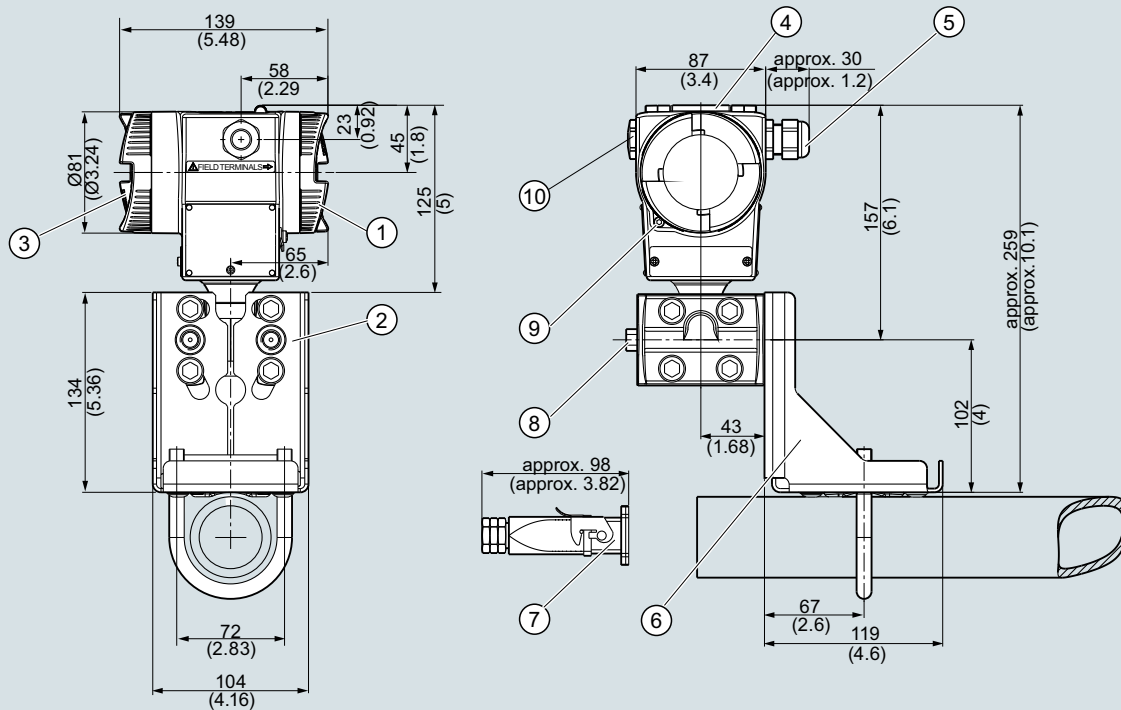
Pressure transmitters  
for applications with highest requirements (Premium)  
SITRANS P500

for differential pressure and flow

1

Selection and Ordering data	Order code
<b>Additional data</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.	
<b>Measuring range to be set</b>	
Specify in plain text:	
• In the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	<b>Y01</b>
• In the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	<b>Y02</b>
<b>Measuring point number and measuring point identifier (only standard ASCII character set)</b>	
Specify in plain text:	
Measuring point number (TAG No.), max. 16 characters Y15: .....	<b>Y15</b>
Measuring point text (max. 27 char.) Y16: .....	<b>Y16</b>
Entry of HART address (TAG), max. 32 characters Y17: .....	<b>Y17</b>
<b>Setting of pressure indication in pressure units</b>	
<b>Y21</b>	
Specify in plain text (standard setting: mbar) Y21: bar, kPa, MPa, psi, ...	
Note: The following pressure units are selectable: bar, mbar, mm H <sub>2</sub> O*, in H <sub>2</sub> O*), ftH <sub>2</sub> O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM, % or mA	
*) Reference temperature 20 °C	
<b>Setting of pressure indication in non-pressure units<sup>1)</sup></b>	
<b>Y22 + Y01 or Y02</b>	
Specify in plain text: Y22: ... up to ... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	
<b>Customer-specific settings</b>	
<b>Y30</b>	
Damping setting (range: 0 ... 100 s) (Standard setting: 2 s)	

<sup>1)</sup> Preset values can only be changed over SIMATIC PDM.

**Dimensional drawings**

- ① Connection side<sup>1)</sup>
- ② Process connection: ¼-18 NPT (IEC 61518)
- ③ Electronics side, local display<sup>1)</sup>
- ④ Cover over buttons
- ⑤ Electrical connection:
  - M20 x 1,5 or ½-14 NPT screw gland
  - Han 7D/Han 8D<sup>2)</sup> or M12<sup>3)</sup> device plug
- ⑥ Mounting bracket (optional)
- ⑦ Electrical connection:
  - Han 7D/Han 8D device plug<sup>2)</sup><sup>3)</sup>
- ⑧ Process connection, with valve (optional) or screwed joint (optional)
- ⑨ Screw lid - safety bracket
- ⑩ Screw-type blank cap

<sup>1)</sup> In addition, allow approx. 20 mm (0.79 inch) for the thread length

<sup>2)</sup> Not with "flameproof enclosure" type of protection

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

SITRANS P pressure transmitter for differential pressure and flow, P500 series, measurements in mm (inch)

# Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

for level

1

## Technical specifications

Input		Long-term stability	≤ (0.05 · r) % per 5 years ≤ (0.08 · r) % per 10 years
Measured variable	Level		
Measuring span (infinitely adjustable)	Measuring span (min. ... max.)	Influence of ambient temperature per 28 °C (50 °F) <sup>1)</sup>	
	1.25 ... 250 mbar (0.5 ... 100 inH <sub>2</sub> O)	• 250 mbar (100 inH <sub>2</sub> O)	≤ (0.025 · r + 0.014) %
	6.25 ... 1250 mbar (2.5 ... 500 inH <sub>2</sub> O)	• 1250 mbar (502 inH <sub>2</sub> O) 6250 mbar (2509 inH <sub>2</sub> O)	≤ (0.006 · r + 0.03) %
	31.25 ... 6250 mbar (12.54 ... 2509 inH <sub>2</sub> O)	Influence of static pressure	
		• At the lower range value (PKN) <sup>1) 2)</sup>	
Lower range limit		- 250 mbar (100 inH <sub>2</sub> O)	≤ (0.035 · r) % je 70 bar (1015 psi) correction via zero point correction
• Measuring cell with silicone oil filling	-100 % of max. measuring span or 500 mbar a (7.25 psi a) vacuum resistance	- 1250 mbar (502 inH <sub>2</sub> O) 6250 mbar (2509 inH <sub>2</sub> O)	≤ (0.007 · r) % je 70 bar (1015 psi) correction via zero point correction
	Also available as vacuum-resistant remote seal: 30 mbar a (0.44 psi a)	• On the measuring span (PKS) <sup>1)</sup>	
Upper range limit	100% of max. measuring span	- 250 mbar (100 inH <sub>2</sub> O) 1250 mbar (502 inH <sub>2</sub> O)	≤ 0.03 % je 70 bar (1015 psi)
Lower range value	Between measuring limits (freely adjustable)	- 6250 mbar (2509 inH <sub>2</sub> O)	≤ 0.09 % je 70 bar (1015 psi)
Output		Influence of power supply	≤ 0.005 %/1 V
Output current signal	4 ... 20 mA	<b>Operating conditions</b>	
• Lower current limit (freely adjustable)	3.55 mA, factory setting 3.8 mA	Mounting position	Defined by flange
• Upper current limit (freely adjustable)	23 mA, factory setting 20.5 mA	Ambient conditions	
• Ripple (without HART communication)	$I_{pp} \leq 0.4$ of max. output current	• Ambient temperature (Note: Observe the temperature class in areas subject to explosion hazard.)	
• adjustable damping	0... 100 s in steps of 0.1 s, factory setting 2 s	- total device	-40 ... +85 °C (-40 ... +185 °F)
• current transmitter	3.55 ... 23 mA	- Readable display	-20 ... +85 °C (-4 ... +185 °F)
• Failure signal	Adjustable within limits: • Lower: 3.55 ... 3.7 mA (factory setting 3.6 mA) • Upper: 21.0 ... 23 mA (factory setting 22.8 mA)	- Storage temperature	-50 ... +90 °C (-58 ... +194 °F)
Load		Climatic class	
• Without HART communication	$R_B \leq (U_H - 10.5 V)/0.023 A$ in $\Omega$ , $U_H$ : Power supply in V	• Condensation	Relative humidity 0 ... 100 % (condensation permissible)
• With HART communication		Degree of protection to IEC 60529	IP66/IP68 and NEMA 4X (with corresponding cable gland)
- HART Communicator	$R_B = 230 \dots 1100 \Omega$	Electromagnetic Compatibility	
- HART modem	$R_B = 230 \dots 500 \Omega$	• Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21
Characteristic curve	Linearly rising or linearly falling and user-specific	Permissible pressures	According to 2014/68/EU pressure equipment directive
		Medium temperature of high-pressure side	
		• Measuring cell with silicone oil filling	
		- $p_{abs} \geq 1$ bar	-40 ... +175 <sup>3)</sup> °C (-40 ... +347 <sup>3)</sup> °F)
		- $p_{abs} < 1$ bar	-40 ... +80 °C (-40 ... +176 °F)
Measuring accuracy		<b>Design</b>	
Reference conditions (in accordance with IEC 60770-1)	<ul style="list-style-type: none"> <li>• Rising characteristic curve</li> <li>• Lower range value 0 bar</li> <li>• Stainless steel seal diaphragm</li> <li>• Measuring cell with silicone oil filling</li> <li>• Room temperature (25 °C (77 °F))</li> </ul>	Weight	
All error information always refers to the set measuring span.		• To EN (pressure transmitter with mounting flange, without tube)	approx. 9.8 ... 11.8 kg (21.6 ... 26.0 (lb)
Error in measurement at limit setting incl. hysteresis and reproducibility		• To ASME (pressure transmitter with mounting flange, without tube)	approx. 9.8 ... 16.8 kg (21.6 ... 37.0 (lb)
r: measuring span ratio (r = max. measuring span / set measuring span)			
Linear characteristic	$r \leq 10$		
	$r \geq 10$		
• 250 mbar (100 inH <sub>2</sub> O) 1250 mbar (502 inH <sub>2</sub> O) 6250 mbar (2509 inH <sub>2</sub> O)	≤ 0.03 %		
	≤ (0.003 · r) %		

Material of wetted parts at the high-pressure side		<b>Auxiliary power supply</b>	
• Seal diaphragm of mounting flange	Stainless steel 1.4404/316L, Hastelloy C276, mat. no. 2.4819, Monel 400, mat. no. 2.4360, Tantal, PFA auf Edelstahl 1.4404/316L, PTFE auf Edelstahl 1.4404/316L	Terminal voltage on transmitter	<ul style="list-style-type: none"> <li>• DC 10.6 ... 44 V</li> <li>• With intrinsically-safe operation DC 10.6 ... 30 V</li> </ul>
• Sealing surface	Smooth to EN 1092-1, Form B1 and/or ASME B16.5 RF 125 ... 250 AA for stainless steel 316L, EN 1092-1 Form B2 and/or ASME B16.5 RFSF in the case of other materials	<b>Certificates and approvals</b>	
• Sealing material in the process connection		Classification according to PED 2014/68/EU	
- O-Ring	<ul style="list-style-type: none"> <li>• Standard: Viton (FKM (FPM))</li> <li>• Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FFPM (Kalrez), Graphite</li> </ul>	• PN 160 (MAWP 2320 psi)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
- For vacuum application of mounting flange	Copper	Explosion protection	
Material of wetted parts at the low-pressure side		<u>Explosion protection for Europe (to ATEX)</u>	
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Hastelloy C276, Monel 400	• Intrinsic safety "i"	PTB 09 ATEX 2004 X
• Process connection and sealing screw	• Stainless steel, mat. no. 1.4404/316L	- Marking	Ex II 1/2 G Ex ia/ib IIC T4
• Sealing material in the process connection		- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
- O-Ring	<ul style="list-style-type: none"> <li>• Standard: Viton (FKM (FPM))</li> <li>• Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FFPM (Kalrez), Graphite</li> </ul>	- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$
Material of parts not in contact with media		- Effective internal inductance:	$L_i = 400 \mu\text{H}$
Die-cast aluminum enclosure	<ul style="list-style-type: none"> <li>• Low copper die-cast aluminum AC-AISI12 (Fe) or AC-AISI 10 Mg (Fe) to DIN EN 1706</li> <li>• Lacquer on polyurethane base, optional epoxy-based primer</li> <li>• Stainless steel serial plate</li> </ul>	- Effective inner capacitance:	$C_i = 6 \text{ nF}$
Stainless steel precision cast enclosure	Stainless steel, mat. no. 1.4404/316L	• Explosion-proof "d"	BVS 09 ATEX E 027
Process connection screws	Stainless steel	- Marking	Ex II 1/2 G Ex db ia IIC T4/T6 Ga/Gb
Measuring cell filling	Silicone oil	- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) -40 ... +60 °C (-40 ... +140 °F) temperature class T6
• Liquid mounting flange	Silicone oil or other material	- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
Process connection		• Dust explosion protection for zone 20	BVS 09 ATEX E 027
• High-pressure side	Flange to EN and ASME	- Marking	Ex II 1 D Ex ta ia IIC T120°C Da
• Low-pressure side	¼-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518/DIN EN 61518	- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
Electrical connection	<ul style="list-style-type: none"> <li>• Screw terminals</li> <li>• Cable entry via the following screwed glands: <ul style="list-style-type: none"> <li>- M20 x 1.5</li> <li>- ½-14 NPT</li> <li>- Device plug Han 7D/Han 8D</li> <li>- Device plug M12</li> </ul> </li> </ul>	- Max. surface temperature	120 °C (248 °F)
Displays and controls		- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$
Push buttons	3; for operation directly on the device	- Effective internal inductance:	$L_i = 400 \mu\text{H}$
Display	<ul style="list-style-type: none"> <li>• With or without integrated display</li> <li>• Cover with or without window</li> </ul>	- Effective inner capacitance:	$C_i = 6 \text{ nF}$
		• Dust explosion protection for zone 21/22	BVS 09 ATEX E 027
		- Marking	Ex II 2 D Ex tb ia IIIC T120°C Db
		- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\text{max}} = 1.2 \text{ W}$
		• Type of protection "n" (zone 2)	PTB 09 ATEX 2004 X
		- Marking	Ex II 3 G Ex nA II T4/T6 Ex II 2/3 G Ex ib/nL IIC T4/T6 Ex II 2/3 G Ex ib/ic IIC T4/T6
		- "nA" connection	$U_m = 45 \text{ V DC}$
		- "nL, ic" connection	$U_i = 45 \text{ V}$
		- Effective internal inductance	$L_i = 400 \mu\text{H}$
		- Effective inner capacitance	$C_i = 6 \text{ nF}$

# Pressure Measurement

Pressure transmitters  
for applications with highest requirements (Premium)  
SITRANS P500

## for level

1

### Explosion protection for USA (to FM)

Certificate of Compliance	No. 3033013
• Identification (XP/DIP) or (IS)	XP CL I, DIV 1, GP ABCDEFG T4 / T6 DIP CL II, III, DIV1, GP EFG T4/T6 IS CL I, II, III, DIV1, GP ABCDEFG T4 CL I, Zone 0, AEx ia IIC T4 CL I, Zone 1, AEx ib IIC T4
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ °C}$ (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N $U_m = 30 \text{ V}$ , $I_m = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $L_i = 400 \text{ } \mu\text{H}$ , $C_i = 6 \text{ nF}$
• Marking (NI/NO)	NI CL I, DIV 2, GP ABCD T4/T6 NI CL I, Zone 2, GP IIC T4/T6 S CL II, III, GPFG T4/T6 NI CL I, DIV 2, GP ABCD T4/T6, NIFW NI CL I, Zone 2, GP IIC T4/T6, NIFW NI CLII, III, DIV 2, GP FG T4/T6, NIFW
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ °C}$ (-40 ... +140 °F)
- (NI/S) parameters	According to "control drawing": A5E02189134N $U_m = 45 \text{ V}$ , $L_i = 400 \text{ } \mu\text{H}$ , $C_i = 6 \text{ nF}$

### Explosion protection for Canada

(to cCSA <sub>US</sub> )	
Certificate of Compliance	No. 2280963
• Marking (XP/DIP)	CL I, DIV 1, GP ABCD T4 /T6; CL II, DIV 1, GP EFG T4/T6
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ °C}$ (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N, $U_m = 45 \text{ V}$
• Marking (ia/ib)	CL I, Ex ia/Ex ib IIC, T4 CL II, III, Ex ia/Ex ib, GP EFG, T4 CL I, AEx ia/AEx ib IIC, T4 CL II, III, AEx ia/ AEx ib, GP EFG, T4
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F)
- Entity parameters	$U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \text{ } \Omega$ , $L_i = 400 \text{ } \mu\text{H}$ , $C_i = 6 \text{ nF}$
• Marking (NI/n)	CL I, DIV2, GP ABCD T4/T6 CL II, III, DIV2, GP FG T4/T6 Ex nA IIC T4/T6 AEx nA IIC T4/T6 Ex nL IIC T4/T6 AEx nL IIC T4/T6
- Permissible Ambient Temperature	$T_a = T4: -40 \dots +85 \text{ °C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ °C}$ (-40 ... +140 °F)
- NI/nA parameters	According to "control drawing": A5E02189134N, $U_m = 45 \text{ V}$
- nL parameters	According to "control drawing": A5E02189134N, $U_i = 45 \text{ V}$ , $I_i = 100 \text{ mA}$ , $L_i = 400 \text{ } \mu\text{H}$ , $C_i = 6 \text{ nF}$

### Explosion protection for China (acc. to NEPSI)

• Intrinsic safety "i"	GYJ111111X Ex ia/ib IIB/IIC T4 40 ... +85 °C (-40 ... +185 °F)
- Marking	
- Permissible ambient temperature	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$
• Explosion-proof "d"	GYJ111112
- Marking	Ex dia IIC T4/T6
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6
- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Dust explosion protection for zone 21/22	GYJ111112
- Marking	DIP A21 TA,T120 °C IP68 D21
- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Type of protection "n" (zone 2)	GYJ111111X
- Marking	Ex nL IIB/IIC T4/T6 Ex nA II T4/T6
- Connection	$U_i = 45 \text{ V DC}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$

- 1) Only relevant for the pressure transmitter. The temperature error of the remote seal must be calculated separately.
- 2) If the Type "D" measuring cell is used, the error should be increased by a factor of 5. This error can be reduced to 0 by a means of a zero adjustment.
- 3) This value may be increased if the process connection is sufficiently insulated.

### HART communication

Load with connection of	
• HART Communicator	$R_B = 230 \dots 1100 \text{ } \Omega$
• HART modem	$R_B = 230 \dots 500 \text{ } \Omega$
Cable	2 wire shielded: $\leq 3.0 \text{ km}$ (1.86 miles), multiwire shielded: $\leq 1.5 \text{ km}$ (0.93 miles)
Protocol	HART Version 6.0
PC/laptop requirements	IBM compatible, RAM > 32 MByte, hard disk > 70 MByte, depending on modem type: RS 232-interface or USB connection, VGA graphics
Software for computer	SIMATIC PDM 6.0



Selection and Ordering data		Article No.	Order code
<b>Pressure transmitters for level, SITRANS P500 HART</b>		7MF56	- - - - - 0 - - - - -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
<b>Enclosure</b>	<b>Thread for cable gland<sup>9)</sup></b>		
Die-cast aluminum, dual chamber enclosure	M20x1.5	0	
Die-cast aluminum, dual chamber enclosure	½-14 NPT	1	
Stainless steel precision casting, dual chamber enclosure	M20x1.5	2	
Stainless steel precision casting, dual chamber enclosure	½-14 NPT	3	
<b>Output</b>		3	
4 ... 20 mA, HART			
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		
Silicone oil	normal	1	
<b>Measuring span (min. ... max.)</b>			
1.25 ... 250 mbar	(0.5 ... 100 inH <sub>2</sub> O)		D
6.25 ... 1250 mbar	(2.5 ... 500 inH <sub>2</sub> O)		E
31.25 ... 6250 mbar	(12.54 ... 2509 inH <sub>2</sub> O)		F
<b>Wetted parts of the low-pressure side</b> (stainless steel process flanges)			
Seal diaphragm	Process connection		
Stainless steel 1.4404/316L	Stainless steel 1.4404/316L		A
Hastelloy C276	Stainless steel 1.4404/316L		B
Monel 400	Stainless steel 1.4404/316L		C
<b>Process connection of low-pressure side</b>			
Female thread ¼-18 NPT			
• Sealing screw opposite process connection			
- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518			0
- Mounting thread M10 to DIN 19213			1
• Vent on side of process flange			
- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518			4
- Mounting thread M10 to DIN 19213			5
<b>Wetted parts materials (high-pressure side)</b>			
Stainless steel 1.4404/316L			0
Hastelloy C276 mat. no. 2.4819			1
Monel 400 mat. no. 2.4360			2
Tantalum			3
PFA coated on stainless steel			4
PTFE on stainless steel 1.4404/316L (not in combination with an extension)			6 A
Other version			9 Y
Add Order code and plain text:			
Material: ... ; Extension length: ...			N 1 Y
<b>Process connection on high-pressure side: Extension length</b>			
None			A
50 mm (1.97 inch)			B
100 mm (3.94 inch)			C
150 mm (5.90 inch)			D
200 mm (7.87 inch)			E
Other version: See option "9" for "Wetted parts materials"			
<b>Process connection on high-pressure side: Nominal diameter/Nominal pressure</b>			
DN 50, PN 40 <sup>6)</sup>			B
DN 80, PN 40			D
DN 100, PN 16			G
DN 100, PN 40			H
2", class 150 <sup>6)</sup>			L
2", class 300 <sup>6)</sup>			M
3", class 150			Q
3", class 300			R
4", class 150			T
4", class 300			U
Other version, add			Z
Order code and plain text:			
Nominal diameter: ... ; Nominal pressure: ...			Q 1 Y

# Pressure Measurement

Pressure transmitters  
for applications with highest requirements (Premium)  
SITRANS P500

for level

1

Selection and Ordering data	Article No.	Order code
<b>Pressure transmitters for level, SITRANS P500 HART</b>	7MF56 - - 0 - - - - -	
<b>Process connection on high-pressure side: Filling liquid</b>		
Silicone oil M5		0
Silicone oil M50		1
High-temperature oil		2
Halocarbon (for oxygen measurement)		3
FDA compliant oil		4
Other version, add		9 R 1 Y
Order code and plain text:		
Filling liquid: ...		

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		<b>Further designs</b> Add "-Z" to Article No. and specify Order code.	
<b>Display</b> (Standard: no display, cover closed)		<b>Degree of protection approvals: Ex d (flameproof)</b>	
With display and blanking cover	<b>A10</b>	Ex d explosion-proof (ATEX)(T4/T6)	<b>E20</b>
With display and glass cover	<b>A11</b>	Ex XP explosion-proof and DIP (FM)(T4/T6)	<b>E21</b>
<b>Special version: cover/enclosure</b>		Ex XP explosion-proof and DIP (cCSA <sub>US</sub> )(T4/T6)	<b>E22</b>
Two coats of lacquer on enclosure, cover (PU on epoxy)	<b>A20</b>	Ex d explosion-proof (NEPSI)(T4/T6)	<b>E26</b>
<b>Electrical connection and cable entry</b> (Standard: no cable gland, only dust protection caps)		<b>Degree of protection approvals: n/NI</b>	
Cable gland made of plastic (IP66/68) <sup>4)</sup>	<b>A50</b>	Zone 2 (nA, nL, ic) (ATEX) (T4/T6)	<b>E40</b>
Cable glands made of metal (IP66/68)	<b>A51</b>	Div2 NI, Div2 NI-field wiring (FM) (T4/T6)	<b>E41</b>
Cable glands made of stainless steel (IP66/68)	<b>A52</b>	Zone 2 (nA, nL), Div2 NI (cCSA <sub>US</sub> ) (T4/T6)	<b>E42</b>
Device plug M12 without cable socket (IP66/67) <sup>4)</sup>	<b>A60</b>	Zone 2 (nA, nL) (NEPSI) (T4/T6)	<b>E46</b>
Device plug M12, cable socket (IP66/67) <sup>4)</sup>	<b>A61</b>	<b>Degree of protection approvals: Zone 20/21/22</b>	
Device plug Han 7D, plastic, straight (with cable socket) (IP65) <sup>4)</sup>	<b>A71</b>	Use in Zone 21/22 (Ex tD) (ATEX) Ex tb	<b>E60</b>
Device plug Han 7D, plastic, angled (with cable socket) (IP65) <sup>4)</sup>	<b>A72</b>	Use in Zone 20/21/22 (Ex iaD) (ATEX) Ex ta	<b>E61</b>
Device plug Han 7D, metal enclosure, straight (with cable socket) (IP65) <sup>4)</sup>	<b>A73</b>	Use in Zone (Ex DIP) (ATEX) (NEPSI)	<b>E66</b>
Device plug Han 7D, metal enclosure, angled (with cable socket) (IP65) <sup>4)</sup>	<b>A74</b>	<b>Degree of protection approvals: Combinations</b>	
Device plug Han 8D, plastic, straight (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>	<b>A75</b>	IS protection and XP and DIP (FM)	<b>E71</b>
Device plug Han 8D, plastic, angled (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>	<b>A76</b>	IS protection and XP and DIP (cCSA <sub>US</sub> )	<b>E72</b>
Device plug Han 8D, metal enclosure, straight (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>	<b>A77</b>	IS protection and XP and DIP (FM/cCSA <sub>US</sub> )	<b>E73</b>
Device plug Han 8D, metal enclosure, angled (with cable socket) (IP65) <sup>4)</sup> <sup>7)</sup>	<b>A78</b>	<b>Supplementary approvals / degree of protection</b>	
PG 13.5 adapters <sup>4)</sup>	<b>A82</b>	Ex-protection Ex ia according to EAC Ex (Russia)	<b>E80</b>
<b>Language for labels, quick-start guide and menu language default<sup>8)</sup></b> (instead of English as standard)		Ex-protection Ex d according to EAC Ex (Russia)	<b>E81</b>
German	<b>B10</b>	Dual Seal approval <sup>5)</sup>	<b>E85</b>
French	<b>B12</b>	Export approval Korea	<b>E86</b>
Spanish	<b>B13</b>	<b>Special process connection versions (diff. pressure)</b>	
Italian	<b>B14</b>	Swap process connection: high-pressure side at front	<b>L33</b>
Chinese	<b>B15</b>	<b>Mosquito protection</b>	
Russian	<b>B16</b>	4 pcs. for ¼-18 NPT thread	<b>L36</b>
Japanese	<b>B17</b>	<b>Process flanges, O-rings, special material</b>	
English with units: psi/inH <sub>2</sub> O	<b>B21</b>	<b>Standard: Viton (FKM (FPM))</b>	
<b>Special version: Supplementary menu languages</b> (Standard: English, German, French, Spanish, Italian)		Process connection sealing rings made of FFPM (Kalrez)	<b>L62</b>
Asia language package (in addition: Chinese, Japanese, Russian)	<b>B80</b>	Process connection sealing rings made of NBR	<b>L63</b>
<b>Certificates (available online for downloading)<sup>1)</sup></b>		Process connection sealing rings made of graphite	<b>L64</b>
Quality test certificate, 5-point factory calibration (IEC 60770-2) <sup>2)</sup>	<b>C11</b>	<b>Drain/Vent valve (1 set = 2 units)</b>	
Inspection certificate according to EN 10204-3.1 <sup>3)</sup>	<b>C12</b>	2 ventilation valves ¼- 18 NPT, in material of process flange)	<b>L80</b>
Inspection certificate (EN 10204-3.1); PMI test of parts in contact with medium	<b>C15</b>	<b>Vacuum-proof design</b>	
<b>Functional Safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	<b>C20</b>	Vacuum service	<b>V04</b>
<b>Degree of protection approvals: Ex ia/ib (intrinsic safety)</b>		Spark arrester	<b>V05</b>
Ex ia/ib protection (ATEX) (T4)	<b>E00</b>	For mounting on zone 0 (including documentation)	
Ex IS protection (FM) (T4)	<b>E01</b>		
Ex IS protection (cCSA <sub>US</sub> ) (T4)	<b>E02</b>		
Ex ia/ib protection (NEPSI) (T4)	<b>E06</b>		

<sup>1)</sup> Enclosed in print or as DVD: see page 1/319.

<sup>2)</sup> When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

<sup>3)</sup> When also ordering the inspection certificate according to EN 10204-3.1 for transmitters with mounted diaphragm seals: Order this certificate as well in addition to the respective remote seals.

<sup>4)</sup> Not together with types of protection "Explosion-proof", "Ex nA" and "Intrinsic safety and explosion-proof"

<sup>5)</sup> Only in conjunction with FM and/or cCSA<sub>US</sub>

<sup>6)</sup> Not recommended for measuring span "D"

<sup>7)</sup> The device plug Han 8D is identical with the former Han 8U versio.

<sup>8)</sup> For option B15, B16 and B17 the menu language default is English. Otherwise the Option B80 (Asia language package) is necessary.

<sup>9)</sup> Cable glands must be ordered separately from "Further designs" (add "-Z" to Article No. and specify order code).

# Pressure Measurement

Pressure transmitters  
for applications with highest requirements (Premium)  
SITRANS P500

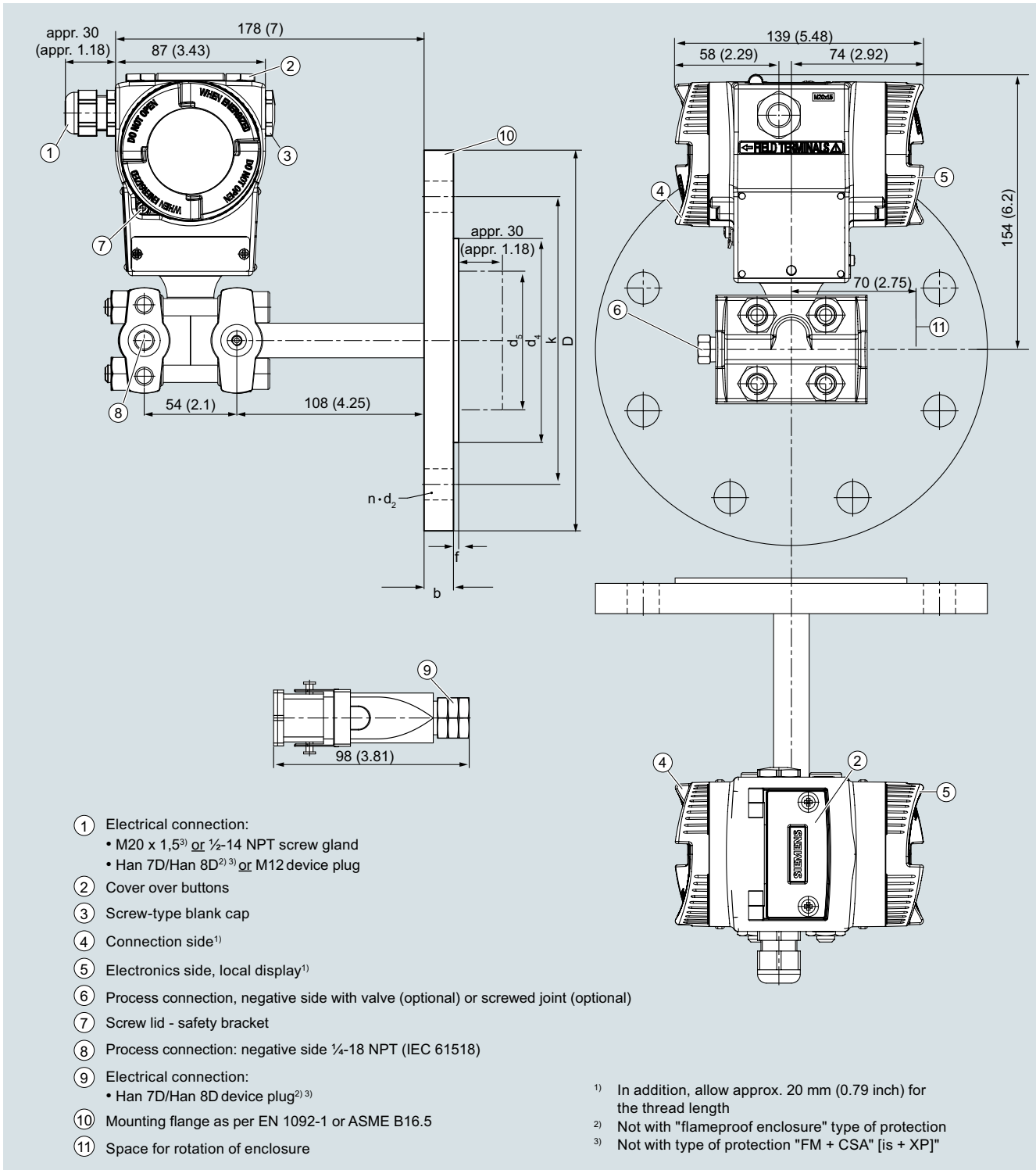
for level

1

Selection and ordering data	Order code
<b>Additional data</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.	
<b>Measuring range to be set</b>	
Specify in plain text:	
Linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, kPa, MPa, psi	<b>Y01</b>
<b>Measuring point number and measuring point identifier (only standard ASCII character set)</b>	
Specify in plain text:	
Measuring point number (TAG No.), max. 16 characters Y15: .....	<b>Y15</b>
Measuring point text (max. 27 char.) Y16: .....	<b>Y16</b>
Entry of HART address (TAG), max. 32 characters Y17: .....	<b>Y17</b>
<b>Setting of pressure indication in pressure units</b>	<b>Y21</b>
Specify in plain text (standard setting: mbar) Y21: bar, kPa, MPa, psi, ...	
Note: The following pressure units are selectable: bar, mbar, mm H <sub>2</sub> O <sup>*</sup> , in H <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM, % or mA	
*) Reference temperature 20 °C	
<b>Setting of pressure indication in non-pressure units<sup>1)</sup></b>	<b>Y22 + Y01</b>
Specify in plain text: Y22: ... up to ... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	
<b>Customer-specific settings</b>	
Damping setting (range: 0 ... 100 s) (Standard setting: 2 s)	<b>Y30</b>

<sup>1)</sup> Preset values can only be changed over SIMATIC PDM.

## Dimensional drawings



SITRANS P pressure transmitter for filling level, P500 series, measurements in mm (inch)

# Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

for level

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b mm	D mm	d mm	d <sub>2</sub> mm	d <sub>4</sub> mm	d <sub>5</sub> mm	d <sub>M</sub> mm	f mm	k mm	n	L mm
DN50	PN 40	20	165	61	18	102	48.3	45 <sup>1)</sup>	2	125	4	0, 50, 100, 150 or 200
DN 80	PN 40	24	200	90	18	138	76	72 <sup>2)</sup>	2	160	8	
DN 100	PN 16	20	220	115	18	158	94	89	2	180	8	
	PN 40	24	235	115	22	162	94	89	2	190	8	

Connection to ASME B16.5

Nominal diameter	Nominal pressure lb/sq.in.	b inch (mm)	D inch (mm)	d <sub>2</sub> inch (mm)	d <sub>4</sub> inch (mm)	d <sub>5</sub> inch (mm)	d <sub>M</sub> inch (mm)	f inch (mm)	k inch (mm)	n	L inch (mm)
2 inch	class 150	0.77 (19.5)	5.91 (150)	0.75 (19.0)	3.62 (92)	1.9 (48.3)	1.77 (45) <sup>1)</sup>	0.079 (2.0)	4.75 (120.7)	4	0, 2, 3.94, 5.94 or 7.87
	class 300	0.89 (22.7)	6.49 (165)	0.75 (19.0)	3.62 (92)	1.9 (48.3)	1.77 (45) <sup>1)</sup>	0.079 (2.0)	5.0 (127)	8	
3 inch	class 150	0.96 (24.3)	7.5 (190.5)	0.75 (19.0)	5 (127)	3.0 (76)	2.83 (72) <sup>2)</sup>	0.079 (2.0)	6 (152.4)	4	
	class 300	1.14 (29.0)	8.27 (210)	0.87 (22.2)	5 (127)	3.0 (76)	2.83 (72) <sup>2)</sup>	0.079 (2.0)	6.69 (168.3)	8	
4 inch	class 150	0.96 (24.3)	9.06 (230)	0.75 (19.0)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.079 (2.0)	7.5 (190.5)	8	
	class 300	1.27 (32.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.079 (2.0)	7.88 (200)	8	

Explanations of tables:

d: Internal diameter of gasket to DIN 2690

d<sub>M</sub>: Effective diaphragm diameter

d<sub>5</sub>: Diameter of extension

f: Milling edge

L: Extension length

<sup>1)</sup> 59 mm = 2.32 inch with tube length L=0.

<sup>2)</sup> 89 mm = 3½ inch with tube length L=0.

## Selection and Ordering data

	Article No.
<b>Mounting brackets</b> For differential pressure transmitters with flange thread M10 (7MF54...10 and 7MF54...50) • Made of steel • Made of stainless steel	<b>7MF5987-1AA</b> <b>7MF5987-1AD</b>
<b>Mounting brackets</b> for differential pressure transmitter with flange thread 7/16-20 UNF (7MF54...00 and 7MF54...40) • Made of steel • Made of stainless steel	<b>7MF5987-1AC</b> <b>7MF5987-1AF</b>
<b>Cover</b> Made of die-cast aluminum, including O-ring • Without inspection window • With inspection window Made of stainless steel, including seal	<b>7MF5987-1BE</b> <b>7MF5987-1BF</b>
<b>Digital indicator</b> Including mounting material	<b>7MF5987-1BR</b>
<b>TAG plate (incl. fastening material)</b> Without inscription (5 pcs.) Printed (1 pc.) Data according to Y01 or Y02, Y15 and Y16 (see "SITRANS P transmitters")	<b>7MF5987-1CA</b> <b>7MF5987-1CB-Z</b> <b>Y...: .....</b>
<b>Mounting screws</b> For TAG plate, grounding and connection terminals and securing and locking screws (30 units)	<b>7MF5987-1CC</b>
<b>Sealing plugs for process flange</b> (1 set = 2 units) • Made of stainless steel • Made of Hastelloy	<b>7MF4997-1CG</b> <b>7MF4997-1CH</b>
<b>Screw plugs with valve</b> Complete (1 set = 2 parts) • Made of stainless steel • Made of Hastelloy	<b>7MF4997-1CP</b> <b>7MF4997-1CQ</b>
<b>Connection board (incl. fastening material)</b> HART, intrinsically safe Ex ia for installation in transmitter enclosure (observe warranty conditions)	<b>7MF5987-1DM</b>
<b>Push buttons assembly (incl. fastening material)</b> For replacement of operating keys for on-site operation of the transmitter	<b>7MF5987-2AF</b>
<b>Sealing ring for</b> • Process connection  • NBR sealing ring for screw cover (10 pcs.) • NBR sealing ring for interface measuring cell/enclosure (10 pcs.)	<b>See catalog FI01, "Fittings"</b> <b>7MF4997-2EA</b> <b>7MF4997-2EB</b>

## Selection and Ordering data

	Article No.
<b>Documentation</b> The entire documentation is available for download free-of-charge in various languages at: <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a> Compact operating instructions	
• German, Spanish, French, Italian, Dutch	<b>A5E02344532</b>
• Estonian, Latvian, Lithuanian, Polish, Romanian	<b>A5E02307339</b>
• Bulgarian, Czech, Finnish, Slovakian, Slovenian	<b>A5E02307340</b>
• Danish, Greek, Portuguese, Swedish, Hungarian	<b>A5E02307341</b>
• Russian	<b>A5E02307338</b>
<b>HART modem</b> With USB interface	<b>7MF4997-1DB</b>
<b>Certificates (order only via SAP) additional to internet download</b> • Hard copy (to order) • On DVD (to order)	<b>A5E03252406</b> <b>A5E03252407</b>
For power supply units, see catalog FI01 "Supplementary Components".	

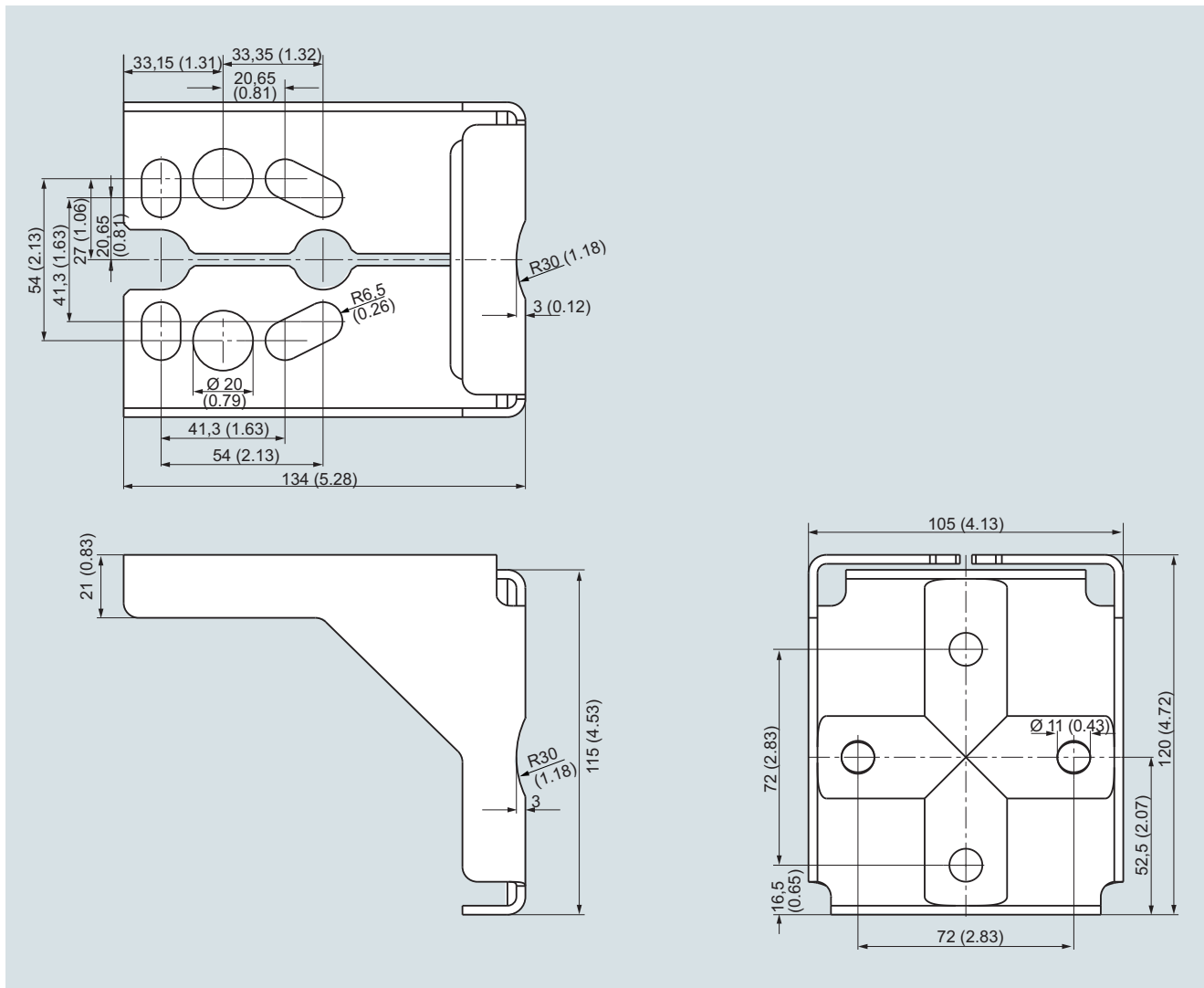
## Pressure Measurement

Pressure transmitters  
for applications with highest requirements (Premium)  
SITRANS P500

### Accessories/Spare parts

1

### Dimensional drawings



Mounting bracket for SITRANS P pressure transmitter, P500 series, measurements in mm (inch)  
Mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



**Overview**

The SITRANS P500 transmitter can be delivered factory-fitted with the following valve manifolds:

- Valve manifolds 7MF9411-5BA: Three valve manifold for differential pressure transmitter
- Valve manifolds 7MF9411-5CA: Three valve manifold for differential pressure transmitter

**Design**

The 7MF9411-5BA and 7MF9411-5CA valve manifolds are sealed with PTFE gaskets between the transmitter and the valve manifold.


Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar (24.11 inH<sub>2</sub>O)) and is certified leak-proof with a factory certificate to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the corresponding mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.


If you order a mounting bracket when choosing the option "Factory mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an inspection certificate 3.1 to EN 10204 after choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitter and for the valve manifold.

**Selection and ordering Data****Valve manifold 7MF9411-5BA on SITRANS P pressure transmitter P500 for differential pressure and flow**

	Add -Z to the Article No. of the transmitter and add Order codes	Order code
	SITRANS P500 7MF54...-... mounted with gaskets made of PTFE and screws made of	
	<ul style="list-style-type: none"> <li>• Chromized steel</li> </ul>	<b>U01</b>
	<ul style="list-style-type: none"> <li>• Stainless steel</li> </ul>	<b>U02</b>
	Delivery incl. high-pressure test certified by factory certificate to EN 10204-2.2	
	<b>Further designs:</b>	
	Delivery includes mounting bracket and mounting clips made of	
	<ul style="list-style-type: none"> <li>• Steel</li> </ul>	<b>A01</b>
	<ul style="list-style-type: none"> <li>• Stainless steel</li> </ul>	<b>A02</b>
	(instead of the mounting bracket supplied with the transmitter)	
	Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	<b>C12</b>

**Valve manifold 7MF9411-5CA on SITRANS P500 pressure transmitter for differential pressure and flow**

	Add -Z to the Article No. of the transmitter and add Order codes	Order code
	SITRANS P500 7MF54...-... mounted with gaskets made of PTFE and screws made of	
	<ul style="list-style-type: none"> <li>• Chromized steel</li> </ul>	<b>U03</b>
	<ul style="list-style-type: none"> <li>• Stainless steel</li> </ul>	<b>U04</b>
	Delivery incl. high-pressure test certified by factory certificate to EN 10204-2.2	
	<b>Further designs:</b>	
	Delivery includes mounting bracket and mounting clips made of	
	<ul style="list-style-type: none"> <li>• Steel</li> </ul>	<b>A01</b>
	<ul style="list-style-type: none"> <li>• Stainless steel</li> </ul>	<b>A02</b>
	(instead of the mounting bracket supplied with the transmitter)	
	Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	<b>C12</b>

## Pressure Measurement

Pressure transmitters  
for applications with highest requirements (Premium)  
SITRANS P500

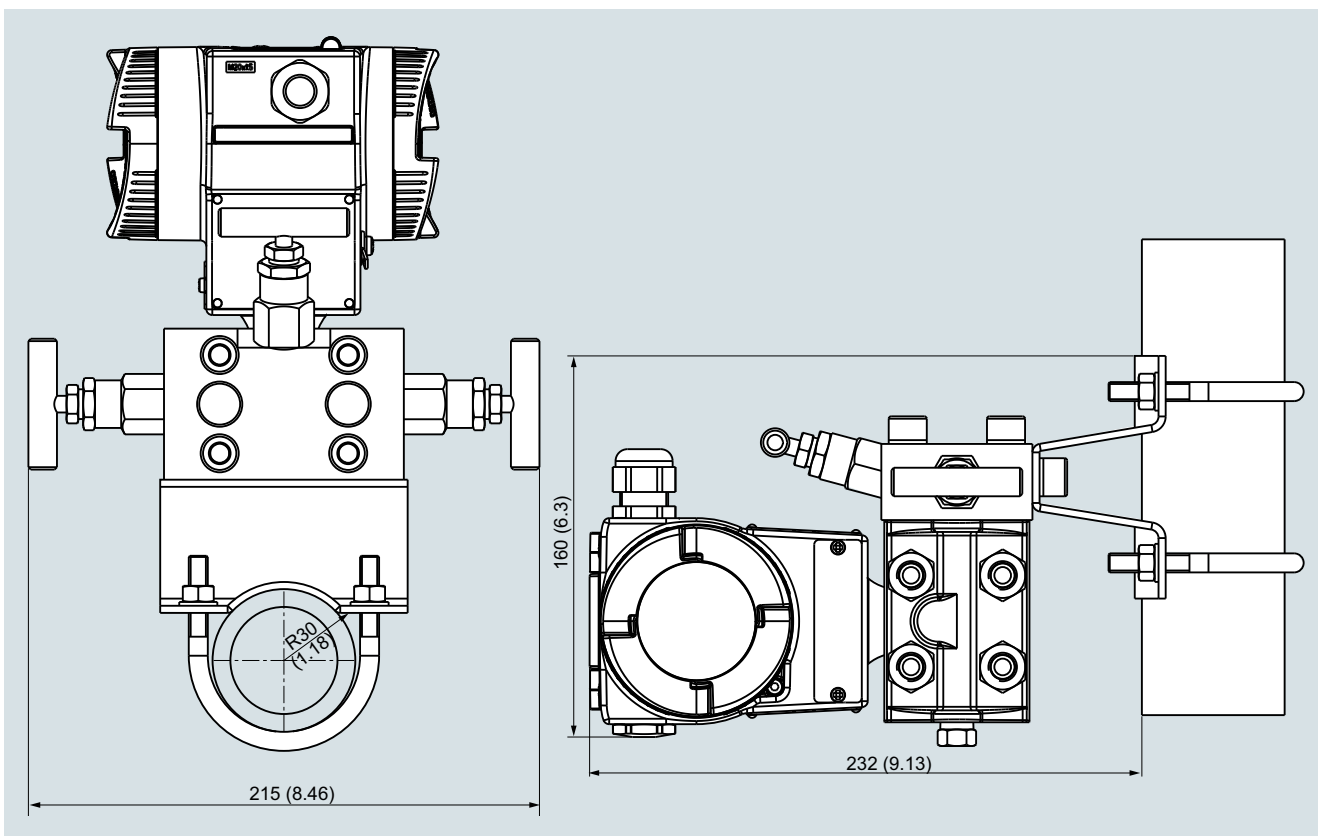
1

### Factory-mounting of valve manifolds on transmitters

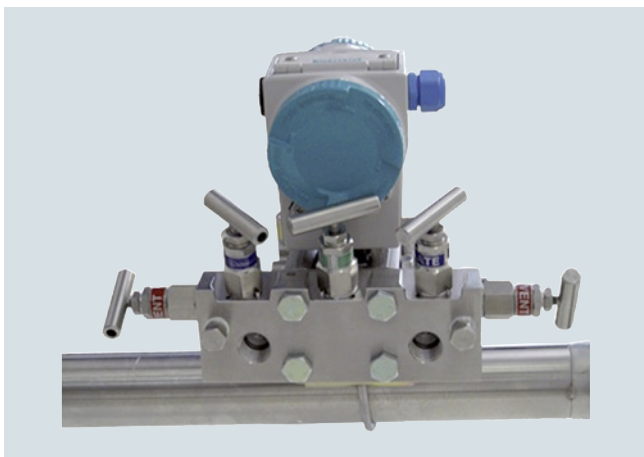
#### Dimensional drawings



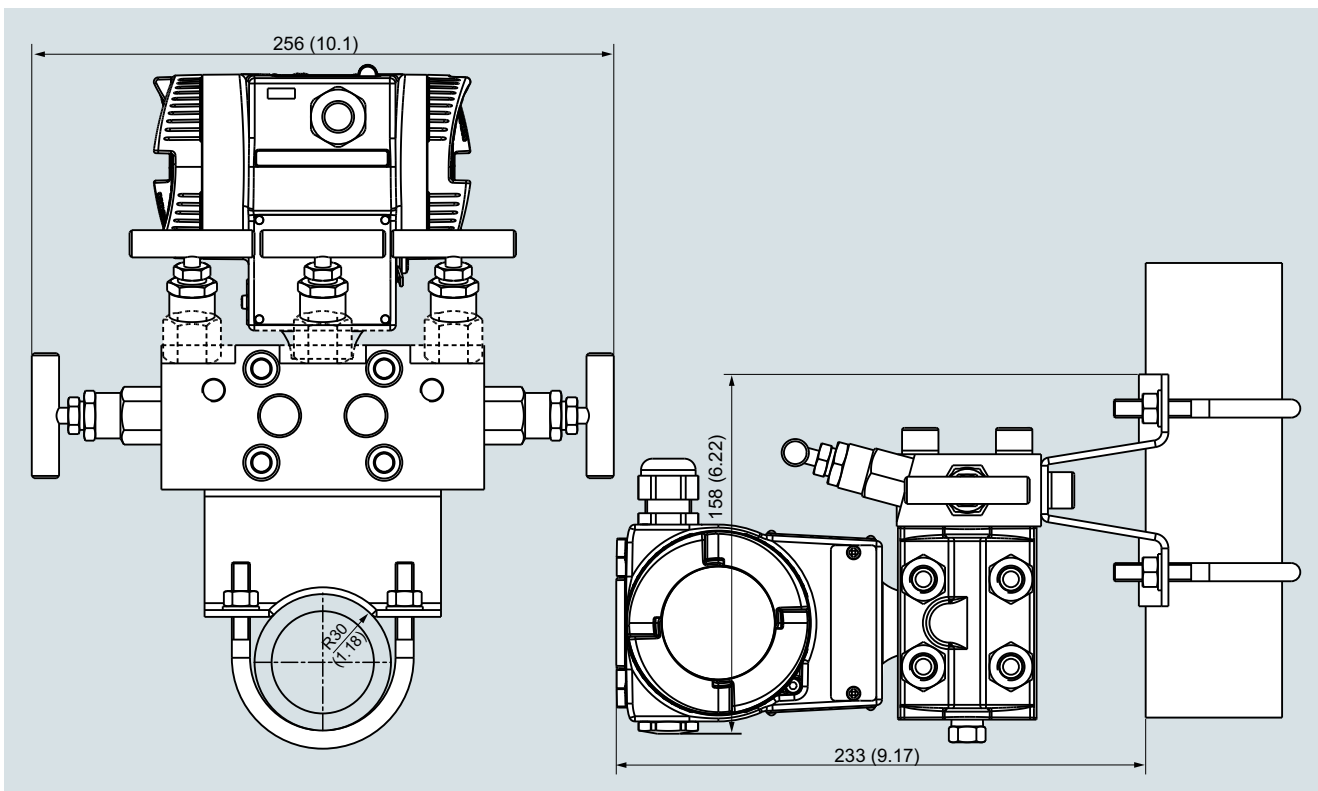
Valve manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



Valve manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)



Valve manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



Valve manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)

## Pressure measurement

### Remote seals for pressure transmitters SITRANS P320/P420

#### Technical description

1

#### Overview

In many cases, the pressure transmitter and the measured medium have to be physically separated. It is then necessary to use a remote seal.

The remote seals can be used with the following SITRANS P320/420 pressure transmitter series:

- Gauge pressure
- Absolute pressure
- Differential pressure and flow

#### Note

When configuring your remote seal, be sure to read the information about transmission response, temperature error and response time to be found in the sections "Function" and "Technical specification". Only then will the remote seal work to optimum effect.

#### Benefits

- No direct contact between pressure transmitter and medium
- Individual configuration of the pressure transmitter for perfect adaptation to the operating conditions
- Available in many versions
- Specially designed for difficult operating conditions
- Quick-release versions available for the food industry

#### Application

Remote seal systems should be used when it is necessary or expedient to separate the medium and measuring instrument.

Some examples of such cases:

- The medium temperature is outside the limits specified for the pressure transmitter.
- The medium is corrosive and requires diaphragm materials that are not available for the pressure transmitter.
- The medium is highly viscous or has a high solids content and would block the sample chambers of the pressure transmitter.
- The medium could freeze in the sample chambers or the pulse cable.
- The medium is heterogeneous or fibrous.
- The medium has a tendency towards polymerization or crystallization.
- The process requires quick-release remote seals, as required in the food & beverages industry for fast cleaning, for example.
- The process requires cleaning of the measuring point, like in a batch process, for example.

#### Design

A remote seal system consists of the following components.

- Pressure transmitter
- One or two remote seals
- Filling liquid
- Connection between the pressure transmitter and remote seal (direct mounting or via a capillary)

The space for the medium is sealed off with a flat embedded elastic diaphragm. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary must be connected between the remote seal and the pressure transmitter in order, for example, to reduce the temperature effects on the pressure transmitter when the measured medium is hot.

However, the capillary influences the activation time and the temperature response of the overall remote seal system. When capillaries are used to connect a remote seal to a pressure transmitter for differential pressure, two capillaries of equal length must always be used.

Optionally, the remote seal with diaphragm extension (tube) can be ordered.

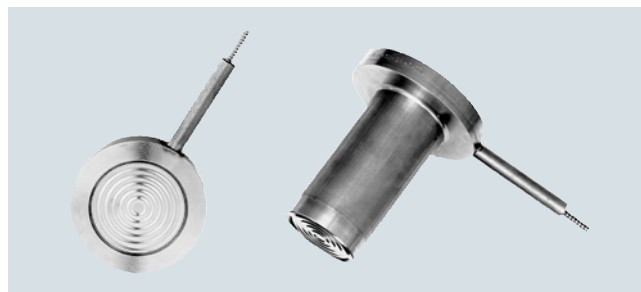
The remote seals in sandwich design are secured with a blank flange.

#### Designs

##### Diaphragm seal

With diaphragm seals, the pressure is sensed by a flat embedded diaphragm.

Diaphragm seals are differentiated as follows:



Diaphragm seal in sandwich design without (left) and with diaphragm extension (tube)

- Sandwich design
- Sandwich design with diaphragm extension (tube) according to EN or ASME and secured with a blank flange



Diaphragm seal in flange design without (left) and with diaphragm extension (tube)

- Flange design
- Flange design with diaphragm extension (tube) according to EN or ASME and secured using holes on the flange



Quick-release diaphragm seal

- Remote seal with quick release, e.g., according to DIN 11851, SMS Standard, IDF Standard, APV-RJF Standard, clamp connection, etc.
- Miniature remote seal with male thread for screwing into threaded holes
- Remote seal with customer-specific process connections

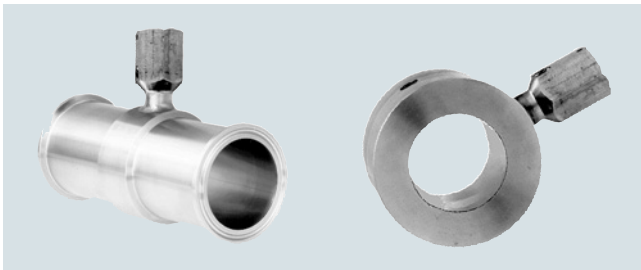


Miniature diaphragm seal with flush-mounted diaphragm

- Miniature diaphragm seal

Remote seals with quick release are used mainly in the food industry. Their design means that the medium cannot accumulate in dead volumes. The remote seal's quick release mechanism enables fast disassembly for cleaning.

#### Inline seal



Quick-release inline seal (left) and for flange mounting

With inline seals, the pressure is sensed using a cylindrical diaphragm inside the pipe and then transmitted with the filling liquid to the pressure transmitter.

The inline seal is a special design for flowing media. It consists of a cylindrical pipe in which a cylindrical diaphragm is embedded. Because it is completely integrated in the process line, there are no turbulences, dead spaces or other obstacles in the flow direction. The inline seal is also piggable.

Inline seals are differentiated as follows:

- Quick-release inline seal, e.g., according to DIN 11851, SMS Standard, IDF Standard, APV/RJF Standard, clamp connection, etc. The remote seal's quick release mechanism enables fast disassembly for cleaning.
- Inline seal for flange mounting according to EN or ASME
- Inline seal with customer-specific process connections

#### **Note:**

The pressure information on the transmitter and the remote seal must be observed in accordance with the pressure-temperature relationship.

#### **Function**

The measured pressure is transferred to the fill fluid by the diaphragm and enters the measuring chamber of the pressure transmitter through the capillary. The fill fluid completely fills the inside of the diaphragm seal, the capillary and the measuring chamber of the pressure transmitter so that it is free of gas.

#### **Transmission response**

The transmission response of a remote seal is characterized by the following variables:

- Temperature error
- Adjustment time

#### Temperature error

Temperature errors are caused by changes in the volume of the fill fluid as a result of temperature fluctuations. To select the right remote seal, you must calculate the temperature error.

Below is an overview of the factors which affect the extent of the temperature error, and information on how to calculate the temperature error.

The temperature error depends on the following variables:

- Rigidity of the diaphragm used
- Fill fluid used
- Effect of the fill fluid underneath the process flanges or in the connection shank of the pressure transmitter
- Inside diameter of the capillary: The greater the inside diameter, the greater the temperature error
- Capillary length: The longer the capillary, the greater the temperature error

#### Diaphragm rigidity

The rigidity of the diaphragm is extremely important. The greater the diameter of the diaphragm, the softer the diaphragm and the more sensitive it is to temperature-induced changes in the volume of the fill fluid.

Large-diameter diaphragms are therefore always required for small measuring ranges.

Apart from diaphragm rigidity, the following factors are also important:

- Diaphragm thickness
- Diaphragm material
- Any coatings

#### Filling liquid

Temperature fluctuations cause volume changes in all fill fluids. Choosing the right fill fluid can minimize the temperature error; however, the fill fluid must be appropriate for the temperature limits and operating pressure. The fill fluid must also be harmless to health.

There is fill fluid underneath the diaphragm, in the capillary and under the process flange of the pressure transmitter (or in the connection shank). The temperature error must therefore be calculated separately for each combination.

#### **Note:**

A vacuum-resistant remote seal is recommended for continuous low-pressure operation at 500 mbar or below, including during commissioning (see ordering data).

You can find an example of how to calculate the temperature error in "Technical specifications".

## Pressure measurement

### Remote seals for pressure transmitters SITRANS P320/P420

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##### Adjustment time

The adjustment time depends on the following factors:

- Inside diameter of the capillary: The greater the inside diameter, the shorter the adjustment time.
- Fill fluid viscosity: The greater the viscosity, the longer the adjustment time.
- Capillary length: The longer the capillary, the longer the adjustment time.
- Pressure in the pressure measurement system: The higher the pressure, the shorter the adjustment time.

##### Recommendations

For the best possible pressure transmitter and remote seal combination, please note the following:

- Use a diameter as large as possible for the remote seal. This makes the effective diameter of the remote seal diaphragms larger and reduces the temperature error.
- Use a capillary as short as possible. This reduces the adjustment time and the temperature error.
- Use the fill fluid with the lowest viscosity and smallest coefficients of expansion. Make sure, however, that the fill fluid meets the high-pressure and low-pressure and temperature process requirements. The fill fluid and the medium must also be compatible.
- Please note the following points for operation in the negative pressure range:
  - The pressure transmitter must always be positioned below the lowest shank.
  - The operating range of some fill fluids may be extremely limited in terms of the admissible temperature of the medium.
  - A vacuum-resistant remote seal is required for continuous operation in the low-pressure range.
- You can find recommendations for the minimum measuring span in "Technical specifications".

##### Note

The remote seals listed here are merely a selection of the most common remote seals. As there is a wide range of process connections, this list may not include all remote seals available.

Other versions may include:

- Different process connections and standards
- Aseptic or sterile screwed glands
- Different dimensions
- Different nominal pressures
- Special diaphragm materials and coatings
- Different sealing surfaces
- Different fill fluids
- Different capillary lengths
- Capillary sheathed in protective tubing
- Calibration at higher/lower temperatures, etc.

**Please contact your local Siemens office for further information.**

##### Negative pressure service

Liquids, such as silicone oils, inert or those suitable for food, are used in remote seal systems for transmission of the process pressure to the pressure transmitter.

In each liquid, particles have the tendency to leave the liquid compound with increasing temperature (transition from liquid to gaseous aggregate state). This means the vapor pressure increases with increasing temperature and is dependent on the substance or mixture present.

The higher the temperature and the lower the associated process pressure in the liquid, the more difficult it gets to guarantee the desired transmission properties of the fill fluid and therefore the measuring arrangement.

Plus the sealing elements at the transmitter must be designed so that a diffusion of molecules from the atmosphere into the remote seal system is prevented due to the constantly occurring negative pressure.

In addition to the influencing variables process pressure and process temperature, the vapor pressure curve of the fill fluid at the remote seal end and the stiffness of the remote seal membrane impact the functionality of the remote seal in the negative pressure range.

This means you have to pay special attention to the physical properties of fill fluids with applications in the negative pressure range.

There are three stages for the negative pressure resistance:

- **Standard design** of the remote seal without additional protective measures, suitable for the overpressure range and low negative pressure range. This design is identified with (1) in the diagrams below.
- **Negative pressure service** with suitable seals and treated fill fluid, identified with (2) in the diagrams below. Here you select the order codes D81 or D83, depending on the mounting type.
- **Extended negative pressure service** with more extended treatment of the fill fluid and the remote seals, identified in the diagrams below with (3). Here you select the order codes D85 or D88, depending on the mounting type.

There are two more areas in the diagrams. The area (4) identifies an area that has to be clarified with Technical Support prior to placing the order. The area (5) describes the area in which the remote seal fill fluid is permanently destroyed and the entire remote seal is therefore without function.

### Technical specifications of the remote seal fill fluids

Filling liquid	Number in the article no.	Density at 20 °C (68 °F) [kg/dm <sup>3</sup> ]	Viscosity at 20 °C (68 °F) [mm <sup>2</sup> /s]	Suitable for negative pressure service	Suitable for extended negative pressure service
Silicone oil M5	1	0.914	4	x	-
Silicone oil M50	2	0.966	50	x	x
High-temperature oil	3	1.079	57	x	x
Halocarbon oil	4	1.968	14	x	-
Food oil (FDA-listed)	7	0.920	10	x	x

The suitable negative pressure service is specified with the pressure/temperature curves of the respective liquids described below.

**Note:** For reasons of operational safety, the transmitter must not exceed the height of the remote seal - with differential pressure applications, the height of the bottom remote seal - for measurements in the negative pressure range. The associated mounting types B, C1, C2 or H are described at the end of this section under the topic "Measuring arrangements".

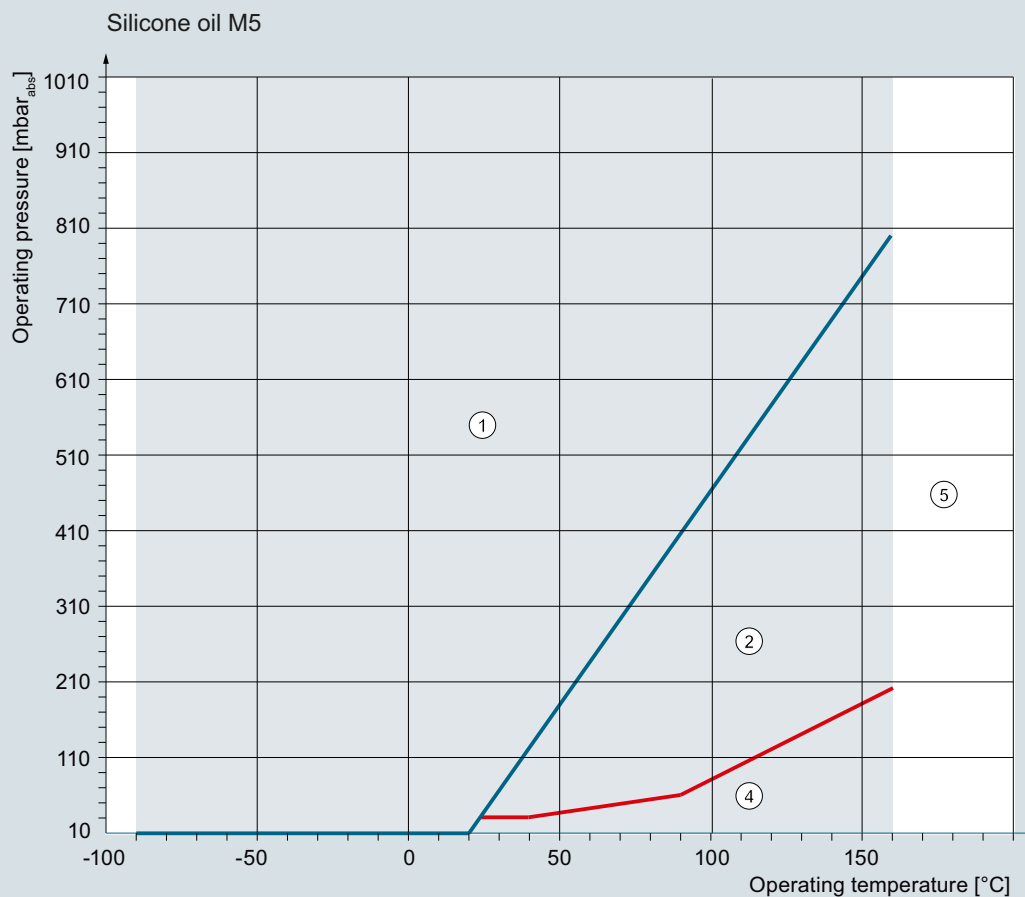
#### Selection of the required negative pressure service

The procedure for determining the required negative pressure service is described below using the silicone oil M5 as filling liquid. The minimum existing process pressure of a fictitious process is 200 mbar<sub>abs</sub> (2.9 psi) (at a maximum process temperature of 150 °C (302 °F)). This intersection is identified by an "X" in the diagram below. This means the negative pressure service D81 or D83 (depending on the application) is sufficient in this example.

The suitable negative pressure resistance is determined this way for all other fill fluids also.

#### Note:

Note the response times according to the table "Response times" (see Technical Specifications, page 1/336).



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service D81 or D83** is required.  
Note: An extended negative pressure service is **not** possible for this fill fluid.
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

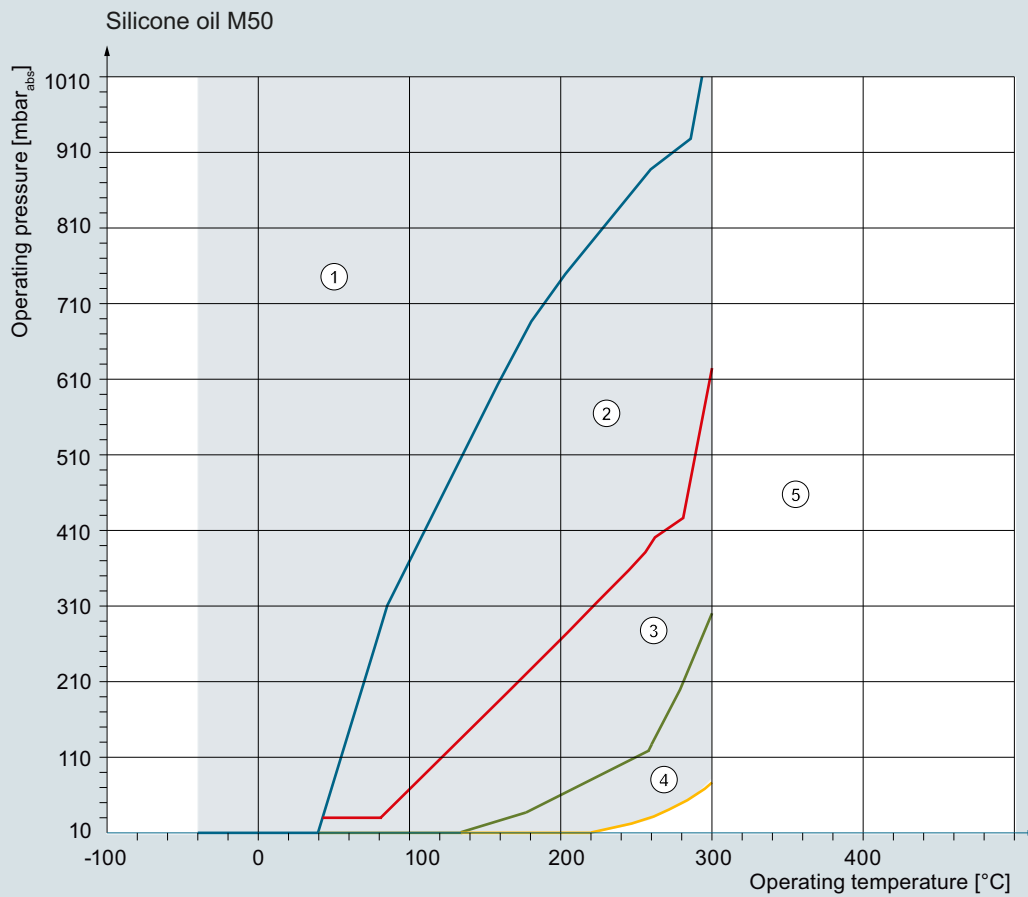
Permissible operating range:  
Max. temperature limit: 160 °C  
Min. temperature limit: -90 °C

Negative pressure applications with silicone oil M5

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Technical description

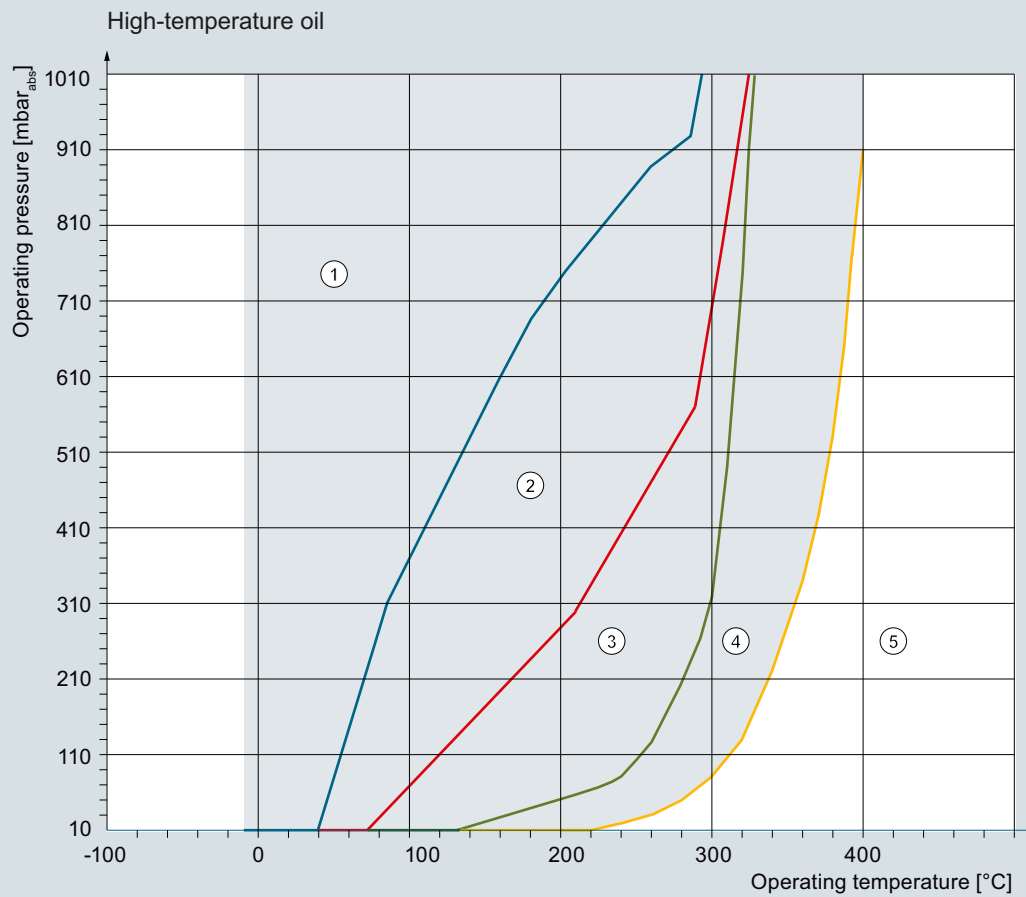


- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service D81 or D83** is required.
- ③ Operating range for which the **extended negative pressure service D85 or D88** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 300 °C  
Min. temperature limit: -40 °C

Negative pressure applications with silicone oil M50





- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service D81 or D83** is required.
- ③ Operating range for which the **extended negative pressure service D85 or D88** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

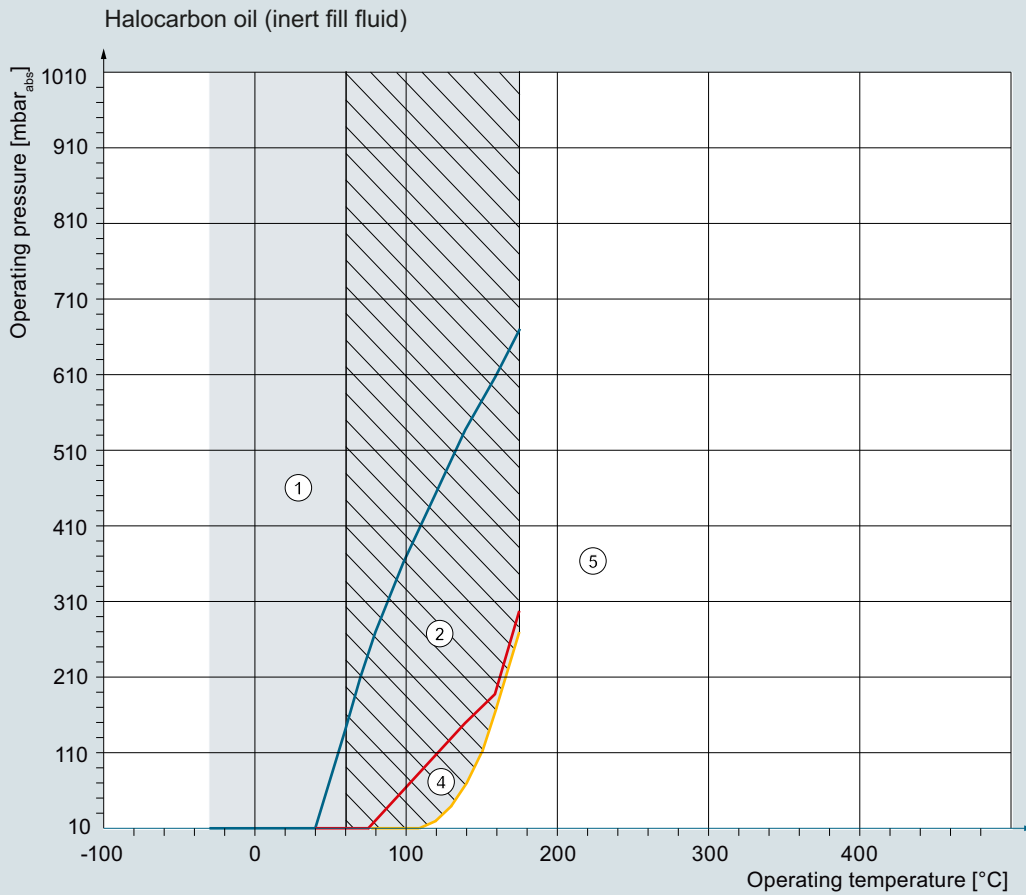
Permissible operating range:  
Max. temperature limit: 400 °C  
Min. temperature limit: -10 °C

Negative pressure applications with high-temperature oil

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Technical description



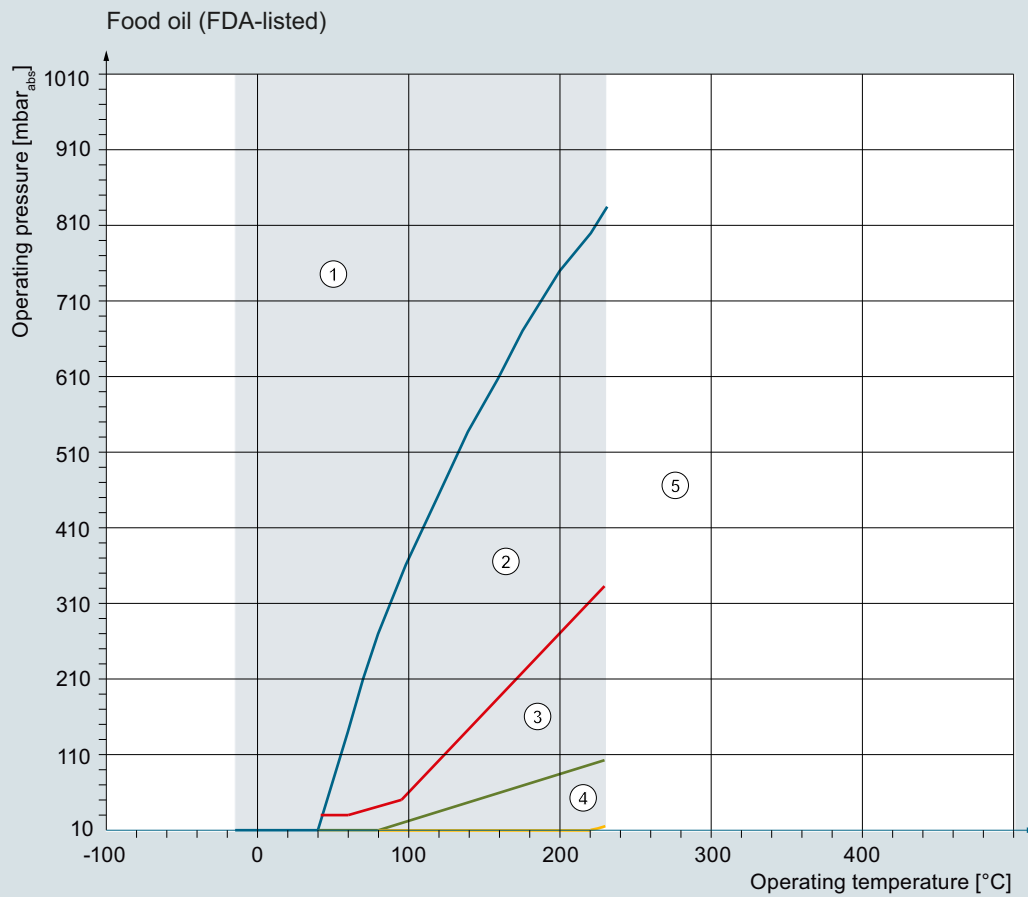
- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service D81 or D83** is required.  
Note: An extended negative pressure service is **not** possible for this fill fluid.
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 175 °C  
Min. temperature limit: -30 °C

Oxygen application for operating temperature between 60 and 175 °C  
and also for operating pressure > 50 bar not permissible.

Negative pressure applications with halocarbon oil (inert fill fluid)

A BAM approval for process temperatures up to 60 °C (140 °F) and system pressures up to 50 bar (725 psi) is available for the oxygen application.



- ① Operating range of the standard remote seal design without special measures.
  - ② Operating range for which the **negative pressure service D81 or D83** is required.
  - ③ Operating range for which the **extended negative pressure service D85 or D88** is required
  - ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
  - ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.
- Permissible operating range:  
 Max. temperature limit: 230 °C  
 Min. temperature limit: -15 °C

Negative pressure applications with food oil (FDA-listed)

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Technical description

#### Technical specifications

##### Diaphragm seal temperature error

Temperature errors of diaphragm seals when connected to pressure transmitters for gauge pressure, absolute pressure, differential pressure (single-sided) and level

##### Notes

Table values apply to:

- The filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed)
- Diaphragm material stainless steel

With selected order code W01:

- The values listed in the table for "High-temperature oil" filling liquid and for the wetted parts made of stainless steel 316L, mat no. 1.4404/1.4435, apply.
- For the other filling liquids, the following supplements must be applied to the determined table values for the temperature errors:
  - For "FDA oil": 5%
  - For "Silicone oil M5": 35%
  - For "Silicone oil M50": 35%
  - For "Halocarbon oil": 20%
 The specified surcharges for the various wetted parts are unaffected. They still need to be included in the calculation.

	Nominal diameter/design	Diaphragm diameter		Temperature error of remote seal $f_{RS}$		Temperature error of capillary $f_{Cap}$		Temperature error of process flange/connection shank $f_{PF}$		Recommended min. measuring spans (guidance values, note temperature error)	
		mm	(inch)	mbar/10 K	(psi/10 K)	mbar/(10 K · $m_{Cap}$ )	(psi/(10 K · $m_{Cap}$ ))	mbar/10 K	(psi/10 K)	mbar	(psi)
<b>Sandwich design or with flange to EN 1092-1</b>	DN 50 without tube	59	(2.32)	1.5	(0.022)	2	(0.029)	2	(0.029)	200	(2.90)
	DN 50 with tube	45	(1.89)	5	(0.073)	10	(0.145)	10	(0.145)	500	(7.25)
	DN 80 without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)	0.2	(0.003)	100	(1.45)
	DN 80 with tube	72	(2.83)	1	(0.015)	1	(1.015)	1	(1.015)	250	(3.63)
	DN 100 without tube	89	(3.50)	0.2	(0.003)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	DN 100 with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	DN 125 without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
DN 125 with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)	
<b>Sandwich design or with flange to ASME B16.5</b>	2 inch without tube	59	(2.32)	1.5	(0.022)	2	(0.029)	2	(0.029)	200	(2.90)
	2 inch with tube	45	(1.89)	5	(0.073)	10	(0.145)	10	(0.145)	500	(7.25)
	3 inch without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)	0.2	(0.003)	100	(1.45)
	3 inch with tube	72	(2.83)	1	(0.015)	1	(1.015)	1	(1.015)	250	(3.63)
	4 inch without tube	89	(3.50)	0.2	(0.003)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	4 inch with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	5 inch without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
5 inch with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)	
<b>Remote seal with union nut according to DIN 11851</b>	DN 25	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
<b>Remote seal, screwed gland design</b>	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
<b>Remote seal with threaded socket according to DIN 11851</b>	DN 25	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
<b>Clamp connection</b>	1½ inch	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	2 inch	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	2½ inch	59	(2.32)	3	(0.044)	5	(0.073)	5	(0.073)	500	(7.25)
	3 inch	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
<b>Miniature diaphragm seal</b>	G1B	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	G1½B	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	G2B	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)

### Temperature errors of diaphragm seals with connection to differential pressure transmitters (double-sided)

#### Notes

Table values apply to:

- The filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed)
- Diaphragm material stainless steel

With selected order code W01:

- The values listed in the table for "High-temperature oil" filling liquid and for the wetted parts made of stainless steel 316L, mat no. 1.4404/1.4435, apply.
- For the other filling liquids, the following supplements must be applied to the determined table values for the temperature errors:
  - For "FDA oil": 5%
  - For "Silicone oil M5": 35%
  - For "Silicone oil M50": 35%
  - For "Halocarbon oil": 20%
 The specified surcharges for the various wetted parts are unaffected. They still need to be included in the calculation.

	Nominal diameter/design	Diaphragm diameter		Temperature error of remote seal $f_{RS}$		Temperature error of capillary $f_{Cap}$		Temperature error of process flange/connection shank $f_{PF}$		Recommended min. measuring spans (guidance values, note temperature error)	
		mm	(inch)	mbar/10 K	(psi/10 K)	mbar/(10 K · $m_{Cap}$ )	(psi/(10 K · $m_{Cap}$ ))	mbar/10 K	(psi/10 K)	mbar	(psi)
<b>Sandwich design or with flange to EN 1092-1</b>	DN 50 without tube	59	(2.32)	0.3	(0.0043)	0.3	(0.0045)	0.3	(0.0045)	250	(3.626)
	DN 50 with tube	45	(1.89)	1.26	(0.018)	1.7	(0.025)	1.7	(0.025)	250	(3.626)
	DN 80 without tube	89	(3.50)	0.05	(0.001)	0.05	(0.001)	0.05	(0.0007)	50	(0.725)
	DN 80 with tube	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.45)
	DN 100 without tube	89	(3.50)	0.05	(0.001)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	DN 100 with tube	89	(3.50)	0.1	(0.002)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	DN 125 without tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
	DN 125 with tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
<b>Sandwich design with flange to ASME B16.5</b>	2 inch without tube	59	(2.32)	0.3	(0.0043)	0.3	(0.0043)	0.3	(0.0045)	250	(3.626)
	2 inch with tube	45	(1.89)	1.26	(0.018)	1.7	(0.025)	1.7	(0.025)	250	(3.626)
	3 inch without tube	89	(3.50)	0.05	(0.001)	0.05	(0.0007)	0.05	(0.0007)	50	(0.725)
	3 inch with tube	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.45)
	4 inch without tube	89	(3.50)	0.05	(0.001)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	4 inch with tube	89	(3.50)	0.1	(0.002)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	5 inch without tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
	5 inch with tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
<b>Remote seal, screwed gland design</b>	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)	0.83	(0.012)	250	(3.626)
<b>Remote seal with union nut according to DIN 11851</b>	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)	0.83	(0.012)	250	(3.626)
	DN 65	59	(2.32)	0.7	(0.010)	0.67	(0.010)	0.67	(0.010)	250	(3.626)
	DN 80	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.450)
<b>Remote seal with threaded socket according to DIN 11851</b>	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)	0.83	(0.012)	250	(3.626)
	DN 65	59	(2.32)	0.7	(0.010)	0.67	(0.010)	0.67	(0.010)	250	(3.626)
	DN 80	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.450)
<b>Clamp connection</b>	2 inch	40	(1.57)	1	(0.015)	2.5	(0.036)	2.5	(0.036)	2000	(29.01)
	2½ inch	59	(2.32)	0.7	(0.010)	0.67	(0.010)	0.67	(0.010)	250	(3.626)
	3 inch	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.450)

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Technical description

#### Inline seal temperature errors

##### Notes

Table values apply to:

- The filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed)
- Diaphragm material stainless steel
- Half the values apply to glycerin/water mixture as filling liquid.

Diaphragm thickness:

- 0.05 mm (0.002 inch) for DN 25/DN 40/DN 50
- 0.1 mm (0.004 inch) for DN 80/DN 100

Temperature errors of inline seals when connected to pressure transmitters for gauge and absolute pressure, and with single-sided connections to pressure transmitters for differential pressure

Nominal diameter/ design	Temperature error of remote seal $f_{RS}$		Temperature error of capillary $f_{Cap}$		Temperature error of process flange/connection shank $f_{PF}$		Recommended min. measuring spans (guidance values, note temperature error)	
	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar	(psi)
DN 25 (1 inch)	6.0	(0.0870)	8.5	(0.123)	8.5	(0.123)	1000	(14.5)
DN 40 (1½ inch)	4.5	(0.065)	4.5	(0.065)	4.5	(0.065)	250	(3.63)
DN 50 (2 inch)	4.0	(0.058)	3.0	(0.044)	3.0	(0.044)	100	(1.45)
DN 80 (3 inch)	9.5	(0.138)	5.0	(0.073)	5.0	(0.073)	100	(1.45)
DN 100 (4 inch)	8.0	(0.012)	3.0	(0.044)	3.0	(0.044)	100	(1.45)

Temperature errors of inline seals with double-sided connection to pressure transmitters for differential pressure

Nominal diameter/ design	Temperature error of remote seal $f_{RS}$		Temperature error of capillary $f_{Cap}$		Temperature error of process flange/connection shank $f_{PF}$		Recommended min. measuring spans (guidance values, note temperature error)	
	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar	(psi)
DN 25 (1 inch)	2.3	(0.033)	1.8	(0.026)	1.8	(0.026)	1000	(14.5)
DN 40 (1½ inch)	0.8	(0.012)	0.3	(0.004)	0.3	(0.004)	250	(3.63)
DN 50 (2 inch)	0.3	(0.004)	0.1	(0.002)	0.1	(0.002)	100	(1.45)
DN 80 (3 inch)	3.0	(0.044)	0.5	(0.007)	0.5	(0.007)	100	(1.45)
DN 100 (4 inch)	1.0	(0.015)	0.1	(0.002)	0.1	(0.002)	100	(1.45)

### Calculation of the temperature error

The following equation is used to calculate the temperature error:

$$dp = (\vartheta_{RS} - \vartheta_{Cal}) \cdot f_{RS} + (\vartheta_{Cap} - \vartheta_{Cal}) \cdot l_{Cap} \cdot f_{Cap} + (\vartheta_{TR} - \vartheta_{Cal}) \cdot f_{PF}$$

dp	Additional temperature error (mbar)
$\vartheta_{RS}$	Temperature on remote seal diaphragm (generally corresponds to temperature of medium)
$\vartheta_{Cal}$	Calibration/reference temperature (20 °C (68 °F))
$f_{DM}$	Temperature error of remote seal
$\vartheta_{Cap}$	Ambient temperature on the capillaries
$l_{Cap}$	Capillary length
$f_{Cap}$	Temperature error of capillaries
$\vartheta_{TR}$	Ambient temperature on pressure transmitter
$f_{PF}$	Temperature error of the oil filling in the process flanges of the pressure transmitter

### Example of temperature error calculation

Given:

SITRANS P pressure transmitter for differential pressure, 250 mbar, set to 0 ... 100 mbar, with DN 100 diaphragm seals without tube, diaphragm made of stainless steel, mat. no. 1.4404/316L	$f_{DM} = 0.05 \text{ mbar}/10 \text{ K}$ (0.039 inH <sub>2</sub> O/10 K)
Capillary length	$l_{Cap} = 6 \text{ m}$ (19.7 ft)
Capillaries fitted on both sides	$f_{Cap} = 0.07 \text{ mbar}/(10 \text{ K} \cdot m_{Cap})$ 0.028 inH <sub>2</sub> O/(10 K · m <sub>Cap</sub> )
Filling liquid silicone oil M5	$f_{PF} = 0.07 \text{ mbar}/10 \text{ K}$ (0.028 inH <sub>2</sub> O/10 K)
Medium temperature	$\vartheta_{RS} = 100 \text{ °C}$ (212 °F)
Temperature on the capillaries	$\vartheta_{Cap} = 50 \text{ °C}$ (122 °F)
Temperature on pressure transmitter	$\vartheta_{TR} = 50 \text{ °C}$ (122 °F)
Calibration temperature	$\vartheta_{Cal} = 20 \text{ °C}$ (68 °F)

Required:

Additional temperature error of remote seals: dp

Calculation:

in mbar:

$$dp = (100 \text{ °C} - 20 \text{ °C}) \cdot 0.05 \text{ mbar}/10 \text{ K} + (50 \text{ °C} - 20 \text{ °C}) \cdot 6 \text{ m} \cdot 0.07 \text{ mbar}/(10 \text{ K} \cdot \text{m}) + (50 \text{ °C} - 20 \text{ °C}) \cdot 0.07 \text{ mbar}/10 \text{ K}$$

$$dp = 0.4 \text{ mbar} + 1.26 \text{ mbar} + 0.21 \text{ mbar}$$

in inH<sub>2</sub>O:

$$dp = (212 \text{ °F} - 68 \text{ °F}) \cdot 0.039 \text{ inH}_2\text{O}/10 \text{ K} + (112 \text{ °F} - 68 \text{ °F}) \cdot 19.7 \text{ ft} \cdot 0.028 \text{ inH}_2\text{O}/(10 \text{ K} \cdot 3.28 \text{ ft}) + (112 \text{ °F} - 68 \text{ °F}) \cdot (0.028 \text{ inH}_2\text{O}/10 \text{ K})$$

$$dp = 0.16 \text{ inH}_2\text{O} + 0.51 \text{ inH}_2\text{O} + 0.08 \text{ inH}_2\text{O}$$

Result:

**dp = 1.87 mbar (0.75 inH<sub>2</sub>O)**

(corresponds to 2.27% of set measuring span)

Note

The determined temperature error only applies to the error resulting from connection of the remote seal.

The transmission response of the respective pressure transmitter is not taken into account here!

The transmission response must be calculated separately, and the resulting measurement error added to the temperature error determined above from connection of the remote seal.

### Dependence of temperature error on diaphragm material

The temperature errors listed in the previous table are based on the use of stainless steel as the diaphragm material. If other diaphragm materials are used, the temperature errors change as follows:

Diaphragm material	Change in temperature error of remote seal
	Increase in values by:
Stainless steel, duplex, ...	See previous tables
Hastelloy C4, mat. no. 2.4602	50%
Hastelloy C276, mat. no. 2.4819	50%
Monel 400, mat. no. 2.4360	60%
Tantalum	50%
Titanium	50%
PTFE coating on stainless steel diaphragm	80%
ECTFE coating or PFA coating on stainless steel diaphragm	100%
Gold coating on stainless steel diaphragm	40%
Inconel	50%
Incoloy	50%

### Maximum medium temperature

Note

When taking into account the maximum medium temperature, the application limits of the filling liquids and gaskets used as well as the pressure/temperature limits of the respective process connections must also be taken into consideration.

The following maximum medium temperatures apply depending on the material of the wetted parts.

Material	Max. medium temperature	Min./max. Pressure
Stainless steel, mat. no. 1.4404/316L	400 °C (752 °F)	No restrictions
PTFE coating	200 °C (392 °F)	< 0 bar (0 psi); gauge pressure
	260 °C (500 °F)	0 bar (0 psi) ... 25 bar (363 psi); gauge pressure
	150 °C (302 °F)	25 bar (363 psi) ... 40 bar (580 psi); gauge pressure
ECTFE coating	50 °C (302 °F)	40 bar (580 psi) ... 60 bar (870 psi); gauge pressure
	150 °C (302 °F)	For pressures < 1 bar (14.5 psi) on request
PFA coating	200 °C (392 °F)	< 0 bar (0 psi); gauge pressure
	260 °C (500 °F)	25 bar (363 psi)/40 bar (580 psi); gauge pressure
	150 °C (302 °F)	40 bar (580 psi)/60 bar (870 psi); gauge pressure
	50 °C (302 °F)	For pressures < 1 bar (14.5 psi) on request
	400 °C (752 °F)	No restrictions
Hastelloy C4, mat. no. 2.4610	400 °C (752 °F)	No restrictions
Hastelloy C276, mat. no. 2.4819	400 °C (752 °F)	No restrictions
Hastelloy C22, mat. no. 2.4602	400 °C (752 °F)	No restrictions
Monel 400, mat. no. 2.4360	400 °C (752 °F)	No restrictions
Tantalum	300 °C (572 °F)	No restrictions
	150 °C (302 °F)	No restrictions
Duplex, mat. no. 1.4462	250 °C (482 °F)	No restrictions
Titanium	150 °C (302 °F)	No restrictions
Inconel	400 °C (752 °F)	No restrictions
Incoloy	400 °C (752 °F)	No restrictions
Gold coating	400 °C (752 °F)	No restrictions

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Technical description

#### Maximum length of the capillary for diaphragm seals (guidance values)

Nominal diameter DN		Max. length of the capillary			
		Diaphragm seal		Inline seal	
		m	(ft)	m	(ft)
DN 25	(1 inch)	2.5	(8.2)	2.5	(8.2)
DN 32	(1¼ inch)	2.5	(8.2)	2.5	(8.2)
DN 40	(1½ inch)	4	(13.1)	6	(19.7)
DN 50	(2 inch)	6	(19.7)	10	(32.8)
DN 65	(2½ inch)	8	(26.2)	10	(32.8)
DN 80	(3 inch)	15	(49.1)	10	(32.8)
DN 100	(4 inch)	15	(49.1)	10	(32.8)
DN 125	(5 inch)	15	(49.1)	-	-

#### Response times

The response times specified in the following table (in seconds per meter length of the capillary) apply to a change in pressure which corresponds to the set measuring span.

The listed values must be multiplied by the respective length of the capillary, or with pressure transmitters for differential pressure and flow by the total length of both capillaries.

The response times are independent of the set measuring span within the range of the respective pressure transmitter. The response times are of insignificant importance for measuring spans above 10 bar (145 psi). The response times of the pressure transmitters are not considered in the table.

Filling liquid	Density		Temperature on capillary		Response time in s/m (s/ft) with max. measuring span of pressure transmitter					
	kg/dm <sup>3</sup>	(lb/in <sup>3</sup> )	°C	(°F)	250 mbar	(101 inH <sub>2</sub> O)	600 mbar	(241 inH <sub>2</sub> O)	1600 mbar	(643 inH <sub>2</sub> O)
<b>Silicone oil M5</b>	0.914	(0.033)	+60	(140)	0.06	(0.018)	0.02	(0.006)	0.01	(0.003)
			+20	(68)	0.11	(0.034)	0.02	(0.006)	0.02	(0.006)
			-20	(-4)	0.3	(0.091)	0.12	(0.037)	0.05	(0.015)
<b>Silicone oil M50</b>	0.966	(0.035)	+60	(140)	0.6	(0.183)	0.25	(0.076)	0.09	(0.027)
			+20	(68)	0.61	(0.186)	0.26	(0.079)	0.1	(0.030)
			-20	(-4)	1.69	(0.515)	0.71	(0.216)	0.27	(0.082)
<b>High-temperature oil</b>	1.070	(0.039)	+60	(140)	0.14	(0.043)	0.06	(0.018)	0.02	(0.006)
			+20	(68)	0.65	(0.198)	0.27	(0.082)	0.1	(0.030)
			-10	(14)	3.96	(1.207)	1.65	(0.503)	0.62	(0.189)
<b>Halocarbon oil</b>	1.968	(0.071)	+60	(140)	0.07	(0.021)	0.03	(0.009)	0.01	(0.003)
			+20	(68)	0.29	(0.088)	0.12	(0.037)	0.05	(0.015)
			-20	(-4)	2.88	(0.878)	1.2	(0.366)	0.45	(0.137)
<b>Food-grade oil (FDA grade)</b>	0.920	(0.033)	+60	(140)	0.75	(0.229)	0.33	(0.101)	0.17	(0.052)
			+20	(68)	4	(1.220)	1.75	(0.534)	0.67	(0.204)
			-20	(-4)	20	(6,100)	8.5	(2,593)	3.25	(0.991)

See diagrams under "Function" for permissible data of filling liquid for pressure and temperatures.



### More information

#### Specification of process conditions for selection and ordering data

##### Ambient temperature range

As standard, the remote seal systems are optimized for an ambient temperature range of -10 to +50 °C (14 to +122 °F). Therefore, in the ordering options, the **order code "D66"** is preset.

If the range of the ambient temperature deviates from this, you have the possibility to choose other ambient temperature ranges:

- With the **order code D67**, a range from -40 to +50 °C (-40 to +122 °F)
- With the **order code D68**, a range from -10 to +85 °C (14 to +185 °F)

In the case of a **special version**, which you can select with the **order option Y99** in the device settings, it is possible to enter the ambient temperature as a numerical value.

#### Process temperature

The standard optimization for the process temperature depends on the filling liquid used:

Filling liquid	Code	Optimized temperature range as standard
Silicone M50	B	-10 ... +200 °C (14 ... +392 °F)
High-temperature oil	C	-10 ... +300 °C (14 ... +572 °F)
Silicone oil M5	A	-40 ... +140 °C (-40 ... +284 °F)
Food-grade oil (FDA grade)	E	-10 ... +140 °C (14 ... +284 °F)
Halocarbon oil	D	-20 ... +60 °C (-4 ... +140 °F)

- If the **process temperatures** deviate from the temperature ranges mentioned in the table above, we ask you to send the process temperature with the **order code Y50** along with the order.
- If the remote seal has a small diameter (< DN 50/2") or a long capillary (> 4 m), we also ask you to provide the process data with the **following order code** when ordering.

These entries are transmitted and ensure the correct functioning of the remote seal systems.

Ambient temperature range	Order code
• -10 ... +50 °C (14 ... +122 °F) preset	<b>D66</b>
• -40 ... +50 °C (-40 ... +122 °F)	<b>D67</b>
• -10 ... +85 °C (14 ... +185 °F)	<b>D68</b>
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Diaphragm seals in sandwich design with flexible capillary

1

#### Overview



Diaphragm seals of sandwich design

#### Technical specifications

##### Diaphragm seals of sandwich design

Nominal diameter	Nominal pressure
Standard of process connection EN 1092-1	PN 16 ... PN 400
<ul style="list-style-type: none"> <li>DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125</li> </ul>	Class 150 ... class 2500
Standard of process connection ASME B16.5	10K ... 63K
<ul style="list-style-type: none"> <li>1 inch, 1½ inch, 2 inch, 2½ inch, 3 inch, 4 inch, 5 inch</li> </ul>	Acc. to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
Process connection standard J.I.S.	Acc. to EN 1092-1, form B2 or ASME B16.5 RFSF
<ul style="list-style-type: none"> <li>DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125</li> </ul>	Stainless steel, mat. no. 1.4404/316L
Sealing surface	Stainless steel, mat. no. 1.4404/316L
<ul style="list-style-type: none"> <li>For stainless steel, mat. no. 1.4404/316L</li> <li>For the other materials</li> </ul>	<ul style="list-style-type: none"> <li>Without coating</li> <li>PTFE coating</li> <li>ECTFE coating (for negative pressure on request)</li> <li>PFA coating</li> </ul>
Materials	Monel 400, mat. no. 2.4360
<ul style="list-style-type: none"> <li>Main body</li> <li>Wetted parts</li> </ul>	Hastelloy C276, mat. no. 2.4819
	Hastelloy C4, mat. no. 2.4602
	Hastelloy C22, mat. no. 2.4602
	Tantalum
	Titanium, mat. no. 3.7035
	Nickel 201
	Duplex 2205, mat. no. 1.4462
	Stainless steel 316L, gold plated, layer thickness approx. 25 µm
<ul style="list-style-type: none"> <li>Capillary</li> </ul>	Stainless steel, mat. no. 1.4571/316Ti (with options W01 and E50 ... E58) or mat. no. 1.4301/304
<ul style="list-style-type: none"> <li>Sheath</li> </ul>	Flexible spiral coiled tube made of stainless steel, mat. no. 1.4404/316L

Gasket material in the process flanges	Copper
<ul style="list-style-type: none"> <li>For gauge pressure transmitters, absolute pressure transmitters and negative pressure applications</li> <li>For other applications</li> </ul>	Viton
Maximum pressure	See above and the technical specifications of the pressure transmitters
Tube length	Standard products without tube (tube available on request)
Capillary	
<ul style="list-style-type: none"> <li>Length</li> </ul>	≤ 10 m (32.8 ft), longer lengths on request
<ul style="list-style-type: none"> <li>Internal diameter</li> <li>Minimum bending radius</li> </ul>	≤ 2 mm (0.079 inch) 150 mm (5.9 inch)
Filling liquid	Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O <sub>2</sub> ) Food-grade oil (FDA grade)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal.
	<b>More information</b>
	In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals:
	<ul style="list-style-type: none"> <li>"Function" - "Technical specifications of the remote seal filling liquids"</li> <li>"Additional information" - "Specification of process conditions for selection and ordering data"</li> </ul>
Weight	Approx. 4 kg (8.82 lb)

##### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
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### Diaphragm seals in sandwich design with flexible capillary

#### Selection and ordering data

	Article No.	Order code		Article No.	Order code
<b>Diaphragm seal</b>					
In sandwich design, connected with flexible capillary tube to a transmitter					
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, scope of delivery: 1 unit</li> <li>SITRANS P320/P420 for absolute pressure from differential pressure, 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, scope of delivery: 2 units</li> </ul>	7MF0800 -		7MF0800 -		
	7MF0801 -		7MF0801 -		
	7MF0802 -		7MF0802 -		
	- 0		- 0		
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>					
<b>Nominal diameter</b>	<b>Nominal pressure</b>				
<u>Process connection standard EN 1092-1</u>					
(DN 25, DN 40 and DN 50 recommended only for pressure transmitters for gauge pressure)					
DN 25	PN 16 ... 400	0BQ			
DN 40	PN 16 ... 400	0DQ			
DN 50	PN 16 ... 400	0EQ			
DN 65	PN 16 ... 400	0FQ			
DN 80	PN 16 ... 400	0GQ			
DN 100	PN 16 ... 400	0HQ			
DN 125	PN 16 ... 400	0JQ			
<u>Process connection standard ASME B16.5</u>					
(1 inch, 1½ inch and 2 inch recommended only for pressure transmitters for gauge pressure)					
1 inch	Class 150 ... 2500	1KX			
1½ inch	Class 150 ... 2500	1LX			
2 inch	Class 150 ... 2500	1MX			
2½ inch	Class 150 ... 2500	1NX			
3 inch	Class 150 ... 2500	1PX			
4 inch	Class 150 ... 2500	1QX			
5 inch	Class 150 ... 2500	1RX			
<u>Process connection standard J.I.S.</u>					
(DN 25, DN 40 and DN 50 recommended only for pressure transmitters for gauge pressure)					
DN 25	10K ... 63K	2BW			
DN 40	10K ... 63K	2DW			
DN 50	10K ... 63K	2EW			
DN 65	10K ... 63K	2FW			
DN 80	10K ... 63K	2GW			
DN 100	10K ... 63K	2HW			
DN 125	10K ... 63K	2JW			
Other version		9AA	H1Y		
Add order code and plain text.					
<b>Capillary length</b>					
1 m (38.37 inch)		10			
1.6 m (63 inch)		11			
2 m (78.7 inch)		12			
2.5 m (98.4 inch)		13			
3 m (118.1 inch)		14			
4 m (157.5 inch)		15			
5 m (196.9 inch)		16			
6 m (236.2 inch)		17			
7 m (275.6 inch)		18			
8 m (315 inch)		20			
9 m (354.3 inch)		21			
10 m (393.7 inch)		22			
11 m (433.1 inch); only for 7MF0802		23			
<b>Diaphragm seal</b>					
In sandwich design, connected with flexible capillary tube to a transmitter					
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, scope of delivery: 1 unit</li> <li>SITRANS P320/P420 for absolute pressure from differential pressure, 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, scope of delivery: 2 units</li> </ul>	7MF0800 -		7MF0800 -		
	7MF0801 -		7MF0801 -		
	7MF0802 -		7MF0802 -		
	- 0		- 0		
12 m (472.4 inch); only for 7MF0802		24			
13 m (511.811 inch); only for 7MF0802		25			
14 m (551.2 inch); only for 7MF0802		26			
15 m (590.6 inch); only for 7MF0802		27			
Other version		98	L1Y		
Add order code and plain text.					
<b>Filling liquid</b>					
Silicone oil M50			B		
High-temperature oil			C		
Silicone oil M5			A		
Food oil (FDA-listed)			E		
Halocarbon oil			D		
Other version			Z	P1Y	
Add order code and plain text.					
<b>Wetted parts materials</b>					
316L stainless steel					
<ul style="list-style-type: none"> <li>Without coating</li> <li>With PFA coating</li> <li>With PTFE coating</li> <li>With ECTFE coating</li> </ul>			A		
Monel 400, 2.4360			D		
			E		
			F		
			G		
Hastelloy C276, 2.4819			J		
Tantalum			K		
Titanium, 3.7035			L		
Nickel 201			M		
Diaphragm Duplex, 1.4462			Q		
Diaphragm and flange Duplex, 1.4462			R		
Stainless steel 316 with gold coating			S		
Hastelloy C4, 2.4610			U		
Hastelloy C22, 2.4602			V		
Other version			Z	Q1Y	
Add order code and plain text.					
<b>Tube length</b>					
None			0		
50 mm (2 inch)			1		
100 mm (4 inch)			2		
150 mm (6 inch)			3		
200 mm (8 inch)			4		
250 mm (10 inch)			5		
Other version			Z	Q1Y	
Add order code and plain text.					

## Pressure measurement

### Remote seals for pressure transmitters SITRANS P320/P420

#### Diaphragm seals in sandwich design with flexible capillary

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		Article No.	Order code			Article No.	Order code
<b>Diaphragm seal</b>				<b>Diaphragm seal</b>			
In sandwich design, connected with flexible capillary tube to a transmitter				In sandwich design, connected with flexible capillary tube to a transmitter			
<ul style="list-style-type: none"> <li>• SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, scope of delivery: 1 unit</li> <li>• SITRANS P320/P420 for absolute pressure from differential pressure, 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit</li> <li>• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, scope of delivery: 2 units</li> </ul>		<b>7MF0800 -</b>  <b>7MF0801 -</b>  <b>7MF0802 -</b>		<ul style="list-style-type: none"> <li>• SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, scope of delivery: 1 unit</li> <li>• SITRANS P320/P420 for absolute pressure from differential pressure, 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit</li> <li>• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, scope of delivery: 2 units</li> </ul>		<b>7MF0800 -</b>  <b>7MF0801 -</b>  <b>7MF0802 -</b>	
		- 0				- 0	
<b>Customer-specific tube length</b>				<b>Customer-specific tube length</b>			
<ul style="list-style-type: none"> <li>• Wetted parts: Stainless steel without coating</li> </ul>				<ul style="list-style-type: none"> <li>• Wetted parts: Hastelloy C276</li> </ul>			
Range	Standard length			Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>A 1</b>	20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>J 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>A 2</b>	51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>J 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>A 3</b>	101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>J 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>A 4</b>	151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>J 4</b>
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		<b>A 5</b>				
<ul style="list-style-type: none"> <li>• Wetted parts: Stainless steel with ECTFE coating</li> </ul>				<ul style="list-style-type: none"> <li>• Wetted parts: Tantalum</li> </ul>			
Range	Standard length			Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>F 1</b>	20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>K 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>F 2</b>	51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>K 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>F 3</b>	101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>K 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>F 4</b>	151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>K 4</b>
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		<b>F 5</b>				
<ul style="list-style-type: none"> <li>• Wetted parts: Stainless steel with PFA coating</li> </ul>							
Range	Standard length						
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>D 1</b>				
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>D 2</b>				
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>D 3</b>				
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>D 4</b>				
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		<b>D 5</b>				
<ul style="list-style-type: none"> <li>• Wetted parts: Monel 400</li> </ul>							
Range	Standard length						
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>G 1</b>				
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>G 2</b>				
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>G 3</b>				
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>G 4</b>				

#### Diaphragm seals in sandwich design with flexible capillary

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Options	Order code	Options	Order code
Add <b>"-Z"</b> to article number and specify order code.		Add <b>"-Z"</b> to article number and specify order code.	
<b>Factory certificates</b>		Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	<b>C11</b>	• DN 25	<b>M70</b>
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	<b>C12</b>	• DN 40	<b>M71</b>
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	<b>C13</b>	• DN 50	<b>M72</b>
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	<b>C15</b>	• DN 80	<b>M73</b>
Certificate of FDA-approved fill oil to EN 10204-2.2	<b>C17</b>	• DN 100	<b>M74</b>
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	<b>C20</b>	• DN 125	<b>M75</b>
<b>Accessories</b>		Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	
Remote seal nameplate	<b>D42</b>	• DN 25	<b>M76</b>
Attached, made of stainless steel, contains article no. and order number of the remote seal		• DN 40	<b>M77</b>
Volume deflagration flame arrester (VDEF)		• DN 50	<b>M78</b>
• For gauge pressure and absolute pressure transmitters	<b>D61</b>	• DN 80	<b>M79</b>
• For differential pressure and level transmitters	<b>D62</b>	• DN 100	<b>M80</b>
<b>Negative pressure service</b>		• DN 125	<b>M81</b>
Negative pressure service		Sealing surface with recess to EN 1092-1, form F (for wetted parts made of stainless steel 316L only)	
• For gauge pressure and absolute pressure transmitters	<b>D81</b>	• DN 25	<b>M82</b>
• For differential pressure transmitters	<b>D83</b>	• DN 40	<b>M83</b>
Extended negative pressure service		• DN 50	<b>M84</b>
• For gauge pressure and absolute pressure transmitters (only 7MF0800)	<b>D85</b>	• DN 80	<b>M85</b>
• For differential pressure transmitters	<b>D88</b>	• DN 100	<b>M86</b>
<b>Marine approvals</b>		• DN 125	<b>M87</b>
<u>Note:</u>		<b>Capillary connection</b> (only for 7MF0800)	
If one of the order codes E50 to E60 is selected, the corresponding option must also be selected for the transmitter!		Single-side mounted at differential pressure transmitter at high side	<b>S03</b>
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>	Single-side mounted at differential pressure transmitter at low side	<b>S04</b>
LR (Lloyds Register)	<b>E51</b>	<b>Capillary coating</b>	
BV (Bureau Veritas)	<b>E52</b>	PE protective tube	
ABS (American Bureau of Shipping)	<b>E53</b>	• 1 m (38.37 inch)	<b>S10</b>
RMR (Russian Maritime Register)	<b>E55</b>	• 1.6 m (63 inch)	<b>S11</b>
KR (Korean Register of Shipping)	<b>E56</b>	• 2 m (78.7 inch)	<b>S12</b>
RINA (Registro Italiano Navale)	<b>E57</b>	• 2.5 m (98.4 inch)	<b>S13</b>
CCS (China Classification Society)	<b>E58</b>	• 3 m (118.1 inch)	<b>S14</b>
<b>Country-specific approval</b>		• 4 m (157.5 inch)	<b>S15</b>
CRN approval Canada (Canadian Registration Number)	<b>E60</b>	• 5 m (196.9 inch)	<b>S16</b>
<b>General product approvals without explosion proof approvals</b>		• 6 m (236.2 inch)	<b>S17</b>
Oil- and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	<b>E80</b>	• 7 m (275.6 inch)	<b>S18</b>
Oil- and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil)	<b>E87</b>	• 8 m (315 inch)	<b>S19</b>
<b>Sealing surface</b>		• 9 m (354.3 inch)	<b>S20</b>
Sealing surface smooth, form B2/EN 1092-1 resp. RFSF/ANSI 16.5 (for wetted parts made of stainless steel 316L only)	<b>M50</b>	• 10 m (393.7 inch)	<b>S21</b>
Sealing surface groove to EN 1092-1, form D (instead of sealing surface B1, for wetted parts made of stainless steel 316L only)	<b>M54</b>	• 11 m (433.1 inch); only for 7MF0802	<b>S22</b>
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, for wetted parts made of stainless steel 316L only)	<b>M64</b>	• 12 m (472.4 inch); only for 7MF0802	<b>S23</b>
		• 13 m (511.811 inch); only for 7MF0802	<b>S24</b>
		• 14 m (551.2 inch); only for 7MF0802	<b>S25</b>
		• 15 m (590.6 inch); only for 7MF0802	<b>S26</b>
		PTFE protective tube	
		• 1 m (38.37 inch)	<b>S40</b>
		• 1.6 m (63 inch)	<b>S41</b>
		• 2 m (78.7 inch)	<b>S42</b>
		• 2.5 m (98.4 inch)	<b>S43</b>
		• 3 m (118.1 inch)	<b>S44</b>
		• 4 m (157.5 inch)	<b>S45</b>
		• 5 m (196.9 inch)	<b>S46</b>
		• 6 m (236.2 inch)	<b>S47</b>
		• 7 m (275.6 inch)	<b>S48</b>
		• 8 m (315 inch)	<b>S49</b>
		• 9 m (354.3 inch)	<b>S50</b>
		• 10 m (393.7 inch)	<b>S51</b>
		• 11 m (433.1 inch); only for 7MF0802	<b>S52</b>
		• 12 m (472.4 inch); only for 7MF0802	<b>S53</b>
		• 13 m (511.811 inch); only for 7MF0802	<b>S54</b>
		• 14 m (551.2 inch); only for 7MF0802	<b>S55</b>
		• 15 m (590.6 inch); only for 7MF0802	<b>S56</b>

## Pressure measurement

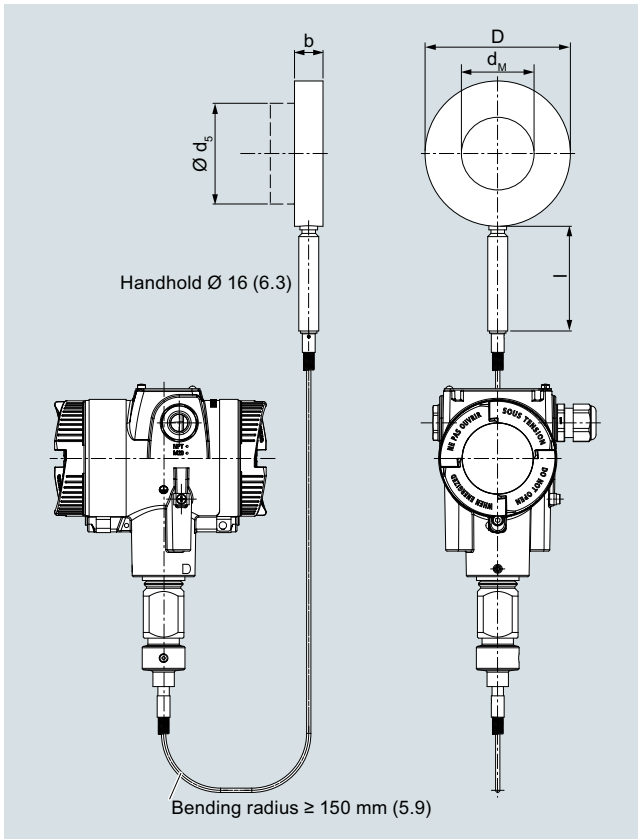
Remote seals for pressure transmitters  
SITRANS P320/P420

### Diaphragm seals in sandwich design with flexible capillary

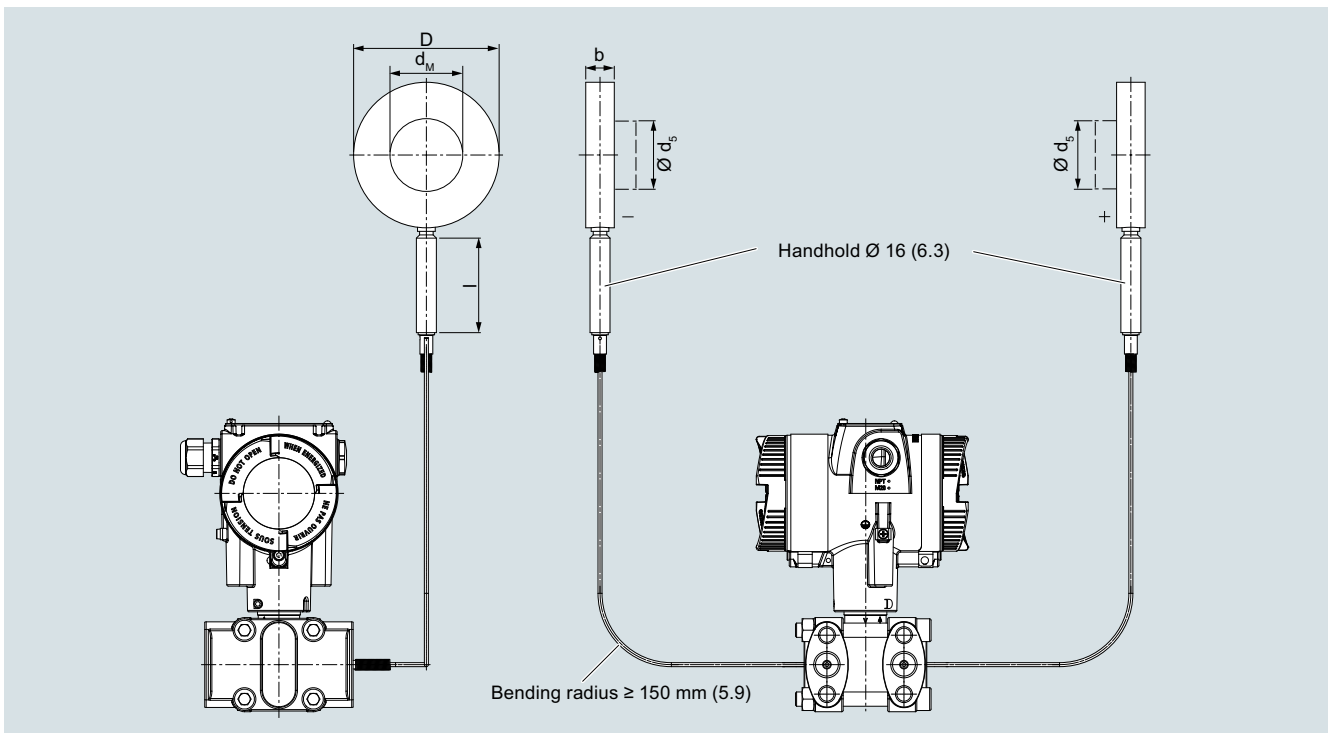
Options	Order code
Add "-Z" to article number and specify order code.	
PVC protective tube	
• 1 m (38.37 inch)	<b>S70</b>
• 1.6 m (63 inch)	<b>S71</b>
• 2 m (78.7 inch)	<b>S72</b>
• 2.5 m (98.4 inch)	<b>S73</b>
• 3 m (118.1 inch)	<b>S74</b>
• 4 m (157.5 inch)	<b>S75</b>
• 5 m (196.9 inch)	<b>S76</b>
• 6 m (236.2 inch)	<b>S77</b>
• 7 m (275.6 inch)	<b>S78</b>
• 8 m (315 inch)	<b>S79</b>
• 9 m (354.3 inch)	<b>S80</b>
• 10 m (393.7 inch)	<b>S81</b>
• 11 m (433.1 inch); only for 7MF0802	<b>S82</b>
• 12 m (472.4 inch); only for 7MF0802	<b>S83</b>
• 13 m (511.811 inch); only for 7MF0802	<b>S84</b>
• 14 m (551.2 inch); only for 7MF0802	<b>S85</b>
• 15 m (590.6 inch); only for 7MF0802	<b>S86</b>
<b>Desired remote seal supplier</b>	
<u>Note:</u> If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	<b>W01</b>
Company Labom, Hude	<b>W02</b>
<b>Special design</b>	
Welded filling hole	<b>X01</b>
<b>Customer-specific tube length</b>	
Customer-specific tube length (specify in plain text in mm)	<b>Y44</b>
<b>Specification of process conditions<sup>1)</sup></b>	
Ambient temperature range	
• 10 ... +50 °C (50 ... +122 °F) preset	<b>D66</b>
• -40 ... +50 °C (-40 ... +122 °F)	<b>D67</b>
• -10 ... +85 °C (14 ... +185 °F)	<b>D68</b>
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>

<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/337.

## Dimensional drawings



Diaphragm seals of sandwich design with flexible capillary for connection to SITRANS P320/420 pressure transmitters for gauge pressure, dimensions in mm (inch)



Diaphragm seals of sandwich design (without flange) with flexible capillary for connection to SITRANS P320/420 pressure transmitters for absolute pressure or differential pressure and flow, dimensions in mm (inch)

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

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### Diaphragm seals in sandwich design with flexible capillary

#### Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> without tube	l
		mm	mm	mm	mm	mm	mm
DN 25	PN 16 ... PN 400	20	68	24.5	22.6	27	100
DN 40		20	88	38	30	40	100
DN 50		20	102	48.3	40	51	100
DN 65		20	122	48.3	40	65	100
DN 80		20	138	76	65	85	100
DN 100		20	158	94	85	85	100
DN 125		22	188	125	16	116	100

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5  
d<sub>M</sub>: Effective diaphragm diameter

#### Connection according to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> without tube	l
		lb/sq.in.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
1 inch	150 ... 2500	20 (0.79)	51 (2.01)	24.5 (0.96)	22.6 (0.89)	30 (1.18)	100 (3.94)
1½ inch		20 (0.79)	73 (2.9)	38 (1.5)	30 (1.18)	40 (1.57)	100 (3.94)
2 inch		20 (0.79)	100 (3.94)	48.3 (1.9)	40 (1.57)	51 (2.01)	100 (3.94)
2½ inch		20 (0.79)	105 (4.13)	48.3 (1.9)	40 (1.57)	65 (2.56)	100 (3.94)
3 inch		20 (0.79)	134 (5.28)	72 (2.8)	65 (2.56)	85 (3.35)	100 (3.94)
4 inch		20 (0.79)	158 (6.22)	94 (3.69)	85 (3.35)	85 (3.35)	100 (3.94)
5 inch		22 (0.87)	186 (7.32)	125 (4.92)	116 (4.57)	116 (4.57)	100 (3.94)

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5  
d<sub>M</sub>: Effective diaphragm diameter

#### Connection according to J.I.S.

Nominal diameter	Nominal pressure	b	D	D	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> without tube	l
		mm (inch)	mm (inch)	10K, 20K (inch)	30K ... 63K (inch)	mm (inch)	mm (inch)	mm (inch)
DN 25	10K ... 63K	20 (0.79)	67 (2.64)	70 (2.76)	24.5 (0.96)	22.6 (0.89)	30 (1.18)	100 (3.94)
DN 40		20 (0.79)	81 (3.19)	90 (3.54)	38 (1.5)	30 (1.18)	36 (1.42)	100 (3.94)
DN 50		20 (0.79)	96 (3.78)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	100 (3.94)
DN 65		20 (0.79)	116 (4.57)	130 (5.12)	48.3 (1.9)	40 (1.57)	65 (2.56)	100 (3.94)
DN 80		20 (0.79)	132 (5.2)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	100 (3.94)
DN 100		20 (0.79)	160 (6.3)	160 (6.3)	94 (3.69)	85 (3.35)	85 (3.35)	100 (3.94)
DN 125		20 (0.79)	195 (7.68)	195 (7.68)	125 (4.92)	116 (4.57)	116 (4.57)	100 (3.94)

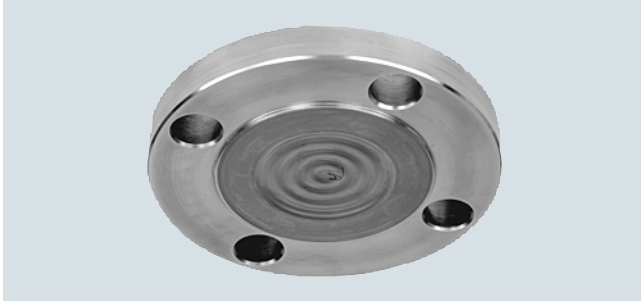
d: Inside diameter of gasket according to EN 1092-1/ASME B16.5  
d<sub>M</sub>: Effective diaphragm diameter



#### Diaphragm seals of flange design with flexible capillary

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#### Overview



Diaphragm seals of flange design

#### Technical specifications

Diaphragm seals of flange design with flexible capillary	
Nominal diameter	Nominal pressure
Standard of process connection EN 1092-1	
<ul style="list-style-type: none"> <li>• DN 25</li> <li>• DN 40</li> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> <li>• DN 125</li> </ul>	PN 10/16/25/40/63/100/160/250 PN 10/16/25/40/63/100/160 PN 10/16/25/40/63/100 PN 10/16/25/40/100 PN 10/16/25/40 PN 16/40
Process connection standard ASME B16.5	
<ul style="list-style-type: none"> <li>• 1 inch</li> <li>• 1½ inch</li> <li>• 2 inch</li> <li>• 3 inch</li> <li>• 4 inch</li> <li>• 5 inch</li> </ul>	Class 150/300/600/1500 Class 150/300/400/600/900/1500 Class 150/300/400/600/900/1500 Class 150/300/600/1500 Class 150/300/400/1500 Class 150/300/400
Process connection standard J.I.S.	
<ul style="list-style-type: none"> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> </ul>	10K 20K 40K
Sealing surface	
<ul style="list-style-type: none"> <li>• For stainless steel, mat. no. 1.4404/316L</li> <li>• For other materials</li> </ul>	Acc. to EN 1092-1, form B1 or ASMR B16.5 RF 125 ... 250 AA Acc. to EN 1092-1, form B2 or ASME B16.5 RFSF

#### Diaphragm seals of flange design with flexible capillary



Materials	Stainless steel, mat. no. 1.4404/316L Stainless steel, mat. no. 1.4404/316L
<ul style="list-style-type: none"> <li>• Main body</li> <li>• Wetted parts</li> </ul>	<ul style="list-style-type: none"> <li>• Without coating</li> <li>• PTFE coating</li> <li>• ECTFE coating (for negative pressure on request)</li> <li>• PFA coating</li> </ul> Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4602 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, layer thickness approx. 25 µm Stainless steel, mat. no. 1.4571/316Ti (with options W01 and E50 to E58) or mat. no. 1.4301/304
<ul style="list-style-type: none"> <li>• Capillary</li> </ul>	Flexible spiral coiled tube made of stainless steel mat. no. 1.4404/316L
<ul style="list-style-type: none"> <li>• Sheath</li> </ul>	Flexible spiral coiled tube made of stainless steel mat. no. 1.4404/316L
Gasket material in the process flanges	
<ul style="list-style-type: none"> <li>• For pressure transmitters, absolute pressure transmitters and negative pressure applications</li> <li>• For other applications</li> </ul>	Copper Viton
Maximum pressure	See above and the technical specifications of the pressure transmitter
Tube length	Standard products without tube (tube available on request)
Capillary	
<ul style="list-style-type: none"> <li>• Length</li> </ul>	≤ 10 m (32.8 ft), longer lengths on request
<ul style="list-style-type: none"> <li>• Internal diameter</li> <li>• Minimum bending radius</li> </ul>	≤ 2 mm (0.079 inch) 150 mm (5.9 inch)
Filling liquid (for remote seals of sandwich and flange design)	Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O <sub>2</sub> ) Food-grade oil (FDA grade)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal.
	<b>More information</b> In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: <ul style="list-style-type: none"> <li>• "Function" - "Technical specifications of the remote seal filling liquids"</li> <li>• "Additional information" - "Specification of process conditions for selection and ordering data"</li> </ul>
Weight	Approx. 4 kg (8.82 lb)
<b>Certificates and approvals</b>	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Diaphragm seals of flange design with flexible capillary

#### Selection and ordering data

		Article No.	Order code			Article No.	Order code
<b>Diaphragm seal</b>				<b>Diaphragm seal</b>			
Flange type design, connected to a transmitter with flexible capillary tube				Flange type design, connected to a transmitter with flexible capillary tube			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> <li>SITRANS P320/P420 for absolute pressure from differential pressure, 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>		<b>7MF0810 -</b>		<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> <li>SITRANS P320/P420 for absolute pressure from differential pressure, 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>		<b>7MF0810 -</b>	
		<b>7MF0811 -</b>				<b>7MF0811 -</b>	
		<b>7MF0812 -</b>				<b>7MF0812 -</b>	
			<b>- 0</b>				<b>- 0</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>				<u>Process connection standard J.I.S.</u> (DN 50 recommended only for pressure transmitters for gauge pressure)			
<b>Nominal diameter</b>	<b>Nominal pressure</b>			DN 50	10 K 20 K 40 K	<b>2ES</b> <b>2ET</b> <b>2EU</b>	
Process connection standard EN 1092-1 (DN 25, DN 40 and DN 50 recommended only for pressure transmitters for gauge pressure)				DN 80	10 K 20 K 40 K	<b>2GS</b> <b>2GT</b> <b>2GU</b>	
DN 25	PN 10/16/25/40 PN 63/100 PN 160 PN 250	<b>0BD</b> <b>0BF</b> <b>0BG</b> <b>0BH</b>		DN 100	10 K 20 K 40 K	<b>2HS</b> <b>2HT</b> <b>2HU</b>	
DN 40	PN 10/16/25/40 PN 63/100 PN 160	<b>0DD</b> <b>0DF</b> <b>0DG</b>		Other version Add order code and plain text.		<b>9AA</b>	<b>H1Y</b>
DN 50	PN 10/16/25/40 PN 63 PN 100	<b>0ED</b> <b>0EE</b> <b>0EF</b>		<b>Transmitter connection</b>			
DN 80	PN 10/16/25/40 PN 100	<b>0GD</b> <b>0GF</b>		Connection via capillary tube Capillary length			
DN 100	PN 10/16 PN 25/40	<b>0HB</b> <b>0HD</b> <b>0JB</b> <b>0JD</b>		1 m (38.37 inch)		<b>10</b>	
DN 125	PN 16 PN 40			1.6 m (63 inch)		<b>11</b>	
Process connection standard ASME B16.5 (1 inch, 1½ inch and 2 inch recommended only for pressure transmitters for gauge pressure)				2 m (78.7 inch)		<b>12</b>	
1 inch	Class 150 Class 300 Class 600 Class 1500	<b>1KL</b> <b>1KM</b> <b>1KN</b> <b>1KP</b>		2.5 m (98.4 inch)		<b>13</b>	
1½ inch	Class 150 Class 300 Class 400/600 Class 900/1500	<b>1LA</b> <b>1LB</b> <b>1LD</b> <b>1LF</b>		3 m (118.1 inch)		<b>14</b>	
2 inch	Class 150 Class 300 Class 400/600 Class 900/1500	<b>1MA</b> <b>1MB</b> <b>1MD</b> <b>1MF</b>		4 m (157.5 inch)		<b>15</b>	
3 inch	Class 150 Class 300 Class 600 Class 1500	<b>1PA</b> <b>1PB</b> <b>1PD</b> <b>1PF</b>		5 m (196.9 inch)		<b>16</b>	
4 inch	Class 150 Class 300 Class 400 Class 1500	<b>1QA</b> <b>1QB</b> <b>1QC</b> <b>1QF</b>		6 m (236.2 inch)		<b>17</b>	
5 inch	Class 150 Class 300 Class 400	<b>1RA</b> <b>1RB</b> <b>1RC</b>		7 m (275.6 inch)		<b>18</b>	
				8 m (315 inch)		<b>20</b>	
				9 m (354.3 inch)		<b>21</b>	
				10 m (393.7 inch)		<b>22</b>	
				11 m (433.1 inch); only for 7MF0812		<b>23</b>	
				12 m (472.4 inch); only for 7MF0812		<b>24</b>	
				13 m (511.811 inch); only for 7MF0812		<b>25</b>	
				14 m (551.2 inch); only for 7MF0812		<b>26</b>	
				15 m (590.6 inch); only for 7MF0812		<b>27</b>	
				Other version Add order code and plain text.		<b>98</b>	<b>L1Y</b>
				<b>Filling liquid</b>			
				Silicone oil M50		<b>B</b>	
				High-temperature oil		<b>C</b>	
				Silicone oil M5		<b>A</b>	
				Food oil (FDA-listed)		<b>E</b>	
				Halocarbon oil		<b>D</b>	
				Other version Add order code and plain text.		<b>Z</b>	<b>P1Y</b>

# Pressure measurement

## Remote seals for pressure transmitters

### SITRANS P320/P420

#### Diaphragm seals of flange design with flexible capillary

1

	Article No.	Order code		Article No.	Order code																																																					
<b>Diaphragm seal</b> Flange type design, connected to a transmitter with flexible capillary tube <ul style="list-style-type: none"> <li>• SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> <li>• SITRANS P320/P420 for absolute pressure from differential pressure, 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit</li> <li>• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>	7MF0810 -			7MF0810 -																																																						
	7MF0811 -			7MF0811 -																																																						
	7MF0812 -			7MF0812 -																																																						
	- 0			- 0																																																						
<b>Wetted parts materials</b> 316L stainless steel <ul style="list-style-type: none"> <li>• Without coating</li> <li>• With PFA coating</li> <li>• With PTFE coating</li> <li>• With ECTFE coating</li> </ul> Monel 400, 2.4360 Hastelloy C276, 2.4819 Tantalum Titanium, 3.7035 Nickel 201 Diaphragm Duplex, 1.4462 Diaphragm and flange Duplex, 1.4462 Stainless steel 316 with gold coating Hastelloy C4, 2.4610 Hastelloy C22, 2.4602 Other version Add order code and plain text.			A D E 0 F G J K L 0 M 0 Q R S 0 U 0 V 0 Z 8		F 1 F 2 F 3 F 4 F 5 D 1 D 2 D 3 D 4 D 5 G 1 G 2 G 3 G 4 J 1 J 2 J 3 J 4 K 1 K 2 K 3 K 4																																																					
<b>Tube length</b> Without tube 50 mm (2 inch) 100 mm (4 inch) 150 mm (6 inch) 200 mm (8 inch) 250 mm (10 inch) Other version Add order code and plain text.			0 1 2 3 4 5 Z 8		Q 1 Y Q 1 Y																																																					
<b>Customer-specific tube length</b> <ul style="list-style-type: none"> <li>• Wetted parts: Stainless steel without coating</li> </ul> <table border="1"> <thead> <tr> <th>Range</th> <th>Standard length</th> </tr> </thead> <tbody> <tr> <td>20 ... 50 mm (0.79 ... 1.97 inch)</td> <td>50 mm (1.97 inch)</td> </tr> <tr> <td>51 ... 100 mm (2.01 ... 3.94 inch)</td> <td>100 mm (3.94 inch)</td> </tr> <tr> <td>101 ... 150 mm (3.98 ... 5.91 inch)</td> <td>150 mm (5.91 inch)</td> </tr> <tr> <td>151 ... 200 mm (5.94 ... 7.87 inch)</td> <td>200 mm (7.87 inch)</td> </tr> <tr> <td>201 ... 250 mm (7.91 ... 9.84 inch)</td> <td>250 mm (9.84 inch)</td> </tr> </tbody> </table>	Range	Standard length	20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)	51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)	101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)	151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)	201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)			A 1 A 2 A 3 A 4 A 5																																											
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## Pressure measurement

### Remote seals for pressure transmitters SITRANS P320/P420

#### Diaphragm seals of flange design with flexible capillary

1

Options	Order code	Options	Order code
Add "-Z" to article number and specify order code.		Add "-Z" to article number and specify order code.	
<b>Factory certificates</b>		<b>Sealing surface</b>	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	<b>C11</b>	Sealing surface smooth, form B2/EN 1092-1 resp. RFSF/ANSI 16.5 (for wetted parts made of stainless steel 316L only)	<b>M50</b>
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	<b>C12</b>	Sealing surface groove to EN 1092-1, form D (instead of sealing surface B1, for wetted parts made of stainless steel 316L only)	<b>M54</b>
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	<b>C13</b>	Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, for wetted parts made of stainless steel 316L only)	<b>M64</b>
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	<b>C15</b>	Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	<b>M70</b> <b>M71</b> <b>M72</b> <b>M73</b> <b>M74</b> <b>M75</b>
Certificate of FDA-approved fill oil to EN 10204-2.2	<b>C17</b>	• DN 25 • DN 40 • DN 50 • DN 80 • DN 100 • DN 125	
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	<b>C20</b>	Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	<b>M76</b> <b>M77</b> <b>M78</b> <b>M79</b> <b>M80</b> <b>M81</b>
<b>Accessories</b>		• DN 25 • DN 40 • DN 50 • DN 80 • DN 100 • DN 125	
Epoxy resin coating	<b>D15</b>	Sealing surface with recess to EN 1092-1, form F (for wetted parts made of stainless steel 316L only)	<b>M82</b> <b>M83</b> <b>M84</b> <b>M85</b> <b>M86</b> <b>M87</b>
Color: transparent, coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. • Only possible with 7MF0812-... • Not possible with negative pressure service		• DN 25 • DN 40 • DN 50 • DN 80 • DN 100 • DN 125	
Remote seal nameplate	<b>D42</b>	<b>Capillary connection</b>	
Attached, made of stainless steel, contains article no. and order number of the remote seal		For 7MF0810	<b>S01</b> <b>S03</b>
Volume deflagration flame arrester (VDEF)		• Radial capillary outlet (for single-side mounting)	
• For gauge pressure and absolute pressure transmitters • For differential pressure and level transmitters	<b>D61</b> <b>D62</b>	• Single-side mounted at differential pressure transmitter at high side	<b>S04</b>
<b>Negative pressure service</b>		• Single-side mounted at differential pressure transmitter at low side	
Negative pressure service		For 7MF0811	<b>S01</b>
• For gauge pressure and absolute pressure transmitters (only for 7MF0810)	<b>D81</b>	• Radial capillary outlet (for single-side mounting)	
• For differential pressure transmitters	<b>D83</b>	For 7MF0812	<b>S02</b>
Extended negative pressure service		• Radial capillary pipe outlet (for double-side mounting)	
• For gauge pressure and absolute pressure transmitters (only for 7MF0810)	<b>D85</b>	<b>Capillary coating</b>	
• For differential pressure transmitters	<b>D88</b>	PE protective tube	<b>S10</b> <b>S11</b> <b>S12</b> <b>S13</b> <b>S14</b> <b>S15</b> <b>S16</b> <b>S17</b> <b>S18</b> <b>S19</b> <b>S20</b> <b>S21</b> <b>S22</b> <b>S23</b> <b>S24</b> <b>S25</b> <b>S26</b>
<b>Marine approvals</b>		• 1 m (38.37 inch) • 1.6 m (63 inch) • 2 m (78.7 inch) • 2.5 m (98.4 inch) • 3 m (118.1 inch) • 4 m (157.5 inch) • 5 m (196.9 inch) • 6 m (236.2 inch) • 7 m (275.6 inch) • 8 m (315 inch) • 9 m (354.3 inch) • 10 m (393.7 inch) • 11 m (433.1 inch); only for 7MF0812 • 12 m (472.4 inch); only for 7MF0812 • 13 m (511.811 inch); only for 7MF0812 • 14 m (551.2 inch); only for 7MF0812 • 15 m (590.6 inch); only for 7MF0812	
<u>Note:</u>			
If one of the order codes E50 to E60 is selected, the corresponding option must also be selected for the transmitter!			
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>		
LR (Lloyds Register)	<b>E51</b>		
BV (Bureau Veritas)	<b>E52</b>		
ABS (American Bureau of Shipping)	<b>E53</b>		
RMR (Russian Maritime Register)	<b>E55</b>		
KR (Korean Register of Shipping)	<b>E56</b>		
RINA (Registro Italiano Navale)	<b>E57</b>		
CCS (China Classification Society)	<b>E58</b>		
<b>Country-specific approval</b>			
CRN approval Canada (Canadian Registration Number)	<b>E60</b>		
<b>General product approvals without explosion proof approvals</b>			
Oil- and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	<b>E80</b>		
Oil- and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil)	<b>E87</b>		

#### Diaphragm seals of flange design with flexible capillary

1

Options	Order code
Add "-Z" to article number and specify order code.	
<b>PTFE protective tube</b>	
• 1 m (38.37 inch)	<b>S40</b>
• 1.6 m (63 inch)	<b>S41</b>
• 2 m (78.7 inch)	<b>S42</b>
• 2.5 m (98.4 inch)	<b>S43</b>
• 3 m (118.1 inch)	<b>S44</b>
• 4 m (157.5 inch)	<b>S45</b>
• 5 m (196.9 inch)	<b>S46</b>
• 6 m (236.2 inch)	<b>S47</b>
• 7 m (275.6 inch)	<b>S48</b>
• 8 m (315 inch)	<b>S49</b>
• 9 m (354.3 inch)	<b>S50</b>
• 10 m (393.7 inch)	<b>S51</b>
• 11 m (433.1 inch); only for 7MF0812	<b>S52</b>
• 12 m (472.4 inch); only for 7MF0812	<b>S53</b>
• 13 m (511.811 inch); only for 7MF0812	<b>S54</b>
• 14 m (551.2 inch); only for 7MF0812	<b>S55</b>
• 15 m (590.6 inch); only for 7MF0812	<b>S56</b>
<b>PVC protective tube</b>	
• 1 m (38.37 inch)	<b>S70</b>
• 1.6 m (63 inch)	<b>S71</b>
• 2 m (78.7 inch)	<b>S72</b>
• 2.5 m (98.4 inch)	<b>S73</b>
• 3 m (118.1 inch)	<b>S74</b>
• 4 m (157.5 inch)	<b>S75</b>
• 5 m (196.9 inch)	<b>S76</b>
• 6 m (236.2 inch)	<b>S77</b>
• 7 m (275.6 inch)	<b>S78</b>
• 8 m (315 inch)	<b>S79</b>
• 9 m (354.3 inch)	<b>S80</b>
• 10 m (393.7 inch)	<b>S81</b>
• 11 m (433.1 inch); only for 7MF0812	<b>S82</b>
• 12 m (472.4 inch); only for 7MF0812	<b>S83</b>
• 13 m (511.811 inch); only for 7MF0812	<b>S84</b>
• 14 m (551.2 inch); only for 7MF0812	<b>S85</b>
• 15 m (590.6 inch); only for 7MF0812	<b>S86</b>
<b>Desired remote seal supplier</b>	
<b>Note:</b> If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	<b>W01</b>
Company Labom, Hude	<b>W02</b>
<b>Special design</b>	
Welded filling hole	<b>X01</b>
<b>Customer-specific tube length</b>	
Customer-specific tube length (specify in plain text in mm)	<b>Y44</b>
<b>Specification of process conditions<sup>1)</sup></b>	
<b>Ambient temperature range</b>	
• 10 ... +50 °C (50 ... +122 °F) preset	<b>D66</b>
• -40 ... +50 °C (-40 ... +122 °F)	<b>D67</b>
• -10 ... +85 °C (14 ... +185 °F)	<b>D68</b>
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>

<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/337.

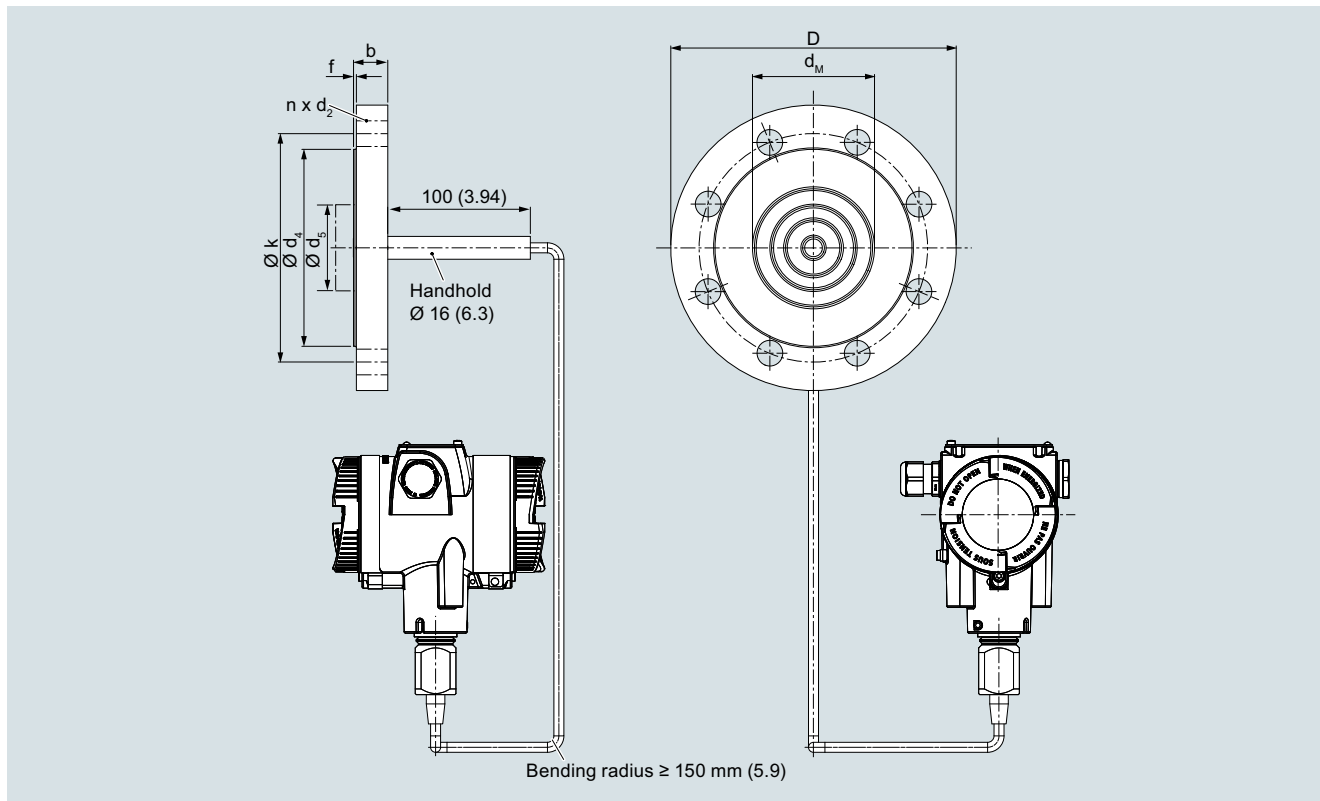
## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

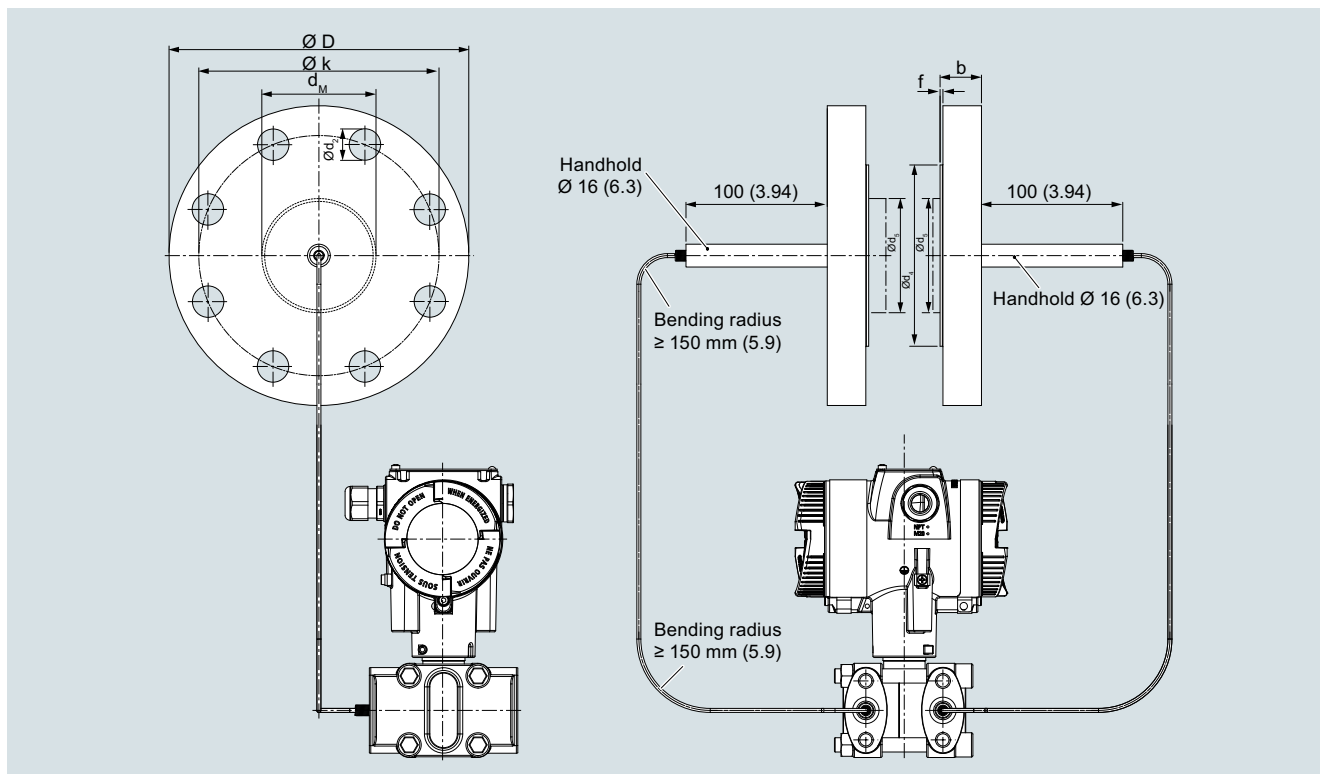
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### Diaphragm seals of flange design with flexible capillary

#### Dimensional drawings



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P320/420 pressure transmitters for gauge pressure, dimensions in mm (inch)



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P320/420 pressure transmitters for absolute pressure or for differential pressure and flow, dimensions in mm (inch)

### Diaphragm seals of flange design with flexible capillary

1

#### Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> Without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 25	PN 10/16/25/40	18	115	14	68	24.5	22.6	27	2	85	4	0, 50, 100, 150 or 200
	PN 63/100	24	140	18	68	24.5	22.6	27	2	100	4	0, 50, 100, 150 or 200
	PN 160	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 250	28	150	22	68	24.5	22.6	27	2	105	4	
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5  
d<sub>M</sub>: Effective diaphragm diameter

#### Connection according to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> Without tube	f	k	n	L
		lb/sq.in. Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)
1 inch	150	0.71 (18)	4.33 (110)	0.61 (15.6)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.08 (2)	3.13 (79.4)	4	0, 2, 3.94, 5.94
	300	0.77 (19.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.08 (2)	3.5 (88.9)	4	or 7.87 (0, 50, 100, 150 or 200)
	600	0.96 (24.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.28 (7)	3.5 (88.9)	4	
	1500	1.4 (35.6)	5.91 (150)	1 (25.4)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.28 (7)	4 (101.6)	4	
1½ inch	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inch	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inch	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inch	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inch	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5  
d<sub>M</sub>: Effective diaphragm diameter

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Diaphragm seals of flange design with flexible capillary

#### Connection according to J.I.S.

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> Without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	(0, 2, 3.94, 5.94 or 7.87)
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

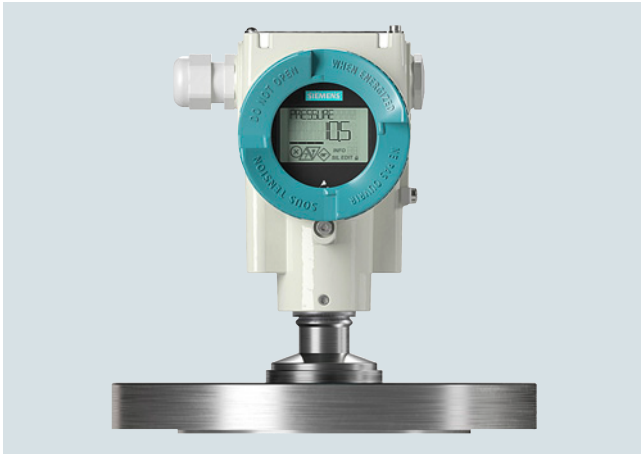
d<sub>M</sub>: Effective diaphragm diameter



#### Diaphragm seals of flange design mounted directly onto the transmitter

1

#### Overview



Diaphragm seals of flange design, directly fitted on a pressure transmitter for gauge pressure

#### Technical specifications

##### Diaphragm seals (flange design) for gauge and absolute pressure, directly fitted on a transmitter

Nominal diameter	Nominal pressure
Standard of process connection EN 1092-1	
<ul style="list-style-type: none"> <li>• DN 25</li> <li>• DN 40</li> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> <li>• DN 125</li> </ul>	PN 10/16/25/40/63/100/160/250 PN 10/16/25/40/63/100/160 PN 10/16/25/40/63/100 PN 10/16/25/40/100 PN 10/16/25/40 PN 16/40
Process connection standard ASME B16.5	
<ul style="list-style-type: none"> <li>• 1 inch</li> <li>• 1½ inch</li> <li>• 2 inch</li> <li>• 3 inch</li> <li>• 4 inch</li> <li>• 5 inch</li> </ul>	Class 150/300/600/1500 Class 150/300/400/600/900/1500 Class 150/300/400/600/900/1500 Class 150/300/600/1500 Class 150/300/400/1500 Class 150/300/400
Process connection standard J.I.S.	
<ul style="list-style-type: none"> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> </ul>	10K 20K 40K
Sealing surface	
<ul style="list-style-type: none"> <li>• For stainless steel, mat. no. 1.4404/316L</li> <li>• For the other materials</li> </ul>	According to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA Smooth according to EN 1092-1, form B2 or ASME B16.5 RFSF

##### Diaphragm seals (flange design) for gauge and absolute pressure, directly fitted on a transmitter

Materials	<ul style="list-style-type: none"> <li>• Main body</li> <li>• Wetted parts</li> </ul>	Stainless steel, mat. no. 1.4404/316L Stainless steel, mat. no. 1.4404/316L <ul style="list-style-type: none"> <li>• No coating</li> <li>• PTFE coating</li> <li>• ECTFE coating (for negative pressure on request)</li> <li>• PFA coating</li> </ul> Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4602 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, layer thickness approx. 25 µm Stainless steel, mat. no. 1.4404/316L Copper
Maximum pressure	<ul style="list-style-type: none"> <li>• Capillary</li> <li>• Gasket material at the transmitter connection</li> </ul>	See above and the technical specifications of the transmitter
Tube length		<ul style="list-style-type: none"> <li>• Without tube</li> <li>• 50 mm (1.97 inch)</li> <li>• 100 mm (3.94 inch)</li> <li>• 150 mm (5.91 inch)</li> <li>• 200 mm (7.87 inch)</li> </ul>
Capillary		
<ul style="list-style-type: none"> <li>• Length</li> </ul>		≤ 10 m (32.8 ft), longer lengths on request
<ul style="list-style-type: none"> <li>• Internal diameter</li> <li>• Minimum bending radius</li> </ul>		≤ 2 mm (0.079 inch) 150 mm (5.9 inch)
Filling liquid		<ul style="list-style-type: none"> <li>• Silicone oil M5</li> <li>• Silicone oil M50</li> <li>• High-temperature oil</li> <li>• Halocarbon oil (for measuring O<sub>2</sub>)</li> <li>• Food oil (FDA-listed)</li> </ul>
Max. recommended medium temperature		170 °C (338 °F)
Permissible ambient temperature		Dependent on the pressure transmitter and the filling liquid of the remote seal.
		<b>More information</b> In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: <ul style="list-style-type: none"> <li>• "Function" - "Technical specifications of the remote seal filling liquids"</li> <li>• "Additional information" - "Specification of process conditions for selection and ordering data"</li> </ul>
Weight		Approx. 4 kg (8.82 lb)
<b>Certificates and approvals</b>		
Classification according to pressure equipment directive (PED 2014/68/EU)		For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

## Pressure measurement

### Remote seals for pressure transmitters SITRANS P320/P420

#### Diaphragm seals of flange design mounted directly onto the transmitter

1

#### Selection and ordering data

		Article No.	Order code			Article No.	Order code
<b>Diaphragm seal</b>				<b>Diaphragm seal</b>			
Flange type design, mounted directly onto the transmitter				Flange type design, mounted directly onto the transmitter			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> </ul>		7MF0810 -		<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> </ul>		7MF0810 -	
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>							
<b>Nominal diameter</b>	<b>Nominal pressure</b>			<b>Transmitter connection</b>			
Process connection standard EN 1092-1				Without capillary tube, direct mount, straight connection (for gauge pressure transmitters)	00		
DN 25	PN 10/16/25/40 PN 63/100 PN 160 PN 250	0BD 0BF 0BG 0BH		Without capillary tube, direct mount, connection with 90° elbow (for gauge pressure transmitters)	01		
DN 40	PN 10/16/25/40 PN 63/100 PN 160	0DD 0DF 0DG		<b>Filling liquid</b>			
DN 50	PN 10/16/25/40 PN 63 PN 100	0ED 0EE 0EF		Silicone oil M50	B		
DN 80	PN 10/16/25/40 PN 100	0GD 0GF		High-temperature oil	C		
DN 100	PN 10/16 PN 25/40	0HB 0HD		Silicone oil M5	A		
DN 125	PN 16 PN 40	0JB 0JD		Food oil (FDA-listed)	E		
Process connection standard ASME B16.5				Halocarbon oil	D		
1 inch	Class 150 Class 300 Class 600 Class 1500	1KL 1KM 1KN 1KP		Other version Add order code and plain text.	Z P1Y		
1½ inch	Class 150 Class 300 Class 400/600 Class 900/1500	1LA 1LB 1LD 1LF		<b>Wetted parts materials</b>			
2 inch	Class 150 Class 300 Class 400/600 Class 900/1500	1MA 1MB 1MD 1MF		316L stainless steel	A		
3 inch	Class 150 Class 300 Class 600 Class 1500	1PA 1PB 1PD 1PF		<ul style="list-style-type: none"> <li>Without coating</li> <li>With PFA coating</li> <li>With PTFE coating</li> <li>With ECTFE coating</li> </ul>	D E0		
4 inch	Class 150 Class 300 Class 400 Class 1500	1QA 1QB 1QC 1QF		Monel 400, 2.4360	F		
5 inch	Class 150 Class 300 Class 400	1RA 1RB 1RC		Hastelloy C276, 2.4819	G		
Process connection standard J.I.S.				Tantalum	J		
DN 50	10 K 20 K 40 K	2ES 2ET 2EU		Titanium, 3.7035	K		
DN 80	10 K 20 K 40 K	2GS 2GT 2GU		Nickel 201	L0		
DN 100	10 K 20 K 40 K	2HS 2HT 2HU		Diaphragm Duplex, 1.4462	M0		
Other version Add order code and plain text.		9AA	H1Y	Diaphragm and flange Duplex, 1.4462	Q		
				Stainless steel 316 with gold coating	R		
				Hastelloy C4, 2.4610	S0		
				Hastelloy C22, 2.4602	U0		
				Other version Add order code and plain text.	V0		
				<b>Tube length</b>			
				Without tube	0		
				50 mm (2 inch)	1		
				100 mm (4 inch)	2		
				150 mm (6 inch)	3		
				200 mm (8 inch)	4		
				250 mm (10 inch)	5		
				Other version Add order code and plain text.	Z8 Q1Y		

#### Diaphragm seals of flange design mounted directly onto the transmitter

1

		Article No.	Order code
<b>Diaphragm seal</b>			
Flange type design, mounted directly onto the transmitter			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> </ul>			
		<b>7MF0810 -</b>	
- 0			
<b>Customer-specific tube length</b>			
<ul style="list-style-type: none"> <li>Wetted parts: Stainless steel without coating</li> </ul>			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)	<b>A 1</b>	
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)	<b>A 2</b>	
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)	<b>A 3</b>	
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)	<b>A 4</b>	
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)	<b>A 5</b>	
<ul style="list-style-type: none"> <li>Wetted parts: Stainless steel with ECTFE coating</li> </ul>			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)	<b>F 1</b>	
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)	<b>F 2</b>	
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)	<b>F 3</b>	
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)	<b>F 4</b>	
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)	<b>F 5</b>	
<ul style="list-style-type: none"> <li>Wetted parts: Stainless steel with PFA coating</li> </ul>			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)	<b>D 1</b>	
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)	<b>D 2</b>	
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)	<b>D 3</b>	
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)	<b>D 4</b>	
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)	<b>D 5</b>	
<ul style="list-style-type: none"> <li>Wetted parts: Monel 400</li> </ul>			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)	<b>G 1</b>	
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)	<b>G 2</b>	
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)	<b>G 3</b>	
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)	<b>G 4</b>	

		Article No.	Order code
<b>Diaphragm seal</b>			
Flange type design, mounted directly onto the transmitter			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> </ul>			
		<b>7MF0810 -</b>	
- 0			
<ul style="list-style-type: none"> <li>Wetted parts: Hastelloy C276</li> </ul>			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>J 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>J 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>J 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>J 4</b>
<ul style="list-style-type: none"> <li>Wetted parts: Tantalum</li> </ul>			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		<b>K 1</b>
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		<b>K 2</b>
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		<b>K 3</b>
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		<b>K 4</b>

## Pressure measurement

### Remote seals for pressure transmitters SITRANS P320/P420

#### Diaphragm seals of flange design mounted directly onto the transmitter

1

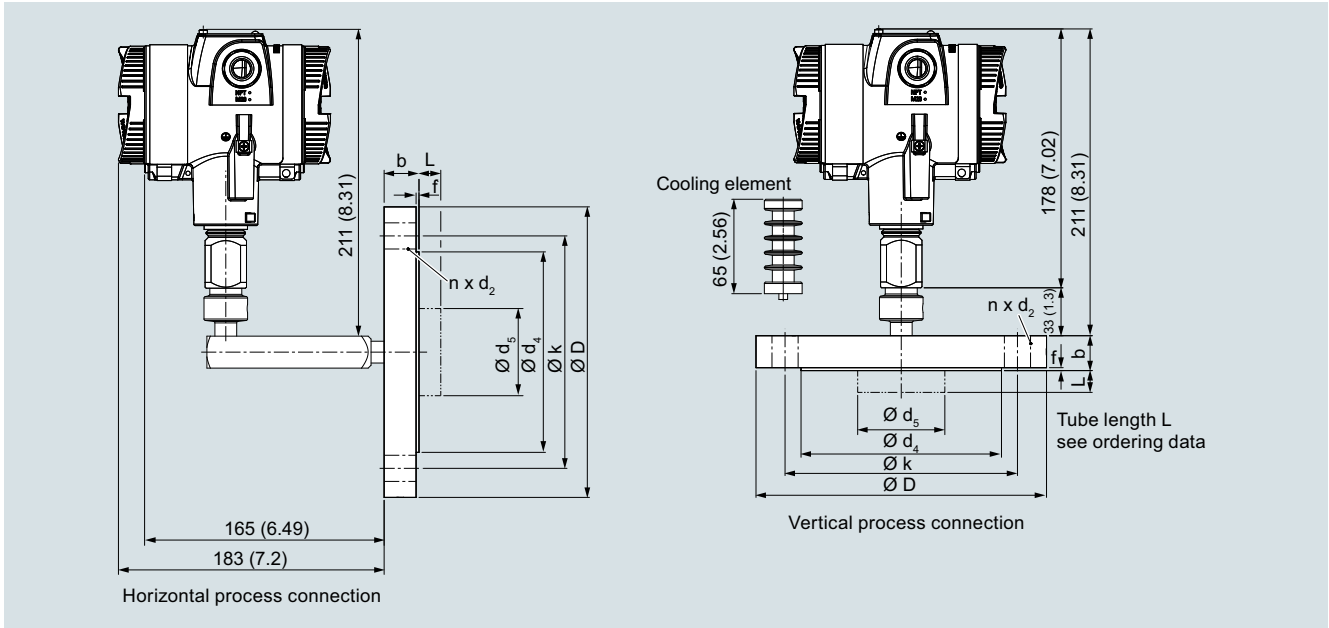
Options	Order code	Options	Order code
Add "-Z" to article number and specify order code.		Add "-Z" to article number and specify order code.	
<b>Factory certificates</b>		Sealing surface with recess to EN 1092-1, form F (for wetted parts made of stainless steel 316L only)	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	<b>C11</b>	<ul style="list-style-type: none"> <li>• DN 25</li> <li>• DN 40</li> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> <li>• DN 125</li> </ul>	<b>M82</b> <b>M83</b> <b>M84</b> <b>M85</b> <b>M86</b> <b>M87</b>
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	<b>C12</b>		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	<b>C13</b>		
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	<b>C15</b>	<b>Capillary connection</b>	
Certificate of FDA-approved fill oil to EN 10204-2.2	<b>C17</b>	Elongated pipe, 150 mm instead of 100 mm, max. medium temperature 250 °C (482 °F), observe the max. permissible media temperature of the filling liquid.	<b>S05</b>
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	<b>C20</b>	Elongated pipe, 200 mm instead of 100 mm, max. medium temperature 300 °C (572 °F), observe the max. permissible media temperature of the filling liquid.	<b>S06</b>
<b>Accessories</b>		Elongated pipe elbow, 200 mm instead of 130 mm, max. medium temperature 300 °C (572 °F), observe the max. permissible media temperature of the filling liquid.	<b>S07</b>
Remote seal nameplate	<b>D42</b>	Cooling element, max. medium temperature 300 °C (572 °F), observe the max. permissible media temperature of the filling liquid.	<b>S08</b>
Attached, made of stainless steel, contains article no. and order number of the remote seal		<b>Desired remote seal supplier</b>	
Volume deflagration flame arrester (VDEF) for gauge pressure and absolute pressure transmitters	<b>D61</b>	Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
<b>Negative pressure service</b>		Company WIKA, Klingenberg	<b>W01</b>
Negative pressure service for gauge pressure and absolute pressure transmitters	<b>D81</b>	Company Labom, Hude	<b>W02</b>
Extended negative pressure service for gauge pressure and absolute pressure transmitters (only for 7MF0810)	<b>D85</b>	<b>Special design</b>	
<b>Country-specific approval</b>		Welded filling hole	<b>X01</b>
CRN approval Canada (Canadian Registration Number)	<b>E60</b>	<b>Customer-specific tube length</b>	
Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!		Customer-specific tube length (specify in plain text in mm)	<b>Y44</b>
<b>General product approvals without explosion proof approvals</b>		<b>Specification of process conditions<sup>1)</sup></b>	
Oil- and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	<b>E80</b>	Ambient temperature range	
Oil- and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil)	<b>E87</b>	<ul style="list-style-type: none"> <li>• 10 ... +50 °C (50 ... +122 °F) preset</li> <li>• -40 ... +50 °C (-40 ... +122 °F)</li> <li>• -10 ... +85 °C (14 ... +185 °F)</li> </ul>	<b>D66</b> <b>D67</b> <b>D68</b>
<b>Sealing surface</b>		Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>
Sealing surface smooth, form B2/EN 1092-1 resp. RFSF/ANSI 16.5 (for wetted parts made of stainless steel 316L only)	<b>M50</b>		
Sealing surface groove to EN 1092-1, form D (instead of sealing surface B1, for wetted parts made of stainless steel 316L only)	<b>M54</b>		
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, for wetted parts made of stainless steel 316L only)	<b>M64</b>		
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)			
<ul style="list-style-type: none"> <li>• DN 25</li> <li>• DN 40</li> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> <li>• DN 125</li> </ul>	<b>M70</b> <b>M71</b> <b>M72</b> <b>M73</b> <b>M74</b> <b>M75</b>		
Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)			
<ul style="list-style-type: none"> <li>• DN 25</li> <li>• DN 40</li> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> <li>• DN 125</li> </ul>	<b>M76</b> <b>M77</b> <b>M78</b> <b>M79</b> <b>M80</b> <b>M81</b>		

<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/337.

**Diaphragm seals of flange design mounted directly onto the transmitter**

1

**Dimensional drawings**



Diaphragm seals of flange design, direct connection to a SITRANS P320/420 pressure transmitter (process connection vertical (top) and horizontal (bottom)), dimensions in mm (inch)

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Diaphragm seals of flange design mounted directly onto the transmitter

#### Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 25	PN 10/16/25/40	18	115	14	68	24.5	22.6	27	2	85	4	0, 50, 100, 150 or 200
	PN 63/100	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 160	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 250	28	150	22	68	24.5	22.6	27	2	105	4	
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

#### Connection to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> without tube	f	k	n	L
		lb/sq.in. inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)
1 inch	150	0.71 (18)	4.33 (110)	0.61 (15.6)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.08 (2)	3.13 (79.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.77 (19.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.08 (2)	3.5 (88.9)	4	
	600	0.96 (24.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.28 (7)	3.5 (88.9)	4	
	1500	1.4 (35.6)	5.91 (150)	1 (25.4)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.28 (7)	4 (101.6)	4	
1½ inch	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inch	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inch	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inch	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inch	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

#### Diaphragm seals of flange design mounted directly onto the transmitter

##### Connection according to J.I.S.

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	(0, 2, 3.94, 5.94 or 7.87)
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

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### Diaphragm seals of flange design directly mounted and with capillary

#### Overview



Diaphragm seal of flange design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

#### Technical specifications

##### Diaphragm seal of flange design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

Nominal diameter	Nominal pressure
Standard of process connection EN 1092-1	
<ul style="list-style-type: none"> <li>• DN 40</li> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> <li>• DN 125</li> </ul>	PN 10/16/25/40/63/100/160 PN 10/16/25/40/63/100 PN 10/16/25/40/100 PN 10/16/25/40 PN 16/40
Process connection standard ASME B16.5	
<ul style="list-style-type: none"> <li>• 1½ inch</li> <li>• 2 inch</li> <li>• 3 inch</li> <li>• 4 inch</li> <li>• 5 inch</li> </ul>	Class 150/300/400/600/900/1500 Class 150/300/400/600/900/1500 Class 150/300/600/1500 Class 150/300/400/1500 Class 150/300/400
Process connection standard J.I.S.	
<ul style="list-style-type: none"> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> </ul>	10K 20K 40K
Sealing surface	
<ul style="list-style-type: none"> <li>• For stainless steel, mat. no. 1.4404/316L</li> <li>• For the other materials</li> </ul>	Acc. to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA Acc. to EN 1092-1, form B2 or ASME B16.5 RFSF

##### Diaphragm seal of flange design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

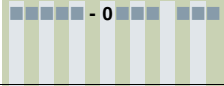
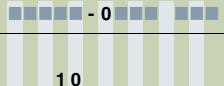
Materials	<ul style="list-style-type: none"> <li>• Main body</li> <li>• Wetted parts</li> </ul>	Stainless steel, mat. no. 1.4404/316L Stainless steel, mat. no. 1.4404/316L <ul style="list-style-type: none"> <li>• Without coating</li> <li>• PTFE coating</li> <li>• ECTFE coating (for negative pressure on request)</li> <li>• PFA coating</li> </ul> Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4602 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, layer thickness approx. 25 µm Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304 Flexible spiral coiled tube made of stainless steel, mat. no. 1.4404/316L
• Capillary		
• Sheath		
Gasket material in the process flanges		Copper
<ul style="list-style-type: none"> <li>• For gauge pressure transmitters, absolute pressure transmitters and negative pressure applications</li> <li>• For other applications</li> </ul>		Viton
Maximum pressure		See above and the technical specifications of the pressure transmitter
Tube length		Without tube 50 mm (1.97 inch) 100 mm (3.94 inch) 150 mm (5.91 inch) 200 mm (7.87 inch)
Capillary		
• Length		≤ 10 m (32.8 ft), longer lengths on request
• Internal diameter		≤ 2 mm (0.079 inch)
• Minimum bending radius		150 mm (5.9 inch)
Filling liquid		Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O <sub>2</sub> ) Food-grade oil (FDA grade)
Max. recommended medium temperature		170 °C (338 °F)
Permissible ambient temperature		Dependent on the pressure transmitter and the filling liquid of the remote seal.
		<b>More information</b>
		In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: <ul style="list-style-type: none"> <li>• "Function" - "Technical specifications of the remote seal filling liquids"</li> <li>• "Additional information" - "Specification of process conditions for selection and ordering data"</li> </ul>
Weight		Approx. 4 kg (8.82 lb)
<b>Certificates and approvals</b>		
Classification according to pressure equipment directive (PED 2014/68/EU)		For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)



#### Diaphragm seals of flange design directly mounted and with capillary

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#### Selection and ordering data

		Article No.	Order code			Article No.	Order code
<b>Diaphragm seal</b>				<b>Diaphragm seal</b>			
Flange type design, direct mounting at high side and with flexible capillary tube at low side to a pressure transmitter				Flange type design, direct mounting at high side and with flexible capillary tube at low side to a pressure transmitter			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>		7MF0813 -		<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>		7MF0813 -	
							
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>							
<b>Nominal diameter</b>	<b>Nominal pressure</b>			<b>Capillary length at low side</b>			
<u>Process connection standard EN 1092-1</u>				1 m (38.37 inch)	10		
DN 40	PN 10/16/25/40	0DD		1.6 m (63 inch)	11		
	PN 63/100	0DF		2 m (78.7 inch)	12		
	PN 160	0DG		2.5 m (98.4 inch)	13		
DN 50	PN 10/16/25/40	0ED		3 m (118.1 inch)	14		
	PN 63	0EE		4 m (157.5 inch)	15		
	PN 100	0EF		5 m (196.9 inch)	16		
DN 80	PN 10/16/25/40	0GD		6 m (236.2 inch)	17		
	PN 100	0GF		7 m (275.6 inch)	18		
DN 100	PN 10/16	0HB		8 m (315 inch)	20		
	PN 25/40	0HD		9 m (354.3 inch)	21		
DN 125	PN 16	0JB		10 m (393.7 inch)	22		
	PN 40	0GF		Other version	98	L1Y	
<u>Process connection standard ASME B16.5</u>				Add order code and plain text.			
1½ inch	Class 150	1LA		<b>Filling liquid</b>			
	Class 300	0GF		Silicone oil M50	B		
	Class 400/600	0HB		High-temperature oil	C		
	Class 900/1500	0HD		Silicone oil M5	A		
2 inch	Class 150	1MA		Food oil (FDA-listed)	E		
	Class 300	0GF		Halocarbon oil	D		
	Class 400/600	0HB		Other version	Z	P1Y	
	Class 900/1500	0HD		Add order code and plain text.			
3 inch	Class 150	1PA		<b>Wetted parts materials</b>			
	Class 300	0GF		316L stainless steel	A		
	Class 600	0HB		• Without coating	D		
	Class 1500	0HD		• With PFA coating	E0		
4 inch	Class 150	1QA		• With PTFE coating	F		
	Class 300	0GF		• With ECTFE coating	G		
	Class 400	0HB		Monel 400, 2.4360	J		
	Class 1500	0HD		Hastelloy C276, 2.4819	K		
5 inch	Class 150	1RA		Tantalum	L0		
	Class 300	0GF		Titanium, 3.7035	M0		
	Class 400	0HB		Nickel 201	Q		
<u>Process connection standard J.I.S.</u>				Diaphragm Duplex, 1.4462	R		
DN 50	10 K	2ES		Diaphragm and flange Duplex, 1.4462	S0		
	20K	0GF		Stainless steel 316 with gold coating	U0		
	40K	0HB		Hastelloy C4, 2.4610	V0		
DN 80	10K	2GS		Hastelloy C22, 2.4602	Z8	Q1Y	
	20K	0GF		Other version			
	40K	0HB		Add order code and plain text.			
DN 100	10K	2HS					
	20K	0GF					
	40K	0HB					
Other version							
Add order code and plain text.			H1Y				

## Pressure measurement

### Remote seals for pressure transmitters

#### SITRANS P320/P420

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#### Diaphragm seals of flange design directly mounted and with capillary

		Article No.	Order code																																				
<b>Diaphragm seal</b> Flange type design, direct mounting at high side and with flexible capillary tube at low side to a pressure transmitter		7MF0813 -	- 0																																				
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>																																							
<b>Tube length</b> None 50 mm (2 inch) 100 mm (4 inch) 150 mm (6 inch) 200 mm (8 inch) 250 mm (10 inch) Other version Add order code and plain text.			<b>0</b> <b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>Z8 Q1Y</b>																																				
<b>Customer-specific tube length</b> <ul style="list-style-type: none"> <li>Wetted parts: Stainless steel without coating</li> </ul> <table border="1"> <thead> <tr> <th>Range</th> <th>Standard length</th> </tr> </thead> <tbody> <tr> <td>20 ... 50 mm (0.79 ... 1.97 inch)</td> <td>50 mm (1.97 inch)</td> </tr> <tr> <td>51 ... 100 mm (2.01 ... 3.94 inch)</td> <td>100 mm (3.94 inch)</td> </tr> <tr> <td>101 ... 150 mm (3.98 ... 5.91 inch)</td> <td>150 mm (5.91 inch)</td> </tr> <tr> <td>151 ... 200 mm (5.94 ... 7.87 inch)</td> <td>200 mm (7.87 inch)</td> </tr> <tr> <td>201 ... 250 mm (7.91 ... 9.84 inch)</td> <td>250 mm (9.84 inch)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Wetted parts: Stainless steel with ECTFE coating</li> </ul> <table border="1"> <thead> <tr> <th>Range</th> <th>Standard length</th> </tr> </thead> <tbody> <tr> <td>20 ... 50 mm (0.79 ... 1.97 inch)</td> <td>50 mm (1.97 inch)</td> </tr> <tr> <td>51 ... 100 mm (2.01 ... 3.94 inch)</td> <td>100 mm (3.94 inch)</td> </tr> <tr> <td>101 ... 150 mm (3.98 ... 5.91 inch)</td> <td>150 mm (5.91 inch)</td> </tr> <tr> <td>151 ... 200 mm (5.94 ... 7.87 inch)</td> <td>200 mm (7.87 inch)</td> </tr> <tr> <td>201 ... 250 mm (7.91 ... 9.84 inch)</td> <td>250 mm (9.84 inch)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Wetted parts: Stainless steel with PFA coating</li> </ul> <table border="1"> <thead> <tr> <th>Range</th> <th>Standard length</th> </tr> </thead> <tbody> <tr> <td>20 ... 50 mm (0.79 ... 1.97 inch)</td> <td>50 mm (1.97 inch)</td> </tr> <tr> <td>51 ... 100 mm (2.01 ... 3.94 inch)</td> <td>100 mm (3.94 inch)</td> </tr> <tr> <td>101 ... 150 mm (3.98 ... 5.91 inch)</td> <td>150 mm (5.91 inch)</td> </tr> <tr> <td>151 ... 200 mm (5.94 ... 7.87 inch)</td> <td>200 mm (7.87 inch)</td> </tr> <tr> <td>201 ... 250 mm (7.91 ... 9.84 inch)</td> <td>250 mm (9.84 inch)</td> </tr> </tbody> </table>		Range	Standard length	20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)	51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)	101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)	151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)	201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)	Range	Standard length	20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)	51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)	101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)	151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)	201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)	Range	Standard length	20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)	51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)	101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)	151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)	201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		<b>A1</b> <b>A2</b> <b>A3</b> <b>A4</b> <b>A5</b> <b>F1</b> <b>F2</b> <b>F3</b> <b>F4</b> <b>F5</b> <b>D1</b> <b>D2</b> <b>D3</b> <b>D4</b> <b>D5</b>
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		Article No.	Order code																														
<b>Diaphragm seal</b> Flange type design, direct mounting at high side and with flexible capillary tube at low side to a pressure transmitter		7MF0813 -	- 0																														
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>																																	
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# Pressure measurement

## Remote seals for pressure transmitters

### SITRANS P320/P420

#### Diaphragm seals of flange design directly mounted and with capillary

1

Options	Order code	Options	Order code
Add <b>"-Z"</b> to article number and specify order code.		Add <b>"-Z"</b> to article number and specify order code.	
<b>Factory certificates</b>		Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	<b>C11</b>	• DN 25	<b>M76</b>
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	<b>C12</b>	• DN 40	<b>M77</b>
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	<b>C13</b>	• DN 50	<b>M78</b>
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	<b>C15</b>	• DN 80	<b>M79</b>
Certificate of FDA-approved fill oil to EN 10204-2.2	<b>C17</b>	• DN 100	<b>M80</b>
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	<b>C20</b>	• DN 125	<b>M81</b>
<b>Accessories</b>		Sealing surface with recess to EN 1092-1, form F (for wetted parts made of stainless steel 316L only)	
Epoxy resin coating	<b>D15</b>	• DN 25	<b>M82</b>
Color: transparent, coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. • Not possible with negative pressure service		• DN 40	<b>M83</b>
Remote seal nameplate	<b>D42</b>	• DN 50	<b>M84</b>
Attached, made of stainless steel, contains article no. and order number of the remote seal		• DN 80	<b>M85</b>
Volume deflagration flame arrester (VDEF) for differential pressure and level transmitters	<b>D62</b>	• DN 100	<b>M86</b>
<b>Negative pressure service</b>		• DN 125	<b>M87</b>
Negative pressure service for differential pressure transmitters	<b>D83</b>	<b>Capillary coating</b>	
Extended negative pressure service for differential pressure transmitters	<b>D88</b>	PE protective tube	
<b>Country-specific approval</b>		• 1 m (38.37 inch)	<b>S10</b>
CRN approval Canada (Canadian Registration Number)	<b>E60</b>	• 1.6 m (63 inch)	<b>S11</b>
Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!		• 2 m (78.7 inch)	<b>S12</b>
<b>General product approvals without explosion proof approvals</b>		• 2.5 m (98.4 inch)	<b>S13</b>
Oil- and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	<b>E80</b>	• 3 m (118.1 inch)	<b>S14</b>
Oil- and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil)	<b>E87</b>	• 4 m (157.5 inch)	<b>S15</b>
<b>Sealing surface</b>		• 5 m (196.9 inch)	<b>S16</b>
Sealing surface smooth, form B2/EN 1092-1 resp. RFSF/ANSI 16.5 (for wetted parts made of stainless steel 316L only)	<b>M50</b>	• 6 m (236.2 inch)	<b>S17</b>
Sealing surface groove to EN 1092-1, form D (instead of sealing surface B1, for wetted parts made of stainless steel 316L only)	<b>M54</b>	• 7 m (275.6 inch)	<b>S18</b>
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, for wetted parts made of stainless steel 316L only)	<b>M64</b>	• 8 m (315 inch)	<b>S19</b>
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)		• 9 m (354.3 inch)	<b>S20</b>
• DN 25	<b>M70</b>	• 10 m (393.7 inch)	<b>S21</b>
• DN 40	<b>M71</b>	PTFE protective tube	
• DN 50	<b>M72</b>	• 1 m (38.37 inch)	<b>S40</b>
• DN 80	<b>M73</b>	• 1.6 m (63 inch)	<b>S41</b>
• DN 100	<b>M74</b>	• 2 m (78.7 inch)	<b>S42</b>
• DN 125	<b>M75</b>	• 2.5 m (98.4 inch)	<b>S43</b>
		• 3 m (118.1 inch)	<b>S44</b>
		• 4 m (157.5 inch)	<b>S45</b>
		• 5 m (196.9 inch)	<b>S46</b>
		• 6 m (236.2 inch)	<b>S47</b>
		• 7 m (275.6 inch)	<b>S48</b>
		• 8 m (315 inch)	<b>S49</b>
		• 9 m (354.3 inch)	<b>S50</b>
		• 10 m (393.7 inch)	<b>S51</b>
		PVC protective tube	
		• 1 m (38.37 inch)	<b>S70</b>
		• 1.6 m (63 inch)	<b>S71</b>
		• 2 m (78.7 inch)	<b>S72</b>
		• 2.5 m (98.4 inch)	<b>S73</b>
		• 3 m (118.1 inch)	<b>S74</b>
		• 4 m (157.5 inch)	<b>S75</b>
		• 5 m (196.9 inch)	<b>S76</b>
		• 6 m (236.2 inch)	<b>S77</b>
		• 7 m (275.6 inch)	<b>S78</b>
		• 8 m (315 inch)	<b>S79</b>
		• 9 m (354.3 inch)	<b>S80</b>
		• 10 m (393.7 inch)	<b>S81</b>
		<b>Desired remote seal supplier</b>	
		Note:	
		If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected.	
		For orders without this option, the remote seal supplier is selected through the dispatch center.	
		Company WIKA, Klingenberg	<b>W01</b>
		Company Labom, Hude	<b>W02</b>
		<b>Special design</b>	
		Welded filling hole	<b>X01</b>

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

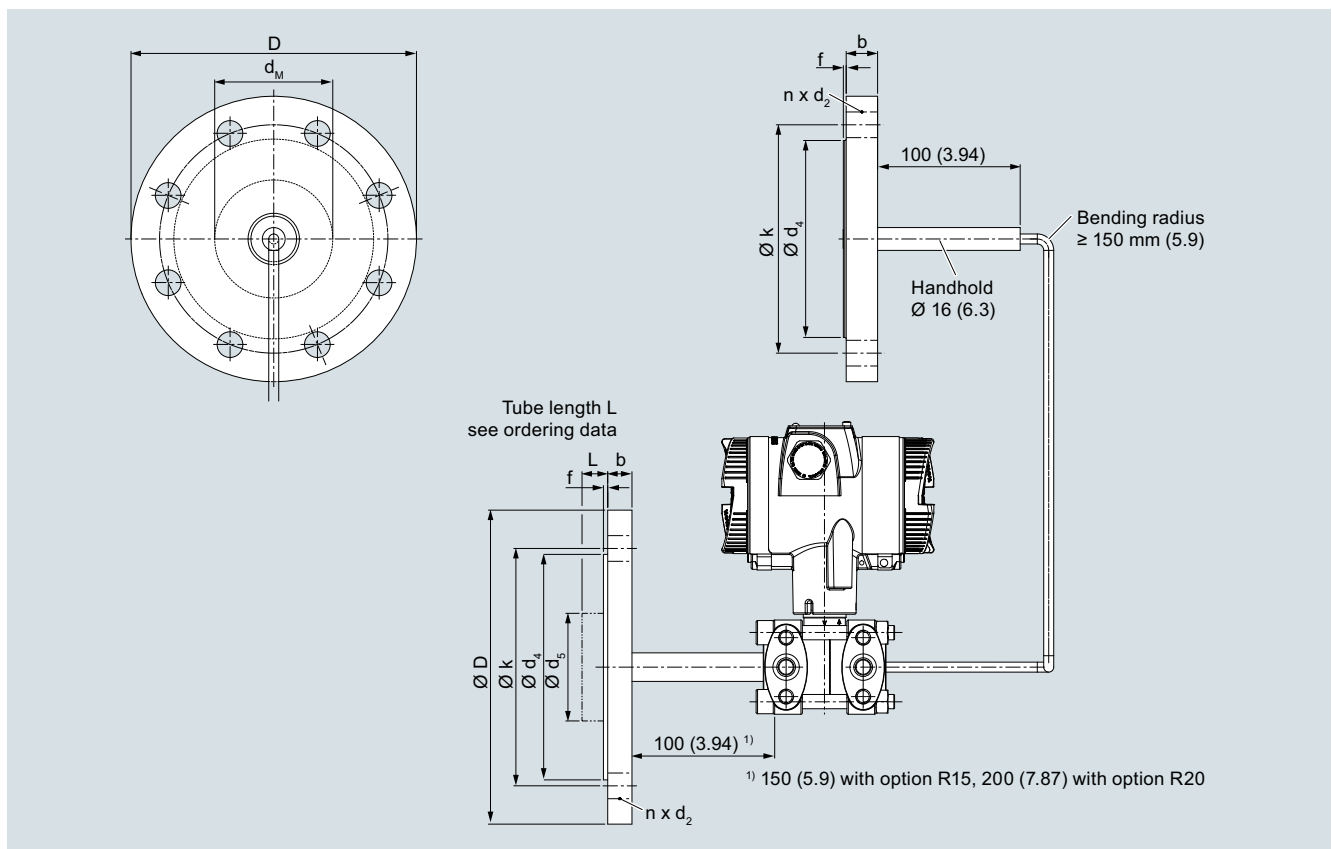
1

### Diaphragm seals of flange design directly mounted and with capillary

Options	Order code
Add "-Z" to article number and specify order code.	
<b>Customer-specific tube length</b>	
Customer-specific tube length (specify in plain text in mm)	<b>Y44</b>
<b>Specification of process conditions<sup>1)</sup></b>	
Ambient temperature range	
• 10 ... +50 °C (50 ... +122 °F) preset	<b>D66</b>
• -40 ... +50 °C (-40 ... +122 °F)	<b>D67</b>
• -10 ... +85 °C (14 ... +185 °F)	<b>D68</b>
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>

<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/337.

### Dimensional drawings



Diaphragm seals of flange design with flexible capillary, rigid connection, for connection to a SITRANS P320/420 pressure transmitter for differential pressure, dimensions in mm (inch)

#### Diaphragm seals of flange design directly mounted and with capillary

1

#### Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	0, 50, 100, 150 or 200
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

#### Connection to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> without tube	f	k	n	L
		lb/sq.in.	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)
1½ inch	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inch	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inch	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inch	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inch	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Diaphragm seals of flange design directly mounted and with capillary

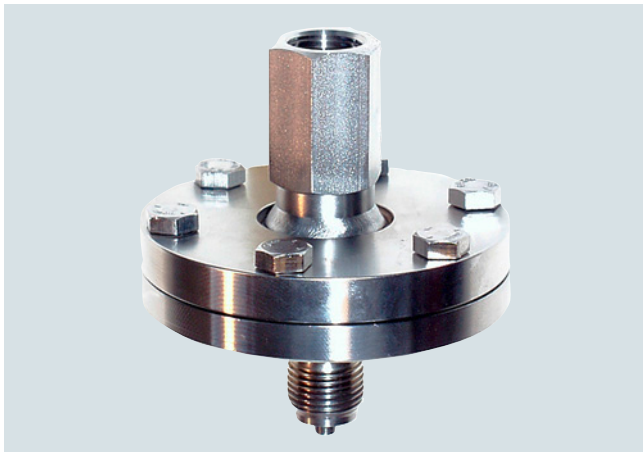
#### Connection according to J.I.S.

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	(0, 2, 3.94, 5.94 or 7.87)
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

## Overview



Diaphragm seal, screwed design with inside diaphragm for gauge, absolute and differential pressure for direct mounting



Process connection: open measurement flange

## Technical specifications

Diaphragm seal, screwed design with inside diaphragm	
Process connection	Nominal pressure
<ul style="list-style-type: none"> <li>Open flange EN 1092-1               <ul style="list-style-type: none"> <li>DN 15</li> <li>DN 20</li> <li>DN 25</li> </ul> </li> <li>Open flange ASME B16.5               <ul style="list-style-type: none"> <li>1/2 inch, 3/4 inch, 1 inch</li> </ul> </li> <li>Thread EN 837-1               <ul style="list-style-type: none"> <li>G 1/4"B, G 1/2"B, G 3/4"B, G 1"B</li> </ul> </li> <li>Thread ASME B1.20.1               <ul style="list-style-type: none"> <li>1/4" NPT-M, 1/4" NPT-F</li> <li>1/2" NPT-M, 1/2" NPT-F</li> <li>3/4" NPT-M, 3/4" NPT-F</li> <li>1" NPT-M, 1" NPT-F</li> </ul> </li> </ul>	PN 10/16/25/40/63/100/160/250 PN 10/16/25/40 PN 10/16/25/40/63/100/160/250  Class 150/300/600/1500  PN 100/250  Class 1500/3675 Class 1500/3675 Class 1500/3675 Class 1500/3675
Sealing surface for open measurement flange	
<ul style="list-style-type: none"> <li>For stainless steel, mat. no. 1.4404/316L</li> </ul>	Acc. to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA

## Diaphragm seal, screwed design with inside diaphragm

Materials	
<ul style="list-style-type: none"> <li>Lower section (in the case of process connection thread)</li> <li>Diaphragm</li> </ul>	Stainless steel, mat. no. 1.4404/316L  Stainless steel, mat. no. 1.4404/316L <ul style="list-style-type: none"> <li>Without coating</li> <li>With PTFE coating</li> </ul> Monel 400, mat. no. 2.4360 Hastelloy C276, mat. no. 2.4819 Hastelloy C4, mat. no. 2.4602 Hastelloy C22, mat. no. 2.4602 Tantalum Titanium, mat. no. 3.7035 Nickel 201 Stainless steel 316L, gold plated, layer thickness approx. 25 µm Stainless steel, mat. no. 1.4404/316L
<ul style="list-style-type: none"> <li>Top section (process connection in the case of an open measurement flange)</li> <li>Capillary</li> </ul>	Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304  Viton and/or (in the case of vacuum-free version) Viton (FKM) (standard:) Teflon (PTFE) metal spring ring (silver-coated)
<ul style="list-style-type: none"> <li>Gasket material on the process connection</li> <li>Gasket material between top and bottom section</li> </ul>	
Capillary	
<ul style="list-style-type: none"> <li>Length</li> <li>Internal diameter</li> <li>Minimum bending radius</li> <li>Sheath</li> </ul>	≤ 10 m (32.8 ft) ≤ 2 mm (0.079 inch) 150 mm (5.9 inch) Flexible spiral coiled tube made of stainless steel, mat. no. 14301/304
Filling liquid (for remote seals of sandwich and flange design)	<ul style="list-style-type: none"> <li>Silicone oil M5</li> <li>Silicone oil M50</li> <li>High-temperature oil</li> <li>Halocarbon oil (for measuring O<sub>2</sub>)</li> <li>Food-grade oil (FDA grade)</li> </ul>
Max. recommended medium temperature	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal.

### More information

In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals:

- "Function" - "Technical specifications of the remote seal filling liquids"
- "Additional information" - "Specification of process conditions for selection and ordering data"

Weight	Approx. 1.5 kg (3.3 lb)
<b>Certificates and approvals</b>	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)



## Pressure measurement

### Remote seals for pressure transmitters SITRANS P320/P420

#### Diaphragm seal, screwed design

1

#### Selection and ordering data

		Article No.	Order code			Article No.	Order code
<b>Diaphragm seal, screwed</b>				<b>Diaphragm seal, screwed</b>			
With inside diaphragm, direct mounting or connected via flexible capillary tube to a transmitter				With inside diaphragm, direct mounting or connected via flexible capillary tube to a transmitter			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>		<b>7MF0840 -</b>		<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>		<b>7MF0840 -</b>	
		<b>7MF0842 -</b>				<b>7MF0842 -</b>	
							
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>				<b>Process connection: thread ASME B1.20.1</b>			
<b>Nominal diameter</b>	<b>Nominal pressure</b>			1" NPTM	Class 1500	<b>5TN</b>	
<u>Open flange, process connection standard EN 1092-1</u>				1" NPTM	Class 3675	<b>5TP</b>	
DN 15	PN 10/16/25/40	<b>0AD</b>		1" NPTF	Class 1500	<b>5TQ</b>	
	PN 63/100	<b>0AF</b>		1" NPTF	Class 3675	<b>5TR</b>	
	PN 160	<b>0AG</b>		Other version		<b>9AA</b>	<b>H1Y</b>
	PN 250	<b>0AH</b>		Add order code and plain text.			
DN 20	PN 10/16/25/40	<b>0AM</b>		<b>Transmitter connection</b>			
DN 25	PN 10/16/25/40	<b>0BD</b>		Without capillary tube, direct mount, straight connection (for gauge pressure transmitters)		<b>00</b>	
	PN 63/100	<b>0BF</b>		Connection via capillary tube			
	PN 160	<b>0BG</b>		Capillary length			
	PN 250	<b>0BH</b>		1 m (38.37 inch)		<b>10</b>	
<u>Open flange, process connection standard ASME B16.5</u>				1.6 m (63 inch)		<b>11</b>	
½ inch	Class 150	<b>1KA</b>		2 m (78.7 inch)		<b>12</b>	
	Class 300	<b>1KB</b>		2.5 m (98.4 inch)		<b>13</b>	
	Class 600	<b>1KC</b>		3 m (118.1 inch)		<b>14</b>	
	Class 1500	<b>1KD</b>		4 m (157.5 inch)		<b>15</b>	
¾ inch	Class 150	<b>1KF</b>		5 m (196.9 inch)		<b>16</b>	
	Class 300	<b>1KG</b>		6 m (236.2 inch)		<b>17</b>	
	Class 600	<b>1KH</b>		7 m (275.6 inch)		<b>18</b>	
	Class 1500	<b>1KJ</b>		8 m (315 inch)		<b>20</b>	
1 inch	Class 150	<b>1KL</b>		9 m (354.3 inch)		<b>21</b>	
	Class 300	<b>1KM</b>		10 m (393.7 inch)		<b>22</b>	
	Class 600	<b>1KN</b>		Other version		<b>98</b>	<b>L1Y</b>
	Class 1500	<b>1KP</b>		Add order code and plain text.			
<u>Process connection: thread EN 837-1</u>				<b>Filling liquid</b>			
G¼"B	PN 100	<b>3SB</b>		Silicone oil M50		<b>B</b>	
G¼"B	PN 250	<b>3SC</b>		High-temperature oil		<b>C</b>	
G½"B	PN 100	<b>3SF</b>		Silicone oil M5		<b>A</b>	
G½"B	PN 250	<b>3SG</b>		Food oil (FDA-listed)		<b>E</b>	
G¾"B	PN 100	<b>3SK</b>		Halocarbon oil		<b>D</b>	
G¾"B	PN 250	<b>3SL</b>		Other version		<b>Z</b>	<b>P1Y</b>
G1"B	PN 100	<b>3SP</b>		Add order code and plain text.			
G1"B	PN 250	<b>3SQ</b>		<b>Wetted parts materials</b>			
<u>Process connection: thread ASME B1.20.1</u>				Stainless steel 316L without coating		<b>A</b>	
¼" NPTM	Class 1500	<b>5TA</b>		Stainless steel 316L with PTFE coating		<b>E</b>	
¼" NPTM	Class 3675	<b>5TB</b>		Monel 400, 2.4360		<b>G</b>	
¼" NPTF	Class 1500	<b>5TC</b>		Hastelloy C276, 2.4819		<b>J</b>	
¼" NPTF	Class 3675	<b>5TD</b>		Tantalum		<b>K</b>	
½" NPTM	Class 1500	<b>5TE</b>		Stainless steel 316 with gold coating		<b>S</b>	
½" NPTM	Class 3675	<b>5TF</b>		Hastelloy C4, 2.4610		<b>U</b>	
½" NPTF	Class 1500	<b>5TG</b>		Other version		<b>Z</b>	<b>Q1Y</b>
½" NPTF	Class 3675	<b>5TH</b>		Add order code and plain text.			
¾" NPTM	Class 1500	<b>5TJ</b>					
¾" NPTM	Class 3675	<b>5TK</b>					
¾" NPTF	Class 1500	<b>5TL</b>					
¾" NPTF	Class 3675	<b>5TM</b>					



Options	Order code
Add <b>"-Z"</b> to article number and specify order code.	
<b>Factory certificates</b>	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	<b>C11</b>
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	<b>C12</b>
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	<b>C13</b>
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	<b>C15</b>
Certificate of FDA-approved fill oil to EN 10204-2.2	<b>C17</b>
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	<b>C20</b>
<b>Accessories</b>	
Epoxy resin coating Color: transparent, coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. • Only possible with 7MF0842-... • Not possible with negative pressure service	<b>D15</b>
Flushing port ¼" 18 NPT unsealed	<b>D70</b>
Flushing port ¼" 18 NPT sealed with stainless steel plug	<b>D71</b>
Gasket material between upper and lower enclosure PTFE (instead of FKM viton)	<b>D75</b>
Gasket material between upper and lower enclosure metal C spring lock washer (instead of FKM viton)	<b>D76</b>
PTFE coating of lower section (only for G½B PN 100, DN 25 PN 10 ... 40, 1 inch Class 150/300)	<b>D77</b>
<b>Country-specific approval</b>	
CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	<b>E60</b>
<b>Negative pressure service</b>	
Negative pressure service (for gauge pressure and absolute pressure transmitters)	<b>D81</b>
Negative pressure service (for differential pressure transmitters)	<b>D83</b>
Extended negative pressure service (for gauge pressure and absolute pressure transmitters) (only 7MF0800)	<b>D85</b>
Extended negative pressure service (for differential pressure transmitters)	<b>D88</b>
<b>General product approvals without explosion proof approvals</b>	
Oil- and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	<b>E80</b>
Oil- and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil)	<b>E87</b>
<b>Capillary connection</b> (only for 7MF0840)	
Single-side mounted at differential pressure transmitter at high side	<b>S03</b>
Single-side mounted at differential pressure transmitter at low side	<b>S04</b>
Cooling element	<b>S08</b>

Options	Order code
Add <b>"-Z"</b> to article number and specify order code.	
<b>Capillary coating</b>	
PE protective tube	
• 1 m (38.37 inch)	<b>S10</b>
• 1.6 m (63 inch)	<b>S11</b>
• 2 m (78.7 inch)	<b>S12</b>
• 2.5 m (98.4 inch)	<b>S13</b>
• 3 m (118.1 inch)	<b>S14</b>
• 4 m (157.5 inch)	<b>S15</b>
• 5 m (196.9 inch)	<b>S16</b>
• 6 m (236.2 inch)	<b>S17</b>
• 7 m (275.6 inch)	<b>S18</b>
• 8 m (315 inch)	<b>S19</b>
• 9 m (354.3 inch)	<b>S20</b>
• 10 m (393.7 inch)	<b>S21</b>
PTFE protective tube	
• 1 m (38.37 inch)	<b>S40</b>
• 1.6 m (63 inch)	<b>S41</b>
• 2 m (78.7 inch)	<b>S42</b>
• 2.5 m (98.4 inch)	<b>S43</b>
• 3 m (118.1 inch)	<b>S44</b>
• 4 m (157.5 inch)	<b>S45</b>
• 5 m (196.9 inch)	<b>S46</b>
• 6 m (236.2 inch)	<b>S47</b>
• 7 m (275.6 inch)	<b>S48</b>
• 8 m (315 inch)	<b>S49</b>
• 9 m (354.3 inch)	<b>S50</b>
• 10 m (393.7 inch)	<b>S51</b>
PVC protective tube	
• 1 m (38.37 inch)	<b>S70</b>
• 1.6 m (63 inch)	<b>S71</b>
• 2 m (78.7 inch)	<b>S72</b>
• 2.5 m (98.4 inch)	<b>S73</b>
• 3 m (118.1 inch)	<b>S74</b>
• 4 m (157.5 inch)	<b>S75</b>
• 5 m (196.9 inch)	<b>S76</b>
• 6 m (236.2 inch)	<b>S77</b>
• 7 m (275.6 inch)	<b>S78</b>
• 8 m (315 inch)	<b>S79</b>
• 9 m (354.3 inch)	<b>S80</b>
• 10 m (393.7 inch)	<b>S81</b>
<b>Desired remote seal supplier</b>	
Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	<b>W01</b>
Company Labom, Hude	<b>W02</b>
<b>Special design</b>	
Welded filling holes	<b>X01</b>
<b>Customer-specific tube length</b>	
Customer-specific tube length (specify in plain text)	<b>Y44</b>
<b>Specification of process conditions<sup>1)</sup></b>	
Ambient temperature range	
• 10 ... +50 °C (50 ... +122 °F) preset	<b>D66</b>
• -40 ... +50 °C (-40 ... +122 °F)	<b>D67</b>
• -10 ... +85 °C (14 ... +185 °F)	<b>D68</b>
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>

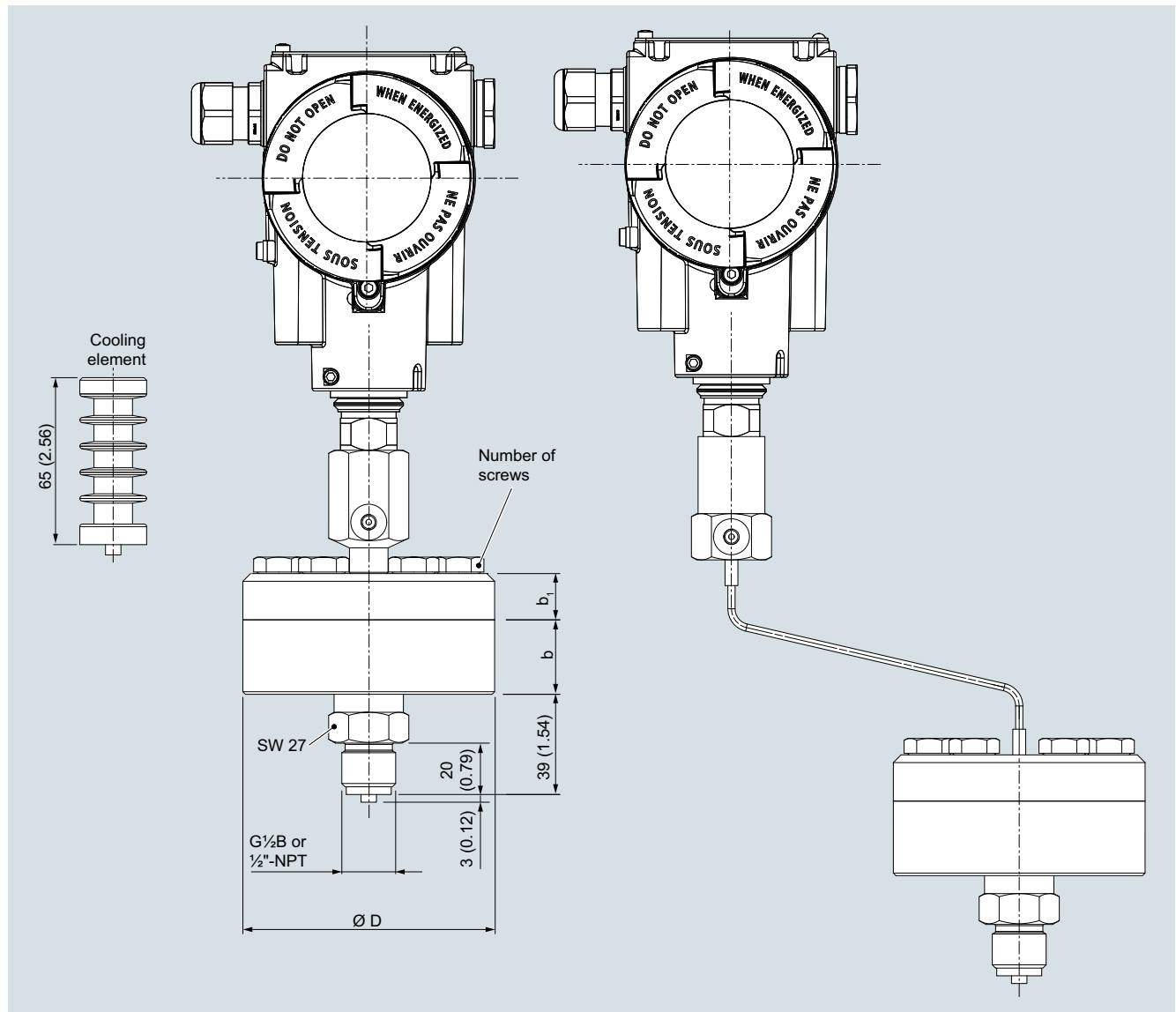
<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/337.

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

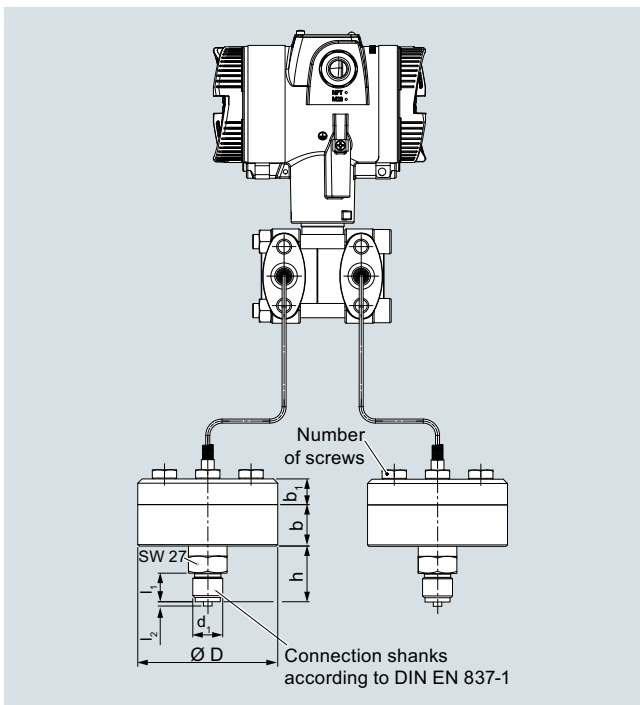
### Diaphragm seal, screwed design

#### Dimensional drawings



Diaphragm seal, screwed design with inside diaphragm, for gauge and absolute pressure, attached to the transmitter directly and with capillaries, measurements in mm (inch)

Range	D mm (inch)	b mm (inch)	b <sub>1</sub> mm (inch)	Number of screws
Up to 100 bar	98 (3.86)	14 (0.55)	16 (0.63)	6
Up to 250 bar	98 (3.86)	14 (0.55)	20 (0.79)	12



Diaphragm seal, screwed design with inside diaphragm, for differential pressure, attached to the transmitter directly and with capillaries, measurements in mm (inch)

Nominal diameter	Nominal pressure	D mm (inch)	d <sub>4</sub> mm (inch)	k mm (inch)	M	Number of holes	b mm (inch)	b <sub>1</sub> mm (inch)	f mm (inch)
DN 25	PN 10/16/25/40	115	68	85	M12	4	26	12	21
1 inch	150 lb/sq.in	110 (4.33)	50.8 (2)	79.4 (3.13)	M12	4	32 (1.26)	12 (0.47)	1.6 (0.063)
1 inch	300 lb/sq.in	125 (4.92)	50.8 (2)	88.9 (3.5)	M16	4	32 (1.26)	12 (0.47)	1.6 (0.063)

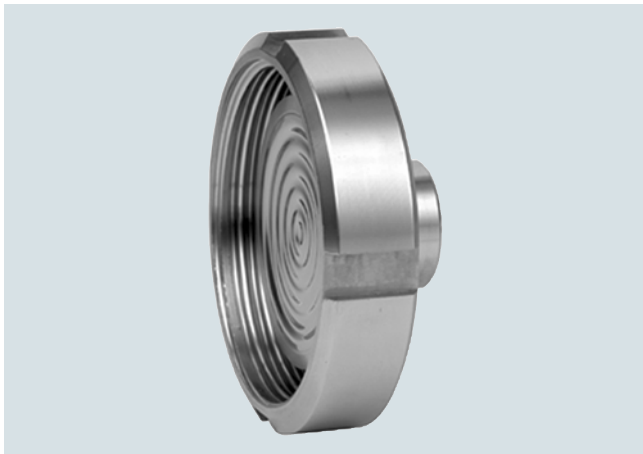
## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Quick-release diaphragm seals

1

#### Overview



Quick-release diaphragm seals, acc. to DIN 11851 with slotted union nut



Quick-release diaphragm seals, with clamp connection

Quick-release diaphragm seals can be supplied for the pressure transmitters of the SITRANS P320/420 series.

The quick-release remote seals are common designs in the food industry. Their design means that the medium cannot accumulate in dead volumes. The remote seal's quick release mechanism enables fast disassembly for cleaning.

#### Technical specifications

##### Quick-release diaphragm seals

Connection, nominal diameter	Nominal pressure
<ul style="list-style-type: none"> <li>Standard of process connection DIN 11851 with groove nut               <ul style="list-style-type: none"> <li>- DN 25/32/40</li> <li>- DN 50/65/80</li> </ul> </li> <li>Standard of process connection DIN 11851 with thread               <ul style="list-style-type: none"> <li>- DN 25/32/40</li> <li>- DN 50/65/80</li> </ul> </li> <li>Standard of process connection clamp ISO 2852               <ul style="list-style-type: none"> <li>- DN 25/38/51</li> <li>- DN 63.5/76.1</li> </ul> </li> <li>Standard of process connection clamp DIN 32676, row C Tri-Clamp               <ul style="list-style-type: none"> <li>- 1 inch, 1½ inch</li> <li>- 2 inch, 2½ inch</li> <li>- 3 inch</li> </ul> </li> </ul>	PN 40 PN 25  PN 40 PN 25  PN 16 PN 10  PN 25 PN 16 PN 10

##### Quick-release diaphragm seals

<ul style="list-style-type: none"> <li>Standard of process connection clamp DIN 32676, row A metric               <ul style="list-style-type: none"> <li>- DN 25/32/40</li> <li>- DN 50</li> <li>- DN 65</li> </ul> </li> <li>Varivent               <ul style="list-style-type: none"> <li>- DN 25/32/40/50</li> </ul> </li> <li>DRD flange               <ul style="list-style-type: none"> <li>- DN 50</li> </ul> </li> </ul>	PN 25 PN 16 PN 10  PN 25  PN 40
Sealing surface <ul style="list-style-type: none"> <li>For stainless steel, mat. no. 1.4404/316L</li> <li>For other materials</li> </ul>	Acc. to EN 1092-1, form B1 or ASME B 16.5RF 125 ... 250 AA Acc. to EN 1092-1, form B2 or ASME B16.5 RFSF
Materials <ul style="list-style-type: none"> <li>Main body</li> <li>Wetted parts</li> <li>Capillary</li> </ul>	Stainless steel, mat. no. 1.4404/316L Stainless steel, mat. no. 1.4404/316L Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304
<ul style="list-style-type: none"> <li>Sheath</li> </ul>	Spiral coiled tube made of stainless steel, W.-Nr. 1.4404/316L
Maximum pressure	See above and the technical specifications of the pressure transmitter
Tube length	Without tube
Capillary	
<ul style="list-style-type: none"> <li>Length</li> </ul>	≤ 10 m (32.8 ft), longer lengths on request
<ul style="list-style-type: none"> <li>Internal diameter</li> <li>Minimum bending radius</li> <li>Sheath</li> </ul>	≤ 2 mm (0.079 inch) 150 mm (5.9 inch) Flexible spiral coiled tube made of stainless steel mat. no. 1.4404/316L
Filling liquid	Food-grade oil (FDA grade)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal.
	<b>More information</b> In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals: <ul style="list-style-type: none"> <li>"Function" - "Technical specifications of the remote seal filling liquids"</li> <li>"Additional information" - "Specification of process conditions for selection and ordering data"</li> </ul>
Weight	Approx. 4 kg (8.82 lb)

##### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
EHEDG	Complies with EHEDG recommendations

#### Selection and ordering data

		Article No.	Order code
<b>Quick-release diaphragm seals</b>			
Flange type design, with flexible capillary tube or direct mounting on pressure transmitter			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>		<b>7MF0830 -</b>	
		<b>7MF0832 -</b>	
		- 0 A 0	
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			
<b>Nominal diameter</b>	<b>Nominal pressure</b>		
<u>Process connection standard DIN 11851 with nut</u>			
DN 25	PN 40	<b>0BM</b>	
DN 32	PN 40	<b>0CD</b>	
DN 40	PN 40	<b>0DM</b>	
DN 50	PN 25	<b>0EK</b>	
DN 65	PN 25	<b>0FL</b>	
DN 80	PN 25	<b>0GK</b>	
<u>Process connection standard DIN 11851 with thread</u>			
DN 25	PN 40	<b>1BM</b>	
DN 32	PN 40	<b>1CD</b>	
DN 40	PN 40	<b>1DM</b>	
DN 50	PN 25	<b>1EK</b>	
DN 65	PN 25	<b>1FL</b>	
DN 80	PN 25	<b>1GK</b>	
<u>Process connection standard Clamp ISO 2852</u>			
DN 25	PN 16	<b>2BK</b>	
DN 38	PN 16	<b>2CQ</b>	
DN 51	PN 16	<b>2FH</b>	
DN 63.5	PN 10	<b>2FJ</b>	
DN 76.1	PN 10	<b>2GJ</b>	
<u>Process connection standard Clamp DIN 32676, row C Tri-Clamp</u>			
DN 1 inch	PN 25	<b>3KV</b>	
DN 1½ inch	PN 25	<b>3LV</b>	
DN 2 inch	PN 16	<b>3MV</b>	
DN 2½ inch	PN 16	<b>3NV</b>	
DN 3 inch	PN 10	<b>3PV</b>	
<u>Process connection standard Clamp DIN 32676, row A metric</u>			
DN 25	PN 25	<b>4BL</b>	
DN 32	PN 25	<b>4CC</b>	
DN 40	PN 25	<b>4DL</b>	
DN 50	PN 16	<b>4EJ</b>	
DN 65	PN 10	<b>4FK</b>	
<u>Varivent</u>			
DN 25/32	PN 25	<b>5CL</b>	
DN 40/50	PN 25	<b>5DK</b>	
<u>DRD flange</u>			
DN 50	PN 40	<b>6EM</b>	
Other version		<b>9AA</b>	<b>H1Y</b>
Add order code and plain text.			

		Article No.	Order code
<b>Quick-release diaphragm seals</b>			
Flange type design, with flexible capillary tube or direct mounting on pressure transmitter			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>		<b>7MF0830 -</b>	
		<b>7MF0832 -</b>	
		- 0 A 0	
<b>Transmitter connection</b>			
Without capillary tube, direct mount, straight connection (for gauge pressure transmitters)		<b>00</b>	
Connection via capillary tube			
Length of capillary			
1 m (38.37 inch)		<b>10</b>	
1.6 m (63 inch)		<b>11</b>	
2 m (78.7 inch)		<b>12</b>	
2.5 m (98.4 inch)		<b>13</b>	
3 m (118.1 inch)		<b>14</b>	
4 m (157.5 inch)		<b>15</b>	
5 m (196.9 inch)		<b>16</b>	
6 m (236.2 inch)		<b>17</b>	
7 m (275.6 inch)		<b>18</b>	
8 m (315 inch)		<b>20</b>	
9 m (354.3 inch)		<b>21</b>	
10 m (393.7 inch)		<b>22</b>	
Other version		<b>98</b>	<b>L1Y</b>
Add order code and plain text.			
<b>Filling liquid</b>			
Food-grade oil (FDA grade)		<b>E</b>	
Other version		<b>Z</b>	<b>P1Y</b>
Add order code and plain text.			

## Pressure measurement

### Remote seals for pressure transmitters SITRANS P320/P420

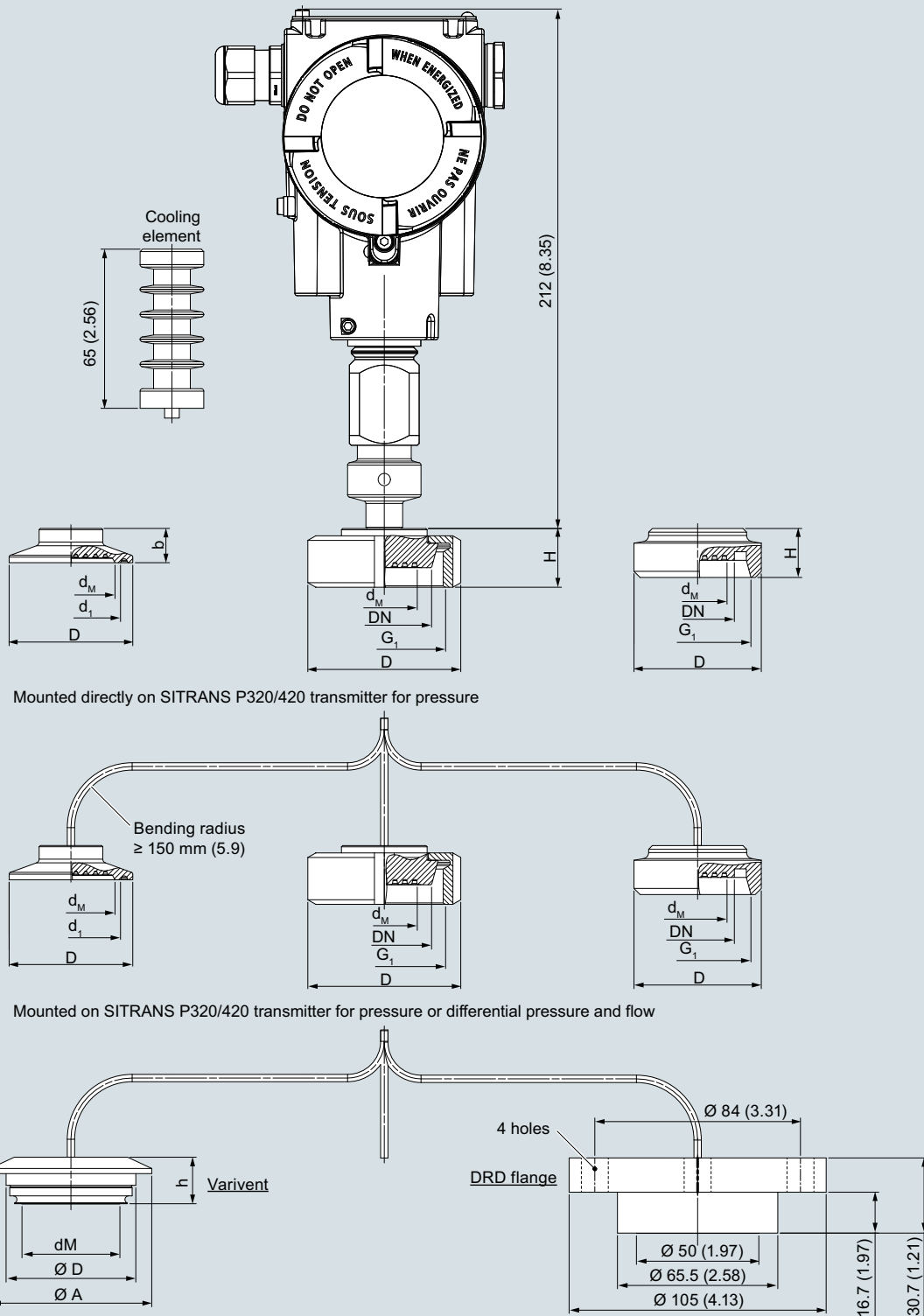
#### Quick-release diaphragm seals

1

Options	Order code	Options	Order code
Add "-Z" to article number and specify order code.		Add "-Z" to article number and specify order code.	
<b>Factory certificates</b>		PVC protective tube	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	<b>C11</b>	• 1 m (38.37 inch)	<b>S70</b>
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	<b>C12</b>	• 1.6 m (63 inch)	<b>S71</b>
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	<b>C15</b>	• 2 m (78.7 inch)	<b>S72</b>
Certificate of FDA-approved fill oil to EN 10204-2.2	<b>C17</b>	• 2.5 m (98.4 inch)	<b>S73</b>
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	<b>C20</b>	• 3 m (118.1 inch)	<b>S74</b>
		• 4 m (157.5 inch)	<b>S75</b>
		• 5 m (196.9 inch)	<b>S76</b>
		• 6 m (236.2 inch)	<b>S77</b>
		• 7 m (275.6 inch)	<b>S78</b>
		• 8 m (315 inch)	<b>S79</b>
		• 9 m (354.3 inch)	<b>S80</b>
		• 10 m (393.7 inch)	<b>S81</b>
<b>Accessories</b>		<b>Desired remote seal supplier</b>	
Remote seal nameplate	<b>D42</b>	Note:	
Attached, made of stainless steel, contains article no. and order number of the remote seal		If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected.	
		For orders without this option, the remote seal supplier is selected through the dispatch center.	
<b>Negative pressure service</b>		Company WIKA, Klingenberg	<b>W01</b>
Negative pressure service	<b>D81</b>	Company Labom, Hude	<b>W02</b>
• For gauge pressure and absolute pressure transmitters	<b>D83</b>		
• For differential pressure transmitters		<b>Special design</b>	
Extended negative pressure service	<b>D85</b>	Welded filling holes	<b>X01</b>
• For gauge pressure and absolute pressure transmitters	<b>D88</b>		
• For differential pressure transmitters		<b>Customer-specific tube length</b>	
		Customer-specific tube length (specify in plain text in mm)	<b>Y44</b>
<b>Country-specific approval</b>		<b>Specification of process conditions<sup>1)</sup></b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>	Ambient temperature range	
Note:		• 10 ... +50 °C (50 ... +122 °F) preset	<b>D66</b>
If the order code E60 is selected, the option E60 must also be selected for the transmitter!		• -40 ... +50 °C (-40 ... +122 °F)	<b>D67</b>
		• -10 ... +85 °C (14 ... +185 °F)	<b>D68</b>
<b>Capillary connection</b>		Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>
(only for 7MF0830)			
Single-side mounted at differential pressure transmitter at high side	<b>S03</b>		
Single-side mounted at differential pressure transmitter at low side	<b>S04</b>		
Cooling element	<b>S08</b>		
<b>Capillary coating</b>			
PE protective tube			
• 1 m (38.37 inch)	<b>S10</b>		
• 1.6 m (63 inch)	<b>S11</b>		
• 2 m (78.7 inch)	<b>S12</b>		
• 2.5 m (98.4 inch)	<b>S13</b>		
• 3 m (118.1 inch)	<b>S14</b>		
• 4 m (157.5 inch)	<b>S15</b>		
• 5 m (196.9 inch)	<b>S16</b>		
• 6 m (236.2 inch)	<b>S17</b>		
• 7 m (275.6 inch)	<b>S18</b>		
• 8 m (315 inch)	<b>S19</b>		
• 9 m (354.3 inch)	<b>S20</b>		
• 10 m (393.7 inch)	<b>S21</b>		
PTFE protective tube			
• 1 m (38.37 inch)	<b>S40</b>		
• 1.6 m (63 inch)	<b>S41</b>		
• 2 m (78.7 inch)	<b>S42</b>		
• 2.5 m (98.4 inch)	<b>S43</b>		
• 3 m (118.1 inch)	<b>S44</b>		
• 4 m (157.5 inch)	<b>S45</b>		
• 5 m (196.9 inch)	<b>S46</b>		
• 6 m (236.2 inch)	<b>S47</b>		
• 7 m (275.6 inch)	<b>S48</b>		
• 8 m (315 inch)	<b>S49</b>		
• 9 m (354.3 inch)	<b>S50</b>		
• 10 m (393.7 inch)	<b>S51</b>		

<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/33.7

**Dimensional drawings**



Quick-release diaphragm seals

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Quick-release diaphragm seals

#### Connection according to DIN 11851 with groove nut

Nominal diameter	Ø d <sub>M</sub> mm	Ø D mm	H mm	G <sub>1</sub> mm
DN 25	25	63	36	Radius 52x1/6
DN 32	32	70	36	Radius 52x1/6
DN 40	40	78	36	Radius 65x1/6
DN 50	52	112	36	Radius 78x1/6
DN 65	65	112	36	Radius 95x1/6
DN 80	72	127	36	Radius 110x1/6

d<sub>M</sub> effective diaphragm diameter

#### Connection according to DIN 11851 with thread

Nominal diameter	Ø d <sub>M</sub> mm	H mm	G <sub>1</sub> mm
DN 25	25	36	Radius 52x1/6
DN 32	32	36	Radius 52x1/6
DN 40	40	36	Radius 65x1/6
DN 50	52	36	Radius 78x1/6
DN 65	65	36	Radius 95x1/6
DN 80	72	36	Radius 110x1/6

d<sub>M</sub> effective diaphragm diameter

#### Clamp connection according to ISO 2852 for pipes according to ISO 2037

Nominal diameter	Nominal pressure	d <sub>M</sub> mm	d <sub>1</sub> mm	b mm	D mm
DN 25	PN 16	22.6	43.5	14	50.5
DN 38	PN 16	34	43.5	12	50.5
DN 51	PN 16	46	56.5	14	64
DN 63.5	PN 10	51	70.5	14	77.5
DN 76.1	PN 10	65	83.5	14	91

d<sub>M</sub> effective diaphragm diameter

#### Clamp connection according to DIN 32676 row C (Tri-Clamp) for pipes according to ASME BPE

Nominal diameter	Nominal pressure	d <sub>M</sub> mm (inch)	d <sub>1</sub> mm (inch)	b mm (inch)	D mm (inch)
1 inch	PN 25	22.6 (0.89)	43.5 (1.71)	14 (0.55)	50.5 (1.99)
1½ inch	PN 25	34 (1.34)	43.5 (1.71)	12 (0.47)	50.5 (1.99)
2 inch	PN 16	46 (1.81)	56.5 (2.22)	14 (0.55)	64 (2.52)
2½ inch	PN 16	51 (2.01)	70.5 (2.78)	14 (0.55)	77.5 (3.05)
3 inch	PN 16	65 (2.56)	83.5 (3.29)	14 (0.55)	91 (3.58)

d<sub>M</sub> effective diaphragm diameter

#### Clamp connection according to DIN 32676 row A (metric) for pipes according to EN 10357 (DIN 11850)

Nominal diameter	Nominal pressure	Ø d <sub>M</sub> mm	d <sub>1</sub> mm	b mm	D mm
DN 25	PN 25	22.6	43.5	14	50.5
DN 32	PN 25	27	43.5	12	50.5
DN 40	PN 25	34	43.5	12	50.5
DN 50	PN 16	46	56.5	14	64
DN 65	PN 16	65	83.5	14	91

d<sub>M</sub> effective diaphragm diameter

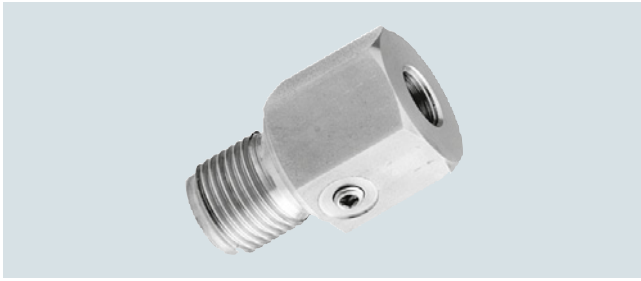
#### Varivent

Nominal diameter	d <sub>M</sub> mm (inch)	A mm (inch)	D mm (inch)	h mm (inch)
DN 25, DN 32, 1", 1¼"	40 (1.57)	66 (2.6)	50 (1.97)	19 (0.75)
DN 40 ... 125, 1½" ... 6"	58 (2.28)	84 (3.3)	68 (2.68)	19 (0.75)

d<sub>M</sub> effective diaphragm diameter



### Overview



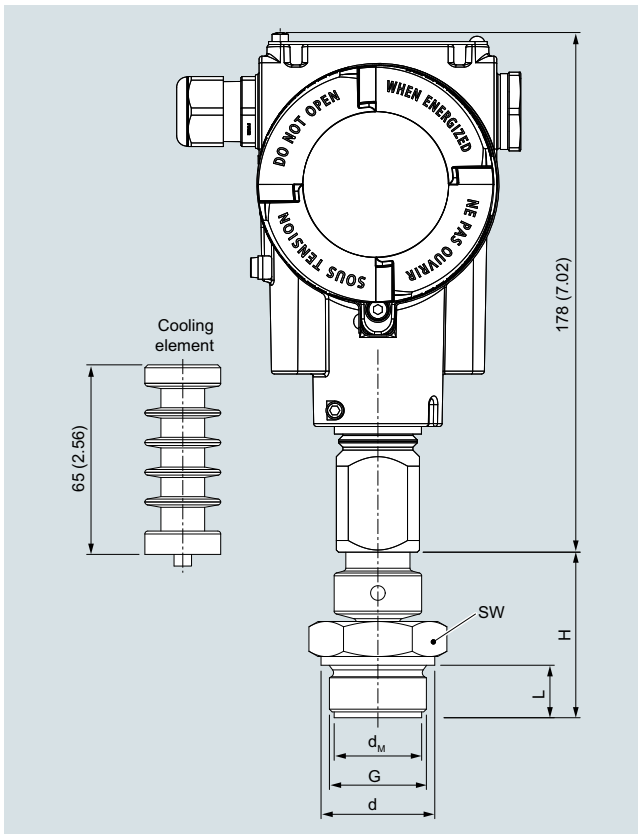
The miniature diaphragm seals can be supplied for the pressure transmitters of the SITRANS P320/420 series.

For high pressures, contaminated, fibrous and viscous media in the chemical, paper, food and drink industries.

### Design

- Flush-mounted diaphragm
- Free of dead space
- Fixed threaded pin

### Dimensional drawings



Miniature diaphragm seal, dimensions in mm (inch)

G	Ø d <sub>M</sub>	Width across flats	Ø d	L	H
	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
G1B	25 (0.98)	41 (1.61)	39 (1.53)	28 (1.1)	56 (2.21)
G1½B	40 (1.57)	55 (2.17)	60 (2.36)	30 (1.18)	50 (1.97)
G2B	50 (1.97)	60 (2.36)	70 (2.76)	30 (1.18)	63 (2.48)

G	Ø d <sub>M</sub>	Width across flats	L	H
	mm (inch)	mm (inch)	mm (inch)	mm (inch)
1" NPT	27 (1.06)	41 (1.61)	25 (0.98)	40 (1.57)
1½" NPT	34 (1.34)	55 (2.17)	26 (1.02)	45 (1.77)
2" NPT	46 (1.81)	60 (2.56)	26 (1.02)	45 (1.77)

d<sub>M</sub>: Effective diaphragm diameter

### Technical specifications

#### Miniature diaphragm seals

Measuring span when

- G1B and 1" NPT > 6 bar (> 87 psi)
- G1½B and 1½" NPT > 2 bar (> 29 psi)
- G2B and 2" NPT > 600 mbar (> 8.7 psi)

Filling liquid

Silicone oil M5 or food oil (FDA-listed)

Material

• Main body

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

• Diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

Maximum pressure

100% of the nominal pressure of the pressure transmitter, but a maximum of PN 400 (5802 psi) (depending on the seal used)

Temperature of use

As for pressure transmitter

Medium temperature range

As for pressure transmitter

Max. recommended medium temperature

150 °C (302 °F)

Weight

- G1B and 1" NPT Approx. 0.3 kg (approx. 0.66 lb)
- G1½B and 1½" NPT Approx. 0.5 kg (approx. 1.10 lb)
- G2B and 2" NPT Approx. 0.8 kg (approx. 1.76 lb)

#### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Miniature diaphragm seals

1

#### Selection and ordering data

	Article No.	Order code
<b>Miniature diaphragm seals</b>		
Installed directly on pressure transmitter	<b>7MF0850 -</b>	
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> </ul>		
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>	<b>00 - 0 0</b>	
<b>Process connection</b>		
Process connection standard DIN 3852		
G ½"	PN 400	<b>4 ST</b>
G ¾"	PN 400	<b>4 SU</b>
G 1"	PN 400	<b>4 SV</b>
G 1½"	PN 400	<b>4 SW</b>
G 2"	PN 400	<b>4 SX</b>
Process connection standard ASME B1.20.1		
½" NPTM	Class 5800	<b>5 TS</b>
¾" NPTM	Class 5800	<b>5 TT</b>
1" NPTM	Class 5800	<b>5 TU</b>
1½" NPT-M	Class 5800	<b>5 TV</b>
2" NPTM	Class 5800	<b>5 TW</b>
Other version		<b>9 AA</b>
Add order code and plain text.		<b>H 1 Y</b>
<b>Filling liquid</b>		
Silicone oil M5		<b>A</b>
Food-grade oil (FDA grade)		<b>E</b>
Other version		<b>Z</b>
Add order code and plain text.		<b>P 1 Y</b>
<b>Wetted parts materials</b>		
Stainless steel 316L without coating		<b>A</b>
Hastelloy C276, 2.4819		<b>J</b>

#### Options

Add "-Z" to article number and specify order code.

#### Factory certificates

Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2

Order code

**C11**

Inspection certificate to EN 10204-3.1 for material of body and diaphragm

**C12**

Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)

**C13**

Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts

**C15**

Certificate of FDA-approved fill oil to EN 10204-2.2

**C17**

Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)

**C20**

#### Accessories

Remote seal nameplate

**D42**

Attached, made of stainless steel, contains article no. and order number of the remote seal

#### Negative pressure service

Negative pressure service for gauge pressure and absolute pressure transmitters

**D81**

Extended negative pressure service for gauge pressure and absolute pressure transmitters

**D85**

#### Country-specific approval

CRN approval Canada (Canadian Registration Number)

**E60**

Note:

If the order code E60 is selected, the option E60 must also be selected for the transmitter!

#### Capillary connection

Cooling element between transmitter and remote seal

**S08**

#### Desired remote seal supplier

Note:

If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.

Company WIKA, Klingenberg

**W01**

Company Labom, Hude

**W02**

#### Special design

Welded filling hole

**X01**

#### Customer-specific tube length

Customer-specific tube length (specify in plain text in mm)

**Y44**

#### Specification of process conditions<sup>1)</sup>

Ambient temperature range

• 10 ... +50 °C (50 ... +122 °F) preset

**D66**

• -40 ... +50 °C (-40 ... +122 °F)

**D67**

• -10 ... +85 °C (14 ... +185 °F)

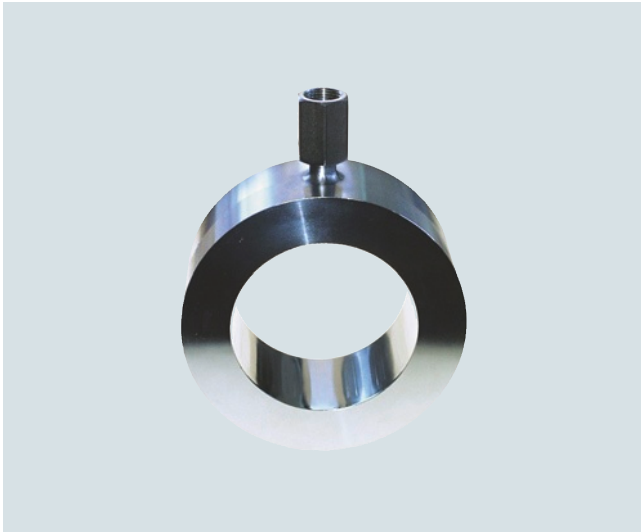
**D68**

Process temperature min. ... °C/(°F)/max. ... °C/(°F)

**Y50**

<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/337.

## Overview



Inline seals for flange-mounting

The inline seal is fully integrated into the process control. It is especially suitable for flowing and high-viscosity media.

The inline seal consists of a cylindrical jacket into which a thin-walled tube is welded. It is clamped directly between two flanges in the pipeline.

## Design

- Inline seals for flange-mounting (flange design) according to EN/ASME for SITRANS P320/420 pressure transmitters
  - For gauge and absolute pressure (only in connection with negative pressure service)
  - For differential pressure and flow
- Sealing surface according to EN 1092-1 or ASME B16.5
- Connection to the pressure transmitter directly or by means of a flexible capillary (max. 10 m long)
- See Technical specifications for details of materials used for the wetted parts
- Material used for the capillary, the guard sleeve, the seal's main body and the measuring cell: Stainless steel, mat.-No. 1.4571
- Filling liquid: Silicone oil, high-temperature oil, halocarbon oil, food oil (FDA-listed) vegetable oil or glycerin/water (not suitable for uses in low-pressure range).

## Function

The measured pressure is transferred to the filling liquid by the diaphragm and enters the sample chamber of the pressure transmitter either directly or through the capillary. The filling fluid completely fills the inside of the diaphragm seal, the capillary and the sample chamber of the pressure transmitter so that it is free of gas.

### Note:

A vacuum-resistant remote seal is recommended for low-pressure operation, including during commissioning (see ordering data).

## Technical specifications

### Inline seals for flange-mounting

Nominal diameter	Nominal pressure
Standard of process connection EN 1092-1	
• DN 25/40/50/65/80/100/125	PN 6 ... PN 100
Standard of process connection ASME B16.5	
• 1, 1½, 2, 2½, 3, 4, 5 inch	Class 150 ... Class 2500
Process connection	Flange according to EN 1092-1 or ASME B 16.5
Sealing surface	<ul style="list-style-type: none"> <li>• for stainless steel mat. no. 1.4404/316L according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA</li> <li>• for all other materials according to EN 1092-1, form B2 or ASME B16.5 RFSF</li> </ul>
Materials	
• Main body	Stainless steel, mat. no. 1.4404/316L
• Diaphragm	Stainless steel, mat. no. 1.4404/316L
• Wetted parts	Stainless steel, mat. no. 1.4404/316L
	<ul style="list-style-type: none"> <li>• Without coating</li> <li>• ECTFE coating (for negative pressure on request)</li> <li>• PFA coating</li> </ul>
	Monel 400, mat. no. 2.4360
	Hastelloy C276, mat. no. 2.4819
	Hastelloy C4, mat. no. 2.4602
	Tantalum
	Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304
• Capillary	
	Flexible spiral coiled tube made of stainless steel, mat. no. 1.4404/316L
• Sheath	
Capillary	
• Length	≤ 10 m (32.8 ft)
• Internal diameter	≤ 2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	Silicone oil M5
	Silicone oil M50
	High-temperature oil
	Halocarbon oil
	Food-grade oil (FDA grade)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal.
	<b>More information</b>
	In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals:
	<ul style="list-style-type: none"> <li>• "Function" - "Technical specifications of the remote seal filling liquids"</li> <li>• "Additional information" - "Specification of process conditions for selection and ordering data"</li> </ul>
Weight	Approx. 4 kg (8.82 lb)
	<b>Certificates and approvals</b>
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of Article 4, Paragraph 1 (annex 1); assigned to category III, conformity evaluation module H by the TÜV Nord

# Pressure measurement

## Remote seals for pressure transmitters SITRANS P320/P420

### Inline seals in sandwich design

1

#### Selection and ordering data

	Article No.	Order code
<b>Inline seal</b>		
In sandwich design, direct mounting or with a flexible capillary tube connected with pressure transmitter		
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>	<b>7MF0900 -</b>	
	<b>7MF0902 -</b>	
	- 0 0	
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Nominal diameter</b>	<b>Nominal pressure</b>	
<u>Process connection standard EN 1092-1</u>		
DN 25	PN 6 ... 100	<b>0BP</b>
DN 40	PN 6 ... 100	<b>0DP</b>
DN 50	PN 6 ... 100	<b>0EP</b>
DN 65	PN 6 ... 100	<b>0FP</b>
DN 80	PN 6 ... 100	<b>0GP</b>
DN 100	PN 6 ... 100	<b>0HP</b>
DN 125	PN 6 ... 100	<b>0JP</b>
<u>Process connection standard ASME B16.5</u>		
1 inch	Class 150 ... 2500	<b>1KX</b>
1½ inch	Class 150 ... 2500	<b>1LX</b>
2 inch	Class 150 ... 2500	<b>1MX</b>
2½ inch	Class 150 ... 2500	<b>1NX</b>
3 inch	Class 150 ... 2500	<b>1PX</b>
4 inch	Class 150 ... 2500	<b>1QX</b>
5 inch	Class 150 ... 2500	<b>1RX</b>
Other version		<b>9AA</b>
Add order code and plain text.		<b>H1Y</b>
<b>Transmitter connection</b>		
Without capillary tube, direct mount, straight connection (for gauge pressure transmitters)		<b>00</b>
Without capillary tube, direct mount, connection with 90° elbow (for gauge pressure transmitters)		<b>01</b>
Connection via capillary tube		
Capillary length		
1 m (38.37 inch)		<b>10</b>
1.6 m (63 inch)		<b>11</b>
2 m (78.7 inch)		<b>12</b>
2.5 m (98.4 inch)		<b>13</b>
3 m (118.1 inch)		<b>14</b>
4 m (157.5 inch)		<b>15</b>
5 m (196.9 inch)		<b>16</b>
6 m (236.2 inch)		<b>17</b>
7 m (275.6 inch)		<b>18</b>
8 m (315 inch)		<b>20</b>
9 m (354.3 inch)		<b>21</b>
10 m (393.7 inch)		<b>22</b>
11 m (433.1 inch); only for 7MF0902		<b>23</b>
12 m (472.4 inch); only for 7MF0902		<b>24</b>
13 m (511.811 inch); only for 7MF0902		<b>25</b>
14 m (551.2 inch); only for 7MF0902		<b>26</b>
15 m (590.6 inch); only for 7MF0902		<b>27</b>
Other version		<b>98</b>
Add order code and plain text.		<b>L1Y</b>

	Article No.	Order code
<b>Inline seal</b>		
In sandwich design, direct mounting or with a flexible capillary tube connected with pressure transmitter		
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> <li>SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 units</li> </ul>	<b>7MF0900 -</b>	
	<b>7MF0902 -</b>	
	- 0 0	
<b>Filling liquid</b>		
Silicone oil M50		<b>B</b>
High-temperature oil		<b>C</b>
Silicone oil M5		<b>A</b>
Food oil (FDA-listed)		<b>E</b>
Halocarbon oil		<b>D</b>
Other version		<b>Z</b>
Add order code and plain text.		<b>P1Y</b>
<b>Wetted parts materials</b>		
316L stainless steel		
<ul style="list-style-type: none"> <li>Without coating</li> <li>With PFA coating</li> <li>With ECTFE coating</li> </ul>		<b>A</b>
Monel 400, 2.4360		<b>D</b>
Hastelloy C276, 2.4819		<b>F</b>
Tantalum		<b>G</b>
Hastelloy C4, 2.4610		<b>J</b>
Other version		<b>K</b>
Add order code and plain text.		<b>U</b>
		<b>Z</b>
		<b>Q1Y</b>

Options	Order code
Add <b>"-Z"</b> to article number and specify order code.	
<b>Factory certificates</b>	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	<b>C11</b>
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	<b>C12</b>
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with wetted parts made of stainless steel 316 L and Hastelloy)	<b>C13</b>
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	<b>C15</b>
Certificate of FDA-approved fill oil to EN 10204-2.2	<b>C17</b>
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	<b>C20</b>
<b>Accessories</b>	
Remote seal nameplate Attached, made of stainless steel, contains article no. and order number of the remote seal	<b>D42</b>
Volume deflagration flame arrester (VDEF) • For gauge pressure and absolute pressure transmitters • For differential pressure and level transmitters	<b>D61</b> <b>D62</b>
<b>Negative pressure service</b>	
Negative pressure service • For gauge pressure and absolute pressure transmitters • For differential pressure transmitters	<b>D81</b> <b>D83</b>
Extended negative pressure service • For gauge pressure and absolute pressure transmitters • For differential pressure transmitters	<b>D85</b> <b>D88</b>
<b>Country-specific approval</b>	
CRN approval Canada (Canadian Registration Number) <b>Note:</b> If the order code E60 is selected, the option E60 must also be selected for the transmitter!	<b>E60</b>
<b>General product approvals without explosion proof approvals</b>	
Oil- and grease-free cleaned version for oxygen application including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	<b>E80</b>
Oil- and grease-free cleaned version not for oxygen application, including certificate EN 10204-2.2 (only with filling liquid Halocarbon oil)	<b>E87</b>
<b>Sealing surface</b>	
Sealing surface smooth, form B2/EN 1092-1 resp. RFSF/ANSI 16.5 (for wetted parts made of stainless steel 316L only)	<b>M50</b>
Sealing surface groove to EN 1092-1, form D (instead of sealing surface B1, for wetted parts made of stainless steel 316L only)	<b>M54</b>
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, for wetted parts made of stainless steel 316L only)	<b>M64</b>
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only) • DN 25 • DN 40 • DN 50 • DN 80 • DN 100 • DN 125	<b>M70</b> <b>M71</b> <b>M72</b> <b>M73</b> <b>M74</b> <b>M75</b>

Options	Order code
Add <b>"-Z"</b> to article number and specify order code.	
Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only) • DN 25 • DN 40 • DN 50 • DN 80 • DN 100 • DN 125	<b>M76</b> <b>M77</b> <b>M78</b> <b>M79</b> <b>M80</b> <b>M81</b>
Sealing surface with recess to EN 1092-1, form F (for wetted parts made of stainless steel 316L only) • DN 25 • DN 40 • DN 50 • DN 80 • DN 100 • DN 125	<b>M82</b> <b>M83</b> <b>M84</b> <b>M85</b> <b>M86</b> <b>M87</b>
<b>Capillary connection</b>	
For 7MF0900 • Single-side mounted at differential pressure transmitter at high side • Single-side mounted at differential pressure transmitter at low side • Cooling element	<b>S03</b> <b>S04</b> <b>S08</b>
<b>Capillary coating</b>	
PE protective tube • 1 m (38.37 inch) • 1.6 m (63 inch) • 2 m (78.7 inch) • 2.5 m (98.4 inch) • 3 m (118.1 inch) • 4 m (157.5 inch) • 5 m (196.9 inch) • 6 m (236.2 inch) • 7 m (275.6 inch) • 8 m (315 inch) • 9 m (354.3 inch) • 10 m (393.7 inch) • 11 m (433.1 inch); only for 7MF0902 • 12 m (472.4 inch); only for 7MF0902 • 13 m (511.811 inch); only for 7MF0902 • 14 m (551.2 inch); only for 7MF0902 • 15 m (590.6 inch); only for 7MF0902	<b>S10</b> <b>S11</b> <b>S12</b> <b>S13</b> <b>S14</b> <b>S15</b> <b>S16</b> <b>S17</b> <b>S18</b> <b>S19</b> <b>S20</b> <b>S21</b> <b>S22</b> <b>S23</b> <b>S24</b> <b>S25</b> <b>S26</b>
PTFE protective tube • 1 m (38.37 inch) • 1.6 m (63 inch) • 2 m (78.7 inch) • 2.5 m (98.4 inch) • 3 m (118.1 inch) • 4 m (157.5 inch) • 5 m (196.9 inch) • 6 m (236.2 inch) • 7 m (275.6 inch) • 8 m (315 inch) • 9 m (354.3 inch) • 10 m (393.7 inch) • 11 m (433.1 inch); only for 7MF0902 • 12 m (472.4 inch); only for 7MF0902 • 13 m (511.811 inch); only for 7MF0902 • 14 m (551.2 inch); only for 7MF0902 • 15 m (590.6 inch); only for 7MF0902	<b>S40</b> <b>S41</b> <b>S42</b> <b>S43</b> <b>S44</b> <b>S45</b> <b>S46</b> <b>S47</b> <b>S48</b> <b>S49</b> <b>S50</b> <b>S51</b> <b>S52</b> <b>S53</b> <b>S54</b> <b>S55</b> <b>S56</b>

## Pressure measurement

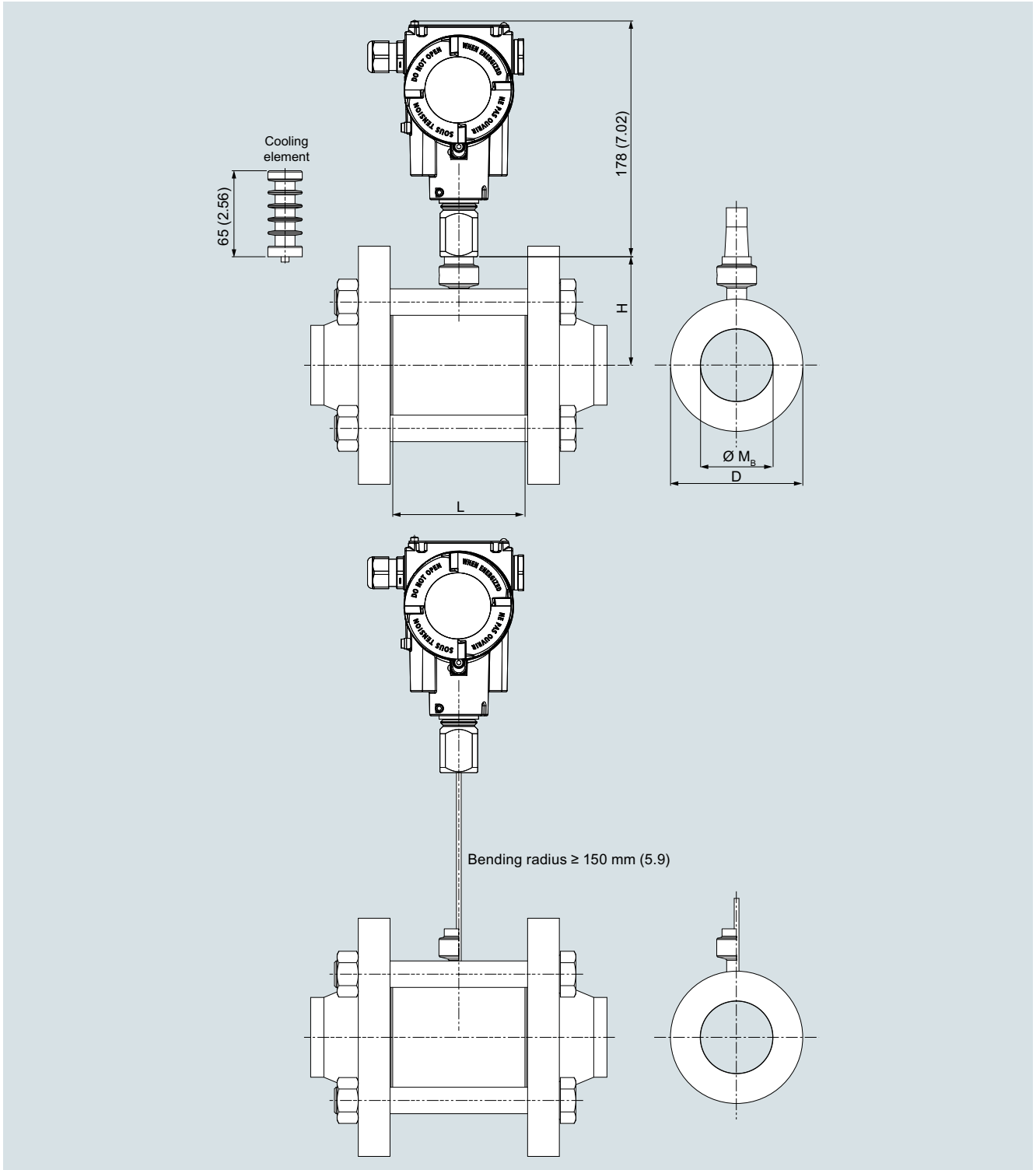
Remote seals for pressure transmitters  
SITRANS P320/P420

### Inline seals in sandwich design

Options	Order code
Add "-Z" to article number and specify order code.	
PVC protective tube	
• 1 m (38.37 inch)	<b>S70</b>
• 1.6 m (63 inch)	<b>S71</b>
• 2 m (78.7 inch)	<b>S72</b>
• 2.5 m (98.4 inch)	<b>S73</b>
• 3 m (118.1 inch)	<b>S74</b>
• 4 m (157.5 inch)	<b>S75</b>
• 5 m (196.9 inch)	<b>S76</b>
• 6 m (236.2 inch)	<b>S77</b>
• 7 m (275.6 inch)	<b>S78</b>
• 8 m (315 inch)	<b>S79</b>
• 9 m (354.3 inch)	<b>S80</b>
• 10 m (393.7 inch)	<b>S81</b>
• 11 m (433.1 inch); only for 7MF0902	<b>S82</b>
• 12 m (472.4 inch); only for 7MF0902	<b>S83</b>
• 13 m (511.811 inch); only for 7MF0902	<b>S84</b>
• 14 m (551.2 inch); only for 7MF0902	<b>S85</b>
• 15 m (590.6 inch); only for 7MF0902	<b>S86</b>
<b>Desired remote seal supplier</b>	
<u>Note:</u> If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	<b>W01</b>
Company Labom, Hude	<b>W02</b>
<b>Special design</b>	
Welded filling holes	<b>X01</b>
<b>Customer-specific tube length</b>	
Customer-specific tube length (specify in plain text in mm)	<b>Y44</b>
<b>Specification of process conditions<sup>1)</sup></b>	
Ambient temperature range	
• 10 ... +50 °C (50 ... +122 °F) preset	<b>D66</b>
• -40 ... +50 °C (-40 ... +122 °F)	<b>D67</b>
• -10 ... +85 °C (14 ... +185 °F)	<b>D68</b>
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>

<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/337.

**Dimensional drawings**



Inline seal for flange-mounting, installed on SITRANS P320/420 pressure transmitter, dimensions in mm (inch)

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

1

### Inline seals in sandwich design

#### Connection to EN 1092-1

DN mm	PN bar	D mm	Mb mm	L mm	H mm
25	6 ... 100	68	28.5	60	81
40		88	43.1	60	91
50		100	54.5	60	93
65		120	70.3	60	107
80		138	82.5	60	116
100		160	107.1	60	127
125		188	127	60	141

#### Connection according to ASME B16.5

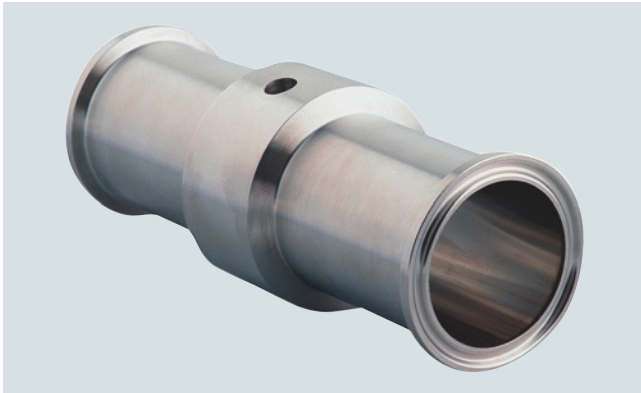
DN (inch)	Class	D mm (inch)	Mb mm (inch)	L mm (inch)	H mm (inch)
1	150 ... 2500	50 (1.97)	28.5 (1.12)	60 (2.36)	72 (2.83)
1½	150 ... 2500	73.5 (2.89)	43.1 (1.70)	60 (2.36)	84 (3.31)
2	150 ... 2500	91.9 (3.62)	54.5 (2.15)	60 (2.36)	93 (3.66)
2½	150 ... 2500	104.6 (4.12)	70.3 (2.77)	60 (2.36)	99 (3.9)
3	150 ... 2500	127 (5)	82.5 (3.25)	60 (2.36)	110 (4.33)
4	150 ... 2500	157.2 (6.19)	107.1 (4.22)	60 (2.36)	125 (4.92)
5	150 ... 2500	188 (7.4)	127 (5)	60 (2.36)	141 (5.55)



## Overview



Quick-release inline seals, according to DIN 11851 with threaded socket



Quick-release inline seals, with clamp connection

Quick-release inline seals can be supplied for the pressure transmitters of the SITRANS P320/420 series.

## Application

The quick-release inline seal is a special design for flowing and high-viscosity media. Because it is completely integrated in the process line, there are no turbulences, dead spaces or other obstacles in the flow direction. The medium flows almost unhindered through the inline seal and causes self-cleaning of the sample chamber. The inline seal is also piggybackable.

## Design

The quick-release lock is available in two versions:

- DIN 11851 with threaded socket
- Clamp connection

The inline seal is connected to the pressure transmitter either directly or via a capillary tube.

## Function

The measured pressure is transferred to the filling liquid by the measuring diaphragm located around the circumference inside the inline seal and enters the sample chamber of the pressure transmitter through the capillary. The filling fluid completely fills the inside of the inline seal, the capillary and the sample chamber of the pressure transmitter so that it is free of gas.

### Note:

A vacuum-resistant remote seal is recommended for low-pressure operation, including during commissioning (see ordering data).

## Technical specifications

### Quick-release inline seals for gauge pressure

Connection	Nominal diameter	Nominal pressure
• Standard of process connection DIN 11851 with thread	DN 25/32/40	PN 40
	DN 50/65/80	PN 25
• Standard of process connection clamp ISO 2852	DN 25/38/51	PN 16
	DN 63.5/76.1	PN 10
	1, 1½ inch	PN 25
	2, 2½ inch	PN 16
• Standard of process connection clamp DIN 32676, row C Tri-Clamp	3 inch	PN 10
	DN 25/32/40	PN 25
	DN 50	PN 16
• Standard of process connection clamp DIN 32676, row A metric	DN 65	PN 10

### Material

- Main body  
Stainless steel, mat. no. 1.4404/316L
- Capillary  
Stainless steel, mat. no. 1.4571/316Ti (with option W01) or mat. no. 1.4301/304
- Diaphragm  
Stainless steel, mat. no. 1.4404/316L

### Capillary

- Length  
≤ 10 m (32.8 ft)
- Internal diameter  
≤ 2 mm (0.079 inch)
- Minimum bending radius  
150 mm (5.9 inch)
- Sheath  
Flexible spiral coiled tube made of stainless steel, mat. no. 1.4404/316L

### Filling liquid

Food-grade oil (FDA grade)

### Permissible ambient temperature

Dependent on the pressure transmitter and the filling liquid of the remote seal.

### More information

In the technical specifications of the pressure transmitters and in the sections in the technical reference of the remote seals:

- "Function" - "Technical specifications of the remote seal filling liquids"
- "Additional information" - "Specification of process conditions for selection and ordering data"

### Weight

Approx. 4 kg (approx. 8.82 lb)

### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of Article 4, Paragraph 1 (annex 1); assigned to category III, conformity evaluation module H by the TÜV Nord

### EHEDG

Complies with EHEDG recommendations

## Pressure measurement


Remote seals for pressure transmitters


SITRANS P320/P420

### Quick-release inline seals

1

#### Selection and ordering data

		Article No.	Order code
<b>Quick-release inline seals</b>			
Flange type design, with flexible capillary tube or direct mounting on pressure transmitter			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> </ul>			
		<b>7MF0930 -</b>	
			
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			
<b>Nominal diameter</b>	<b>Nominal pressure</b>		
<u>Process connection standard DIN 11851 with thread</u>			
DN 25	PN 40	<b>1 BM</b>	
DN 32	PN 40	<b>1 CD</b>	
DN 40	PN 40	<b>1 DM</b>	
DN 50	PN 25	<b>1 EK</b>	
DN 65	PN 25	<b>1 FL</b>	
DN 80	PN 25	<b>1 GK</b>	
<u>Process connection standard Clamp ISO 2852</u>			
DN 25	PN 16	<b>2 BK</b>	
DN 38	PN 16	<b>2 CQ</b>	
DN 51	PN 16	<b>2 FH</b>	
DN 63.5	PN 10	<b>2 FJ</b>	
DN 76.1	PN 10	<b>2 GJ</b>	
<u>Process connection standard Clamp DIN 32676, row C Tri-Clamp</u>			
DN 1 inch	PN 25	<b>3 KV</b>	
DN 1½ inch	PN 25	<b>3 LV</b>	
DN 2 inch	PN 16	<b>3 MV</b>	
DN 2½ inch	PN 16	<b>3 NV</b>	
DN 3 inch	PN 10	<b>3 PV</b>	
<u>Process connection standard Clamp DIN 32676, row A metric</u>			
DN 25	PN 25	<b>4 BL</b>	
DN 32	PN 25	<b>4 CC</b>	
DN 40	PN 25	<b>4 DL</b>	
DN 50	PN 16	<b>4 EJ</b>	
DN 65	PN 10	<b>4 FK</b>	
Other version Add order code and plain text.		<b>9 AA</b>	<b>H 1 Y</b>

		Article No.	Order code
<b>Quick-release inline seals</b>			
Flange type design, with flexible capillary tube or direct mounting on pressure transmitter			
<ul style="list-style-type: none"> <li>SITRANS P320/P420 transmitter for gauge and absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately, Scope of delivery: 1 unit</li> </ul>			
		<b>7MF0930 -</b>	
			
<b>Transmitter connection</b>			
Without capillary tube, direct mount, straight connection (for gauge pressure transmitters)			
		<b>00</b>	
Connection via capillary tube			
Capillary length			
1 m (38.37 inch)		<b>10</b>	
1.6 m (63 inch)		<b>11</b>	
2 m (78.7 inch)		<b>12</b>	
2.5 m (98.4 inch)		<b>13</b>	
3 m (118.1 inch)		<b>14</b>	
4 m (157.5 inch)		<b>15</b>	
5 m (196.9 inch)		<b>16</b>	
6 m (236.2 inch)		<b>17</b>	
7 m (275.6 inch)		<b>18</b>	
8 m (315 inch)		<b>20</b>	
9 m (354.3 inch)		<b>21</b>	
10 m (393.7 inch)		<b>22</b>	
Other version Add order code and plain text.		<b>98</b>	<b>L 1 Y</b>
<b>Filling liquid</b>			
Food-grade oil (FDA grade)			
		<b>E</b>	
Other version Add order code and plain text.			
		<b>Z</b>	<b>P 1 Y</b>

# Pressure measurement

## Remote seals for pressure transmitters SITRANS P320/P420

### Quick-release inline seals

1

Options	Order code
Add " <b>Z</b> " to article number and specify order code.	
<b>Factory certificates</b>	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	<b>C11</b>
Inspection certificate to EN 10204-3.1 for material of body and diaphragm	<b>C12</b>
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	<b>C15</b>
Certificate of FDA-approved fill oil to EN 10204-2.2	<b>C17</b>
Factory certificate functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	<b>C20</b>
<b>Accessories</b>	
Remote seal nameplate	<b>D42</b>
Attached, made of stainless steel, contains article no. and order number of the remote seal	
<b>Negative pressure service</b>	
Negative pressure service for gauge pressure and absolute pressure transmitters	<b>D81</b>
Extended negative pressure service for gauge pressure and absolute pressure transmitters	<b>D85</b>
<b>Country-specific approval</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>
Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	
<b>Capillary connection</b>	
Single-side mounted at differential pressure transmitter at high side	<b>S03</b>
Single-side mounted at differential pressure transmitter at low side	<b>S04</b>
Cooling element	<b>S08</b>
<b>Capillary coating</b>	
PE protective tube	
• 1 m (38.37 inch)	<b>S10</b>
• 1.6 m (63 inch)	<b>S11</b>
• 2 m (78.7 inch)	<b>S12</b>
• 2.5 m (98.4 inch)	<b>S13</b>
• 3 m (118.1 inch)	<b>S14</b>
• 4 m (157.5 inch)	<b>S15</b>
• 5 m (196.9 inch)	<b>S16</b>
• 6 m (236.2 inch)	<b>S17</b>
• 7 m (275.6 inch)	<b>S18</b>
• 8 m (315 inch)	<b>S19</b>
• 9 m (354.3 inch)	<b>S20</b>
• 10 m (393.7 inch)	<b>S21</b>
PTFE protective tube	
• 1 m (38.37 inch)	<b>S40</b>
• 1.6 m (63 inch)	<b>S41</b>
• 2 m (78.7 inch)	<b>S42</b>
• 2.5 m (98.4 inch)	<b>S43</b>
• 3 m (118.1 inch)	<b>S44</b>
• 4 m (157.5 inch)	<b>S45</b>
• 5 m (196.9 inch)	<b>S46</b>
• 6 m (236.2 inch)	<b>S47</b>
• 7 m (275.6 inch)	<b>S48</b>
• 8 m (315 inch)	<b>S49</b>
• 9 m (354.3 inch)	<b>S50</b>
• 10 m (393.7 inch)	<b>S51</b>

Options	Order code
Add " <b>Z</b> " to article number and specify order code.	
PVC protective tube	
• 1 m (38.37 inch)	<b>S70</b>
• 1.6 m (63 inch)	<b>S71</b>
• 2 m (78.7 inch)	<b>S72</b>
• 2.5 m (98.4 inch)	<b>S73</b>
• 3 m (118.1 inch)	<b>S74</b>
• 4 m (157.5 inch)	<b>S75</b>
• 5 m (196.9 inch)	<b>S76</b>
• 6 m (236.2 inch)	<b>S77</b>
• 7 m (275.6 inch)	<b>S78</b>
• 8 m (315 inch)	<b>S79</b>
• 9 m (354.3 inch)	<b>S80</b>
• 10 m (393.7 inch)	<b>S81</b>
<b>Desired remote seal supplier</b>	
Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	<b>W01</b>
Company Labom, Hude	<b>W02</b>
<b>Special design</b>	
Welded filling holes	<b>X01</b>
<b>Customer-specific tube length</b>	
Customer-specific tube length (specify in plain text in mm)	<b>Y44</b>
<b>Specification of process conditions<sup>1)</sup></b>	
Ambient temperature range	
10 ... +50 °C (50 ... +122 °F) preset	<b>D66</b>
-40 ... +50 °C (-40 ... +122 °F)	<b>D67</b>
-10 ... +85 °C (14 ... +185 °F)	<b>D68</b>
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	<b>Y50</b>

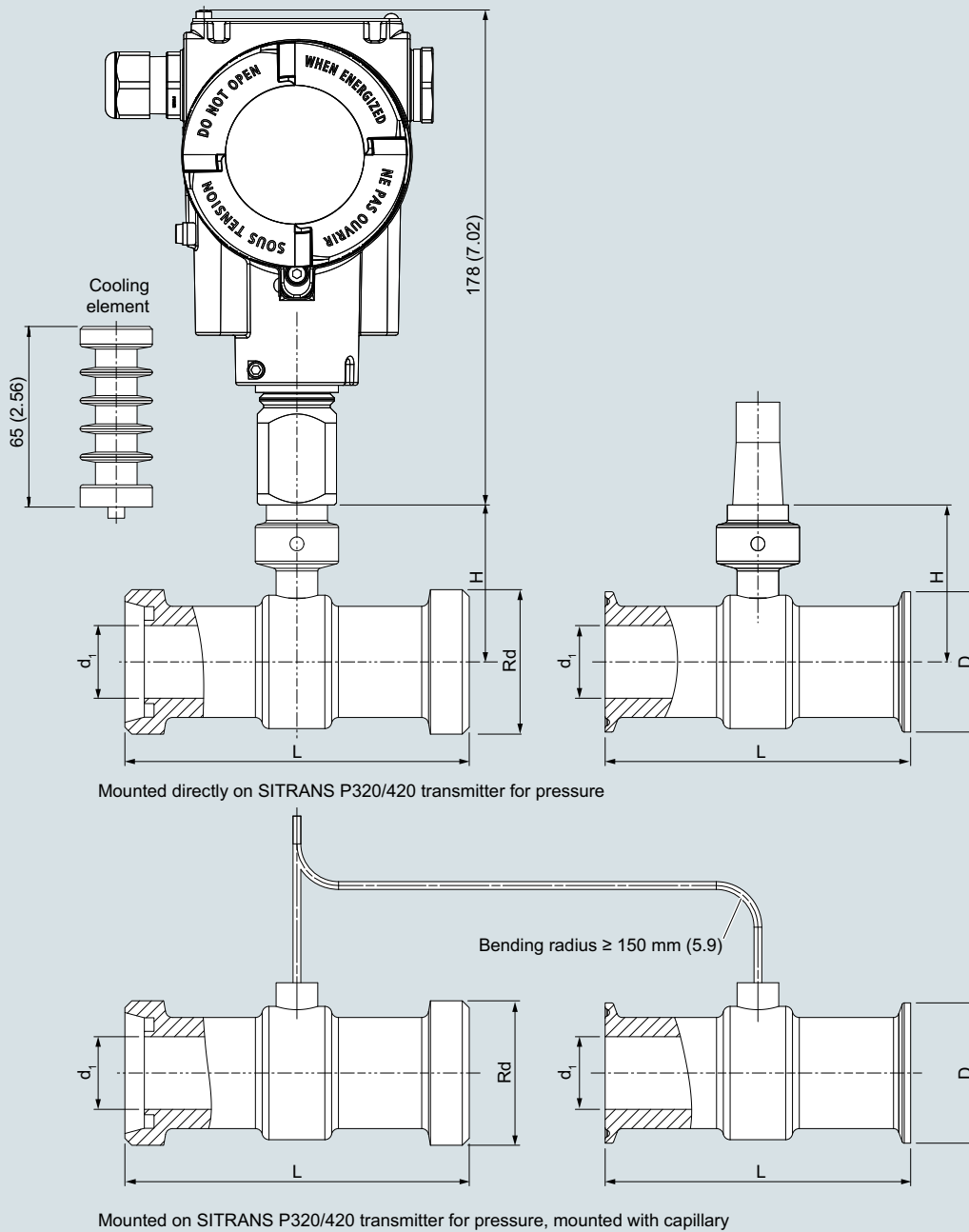
<sup>1)</sup> See also "Specification of process conditions for selection and ordering data" page 1/337.

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Quick-release inline seals

### Dimensional drawings



Quick-release inline seal, dimensions in mm (inch)

**Inline seals for pipes according to EN 10357 (DIN 11851)**

				Food connections			
				DIN 11851		DIN 32676	
Length		Internal diameter	Connection height	Nominal pressure	Round thread connection according to DIN 11851	Nominal pressure	Clamp connection according to DIN 32676
Nominal diameter	L [mm]	di (mm)	h (mm)		Thread Rd		D (mm)
DN 10	96	10	27.5	PN 40	28 x 1/8"	PN 16	34
DN 15	150	16	12	PN 40	34 x 1/8"	PN 16	34
DN 25	110	26	21	PN 40	52 x 1/6"	PN 16	50.5
DN 32	110	32	26	PN 40	58 x 1/6"	PN 16	50.5
DN 40	110	38	28.5	PN 40	65 x 1/6"	PN 16	50.5
DN 50	110	50	34	PN 25	78 x 1/6"	PN 16	64
DN 65	110	66	42	PN 25	95 x 1/6"	PN 10	91
DN 80	60	81	47.5	PN 25	110 x 1/4"	PN 10	106
DN 100	60	100	60	PN 25	130 x 1/4"	PN 10	119

**Inline seals for pipes according to BS 4825 Part 3 and O.D. Tube (suitable for pipes according to ASME-BPE)**

				Food connections				
				IDF according to ISO 2853		Clamp connection according to ISO 2852		
Length		Internal diameter	Connection height	Nominal pressure	IDF thread according to ISO 2853	Nominal pressure	Clamp connection according to ISO 2852	
Nominal diameter	L [mm]	di (mm)	h (mm)		IDF thread (Tr)		D (mm)	
1 inch	25.4 mm	110	22.2	21	PN 40	37 x 3.175	PN 16	50.5
1½ inch	38 mm	110	34.8	28.5	PN 40	50 x 3.175	PN 16	50.5
2 inch	51 mm	110	47.8	34	PN 25	64 x 3.175	PN 16	64
1½ inch	63.5 mm	110	60.3	38	PN 25	77.5 x 3.175	PN 16	77.5
3 inch	76.1 mm	60	72.9	44.5	PN 25	91 x 3.175	PN 10	91
4 inch	101.6 mm	60	97.6	59.5	PN 25	118 x 3.175	PN 10	119

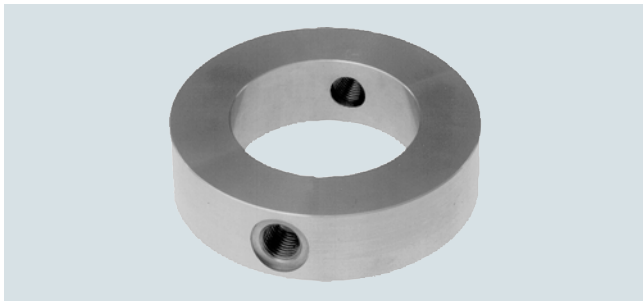
## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Flushing ring for diaphragm seals

1

#### Overview



Flushing rings are required for remote seals in flange and sandwich design (article numbers 7MF0800 ... 7MF0814) when the medium has a tendency to form deposits or blockages due to the process conditions and the geometry of the connection.

The ferrule is clamped in between the process flange and the remote seal.

Due to the lateral flushing holes, particles accumulated in front of the membrane can be washed away and the pressure space can be vented. Different nominal diameters and forms enable adaption to the relevant process flange.

#### Process connection

For flanges according to EN and ASME:  
DN 50, 80, 100, 125; PN 16 ... 100 or  
DN 2 inch, 3 inch, 4 inch, 5 inch; Class 150 ... 600

#### Standard version

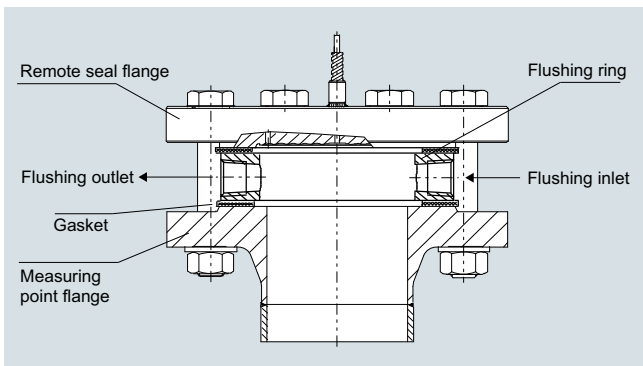
Material: CrNi steel, Mat. No. 1.4404/316L  
Sealing surfaces and flushing holes: See ordering data

#### Technical specifications

##### Flushing ring for remote seals in flange and sandwich designs

Nominal diameter	Nominal pressure
• DN 50	PN 16 ... PN 100
• DN 80	PN 16 ... PN 100
• DN 100	PN 16 ... PN 100
• DN 125	PN 16 ... PN 100
• 2 inch	Class 150 ... class 600
• 3 inch	Class 150 ... class 600
• 4 inch	Class 150 ... class 600
• 5 inch	Class 150 ... class 600
Sealing surface	Form B1
• According to EN 1092-1	Form B2
	Form D/Form D
	Form C/Form C
	Form D/Form C
	Form E
	Form F
• According to ASME B16.5	RF 125 ... 250 AA
	RFSF
	RJF ring groove
Flushing holes (2 units), female thread:	• G $\frac{1}{4}$
	• G $\frac{1}{2}$
	• $\frac{1}{4}$ -18 NPT
	• $\frac{1}{2}$ -14 NPT
Material	Stainless steel 1.4404/316L

#### Design



Example of installation

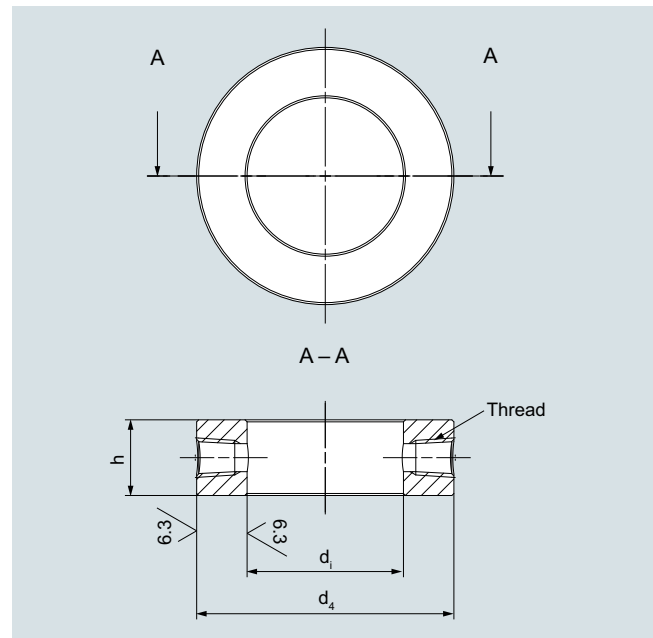
### Selection and ordering data

		Article No.	Order code
<b>Flushing ring</b>		<b>7MF 4 9 2 5 -</b>	
For remote seals 7MF0800 to 7MF0814		<b>1</b>	
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>			
<b>Nominal diameter</b>	<b>Nominal pressure</b>		
DN 50	PN 16 ... PN 100	<b>A</b>	
DN 80	PN 16 ... PN 100	<b>B</b>	
DN 100	PN 16 ... PN 100	<b>C</b>	
DN 125	PN 16 ... PN 100	<b>D</b>	
2 inch	Class 150 ... 600	<b>G</b>	
3 inch	Class 150 ... 600	<b>H</b>	
4 inch	Class 150 ... 600	<b>J</b>	
5 inch	Class 150 ... 600	<b>K</b>	
Only for RJF ring groove, 7MF4925-1*R....:			
2 inch	Class 150	<b>NR</b>	
3 inch	Class 150	<b>PR</b>	
4 inch	Class 150	<b>QR</b>	
5 inch	Class 150	<b>RR</b>	
2 inch	Class 300 ... 600	<b>UR</b>	
3 inch	Class 300 ... 600	<b>VR</b>	
4 inch	Class 300 ... 600	<b>WR</b>	
5 inch	Class 300 ... 600	<b>XR</b>	
Other version		<b>Z</b>	<b>J 1 Y</b>
Add order code and plain text:			
Nominal diameter: ..., Nominal pressure: ...			
<b>Sealing surface</b>			
EN 1092-1		<b>A</b>	
• Form B1		<b>C</b>	
• Form B2		<b>D</b>	
• Form C / Form C		<b>E</b>	
• Form D / Form C		<b>F</b>	
• Form D / Form D		<b>G</b>	
• Form E		<b>H</b>	
• Form F			
ASME B16.5			
• RF 125 ... 250 AA		<b>M</b>	
• RFSF		<b>Q</b>	
• RJF ring groove		<b>R</b>	
Other version		<b>Z</b>	<b>K 1 Y</b>
Add order code and plain text:			
Sealing surface: ...			
<b>Flushing holes (2 units)</b>			
Female thread G $\frac{1}{4}$		<b>1</b>	
Female thread G $\frac{1}{2}$		<b>2</b>	
Female thread $\frac{1}{4}$ -18 NPT		<b>3</b>	
Female thread $\frac{1}{2}$ -14 NPT		<b>4</b>	
<b>Material</b>			
Stainless steel, mat. no. 1.4404/316L		<b>0</b>	
Other version		<b>9</b>	<b>M 1 Y</b>
Add order code and plain text:			
Material: ...			
<b>Options</b>		<b>Order code</b>	
Add "-Z" to article number and specify order code.			
<b>Inspection certificate</b>		<b>C12</b>	
to EN 10204, section 3.1			

### Dimensional drawings

#### Connection to EN 1092-1

#### Form B1 and form B2



Flushing ring; sealing surface (EN 1092-1), form B1 and form B2

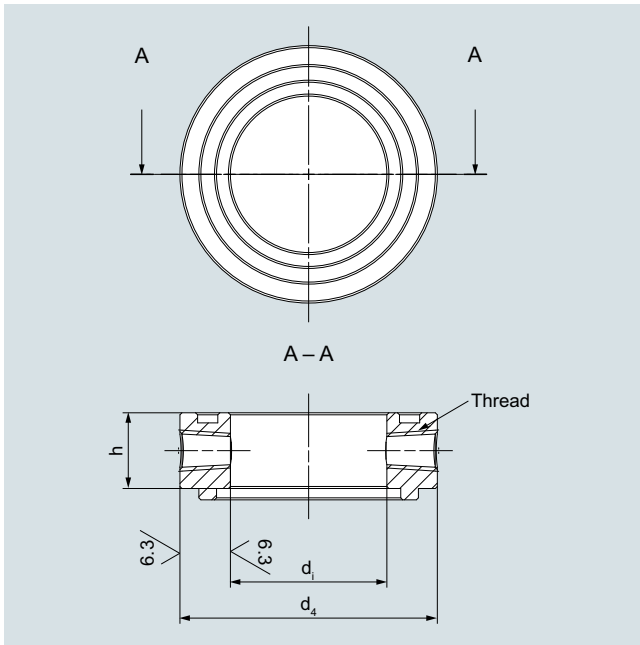
DN	PN	Thread	d <sub>4</sub>	d <sub>i</sub>	h	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	30 (1.18)	1.24 (2.73)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	30 (1.18)	1.99 (4.39)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	30 (1.18)	3.35 (7.39)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	30 (1.18)	3.38 (7.45)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	30 (1.18)	1.24 (2.73)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	30 (1.18)	1.99 (4.39)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	30 (1.18)	3.35 (7.39)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	30 (1.18)	3.38 (7.45)

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

### Flushing ring for diaphragm seals

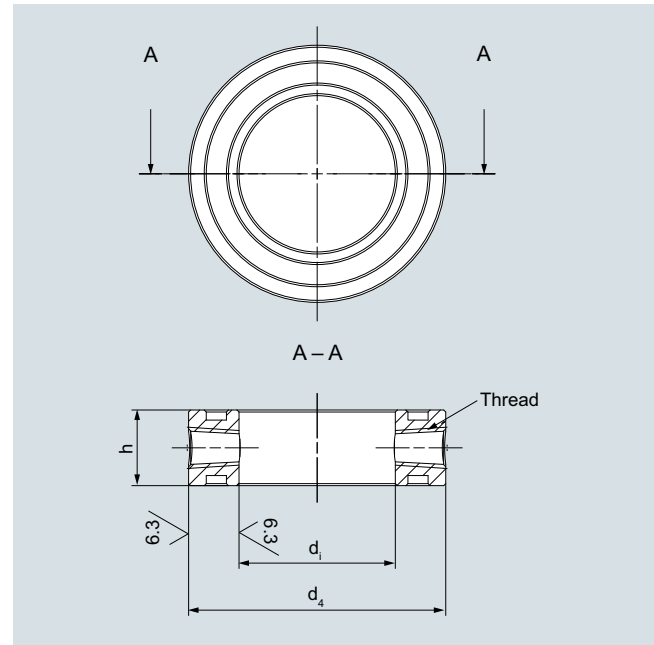
#### Form D / Form C



Flushing ring; sealing surface (EN 1092-1), form D/form C

DN mm	PN bar	Thread	d <sub>4</sub> Ø in mm (inch)	d <sub>i</sub> Ø in mm (inch)	h Ø in mm (inch)	Weight kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	35.5 (1.40)	1.46 (3.22)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	35.5 (1.40)	2.36 (5.2)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	35.5 (1.40)	3.96 (8.73)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	35.5 (1.40)	4.00 (8.82)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	40.5 (1.595)	1.67 (3.68)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	40.5 (1.595)	2.69 (5.93)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	40.5 (1.595)	4.52 (9.97)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	40.5 (1.595)	4.56 (10.05)

#### Form D / Form D



Flushing ring; sealing surface (EN 1092-1), form D/form D

DN mm	PN bar	Thread	d <sub>4</sub> Ø in mm (inch)	d <sub>i</sub> Ø in mm (inch)	h Ø in mm (inch)	Weight kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	40 (1.58)	2.66 (5.86)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	40 (1.58)	4.47 (9.86)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	40 (1.58)	4.50 (9.92)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	40 (1.58)	2.66 (5.86)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	40 (1.58)	4.47 (9.86)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	40 (1.58)	4.50 (9.92)



# Pressure measurement

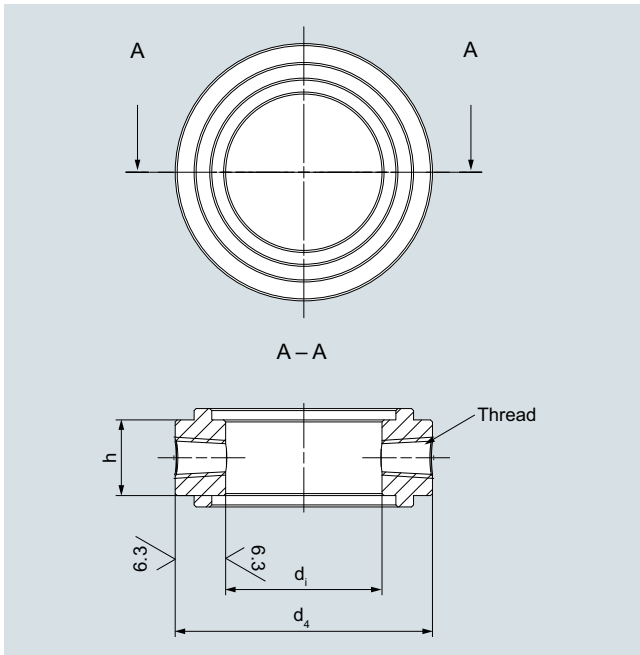
## Remote seals for pressure transmitters

### SITRANS P320/P420

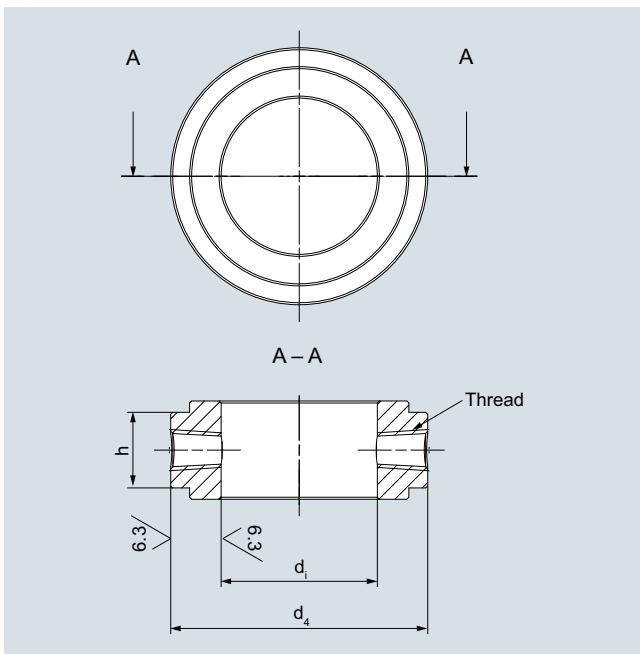
#### Flushing ring for diaphragm seals

1

#### Form C/form C and form E



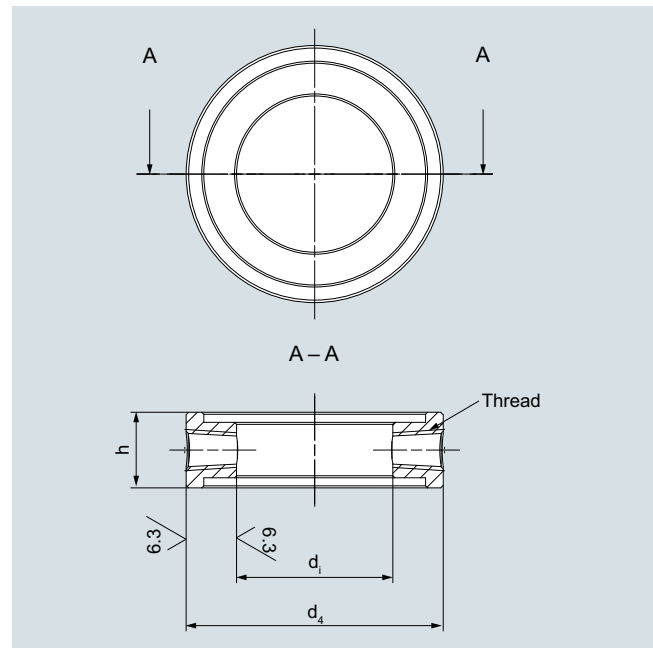
Flushing ring; sealing surface (EN 1092-1), form C/form C



Flushing ring; sealing surface (EN 1092-1), form E

DN mm	PN bar	Thread	d <sub>4</sub> Ø in mm (inch)	d <sub>i</sub> Ø in mm (inch)	h Ø in mm (inch)	x Ø in mm (inch)	f3 Ø in mm (inch)	Weight kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	31 (1.22)	87 (3.43)	4.5 (0.18)	1.49 (3.28)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	31 (1.22)	120 (4.72)	4.5 (0.18)	2.40 (5.29)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	30 (1.18)	149 (5.87)	5 (0.2)	4.21 (9.28)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	30 (1.18)	175 (6.89)	5 (0.2)	4.21 (9.28)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	31 (1.22)	87 (3.43)	4.5 (0.18)	1.49 (3.28)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	31 (1.22)	120 (4.72)	4.5 (0.18)	2.40 (5.29)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	30 (1.18)	149 (5.87)	5 (0.2)	4.21 (9.28)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	30 (1.18)	175 (6.89)	5 (0.2)	3.38 (7.45)

#### Form F



Flushing ring; sealing surface (EN 1092-1), form F

DN mm	PN bar	Thread	d <sub>4</sub> Ø in mm (inch)	d <sub>i</sub> Ø in mm (inch)	h Ø in mm (inch)	x Ø in mm (inch)	f3 Ø in mm (inch)	Weight kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	35 (1.38)	88 (3.46)	4 (0.16)	1.25 (2.76)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	35 (1.38)	121 (4.76)	4 (0.16)	2.02 (4.45)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	35 (1.38)	150 (5.91)	4.5 (0.18)	3.11 (6.86)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	35 (1.38)	175 (6.89)	4.5 (0.18)	3.19 (7.03)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	40 (1.58)	88 (3.46)	4 (0.16)	1.45 (3.2)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	40 (1.58)	121 (4.76)	4 (0.16)	2.35 (5.18)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	40 (1.58)	150 (5.91)	4.5 (0.18)	3.67 (8.09)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	40 (1.58)	175 (6.89)	4.5 (0.18)	3.76 (8.29)

## Pressure measurement

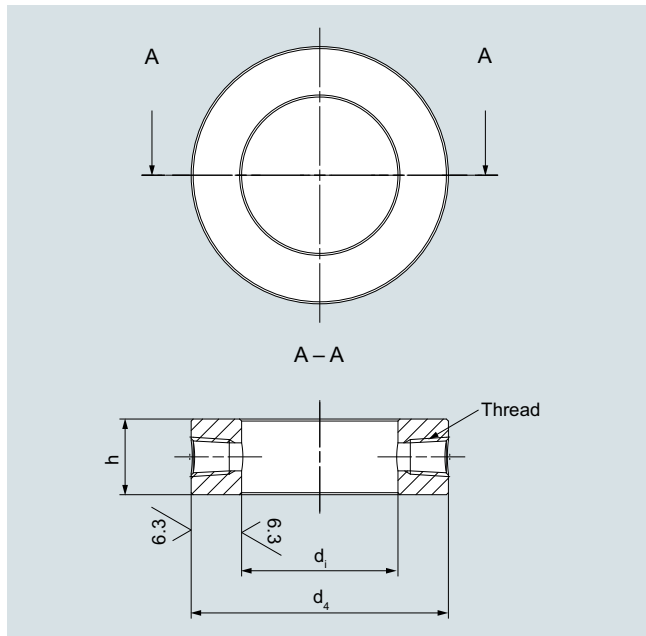
Remote seals for pressure transmitters  
SITRANS P320/P420

1

### Flushing ring for diaphragm seals

#### Connection according to ASME B 16.5

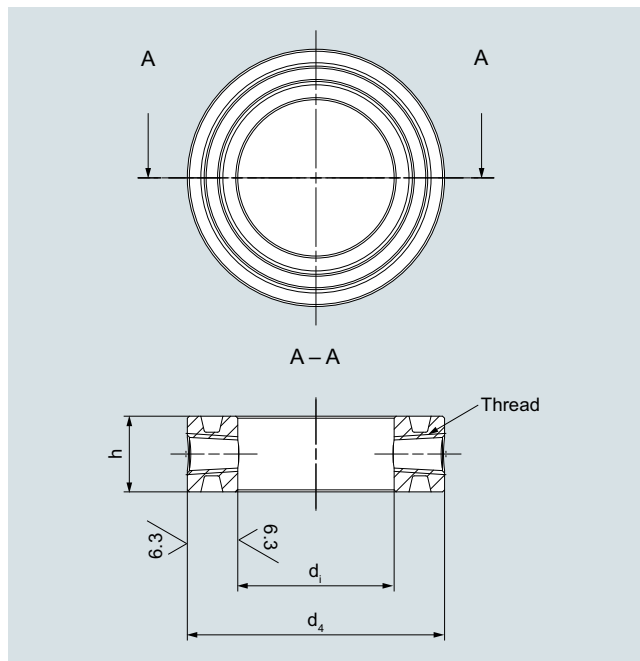
RFSF and RF 125 ... 250 AA



Flushing ring; sealing surface (ASME B 16.5), RFSF and RF 125 to 250 AA

DN Inch	Class	Thread	d <sub>4</sub> Ø in mm (inch)	d <sub>i</sub> Ø in mm (inch)	h Ø in mm (inch)	Weight kg (lb)
2	150 ... 600	¼ NPT	92 (3.62)	62 (2.44)	30 (1.18)	0.87 (1.92)
3	150 ... 600	¼ NPT	127 (5)	92 (3.62)	30 (1.18)	1.44 (3.17)
4	150 ... 600	¼ NPT	157 (6.18)	92 (3.62)	30 (1.18)	3.05 (6.72)
5	150 ... 600	¼ NPT	186 (7.32)	141 (5.55)	30 (1.18)	2.77 (6.11)
2	150 ... 600	½ NPT	92 (3.62)	62 (2.44)	30 (1.18)	0.87 (1.92)
3	150 ... 600	½ NPT	127 (5)	92 (3.62)	30 (1.18)	1.44 (3.17)
4	150 ... 600	½ NPT	157 (6.18)	92 (3.62)	30 (1.18)	3.05 (6.72)
5	150 ... 600	½ NPT	186 (7.32)	141 (5.55)	30 (1.18)	2.77 (6.11)

#### RJF ring groove



Flushing ring; sealing surface (ASME B 16.5), RJF ring groove

DN Inch	Class	Thread	d <sub>4</sub> Ø in mm (inch)	d <sub>i</sub> Ø in mm (inch)	h Ø in mm (inch)	Weight kg (lb)
2	150	¼ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
3	150	¼ NPT	133 (5.24)	92 (3.62)	40 (1.58)	2.32 (5.12)
4	150	¼ NPT	171 (6.73)	92 (3.62)	40 (1.58)	5.22 (11.51)
5	150	¼ NPT	194 (7.64)	141 (5.55)	40 (1.58)	4.46 (9.83)
2	150	½ NPT	102 (4.02)	62 (2.44)	46 (1.81)	1.90 (4.19)
3	150	½ NPT	133 (5.24)	92 (3.62)	46 (1.81)	2.66 (5.86)
4	150	½ NPT	171 (6.73)	92 (3.62)	46 (1.81)	6.00 (13.23)
5	150	½ NPT	194 (7.64)	141 (5.55)	46 (1.81)	5.13 (11.31)
2	300 ... 600	¼ NPT	108 (4.25)	62 (2.44)	40 (1.58)	1.96 (4.32)
3	300 ... 600	¼ NPT	146 (5.75)	92 (3.62)	40 (1.58)	3.23 (7.12)
4	300 ... 600	¼ NPT	175 (6.89)	92 (3.62)	40 (1.58)	5.57 (12.28)
5	300 ... 600	¼ NPT	210 (8.27)	141 (5.55)	40 (1.58)	6.08 (13.4)
2	300 ... 600	½ NPT	108 (4.25)	62 (2.44)	46 (1.81)	2.26 (4.98)
3	300 ... 600	½ NPT	146 (5.75)	92 (3.62)	46 (1.81)	3.71 (8.18)
4	300 ... 600	½ NPT	175 (6.89)	92 (3.62)	46 (1.81)	6.4 (14.11)
5	300 ... 600	½ NPT	210 (8.27)	141 (5.55)	46 (1.81)	7 (15.43)

### Overview

Examples of typical measuring arrangements for using the SITRANS P320/420 transmitter with and without remote seal are illustrated in this section.

Formulas for calculating lower range value and upper range value are listed for each example.

### Mounting

Remote seals in sandwich design are mounted between the connecting flange of the measuring point and a blank flange. Remote seals in flange design are mounted directly to the connecting flange of the measuring point. The respective pressure level of the blank flange or of the flange remote seal must be taken into consideration.

The pressure transmitter should be mounted below the connecting flange; pressure transmitters for differential pressure should be mounted below the bottom connecting flange. This arrangement must be selected in the negative pressure range.

For measurements in the overpressure range, the transmitter can also be mounted above the connecting flange.

For a good transmission characteristic, the capillaries between remote seal and pressure transmitter should be kept as short as possible.

### Shifting the measuring range

If the two connecting flanges are installed at different heights for measurements with two remote seals, additional differential pressure is generated due to the oil filling of the remote seal capillaries. This additional pressure causes a shift of the measuring range that has to be taken into consideration when setting the pressure transmitter.

A shift of the measuring range will also occur when you combine a remote seal with a pressure transmitter and when the remote seal is not installed at the height of the pressure transmitter.

### Pressure transmitter output

When level, interface or density increase in closed containers, the differential pressure and therefore the output signal of the pressure transmitter increases as well.

For a reverse relationship between differential pressure and output signal, the lower range value and upper range value must be reversed with SITRANS P320/420.

For open containers, an increasing pressure is usually assigned to an increase in level, interface or density.

### Effect of ambient temperature

Try to avoid temperature differences between the individual capillaries and the individual remote seals.

Temperature fluctuations in the area of the measuring unit cause a change in the volume of the fill fluid and therefore measuring errors.

### Notes

- For interface measurements, the interface must be located between the two nozzles. In addition, the fill level of the container must always be above the top nozzle.
- A constant level of the process medium is required for density measurement. The level should be above the top nozzle.

### Possible combinations of pressure transmitters and remote seals

Mounting types	Pressure transmitter	Remote seal
A/B	7MF030-... 7MF031-... 7MF040-... 7MF041-...	7MF0800-... 7MF0810-...
C <sub>1</sub> and C <sub>2</sub>	7MF032-... 7MF042-...	7MF0800-... 7MF0810-... (negative pressure service in all cases)
	7MF033-... 7MF043-...	7MF0801-... 7MF0811-...
D	7MF034-... 7MF035-... 7MF044-... 7MF045-...	7MF0802-... 7MF0812-...
E	7MF034-... 7MF035-... 7MF044-... 7MF045-...	7MF0813-...
G, H and J	7MF034-... 7MF035-... 7MF044-... 7MF045-...	7MF0802-... 7MF0812-...

## Pressure measurement

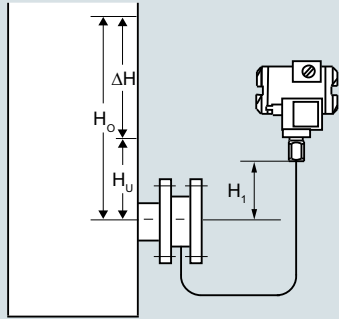
Remote seals for pressure transmitters  
SITRANS P320/P420

### Measuring setups with remote seal

#### Dimensional drawings

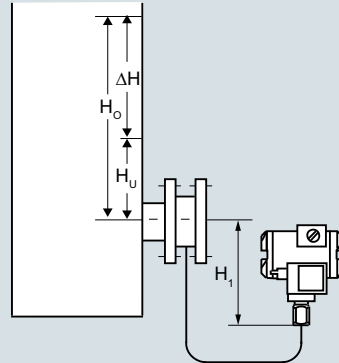
##### Mounting types for gauge pressure and level measurements (open vessels)

Installation type A



Pressure transmitter  
above the measuring point

Installation type B



Pressure transmitter  
below the measuring point

$H_1 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling liquid only  $H_1 \leq 4 \text{ m (13.1 ft)}$

##### Installation type A

Lower range value:  $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{OIL} \cdot g \cdot H_1$

Upper range value:  $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{OIL} \cdot g \cdot H_1$

##### Installation type B

Lower range value:  $p_{MA} = \rho_{FL} \cdot g \cdot H_U + \rho_{OIL} \cdot g \cdot H_1$

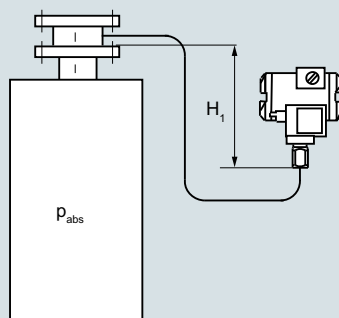
Upper range value:  $p_{ME} = \rho_{FL} \cdot g \cdot H_O + \rho_{OIL} \cdot g \cdot H_1$

##### Legend

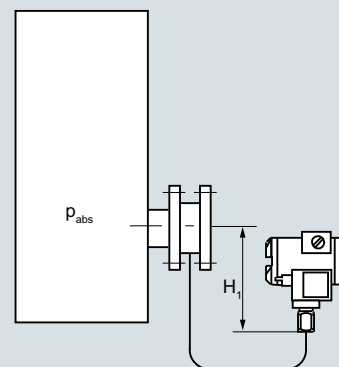
$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$\rho_{FL}$	Density of medium in vessel
$\rho_{OIL}$	Density of filling oil in the capillary to the remote seal
$g$	Local acceleration due to gravity
$H_U$	Lower range value
$H_O$	Upper range value
$H_1$	Distance between vessel flange and pressure trans.

##### Mounting type for absolute pressure measurements (closed vessels)

Installation type C<sub>1</sub>



Installation type C<sub>2</sub>



Pressure transmitter for absolute pressure always below the measuring point:  $H_1 \geq 200 \text{ mm (7.9 inch)}$

##### Installation type C<sub>1</sub> and C<sub>2</sub>

Lower range value:  $p_{MA} = p_{START} + \rho_{OIL} \cdot g \cdot H_1$

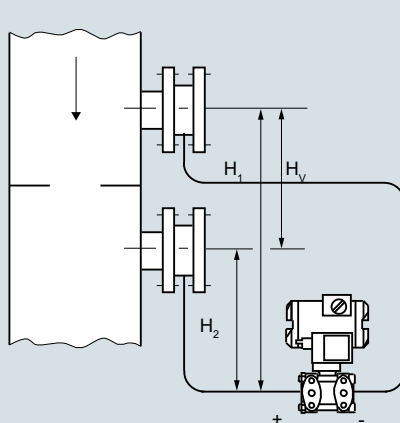
Upper range value:  $p_{ME} = p_{END} + \rho_{OIL} \cdot g \cdot H_1$

##### Legend

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$p_{START}$	Lower range value
$p_{END}$	Upper range value
$\rho_{OIL}$	Density of filling oil in the capillary to the remote seal
$g$	Local acceleration due to gravity
$H_1$	Distance between vessel flange and pressure trans.

##### Mounting types for differential pressure and flow measurements

Installation type D Filter monitoring



##### Installation type D

Lower range value:  $p_{MA} = p_{START} - \rho_{OIL} \cdot g \cdot H_V$

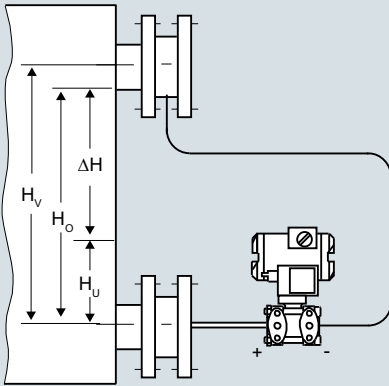
Upper range value:  $p_{ME} = p_{END} - \rho_{OIL} \cdot g \cdot H_V$

##### Legend

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$p_{START}$	Lower range value
$p_{END}$	Upper range value
$\rho_{OIL}$	Density of filling oil in the capillary to the remote seal
$g$	Local acceleration due to gravity
$H_V$	Distance between the measuring points (spigots)

**Mounting type for level measurements (closed vessels)**

Installation type E



Installation type E

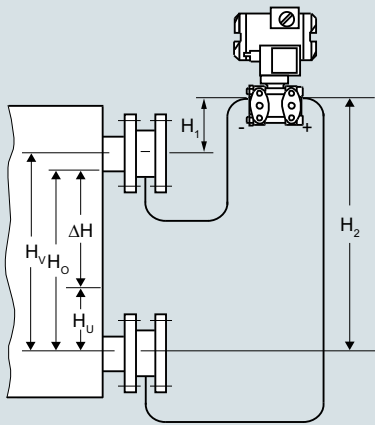
Lower range value:  $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{OIL} \cdot g \cdot H_V$

Upper range value:  $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{OIL} \cdot g \cdot H_V$

**Legend**

- $p_{MA}$  Lower range value to be set
- $p_{ME}$  Upper range value to be set
- $\rho_{FL}$  Density of medium in vessel
- $\rho_{OIL}$  Density of filling oil in the capillary to the remote seal
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)

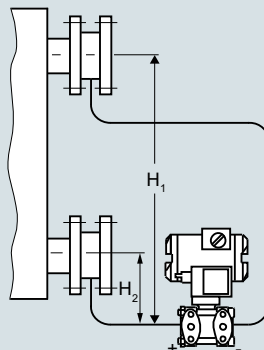
Installation type G



Pressure transmitter for differential pressure above the upper measuring point, no vacuum

$H_2 \leq 7$  m (23 ft), with halocarbon oil as filling liquid only  $H_1 \leq 4$  m (13.1 ft)

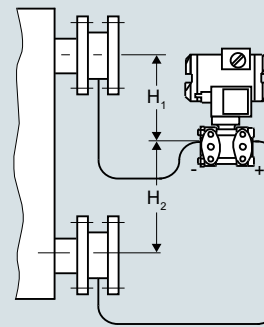
Installation type H



below the lower measuring point

Installation type for vacuum applications

Installation type J



between the measuring points, no vacuum

$H_2 \leq 7$  m (23 ft), with halocarbon oil as filling liquid only  $H_2 \leq 4$  m (13.1 ft)

Installation type G, H and J

Lower range value:

$p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{OIL} \cdot g \cdot H_V$

Upper range value:

$p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{OIL} \cdot g \cdot H_V$

**Legend**

- $p_{MA}$  Lower range value to be set
- $p_{ME}$  Upper range value to be set
- $\rho_{FL}$  Density of medium in vessel
- $\rho_{OIL}$  Density of filling oil in the capillary to the remote seal
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)

## Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

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### Measuring setups without remote seal

#### Overview

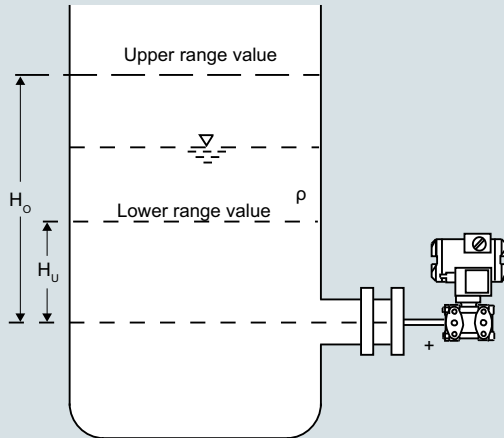
##### Notes

- For interface measurements, the interface must be located between the two nozzles. In addition, the fill level of the container must always be above the top nozzle.
- A constant level of the process medium is required for density measurement. The level should be above the top nozzle.

#### Dimensional drawings

##### Pressure transmitters for differential pressure for flanging

###### Measuring arrangements for open containers



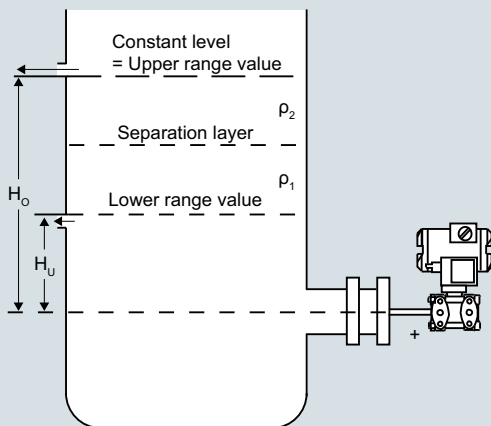
##### Level measurement

$$\text{Lower range value: } p_{MA} = \rho \cdot g \cdot H_U$$

$$\text{Upper range value: } p_{ME} = \rho \cdot g \cdot H_O$$

##### Legend

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$\rho$	Density of medium in vessel
$g$	Local acceleration due to gravity
$H_U$	Lower range value
$H_O$	Upper range value



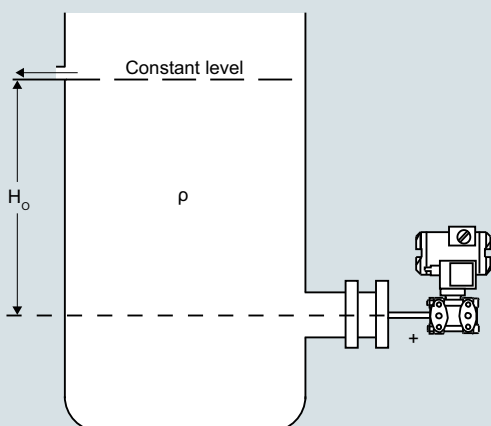
##### Separation layer measurement

$$\text{Lower range value: } p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2)$$

$$\text{Upper range value: } p_{ME} = \rho_1 \cdot g \cdot H_O$$

##### Legend

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$\rho_1$	Density of heavier liquid
$\rho_2$	Density of lighter liquid
$g$	Local acceleration due to gravity
$H_U$	Lower range value
$H_O$	Upper range value



##### Density measurement

$$\text{Lower range value: } p_{MA} = \rho_{MIN} \cdot g \cdot H_O$$

$$\text{Upper range value: } p_{ME} = \rho_{MAX} \cdot g \cdot H_O$$

##### Legend

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$\rho_{MIN}$	Minimum density of medium in vessel
$\rho_{MAX}$	Maximum density of medium in vessel
$g$	Local acceleration due to gravity
$H_O$	Upper range value in m

Measuring arrangements for closed containers

**Level measurement, Version 1**

Lower range value:  $\Delta p_{MA} = \rho \cdot g \cdot H_U$   
Upper range value:  $\Delta p_{ME} = \rho \cdot g \cdot H_O$

**Legend**

- $\Delta p_{MA}$  Lower range value to be set
- $\Delta p_{ME}$  Upper range value to be set
- $\rho$  Density of medium in vessel
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value

**Level measurement, Version 2**

Lower range value:  $\Delta p_{MA} = g \cdot (H_U \cdot \rho - H_V \cdot \rho')$   
Upper range value:  $\Delta p_{ME} = g \cdot (H_O \cdot \rho - H_V \cdot \rho')$

**Legend**

- $\Delta p_{MA}$  Lower range value to be set
- $\Delta p_{ME}$  Upper range value to be set
- $\rho$  Density of medium in vessel
- $\rho'$  Density of liquid in the negative pressure line (corresponding to the temperature existing there)
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)

# Pressure measurement

Remote seals for pressure transmitters  
SITRANS P320/P420

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## Measuring setups without remote seal

**Level measurement, Version 3**

Lower range value:  $\Delta p_{MA} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_U}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

Upper range value:  $\Delta p_{ME} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_O}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

**Legend**

- $\Delta p_{MA}$  Lower range value to be set
- $\Delta p_{ME}$  Upper range value to be set
- $\rho$  Density of medium in vessel
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)

The pressure measuring range ( $\pm$  level) will be calculated by subtraction of measuring range of transmitter 1 minus measuring range of transmitter 2 in the process control system.

Pressure transmitters for differential pressure for flanging, measuring arrangement for closed containers, level measurement

**Separation layer measurement**

Lower range value:  $\Delta p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2 - H_V \cdot \rho'_2)$

Upper range value:  $\Delta p_{ME} = g \cdot (H_O \cdot \rho_1 - H_V \cdot \rho'_2)$

**Legend**

- $\Delta p_{MA}$  Lower range value to be set
- $\Delta p_{ME}$  Upper range value to be set
- $\rho_1$  Density of heavier liquid with separation layer in vessel
- $\rho_2$  Density of lighter liquid with separation layer
- $\rho'_2$  Density of liquid in the negative pressure line (corresponding to the temperature existing there)
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)



## Overview

In many cases the pressure transmitter and the medium have to be physically separated. It is then necessary to use a remote seal.

The remote seals can be used with the following SITRANS P pressure transmitter series:

- Gauge pressure
  - P300 with HART, PROFIBUS PA, FOUNDATION Fieldbus
  - DS III with HART, PROFIBUS PA, FOUNDATION Fieldbus
  - P410 with HART, PROFIBUS PA, FOUNDATION Fieldbus
- Absolute pressure
  - P300, DS III with HART
  - DS III with PROFIBUS PA
  - DS III with FOUNDATION Fieldbus
- Differential pressure and flow
  - DS III with HART, PROFIBUS PA, FOUNDATION Fieldbus
  - P410 with HART, PROFIBUS PA, FOUNDATION Fieldbus
  - P500 with HART

## Note

When configuring your remote seal, be sure to read the information about transmission response, temperature error and response time to be found in the sections "Function" and "Technical data". Only then will the remote seal work to optimum effect.

## Benefits

- No direct contact between the pressure transmitter and the medium
- Individual configuration of the pressure transmitter for perfect adaptation to the operating conditions
- Available in many versions
- Specially designed for difficult operating conditions
- Quick-release versions available for the food industry

## Application

Remote seal systems should be used if a separation between the medium and the measuring instrument is essential or appropriate.

Examples of such cases:

- The temperature of the medium is outside the limits specified for the pressure transmitter.
- The medium is corrosive and requires diaphragm materials which are not available for the pressure transmitter.
- The medium is highly viscous or contains solids which would block the measuring chambers of the pressure transmitter.
- The medium may freeze in the measuring chambers or pulse line.
- The medium is heterogeneous or fibrous.
- The medium tends towards polymerization or crystallization.
- The process requires quick-release remote seals, as necessary e.g. in the food industry for fast cleaning.
- The process requires cleaning of the measuring point, e.g. in a batch process.

## Design

A remote seal system consists of the following components.

- Pressure transmitter
- One or two remote seals
- Filling liquid
- Connection between pressure transmitter and remote seal (direct mounting or by means of capillary)

The space for the medium is sealed off with a flat embedded elastic diaphragm. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary must be connected between the remote seal and the pressure transmitter in order, for example, to reduce the temperature effects on the pressure transmitter when the measured medium is hot.

However, the capillary influences the activation time and the temperature response of the overall remote seal system. When capillaries are used to connect a remote seal to a pressure transmitter for differential pressure, two capillaries of equal length must always be used.

Optionally, the remote seal with diaphragm extension (tube) can be ordered.

The remote seals in sandwich design are secured with a blank flange.

## Designs

### Diaphragm seal

With diaphragm seals, the pressure is measured by means of a flat diaphragm which rests in a bed.

The following types of diaphragm seals exist:



Diaphragm seal of sandwich design without (left) and with a projecting diaphragm (tube)

- Sandwich design
- Sandwich design with projecting diaphragm (tube) to DIN or ASME which are secured using a dummy flange.



Diaphragm seal of flange design without (left) and with a projecting diaphragm (tube)

- Flange design
- Flange design with projecting diaphragm (tube) to DIN or ASME, secured using holes in the flange.



Quick-release diaphragm seal

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

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### Technical description

- Quick-release remote seals, e.g. to DIN 11851, SMS standard, IDF standard, APV RJF standard, clamp connection, etc.
- Miniature diaphragm seal with male thread for screwing into tapped holes
- Remote seals with customer-specific process connections

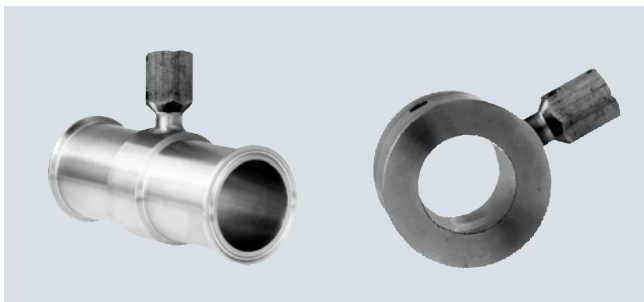


Miniature diaphragm seal with diaphragm flush with front

- Miniature diaphragm seals

The quick-release remote seals are used above all in the food industry. Their design means that the medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

#### Inline seal



Inline seal with quick-release design (left) and for flange mounting

With inline seals, the pressure is first measured using a cylindrical diaphragm positioned in a pipe, and then transmitted to the pressure transmitter by means of the filling liquid.

The inline seal is a special design for flowing media. It consists of a cylindrical pipe in which a cylindrical diaphragm is embedded. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. Furthermore, the inline seal can be cleaned by a pig.

The following types of inline seals exist:

- Quick-release inline seals, e.g. to DIN 11851, SMS standard, IDF standard, APV/RJF standard, clamp connection etc. The quick-release facility attached to the remote seal enables the seal to be removed quickly for cleaning purposes.
- Inline seals for flanging to EN or ASME.
- Inline seals with customer-specific process connections.

#### **Note:**

The pressure data on the transmitter and the remote seal must be observed with regard to pressure/temperature behavior.

### Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the transmitter, are filled gas-free by the filling liquid.

#### **Transmission response**

The transmission response of a remote seal is characterized by the following variables:

- Temperature error
- Adjustment time

#### Temperature error

Temperature errors are caused by the change of volume of the filling liquid due to temperature variations. To select the right remote seal you must calculate the temperature error.

Below you will find an overview of the factors which influence the size of the temperature error, as well as information on how to calculate the temperature error.

The temperature error is dependent on the following variables:

- Rigidity of the diaphragm used
- Filling liquid used
- Influence of the filling liquid underneath the process flanges or in the connection shank of the pressure transmitter
- Internal diameter of the capillary: The bigger the internal diameter, the bigger the temperature error
- Length of the capillary: The longer the capillary, the bigger the temperature error

#### Diaphragm rigidity

The rigidity of the diaphragm is of decisive importance. The bigger the diameter of the diaphragm, the softer the diaphragm and the more sensitively it reacts to temperature-induced changes in volume of the filling liquid.

The result is that small measuring ranges are only possible with large diaphragm diameters.

Other factors apart from diaphragm rigidity which also play a role:

- Diaphragm thickness
- Diaphragm material
- Coatings if present

#### Filling liquid

Every filling liquid reacts to temperature variations with a change of volume. Temperature errors can be minimized by selecting a suitable filling liquid, but the filling liquid must also be appropriate for the temperature limits and operating pressure. Furthermore, the filling liquid must also be physiologically harmless.

Since the filling liquid is present under the diaphragm, in the capillary and under the process flange of the pressure transmitter (or in the connection shank), the temperature error must be calculated separately for each combination.

#### **Note:**

A vacuum-resistant remote seal is recommended for continuous low-pressure operation at 500 mbar or below, including during commissioning (see ordering data).

An example of a temperature error calculation can be found in the section "Technical Specifications".

### Response time

The response time is dependent on the following factors:

- Internal diameter of the capillary: The bigger the internal diameter, the shorter the response time
- Viscosity of the filling liquid: The greater the viscosity, the longer the response time
- Length of the capillary: The longer the capillary, the longer the response time
- Pressure in the pressure measuring system: The higher the pressure, the shorter the response time

### Recommendations

The following should be observed to obtain an optimum combination of transmitter and remote seal:

- Choose the biggest possible diameter for the remote seal. The effective diameter of the seal diaphragm is then bigger and the temperature error smaller.
- Choose the shortest possible capillary. The response time is then shorter and the temperature error smaller
- Choose the filling liquid with the least viscosity and the smallest coefficient of expansion. Make sure, however, that the filling liquid meets the process requirements with regard to pressure, vacuum and temperature. And ensure that the filling liquid and the medium are compatible with one another.
- Note the following points for use in the vacuum range:
  - The pressure transmitter must always be positioned below the lowest spigot.
  - The operating range of some filling liquids is very limited with regard to the permissible temperature of the medium.
  - A vacuum-proof seal is necessary for continuous operation in the low-pressure range.
- Recommendations for the minimum measuring span can be found in the section "Technical data".

### **Note**

The remote seals listed here are a selection of the most common designs. On account of the large variety of process connections, certain remote seals which are not listed here may be available nevertheless.

Other versions can be:

- Other process connections, standards
- Aseptic or sterile connections
- Other dimensions
- Other nominal pressures
- Special diaphragm materials, including coatings
- Other sealing faces
- Other filling liquids
- Other capillary lengths
- Sheathing of capillaries with protective hose
- Calibration at higher/lower temperatures etc.

**Please contact your local Siemens office for further information.**

### **Negative pressure service**

Liquids, such as silicone oils, inert or those suitable for food, are used in remote seal systems for transmission of the process pressure to the pressure transmitter.

In each liquid, particles have the tendency to leave the liquid compound with increasing temperature (transition from liquid to gaseous aggregate state). This means the vapor pressure increases with increasing temperature and is dependent on the substance or mixture being present.

The higher the temperature and the lower the associated process pressure in the liquid, the more difficult it gets to guarantee the desired transmission properties of the fill fluid and therefore the measuring arrangement.

Plus the sealing elements at the transmitter must be designed so that a diffusion of molecules from the atmosphere into the remote seal system is prevented due to the constantly occurring negative pressure.

In addition to the influencing variables process pressure and process temperature, the vapor pressure curve of the fill fluid at the remote seal end and the stiffness of the remote seal membrane impact the functionality of the remote seal in the negative pressure range.

This means you have to pay special attention to the physical properties of fill fluids with applications in the negative pressure range.

There are three stages for the negative pressure resistance:

- **Standard design** of the remote seal without additional protective measures, suitable for the overpressure range and low negative pressure range. This design is identified with (1) in the diagrams below in section 3.
- **Negative pressure service** with suitable seals and treated fill fluid, identified with (2) in the diagrams below in section 3. Here you select the order codes V01, V03 or V04, depending on the mounting type.
- **Extended negative pressure service** with more extended treatment of the fill fluid and the remote seals, identified in the diagrams below. Here you select the order codes V51, V53 or V54, depending on the mounting type.

There are two more areas in the diagrams. The area (4) identifies an area that has to be clarified with Technical Support prior to placing the order. The area (5) describes the area in which the remote seal fill fluid is permanently destroyed and the entire remote seal is therefore without function.

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Technical description

Technical specifications of the remote seal filling liquids

Filling liquid	Number in the Article No.	Density at 20°C [kg/dm <sup>3</sup> ]	Viscosity at 20°C [mm <sup>2</sup> /s]	Suitable for negative pressure service	Suitable for extended negative pressure service
Silicone oil M5	1	0,914	4	x	-
Silicone oil M50	2	0,966	50	x	x
High-temperature oil	3	1,070	57	x	x
Halocarbon oil	4	1,968	14	x	-
Food oil (FDA-listed)	7	0,920	10	x	x

The suitable negative pressure service is specified with the pressure/temperature curves of the respective liquids described below.

**Note:** For reasons of operational safety, the transmitter must not exceed the height of the remote seal - with differential pressure applications, the height of the bottom remote seal - for measurements in the negative pressure range. The associated installation types B, C1, C2 or H are described at the end of this section under the topic "Measuring arrangements".

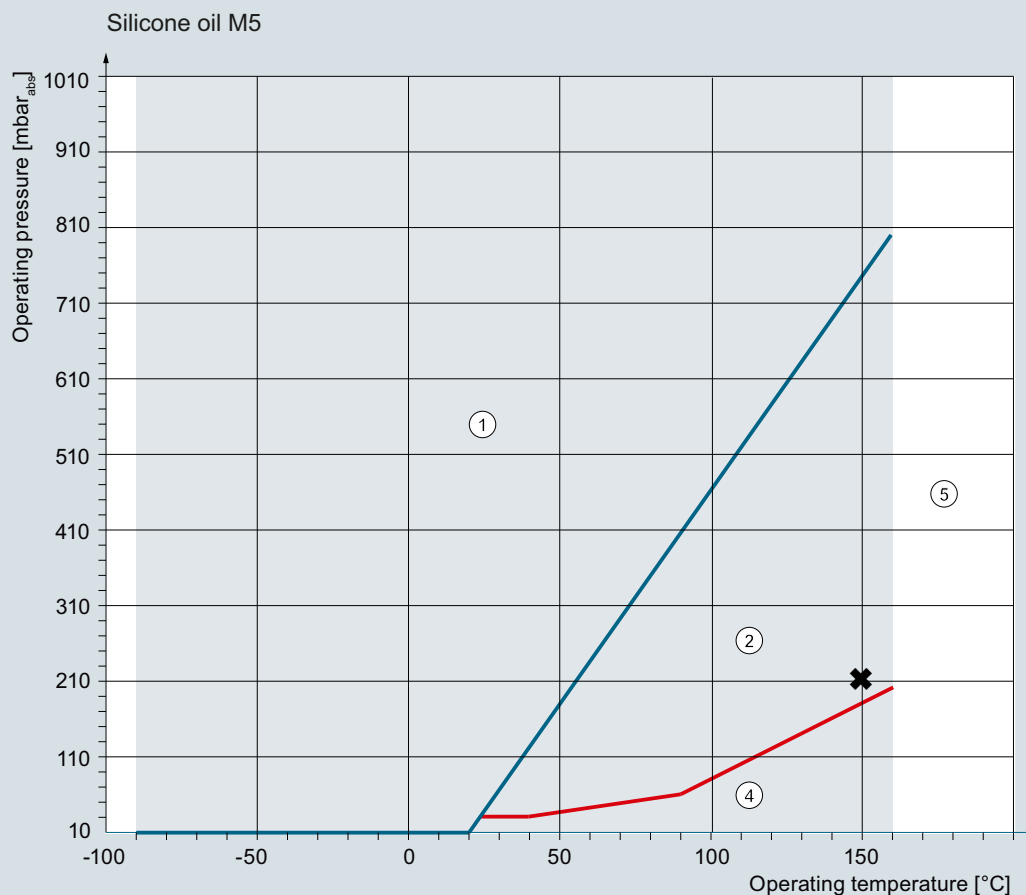
#### Selection of the required negative pressure service

The procedure for determining the required negative pressure service is described below using the silicone oil M5 as fill fluid. The minimum existing process pressure of a fictitious process is 200 mbar<sub>abs</sub> (2.9 psi) (at a maximum process temperature of 150 °C (302 °F)). This intersection is identified by an "✱" in the diagram below. This means the negative pressure service V01, V03 or V04 (depending on the application) is sufficient in this example.

The suitable negative pressure resistance is determined this way for all other fill fluids.

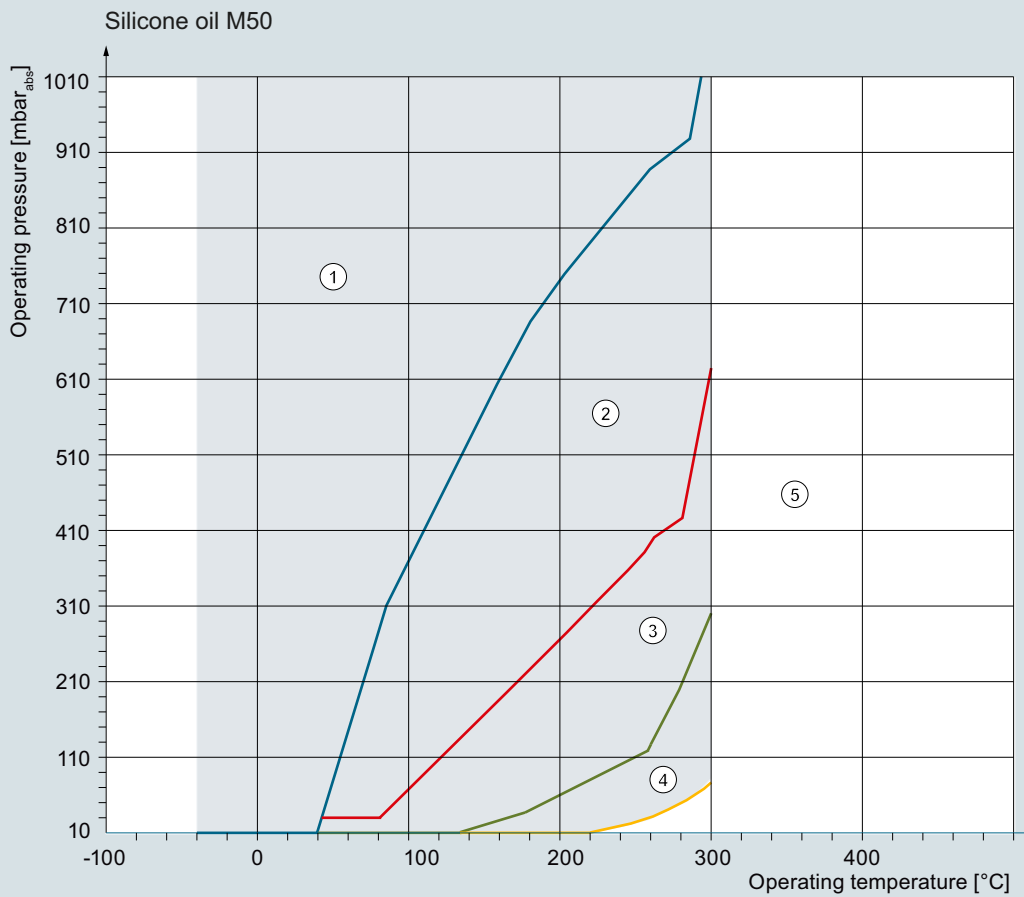
#### Note:

Note the response times according to the table on page 1/413.



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.  
Note: An extended negative pressure service is **not** possible for this fill fluid.
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 160 °C  
Min. temperature limit: -90 °C



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.
- ③ Operating range for which the **extended negative pressure service V51, V53 or V54** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

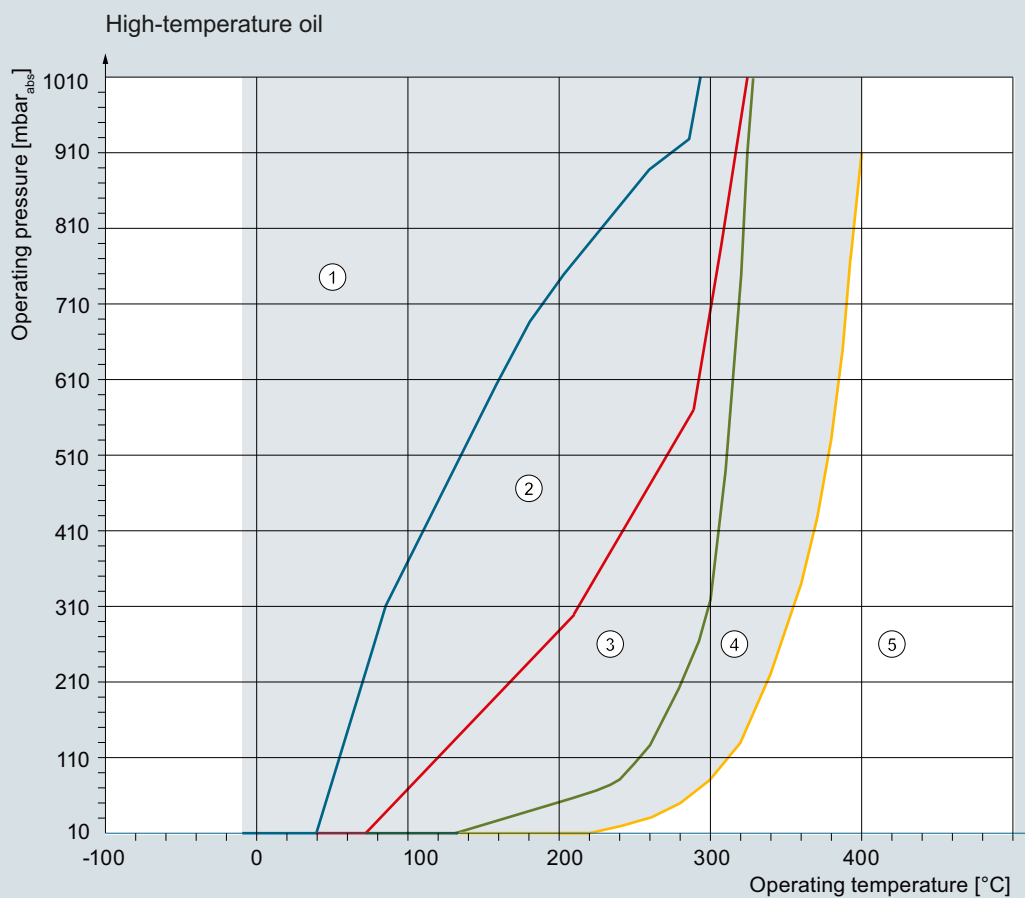
Permissible operating range:  
Max. temperature limit: 300 °C  
Min. temperature limit: -40 °C

Negative pressure applications with silicone oil M50

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

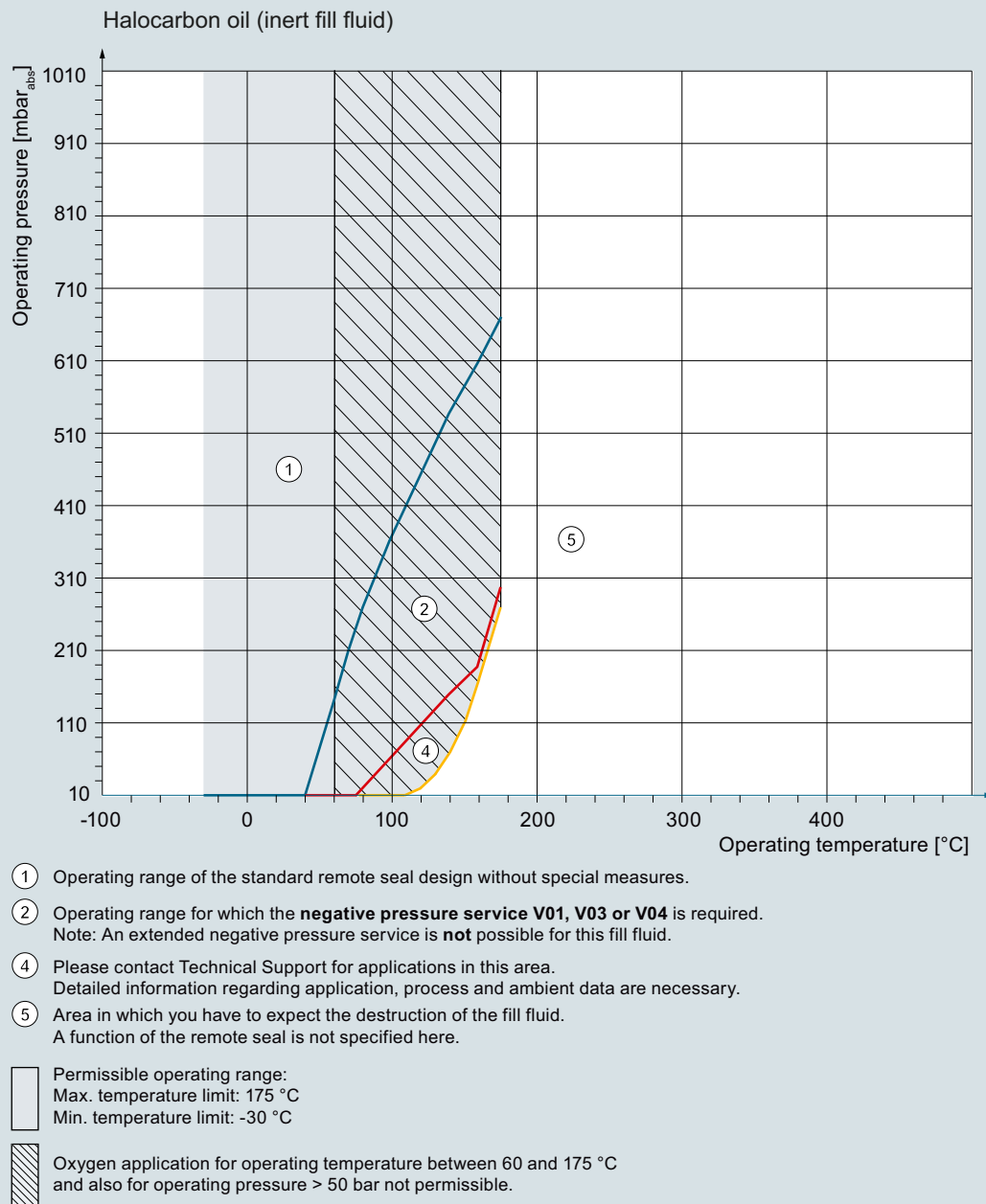
### Technical description



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.
- ③ Operating range for which the **extended negative pressure service V51, V53 or V54** is required
- ④ Please contact Technical Support for applications in this area.  
Detailed information regarding application, process and ambient data are necessary.
- ⑤ Area in which you have to expect the destruction of the fill fluid.  
A function of the remote seal is not specified here.

Permissible operating range:  
Max. temperature limit: 400 °C  
Min. temperature limit: -10 °C

Negative pressure applications with high-temperature oil



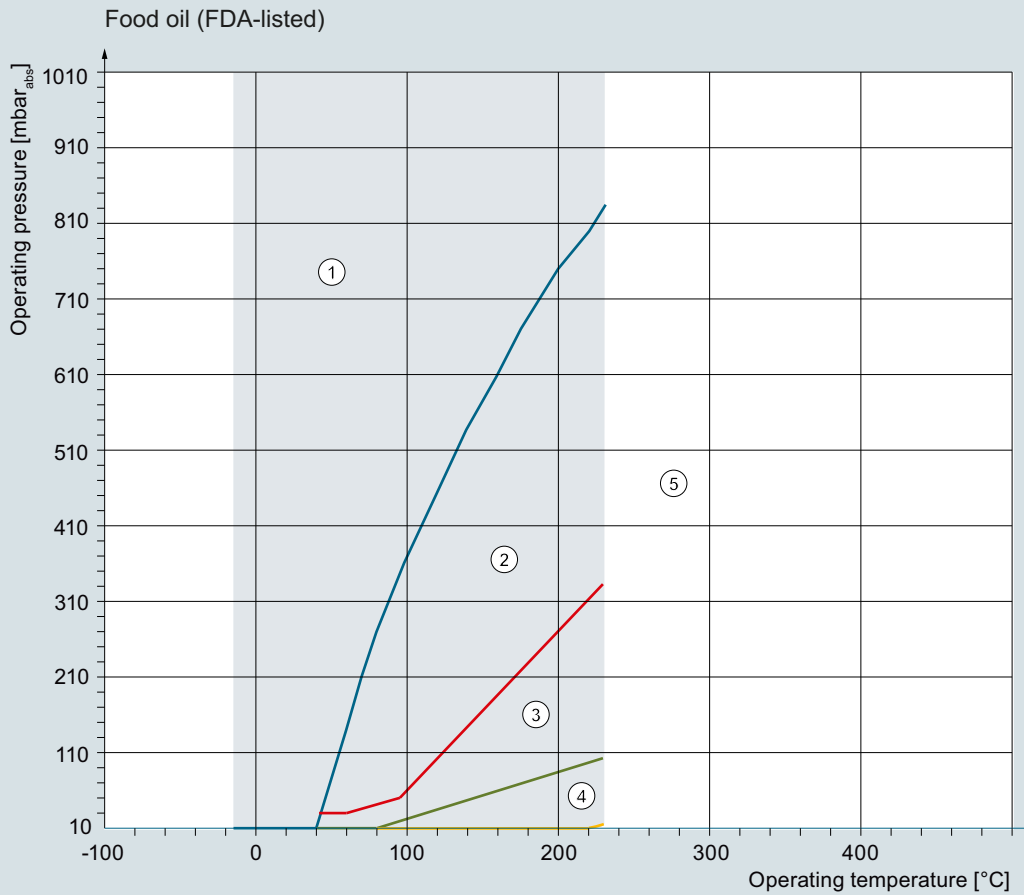
Negative pressure applications with halocarbon oil (inert filling liquid)

A BAM approval for process temperatures up to 60 °C (140 °F) and system pressures up to 50 bar (725 psi) is available for the oxygen application.

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Technical description



- ① Operating range of the standard remote seal design without special measures.
  - ② Operating range for which the **negative pressure service V01, V03 or V04** is required.
  - ③ Operating range for which the **extended negative pressure service V51, V53 or V54** is required.
  - ④ Please contact Technical Support for applications in this area. Detailed information regarding application, process and ambient data are necessary.
  - ⑤ Area in which you have to expect the destruction of the fill fluid. A function of the remote seal is not specified here.
- Permissible operating range:  
Max. temperature limit: 230 °C  
Min. temperature limit: -15 °C

Negative pressure applications with food oil (FDA listed)



**Technical specifications****Temperature error Diaphragm seals**

Temperature errors of diaphragm seals when connected to pressure transmitters for pressure, absolute pressure, differential pressure (single-sided) and level

	Nominal diameter/ design	Diaphragm diameter		Temperature error of remote seal $f_{RS}$		Temperature error of capillary $f_{Cap}$		Temperature error of process flange/connec- tion spigot $f_{PF}$		Recommended min. measuring spans (guidance values, observe temp. error)	
		mm	(inch)	mbar/ 10 K	(psi/ 10 K)	mbar/ (10 K · $m_{Cap}$ )	(psi/ (10 K · $m_{Cap}$ ))	mbar/ 10 K	(psi/ 10 K)	mbar	(psi)
Sandwich design or with flange to EN 1092-1	DN 50 without tube	59	(2.32)	1.5	(0.022)	2	(0.029)	2	(0.029)	200	(2.90)
	DN 50 with tube	45	(1.89)	5	(0.073)	10	(0.145)	10	(0.145)	500	(7.25)
	DN 80 without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)	0.2	(0.003)	100	(1.45)
	DN 80 with tube	72	(2.83)	1	(0.015)	1	(1.015)	1	(1.015)	250	(3.63)
	DN 100 without tube	89	(3.50)	0.2	(0.003)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	DN 100 with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	DN 125 without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
DN 125 with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)	
Sandwich design or with flange to ASME B16.5	2 inch without tube	59	(2.32)	1.5	(0.022)	2	(0.029)	2	(0.029)	200	(2.90)
	2 inch with tube	45	(1.89)	5	(0.073)	10	(0.145)	10	(0.145)	500	(7.25)
	3 inch without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)	0.2	(0.003)	100	(1.45)
	3 inch with tube	72	(2.83)	1	(0.015)	1	(1.015)	1	(1.015)	250	(3.63)
	4 inch without tube	89	(3.50)	0.2	(0.003)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	4 inch with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	5 inch without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
5 inch with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)	
Remote seal with union nut to DIN 11851	DN 25	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
Remote seal, screwed gland design	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
Remote seal with threaded socket to DIN 11851	DN 25	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
Clamp connec- tion	1½ inch	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	2 inch	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	2½ inch	59	(2.32)	3	(0.044)	5	(0.073)	5	(0.073)	500	(7.25)
	3 inch	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
Miniature dia- phragm seal	G1B	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	G1½B	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	G2B	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)

**Remarks:**

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Technical description

Temperature errors of diaphragm seals with connection to differential pressure transmitters (double-sided)

	Nominal diameter/ design	Diaphragm diameter		Temperature error of remote seal $f_{RS}$		Temperature error of capillary $f_{Cap}$		Temperature error of process flange/connec- tion spigot $f_{PF}$		Recommended min. measur- ing spans (guidance val- ues, observe temperature error)	
		mm	(inch)	mbar/ 10 K	(psi/ 10 K)	mbar/ (10 K · $m_{Cap}$ )	(psi/ (10 K · $m_{Cap}$ ))	mbar/ 10 K	(psi/ 10 K)	mbar	(psi)
Sandwich design or with flange to EN 1092-1	DN 50 without tube	59	(2.32)	0.3	(0.0043)	0.3	(0.0045)	0.3	(0.0045)	250	(3.626)
	DN 50 with tube	45	(1.89)	1.26	(0.018)	1.7	(0.025)	1.7	(0.025)	250	(3.626)
	DN 80 without tube	89	(3.50)	0.05	(0.001)	0.05	(0.001)	0.05	(0.0007)	50	(0.725)
	DN 80 with tube	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.45)
	DN 100 without tube	89	(3.50)	0.05	(0.001)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	DN 100 with tube	89	(3.50)	0.1	(0.002)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	DN 125 without tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
	DN 125 with tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
Sandwich design with flange to ASME B16.5	2 inch without tube	59	(2.32)	0.3	(0.0043)	0.3	(0.0043)	0.3	(0.0045)	250	(3.626)
	2 inch with tube	45	(1.89)	1.26	(0.018)	1.7	(0.025)	1.7	(0.025)	250	(3.626)
	3 inch without tube	89	(3.50)	0.05	(0.001)	0.05	(0.0007)	0.05	(0.0007)	50	(0.725)
	3 inch with tube	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.45)
	4 inch without tube	89	(3.50)	0.05	(0.001)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	4 inch with tube	89	(3.50)	0.1	(0.002)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	5 inch without tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
	5 inch with tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
Remote seal, screwed gland design	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)	0.83	(0.012)	250	(3.626)
Remote seal with union nut to DIN 11851	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)	0.83	(0.012)	250	(3.626)
	DN 65	59	(2.32)	0.7	(0.010)	0.67	(0.010)	0.67	(0.010)	250	(3.626)
	DN 80	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.450)
Remote seal with threaded socket to DIN 11851	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)	0.83	(0.012)	250	(3.626)
	DN 65	59	(2.32)	0.7	(0.010)	0.67	(0.010)	0.67	(0.010)	250	(3.626)
	DN 80	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.450)
Clamp connec- tion	2 inch	40	(1.57)	1	(0.015)	2.5	(0.036)	2.5	(0.036)	2000	(29.01)
	2½ inch	59	(2.32)	0.7	(0.010)	0.67	(0.010)	0.67	(0.010)	250	(3.626)
	3 inch	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.450)

#### Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

### Temperature error inline seals

Temperature errors of inline seals when connected to pressure transmitters for gauge pressure and absolute pressure, and with single-sided connection to pressure transmitters for differential pressure

Nominal diameter/ design	Temperature error of remote seal $f_{RS}$		Temperature error of capillary $f_{Cap}$		Temperature error of process flange/connection spigot $f_{PF}$		Recommended min. measuring spans (guidance values, observe temperature error)	
	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar	(psi)
DN 25 (1 inch)	6.0	(0.0870)	8.5	(0.123)	8.5	(0.123)	1000	(14.5)
DN 40 (1½ inch)	4.5	(0.065)	4.5	(0.065)	4.5	(0.065)	250	(3.63)
DN 50 (2 inch)	4.0	(0.058)	3.0	(0.044)	3.0	(0.044)	100	(1.45)
DN 80 (3 inch)	9.5	(0.138)	5.0	(0.073)	5.0	(0.073)	100	(1.45)
DN 100 (4 inch)	8.0	(0.012)	3.0	(0.044)	3.0	(0.044)	100	(1.45)

Temperature errors of inline seals with double-sided connection to pressure transmitters for differential pressure

Nominal diameter/ design	Temperature error of remote seal $f_{RS}$		Temperature error of capillary $f_{Cap}$		Temperature error of process flange/connection spigot $f_{PF}$		Recommended min. measuring spans (guidance values, observe temperature error)	
	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar	(psi)
DN 25 (1 inch)	2.3	(0.033)	1.8	(0.026)	1.8	(0.026)	1000	(14.5)
DN 40 (1½ inch)	0.8	(0.012)	0.3	(0.004)	0.3	(0.004)	250	(3.63)
DN 50 (2 inch)	0.3	(0.004)	0.1	(0.002)	0.1	(0.002)	100	(1.45)
DN 80 (3 inch)	3.0	(0.044)	0.5	(0.007)	0.5	(0.007)	100	(1.45)
DN 100 (4 inch)	1.0	(0.015)	0.1	(0.002)	0.1	(0.002)	100	(1.45)

#### Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Half the values apply to glycerin/water mixture as the filling liquid.
- Values apply to stainless steel as the diaphragm material.
- Diaphragm thickness 0.05 mm (0.002 inch) for DN 25/DN 40/DN 50 and 0.1 mm (0.004 inch) for DN 80/DN 100

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Technical description

#### Calculation of the temperature error

The following equation is used to calculate the temperature error:

$$dp = (\vartheta_{RS} - \vartheta_{Cal}) \cdot f_{RS} + (\vartheta_{Cap} - \vartheta_{Cal}) \cdot l_{Cap} \cdot f_{Cap} + (\vartheta_{TR} - \vartheta_{Cal}) \cdot f_{PF}$$

dp	Additional temperature error (mbar)
$\vartheta_{RS}$	Temperature on remote seal diaphragm (generally corresponds to temperature of medium)
$\vartheta_{Cal}$	Calibration (reference) temperature (20 °C (68 °F))
$f_{RS}$	Temperature error of remote seal
$\vartheta_{Cap}$	Ambient temperature on the capillaries
$l_{Cap}$	Capillary length
$f_{Cap}$	Temperature error of capillaries
$\vartheta_{TR}$	Ambient temperature on pressure transmitter
$f_{PF}$	Temperature error of the oil filling in the process flanges of the pressure transmitter

#### Example of temperature error calculation

##### Existing conditions:

SITRANS P pressure transmitter for differential pressure, 250 mbar, set to 0 ... 100 mbar, with DN 100 remote seal diaphragms without tube, diaphragm made of stainless steel, mat. No. 1.4404/316L	$f_{RS} = 0.05 \text{ mbar}/10 \text{ K}$ (0.039 inH <sub>2</sub> O/10 K)
Capillary length	$l_{Cap} = 6 \text{ m}$ (19.7 ft)
Capillaries fitted on both sides	$f_{Cap} = 0.07 \text{ mbar}/(10 \text{ K} \cdot m_{Cap})$ (0.028 inH <sub>2</sub> O/(10 K · m <sub>Cap</sub> ))
Filling liquid silicone oil M5	$f_{PF} = 0.07 \text{ mbar}/10 \text{ K}$ (0.028 inH <sub>2</sub> O/10 K)
Process temperature	$\vartheta_{RS} = 100 \text{ °C}$ (212 °F)
Temperature on the capillaries	$\vartheta_{Cap} = 50 \text{ °C}$ (122 °F)
Temperature on pressure transmitter	$\vartheta_{TR} = 50 \text{ °C}$ (122 °F)
Calibration temperature	$\vartheta_{Cal} = 20 \text{ °C}$ (68 °F)

##### Required:

Additional temperature error of remote seals: dp

##### Calculation:

###### in mbar

$$dp = (100 \text{ °C} - 20 \text{ °C}) \cdot 0.05 \text{ mbar}/10 \text{ K} + (50 \text{ °C} - 20 \text{ °C}) \cdot 6 \text{ m} \cdot 0.07 \text{ mbar}/(10 \text{ K} \cdot \text{m}) + (50 \text{ °C} - 20 \text{ °C}) \cdot 0.07 \text{ mbar}/10 \text{ K}$$

$$dp = 0.4 \text{ mbar} + 1.26 \text{ mbar} + 0.21 \text{ mbar}$$

###### in inH<sub>2</sub>O

$$dp = (212 \text{ °F} - 68 \text{ °F}) \cdot 0.039 \text{ inH}_2\text{O}/10 \text{ K} + (112 \text{ °F} - 68 \text{ °F}) \cdot 19.7 \text{ ft} \cdot 0.028 \text{ inH}_2\text{O}/(10 \text{ K} \cdot 3.28 \text{ ft}) + (112 \text{ °F} - 68 \text{ °F}) \cdot (0.028 \text{ inH}_2\text{O}/10 \text{ K})$$

$$dp = 0.16 \text{ inH}_2\text{O} + 0.51 \text{ inH}_2\text{O} + 0.08 \text{ inH}_2\text{O}$$

##### Result:

$$dp = 1.87 \text{ mbar (0.75 inH}_2\text{O)}$$

(corresponds to 2.27% of set measuring span)

##### Note

The determined temperature error only applies to the error resulting from connection of the remote seal.

The transmission response of the respective transmitter is not included in this consideration.

It must be calculated separately, and the resulting error added to the error determined above from connection of the remote seal.

#### Dependence of temperature error on diaphragm material

The temperature errors listed in the previous table are based on the use of stainless steel as the diaphragm material. If other diaphragm materials are used, the temperature errors change as follows:

Diaphragm material	Change in temperature error of remote seal
	Increase in values by
Stainless steel, Duplex, ...	See previous tables
Hastelloy C4, mat. No. 2.4602	50 %
Hastelloy C276, mat. No. 2.4819	50 %
Monel 400, mat. No. 2.4360	60 %
Tantalum	50 %
Titanium	50 %
PTFE coating on stainless steel diaphragm	80 %
ECTFE coating or PFA coating on stainless steel diaphragm	100 %
Gold coating on stainless steel diaphragm	40 %
Inconel	50 %
Incoloy	50 %

#### Maximum temperature of medium

##### Note

When taking into account the maximum medium temperature, the application limits of the fill fluids and gaskets used as well as the pressure/temperature limits of the respective process connections must also be taken into consideration. The following maximum temperatures of the medium apply depending on the material of the wetted parts.

Material	Max. medium temperature	Min./max. Pressure
Stainless steel, mat. no. 1.4404/31L	400 °C (752 °F)	No restrictions
PTFE coating	200 °C (392 °F) 260 °C (500 °F)	< 0 bar (0 psi); gauge pressure 0 bar (0 psi) ... 25 bar (363 psi); gauge pressure
	150 °C (302 °F)	25 bar (363 psi) ... 40 bar (580 psi); gauge pressure
	50 °C (302 °F)	40 bar (580 psi) ... 60 bar (870 psi); gauge pressure
ECTFE coating	150 °C (302 °F)	For pressures < 1 bar (14.5 psi) on request
PFA coating	200 °C (392 °F) 260 °C (500 °F)	< 0 bar (0 psi); gauge pressure 25 bar (363 psi)/40 bar (580 psi); gauge pressure
	150 °C (302 °F)	40 bar (580 psi)/60 bar (870 psi); gauge pressure
	50 °C (302 °F)	For pressures < 1 bar (14.5 psi) on request
Hastelloy C4, mat. no. 2.4610	400 °C (752 °F)	No restrictions
Hastelloy C276, mat. no. 2.4819	400 °C (752 °F)	No restrictions
Hastelloy C22, mat. no. 2.4602	400 °C (752 °F)	No restrictions
Monel 400, mat. no. 2.4360	400 °C (752 °F)	No restrictions
Tantalum	300 °C (572 °F)	No restrictions
Duplex, mat. no. 1.4462	250 °C (482 °F)	No restrictions
Titanium	150 °C (302 °F)	No restrictions
Inconel	400 °C (752 °F)	No restrictions
Incoloy	400 °C (752 °F)	No restrictions
Gold coating	400 °C (752 °F)	No restrictions

### Maximum capillary length for diaphragm seals (guidance values)

Nom. diam.		Max. length of capillary			
		Diaphragm seal		Inline seal	
		m	(ft)	m	(ft)
DN 25	(1 inch)	2.5	(8.2)	2.5	(8.2)
DN 32	(1¼ inch)	2.5	(8.2)	2.5	(8.2)
DN 40	(1½ inch)	4	(13.1)	6	(19.7)
DN 50	(2 inch)	6	(19.7)	10	(32.8)
DN 65	(2½ inch)	8	(26.2)	10	(32.8)
DN 80	(3 inch)	15	(49.1)	10	(32.8)
DN 100	(4 inch)	15	(49.1)	10	(32.8)
DN 125	(5 inch)	15	(49.1)	-	-

### Response times

The values listed in the following table are the response times (in seconds per meter of capillary) for a change in pressure which corresponds to the set measuring span.

The listed values must be multiplied by the respective length of the capillary, or with transmitters for differential pressure and flow by the total length of both capillaries.

The response times are independent of the set measuring span within the range of the respective transmitter. The response times are of insignificant importance for measuring spans above 10 bar (145 psi). The response times of the pressure transmitters are not considered in the table.

Filling liquid	Density		Temperature on capillary		Response time in s/m (s/ft) with max. measuring span of pressure transmitter					
	kg/dm <sup>3</sup>	(lb/in <sup>3</sup> )	°C	(°F)	250 mbar	(101 inH <sub>2</sub> O)	600 mbar	(241 inH <sub>2</sub> O)	1600 mbar	(643 inH <sub>2</sub> O)
Silicone oil M5	0.914	(0.033)	+60	(140)	0.06	(0.018)	0.02	(0.006)	0.01	(0.003)
			+20	(68)	0.11	(0.034)	0.02	(0.006)	0.02	(0.006)
			-20	(-4)	0.3	(0.091)	0.12	(0.037)	0.05	(0.015)
Silicone oil M50	0.966	(0.035)	+60	(140)	0.6	(0.183)	0.25	(0.076)	0.09	(0.027)
			+20	(68)	0.61	(0.186)	0.26	(0.079)	0.1	(0.030)
			-20	(-4)	1.69	(0.515)	0.71	(0.216)	0.27	(0.082)
High-temperature oil	1.070	(0.039)	+60	(140)	0.14	(0.043)	0.06	(0.018)	0.02	(0.006)
			+20	(68)	0.65	(0.198)	0.27	(0.082)	0.1	(0.030)
			-10	(14)	3.96	(1.207)	1.65	(0.503)	0.62	(0.189)
Halocarbon oil	1.968	(0.071)	+60	(140)	0.07	(0.021)	0.03	(0.009)	0.01	(0.003)
			+20	(68)	0.29	(0.088)	0.12	(0.037)	0.05	(0.015)
			-20	(-4)	2.88	(0.878)	1.2	(0.366)	0.45	(0.137)
Food oil (FDA listed)	0.920	(0.033)	+60	(140)	0.75	(0.229)	0.33	(0.101)	0.17	(0.052)
			+20	(68)	4	(1.220)	1.75	(0.534)	0.67	(0.204)
			-20	(-4)	20	(6.100)	8.5	(2.593)	3.25	(0.991)

Permissible data of filling liquids for pressure and temperature see diagrams on page 1/404 ff.

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of sandwich design with flexible capillary

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#### Overview



Diaphragm seals of sandwich design

#### Technical specifications

##### Diaphragm seals of sandwich design

Nominal diameter	Nominal pressure
• DN 50	PN 16 ... PN 400
• DN 80	PN 16 ... PN 400
• DN 100	PN 16 ... PN 400
• DN 125	PN 16 ... PN 400
• 2 inch	Class 150 ... class 2500
• 3 inch	Class 150 ... class 2500
• 4 inch	Class 150 ... class 2500
• 5 inch	Class 150 ... class 2500
Sealing surface	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	To EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel mat. no. 1.4404/316L
• Wetted parts	Stainless steel mat. no. 1.4404/316L
	<ul style="list-style-type: none"> <li>• Without coating</li> <li>• PTFE coating</li> <li>• ECTFE coating (for vacuum on request)</li> <li>• PFA coating</li> </ul>
	Monel 400, mat. No. 2.4360
	Hastelloy C276, mat. No. 2.4819
	Hastelloy C4, mat. No. 2.4602
	Hastelloy C22, mat. no. 2.4602
	Tantalum
	Titanium, mat. no. 3.7035
	Nickel 201
	Duplex 2205, mat. no. 1.4462
	Stainless steel 316L, gold plated, thickness approx. 25 µm
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4404/316L

Sealing material in the process flanges

- For pressure transmitters, absolute pressure transmitters and low-pressure applications
- For other applications

Copper

Viton

Maximum pressure

See above and the technical data of the pressure transmitters

Tube length

Without tube as standard (tube available on request)

Capillary

- Length

Max. 10 m (32.8 ft), longer lengths on request

- Internal diameter

max. 2 mm (0.079 inch)

- Minimum bending radius

150 mm (5.9 inch)

Filling liquid

Silicone oil M5

Silicone oil M50

High-temperature oil

Halocarbon oil (for measuring O<sub>2</sub>)

Food oil (FDA listed)

Permissible ambient temperature

Dependent on the pressure transmitter and the filling liquid of the remote seal

More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals

Weight

Approx. 4 kg (8.82 lb)

##### Certificate and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

# Pressure Measurement

## Remote seals for pressure transmitters

### SITRANS P300, P DS III, P410, P500

#### Diaphragm seals of sandwich design with flexible capillary

1

Selection and Ordering data	Article No.	Ord.code	Selection and Ordering data	Article No.	Ord.code																																																																																																		
<b>Diaphragm seal</b> Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately): <b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; Scope of delivery (1 off) <b>for absolute pressure</b> 7MF433-...; Scope of delivery (1 off) <b>for differential pressure and flow</b> 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery 2 off <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>	7MF4900-		<b>Diaphragm seal</b> Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately): <b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; Scope of delivery (1 off) <b>for absolute pressure</b> 7MF433-...; Scope of delivery (1 off) <b>for differential pressure and flow</b> 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery 2 off <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>	7MF4900-																																																																																																			
<b>Nominal diameter and nominal pressure</b> • DN 25 • DN 40 • DN 50 PN 16 ... 400 (recommended only for pressure transmitters for pressure) • DN 80 PN 16 ... 400 • DN 100 PN 16 ... 400 • DN 125 PN 16 ... 400 • 2 inch Class 150 ... 2500 (recommended only for pressure transmitters for pressure) • 3 inch Class 150 ... 2500 • 4 inch Class 150 ... 2500 • 5 inch Class 150 ... 2500 Smooth sealing surface to EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 AA Other version Add Order code and plain text: Nominal diameter: ...; Nominal pressure: ... Sealing surface: see "Technical data"	Z Z A  B C D E  H L N  Z	J 0 A J 0 B         J 1 Y	<b>Customer-specific tubus length</b> Specify customer-specific length with Y44, see Order Code • Wetted parts materials: Stainless steel without foil <table border="1"> <thead> <tr> <th>Range</th> <th>Standard length</th> <th></th> </tr> </thead> <tbody> <tr> <td>20 ... 50 mm (0.79 ... 1.97")</td> <td>50 mm (1.97")</td> <td>A 1</td> </tr> <tr> <td>51 ... 100 mm (2.01 ... 3.94")</td> <td>100 mm (3.94")</td> <td>A 2</td> </tr> <tr> <td>101 ... 150 mm (3.98 ... 5.91")</td> <td>150 mm (5.91")</td> <td>A 3</td> </tr> <tr> <td>151 ... 200 mm (5.94 ... 7.87")</td> <td>200 mm (7.87")</td> <td>A 4</td> </tr> <tr> <td>201 ... 250 mm (7.91 ... 9.84")</td> <td>250 mm (9.84")</td> <td>A 5</td> </tr> </tbody> </table> • Wetted parts materials: Stainless steel coated with ECTFE <table border="1"> <thead> <tr> <th>Range</th> <th>Standard length</th> <th></th> </tr> </thead> <tbody> <tr> <td>20 ... 50 mm (0.79 ... 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<b>Wetted parts materials</b> • Stainless steel 316L - without coating - with PTFE coating <sup>2)</sup> - with ECTFE coating <sup>2) 3) 4)</sup> - with PFA coating <sup>2) 4)</sup> • Monel 400, mat. No. 2.4360 • Hastelloy C276, mat. No. 2.4819 • Hastelloy C4, mat. No. 2.4602 • Hastelloy C22, mat. No. 2.4602 • Tantalum • Titanium, mat. No. 3.7035 (max. 150 °C (302 °F)) • Nickel 201 (max. 260 °C (500 °F)) • Duplex 2205, mat. no. 1.4462 • Duplex 2205, mat. no. 1.4462, incl. main body • Stainless steel 316L, gold plated, thickness approx. 25 µm	A E 0 F D G J U 0 V 0 K L 0  M 0 Q R S 0																																																																																																						
<b>Tube length</b> • without tube Other version: Add Order code and plain text: Wetted parts materials: ... Tube length: ...	0 Z 8	K 1 Y																																																																																																					

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of sandwich design with flexible capillary

Selection and Ordering data	Article No.	Ord.code	Selection and Ordering data	Order code
<b>Diaphragm seal</b>			<b>Further designs</b>	
Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately):			Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; Scope of delivery (1 off)	7MF4900-		<b>Customer-specific tubus length</b>	Y44
<b>for absolute pressure</b> 7MF433-...; Scope of delivery (1 off)	7MF4901-		Select range, enter desired length in plain text (No entry = standard length)	
<b>for differential pressure and flow</b> 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery 2 off	7MF4903-		<b>Spark arrester</b>	
	1 ■ ■ ■ ■ - ■ ■ ■ ■		With spark arrester for mounting on zone 0 (including documentation)	
<b>Filling liquid</b>			• Pressure and absolute pressure	A01
• Silicone oil M5	1		• for differential pressure transmitters	A02
• Silicone oil M50	2		<b>Remote seal nameplate</b>	B20
• High-temperature oil	3		Attached out of stainless steel, contains Article No. and order number of the remote seal supplier	
• Halocarbon oil (for measuring O <sub>2</sub> ) <sup>5)</sup>	4		<b>Oil- and grease-free cleaned version</b>	C10
• Food oil (FDA listed)	7		Oil- and grease-free cleaned and packed version, <u>not for oxygen application</u> , only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2	
Other version	9	M 1 Y	<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>	C11
Add Order code and plain text: Filling liquid: ...			<b>Inspection certificate</b>	C12
<b>Length of capillary<sup>6)</sup></b>			to EN 10204, section 3.1	
• 1.0 m (3.28 ft)	2		<b>2.2 Certificate of FDA approval of fill oil</b>	C17
• 1.6 m (5.25 ft)	3		Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"	
• 2.5 m (8.20 ft)	4		<b>Functional safety certificate ("SIL 2") to IEC 61508</b>	C20
• 4.0 m (13.1 ft)	5		(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	
• 6.0 m (19.7 ft)	6		<b>Functional safety certificate ("SIL 2/3") to IEC 61508</b>	C23
• 8.0 m (26.25 ft)	7		(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)	
• 10.0 m (32.8 ft)	8		<b>Certification acc. to NACE MR-0175</b>	D07
<b>Special lengths for capillaries</b>			Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	
• 2.0 m (6.56 ft)	9	N 1 C	<b>Certification acc. to NACE MR-0103</b>	D08
• 3.0 m (9.84 ft)	9	N 1 E	Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	
• 5.0 m (16.40 ft)	9	N 1 G	<b>Oil- and grease-free cleaned version</b>	E10
• 7.0 m (23.97 ft)	9	N 1 J	Oil- and grease-free cleaned and packed version, <u>only for oxygen application</u> , only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2	
• 9.0 m (29.53 ft)	9	N 1 L	<b>Epoxy painting</b>	E15
<u>only for 7MF4903-...</u>			(not possible with vacuum-proof design and not for 7MF4901-...)	
• 11.0 m (36.09 ft)	9	N 1 N	Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42.. only possible with process connection G $\frac{1}{2}$ B according to EN 837-1	
• 12.0 m (39.37 ft)	9	N 1 P	<b>One-sided mounting on differential pressure transmitters</b>	
• 13.0 m (42.65 ft)	9	N 1 Q	(only for 7MF4900-...)	
• 14.0 m (45.93 ft)	9	N 1 R	on high-pressure side	H10
• 15.0 m (49.21 ft)	9	N 1 S	on low-pressure side	H11

1) With 7MF802-... and the measuring cells Q, S, T and U also order negative pressure service version.

2) Only possible up to max. PN 100.

3) For vacuum on request

4) Only for use in non-hazardous atmospheres.

5) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.

6) Max. capillary length, see section "Technical description".



## Pressure Measurement

### Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

#### Diaphragm seals of sandwich design with flexible capillary

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<b>Further designs</b>		<b>Further designs</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code.		Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)</b>	<b>J11</b>	<b>PE protective tube</b>	
previously DIN 2501, form E		over the spiral protective tube of the capillaries (color: white)	
<b>Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA</b>	<b>J12</b>	1.0 m (3.28 ft)	<b>N20</b>
instead of sealing surface B2 or RFSF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80)		1.6 m (5.25 ft)	<b>N21</b>
<b>Sealing surface groove, EN 1092-1, form D</b>	<b>J14</b>	2.0 m (6.56 ft)	<b>N22</b>
instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)		2.5 m (8.20 ft)	<b>N23</b>
<b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b>	<b>J24</b>	3.0 m (9.84 ft)	<b>N24</b>
instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)		4.0 m (13.12 ft)	<b>N25</b>
<b>Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L</b>		5.0 m (16.40 ft)	<b>N26</b>
DN 25	<b>J30</b>	6.0 m (19.69 ft)	<b>N27</b>
DN 40	<b>J31</b>	7.0 m (22.97 ft)	<b>N28</b>
DN 50	<b>J32</b>	8.0 m (26.25 ft)	<b>N29</b>
DN 80	<b>J33</b>	9.0 m (29.53 ft)	<b>N30</b>
DN 100	<b>J34</b>	10.0 m (32.81 ft)	<b>N31</b>
DN 125	<b>J35</b>	<u>only for 7MF4903-...</u>	
<b>Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L</b>		11.0 m (36.09 ft)	<b>N32</b>
DN 25	<b>J40</b>	12.0 m (39.37 ft)	<b>N33</b>
DN 40	<b>J41</b>	13.0 m (42.65 ft)	<b>N34</b>
DN 50	<b>J42</b>	14.0 m (45.93 ft)	<b>N35</b>
DN 80	<b>J43</b>	15.0 m (49.21 ft)	<b>N36</b>
DN 100	<b>J44</b>		
DN 125	<b>J45</b>	<b>PTFE protective tube</b>	
<b>Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L</b>		over the spiral protective tube of the capillaries (color: transparent)	
DN 25	<b>J50</b>	1.0 m (3.28 ft)	<b>N40</b>
DN 40	<b>J51</b>	1.6 m (5.25 ft)	<b>N41</b>
DN 50	<b>J52</b>	2.0 m (6.56 ft)	<b>N42</b>
DN 80	<b>J53</b>	2.5 m (8.20 ft)	<b>N43</b>
DN 100	<b>J54</b>	3.0 m (9.84 ft)	<b>N44</b>
DN 125	<b>J55</b>	4.0 m (13.12 ft)	<b>N45</b>
		5.0 m (16.40 ft)	<b>N46</b>
		6.0 m (19.69 ft)	<b>N47</b>
		7.0 m (22.97 ft)	<b>N48</b>
		8.0 m (26.25 ft)	<b>N49</b>
		9.0 m (29.53 ft)	<b>N50</b>
		10.0 m (32.81 ft)	<b>N51</b>
		<u>only for 7MF4903-...</u>	
		11.0 m (36.09 ft)	<b>N52</b>
		12.0 m (39.37 ft)	<b>N53</b>
		13.0 m (42.65 ft)	<b>N54</b>
		14.0 m (45.93 ft)	<b>N55</b>
		15.0 m (49.21 ft)	<b>N56</b>

## Pressure Measurement

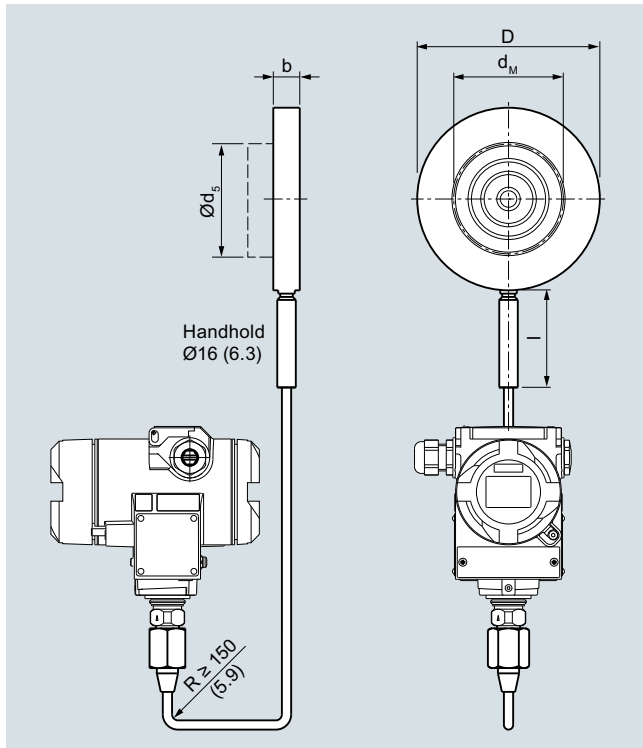
Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of sandwich design with flexible capillary

1

Selection and Ordering data	Order code
<b>Further designs</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>PVC protective tube</b> over the spiral protective tube of the capillaries (color: black)	
1.0 m (3.28 ft)	<b>N60</b>
1.6 m (5.25 ft)	<b>N61</b>
2.0 m (6.56 ft)	<b>N62</b>
2.5 m (8.20 ft)	<b>N63</b>
3.0 m (9.84 ft)	<b>N64</b>
4.0 m (13.12 ft)	<b>N65</b>
5.0 m (16.40 ft)	<b>N66</b>
6.0 m (19.69 ft)	<b>N67</b>
7.0 m (22.97 ft)	<b>N68</b>
8.0 m (26.25 ft)	<b>N69</b>
9.0 m (29.53 ft)	<b>N70</b>
10.0 m (32.81 ft)	<b>N71</b>
<u>only for 7MF4903-...</u>	
11.0 m (36.09 ft)	<b>N72</b>
12.0 m (39.37 ft)	<b>N73</b>
13.0 m (42.65 ft)	<b>N74</b>
14.0 m (45.93 ft)	<b>N75</b>
15.0 m (49.21 ft)	<b>N76</b>
<b>Negative pressure service</b> for use in low-pressure range for transmitters for	
• gauge and absolute pressure from the pressure series	<b>V01</b>
• differential pressure	<b>V03</b>
<b>Extended negative pressure service</b> for use in low-pressure range for transmitters for	
• gauge and absolute pressure from the pressure series	<b>V51</b>
• differential pressure	<b>V53</b>

## Dimensional drawings



Diaphragm seals of sandwich design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)

### Connection to EN 1092-1

Nom. diam.	Nominal pressure	b	D	d <sub>5</sub>	d <sub>M</sub>	l
		mm	mm	mm	mm	mm
DN 50	PN 16 ... PN 400	20	102	48.3	45 <sup>1)</sup>	100
DN 80		20	138	76	72 <sup>2)</sup>	100
DN 100		20	158	94	89	100
DN 125		22	188	125	124	100

### Connection to ASME B16.5

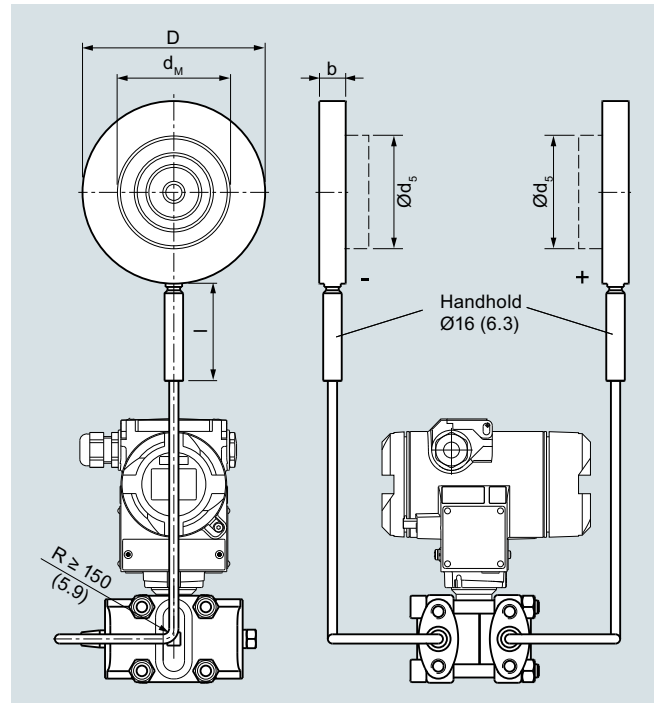
Nom. diam.	Nominal pressure lb/sq.in.	b	D	d <sub>5</sub>	d <sub>M</sub>	l
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
2 inch	150 ... 2500	20 (0.79)	100 (3.94)	48.3 (1.9)	45 <sup>1)</sup> (1.77)	100 (3.94)
3 inch		20 (0.79)	134 (5.28)	72 (2.83)	72 <sup>2)</sup> (2.83)	100 (3.94)
4 inch		20 (0.79)	158 (6.22)	94 (3.69)	89 (2.32)	100 (3.94)
5 inch		22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	100 (3.94)

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0



Diaphragm seals of sandwich design (without flange) with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or differential pressure and flow, dimensions in mm (inch)

### Connection to EN 1092-1

Nom. diam.	Nominal pressure	b	D	d <sub>5</sub>	d <sub>M</sub>	l
		mm	mm	mm	mm	mm
DN 50	PN 16 ... PN 400	20	102	48.3	45 <sup>1)</sup>	100
DN 80		20	138	76	72 <sup>2)</sup>	100
DN 100		20	158	94	89	100
DN 125		22	188	125	124	100

### Connection to ASME B16.5

Nom. diam.	Nominal pressure lb/sq.in.	b	D	d <sub>5</sub>	d <sub>M</sub>	l
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
2 inch	150 ... 2500	20 (0.79)	100 (3.94)	48.3 (1.9)	45 <sup>1)</sup> (1.77)	100 (3.94)
3 inch		20 (0.79)	134 (5.28)	72 (2.83)	72 <sup>2)</sup> (2.83)	100 (3.94)
4 inch		20 (0.79)	158 (6.22)	94 (3.69)	89 (2.32)	100 (3.94)
5 inch		22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	100 (3.94)

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design with flexible capillary

1

#### Overview



Diaphragm seals of flange design

#### Technical specifications

##### Diaphragm seals of flange design with flexible capillary

Nominal diameter	Nominal pressure
<ul style="list-style-type: none"> <li>• DN 50 (recommendable only for pressure transmitters for pressure)</li> <li>• DN 80</li> <li>• DN 100</li> <li>• DN 125</li> <li>• 2 inch (recommendable only for pressure transmitters for pressure)</li> <li>• 3 inch</li> <li>• 4 inch</li> <li>• 5 inch</li> </ul>	PN 10/16/25/40, PN 100 PN 10/16/25/40, PN 100 PN 10/16, PN 25/40 PN 16, PN 40 Class 150, class 300, class 400/600, class 900/1500 Class 150, class 300, class 600 Class 150, class 300, class 400 Class 150, class 300, class 400
Sealing surface	
<ul style="list-style-type: none"> <li>• For stainless steel, mat. No. 1.4404/316L</li> <li>• For the other materials</li> </ul>	To EN 1092-1, form B1 or ASMR B16.5 RF 125 ... 250 AA To EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
<ul style="list-style-type: none"> <li>• Main body</li> <li>• Wetted parts</li> </ul>	Stainless steel mat. no. 1.4404/316L Stainless steel mat. no. 1.4404/316L <ul style="list-style-type: none"> <li>• Without coating</li> <li>• PTFE coating</li> <li>• ECTFE coating (for vacuum on request)</li> <li>• PFA coating</li> </ul> Monel 400, mat. No. 2.4360 Hastelloy C276, mat. No. 2.4819 Hastelloy C4, mat. No. 2.4602 Hastelloy C22, W.-Nr. 2.4602 Tantalum Titanium, W.-Nr. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, thickness approx. 25 µm
<ul style="list-style-type: none"> <li>• Capillary</li> </ul>	Stainless steel, mat. No. 1.4404/316L

<ul style="list-style-type: none"> <li>• Sheath</li> </ul>	Spiral protective tube made of stainless steel, mat. no. 1.4301/304
Sealing material in the process flanges	
<ul style="list-style-type: none"> <li>• For pressure transmitters, absolute pressure transmitters and low-pressure applications</li> <li>• For other applications</li> </ul>	Copper Viton
Maximum pressure	See above and the technical data of the pressure transmitter
Tube length	Without tube as standard (tube available on request)
Capillary	
<ul style="list-style-type: none"> <li>• Length</li> </ul>	Max. 10 m (32.8 ft), longer lengths on request
<ul style="list-style-type: none"> <li>• Internal diameter</li> <li>• Minimum bending radius</li> </ul>	2 mm (0.079 inch) 150 mm (5.9 inch)
Filling liquid	
(for remote seals of sandwich and flange design)	Silicone oil M5
	Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O <sub>2</sub> ) Food oil (FDA listed)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
Weight	Approx. 4 kg (8.82 lb)
<b>Certificate and approvals</b>	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

# Pressure Measurement

## Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design with flexible capillary

1

Selection and Ordering data	Article No.	Ord. code	Selection and Ordering data	Article No.	Ord. code
<b>Diaphragm seal</b>			<b>Diaphragm seal</b>		
Flange design, with flexible capillary, connected to a pressure transmitter SITRANS P (order separately):			Flange design, with flexible capillary, connected to a pressure transmitter SITRANS P (order separately):		
<b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1</sup> ); scope of delivery: 1 off	7MF4920-		<b>for pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1</sup> ); scope of delivery: 1 off	7MF4920-	
<b>for absolute pressure (differential pressure series)</b> 7MF433-...; scope of delivery: 1 off	7MF4921-		<b>for absolute pressure (differential pressure series)</b> 7MF433-...; scope of delivery: 1 off	7MF4921-	
<b>for differential pressure and flow</b> 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off	7MF4923-		<b>for differential pressure and flow</b> 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off	7MF4923-	
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	1 ■ ■ ■ ■ ■ - ■ B ■ ■ ■ ■ ■			1 ■ ■ ■ ■ ■ - ■ B ■ ■ ■ ■ ■	
<b>Nominal diameter and nominal pressure</b>			<b>Wetted parts materials</b>		
• DN 25 PN 10/16/25/40	Z	J 0 A	• Stainless steel 316L	A	
	Z	J 0 B	- without coating	E	0
• DN 40 PN 10/16/25/40	Z	J 0 C	- with PTFE coating	F	
	Z	J 0 D	- with ECTFE coating <sup>2) 3)</sup>	D	
	Z	J 0 E	- with PFA coating <sup>3)</sup>	G	
• DN 50 PN 10/16/25/40	A		• Monel 400, mat. No. 2.4360	J	
	B		• Hastelloy C276, mat. No. 2.4819	U	
(DN 50 recommended only for pressure transmitters for pressure)			• Hastelloy C4, mat. No. 2.4602	V	
• DN 80 PN 10/16/25/40	D		• Hastelloy C22, mat. No. 2.4602	0	
	E		• Tantalum	K	
• DN 100 PN 10/16	G		• Titanium, mat. No. 3.7035 (max. 150 °C (302 °F))	L	
• DN 125 PN 25/40	H		• Nickel 201 (max. 260 °C (500 °F))	M	
	J		• Duplex 2205, mat. no. 1.4462	Q	
	K		• Duplex 2205, mat. no. 1.4462, incl. main body	R	
• 1 inch Class 150	Z	J 6 A	• Stainless steel 316L, gold plated, thickness approx. 25 µm	S	0
	Z	J 6 B			
	Z	J 6 C			
	Z	J 6 D			
• 1½ inch Class 150	Z	J 6 E			
	Z	J 6 F			
	Z	J 6 G			
	Z	J 6 H			
• 2 inch Class 150	L				
	M				
	N				
	P				
(2 inch recommended only for pressure transmitters for pressure)					
• 3 inch Class 150	Q				
	R				
	S				
• 4 inch Class 150	T				
	U				
	V				
• 5 inch Class 150	W				
	X				
	Y				
• JIS DN 50 10 K 316L	Z	J 7 A			
	Z	J 7 B			
• JIS DN 80 10 K 316L	Z	J 7 C			
	Z	J 7 D			
Smooth sealing surface to EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 AA					
Other version	Z	J 1 Y			
Add Order code and plain text: Nominal diameter: ...; Nominal pressure: ... Sealing surface: See "Technical data"					

# Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

## Diaphragm seals of flange design with flexible capillary

1

### Selection and Ordering data

Article No. Ord. code

#### Diaphragm seal

Flange design, with flexible capillary, connected to a pressure transmitter  
SITRANS P (order separately):

**for pressure** 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-...<sup>1</sup>); scope of delivery: 1 off

**for absolute pressure (differential pressure series)** 7MF433-...; scope of delivery: 1 off

**for differential pressure and flow** 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off

7MF4920 -

7MF4921 -

7MF4923 -

1 ■■■■ - ■ B ■■■■

#### Tube length

- without tube

Other version:

Add Order code and plain text:

Wetted parts materials: ...

Tube length: ...

0

Z 8

K 1 Y

#### Customer-specific tubus length

Specify customer-specific length with Y44, see Order Code

- Wetted parts materials: Stainless steel without foil

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	A 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	A 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	A 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	A 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	A 5

- Wetted parts materials: Stainless steel coated with ECTFE

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	F 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	F 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	F 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	F 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	F 5

- Wetted parts materials: Stainless steel coated with PFA

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	D 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	D 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	D 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	D 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	D 5

- Wetted parts materials: Monel 400

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	G 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	G 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	G 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	G 4

- Wetted parts materials: Hastelloy C276

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	J 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	J 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	J 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	J 4

- Wetted parts materials: Tantalum

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	K 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	K 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	K 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	K 4

### Selection and Ordering data

Article No. Ord. code

#### Diaphragm seal

Flange design, with flexible capillary, connected to a pressure transmitter  
SITRANS P (order separately):

**for pressure** 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-...<sup>1</sup>); scope of delivery: 1 off

**for absolute pressure (differential pressure series)** 7MF433-...; scope of delivery: 1 off

**for differential pressure and flow** 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off

7MF4920 -

7MF4921 -

7MF4923 -

1 ■■■■ - ■ B ■■■■

#### Filling liquid

- Silicone oil M5
- Silicone oil M50
- High-temperature oil
- Halocarbon oil (for measuring O<sub>2</sub>)<sup>4</sup>
- Food oil (FDA listed)

Other version:

Add Order code and plain text:

Filling liquid: ...

1

2

3

4

7

9

M 1 Y

#### Length of capillary<sup>5</sup>

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

2

3

4

5

6

7

8

#### Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

9

9

9

9

9

9

N 1 C

N 1 E

N 1 G

N 1 J

N 1 L

#### only for 7MF4923-...

- 11.0 m (36.09 ft)
- 12.0 m (39.37 ft)
- 13.0 m (42.65 ft)
- 14.0 m (45.93 ft)
- 15.0 m (49.21 ft)

9

9

9

9

9

9

N 1 N

N 1 P

N 1 Q

N 1 R

N 1 S

- With 7MF802-... and the measuring cells Q, S, T and U also order the negative pressure service.
- For vacuum on request.
- Only for use in non-hazardous atmospheres.
- Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.
- Max. capillary length, see section "Technical description".

## Pressure Measurement

### Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

#### Diaphragm seals of flange design with flexible capillary

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<b>Further designs</b> Please add "-Z" to Article No. and specify Order code.		<b>Further designs</b> Please add "-Z" to Article No. and specify Order code.	
<b>Customer-specific tubus length</b> Select range, enter desired length in plain text (No entry = standard length)	<b>Y44</b>	<b>Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)</b> previously DIN 2501, form E	<b>J11</b>
<b>Spark arrestor</b> With spark arrestor for mounting on zone 0 (including documentation) for transmitters for		<b>Sealing surface groove, EN 1092-1, form D</b> instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	<b>J14</b>
<ul style="list-style-type: none"> <li>• pressure and absolute pressure</li> <li>• differential pressure</li> </ul>	<b>A01</b> <b>A02</b>	<b>Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L</b> DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	<b>J30</b> <b>J31</b> <b>J32</b> <b>J33</b> <b>J34</b> <b>J35</b>
<b>Remote seal nameplate</b> Attached out of stainless steel, contains MLFB and order number of the remote seal	<b>B20</b>	<b>Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L</b> DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	<b>J40</b> <b>J41</b> <b>J42</b> <b>J43</b> <b>J44</b> <b>J45</b>
<b>Oil- and grease-free cleaned version</b> Oil- and grease-free cleaned and packed version, <u>not for oxygen application</u> , only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2	<b>C10</b>	<b>Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L</b> DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	<b>J50</b> <b>J51</b> <b>J52</b> <b>J53</b> <b>J54</b> <b>J55</b>
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>	<b>C11</b>	<b>Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA</b> instead of sealing surface B2 or RFSF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80)	<b>J12</b>
<b>Inspection certificate</b> to EN 10204, section 3.1	<b>C12</b>	<b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b> instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)	<b>J24</b>
<b>2.2 Certificate of FDA approval of fill oil</b> Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"	<b>C17</b>		
<b>Functional safety certificate ("SIL 2") to IEC 61508</b> (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	<b>C20</b>		
<b>Functional safety certificate ("SIL 2/3") to IEC 61508</b> (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)	<b>C23</b>		
<b>Certification acc. to NACE MR-0175</b> Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	<b>D07</b>		
<b>Certification acc. to NACE MR-0103</b> Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	<b>D08</b>		
<b>Oil- and grease-free cleaned version</b> Oil- and grease-free cleaned and packed version, <u>only for oxygen application</u> , only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2	<b>E10</b>		
<b>Epoxy painting</b> (not possible with negative pressure service and not for 7MF4921-...) Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42..., only possible with process connection G½B according to EN 837-1.	<b>E15</b>		
<b>One-sided mounting on differential pressure transmitters</b> (only for 7MF4920-...) on high-pressure side on low-pressure side	<b>H10</b> <b>H11</b>		

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design with flexible capillary

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<b>Further designs</b> Please add "-Z" to Article No. and specify Order code.		<b>PVC protective tube</b> over the spiral protective tube of the capillaries (color: black)	
<b>Radial capillary pipe outlet</b> for one-sided mounting	<b>K01</b>	1.0 m (3.28 ft)	<b>N60</b>
for two-sided mounting	<b>K03</b>	1.6 m (5.25 ft)	<b>N61</b>
<b>PE protective tube</b> over the spiral protective tube of the capillaries (color: white)		2.0 m (6.56 ft)	<b>N62</b>
1.0 m (3.28 ft)	<b>N20</b>	2.5 m (8.20 ft)	<b>N63</b>
1.6 m (5.25 ft)	<b>N21</b>	3.0 m (9.84 ft)	<b>N64</b>
2.0 m (6.56 ft)	<b>N22</b>	4.0 m (13.12 ft)	<b>N65</b>
2.5 m (8.20 ft)	<b>N23</b>	5.0 m (16.40 ft)	<b>N66</b>
3.0 m (9.84 ft)	<b>N24</b>	6.0 m (19.69 ft)	<b>N67</b>
4.0 m (13.12 ft)	<b>N25</b>	7.0 m (22.97 ft)	<b>N68</b>
5.0 m (16.40 ft)	<b>N26</b>	8.0 m (26.25 ft)	<b>N69</b>
6.0 m (19.69 ft)	<b>N27</b>	9.0 m (29.53 ft)	<b>N70</b>
7.0 m (22.97 ft)	<b>N28</b>	10.0 m (32.81 ft)	<b>N71</b>
8.0 m (26.25 ft)	<b>N29</b>	only for 7MF4923-...	
9.0 m (29.53 ft)	<b>N30</b>	11.0 m (36.09 ft)	<b>N72</b>
10.0 m (32.81 ft)	<b>N31</b>	12.0 m (39.37 ft)	<b>N73</b>
only for 7MF4923-...		13.0 m (42.65 ft)	<b>N74</b>
11.0 m (36.09 ft)	<b>N32</b>	14.0 m (45.93 ft)	<b>N75</b>
12.0 m (39.37 ft)	<b>N33</b>	15.0 m (49.21 ft)	<b>N76</b>
13.0 m (42.65 ft)	<b>N34</b>	<b>Negative pressure service</b> for use in low-pressure range for transmitters for	
14.0 m (45.93 ft)	<b>N35</b>	• gauge and absolute pressure from the pressure series	<b>V01</b>
15.0 m (49.21 ft)	<b>N36</b>	• differential pressure	<b>V03</b>
<b>PTFE protective tube</b> over the spiral protective tube of the capillaries (color: transparent)		<b>Extended negative pressure service</b> for use in low-pressure range for transmitters for	
1.0 m (3.28 ft)	<b>N40</b>	• gauge and absolute pressure from the pressure series	<b>V51</b>
1.6 m (5.25 ft)	<b>N41</b>	• differential pressure	<b>V53</b>
2.0 m (6.56 ft)	<b>N42</b>		
2.5 m (8.20 ft)	<b>N43</b>		
3.0 m (9.84 ft)	<b>N44</b>		
4.0 m (13.12 ft)	<b>N45</b>		
5.0 m (16.40 ft)	<b>N46</b>		
6.0 m (19.69 ft)	<b>N47</b>		
7.0 m (22.97 ft)	<b>N48</b>		
8.0 m (26.25 ft)	<b>N49</b>		
9.0 m (29.53 ft)	<b>N50</b>		
10.0 m (32.81 ft)	<b>N51</b>		
only for 7MF4923-...			
11.0 m (36.09 ft)	<b>N52</b>		
12.0 m (39.37 ft)	<b>N53</b>		
13.0 m (42.65 ft)	<b>N54</b>		
14.0 m (45.93 ft)	<b>N55</b>		
15.0 m (49.21 ft)	<b>N56</b>		



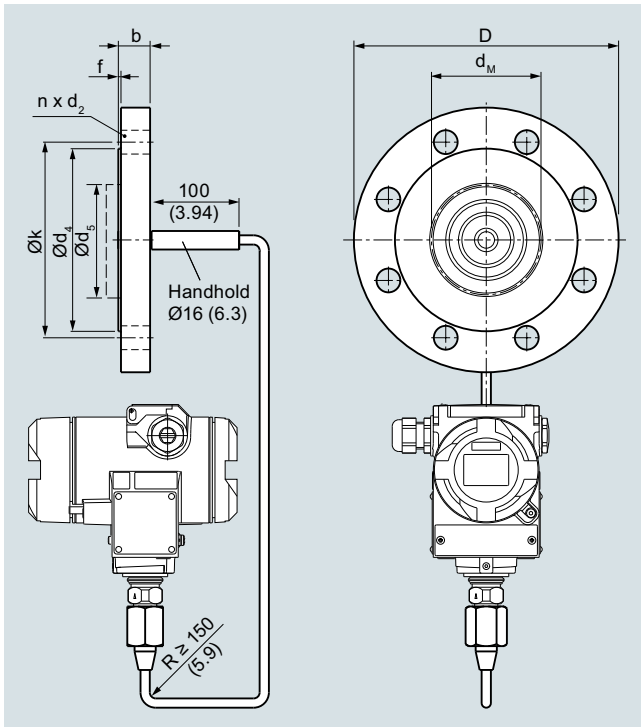
# Pressure Measurement

## Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design with flexible capillary

1

#### Dimensional drawings



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)

#### Connection to EN 1092-1

Nom. diam.	Nom. press.	b mm	D mm	d <sub>2</sub> mm	d <sub>4</sub> mm	d <sub>5</sub> mm	d <sub>M</sub> mm	f mm	k mm	n
DN 50	PN 10/1 6/ 25/40	20	165	18	102	48.3	45 <sup>1)</sup>	2	125	4
	PN 100	28	195	26	102	48.3	45 <sup>1)</sup>	2	145	4
DN 80	PN 10/1	24	200	18	138	76	72 <sup>2)</sup>	2	160	8
	PN 100	32	230	26	138	76	72 <sup>2)</sup>	2	180	8
DN 100	PN 10/1	20	220	18	158	94	89	2	180	8
	PN 25/4	24	235	22	162	94	89	2	190	8
DN 125	PN 16	22	250	18	188	125	124	2	210	8
	PN 40	26	270	26	188	125	124	2	220	8

#### Connection to ASME B16.5

Nom. diam.	Nom. press.	b mm	D mm	d <sub>2</sub> mm	d <sub>4</sub> mm	d <sub>5</sub> mm	d <sub>M</sub> mm	f mm	k mm	n
lb/sq.in.		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	
2 inch	150	19.5 (0.77)	150 (5.80)	20 (0.79)	92 (3.62)	48.3 (1.9)	45 <sup>1)</sup> (1.77)	2 (0.08)	120.5 (4.74)	4
	300	22.7 (0.89)	165 (6.50)	20 (0.79)	92 (3.62)	48.3 (1.9)	45 <sup>1)</sup> (1.77)	2 (0.08)	127 (5)	8
	400/ 600	32.4 (1.28)	165 (6.50)	20 (0.79)	92 (3.62)	48.3 (1.9)	45 <sup>1)</sup> (1.77)	2 (0.08)	127 (5)	8
	900/ 1500	45.1 (1.78)	215 (8.46)	26 (1.02)	92 (3.62)	48.3 (1.9)	45 <sup>1)</sup> (1.77)	7 (0.28)	165 (6.5)	8
3 inch	150	24.3 (0.96)	190 (7.48)	20 (0.79)	127 (5)	76 (3)	72 <sup>2)</sup> (2.83)	2 (0.08)	152.5 (6)	4
	300	29 (1.14)	210 (8.27)	22 (0.87)	127 (5)	76 (3)	72 <sup>2)</sup> (2.83)	2 (0.08)	168.5 (6.63)	8
	600	38.8 (1.53)	210 (8.27)	22 (0.87)	127 (5)	76 (3)	72 <sup>2)</sup> (2.83)	7 (0.28)	168.5 (6.63)	8
4 inch	150	24.3 (0.96)	230 (9.06)	20 (0.79)	158 (6.22)	94 (3.69)	89 (3.50)	2 (0.08)	190.5 (7.5)	8
	300	32.2 (1.27)	255 (10.04)	22 (0.87)	158 (6.22)	94 (3.69)	89 (3.50)	2 (0.08)	200 (7.87)	8
	400	42 (1.65)	255 (10.04)	26 (1.02)	158 (6.22)	94 (3.69)	89 (3.50)	7 (0.28)	200 (7.87)	8
5 inch	150	24.3 (0.96)	255 (10.04)	22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	2 (0.08)	216 (8.50)	8
	300	35.8 (1.41)	280 (11.02)	22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	2 (0.08)	235 (9.25)	8
	400	45.1 (1.79)	280 (11.02)	26 (1.02)	186 (7.32)	125 (4.92)	124 (4.88)	7 (0.28)	235 (9.25)	8

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

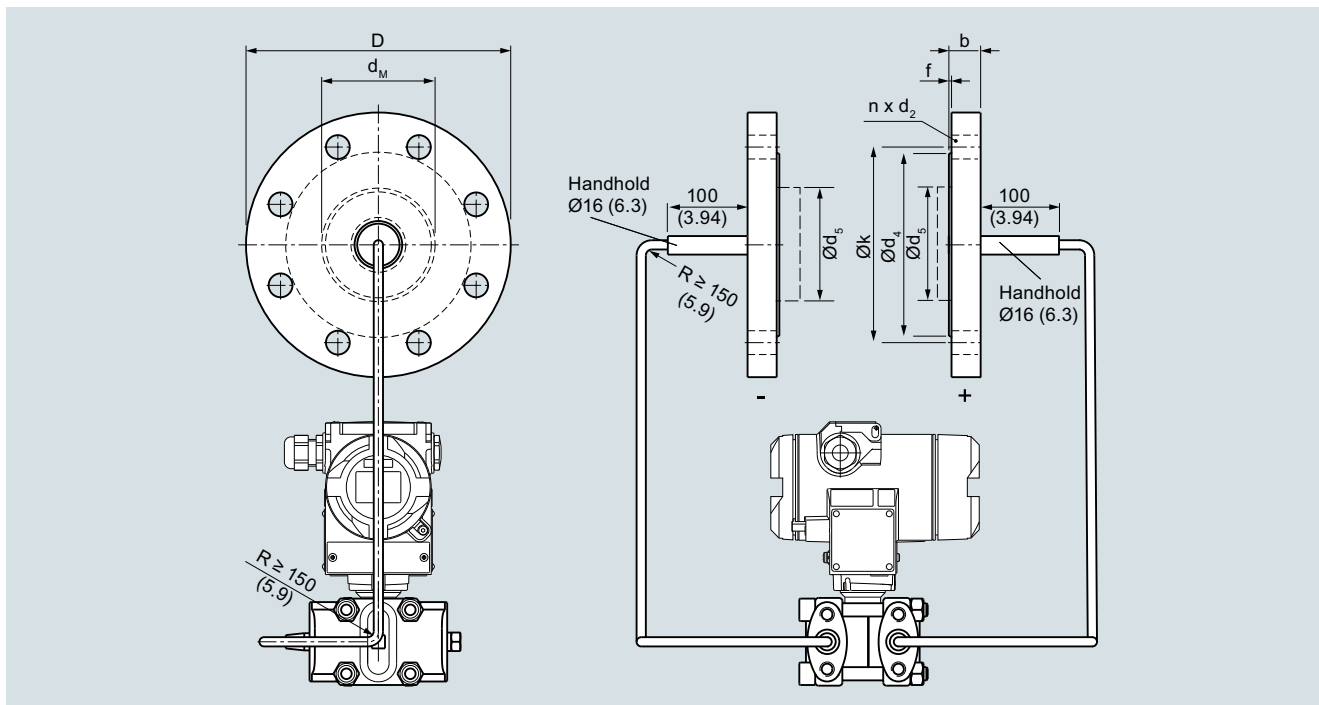
<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design with flexible capillary

1



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or for differential pressure and flow, dimensions in mm (inch)

#### Connection to EN 1092-1

Nom. diam.	Nom. press.	b mm	D mm	d <sub>2</sub> mm	d <sub>4</sub> mm	d <sub>5</sub> mm	d <sub>M</sub> mm	f mm	k mm	n
DN 80	PN 10/16	24	200	18	138	76	72 <sup>1)</sup>	2	160	8
	PN 100	32	230	26	138	76	72 <sup>1)</sup>	2	180	8
DN 100	PN 10/16	20	220	18	158	94	89	2	180	8
	PN 25/40	24	235	22	162	94	89	2	190	8
DN 125	PN 16	22	250	18	188	125	124	2	210	8
	PN 40	26	270	26	188	125	124	2	220	8

#### Connection to ASME B16.5

Nom. diam.	Nom. press.	b mm	D mm	d <sub>2</sub> mm	d <sub>4</sub> mm	d <sub>5</sub> mm	d <sub>M</sub> mm	f mm	k mm	n
lb/sq.in.		mm	mm	mm	mm	mm	mm	mm	mm	
		(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	
3 inch	150	24.3	190	20	127	76	72 <sup>1)</sup>	2	152.5	4
		(0.96)	(7.48)	(0.79)	(5)	(3)	(2.83)	(0.08)	(6)	
	300	29	210	22	127	76	72 <sup>1)</sup>	2	168.5	8
		(1.14)	(8.27)	(0.87)	(5)	(3)	(2.83)	(0.08)	(6.63)	
	600	38.8	210	22	127	76	72 <sup>1)</sup>	7	168.5	8
		(1.52)	(8.27)	(0.87)	(5)	(3)	(2.83)	(0.28)	(6.63)	
4 inch	150	24.3	230	20	158	94	89	2	190.5	8
		(0.96)	(9.06)	(0.79)	(6.22)	(3.69)	(3.50)	(0.08)	(7.5)	
	300	32.2	255	22	158	94	89	2	200	8
		(1.27)	(10.04)	(0.87)	(6.22)	(3.69)	(3.50)	(0.08)	(7.87)	
	400	42	255	26	158	94	89	7	200	8
		(1.65)	(10.04)	(1.02)	(6.22)	(3.69)	(3.50)	(0.28)	(7.87)	
5 inch	150	24.3	255	22	186	125	124	2	216	8
		(0.96)	(10.04)	(0.87)	(7.32)	(4.92)	(4.88)	(0.08)	(8.50)	
	300	35.8	280	22	186	125	124	2	235	8
		(1.41)	(11.02)	(0.87)	(7.32)	(4.92)	(4.88)	(0.08)	(9.25)	
	400	45.1	280	26	186	125	124	7	235	8
		(1.79)	(11.02)	(1.02)	(7.32)	(4.92)	(4.88)	(0.28)	(9.25)	

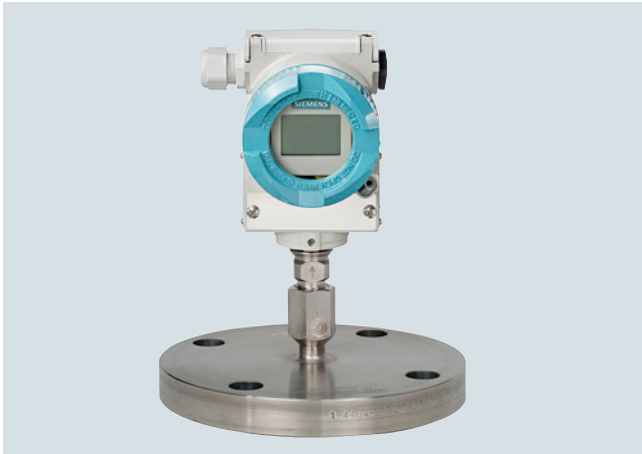
d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 89 mm = 3½ inch with tube length L = 0

### Diaphragm seals of flange design mounted directly on transmitter

#### Overview



Diaphragm seals of flange design, directly fitted on a pressure transmitter for pressure

#### Technical specifications

##### Diaphragm seals (flange design) for pressure and absolute pressure, directly fitted on a transmitter

Nominal diameter	Nominal pressure
• DN 50	PN 10/16/25/40, PN 100
• DN 80	PN 10/16/25/40, PN 100
• DN 100	PN 10/16, PN 25/40
• 2 inch	Class 150, class 300, class 400/600, class 900/1500
• 3 inch	Class 150, class 300, class 600
• 4 inch	Class 150, class 300, class 400
Sealing surface	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	Smooth to EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel mat. no. 1.4404/316L
• Wetted parts	Stainless steel mat. no. 1.4404/316L
	• Without coating
	• PTFE coating
	• ECTFE coating (for vacuum on request)
	• PFA coating
	Monel 400, mat. No. 2.4360
	Hastelloy C276, mat. No. 2.4819
	Hastelloy C4, mat. No. 2.4602
	Hastelloy C22, mat. No. 2.4602
	Tantalum
	Titanium, mat. No. 3.7035
	Nickel 201
	Duplex 2205, mat. no. 1.4462
	Stainless steel 316L, gold plated, thickness approx. 25 µm
• Capillary	Stainless steel, mat. No. 1.4404/316L
• Sealing material at the transmitter connection	Copper

Maximum pressure	See above and the technical data of the transmitter
Tube length	<ul style="list-style-type: none"> <li>• Without tube</li> <li>• 50 mm (1.97 inch)</li> <li>• 100 mm (3.94 inch)</li> <li>• 150 mm (5.91 inch)</li> <li>• 200 mm (7.87 inch)</li> </ul>
Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	<ul style="list-style-type: none"> <li>• Silicone oil M5</li> <li>• Silicone oil M50</li> <li>• High-temperature oil</li> <li>• Halocarbon oil (for measuring O<sub>2</sub>)</li> <li>• Food oil (FDA listed)</li> </ul>
Max. recommended temperature of medium	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal.  More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals.
Weight	Approx. 4 kg (8.82 lb)
<b>Certificate and approvals</b>	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design mounted directly on transmitter

1

#### Selection and Ordering data

Article No. Ord. code

##### Diaphragm seal

7MF4910 -

Directly fitted to a pressure transmitter SITRANS P for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-...<sup>1)</sup>; must be ordered separately

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

##### Process connection

- Vertical (pressure transmitter upright)
- Horizontal

0  
2

##### Nominal diameter and nominal pressure

Nominal diameter	Nominal pressure	Article No.	Ord. code
DN 25	PN 10/16/25/40	Z	J 0 A
	PN 63/100/160	Z	J 0 B
DN 40	PN 10/16/25/40	Z	J 0 C
	PN 63/100	Z	J 0 D
• DN 50	PN 160	Z	J 0 E
	PN 10/16/25/40	A	
• DN 80	PN 100	B	
	PN 10/16/25/40	D	
• DN 100	PN 100	E	
	PN 10/16	G	
1 inch	PN 25/40	H	
	class 150	Z	J 6 A
	class 300	Z	J 6 B
	class 400/600	Z	J 6 C
1½ inch	class 900/1500	Z	J 6 D
	class 150	Z	J 6 E
	class 300	Z	J 6 F
	class 400/600	Z	J 6 G
• 2 inch	class 900/1500	Z	J 6 H
	Class 150	L	
	Class 300	M	
	Class 400/600	N	
• 3 inch	Class 900/1500	P	
	Class 150	Q	
	Class 300	R	
	Class 600	S	
• 4 inch	Class 150	T	
	Class 300	U	
	Class 400	V	
	10 K 316L	Z	J 7 A
JIS DN 50	20 K 316L	Z	J 7 B
JIS DN 80	10 K 316L	Z	J 7 C
	20 K 316L	Z	J 7 D

Smooth sealing surface to DIN 1092-01, form B1 or B2, or to ASME B16.5 125 ... 250 AA or RFSF

Other version

Add Order code and plain text:

Nominal diameter: ...; Nominal pressure: ...

Z J 1 Y

#### Selection and Ordering data

Article No. Ord. code

##### Diaphragm seal

7MF4910 -

Directly fitted to a pressure transmitter SITRANS P for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-...<sup>1)</sup>; must be ordered separately

##### Wetted parts materials

- Stainless steel 316L
  - without coating
  - with PTFE coating
  - with ECTFE coating<sup>2) 3)</sup>
  - with PFA coating<sup>3)</sup>
- Monel 400, mat. No. 2.4360
- Hastelloy C276, mat. No. 2.4819
- Hastelloy C4, mat. No. 2.4602
- Hastelloy C22, mat. No. 2.4602
- Tantalum
- Titanium, mat. No. (max. 150 °C (302 °F))
- Nickel 201 (max. 260 °C (500 °F))
- Duplex 2205, W.-Nr. 1.4462
- Stainless steel 316L, gold plated, thickness approx. 25 µm

##### Tube length

- Without tube

Other version:

Add Order code and plain text:

Wetted parts materials: ...,

Tube length: ...


A  
E 0  
F  
D  
G  
J  
U  
V 0  
K  
L 0  
M 0  
Q  
S 0  
0  
Z 8 K 1 Y

# Pressure Measurement

## Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design mounted directly on transmitter

1

Selection and Ordering data	Article No. Ord. code	Selection and Ordering data	Order code																																																																																																	
<b>Diaphragm seal</b> Directly fitted to a pressure transmitter SITRANS P for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; must be ordered separately	<b>7MF4910 -</b> 	<b>Further designs</b> Please add "-Z" to Article No. and specify Order code.																																																																																																		
<b>Customer-specific tubus length</b> Specify customer-specific length with Y44, see Order Code		<b>Customer-specific tubus length</b> Select range, enter desired length in plain text (No entry = standard length)	<b>Y44</b>																																																																																																	
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<b>Filling liquid</b> <ul style="list-style-type: none"> <li>Silicone oil M5</li> <li>Silicone oil M50</li> <li>High-temperature oil</li> <li>Halocarbon oil (for measuring O<sub>2</sub>)<sup>4)</sup></li> <li>Food oil (FDA listed)</li> </ul> Other version Add Order code and plain text: Filling liquid: ...	1 2 3 4 7 9		<b>M 1 Y</b>																																																																																																	
<b>Oil- and grease-free cleaned version</b> Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2		<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b> <b>Inspection certificate</b> to EN 10204, section 3.1 <b>2.2 Certificate of FDA approval of fill oil</b> Only in conjunction with "Food-grade oil" fill liquid (FDA listed) <b>Functional safety certificate ("SIL 2") to IEC 61508</b> (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter) <b>Functional safety certificate ("SIL 2/3") to IEC 61508</b> (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter) <b>Certification acc. to NACE MR-0175</b> Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) <b>Certification acc. to NACE MR-0103</b> Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) <b>Oil- and grease-free cleaned version</b> Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2 <b>Epoxy painting</b> Not possible with negative pressure service Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN 837-1.	<b>A01</b>  <b>B20</b>  <b>C10</b>  <b>C11</b>  <b>C12</b>  <b>C17</b>  <b>C20</b>  <b>C23</b>  <b>D07</b>  <b>D08</b>  <b>E10</b>  <b>E15</b>																																																																																																	

1) With 7MF802-... and the measuring cells Q, S, T and U also order negative pressure service.

2) For vacuum on request.

3) Only for use in non-hazardous atmospheres.

4) Oil- and grease-free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design mounted directly on transmitter

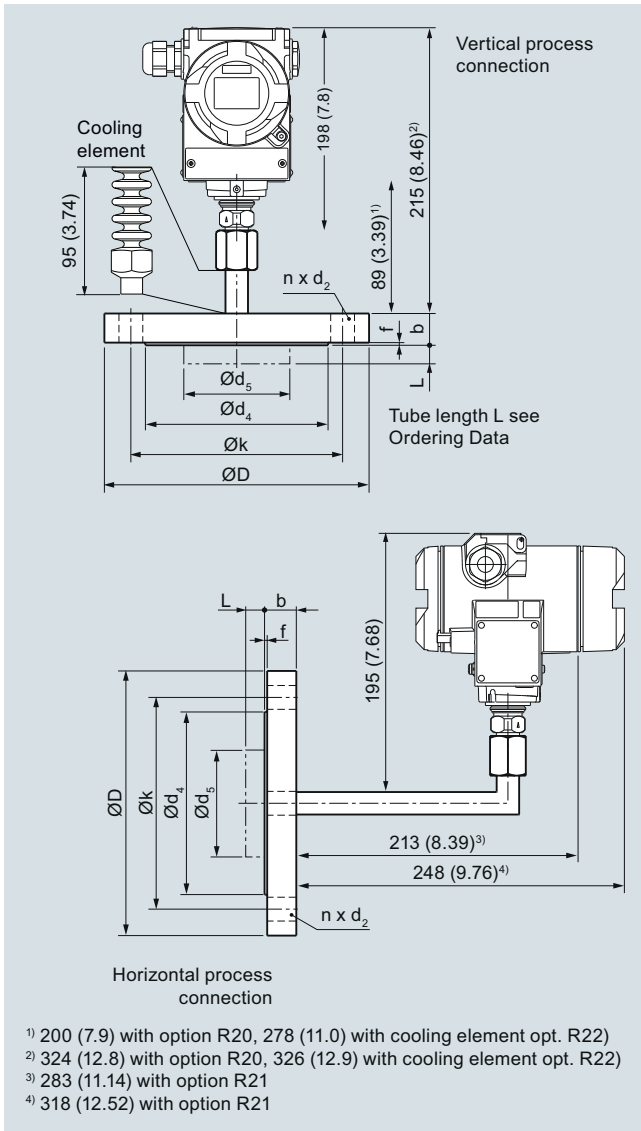
1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<i>Further designs</i>		<i>Further designs</i>	
Please add "-Z" to Article No. and specify Order code.		Please add "-Z" to Article No. and specify Order code.	
<b>Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)</b> previously DIN 2501, form E	<b>J11</b>	<b>Elongated pipe</b> 200 mm instead of 89 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	<b>R20</b>
<b>Sealing surface groove, EN 1092-1, form D</b> instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	<b>J14</b>	<b>Elongated pipe elbow</b> 200 mm instead of 130 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	<b>R21</b>
<b>Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L</b> DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	<b>J30</b> <b>J31</b> <b>J32</b> <b>J33</b> <b>J34</b> <b>J35</b>	<b>Cooling element</b> max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	<b>R22</b>
<b>Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L</b> DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	<b>J40</b> <b>J41</b> <b>J42</b> <b>J43</b> <b>J44</b> <b>J45</b>	<b>Negative pressure service</b> for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	<b>V01</b>
<b>Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L</b> DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	<b>J50</b> <b>J51</b> <b>J52</b> <b>J53</b> <b>J54</b> <b>J55</b>	<b>Extended negative pressure service</b> for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	<b>V51</b>
<b>Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA</b> Instead of sealing surface B2 and RFSF (Only for wetted parts in Hastelloy C276 (2.4819), Tantal and Duplex 2205 (1.4462) and for sizes 2", 3", DN 50 and DN 80)	<b>J12</b>		
<b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b> instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)	<b>J24</b>		

## Diaphragm seals of flange design mounted directly on transmitter

1

### Dimensional drawings



Diaphragm seals of flange design, direct connection to a SITRANS P pressure transmitter (process connection vertical (top) and horizontal (bottom)), dimensions in mm (inch)

### Connection to EN 1092-1

Nom. diam.	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub>	f	k	n
		mm	mm	mm	mm	mm	mm	mm	mm	
DN 50	PN 10/16/25/40	20	165	18	102	48.3	45 <sup>1)</sup>	2	125	4
	PN 100	28	195	26	102	48.3	45 <sup>1)</sup>	2	145	4
DN 80	PN 10/16/25/40	24	200	18	138	76	72 <sup>1)</sup>	2	160	8
	PN 100	32	230	26	138	76	72 <sup>1)</sup>	2	180	8
DN 100	PN 10/16	20	220	18	158	94	89-2	2	180	8
	PN 25/40	24	235	22	162	94	89	2	190	8

### Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub>	f	k	n
lb/sq.in.	mm	mm	mm	mm	mm	mm	mm	mm	mm	
	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	
2 inch	150	19.5	150	20	92	48.3	45 <sup>1)</sup>	2	120.5	4
		(0.77)	(5.91)	(0.79)	(3.62)	(1.9)	(1.77) <sup>1)</sup>	(0.08)	(4.74)	
	300	22.7	165	20	92	48.3	45 <sup>1)</sup>	2	127	8
		(0.89)	(6.5)	(0.79)	(3.62)	(1.9)	(1.77) <sup>1)</sup>	(0.08)	(5)	
400/600	32.4	165	20	92	48.3	45 <sup>1)</sup>	7	127	8	
	(1.28)	(6.5)	(0.79)	(3.62)	(1.9)	(1.77) <sup>1)</sup>	(0.28)	(5)		
900/1500	45.1	215	26	92	48.3	45 <sup>1)</sup>	7	165	8	
	(1.78)	(8.46)	(1.02)	(3.62)	(1.9)	(1.77) <sup>1)</sup>	(0.28)	(6.5)		
3 inch	150	24.3	190	20	127	76	72 <sup>2)</sup>	2	152.5	4
		(0.96)	(7.48)	(0.79)	(5)	(3)	(2.83) <sup>2)</sup>	(0.08)	(6)	
	300	29	210	22	127	76	72 <sup>2)</sup>	2	168.5	8
		(1.14)	(8.27)	(0.87)	(5)	(3)	(2.83) <sup>2)</sup>	(0.08)	(6.63)	
600	38.8	210	22	127	76	72 <sup>2)</sup>	7	168.5	8	
	(1.53)	(8.27)	(0.87)	(5)	(3)	(2.83) <sup>2)</sup>	(0.28)	(6.63)		
4 inch	150	24.3	230	20	158	94	89	2	190.5	8
		(0.96)	(9.06)	(0.79)	(6.22)	(3.69)	(3.50)	(0.08)	(7.5)	
	300	32.2	255	22	158	94	89	2	200	8
		(1.27)	(10.04)	(0.79)	(6.22)	(3.69)	(3.50)	(0.08)	(7.87)	
400	42	255	26	158	94	89	7	200	8	
	(1.65)	(10.04)	(1.02)	(6.22)	(3.69)	(3.50)	(0.28)	(7.87)		

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design mounted directly and with capillary

1

#### Overview



Diaphragm seals of screwed design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

#### Technical specifications

##### Diaphragm seals of screwed design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

Nominal diameter	Nominal pressure
<ul style="list-style-type: none"> <li>• DN 50</li> <li>• DN 80</li> <li>• DN 100</li> <li>• 2 inch</li> <li>• 3 inch</li> <li>• 4 inch</li> </ul>	PN 10/16/25/40, PN 100 PN 10/16/25/40 PN 10/16, PN 25/40 Class 150, class 300, class 400/600, class 900/1500 Class 150, class 300 Class 150, class 300
Sealing surface	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
<ul style="list-style-type: none"> <li>• For stainless steel, mat. No. 1.4404/316L</li> <li>• For the other materials</li> </ul>	To EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
<ul style="list-style-type: none"> <li>• Main body</li> <li>• Wetted parts</li> </ul>	Stainless steel mat. no. 1.4404/316L Stainless steel mat. no. 1.4404/316L <ul style="list-style-type: none"> <li>• Without coating</li> <li>• PTFE coating</li> <li>• ECTFE coating (for vacuum on request)</li> <li>• PFA coating</li> </ul> Monel 400, mat. No. 2.4360 Hastelloy C276, mat. No. 2.4819 Hastelloy C4, mat. No. 2.4602 Hastelloy C22, W.-Nr. 2.4602 Tantalum Titanium, W.-Nr. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, thickness approx. 25 µm
<ul style="list-style-type: none"> <li>• Capillary</li> <li>• Sheath</li> </ul>	Stainless steel, mat. No. 1.4571/316Ti Spiral protective tube made of stainless steel, mat. No. 1.4404/316L

Sealing material in the process flanges	<ul style="list-style-type: none"> <li>• For pressure transmitters, absolute pressure transmitters and low-pressure applications</li> <li>• For other applications</li> </ul>	Copper
Maximum pressure		Viton
Tube length		See above and the technical data of the pressure transmitter
Capillary		Without tube
<ul style="list-style-type: none"> <li>• Length</li> <li>• Internal diameter</li> <li>• Minimum bending radius</li> </ul>		50 mm (1.97 inch) 100 mm (3.94 inch) 150 mm (5.91 inch) 200 mm (7.87 inch)
Filling liquid		Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O <sub>2</sub> ) Food oil (FDA listed)
Max. recommended temperature of medium		170 °C (338 °F)
Permissible ambient temperature		Dependent on the pressure transmitter and the filling liquid of the remote seal More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
Weight		Approx. 4 kg (8.82 lb)
<b>Certificate and approvals</b>		
Classification according to pressure equipment directive (DGRL 2014/68/EU)		For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)





## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design mounted directly and with capillary

1

#### Selection and Ordering data

Article No. Ord. code

##### Diaphragm seal

7MF4913 -

**Mounting flange (with tube as option)** for direct mounting to high-pressure side **and flanged remote seal without tube**, fitted by means of capillary to low-pressure side of SITRANS P for differential pressure; SITRANS P DS III series and P410 (7MF443-...) and SITRANS P500 (7MF54-...)

1 ■ ■ ■ ■ - ■ B ■ ■ ■ ■

##### Tube length

(for mounting flange on high-pressure side)

- Without tube

0

Other version:

Add Order code and plain text:

Wetted parts materials: .....,

Tube length: ...

Z 8 K 1 Y

##### Customer-specific tubus length

Specify customer-specific length with Y44, see Order Code

- Wetted parts materials: Stainless steel without foil Range

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	A 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	A 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	A 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	A 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	A 5

- Wetted parts materials: Stainless steel coated with ECTFE

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	F 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	F 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	F 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	F 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	F 5

- Wetted parts materials: Stainless steel coated with PFA

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	D 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	D 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	D 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	D 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	D 5

- Wetted parts materials: Monel 400

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	G 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	G 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	G 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	G 4

- Wetted parts materials: Hastelloy C276

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	J 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	J 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	J 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	J 4

- Wetted parts materials: Tantalum

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	K 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	K 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	K 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	K 4

#### Selection and Ordering data

Article No. Ord. code

##### Diaphragm seal

7MF4913 -

**Mounting flange (with tube as option)** for direct mounting to high-pressure side **and flanged remote seal without tube**, fitted by means of capillary to low-pressure side of SITRANS P for differential pressure; SITRANS P DS III series and P410 (7MF443-...) and SITRANS P500 (7MF54-...)

1 ■ ■ ■ ■ - ■ B ■ ■ ■ ■

##### Filling liquid

- Silicone oil M5
- Silicone oil M50
- High-temperature oil
- Halocarbon oil (for measuring O<sub>2</sub>)<sup>3)</sup>
- Food oil (FDA listed)

1

2

3

4

7

Other version

Add Order code and plain text:

Filling liquid: ...

9 M 1 Y

##### Length of capillary<sup>4)</sup>

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

2

3

4

5

6

7

8

##### Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

9 N 1 C

9 N 1 E

9 N 1 G

9 N 1 J

9 N 1 L

1) For vacuum on request.

2) Only for use in non-hazardous atmospheres.

3) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.

4) Max. capillary length, see section "Technical description".

## Pressure Measurement

### Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

#### Diaphragm seals of flange design mounted directly and with capillary

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<b>Further designs</b>		<b>Further designs</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code.		Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>Customer-specific tubus length</b>	<b>Y44</b>	<b>Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)</b>	<b>J11</b>
Select range, enter desired length in plain text (No entry = standard length)		previously DIN 2501, form E	
<b>Spark arrestor</b>	<b>A02</b>	<b>Sealing surface groove, EN 1092-1, form D</b>	<b>J14</b>
With spark arrestor for mounting on zone 0 (including documentation)		instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	
<b>Remote seal nameplate</b>	<b>B20</b>	<b>Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L</b>	
Attached out of stainless steel, contains MLFB and order number of the remote seal		DN 25	<b>J30</b>
<b>Oil- and grease-free cleaned version</b>	<b>C10</b>	DN 40	<b>J31</b>
Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2		DN 50	<b>J32</b>
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>	<b>C11</b>	DN 80	<b>J33</b>
<b>Inspection certificate</b>	<b>C12</b>	DN 100	<b>J34</b>
to EN 10204, section 3.1		DN 125	<b>J35</b>
<b>2.2 Certificate of FDA approval of fill oil</b>	<b>C17</b>	<b>Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L</b>	
Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"		DN 25	<b>J40</b>
<b>Functional safety certificate ("SIL 2") to IEC 61508</b>	<b>C20</b>	DN 40	<b>J41</b>
(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)		DN 50	<b>J42</b>
<b>Functional safety certificate ("SIL 2/3") to IEC 61508</b>	<b>C23</b>	DN 80	<b>J43</b>
(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)		DN 100	<b>J44</b>
<b>Certification acc. to NACE MR-0175</b>	<b>D07</b>	DN 125	<b>J45</b>
Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)		<b>Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L</b>	
<b>Certification acc. to NACE MR-0103</b>	<b>D08</b>	DN 25	<b>J50</b>
Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)		DN 40	<b>J51</b>
<b>Oil- and grease-free cleaned version</b>	<b>E10</b>	DN 50	<b>J52</b>
Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2		DN 80	<b>J53</b>
<b>Epoxy painting</b>	<b>E15</b>	DN 100	<b>J54</b>
Not possible with negative pressure service.		DN 125	<b>J55</b>
Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter.		<b>Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA</b>	<b>J12</b>
With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN 837-1.		Instead of sealing surface B2 and RFSF (Only for wetted parts in Hastelloy C276 (2.4819), Tantal and Duplex 2205 (1.4462) and for sizes 2", 3", DN 50 and DN 80)	
		<b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b>	<b>J24</b>
		instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)	

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design mounted directly and with capillary

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<b>Further designs</b>		<b>Further designs</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code.		Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>Radial capillary pipe outlet</b> for one-sided mounting	<b>K01</b>	<b>PVC protective tube</b> over the spiral protective tube of the capillaries (color: black)	
<b>PE protective tube</b> over the spiral protective tube of the capillaries (color: white)		1.0 m (3.28 ft)	<b>N60</b>
1.0 m (3.28 ft)	<b>N20</b>	1.6 m (5.25 ft)	<b>N61</b>
1.6 m (5.25 ft)	<b>N21</b>	2.0 m (6.56 ft)	<b>N62</b>
2.0 m (6.56 ft)	<b>N22</b>	2.5 m (8.20 ft)	<b>N63</b>
2.5 m (8.20 ft)	<b>N23</b>	3.0 m (9.84 ft)	<b>N64</b>
3.0 m (9.84 ft)	<b>N24</b>	4.0 m (13.12 ft)	<b>N65</b>
4.0 m (13.12 ft)	<b>N25</b>	5.0 m (16.40 ft)	<b>N66</b>
5.0 m (16.40 ft)	<b>N26</b>	6.0 m (19.69 ft)	<b>N67</b>
6.0 m (19.69 ft)	<b>N27</b>	7.0 m (22.97 ft)	<b>N68</b>
7.0 m (22.97 ft)	<b>N28</b>	8.0 m (26.25 ft)	<b>N69</b>
8.0 m (26.25 ft)	<b>N29</b>	9.0 m (29.53 ft)	<b>N70</b>
9.0 m (29.53 ft)	<b>N30</b>	10.0 m (32.81 ft)	<b>N71</b>
10.0 m (32.81 ft)	<b>N31</b>	<b>Elongated pipe, distance from transmitter process flange to flange is 150 mm instead of 100 mm,</b> max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid.	<b>R15</b>
<b>PTFE protective tube</b> over the spiral protective tube of the capillaries (color: transparent)		<b>Elongated pipe, distance from transmitter process flange to flange is 100 mm instead of 100 mm,</b> max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	<b>R20</b>
1.0 m (3.28 ft)	<b>N40</b>	<b>Negative pressure service</b> for use in low-pressure range for transmitters for • differential pressure	<b>V03</b>
1.6 m (5.25 ft)	<b>N41</b>	<b>Extended negative pressure service</b> for use in low-pressure range for transmitters for • differential pressure	<b>V53</b>
2.0 m (6.56 ft)	<b>N42</b>		
2.5 m (8.20 ft)	<b>N43</b>		
3.0 m (9.84 ft)	<b>N44</b>		
4.0 m (13.12 ft)	<b>N45</b>		
5.0 m (16.40 ft)	<b>N46</b>		
6.0 m (19.69 ft)	<b>N47</b>		
7.0 m (22.97 ft)	<b>N48</b>		
8.0 m (26.25 ft)	<b>N49</b>		
9.0 m (29.53 ft)	<b>N50</b>		
10.0 m (32.81 ft)	<b>N51</b>		

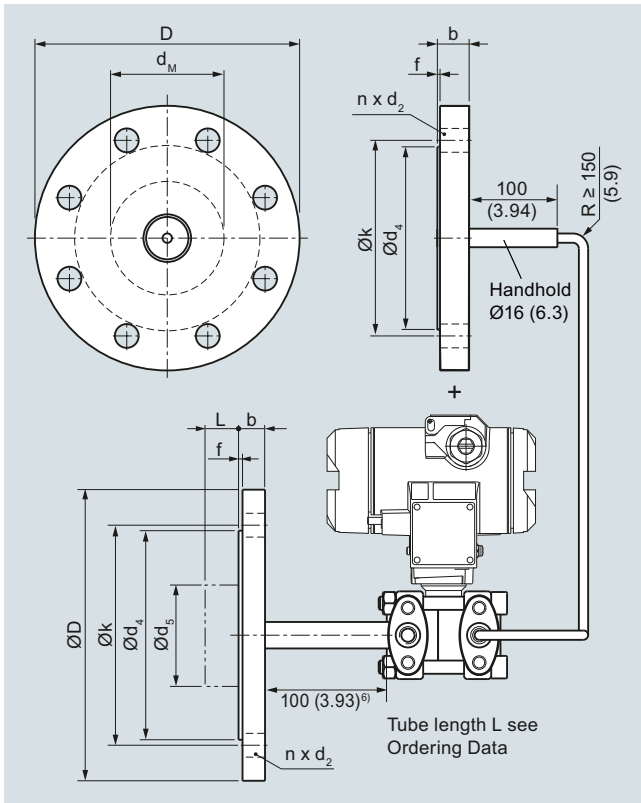
# Pressure Measurement

## Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

### Diaphragm seals of flange design mounted directly and with capillary

1

#### Dimensional drawings



Diaphragm seals of screwed design with flexible capillary, fixed connection, for connection to a SITRANS P pressure transmitter for differential pressure, dimensions in mm (inch)

#### Connection to EN 1092-1

Nom. diam.	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub>	f	k	n
		mm	mm	mm	mm	mm	mm	mm	mm	
DN 50	PN 10/16/25/40	20	165	18	102	48.3	45 <sup>1)</sup>	2	125	4
	PN 100	28	195	26	102	48.3	45 <sup>1)</sup>	2	145	4
DN 80	PN 10/16/25/40	24	200	18	138	76	72 <sup>2)</sup>	2	160	8
	PN 100	32	230	26	138	76	72 <sup>2)</sup>	2	180	8
DN 100	PN 10/16	20	220	18	158	94	89	2	180	8
	PN 25/40	24	235	22	162	94	89	2	190	8

#### Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub>	f	k	n
	lb/sq.in.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	
2 inch	150	19.5 (0.77)	150 (5.91)	20 (0.79)	92 (3.62)	48.3 (1.9)	45 <sup>1)</sup> (1.77) <sup>1)</sup>	2 (0.08)	120.5 (4.74)	4
	300	22.7 (0.89)	165 (6.5)	20 (0.79)	92 (3.62)	48.3 (1.9)	45 <sup>1)</sup> (1.77) <sup>1)</sup>	2 (0.08)	127 (5)	8
	400/600	32.4 (1.28)	165 (6.5)	20 (0.79)	92 (3.62)	48.3 (1.9)	45 <sup>1)</sup> (1.77) <sup>1)</sup>	7 (0.28)	127 (5)	8
	900/1500	45.1 (1.78)	215 (8.46)	26 (1.02)	92 (3.62)	48.3 (1.9)	45 <sup>1)</sup> (1.77) <sup>1)</sup>	7 (0.28)	165 (6.5)	8
3 inch	150	24.3 (0.96)	190 (7.48)	20 (0.79)	127 (5)	76 (3)	72 <sup>2)</sup> (2.83) <sup>2)</sup>	2 (0.08)	152.5 (6)	4
	300	29 (1.14)	210 (8.27)	22 (0.87)	127 (5)	76 (3)	72 <sup>2)</sup> (2.83) <sup>2)</sup>	2 (0.08)	168.5 (6.63)	8
4 inch	150	24.3 (0.96)	230 (9.06)	20 (0.79)	158 (6.22)	94 (3.69)	89 (3.50)	2 (0.08)	190.5 (7.5)	8
	300	32.2 (1.27)	255 (10.04)	22 (0.79)	158 (6.22)	94 (3.69)	89 (3.50)	2 (0.08)	200 (7.87)	8

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d<sub>M</sub>: Effective diaphragm diameter

<sup>1)</sup> 59 mm = 2.32 inch with tube length L = 0

<sup>2)</sup> 89 mm = 3½ inch with tube length L = 0

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Diaphragm seal, screwed design, mounted directly or/and with capillary

1

#### Overview



Diaphragm seal, screwed gland design with inside diaphragm for gauge, absolute and differential pressure for direct mounting



Process connection: open measurement flange

#### Technical specifications

##### Diaphragm seal, screwed gland with inside diaphragm

Process connection	Nominal pressure
• Male thread G $\frac{1}{2}$ B to EN 837-1	PN 100, PN 250
• External thread $\frac{1}{2}$ -14" NPT-M	PN 100, PN 250
• open measurement flange	
- DN 25	PN 10 ... PN 40
- 1 inch	Class 150, class 300
Sealing surface for open measurement flange	
• For stainless steel, mat. no. 1.4404/316L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
Materials	
• Lower section (in the case of process connection thread)	Stainless steel, Mat. no. 1.4404/316L
• Diaphragm	Stainless steel, Mat. no. 1.4404/316L
	• No coating
	• With PTFE coating
	Monel 400, mat. no. 2.4360
	Hastelloy C276, mat. no. 2.4819
	Hastelloy C4, mat. no. 2.4602
	Tantal
	Stainless steel 316L, gold plated, thickness approx. 25 $\mu$ m
• Top section (process connection in the case of an open measurement flange)	Stainless steel, mat. no. 1.4404/316L
• Capillary	Stainless steel, mat. no. 1.4404/316L
• Sealing material on the process connection	Viton or copper (in the case of vacuum-free version)
• Sealing material between top and bottom section	Viton (FKM) (standard) Teflon (PTFE) metal spring ring (silver-coated)

Capillary	
• Length	Max. 10 m (32.8 ft)
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
• Sheath	Stainless steel protective tube, mat. No. 1.4301/304
Filling liquid	<ul style="list-style-type: none"> <li>• Silicone oil M5</li> <li>• Silicone oil M50</li> <li>• High-temperature oil</li> <li>• Halocarbon oil (for measuring O<sub>2</sub>)</li> <li>• Food oil (FDA listed)</li> </ul>
Max. recommended temperature of medium	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal
	More information can be found in the technical specifications of the pressure transmitters and in the section "Technical data of filling liquid" in the introduction to the remote seals
Weight	Approx. 1.5 kg (3.3 lb)

##### Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
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# Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

## Diaphragm seal, screwed design, mounted directly or/and with capillary

1

Selection and Ordering data	Article No.	Ord.	Code	Selection and Ordering data	Article No.	Ord.	Code
<b>Remote seal, screwed gland with inside diaphragm</b>				<b>Remote seal, screwed gland with inside diaphragm</b>			
<b>Mounted on SITRANS P pressure transmitter for</b>				<b>Mounted on SITRANS P pressure transmitter for</b>			
<ul style="list-style-type: none"> <li><b>gauge pressure</b> 7MF2033-...; 7MF403-... and SITRANS P300, 7MF802-...</li> <li><b>absolute pressure</b> 7MF423-... and SITRANS P300, 7MF802-...</li> </ul> In conjunction with Order code "V01" (vacuum-proof design)				<ul style="list-style-type: none"> <li><b>gauge pressure</b> 7MF2033-...; 7MF403-... and SITRANS P300, 7MF802-...</li> <li><b>absolute pressure</b> 7MF423-... and SITRANS P300, 7MF802-...</li> </ul> In conjunction with Order code "V01" (vacuum-proof design)			
7MF4930 -				7MF4930 -			
<b>Mounted on either side of SITRANS P pressure transmitter for</b>				<b>Mounted on either side of SITRANS P pressure transmitter for</b>			
<ul style="list-style-type: none"> <li><b>differential pressure</b> 7MF243-...; 7MF443-... and 7MF54-...</li> </ul>				<ul style="list-style-type: none"> <li><b>differential pressure</b> 7MF243-...; 7MF443-... and 7MF54-...</li> </ul>			
7MF4933 -				7MF4933 -			
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
<b>Type</b>				<b>Sealing material between top and bottom section</b>			
<ul style="list-style-type: none"> <li>no flushing hole</li> <li>with flushing hole 1x 1/8 NPT unsealed (only with process connection 316L)</li> </ul> Other version, add Order code and plain text: Version: ...				FKM (standard with diaphragm and 316L process connection) PTFE (standard with custom material with max. 260 °C (500 °F)) Metal C- circlip, silver coated for > 260 °C (500 °F) incl. high temperature-resistant screwed gland			
1				1			
2				2			
9				3			
H 1 Y							
<b>Process connection version</b>				<b>Filling liquid</b>			
<b>Lower flange material</b>	<b>Process connection</b>	<b>Nominal diameter and pressure level</b>		<ul style="list-style-type: none"> <li>Silicone oil M5</li> <li>Silicone oil M50</li> <li>High-temperature oil</li> <li>Halocarbon oil (for measuring O<sub>2</sub>)<sup>2)</sup></li> <li>Food oil (FDA-listed)</li> </ul> Other version, add Order code and plain text: filling liquid: ...			
316L/1.4404	Thread	G½B/PN100	B	1			
316L/1.4404	Thread	G½B/PN250	C	2			
316L/1.4404	Thread	½NPT-M/PN100	E	3			
316L/1.4404	Thread	½NPT-M/PN250	F	4			
316L/1.4404	Thread	½NPT-F/PN100	H	7			
316L/1.4404	Thread	½NPT-F/PN250	J	9			
316L/1.4404	open measurement flange	DN 25/ PN 10 ... 40	N	M 1 Y			
316L/1.4404	open measurement flange	1"/Class 150	P				
316L/1.4404	open measurement flange	1"/Class 300	Q				
PTFE <sup>1)</sup>	Thread	G½B/PN100	T				
PTFE <sup>1)</sup>	open measurement flange	DN 25/ PN 10 ... 40	U				
PTFE <sup>1)</sup>	open measurement flange	1"/Class 150	V				
PTFE <sup>1)</sup>	open measurement flange	1"/Class 300	W				
Other version, add Order code and plain text: Lower flange material: ...; Process connection: ...; Nominal diameter/pressure level: ...				Z			
				J 1 Y			
<b>Diaphragm material</b>				<b>Capillary length<sup>3)</sup></b>			
Stainless steel 316L				<ul style="list-style-type: none"> <li>none, direct mounting</li> <li>none, direct mounting with cooling element (not in conjunction with transmitter for differential pressure)</li> </ul>			
316L stainless steel with PTFE film				<ul style="list-style-type: none"> <li>1.0 m (3.28 ft)</li> <li>1.6 m (5.25 ft)</li> <li>2.5 m (8.20 ft)</li> <li>4.0 m (13.1 ft)</li> <li>6.0 m (19.7 ft)</li> <li>8.0 m (26.25 ft)</li> <li>10.0 m (32.8 ft)</li> </ul>			
Monel 400				2			
Hastelloy C276				3			
Hastelloy C4				4			
Tantalum				5			
Stainless steel 316L, gold plated, thickness approx. 25 µm				6			
				7			
				8			
Other version, add Order code and plain text: Diaphragm material: ...				9			
				9 N 1 C			
				9 N 1 E			
				9 N 1 G			
				9 N 1 J			
				9 N 1 L			
Z				K 1 Y			

1) Not in combination with flushing holes. Not together with the options for negative pressure service (V01 and V03) and extended negative pressure service (V51 and V53).  
 2) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.  
 3) Max. capillary length, see section "Technical description".

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

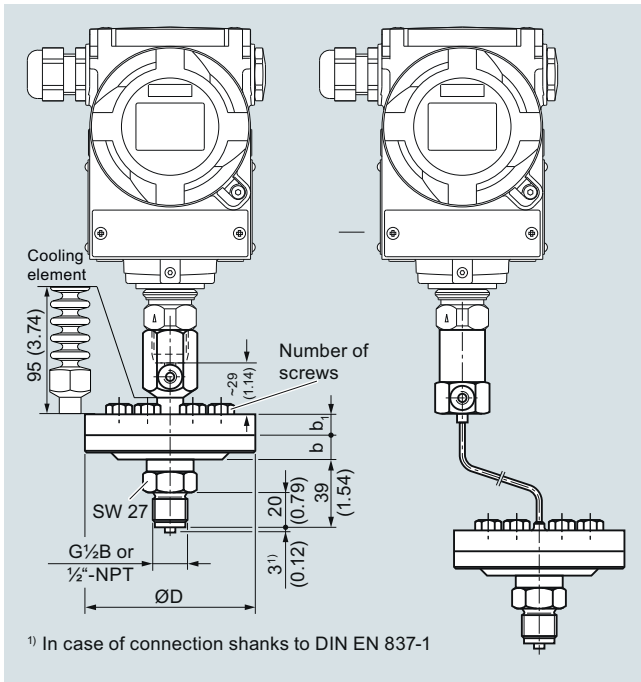
### Diaphragm seal, screwed design, mounted directly or/and with capillary

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<b>Further designs</b>		<b>Further designs</b>	
Add "-Z" to Article No. and specify Order code.		Add "-Z" to Article No. and specify Order code.	
<b>Remote seal nameplate</b>	<b>B20</b>	<b>PE protective tube</b>	
Attached out of stainless steel, contains MLFB and order number of the remote seal		over the spiral protective tube of the capillaries (color: white)	
<b>Oil- and grease-free cleaned version</b>	<b>C10</b>	1.0 m (3.28 ft)	<b>N20</b>
Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2		1.6 m (5.25 ft)	<b>N21</b>
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>	<b>C11</b>	2.0 m (6.56 ft)	<b>N22</b>
<b>Inspection certificate</b>	<b>C12</b>	2.5 m (8.20 ft)	<b>N23</b>
to EN 10204, section 3.1		3.0 m (9.84 ft)	<b>N24</b>
<b>2.2 Certificate of FDA approval of fill oil</b>	<b>C17</b>	4.0 m (13.12 ft)	<b>N25</b>
Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"		5.0 m (16.40 ft)	<b>N26</b>
<b>Functional safety certificate ("SIL 2") to IEC 61508</b>	<b>C20</b>	6.0 m (19.69 ft)	<b>N27</b>
(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)		7.0 m (22.97 ft)	<b>N28</b>
<b>Functional safety certificate ("SIL 2/3") to IEC 61508</b>	<b>C23</b>	8.0 m (26.25 ft)	<b>N29</b>
(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)		9.0 m (29.53 ft)	<b>N30</b>
<b>Certification acc. to NACE MR-0175</b>	<b>D07</b>	10.0 m (32.81 ft)	<b>N31</b>
Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)		<b>PTFE protective tube</b>	
<b>Certification acc. to NACE MR-0103</b>	<b>D08</b>	over the spiral protective tube of the capillaries (color: transparent)	
Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)		1.0 m (3.28 ft)	<b>N40</b>
<b>Oil- and grease-free cleaned version</b>	<b>E10</b>	1.6 m (5.25 ft)	<b>N41</b>
Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2		2.0 m (6.56 ft)	<b>N42</b>
<b>Epoxy painting</b>	<b>E15</b>	2.5 m (8.20 ft)	<b>N43</b>
Not possible with negative pressure service.		3.0 m (9.84 ft)	<b>N44</b>
Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter.		4.0 m (13.12 ft)	<b>N45</b>
With transmitters 7MF40.. and 7MF42..., only possible with process connection G½B according to EN 837-1.		5.0 m (16.40 ft)	<b>N46</b>
<b>One-sided mounting on differential pressure transmitters</b>	<b>H10</b>	6.0 m (19.69 ft)	<b>N47</b>
(only for 7MF4930-...)	<b>H11</b>	7.0 m (22.97 ft)	<b>N48</b>
on high-pressure side		8.0 m (26.25 ft)	<b>N49</b>
on low-pressure side		9.0 m (29.53 ft)	<b>N50</b>
<b>Sealing surface groove, EN 1092-1, form D</b>	<b>J14</b>	10.0 m (32.81 ft)	<b>N51</b>
instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)		<b>PVC protective tube</b>	
<b>Sealing surface RJF (groove, previously RTJ) ASME B16.5</b>	<b>J24</b>	over the spiral protective tube of the capillaries (color: black)	
instead of sealing surface		1.0 m (3.28 ft)	<b>N60</b>
ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)		1.6 m (5.25 ft)	<b>N61</b>
<b>Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L</b>	<b>J30</b>	2.0 m (6.56 ft)	<b>N62</b>
DN 25	<b>J31</b>	2.5 m (8.20 ft)	<b>N63</b>
DN 40		3.0 m (9.84 ft)	<b>N64</b>
		4.0 m (13.12 ft)	<b>N65</b>
		5.0 m (16.40 ft)	<b>N66</b>
		6.0 m (19.69 ft)	<b>N67</b>
		7.0 m (22.97 ft)	<b>N68</b>
		8.0 m (26.25 ft)	<b>N69</b>
		9.0 m (29.53 ft)	<b>N70</b>
		10.0 m (32.81 ft)	<b>N71</b>
		<b>Negative pressure service</b>	
		for use in low-pressure range for transmitters for	
		• gauge and absolute pressure from the pressure series	<b>V01</b>
		• differential pressure	<b>V03</b>
		<b>Extended negative pressure service</b>	
		for use in low-pressure range for transmitters for	
		• gauge and absolute pressure from the pressure series	<b>V51</b>
		• differential pressure	<b>V53</b>

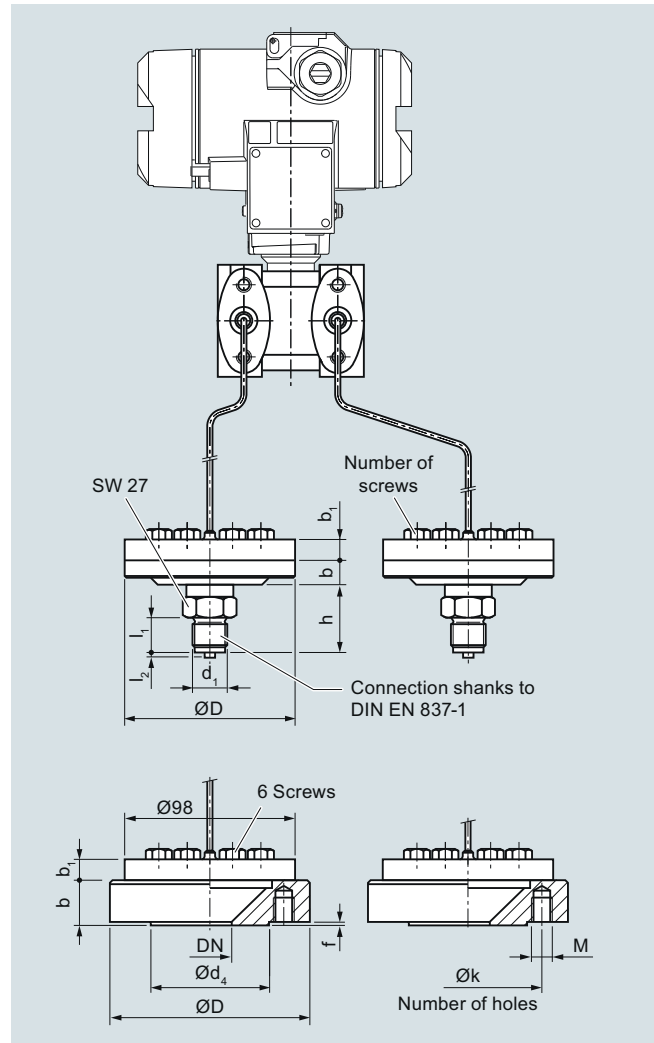


**Dimensional drawings**



Diaphragm seal, screwed gland with inside diaphragm, for gauge and absolute pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

Range	D mm	b mm	b <sub>1</sub> mm	Number of screws
up to 100 bar	98	14	16	6
up to 250 bar	98	14	20	12



Diaphragm seal, screwed gland with inside diaphragm, for differential pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

Nominal diameter	Nominal pressure	D mm	d <sub>4</sub> mm	k mm	M	Number of holes	b mm	b <sub>1</sub> mm	f mm
DN 25	PN 10/16/25/40	115	68	85	M12	4	26	12	2
1 inch	150 lb/sq.in	108	50.8	79.2	M12	4	22	12	1.6
1 inch	300 lb/sq.in	124	50.8	88.9	M16	4	22	12	1.6

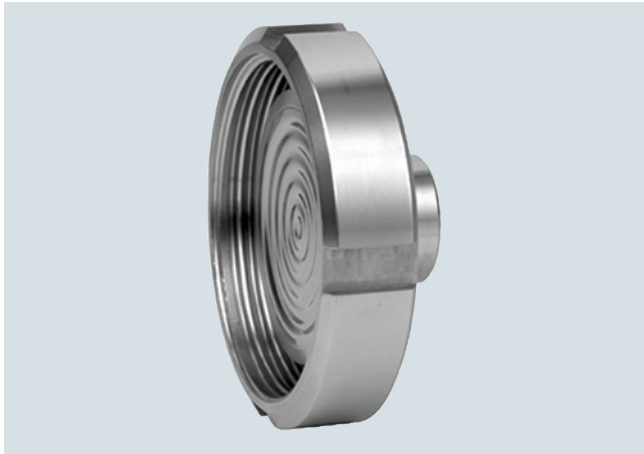
## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Quick-release diaphragm seals

1

#### Overview



Quick-release diaphragm seals, to DIN 11851 with slotted union nut



Quick-release diaphragm seals, with clamp connection

Quick-release diaphragm seals are available for the following SITRANS P pressure transmitter series:

- For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- For differential pressure and flow: P500, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- The quick-release remote seals are common designs in the food industry. Their design means that the medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

#### Technical specifications

##### Quick-release diaphragm seal

Connection, nominal diameter	Nominal pressure
<u>For pressure</u>	
• To DIN 11851 with slotted union nut	
- DN 25	PN 40
- DN 32	PN 40
- DN 40	PN 40
- DN 50	PN 25
- DN 65	PN 25
- DN 80	PN 25
• To DIN 11851 with threaded socket	
- DN 25	PN 40
- DN 32	PN 40
- DN 40	PN 40
- DN 50	PN 25
- DN 65	PN 25
- DN 80	PN 25

• Clamp connection	
- 1½ inch	PN 16
- 2 inch	PN 16
- 2½ inch	PN 16
- 3 inch	PN 10
<u>For differential pressure and flow</u>	
• To DIN 11851 with slotted union nut	
- DN 50	PN 25
- DN 65	PN 25
- DN 80	PN 25
• To DIN 11851 with threaded socket	
- DN 50	PN 25
- DN 65	PN 25
- DN 80	PN 25
• Clamp connection	
- 2 inch	PN 16
- 2½ inch	PN 16
- 3 inch	PN 10
Sealing surface	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASME B 16.5RF 125 ... 250 AA
• For the other materials	To EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel 316L
• Wetted parts	Stainless steel 316L
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral protective tube made of stainless steel, mat. no.1.4404/316L
Maximum pressure	See above and the technical data of the pressure transmitter
Tube length	Without tube
Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4301/316
Filling liquid	Food oil (FDA listed)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal
	More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
Weight	Approx. 4 kg (8.82 lb)
<b>Certificates and approvals</b>	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
EHEDG	Complies with EHEDG recommendations

# Pressure Measurement

## Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

### Quick-release diaphragm seals

1

Selection and Ordering data		Article No.	Ord. code	Selection and Ordering data		Ord. code
<b>Quick-release diaphragm seal</b>		<b>7MF4940-</b>		<b>Further designs</b>		
for SITRANS P pressure transmitters for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; must be ordered separately Filling liquid: Food oil (FDA listed) Material: Stainless steel, mat. No. 1.4435		<b>A 0 - B</b>		Please add <b>"-Z"</b> to Article No. and specify Order code.		
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>				<b>Remote seal nameplate</b>		<b>B20</b>
				Attached out of stainless steel, contains MLFB and order number of the remote seal		
				<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>		<b>C11</b>
				<b>Inspection certificate</b> to EN 10204, section 3.1		<b>C12</b>
<b>Nom. diam.      Nominal pressure</b>				<b>2.2 Certificate of FDA approval of fill oil</b>		<b>C17</b>
<ul style="list-style-type: none"> <li>• Connection to DIN 11851 with slotted union nut               <ul style="list-style-type: none"> <li>- DN 25      PN 40</li> <li>- DN 32      PN 40</li> <li>- DN 40      PN 40</li> <li>- DN 50      PN 25</li> <li>- DN 65      PN 25</li> <li>- DN 80      PN 25</li> </ul> </li> <li>• Connection to DIN 11851 with screw necks               <ul style="list-style-type: none"> <li>- DN 25      PN 40</li> <li>- DN 32      PN 40</li> <li>- DN 40      PN 40</li> <li>- DN 50      PN 25</li> <li>- DN 65      PN 25</li> <li>- DN 80      PN 25</li> </ul> </li> <li>• Tri-Clamp connection to DIN 32676/ISO 2852               <ul style="list-style-type: none"> <li>- DN 40/1½ inch      PN 16</li> <li>- DN 50/2 inch      PN 16</li> <li>- DN 65/2½ inch      PN 16</li> <li>- DN 80/3 inch      PN 10</li> </ul> </li> </ul>		<b>1 B</b>		Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"		
		<b>1 C</b>		<b>Functional safety certificate ("SIL 2") to IEC 61508</b>		<b>C20</b>
		<b>1 D</b>		(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)		
		<b>1 E</b>		<b>Functional safety certificate ("SIL 2/3") to IEC 61508</b>		<b>C23</b>
		<b>1 F</b>		(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)		
		<b>1 G</b>		<b>One-sided mounting on differential pressure transmitters</b> (only for 7MF4940-...) on high-pressure side on low-pressure side		<b>H10</b> <b>H11</b>
		<b>2 B</b>		<b>PE protective tube</b> over the spiral protective tube of the capillaries (color: white)		
		<b>2 C</b>		1.0 m (3.28 ft)		<b>N20</b>
		<b>2 D</b>		1.6 m (5.25 ft)		<b>N21</b>
		<b>2 E</b>		2.0 m (6.56 ft)		<b>N22</b>
		<b>2 F</b>		2.5 m (8.20 ft)		<b>N23</b>
		<b>2 G</b>		3.0 m (9.84 ft)		<b>N24</b>
		<b>4 L</b>		4.0 m (13.12 ft)		<b>N25</b>
		<b>4 M</b>		5.0 m (16.40 ft)		<b>N26</b>
		<b>4 N</b>		6.0 m (19.69 ft)		<b>N27</b>
		<b>4 P</b>		7.0 m (22.97 ft)		<b>N28</b>
Other version Add Order codes and plain text: Process connection: ..., Nominal diameter: ...; Nominal pressure: ...		<b>9 A</b>	<b>H 1 Y</b>	8.0 m (26.25 ft)		<b>N29</b>
				9.0 m (29.53 ft)		<b>N30</b>
				10.0 m (32.81 ft)		<b>N31</b>
<b>Filling liquid</b>		<b>7</b>		<b>PTFE protective tube</b> over the spiral protective tube of the capillaries (color: transparent)		
• Food oil (FDA listed)		<b>9</b>	<b>M 1 Y</b>	1.0 m (3.28 ft)		<b>N40</b>
Other version Add Order code and plain text: Filling liquid: ...				1.6 m (5.25 ft)		<b>N41</b>
				2.0 m (6.56 ft)		<b>N42</b>
				2.5 m (8.20 ft)		<b>N43</b>
				3.0 m (9.84 ft)		<b>N44</b>
				4.0 m (13.12 ft)		<b>N45</b>
				5.0 m (16.40 ft)		<b>N46</b>
				6.0 m (19.69 ft)		<b>N47</b>
				7.0 m (22.97 ft)		<b>N48</b>
				8.0 m (26.25 ft)		<b>N49</b>
				9.0 m (29.53 ft)		<b>N50</b>
				10.0 m (32.81 ft)		<b>N51</b>
<b>Connection to pressure transmitter</b>						
• direct		<b>0</b>				
through capillary, length: <sup>2)</sup>						
• 1.0 m (3.28 ft)		<b>2</b>				
• 1.6 m (5.25 ft)		<b>3</b>				
• 2.5 m (8.20 ft)		<b>4</b>				
• 4.0 m (13.1 ft)		<b>5</b>				
• 6.0 m (19.7 ft)		<b>6</b>				
• 8.0 m (26.25 ft)		<b>7</b>				
• 10.0 m (32.8 ft)		<b>8</b>				
<b>Special lengths for capillaries</b>						
• 2.0 m (6.56 ft)		<b>9</b>	<b>N 1 C</b>			
• 3.0 m (9.84 ft)		<b>9</b>	<b>N 1 E</b>			
• 5.0 m (16.40 ft)		<b>9</b>	<b>N 1 G</b>			
• 7.0 m (23.97 ft)		<b>9</b>	<b>N 1 J</b>			
• 9.0 m (29.53 ft)		<b>9</b>	<b>N 1 L</b>			

<sup>1)</sup> With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

<sup>2)</sup> Max. capillary length, see section "Technical description"

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Quick-release diaphragm seals

1

Selection and Ordering data	Ord. code
<b>Further designs</b> Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>PVC protective tube</b> over the spiral protective tube of the capillaries (color: black)	
1.0 m (3.28 ft)	<b>N60</b>
1.6 m (5.25 ft)	<b>N61</b>
2.0 m (6.56 ft)	<b>N62</b>
2.5 m (8.20 ft)	<b>N63</b>
3.0 m (9.84 ft)	<b>N64</b>
4.0 m (13.12 ft)	<b>N65</b>
5.0 m (16.40 ft)	<b>N66</b>
6.0 m (19.69 ft)	<b>N67</b>
7.0 m (22.97 ft)	<b>N68</b>
8.0 m (26.25 ft)	<b>N69</b>
9.0 m (29.53 ft)	<b>N70</b>
10.0 m (32.81 ft)	<b>N71</b>
<b>Cooling element</b> max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	<b>R22</b>
<b>Negative pressure service</b> for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	<b>V01</b>
<b>Extended negative pressure service</b> for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	<b>V51</b>

# Pressure Measurement

## Remote seals for pressure transmitters

### SITRANS P300, P DS III, P410, P500

#### Quick-release diaphragm seals

1

Selection and Ordering data		Article No.	Ord. code	Selection and Ordering data		Order code
<b>Quick-release diaphragm seal</b>		7 M F 4 9 4 3 -		<b>Further designs</b>		
for SITRANS P pressure transmitters for pressure for differential pressure and flow, type 7MF243...; 7MF443... and 7MF54...; order separately Filling liquid: Food oil (FDA listed) Material: Stainless steel, mat. No. 1.4435 Delivery unit: 2 off		■ A 0 ■ - ■ B ■ ■ ■		Please add "-Z" to Article No. and specify Order code.		
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>				<b>Remote seal nameplate</b>		<b>B20</b>
				Attached out of stainless steel, contains MLFB and order number of the remote seal		
				<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>		<b>C11</b>
				<b>Inspection certificate</b>		<b>C12</b>
				to EN 10204, section 3.1		
				<b>2.2 Certificate of FDA approval of fill oil</b>		<b>C17</b>
				Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"		
				<b>Functional safety certificate ("SIL 2") to IEC 61508</b>		<b>C20</b>
				(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)		
				<b>Functional safety certificate ("SIL 2/3") to IEC 61508</b>		<b>C23</b>
				(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)		
				<b>PE protective tube</b>		
				over the spiral protective tube of the capillaries (color: white)		
				1.0 m (3.28 ft)		<b>N20</b>
				1.6 m (5.25 ft)		<b>N21</b>
				2.0 m (6.56 ft)		<b>N22</b>
				2.5 m (8.20 ft)		<b>N23</b>
				3.0 m (9.84 ft)		<b>N24</b>
				4.0 m (13.12 ft)		<b>N25</b>
				5.0 m (16.40 ft)		<b>N26</b>
				6.0 m (19.69 ft)		<b>N27</b>
				7.0 m (22.97 ft)		<b>N28</b>
				8.0 m (26.25 ft)		<b>N29</b>
				9.0 m (29.53 ft)		<b>N30</b>
				10.0 m (32.81 ft)		<b>N31</b>
				<b>PTFE protective tube</b>		
				over the spiral protective tube of the capillaries (color: transparent)		
				1.0 m (3.28 ft)		<b>N40</b>
				1.6 m (5.25 ft)		<b>N41</b>
				2.0 m (6.56 ft)		<b>N42</b>
				2.5 m (8.20 ft)		<b>N43</b>
				3.0 m (9.84 ft)		<b>N44</b>
				4.0 m (13.12 ft)		<b>N45</b>
				5.0 m (16.40 ft)		<b>N46</b>
				6.0 m (19.69 ft)		<b>N47</b>
				7.0 m (22.97 ft)		<b>N48</b>
				8.0 m (26.25 ft)		<b>N49</b>
				9.0 m (29.53 ft)		<b>N50</b>
				10.0 m (32.81 ft)		<b>N51</b>
<b>Nom. diam.</b>						
<b>Nominal pressure</b>						
<ul style="list-style-type: none"> <li>Connection to DIN 11851 with slotted union nut               <ul style="list-style-type: none"> <li>- DN 50 PN 25</li> <li>- DN 65 PN 25</li> <li>- DN 80 PN 25</li> </ul> </li> <li>Connection to DIN 11851 with threaded socket               <ul style="list-style-type: none"> <li>- DN 50 PN 25</li> <li>- DN 65 PN 25</li> <li>- DN 80 PN 25</li> </ul> </li> <li>Tri-Clamp connection to DIN 32676/ ISO 2852               <ul style="list-style-type: none"> <li>- DN 50/2 inch PN 16</li> <li>- DN 65/2½ inch PN 16</li> <li>- DN 80/3 inch PN 10</li> </ul> </li> </ul>		<b>1 E</b> <b>1 F</b> <b>1 G</b>  <b>2 E</b> <b>2 F</b> <b>2 G</b>  <b>4 M</b> <b>4 N</b> <b>4 P</b>				
Other version Add Order codes and plain text: Process connection: ..., Nominal diameter: ...; Nominal pressure: ...		<b>9 A</b>		<b>H 1 Y</b>		
<b>Filling liquid</b>						
<ul style="list-style-type: none"> <li>Food oil (FDA listed)</li> </ul>		<b>7</b>				
Other version Add Order code and plain text: Filling liquid: ...		<b>9</b>		<b>M 1 Y</b>		
<b>Connection to transmitter</b>						
through capillary, Length: <sup>1)</sup>						
<ul style="list-style-type: none"> <li>1.0 m (3.28 ft)</li> <li>1.6 m (5.25 ft)</li> <li>2.5 m (8.20 ft)</li> <li>4.0 m (13.1 ft)</li> <li>6.0 m (19.7 ft)</li> <li>8.0 m (26.25 ft)</li> <li>10.0 m (32.8 ft)</li> </ul>		<b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>7</b> <b>8</b>				
<b>Special lengths for capillaries</b>						
<ul style="list-style-type: none"> <li>2.0 m (6.56 ft)</li> <li>3.0 m (9.84 ft)</li> <li>5.0 m (16.40 ft)</li> <li>7.0 m (23.97 ft)</li> <li>9.0 m (29.53 ft)</li> </ul>		<b>9</b> <b>9</b> <b>9</b> <b>9</b> <b>9</b>		<b>N 1 C</b> <b>N 1 E</b> <b>N 1 G</b> <b>N 1 J</b> <b>N 1 L</b>		

<sup>1)</sup> Max. capillary length, see section "Technical description"

## Pressure Measurement

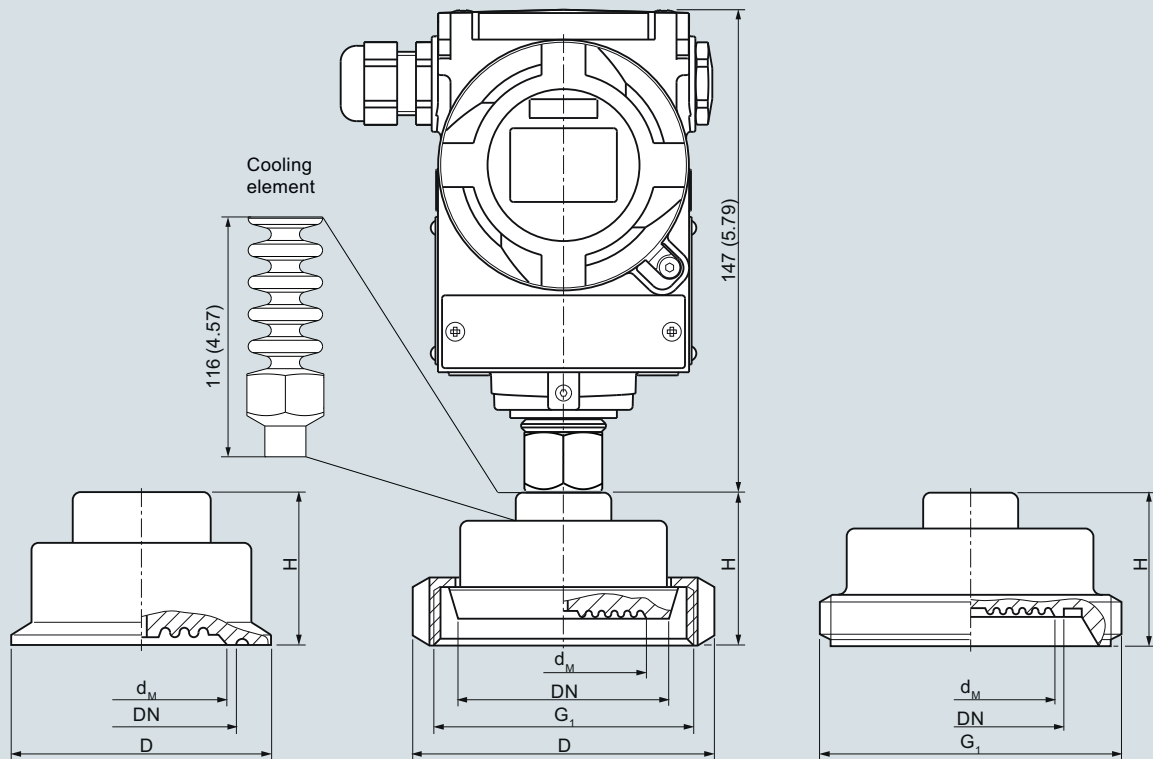
Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Quick-release diaphragm seals

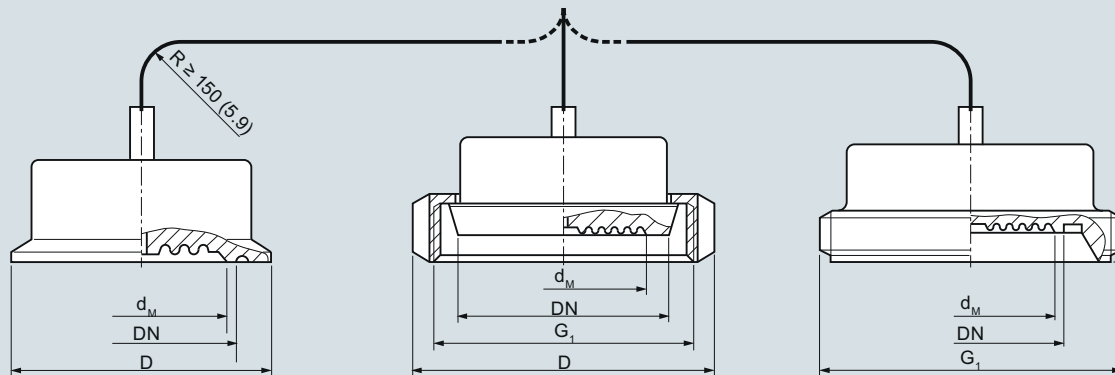
1

Selection and Ordering data	Order code
<b>Further designs</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>PVC protective tube</b> over the spiral protective tube of the capillaries (color: black)	
1.0 m (3.28 ft)	<b>N60</b>
1.6 m (5.25 ft)	<b>N61</b>
2.0 m (6.56 ft)	<b>N62</b>
2.5 m (8.20 ft)	<b>N63</b>
3.0 m (9.84 ft)	<b>N64</b>
4.0 m (13.12 ft)	<b>N65</b>
5.0 m (16.40 ft)	<b>N66</b>
6.0 m (19.69 ft)	<b>N67</b>
7.0 m (22.97 ft)	<b>N68</b>
8.0 m (26.25 ft)	<b>N69</b>
9.0 m (29.53 ft)	<b>N70</b>
10.0 m (32.81 ft)	<b>N71</b>
<b>Negative pressure service</b> for use in low-pressure range for transmitters for • differential pressure	<b>V03</b>
<b>Extended negative pressure service</b> for use in low-pressure range for transmitters for • differential pressure	<b>V53</b>

**Dimensional drawings**



Mounted directly on SITRANS P transmitter for pressure



Mounted on SITRANS P transmitter for pressure or differential pressure and flow

Quick-release diaphragm seal, dimensions in mm (inch)

Clamp connection (left)				
DN	Ø d <sub>M</sub>	Ø D		H
40 (1½ inch)	32 (1.26)	50.5 (2)		35 (1.38)
50 (2 inch)	40 (1.57)	64 (2.52)		35 (1.38)
65 (2½ inch)	52 (2.05)	77.5 (3.05)		35 (1.38)
80 (3 inch)	72 (2.83)	91 (3.58)		35 (1.38)

Connection to DIN 11851 with slotted union nut (center)				
DN	Ø d <sub>M</sub>	Ø D	H	G <sub>1</sub>
25	25	63	36	Rd 52x1/6
32	32	70	36	Rd 52x1/6
40	40	78	36	Rd 65x1/6
50	52	112	36	Rd 78x1/6
65	65	112	36	Rd 95x1/6
80	72	127	36	Rd 110x1/6
25	25	63	36	Rd 52x1/6

Connection to DIN 11851 with threaded socket (right)				
DN	Ø d <sub>M</sub>	H		G <sub>1</sub>
25	25	36		Rd 52x1/6
32	32	36		Rd 52x1/6
40	40	36		Rd 65x1/6
50	52	36		Rd 78x1/6
65	65	36		Rd 95x1/6
80	72	36		Rd 110x1/6

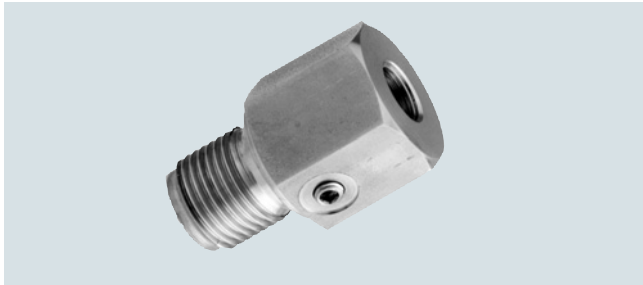
d<sub>M</sub> Effective diaphragm diameter

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Miniature diaphragm seals

#### Overview



Miniature diaphragm seals

The miniature diaphragm seals are available for the following SITRANS P pressure transmitter series for pressure:

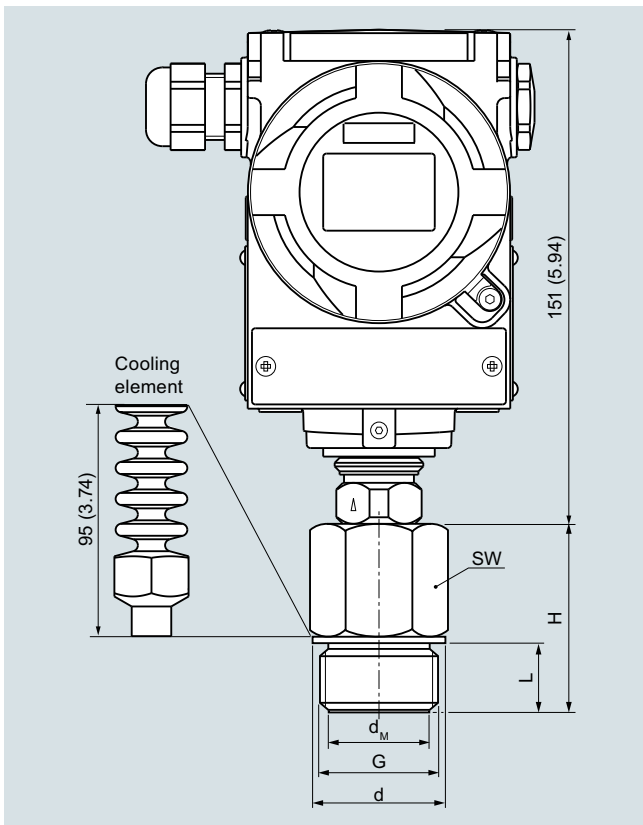
- P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus

Suitable for high pressures, contaminated, fibrous and viscous media in the chemical, paper, food and drink industries.

#### Design

- Flush-mounted diaphragm
- No dead spaces
- Fixed threaded stems

#### Dimensional drawings



Miniature diaphragm seal, dimensions in mm (inch)

G	Ø d <sub>M</sub>		SW		Ø d		L		H	
	mm	(inch)	mm	(inch)	mm	(inch)	mm	(inch)	mm	(inch)
G1B	25	(0.98)	41	(1.61)	39	(1.53)	28	(1.1)	56	(2.21)
G1½B	40	(1.57)	55	(2.17)	60	(2.36)	30	(1.18)	50	(1.97)
G2B	50	(1.97)	60	(2.36)	70	(2.76)	30	(1.18)	63	(2.48)

G	Ø d <sub>M</sub>		SW		L		H	
	mm	(inch)	mm	(inch)	mm	(inch)	mm	(inch)
1"-NPT	27	(1.06)	41	(1.61)	25	(0.98)	40	(1.57)
1½"-NPT	34	(1.34)	55	(2.17)	26	(1.02)	45	(1.77)
2"-NPT	46	(1.81)	65	(2.56)	26	(1.02)	45	(1.77)

d<sub>M</sub>: Effective diaphragm diameter

#### Technical specifications

##### Miniature diaphragm seals

Measuring span when

- G1B and 1"-NPT > 6 bar (> 87 psi)
- G1½B and 1½"-NPT > 2 bar (> 29 psi)
- G2B and 2"-NPT > 600 mbar (> 8.7 psi)

Filling liquid

Silicone oil M5 or food oil (FDA listed)

Material

- Main body

Stainl. steel mat No. 1.4404/ 316L or Hastelloy C276, mat No. 2.4819

- Diaphragm

Stainl. steel mat No. 1.4404 / 316L or Hastelloy C276, mat. No. 2.4819

Maximum pressure

100% of nominal pressure of pressure transmitter, up to maximum of PN 400 (5802 psi) (depending on the seal used)

Temperature of use

Same as pressure transmitter

Temperature range of medium

Same as pressure transmitter

Max. recommended temperature of medium

150 °C (302 °F)

Weight

- G1B and 1"-NPT
- G1½B and 1½"-NPT
- G2B and 2"-NPT

Approx. 0.3 kg (approx. 0.66 lb)

Approx. 0.5 kg (approx. 1.10 lb)

Approx. 0.8 kg (approx. 1.76 lb)

##### Certificate and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)



# Pressure Measurement

## Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

### Miniature diaphragm seals

1

Selection and Ordering data		Article No.	Ord. code	Selection and Ordering data	Order code
<b>Miniature diaphragm seals</b>		<b>7MF4960-</b>		<b>Further designs</b> Please add "-Z" to Article No. and specify Order code.	
directly fitted to SITRANS P pressure transmitters for pressure; type, 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (vacuum-proof design) and 7MF802-... <sup>1)</sup> ; must be ordered separately Material: Stainless steel, mat. No. 1.4404/316L Nominal pressure, see "Pressure transmitters"		1	0	<b>Remote seal nameplate</b> Attached out of stainless steel, contains MLFB and order number of the remote seal	<b>B20</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>				<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>	<b>C11</b>
<b>Process connection</b>				<b>Inspection certificate</b> to EN 10204, section 3.1	<b>C12</b>
<ul style="list-style-type: none"> <li>• G1B</li> <li>• G1½B</li> <li>• G2B</li> <li>• 1" - NPT</li> <li>• 1½" - NPT</li> <li>• 2" - NPT</li> </ul> Other version, add Order code and plain text: Process connection: ...		C D E K L M Z	J 1 Y	<b>2.2 Certificate of FDA approval of fill oil</b> Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"	<b>C17</b>
<b>Material</b>				<b>Functional safety certificate ("SIL 2") to IEC 61508</b> (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	<b>C20</b>
Remote seal enclosure	Wetted parts materials			<b>Functional safety certificate ("SIL 2/3") to IEC 61508</b> (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)	<b>C23</b>
Stainless steel mat. No. 1.4404/316L	Stainless steel mat. No. 1.4404/316L	A		<b>Certification acc. to NACE MR-0175</b> Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	<b>D07</b>
Hastelloy C276	Hastelloy C276	J		<b>Certification acc. to NACE MR-0103</b> Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	<b>D08</b>
Stainless steel mat. No. 1.4404/316L	Other version Add Order code and plain text: Wetted parts materials	Z	K 1 Y	<b>Cooling element</b> max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	<b>R22</b>
<b>Wetted parts materials</b>				<b>Negative pressure service</b> for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	<b>V01</b>
<ul style="list-style-type: none"> <li>• Stainless steel 316L</li> </ul> Other version, add Order code and plain text: Wetted parts materials: ...		A Z	K 1 Y	<b>Extended negative pressure service</b> for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	<b>V51</b>
<b>Filling liquid</b>					
<ul style="list-style-type: none"> <li>• Silicone oil M5</li> <li>• Food oil (FDA listed)</li> </ul> Other version, add Order code and plain text: Filling liquid: ...		1 7 9	M 1 Y		
<sup>1)</sup> With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.					

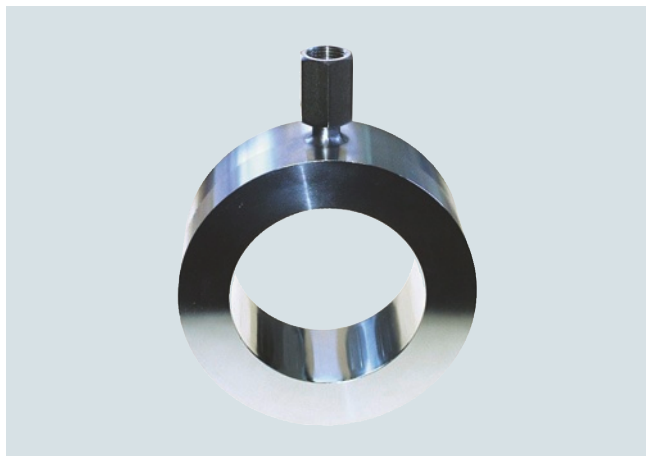
## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Inline seals in sandwich design

1

#### Overview



Inline seals for flange-mounting

The inline seal is completely integrated in the process line. It is particularly suitable for flowing and highly viscous media.

The inline seal consists of a cylindrical jacket into which a thin-walled pipe is welded. It is clamped directly between two flanges in the pipeline.

#### Design

- Inline seals for flange-mounting (flange design) to EN/ASME for SITRANS P pressure transmitters
  - For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
  - For differential pressure and flow: DS III with HART, DS III with PROFIBUS PA, DS III with FOUNDATION Fieldbus and P500
- Sealing surface to EN 1092-1 or ASME B16.5
- Connection to the transmitter directly or by means of a flexible capillary (max. 10 m long)
- See Technical data for details of materials used for the wetted parts
- Material used for the capillary, the guard sleeve, the seal's main body and the measuring cell: Stainless steel, mat.-No. 1.4571
- Filling liquid: Silicone oil, high-temperature oil, halocarbon oil, food oil (FDA listed) or glycerin/water (not suitable for uses in low-pressure range)

#### Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes either directly or through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

#### Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof remote seal (see Selection and Ordering data).

#### Technical specifications

##### Inline seals for flange-mounting

Nominal diameter	Nominal pressure
• DN 25	PN 6 ... PN 100
• DN 40	PN 6 ... PN 100
• DN 50	PN 6 ... PN 100
• DN 80	PN 6 ... PN 100
• DN 100	PN 6 ... PN 100
• 1 inch	Class 150 ... class 2500
• 1½ inch	Class 150 ... class 2500
• 2 inch	Class 150 ... class 2500
• 3 inch	Class 150 ... class 2500
• 4 inch	Class 150 ... class 2500
Process connection	Flange to EN 1092-1 or ASME B 16.5
Sealing surface	<ul style="list-style-type: none"> <li>• for stainless steel mat. no. 1.4404/316L according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA</li> <li>• for all other materials according to EN 1092-1, form B2 or ASME B16.5 RFSF</li> </ul>
Materials	
• Main body	Stainless steel 1.4404/316L
• Diaphragm	Stainless steel 1.4404/316L
• Wetted parts	Stainless steel 1.4404/316L <ul style="list-style-type: none"> <li>• Without coating</li> <li>• ECTFE coating (for vacuum on request)</li> <li>• PFA coating</li> </ul>
	Monel 400, mat. No. 2.4360
	Hastelloy C276, mat. No. 2.4819
	Hastelloy C4, mat. No. 2.4602
	Tantalum
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4404/316L
Capillary	
• Length	Max. 10 m (32.8 ft)
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	Silicone oil M5
	Silicone oil M50
	High-temperature oil
	Halocarbon oil
	Food oil (FDA listed)
Permissible ambient temperature	See pressure transmitters, see filling liquid
Weight	Approx. 4 kg (8.82 lb)
<b>Certificates and approvals</b>	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord

## Pressure Measurement

### Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

#### Inline seals in sandwich design

1

Selection and Ordering data	Article No.Ord. code	Selection and Ordering data	Article No.Ord. code
<b>Inline seal for flange-mounting for SITRANS P pressure transmitters</b>		<b>Inline seal for flange-mounting for SITRANS P pressure transmitters</b>	
<b>for gauge pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; must be ordered separately, scope of delivery: 1 off	7MF4980 -	<b>for gauge pressure</b> 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... <sup>1)</sup> ; must be ordered separately, scope of delivery: 1 off	7MF4980 -
<b>for differential pressure and flow</b> 7MF243-...; 7MF4433 or 7MF54-...; order separately, scope of delivery: 1 pair (set); Material: Completely of stainless steel, mat. No. 1.4404/316L; Process connection to EN 1092-1 or ASME B16.5; sealing surface to EN 1092-1, form B1, or to ASME B16.5 RF 125 ... 250 AA	7MF4983 -	<b>for differential pressure and flow</b> 7MF243-...; 7MF4433 or 7MF54-...; order separately, scope of delivery: 1 pair (set); Material: Completely of stainless steel, mat. No. 1.4404/316L; Process connection to EN 1092-1 or ASME B16.5; sealing surface to EN 1092-1, form B1, or to ASME B16.5 RF 125 ... 250 AA	7MF4983 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	1 ■ 0 ■ - ■ B ■ ■ ■	↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	1 ■ 0 ■ - ■ B ■ ■ ■
<b>Nominal diameter and nominal pressure</b>		<b>Connection to transmitter</b>	
<ul style="list-style-type: none"> <li>• DN 25            PN 6 ... 100</li> <li>• DN 40            PN 6 ... 100</li> <li>• DN 50            PN 6 ... 100</li> <li>• DN 80            PN 6 ... 100</li> <li>• DN 100          PN 6 ... 100</li> <li>• 1 inch            Class 150 ... 2500</li> <li>• 1½ inch          Class 150 ... 2500</li> <li>• 2 inch            Class 150 ... 2500</li> <li>• 3 inch            Class 150 ... 2500</li> <li>• 4 inch            Class 150 ... 2500</li> </ul>	B D E G H L M N P Q Z	<ul style="list-style-type: none"> <li>• direct (only for 7MF4980) through capillary, length:<sup>5)</sup></li> <li>• 1.0 m (3.28 ft)</li> <li>• 1.6 m (5.25 ft)</li> <li>• 2.5 m (8.20 ft)</li> <li>• 4.0 m (13.1 ft)</li> <li>• 6.0 m (19.7 ft)</li> <li>• 8.0 m (26.25 ft)</li> <li>• 10.0 m (32.8 ft)</li> </ul>	0 2 3 4 5 6 7 8
Other version Add Order code and plain text: Nominal diameter: ...; Nominal pressure: ...	J 1 Y	<b>Special lengths for capillaries</b>	9 N 1 C 9 N 1 E 9 N 1 G 9 N 1 J 9 N 1 L
<b>Wetted parts materials</b>		<ul style="list-style-type: none"> <li>• 2.0 m (6.56 ft)</li> <li>• 3.0 m (9.84 ft)</li> <li>• 5.0 m (16.40 ft)</li> <li>• 7.0 m (23.97 ft)</li> <li>• 9.0 m (29.53 ft)</li> </ul>	9 N 1 N 9 N 1 P 9 N 1 Q 9 N 1 R 9 N 1 S
<ul style="list-style-type: none"> <li>• Stainless steel 316L</li> <li>- Without coating</li> <li>- With PFA coating <sup>2)</sup></li> <li>- With ECTFE coating <sup>2) 3)</sup></li> <li>• Monel 400, mat. No. 2.4360</li> <li>• Hastelloy C276, mat. No. 2.4819</li> <li>• Hastelloy C4, mat. No. 2.4602</li> <li>• Tantalum</li> </ul>	A D F G J U K Z	only for 7MF4983-...	
Other version Add Order code and plain text: Wetted parts materials: ...	K 1 Y	<ul style="list-style-type: none"> <li>• 11.0 m (36.09 ft)</li> <li>• 12.0 m (39.37 ft)</li> <li>• 13.0 m (42.65 ft)</li> <li>• 14.0 m (45.93 ft)</li> <li>• 15.0 m (49.21 ft)</li> </ul>	
<b>Filling liquid</b>		<ol style="list-style-type: none"> <li>1) With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.</li> <li>2) Only for use in non-hazardous atmospheres.</li> <li>3) For vacuum on request.</li> <li>4) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.</li> <li>5) Max. capillary length, see section "Technical description"</li> </ol>	
<ul style="list-style-type: none"> <li>• Silicone oil M5</li> <li>• Silicone oil M50</li> <li>• High-temperature oil</li> <li>• Halocarbon oil (for measuring O<sub>2</sub>)<sup>4)</sup></li> <li>• Food oil (FDA listed)</li> </ul>	1 2 3 4 7 9		
Other version Add Order code and plain text: Filling liquid: ...	M 1 Y		

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Inline seals in sandwich design

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<b>Further designs</b>		<b>Further designs</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code.		Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>Spark arrester</b> With spark arrester for mounting on zone 0 (including documentation)		<b>PE protective tube</b> over the spiral protective tube of the capillaries (color: white)	
<ul style="list-style-type: none"> <li>• Pressure and absolute pressure</li> <li>• for differential pressure transmitters</li> </ul>	<b>A01</b> <b>A02</b>	1.0 m (3.28 ft)	<b>N20</b>
<b>Remote seal nameplate</b> Attached out of stainless steel, contains MLFB and order number of the remote seal	<b>B20</b>	1.6 m (5.25 ft)	<b>N21</b>
<b>Oil- and grease-free cleaned version</b> Oil- and grease-free cleaned and packed version, <u>not for oxygen application</u> , only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2	<b>C10</b>	2.0 m (6.56 ft)	<b>N22</b>
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>	<b>C11</b>	2.5 m (8.20 ft)	<b>N23</b>
<b>Inspection certificate</b> to EN 10204, section 3.1	<b>C12</b>	3.0 m (9.84 ft)	<b>N24</b>
<b>2.2 Certificate of FDA approval of fill oil</b> Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"	<b>C17</b>	4.0 m (13.12 ft)	<b>N25</b>
<b>Functional safety certificate ("SIL 2") to IEC 61508</b> (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	<b>C20</b>	5.0 m (16.40 ft)	<b>N26</b>
<b>Functional safety certificate ("SIL 2/3") to IEC 61508</b>	<b>C23</b>	6.0 m (19.69 ft)	<b>N27</b>
<b>Certification acc. to NACE MR-0175</b> Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	<b>D07</b>	7.0 m (22.97 ft)	<b>N28</b>
<b>Certification acc. to NACE MR-0103</b> Includes inspection certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	<b>D08</b>	8.0 m (26.25 ft)	<b>N29</b>
<b>Oil- and grease-free cleaned version</b> Oil- and grease-free cleaned and packed version, <u>only for oxygen application</u> , only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2	<b>E10</b>	9.0 m (29.53 ft)	<b>N30</b>
<b>One-sided mounting on differential pressure transmitters</b> (only for 7MF4980-...) on high-pressure side on low-pressure side	<b>H10</b> <b>H11</b>	10.0 m (32.81 ft)	<b>N31</b>
		<u>only for 7MF4983-...</u>	
		11.0 m (36.09 ft)	<b>N32</b>
		12.0 m (39.37 ft)	<b>N33</b>
		13.0 m (42.65 ft)	<b>N34</b>
		14.0 m (45.93 ft)	<b>N35</b>
		15.0 m (49.21 ft)	<b>N36</b>
		<b>PTFE protective tube</b> over the spiral protective tube of the capillaries (color: transparent)	
		1.0 m (3.28 ft)	<b>N40</b>
		1.6 m (5.25 ft)	<b>N41</b>
		2.0 m (6.56 ft)	<b>N42</b>
		2.5 m (8.20 ft)	<b>N43</b>
		3.0 m (9.84 ft)	<b>N44</b>
		4.0 m (13.12 ft)	<b>N45</b>
		5.0 m (16.40 ft)	<b>N46</b>
		6.0 m (19.69 ft)	<b>N47</b>
		7.0 m (22.97 ft)	<b>N48</b>
		8.0 m (26.25 ft)	<b>N49</b>
		9.0 m (29.53 ft)	<b>N50</b>
		10.0 m (32.81 ft)	<b>N51</b>
		<u>only for 7MF4983-...</u>	
		11.0 m (36.09 ft)	<b>N52</b>
		12.0 m (39.37 ft)	<b>N53</b>
		13.0 m (42.65 ft)	<b>N54</b>
		14.0 m (45.93 ft)	<b>N55</b>
		15.0 m (49.21 ft)	<b>N56</b>

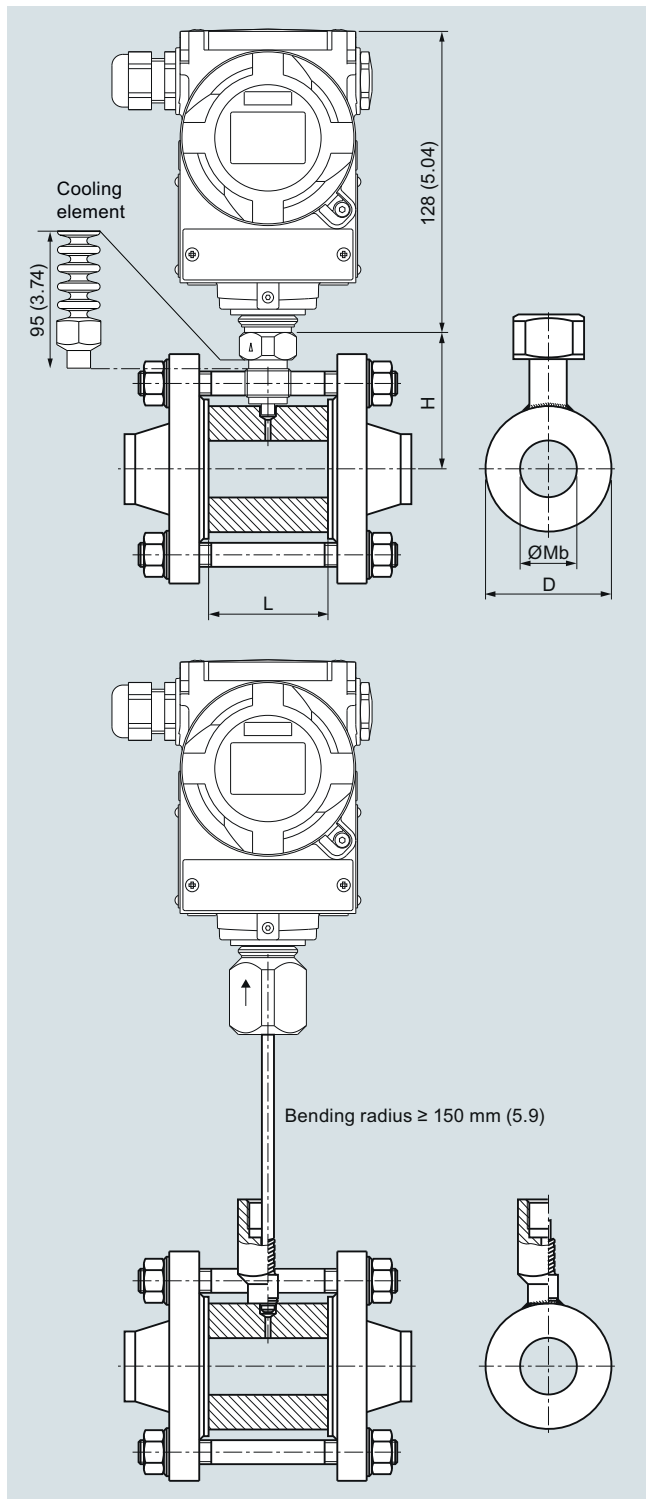
Selection and Ordering data	Order code
<b>Further designs</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>PVC protective tube</b> over the spiral protective tube of the capillaries (color: black)	
1.0 m (3.28 ft)	<b>N60</b>
1.6 m (5.25 ft)	<b>N61</b>
2.0 m (6.56 ft)	<b>N62</b>
2.5 m (8.20 ft)	<b>N63</b>
3.0 m (9.84 ft)	<b>N64</b>
4.0 m (13.12 ft)	<b>N65</b>
5.0 m (16.40 ft)	<b>N66</b>
6.0 m (19.69 ft)	<b>N67</b>
7.0 m (22.97 ft)	<b>N68</b>
8.0 m (26.25 ft)	<b>N69</b>
9.0 m (29.53 ft)	<b>N70</b>
10.0 m (32.81 ft)	<b>N71</b>
<u>only for 7MF4983-...</u>	
11.0 m (36.09 ft)	<b>N72</b>
12.0 m (39.37 ft)	<b>N73</b>
13.0 m (42.65 ft)	<b>N74</b>
14.0 m (45.93 ft)	<b>N75</b>
15.0 m (49.21 ft)	<b>N76</b>
<b>Cooling element</b> max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	<b>R22</b>
<b>Negative pressure service</b> for use in low-pressure range for transmitters for	
• gauge and absolute pressure from the pressure series	<b>V01</b>
• differential pressure	<b>V03</b>
Note: Suffix "Y01" required with pressure transmitter	
<b>Extended negative pressure service</b> for use in low-pressure range for transmitters for	
• gauge and absolute pressure from the pressure series	<b>V51</b>
• differential pressure	<b>V53</b>
Note: Suffix "Y01" required with pressure transmitter	

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Inline seals in sandwich design

#### Dimensional drawings



Inline seal for flange-mounting, connected to SITRANS P pressure transmitter, dimensions in mm (inch)

#### Connection to EN 1092-1

DN mm	PN bar	D mm	Mb mm	L mm	H mm
25	6 ... 100	63	28.5	60	78.5
40	6 ... 100	85	43	60	89.5
50	6 ... 100	95	54.5	60	92.5
80	6 ... 100	130	82.5	60	112
100	6 ... 100	150	107	60	122

#### Connection to ASME B16.5

DN (inch)	Class	D mm (inch)	Mb mm (inch)	L mm (inch)	H mm (inch)
1	150 ... 2500	63 (2.48)	28.5 (1.12)	60 (2.36)	78.5 (3.1)
1½	150 ... 2500	85 (3.35)	43 (1.69)	60 (2.36)	86 (3.4)
2	150 ... 2500	95 (3.74)	54.5 (2.15)	60 (2.36)	94.5 (3.72)
3	150 ... 2500	130 (5.12)	82.5 (3.25)	60 (2.36)	112 (4.4)
4	150 ... 2500	150 (5.9)	107 (4.21)	60 (2.36)	122 (4.8)

# Pressure Measurement

## Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

### Quick-release inline seals

1

#### Overview



Quick-release inline seals, to DIN 11851 with threaded socket



Quick-release inline seals, with clamp connection

Quick-release inline seals for pressure are available for the following SITRANS P pressure transmitter series:

- P300
- DS III with HART
- DS III with PROFIBUS PA
- DS III with FOUNDATION Fieldbus

#### Application

The quick-release inline seal is a special design for flowing and high-viscosity media. Because it is completely integrated in the process line, there are no turbulences, dead spaces or other obstacles in the flow direction. The medium flows almost unhindered through the inline seal and causes self-cleaning of the sample chamber. The inline seal is also piggybackable.

#### Design

The quick-release clamp is available in two versions:

- DIN 11851 with threaded socket
- Clamp connection

The inline seal is connected to the pressure transmitter either directly or by way of a capillary.

#### Function

The measured pressure is transferred from the diaphragm, mounted on the inner circumference of the inline seal, to the filling liquid and then passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the inline seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

#### Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof pressure transmitter (see Selection and Ordering data).

#### Technical specifications

Quick-release inline seals for gauge pressure		
Connection	Nominal diameter	Nominal pressure
• To DIN 11851 with threaded socket	DN 25	PN 40
	DN 40	PN 40
	DN 50	PN 25
	DN 65	PN 25
	DN 80	PN 25
	DN 100	PN 25
• Clamp connection	1½ inch	PN 40
	2 inch	PN 40
	2½ inch	PN 40
	3 inch	PN 40
<b>Material</b>		
• Main body	Stainless steel 1.4404/316L	
• Diaphragm	Stainless steel 1.4404/316L	
<b>Capillary</b>		
• Length	Max. 10 m (32.8 ft)	
• Internal diameter	2 mm (0.079 inch)	
• Minimum bending radius	150 mm (5.9 inch)	
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4404/316L	
Filling liquid	• Food oil (FDA listed)	
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals	
Weight	Approx. 4 kg (approx. 8.82 lb)	
<b>Certificate and approvals</b>		
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord	
EHEDG	Complies with EHEDG recommendations	

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Quick-release inline seals

#### Selection and Ordering data

##### Quick-release inline seal

for SITRANS P pressure transmitters for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-...<sup>1)</sup>; must be ordered separately  
Filling liquid: Food oil (FDA listed)  
Material: Stainless steel 316L

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

##### Nominal diameter Nominal pressure

- Connection to DIN 11851 with screw necks
  - DN 25 PN 40
  - DN 40 PN 40
  - DN 50 PN 25
  - DN 65 PN 25
  - DN 80 PN 25
  - DN 100 PN 25
- Clamp connection
  - 1½ inch PN 16
  - 2 inch PN 16
  - 2½ inch PN 16
  - 3 inch PN 10

Other version

Add Order codes and plain text:

Process connection: ..., Nominal diameter: ...;  
Nominal pressure: ...

##### Filling liquid

- Food oil (FDA listed)

Other version

Add Order code and plain text:

Filling liquid: ...

##### Connection to transmitter

- Direct

Through capillary, length:<sup>2)</sup>

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

##### Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

<sup>1)</sup> With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

<sup>2)</sup> Max. capillary length, see section "Technical description"

Article No. Ord. code

7 M F 4 9 5 0 -

■ A 0 ■ - ■ B ■ ■

2 B

2 D

2 E

2 F

2 G

2 H

4 L

4 M

4 N

4 P

9 Z

7

9

0

2

3

4

5

6

7

8

9

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#### Selection and Ordering data

##### Further designs

Please add "-Z" to Article No. and specify Order code.

##### Remote seal nameplate

Attached out of stainless steel, contains MLFB and order number of the remote seal

##### Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2

Inspection certificate  
to EN 10204, section 3.1

##### 2.2 Certificate of FDA approval of fill oil

Only in conjunction with "Food-grade oil" fill liquid (FDA listed)

##### Functional safety certificate ("SIL 2") to IEC 61508

(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)

##### Functional safety certificate ("SIL 2/3") to IEC 61508

(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)

##### One-sided mounting on differential pressure transmitters

on high-pressure side  
on low-pressure side

##### PE protective tube

over the spiral protective tube of the capillaries (color: white)

1.0 m (3.28 ft)

1.6 m (5.25 ft)

2.0 m (6.56 ft)

2.5 m (8.20 ft)

3.0 m (9.84 ft)

4.0 m (13.12 ft)

5.0 m (16.40 ft)

6.0 m (19.69 ft)

7.0 m (22.97 ft)

8.0 m (26.25 ft)

9.0 m (29.53 ft)

10.0 m (32.81 ft)

##### PTFE protective tube

over the spiral protective tube of the capillaries (color: transparent)

1.0 m (3.28 ft)

1.6 m (5.25 ft)

2.0 m (6.56 ft)

2.5 m (8.20 ft)

3.0 m (9.84 ft)

4.0 m (13.12 ft)

5.0 m (16.40 ft)

6.0 m (19.69 ft)

7.0 m (22.97 ft)

8.0 m (26.25 ft)

9.0 m (29.53 ft)

10.0 m (32.81 ft)

Order code

B20

C11

C12

C17

C20

C23

H10

H11

N20

N21

N22

N23

N24

N25

N26

N27

N28

N29

N30

N31

N40

N41

N42

N43

N44

N45

N46

N47

N48

N49

N50

N51



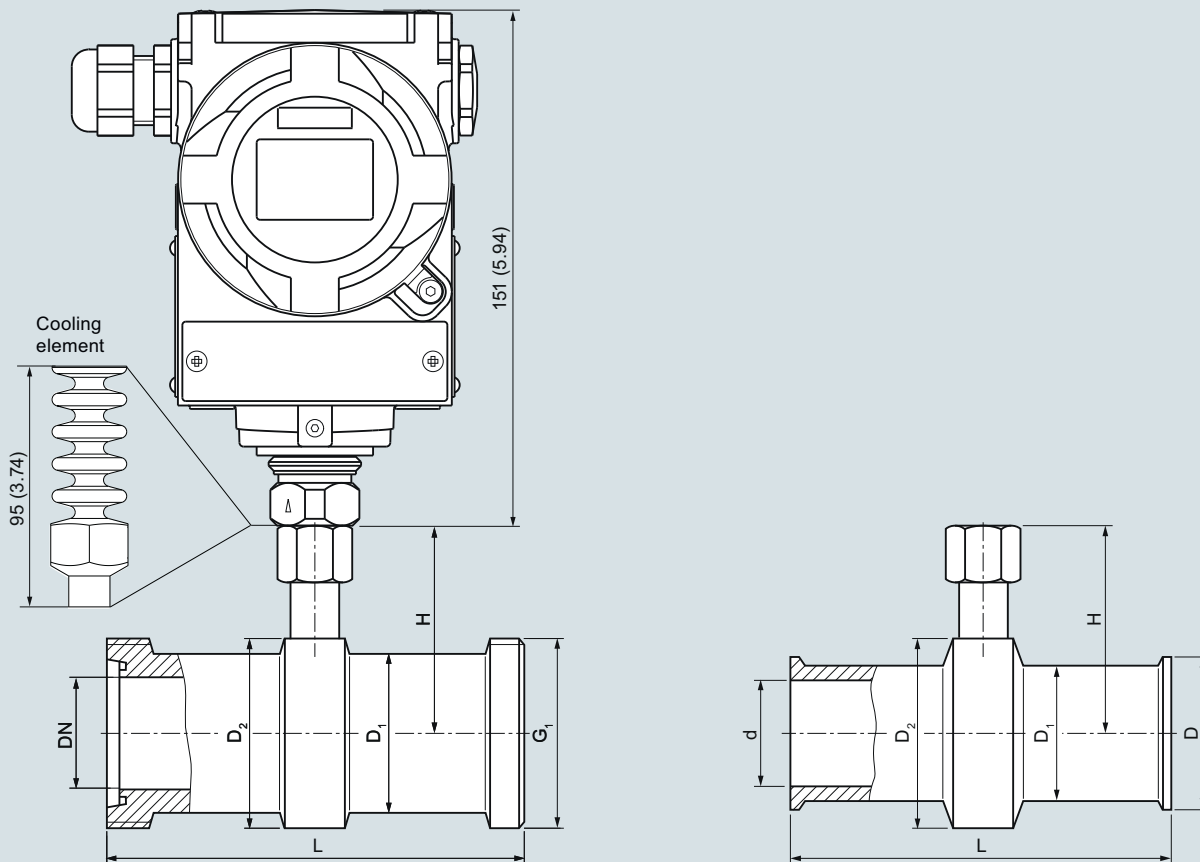
Selection and Ordering data	Order code
<b>Further designs</b>	
Please add <b>"-Z"</b> to Article No. and specify Order code.	
<b>PVC protective tube</b> over the spiral protective tube of the capillaries (color: black)	
1.0 m (3.28 ft)	<b>N60</b>
1.6 m (5.25 ft)	<b>N61</b>
2.0 m (6.56 ft)	<b>N62</b>
2.5 m (8.20 ft)	<b>N63</b>
3.0 m (9.84 ft)	<b>N64</b>
4.0 m (13.12 ft)	<b>N65</b>
5.0 m (16.40 ft)	<b>N66</b>
6.0 m (19.69 ft)	<b>N67</b>
7.0 m (22.97 ft)	<b>N68</b>
8.0 m (26.25 ft)	<b>N69</b>
9.0 m (29.53 ft)	<b>N70</b>
10.0 m (32.81 ft)	<b>N71</b>
<b>Cooling element</b> max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	<b>R22</b>
<b>Negative pressure services</b> for use in low-pressure range for transmitters for <ul style="list-style-type: none"> <li>gauge and absolute pressure from the pressure series</li> </ul>	<b>V01</b>
<b>Extended negative pressure service</b> for use in low-pressure range for transmitters for <ul style="list-style-type: none"> <li>gauge and absolute pressure from the pressure series</li> </ul>	<b>V51</b>

## Pressure Measurement

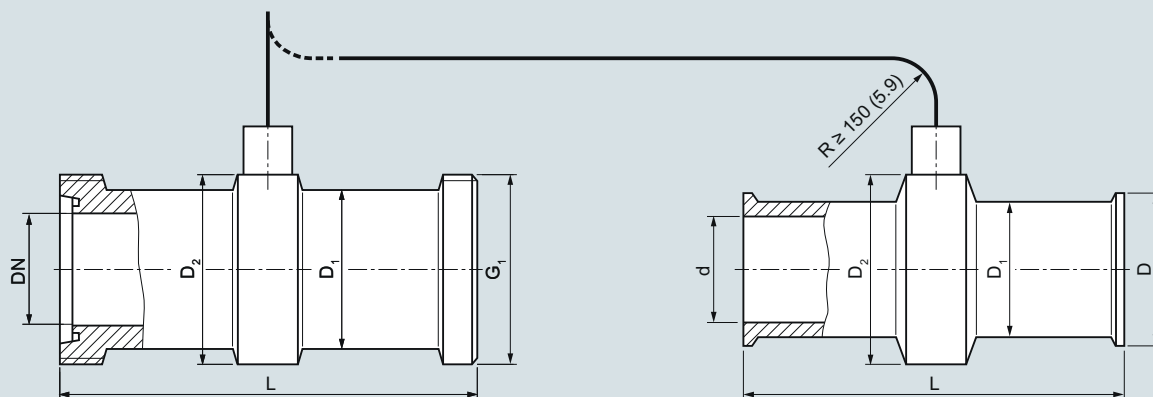
Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Quick-release inline seals

#### Dimensional drawings



Mounted directly on SITRANS P transmitter for pressure



Mounted on SITRANS P transmitter for pressure or differential pressure and flow

#### Connection to DIN 11851 with screw necks

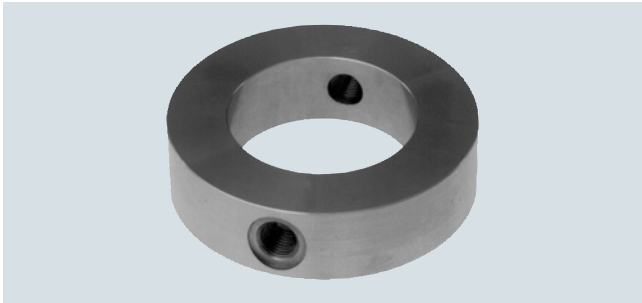
DN	Ø D <sub>1</sub>	Ø D <sub>2</sub>	H	L	G <sub>1</sub>
25	38	52	68	128	Rd 52x1/6
40	55	65	74.5	160	Rd 65x1/6
50	68	78	81	170	Rd 78x1/6
65	85	95	89.5	182	Rd 95x1/6
80	110	110	97	182	Rd 110x1/4
100	130	130	107	182	Rd 110x1/4

#### Clamp connection for pipes to BS 4825/3 and o.D. tubes

d	Ø D <sub>1</sub>	Ø D <sub>2</sub>	H	L	D
mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
22.2 (1)	38 (1.5)	50 (1.97)	67 (2.64)	114 (4.49)	50.5 (1.98)
34.9 (1½)	43 (1.69)	65 (2.56)	74.5 (2.93)	146 (5.75)	50.5 (1.98)
47.6 (2)	56 (2.2)	75 (2.95)	79.5 (3.13)	156 (6.14)	64 (2.52)
60.3 (2½)	68 (2.68)	77 (3.03)	80.5 (3.17)	156 (6.14)	77.5 (3.05)
73.0 (3)	82 (3.23)	91 (3.58)	87.5 (3.44)	156 (6.14)	91 (3.58)

Quick-release inline seal, dimensions in mm (inch)

### Overview



Flushing ring

Flushing rings are required for flange-mounted and sandwich-type remote seals (Article No. 7MF4900 ... 7MF4923) if the danger exists that the process conditions and the geometry of the connection could cause the medium to form deposits or blockages.

The flushing ring is clamped between the process flange and the remote seal.

Deposits can be flushed away from the diaphragm through the holes in the side, or the pressure volume can be vented. Different nominal diameters and forms permit adaptation to the respective process flange.

#### Process connection

For flanges to EN and ASME:  
DN 50, 80, 100, 125; PN 16 ... 100 or  
DN 2 inch, 3 inch, 4 inch, 5 inch; Class 150 ... 600

#### Standard design

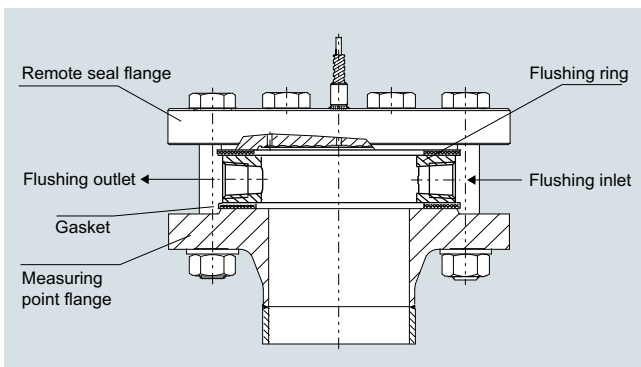
Material: CrNi-Stahl, mat. No. 1.4404/316L  
Sealing faces and flushing holes: See Selection and Ordering data

### Technical specifications

#### Flushing ring for remote seals of sandwich and flange design

Nominal diameter	Nominal pressure
• DN 50	PN 16 ... PN 100
• DN 80	PN 16 ... PN 100
• DN 100	PN 16 ... PN 100
• DN 125	PN 16 ... PN 100
• 2 inch	Class 150 ... class 600
• 3 inch	Class 150 ... class 600
• 4 inch	Class 150 ... class 600
• 5 inch	Class 150 ... class 600
Sealing surface	
• To EN 1092-1	Form B1
	Form B2
	Form D/Form D
	Form C/Form C
	Form C/Form C
	Form E
	Form F
• To ASME B16.5	RF 125 ... 250 AA
	RFSF
	RJF ring groove
Flushing holes (2 off), female thread	• G $\frac{1}{4}$
	• G $\frac{1}{2}$
	• $\frac{1}{4}$ -18 NPT
	• $\frac{1}{2}$ -14 NPT
Material	Stainless steel 1.4404/316L

### Design



Installation example

# Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

## Flushing rings for diaphragm seals

1

### Selection and Ordering data

Article No.Ord. code

#### Flushing ring

7MF4925 -

for remote seals 7MF4900 to 7MF4923

1

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Nom. diam.

Nom. diam.	Nominal pressure
• DN 50	PN 16 ... PN 100
• DN 80	PN 16 ... PN 100
• DN 100	PN 16 ... PN 100
• DN 125	PN 16 ... PN 100
• 2 inch	Class 150 ... 600
• 3 inch	Class 150 ... 600
• 4 inch	Class 150 ... 600
• 5 inch	Class 150 ... 600

A  
B  
C  
D  
G  
H  
J  
K

Only for RJF ring groove, 7MF4925-1\*R....:

• 2 inch	Class 150
• 3 inch	Class 150
• 4 inch	Class 150
• 5 inch	Class 150
• 2 inch	Class 300 ... 600
• 3 inch	Class 300 ... 600
• 4 inch	Class 300 ... 600
• 5 inch	Class 300 ... 600

NR  
PR  
QR  
RR  
UR  
VR  
WR  
XR

Other version

Add Order code and plain text:

Nominal diameter: ...; Nominal pressure: ...

Z J 1 Y

#### Sealing surface

- EN 1092-1
  - Form B1
  - Form B2
  - Form C/Form C
  - Form D/Form C
  - Form D/Form D
- Form E
- Form F
- ASME B16.5
  - RF 125 ... 250 AA
  - RFSF
  - RJF ring groove

A  
C  
D  
E  
F  
G  
H  
M  
Q  
R  
Z

Other version

Add Order code and plain text:

Sealing surface: ...

K 1 Y

#### Flushing holes (2 off)

- Female thread G $\frac{1}{4}$
- Female thread G $\frac{1}{2}$
- Female thread  $\frac{1}{4}$ -18 NPT
- Female thread  $\frac{1}{2}$ -14 NPT

1  
2  
3  
4

#### Material

- Stainless steel 316L

Other version

Add Order code and plain text:

Material: ...

0  
9 M 1 Y

#### Further designs

Please add "-Z" to Article No. and specify Order code.

Order code

#### Inspection certificate

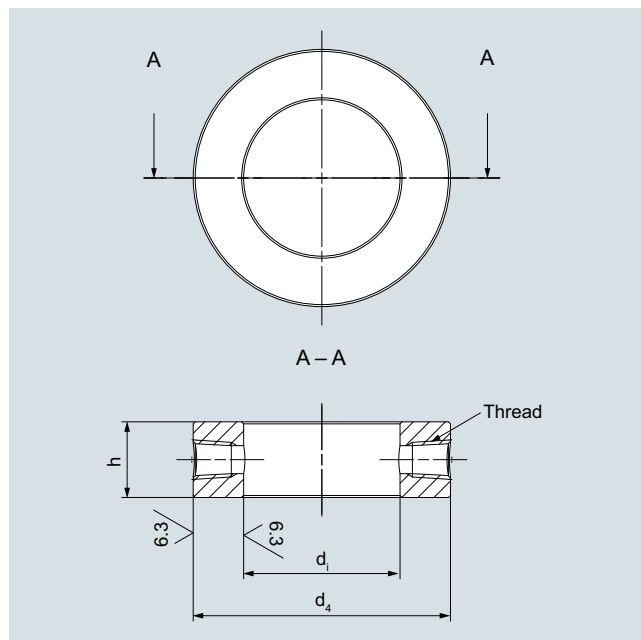
to EN 10204, section 3.1

C12

### Dimensional drawings

#### Connection according to EN 1092-1

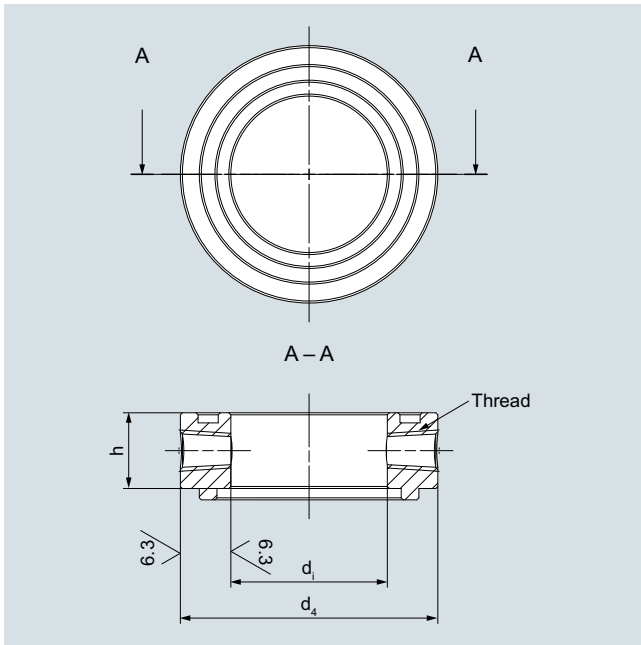
Form B1 and form B2



Flushing ring; sealing surface (EN 1092-1), form B1 and form B2

DN	PN	Thread	d <sub>4</sub>	d <sub>i</sub>	h	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	30 (1.18)	1.24 (2.73)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	30 (1.18)	1.99 (4.39)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	30 (1.18)	3.35 (7.39)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	30 (1.18)	3.38 (7.45)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	30 (1.18)	1.24 (2.73)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	30 (1.18)	1.99 (4.39)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	30 (1.18)	3.35 (7.39)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	30 (1.18)	3.38 (7.45)

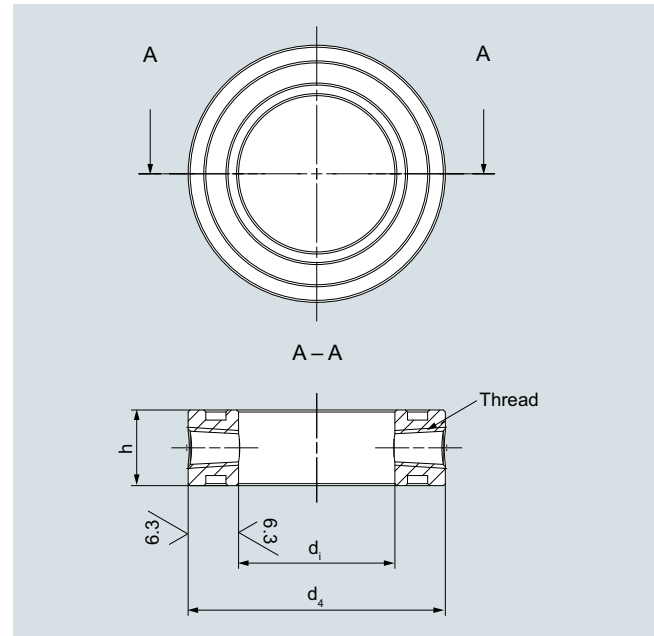
Form D/form C



Flushing ring; sealing surface (EN 1092-1), form D/form C

DN	PN	Thread	d <sub>4</sub>	d <sub>i</sub>	h	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	35.5 (1.40)	1.46 (3.22)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	35.5 (1.40)	2.36 (5.2)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	35.5 (1.40)	3.96 (8.73)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	35.5 (1.40)	4.00 (8.82)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	40.5 (1.595)	1.67 (3.68)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	40.5 (1.595)	2.69 (5.93)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	40.5 (1.595)	4.52 (9.97)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	40.5 (1.595)	4.56 (10.05)

Form D/form D



Flushing ring; sealing surface (EN 1092-1), form D/form D

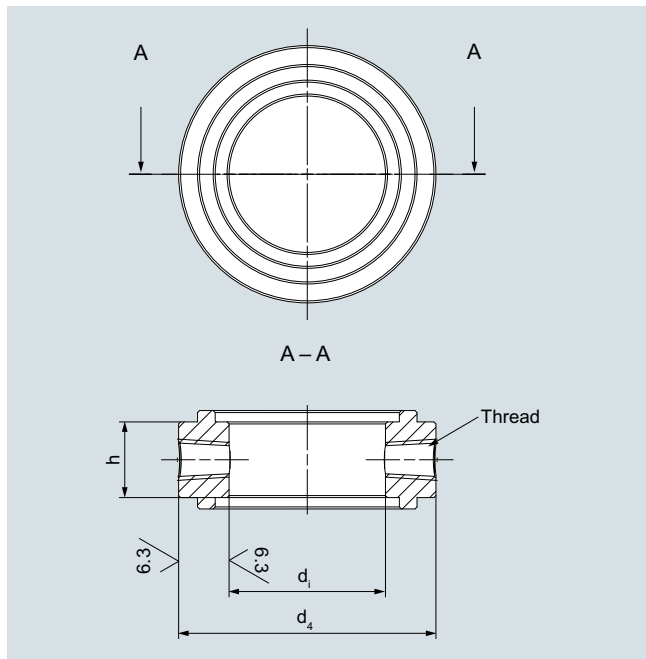
DN	PN	Thread	d <sub>4</sub>	d <sub>i</sub>	h	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	40 (1.58)	2.66 (5.86)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	40 (1.58)	4.47 (9.86)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	40 (1.58)	4.50 (9.92)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	40 (1.58)	2.66 (5.86)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	40 (1.58)	4.47 (9.86)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	40 (1.58)	4.50 (9.92)

## Pressure Measurement

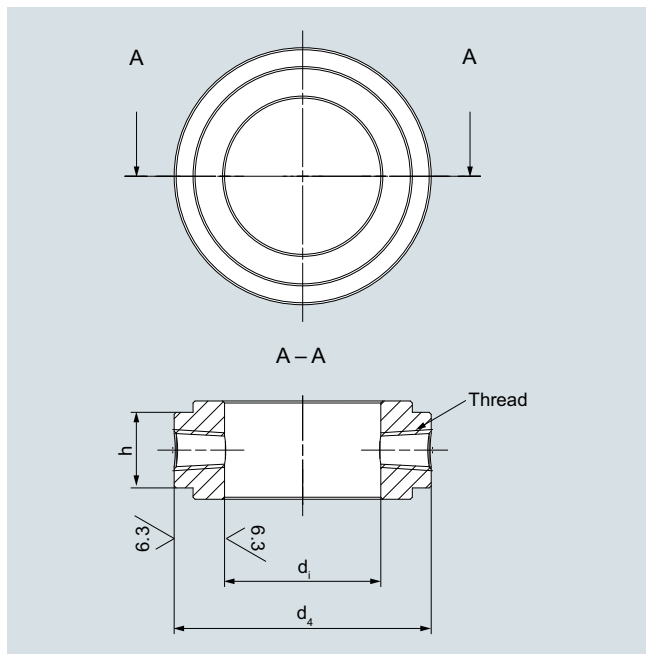
Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Flushing rings for diaphragm seals

#### Form C/form C and form E



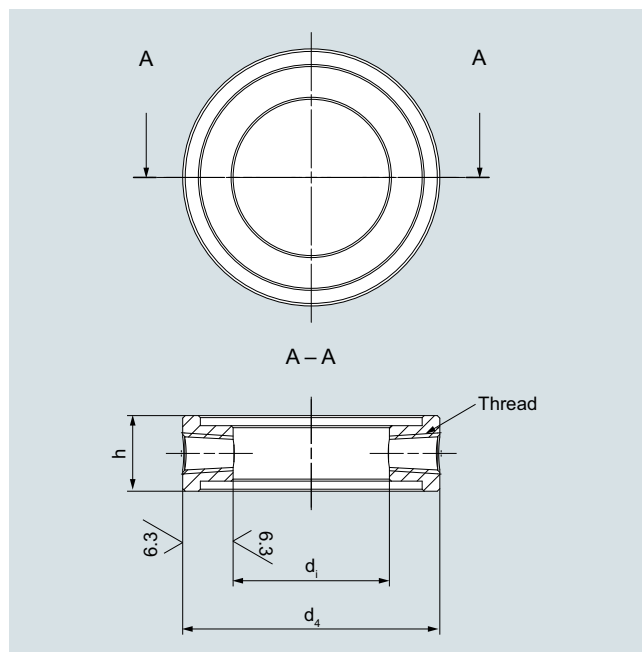
Flushing ring; sealing surface (EN 1092-1), form C/form C



Flushing ring; sealing surface (EN 1092-1), form E

DN	PN	Thread	d <sub>4</sub>	d <sub>i</sub>	h	x	f3	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	31 (1.22)	87 (3.43)	4.5 (0.18)	1.49 (3.28)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	31 (1.22)	120 (4.72)	4.5 (0.18)	2.40 (5.29)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	30 (1.18)	149 (5.87)	5 (0.2)	4.21 (9.28)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	30 (1.18)	175 (6.89)	5 (0.2)	4.21 (9.28)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	31 (1.22)	87 (3.43)	4.5 (0.18)	1.49 (3.28)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	31 (1.22)	120 (4.72)	4.5 (0.18)	2.40 (5.29)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	30 (1.18)	149 (5.87)	5 (0.2)	4.21 (9.28)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	30 (1.18)	175 (6.89)	5 (0.2)	3.38 (7.45)

#### Form F

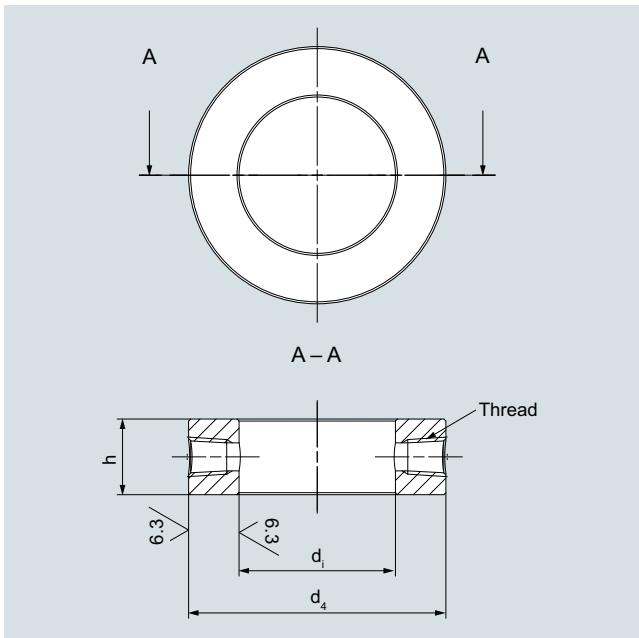


Flushing ring; sealing surface (EN 1092-1), form F

DN	PN	Thread	d <sub>4</sub>	d <sub>i</sub>	h	x	f3	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	35 (1.38)	88 (3.46)	4 (0.16)	1.25 (2.76)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	35 (1.38)	121 (4.76)	4 (0.16)	2.02 (4.45)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	35 (1.38)	150 (5.91)	4.5 (0.18)	3.11 (6.86)
125	16 ... 100	¼ NPT	188 (7.40)	132 (5.2)	35 (1.38)	175 (6.89)	4.5 (0.18)	3.19 (7.03)
50	16 ... 100	½ NPT	102 (4.02)	62 (2.44)	40 (1.58)	88 (3.46)	4 (0.16)	1.45 (3.2)
80	16 ... 100	½ NPT	138 (5.43)	92 (3.62)	40 (1.58)	121 (4.76)	4 (0.16)	2.35 (5.18)
100	16 ... 100	½ NPT	162 (6.38)	92 (3.62)	40 (1.58)	150 (5.91)	4.5 (0.18)	3.67 (8.09)
125	16 ... 100	½ NPT	188 (7.40)	132 (5.2)	40 (1.58)	175 (6.89)	4.5 (0.18)	3.76 (8.29)

### Connection according to ASME B 16.5

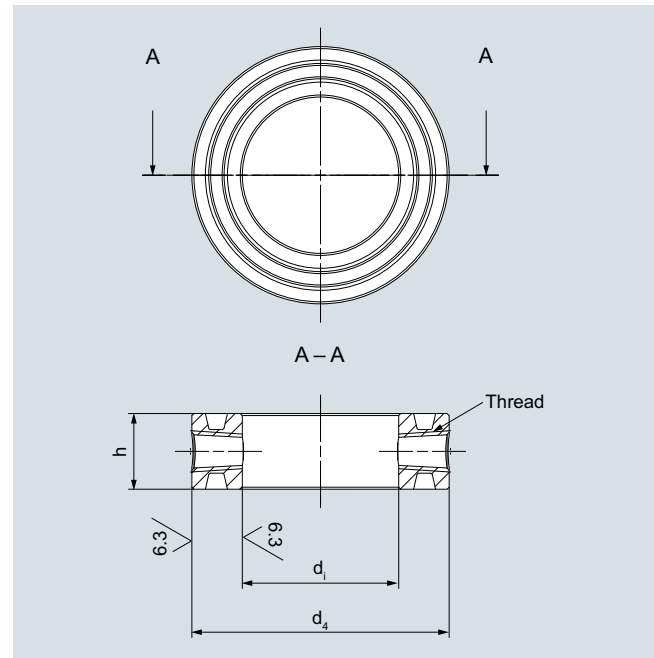
RFSF and RF 125 ... 250 AA



Flushing ring; sealing surface (ASME B 16.5), RFSF and RF 125 to 250 AA

DN	Class	Thread	$d_4$	$d_i$	h	Weight
inch			Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg lb)
2	150 ... 600	¼ NPT	92 (3.62)	62 (2.44)	30 (1.18)	0.87 (1.92)
3	150 ... 600	¼ NPT	127 (5)	92 (3.62)	30 (1.18)	1.44 (3.17)
4	150 ... 600	¼ NPT	157 (6.18)	92 (3.62)	30 (1.18)	3.05 (6.72)
5	150 ... 600	¼ NPT	186 (7.32)	141 (5.55)	30 (1.18)	2.77 (6.11)
2	150 ... 600	½ NPT	92 (3.62)	62 (2.44)	30 (1.18)	0.87 (1.92)
3	150 ... 600	½ NPT	127 (5)	92 (3.62)	30 (1.18)	1.44 (3.17)
4	150 ... 600	½ NPT	157 (6.18)	92 (3.62)	30 (1.18)	3.05 (6.72)
5	150 ... 600	½ NPT	186 (7.32)	141 (5.55)	30 (1.18)	2.77 (6.11)

RJF ring groove



Flushing ring; sealing surface (ASME B 16.5), RJF ring groove

DN	Class	Thread	$d_4$	$d_i$	h	Weight
inch			Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg lb)
2	150	¼ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
3	150	¼ NPT	133 (5.24)	92 (3.62)	40 (1.58)	2.32 (5.12)
4	150	¼ NPT	171 (6.73)	92 (3.62)	40 (1.58)	5.22 (11.51)
5	150	¼ NPT	194 (7.64)	141 (5.55)	40 (1.58)	4.46 (9.83)
2	150	½ NPT	102 (4.02)	62 (2.44)	46 (1.81)	1.90 (4.19)
3	150	½ NPT	133 (5.24)	92 (3.62)	46 (1.81)	2.66 (5.86)
4	150	½ NPT	171 (6.73)	92 (3.62)	46 (1.81)	6.00 (13.23)
5	150	½ NPT	194 (7.64)	141 (5.55)	46 (1.81)	5.13 (11.31)
2	300 ... 600	¼ NPT	108 (4.25)	62 (2.44)	40 (1.58)	1.96 (4.32)
3	300 ... 600	¼ NPT	146 (5.75)	92 (3.62)	40 (1.58)	3.23 (7.12)
4	300 ... 600	¼ NPT	175 (6.89)	92 (3.62)	40 (1.58)	5.57 (12.28)
5	300 ... 600	¼ NPT	210 (8.27)	141 (5.55)	40 (1.58)	6.08 (13.4)
2	300 ... 600	½ NPT	108 (4.25)	62 (2.44)	46 (1.81)	2.26 (4.98)
3	300 ... 600	½ NPT	146 (5.75)	92 (3.62)	46 (1.81)	3.71 (8.18)
4	300 ... 600	½ NPT	175 (6.89)	92 (3.62)	46 (1.81)	6.4 (14.11)
5	300 ... 600	½ NPT	210 (8.27)	141 (5.55)	46 (1.81)	7 (15.43)

## Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

### Measuring setups

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#### Overview

This section shows examples of typical measuring setups for using SITRANS P pressure transmitters with and without remote seals.

Equations for calculating lower range value and upper range value are provided for each example.

Questionnaires are included to help you select the right combination of remote seal and pressure transmitter.

#### Installation

Remote seals of sandwich design are fitted between the connection flange of the measuring point and a dummy flange. Remote seals of flange design are fitted directly on the connection flange of the measuring point. The respective pressure rating of the dummy flange or the flanged remote seal must be observed.

The pressure transmitter should be installed below the connection flange (and below the lower connection flange in the case of differential pressure transmitters). This arrangement must be used in the low-pressure range.

When measuring at pressures above atmospheric, the pressure transmitter can also be installed above the connection flange.

The capillaries between the remote seal and the pressure transmitter should be as short as possible to obtain a good transmission response.

#### Offset of measuring range

If there is a difference in height between the two connection flanges when measuring with two remote seals, an additional differential pressure will result from the oil filling of the remote seal capillaries. This results in a measuring range offset which has to be taken into account when you set the pressure transmitter.

An offset in the measuring range also occurs when combining a remote seal with a transmitter if the remote seal is not installed at the same height as the transmitter.

#### Pressure transmitter output

If the level, separation layer or density increase in closed vessels, the differential pressure and hence the output signal of the pressure transmitter also increase.

For an inverted relationship between the differential pressure and the output signal, the lower range value and upper range value of the SITRANS P must be interchanged.

With open vessels, a rising pressure is usually assigned to an increasing level, separation layer or density.

#### Influence of ambient temperature

Temperature differences between the individual capillaries and between the individual remote seals should be avoided.

Temperature variations in the area of the measuring setup cause a change in volume of the filling liquid and hence measuring errors.

#### Notes

- For the separation layer measurement, the separation layer has to be positioned between the two spigots. Also you must make sure that the level in the container is always above the top spigot.
- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot.

#### Possible combinations of pressure transmitters and remote seals

Type of installation	Pressure transmitters	Remote seals
A/B	7MF2033 7MF4033 7MF4034 7MF4035 7MF8023 7MF8024 7MF8025	7MF4900 7MF4910 7MF4920
C <sub>1</sub> and C <sub>2</sub>	7MF4233 7MF4234 7MF4235  7MF4333 7MF4334 7MF4335	7MF4900 7MF4910 7MF4920  (negative pressure service in each case) 7MF4901 7MF4921
D	7MF2433 7MF2434 7MF2435 7MF4433 7MF4434 7MF4435 7MF4533 7MF4534 7MF4535 7MF5403 7MF5413	7MF4903 7MF4923
E	7MF2433 7MF2434 7MF2435 7MF4433 7MF4434 7MF4435 7MF4533 7MF4534 7MF4535 7MF5403 7MF5413	7MF4913
G, H and J	7MF2433 7MF2434 7MF2435 7MF4433 7MF4434 7MF4435 7MF4533 7MF4534 7MF4535 7MF5403 7MF5413	7MF4903 7MF4923



**Dimensional drawings**

**Types of installation for pressure and level measurements (open vessels)**

**Installation type A**

Pressure transmitter above the measuring point

**Installation type B**

Pressure transmitter below the measuring point

**Installation type A**

Lower range value:  $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{OIL} \cdot g \cdot H_1$

Upper range value:  $p_{ME} = \rho_{FL} \cdot g \cdot H_0 - \rho_{OIL} \cdot g \cdot H_1$

**Installation type B**

Lower range value:  $p_{MA} = \rho_{FL} \cdot g \cdot H_U + \rho_{OIL} \cdot g \cdot H_1$

Upper range value:  $p_{ME} = \rho_{FL} \cdot g \cdot H_0 + \rho_{OIL} \cdot g \cdot H_1$

**Legend**

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$\rho_{FL}$	Density of medium in vessel
$\rho_{OIL}$	Density of filling oil in the capillary to the remote seal
$g$	Local acceleration due to gravity
$H_U$	Lower range value
$H_0$	Upper range value
$H_1$	Distance between vessel flange and pressure trans.

$H_1 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling liquid only  $H_1 \leq 4 \text{ m (13.1 ft)}$

**Types of installation for absolute level measurements (closed vessels)**

**Installation type C<sub>1</sub>**

**Installation type C<sub>2</sub>**

**Installation type C<sub>1</sub> and C<sub>2</sub>**

Lower range value:  $p_{MA} = p_{START} + \rho_{OIL} \cdot g \cdot H_1$

Upper range value:  $p_{ME} = p_{END} + \rho_{OIL} \cdot g \cdot H_1$

**Legend**

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$p_{START}$	Lower range value
$p_{END}$	Upper range value
$\rho_{OIL}$	Density of filling oil in the capillary to the remote seal
$g$	Local acceleration due to gravity
$H_1$	Distance between vessel flange and pressure trans.

Pressure transmitter for absolute pressure always below the measuring point:  $H_1 \geq 200 \text{ mm (7.9 inch)}$

**Type of installation for differential pressure and flow measurements**

**Installation type D Filter monitoring**

**Installation type D**

Lower range value:  $p_{MA} = p_{START} - \rho_{OIL} \cdot g \cdot H_V$

Upper range value:  $p_{ME} = p_{END} - \rho_{OIL} \cdot g \cdot H_V$

**Legend**

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$p_{START}$	Lower range value
$p_{END}$	Upper range value
$\rho_{OIL}$	Density of filling oil in the capillary to the remote seal
$g$	Local acceleration due to gravity
$H_V$	Distance between the measuring points (spigots)

# Pressure Measurement

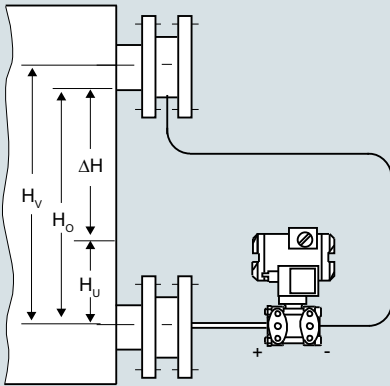
Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

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## Measuring setups with remote seals

### Types of installation for level measurements (closed vessels)

Installation type E



Installation type E

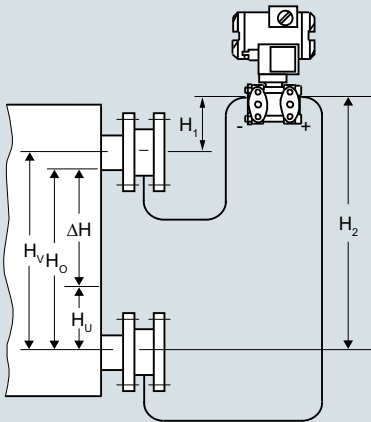
Lower range value:  $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Upper range value:  $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

**Legend**

- $p_{MA}$  Lower range value to be set
- $p_{ME}$  Upper range value to be set
- $\rho_{FL}$  Density of medium in vessel
- $\rho_{Oil}$  Density of filling oil in the capillary to the remote seal
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)

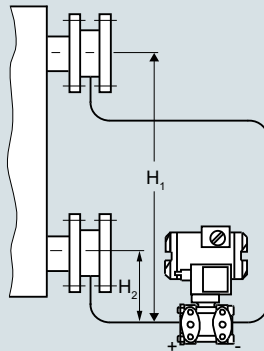
Installation type G



Pressure transmitter for differential pressure above the upper measuring point, no vacuum

$H_2 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling liquid only  $H_1 \leq 4 \text{ m (13.1 ft)}$

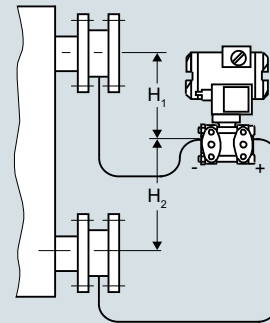
Installation type H



below the lower measuring point

Installation type for vacuum applications

Installation type J



between the measuring points, no vacuum

$H_2 \leq 7 \text{ m (23 ft)}$ , with halocarbon oil as filling liquid only  $H_2 \leq 4 \text{ m (13.1 ft)}$

Installation type G, H and J

Lower range value:  
 $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Upper range value:  
 $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

**Legend**

- $p_{MA}$  Lower range value to be set
- $p_{ME}$  Upper range value to be set
- $\rho_{FL}$  Density of medium in vessel
- $\rho_{Oil}$  Density of filling oil in the capillary to the remote seal
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)

## Overview

### Notes

- For the separation layer measurement, the separation layer has to be positioned between the two spigots.

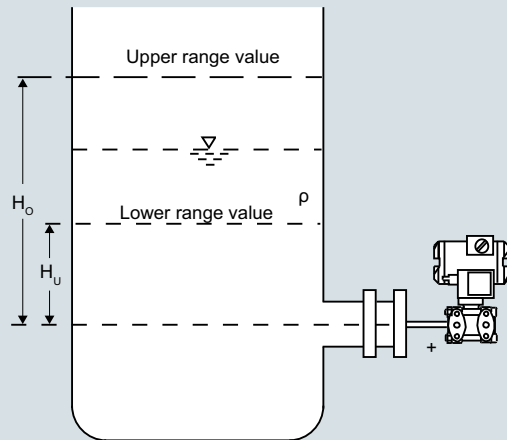
Also you must make sure that the level in the container is always above the top spigot.

- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot

## Dimensional drawings

### Pressure transmitters for differential pressure, for flanging

#### Measuring setups for open containers



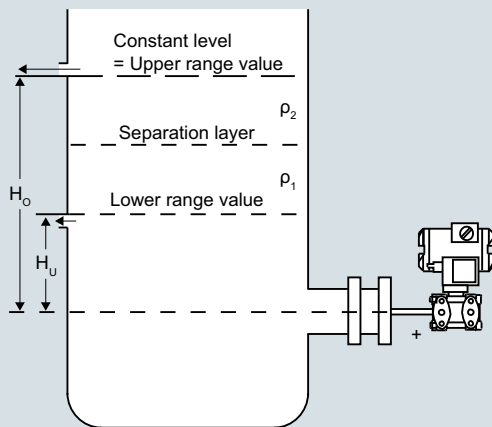
#### Level measurement

$$\text{Lower range value: } p_{MA} = \rho \cdot g \cdot H_U$$

$$\text{Upper range value: } p_{ME} = \rho \cdot g \cdot H_O$$

#### Legend

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$\rho$	Density of medium in vessel
$g$	Local acceleration due to gravity
$H_U$	Lower range value
$H_O$	Upper range value



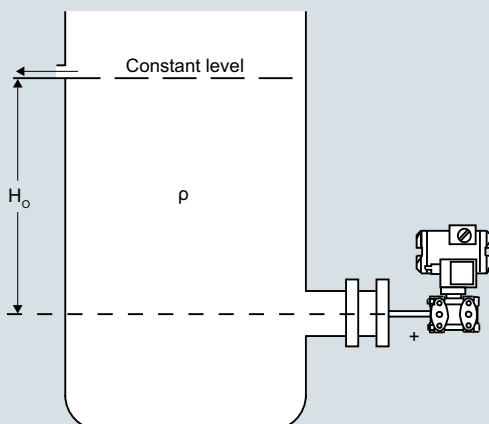
#### Separation layer measurement

$$\text{Lower range value: } p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2)$$

$$\text{Upper range value: } p_{ME} = \rho_1 \cdot g \cdot H_O$$

#### Legend

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$\rho_1$	Density of heavier liquid
$\rho_2$	Density of lighter liquid
$g$	Local acceleration due to gravity
$H_U$	Lower range value
$H_O$	Upper range value



#### Density measurement

$$\text{Lower range value: } p_{MA} = \rho_{MIN} \cdot g \cdot H_O$$

$$\text{Upper range value: } p_{ME} = \rho_{MAX} \cdot g \cdot H_O$$

#### Legend

$p_{MA}$	Lower range value to be set
$p_{ME}$	Upper range value to be set
$\rho_{MIN}$	Minimum density of medium in vessel
$\rho_{MAX}$	Maximum density of medium in vessel
$g$	Local acceleration due to gravity
$H_O$	Upper range value in m

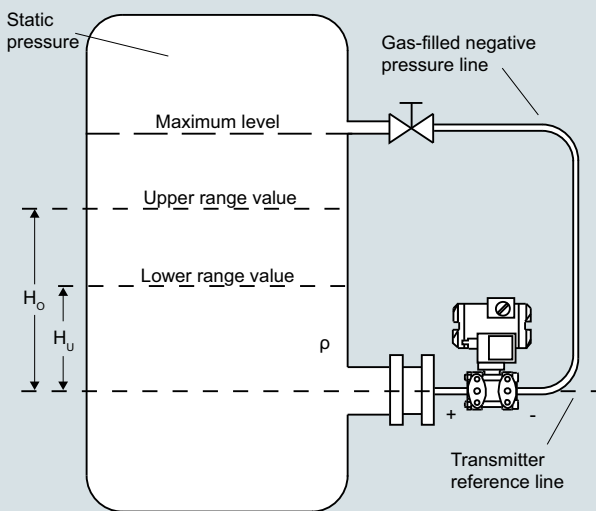
# Pressure Measurement

Remote seals for pressure transmitters  
SITRANS P300, P DS III, P410, P500

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## Measuring setups without remote seals

### Measuring setups for closed containers



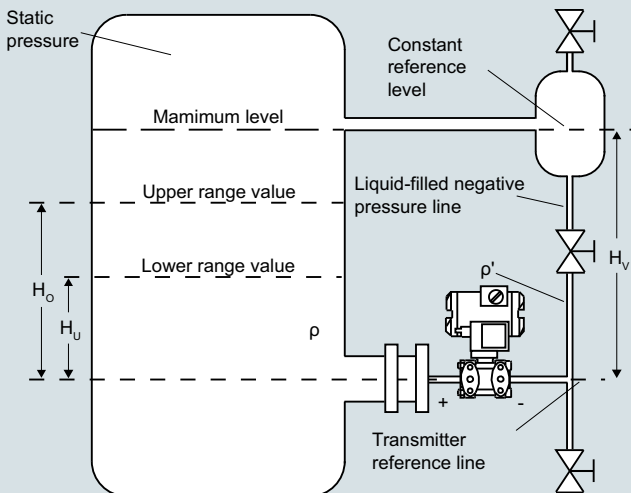
#### Level measurement, Version 1

Lower range value:  $\Delta p_{MA} = \rho \cdot g \cdot H_U$

Upper range value:  $\Delta p_{ME} = \rho \cdot g \cdot H_O$

#### Legend

- $\Delta p_{MA}$  Lower range value to be set
- $\Delta p_{ME}$  Upper range value to be set
- $\rho$  Density of medium in vessel
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value



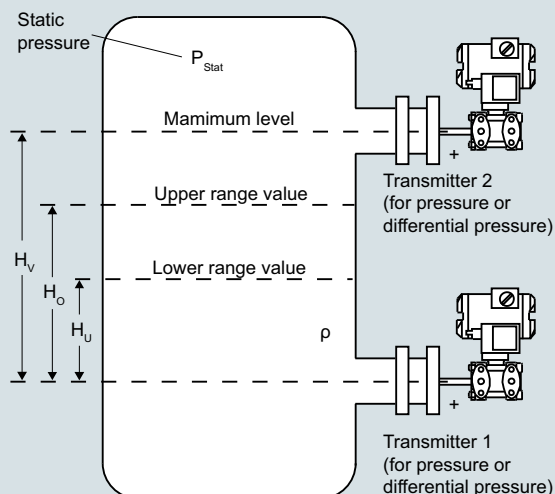
#### Level measurement, Version 2

Lower range value:  $\Delta p_{MA} = g \cdot (H_U \cdot \rho - H_V \cdot \rho')$

Upper range value:  $\Delta p_{ME} = g \cdot (H_O \cdot \rho - H_V \cdot \rho')$

#### Legend

- $\Delta p_{MA}$  Lower range value to be set
- $\Delta p_{ME}$  Upper range value to be set
- $\rho$  Density of medium in vessel
- $\rho'$  Density of liquid in the negative pressure line (corresponding to the temperature existing there)
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)



### Level measurement, Version 3

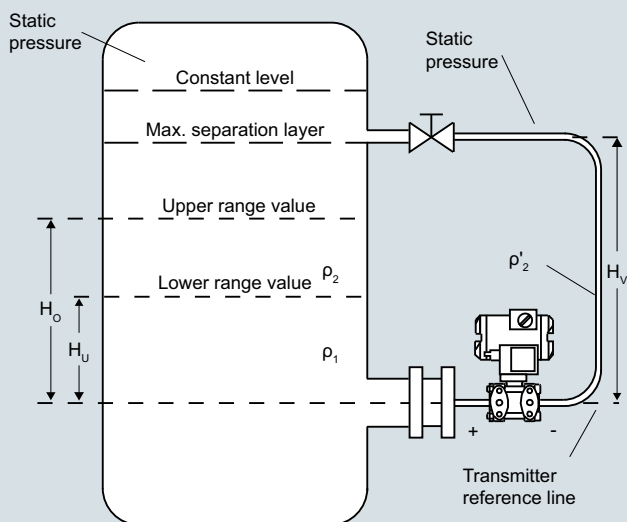
Lower range value:  $\Delta p_{MA} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_U}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

Upper range value:  $\Delta p_{ME} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_O}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

### Legend

- $\Delta p_{MA}$  Lower range value to be set
- $\Delta p_{ME}$  Upper range value to be set
- $\rho$  Density of medium in vessel
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)

The pressure measuring range ( $\pm$  level) will be calculated by subtraction of measuring range of transmitter 1 minus measuring range of transmitter 2 in the process control system.



### Separation layer measurement

Lower range value:  $\Delta p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2 - H_V \cdot \rho'_2)$

Upper range value:  $\Delta p_{ME} = g \cdot (H_O \cdot \rho_1 - H_V \cdot \rho'_2)$

### Legend

- $\Delta p_{MA}$  Lower range value to be set
- $\Delta p_{ME}$  Upper range value to be set
- $\rho_1$  Density of heavier liquid with separation layer in vessel
- $\rho_2$  Density of lighter liquid with separation layer
- $\rho'_2$  Density of liquid in the negative pressure line (corresponding to the temperature existing there)
- $g$  Local acceleration due to gravity
- $H_U$  Lower range value
- $H_O$  Upper range value
- $H_V$  Distance between the measuring points (spigots)

# Pressure Measurement

## Fittings

1

### Technical description

#### Overview

All shut-off fittings can be secured onto walls, racks (72 mm grid) and vertical and horizontal pipes.

This offers the advantage when assembling a plant that the shut-off fittings can be secured first and the lines for the medium and differential pressure connected to them. It is then possible to check all connections for leaks and to blow out or flush the pipes in order to remove dirt (welding residues, shavings etc.).

The measuring instruments can be screwed onto the shut-off fittings right at the end when all piping has been completed.

If an instrument has to be removed for maintenance, the fittings and pipes remain as they are. It is only necessary to close the valves – the instrument can then be removed, and refitted following maintenance.

#### **Classification according to pressure equipment directive (PED 2014/68/EU):**

For gases of fluid group 1 and liquids of fluid group 1; compliance with requirements of article 4, paragraph 3 (sound engineering practice).

#### **Norm IEC 61518/DIN EN 61518**

The flange connection between transmitter and valve manifold was modified in the new standard IEC 61518/DIN EN 61518. The only connection thread approved for use in the process flanges of the pressure transmitter is  $7/16$ -20 UNF.

The valve manifolds for M12 screws, including the accessory sets, have therefore been deleted.

#### **Inspection certificate to EN 10204-3.**

If an inspection certificate according to EN 10204-3.1 is required for ordering valve manifolds or shut-off fittings, be aware that one certificate is sufficient for each valve type ordered. This means that you will only be charged for one certificate in the cost calculations.

#### **Minimum/maximum operating temperatures**

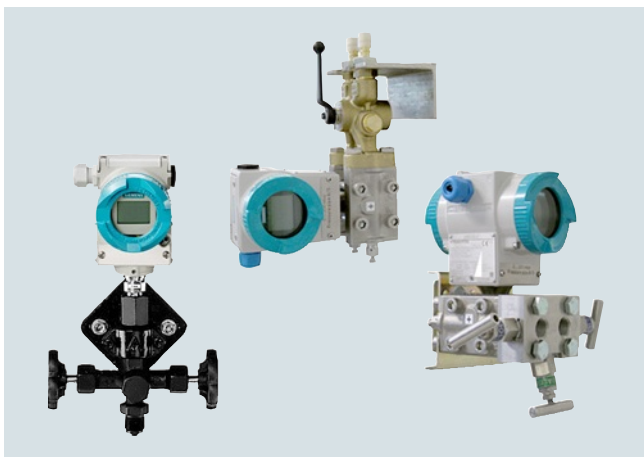
The maximum operating temperatures are given for each valve or valve manifold.

The minimum operating temperatures depend on the material used for the valves or valve manifold.

They are as follows:

Material	Minimum operating temperature
Brass	-10 °C (-14 °F) according to EN 12516-4
Steel	-10 °C (-14 °F) according to AD200-W10
Stainless steel	-40 °C (-40 °F)

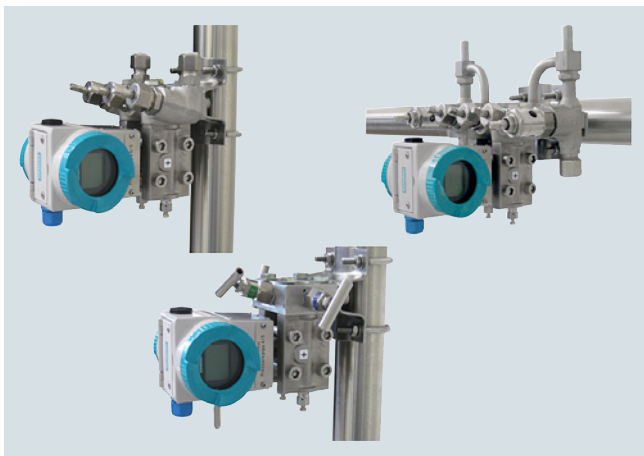
### Pressure transmitters with shut-off fittings - mounting examples



SITRANS P transmitter for gauge pressure with double shut-off valve, SITRANS P pressure transmitter with multiway cock or 3-spindle valve manifold



SITRANS P pressure transmitter for differential pressure, mounted in protective box (available on request)






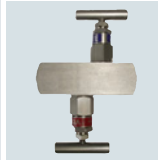
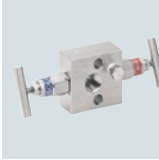
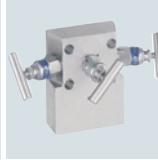


SITRANS P transmitter for differential pressure with 3-way valve manifold, 3-spindle valve manifold or valve manifold combination DN 5/DN 8



SITRANS P pressure transmitter mounted on valve combination "Mono-flange" for direct connection to flanges (available on request)














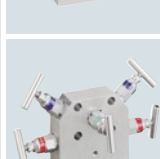

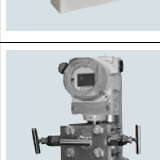
## Selection of available shut-off valves

Transmitters	Shut-off valves for general applications	Page		Shut-off valves for special applications	Page	
<b>Relative and absolute pressure transmitters with process connection G½" male thread</b> e.g. <ul style="list-style-type: none"> <li>• SITRANS P200 7MF1565-...</li> <li>• SITRANS P210 7MF1566-...</li> <li>• SITRANS P220 7MF1567-...</li> <li>• SITRANS P300 7MF802-...0-...</li> <li>• SITRANS P 320/420 7MF030-...D.-... 7MF032-...D.-... 7MF040-...D.-... 7MF042-...D.-...</li> <li>• SITRANS P DS III series 7MF403-...0.-... and 7MF423-...0.-...</li> <li>• SITRANS P410 7MF243-...0.-... C41</li> </ul>	Shut-off valves/double shut-off valves to DIN 16270, DIN 16271 and DIN 16272	1/473		Double shut-off valve DN 5 for crossover ½-NPT-F to G½ nipple connection 7MF9011-4EA	1/476	
				2-spindle valve manifold DN 5 for installation in protective boxes 7MF9412-1B	1/494	
<b>Gauge and absolute pressure transmitters with process connection ½"-14 NPT female or male thread</b> e.g. <ul style="list-style-type: none"> <li>• SITRANS P200 7MF1565-...</li> <li>• SITRANS P210 7MF1566-...</li> <li>• SITRANS P220 7MF1567-...</li> <li>• SITRANS P300 7MF802-...1.-...</li> <li>• SITRANS P 320/420 7MF030-...E.-... 7MF030-...F.-... 7MF032-...E.-... 7MF032-...F.-... 7MF040-...E.-... 7MF040-...F.-... 7MF042-...E.-... 7MF042-...F.-...</li> <li>• SITRANS P DS III series 7MF403-...1.-... and 7MF423-...1.-...</li> <li>• SITRANS P410 7MF243-...1.-... C41</li> </ul>	Double shut-off valve DN 5 7MF9011-4EA, -4FA, -4GA and -4KA	1/476	 7MF9011-4FA  7MF9011-4KA	Double shut-off valve DN 5 for process connection ½-NPT 7MF9011-4HA	1/476	
<b>Absolute pressure transmitter with process connection to IEC 61518/DIN EN 61518</b> e.g. <ul style="list-style-type: none"> <li>• SITRANS P 320/420 7MF033-...-... 7MF043-...-... • SITRANS P DS III series 7MF433-...</li> </ul>	2-spindle valve manifold DN 5 7MF9411-5A.	1/479		2-spindle valve manifold DN 5 for installation in protective boxes 7MF9412-1C.	1/494	

# Pressure Measurement

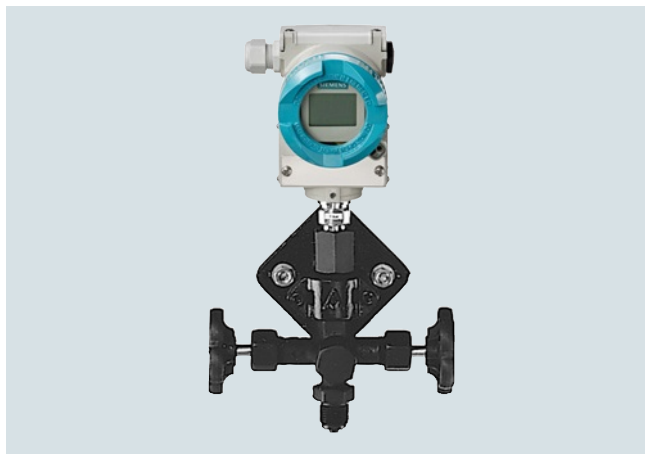
## Fittings

### Selection aid

Transmitters	Shut-off valves for general applications	Page	Shut-off valves for special applications	Page		
<b>Differential pressure transmitter with process connection to IEC 61518/DIN EN 61518</b> e.g. <ul style="list-style-type: none"> <li>• SITRANS P 320/420 7MF034-.....-..... 7MF044-.....-.....</li> <li>• SITRANS P DS III series 7MF443-.... and 7MF453-....</li> <li>• SITRANS P410 7MF443-.... C41; 7MF453-.... C41</li> <li>• SITRANS P500 7MF54...-....</li> </ul>	For 3/5-spindle valve manifold DN 5 7MF9411-5B. and 7MF9411-5C.	1/479		1/484		
				1/484		
	PN 100 multiway cocks 7MF9004-...		1/482		1/487	
					1/490	
					1/492	
					1/494	
					1/498	
					1/501	



## Overview



Transmitter for pressure with double shut-off valve 7MF9401-...

The shut-off valves for pressure gauges are used to shut off the line of the measured medium when dealing with aggressive and non-aggressive gases, vapors and liquids.

## Design

A water trap must be connected upstream of the shut-off valve in the case of temperatures of the medium above 120 °C. The shut-off valves form B have a shaft with which they can be secured on an instrument bracket. An adapter is therefore not required to secure these valves. The vent/test connection can be shut off separately with the double shut-off valves DN 5. This permits checking of the zero on the pressure gauge. In addition, the characteristic of the pressure gauge can be checked using an external pressure source. The valve packing material is PTFE.

## Selection and Ordering data

Article No.

## Shut-off valves, form B, DIN 16270

without test collar, connection shank,  
without certificate

Material Valve enclosure	Maximum permissible working pressure	Article No.
CW614N (CuZn39Pb3) (mat. No. 2.0402)	250 bar (3626 psi)	<b>7MF9401-7AA</b>
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	<b>7MF9401-7AB</b>
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	<b>7MF9401-7AC</b>

## Shut-off valves, form B, DIN 16271

with test collar, connection shank,  
without certificate

Material Valve enclosure	Maximum permissible working pressure	Article No.
CW614N (CuZn39Pb3) (mat. No. 2.0402)	250 bar (3626 psi)	<b>7MF9401-7BA</b>
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	<b>7MF9401-7BB</b>
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	<b>7MF9401-7BC</b>

## Selection and Ordering data

Article No.

## Shut-off valves, form B, DIN 16270

without test collar, pipe union with ferrule  
12 S DIN EN ISO 8434-1, without certificate

Material Valve enclosure	Maximum permissible working pressure	Article No.
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	<b>7MF9401-8AB</b>
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	<b>7MF9401-8AC</b>

## Shut-off valves, form B, DIN 16271

with test collar, pipe union with ferrule  
12 S DIN EN ISO 8434-1, without certificate

Material Valve enclosure	Maximum permissible working pressure	Article No.
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	<b>7MF9401-8BB</b>
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	<b>7MF9401-8BC</b>

## Double shut-off valves, form B, DIN 16272

with test collar, connection shank,  
without certificate

Material Valve enclosure	Maximum permissible working pressure	Article No.
CW614N (CuZn39Pb3) (mat. No. 2.0402)	250 bar (3626 psi)	<b>7MF9401-7DA</b>
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	<b>7MF9401-7DB</b>
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	<b>7MF9401-7DC</b>

## Double shut-off valves, form B, DIN 16272

with test collar, pipe union with ferrule  
12 S DIN EN ISO 8434-1, without certificate

Material Valve enclosure	Maximum permissible working pressure	Article No.
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	<b>7MF9401-8DB</b>
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	<b>7MF9401-8DC</b>

## Accessories

Factory certificate according to EN 10204-2.2

Material inspection certificate EN 10204-3.1

Instrument bracket, see page 1/478.

## Pressure Measurement

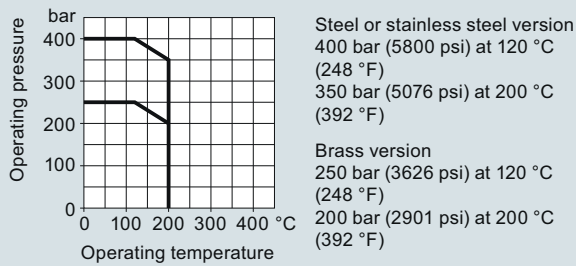
### Fittings

### Shut-off valves for gauge and absolute pressure transmitters

#### Shut-off valves to DIN 16270, DIN 16271 and DIN 16272

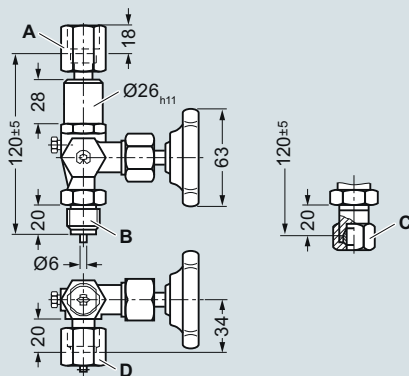
1

#### Characteristic curves



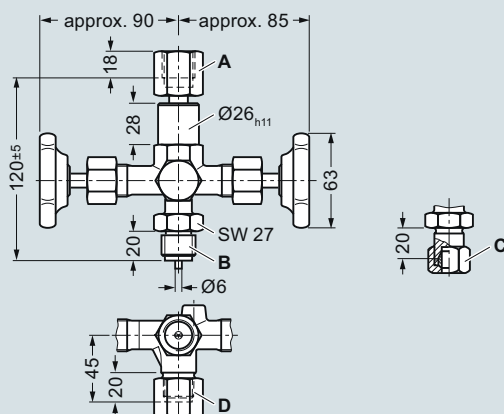
Permissible operating pressure as a function of the permissible operating temperature

#### Dimensional drawings



- A Connection on device side: to DIN 16284, G½, SW 27
- B Connection on measurement side: connection shank to DIN EN 837-1, G½
- C Connection on measurement side: pipe union with ferrule 12 mm diameter, S series, to DIN EN ISO 8434-1
- D Connection on test collar (with sealing cap): thread M20 x 1,5

Shut-off valve, form B, dimension drawing, dimensions in mm



- A Connection on device side: to DIN 16284, G½, SW 27
- B Connection on measurement side: connection shank to DIN EN 837-1, G½
- C Connection on measurement side: pipe union with ferrule 12 mm diameter, S series, to DIN EN ISO 8434-1
- D Connection on test collar (with sealing cap): thread M20 x 1,5

Double shut-off valve, form B, dimension drawing, dimensions in mm

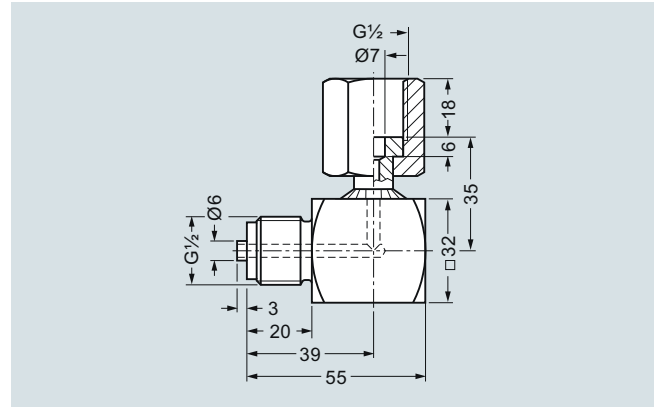
## Overview



P300 pressure transmitter with shut-off valve and angle adapter

The angle adapter enables pressure transmitters with top displays to be read from the front.

## Dimensional drawings



Angle adapter, dimensions in mm

## Selection and Ordering data

Article No.

## Angle adapters

7MF9401-7WA

Material: X 12 CrNiMoTi 17 12 2 (mat. No. 1.45714/316Ti), max. permissible operating pressure 400 bar (5800 psi)

## Accessories

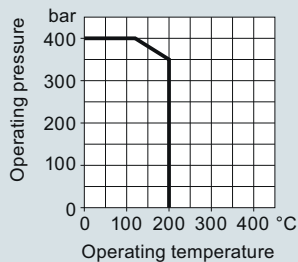
Factory certificate according to EN 10204-2.2

7MF9000-8AB

Material inspection certificate EN 10204-3.1

7MF9000-8AD

## Characteristic curves



Stainless steel version  
400 bar (5800 psi) at 120 °C  
(248 °F)  
350 bar (5076 psi) at 200 °C  
(392 °F)

Permissible operating overpressure as a function of the permissible operating temperature

# Pressure Measurement

## Fittings

### Shut-off valves for gauge and absolute pressure transmitters

#### Shut-off valves/Double shut-off valves

1

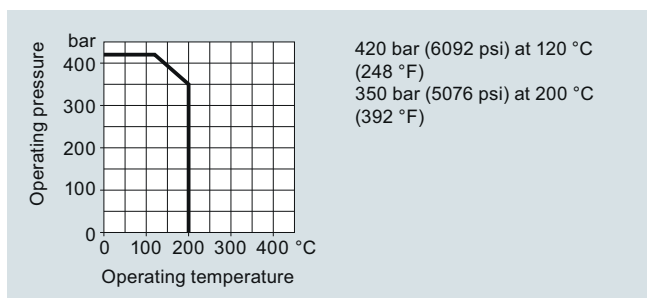
#### Overview

The double shut-off valves DN 5 are suitable for pressure gauges and pressure transmitters and available in 5 versions:

- Sleeve-nipple
- Sleeve-sleeve
- Sleeve-collar
- Collar-collar
- Collar-sleeve

The valve packing material is PTFE.

#### Characteristic curves



Permissible operating pressure as a function of the permissible operating temperature

#### Selection and Ordering data

Article No.

##### Shut-off valve DN 5

Material: X 6 CrNiMoTi 17 13 2 (W.-Nr. 1.4404/316L), max. permissible operating overpressure 420 bar (6092 psi)

- Sleeve-sleeve

7MF9011-3HA

##### Double shut-off valves DN 5

Material: X 6 CrNiMoTi 17 13 2 (mat. No. 1.4404/316L), max. permissible working pressure 420 bar (6092 psi);

- Sleeve-nipple connection
- Sleeve-sleeve
- Sleeve-collar
- Collar-collar
- Collar-sleeve

7MF9011-4EA

7MF9011-4HA

7MF9011-4FA

7MF9011-4GA

7MF9011-4KA

#### Accessories

Factory certificate according to EN 10204-2.2

7MF9000-8AB

Material inspection certificate EN 10204-3.1

7MF9000-8AD

#### Further designs

Order code

Add "-Z" to Article No. and specify Order code.

Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)

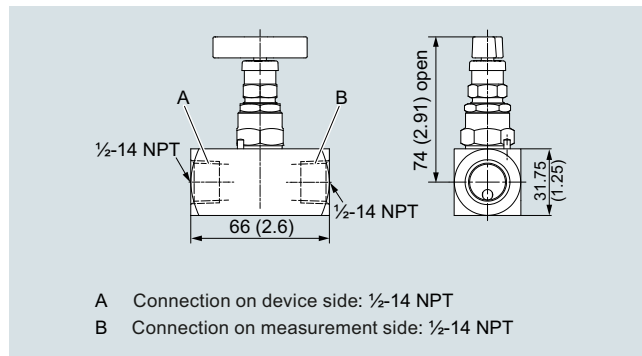
S12

#### NACE MR-0175-certified

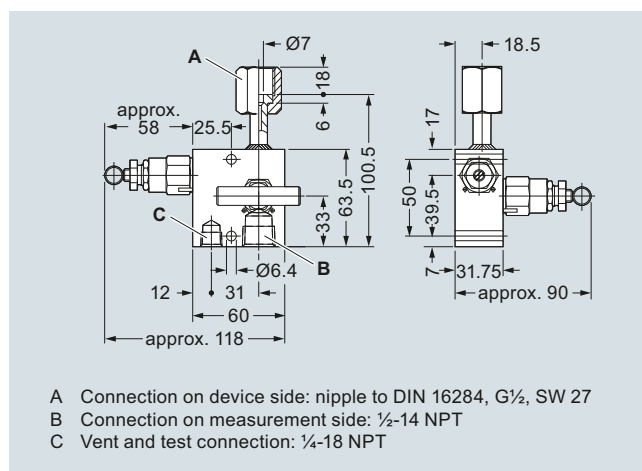
D07

incl. inspection certificate 3.1 to EN 10204

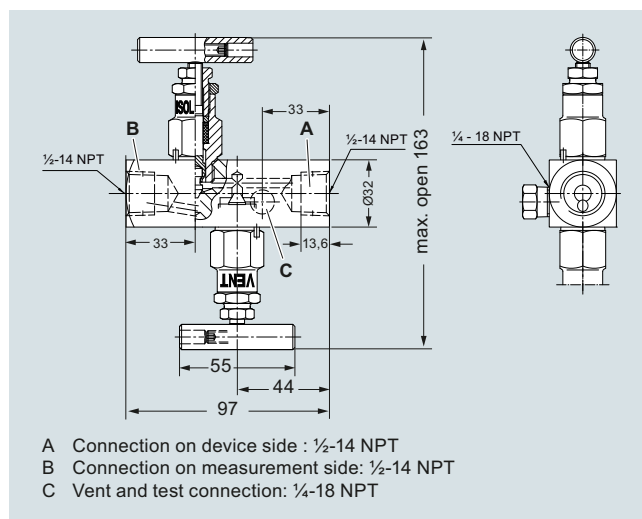
#### Dimensional drawings



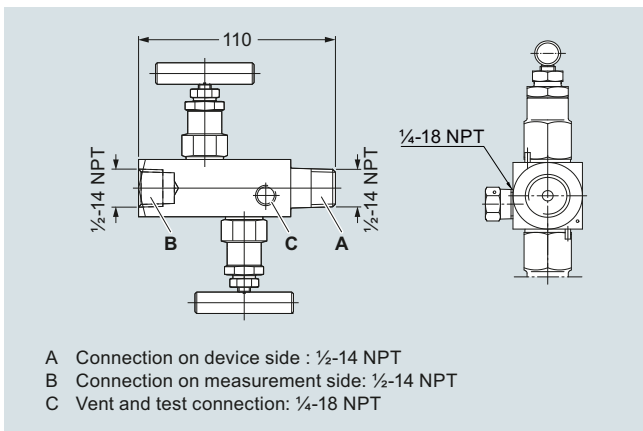
Shut-off valve DN 5 (sleeve-sleeve) 7MF9011-3HA, dimensions in mm (inch)



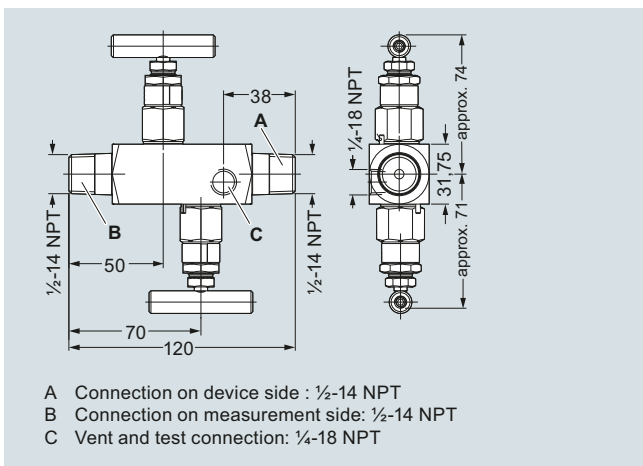
Double shut-off valve DN 5 (sleeve-nipple) 7MF9011-4EA, dimensions in mm



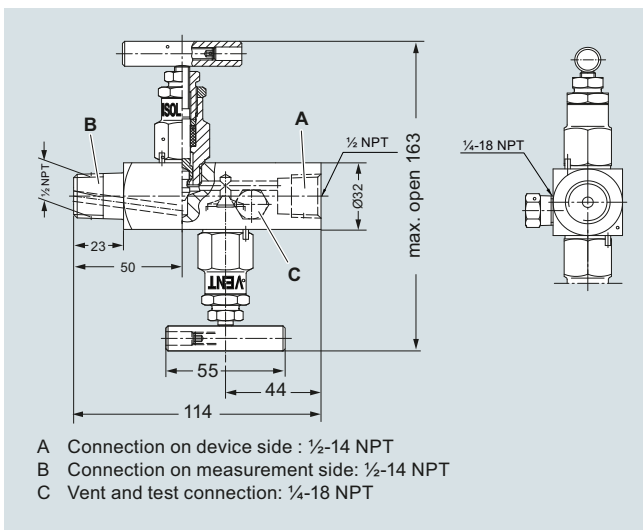
Double shut-off valve DN 5 (sleeve-sleeve) 7MF9011-4HA, dimensions in mm



Double shut-off valve DN 5 (sleeve-collar) 7MF9011-4FA, dimensions in mm



Double shut-off valve DN 5 (collar-collar) 7MF9011-4GA, dimensions in mm



Double shut-off valve DN 5 (collar-sleeve) 7MF9011-4KA, dimensions in mm

## Pressure Measurement

### Fittings

### Shut-off valves for gauge and absolute pressure transmitters

#### Accessories for shut-off valves/double shut-off valves

##### Overview

The mounting set is suitable for the double shut-off valves 7MF9011-4.A and for wall, rack and pipe mounting.

##### Selection and Ordering data

Article No.

##### Mounting set for shut-off valves

- 7MF9011-4DA and -4EA

made of stainless steel, scope of delivery:  
1x mounting bracket,  
2x hexagon screws M6x40,  
1x mounting clip,  
2x washers 8.4 to DIN 125;  
2x hexagon nuts 8.4 to DIN EN 24032

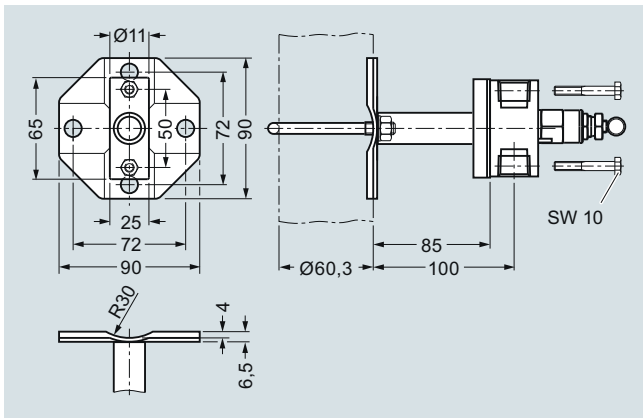
**7MF9011-8AB**

- 7MF9011-4FA, -4GA, 4HA, -4KA and -3HA

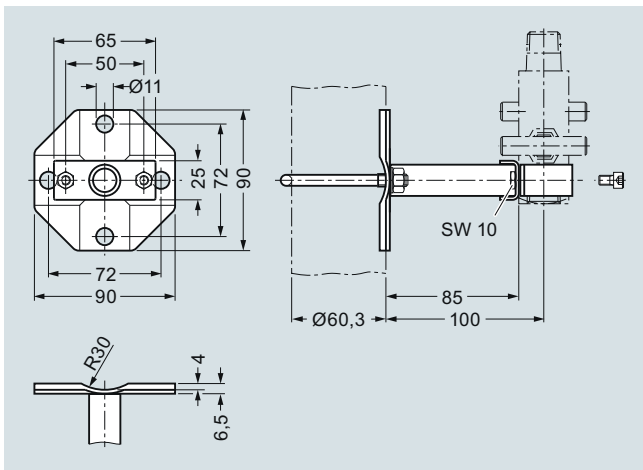
made of stainless steel, scope of delivery:  
1x mounting bracket,  
2x hexagon screws M6x10,  
1x mounting clip,  
2x washers 8.4 to DIN 125;  
2x hexagon nuts 8.4 to DIN EN 24032

**7MF9011-8AC**

##### Dimensional drawings



Mounting bracket (7MF9011-8AB) for shut-off valves 7MF9011-4DA and 7MF9011-4EA for wall, rack or pipe mounting, dimensions in mm



Mounting bracket (7MF9011-8AC) for shut-off valves 7MF9011-4FA and 7MF9011-4GA for wall, rack or pipe mounting, dimensions in mm

##### Overview

The instrument brackets are needed to mount the following units:

- Pressure gauges with threaded connection at the bottom
- Shut-off valves to DIN 16270, DIN 16271 and DIN 16272 (7MF9401-7.. and 7MF9401-8..)

##### Selection and Ordering data

Article No.

##### Instrument bracket, form H, DIN 16281

(e.g. for gauge)  
made of aluminium alloy, painted black,  
**for wall mounting**, screw-type bracket cover

- Projection length 60 mm
- Projection length 100 mm

**M56340-A0046**  
**M56340-A0047**

##### Instrument bracket, form A, DIN 16281

(e.g. for transmitter)  
made of annealed cast iron, galvanized and primed  
**for mounting on a wall** or rack or on a sectional rail (horizontal/vertical);  
Screw-type bracket cover

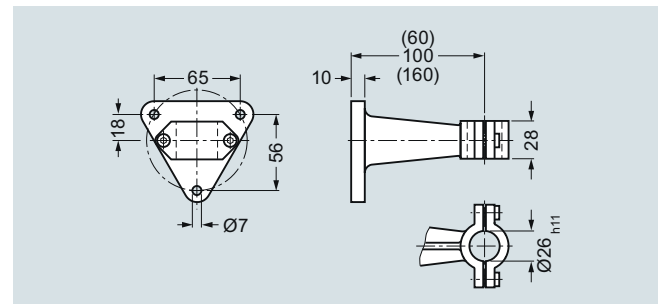
**M56340-A0053**

##### Instrument bracket, form A, DIN 16281

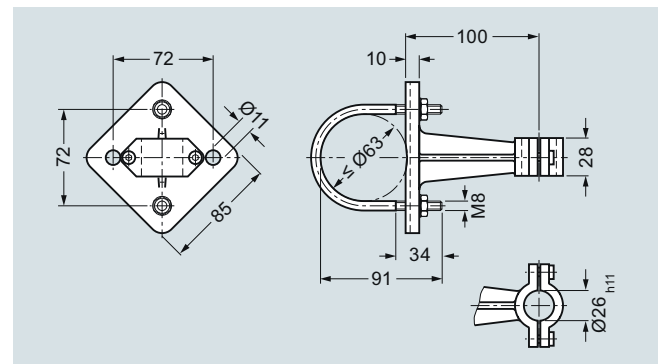
(e.g. for transmitter)  
made of annealed cast iron, galvanized and primed with pipe clamp for **wall and pipe mounting** (horizontal/vertical)  
Screw-type bracket cover

**M56340-A0079**

##### Dimensional drawings



Instrument bracket form H, for wall mounting, M56340-A0046/-A0047, dimensions in mm



Instrument bracket form A, wall or pipe mounting, M56340-A0053/-A0079, dimensions in mm

## Overview



The 2-spindle, 3-spindle and 5-spindle valve manifolds 7MF9411-5.. are for pressure transmitters for absolute pressure or differential pressure.

The valve manifolds are used to shut off the differential pressure lines and to check the pressure transmitter zero.

The 2-spindle and the 5-spindle valve manifold enable in addition venting on the transmitter side and checking of the pressure transmitter characteristic.

## Benefits

- Max. working pressure 420 bar (6092 psi)
- Each available in version for oxygen

## Application

The spindle valve manifolds DN 5 are designed for liquids and gases.

Each is available in a version for oxygen on request.

## Design

All versions of the valve manifolds have a process connection 1/2-14 NPT. The connection for the pressure transmitter is always designed as a flange connection to IEC 61518/DIN EN 61518, form B. The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection 1/4-18 NPT.

The valves have an external spindle thread.

## Materials used

Component	Material	Mat. No.
Enclosure	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

## Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

## Selection and Ordering data

Article No.

## Valve manifolds DN 5

7MF9411 - A

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

for liquids and gases, for flanging to pressure transmitters for absolute and differential pressure, max. working pressure 420 bar (order accessory set with Order code), without certificate

- 2-spindle valve manifold
- 3-spindle valve manifold
- 5-spindle valve manifold

5 A  
5 B  
5 C

## Accessories

Factory certificate according to EN 10204-2.2

7MF9000-8AB

Material inspection certificate EN 10204-3.1

7MF9000-8AD

## Selection and Ordering data

Order code

Article No.

Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

## Accessory set to EN

(connection between valve manifold and pressure transmitter)

for valve manifold 7MF9411-5A.

2x screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1; chromized steel  
1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K35

7MF9411-7DB

2x screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1;

## stainless steel

1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K45

7MF9411-7DC

for valve manifolds 7MF9411-5B. and -5C.

4x screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1; chromized steel  
2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K36

7MF9411-5DB

4x screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1;

## stainless steel

2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K46

7MF9411-5DC

Accessory set to DIN<sup>2)</sup>

(connection between valve manifold and pressure transmitter)

for valve manifold 7MF9411-5A.

2x screws M10x45 to DIN EN 24014; chromized steel  
2x washers Ø 10.5 mm to DIN 125;  
1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K15

7MF9411-7BB

2x screws M10x45 to DIN EN 24014;

## stainless steel

2x washers Ø 10.5 mm to DIN 125, stainless steel;  
1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K25

7MF9411-7BC

# Pressure Measurement

## Fittings

### Shut-off valves for differential pressure transmitters

1

#### 2-, 3- and 5-spindle valve manifolds DN 5

Selection and Ordering data	Order code	Article No.
<b>Further designs<sup>1)</sup></b>		
Please add <b>"-Z"</b> to Article No. and specify Order code.		
<u>for valve manifolds 7MF9411-5B. and -5C.</u>		
4x screws M10x45 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) Flange connection with M10 screws only permissible up to PN 160.	<b>K16</b>	<b>7MF9411-6BB</b>
4x screws M10x45 to DIN EN 24014; <b>stainless steel</b> 4x washers Ø 10.5 mm to DIN 125, <b>stainless steel</b> ; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) Flange connection with M10 screws only permissible up to PN 160.	<b>K26</b>	<b>7MF9411-6BC</b>
<b>Mounting plate</b>		
<ul style="list-style-type: none"> <li>for valve manifold, made of electrogalvanized sheet-steel               <ul style="list-style-type: none"> <li>- <b>for wall mounting</b> or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold</li> <li>- <b>for pipe mounting</b>, weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm) and fastening screws for mounting on valve manifold</li> </ul> </li> <li>for valve manifold, made of <b>stainless steel 316L</b> <ul style="list-style-type: none"> <li>- <b>for wall mounting</b> or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold</li> <li>- <b>for pipe mounting</b>, weight 0.7 kg Scope of delivery: 1x mounting plate M21, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)</li> </ul> </li> </ul>	<b>M11</b>	<b>7MF9006-6EA</b>
	<b>M12</b>	<b>7MF9006-6GA</b>
	<b>M21</b>	<b>7MF9006-6EC</b>
	<b>M22</b>	<b>7MF9006-6GC</b>
<b>Valve manifold 100 bar</b>		
Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)		
<ul style="list-style-type: none"> <li>for 7MF9411-5A.</li> <li>for 7MF9411-5B.</li> <li>for 7MF9411-5C.</li> </ul>	<b>S12</b>	<b>S13</b>
	<b>S13</b>	<b>S14</b>
	<b>S14</b>	
<b>NACE MR-0175-certified</b>		
incl. inspection certificate 3.1 to EN 10204		
	<b>D07</b>	

- 1) When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.  
2) Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

#### Accessories

##### Accessory set for 2-, 3- and 5-spindle valve manifolds

###### 2-spindle valve manifold DN 5

- K35: 2 screws  $\frac{7}{16}$ -20 UNF x 1¼ inch to ASME B18.2.1, 1 flat gasket
- K15: 2 screws M10x45 to DIN EN 24014, 2 washers, 1 flat gasket

###### 3-spindle and 5-way valve manifold DN 5

- K36: 4 screws  $\frac{7}{16}$ -20 UNF x 1¼ inch to ASME B18.2.1, 2 flat gaskets
- K16: 4 screws M10x45 to DIN EN 24014, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

**Note:** Flange connection with M10 screws only permissible up to PN 160!

##### Mounting plate

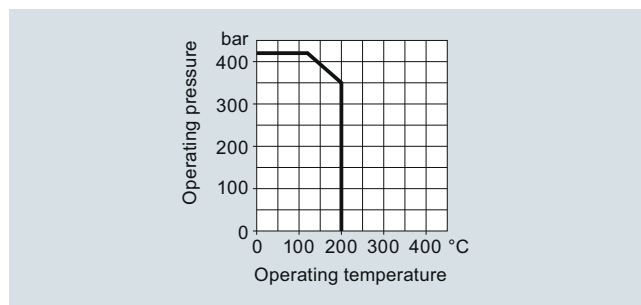
Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid)  
Scope of delivery:  
- 1 mounting plate with bolts for mounting on valve manifold
- M12: For pipe mounting  
Scope of delivery:  
- 1 mounting plate M11  
- 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

##### Valve manifold 100 bar, suitable for oxygen

- S12: For 2-way valve manifold
- S13: For 3-way valve manifold
- S14: For 5-way valve manifold

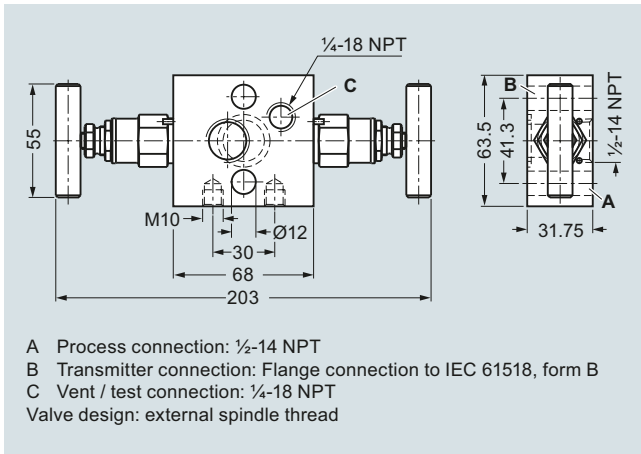
#### Characteristic curves



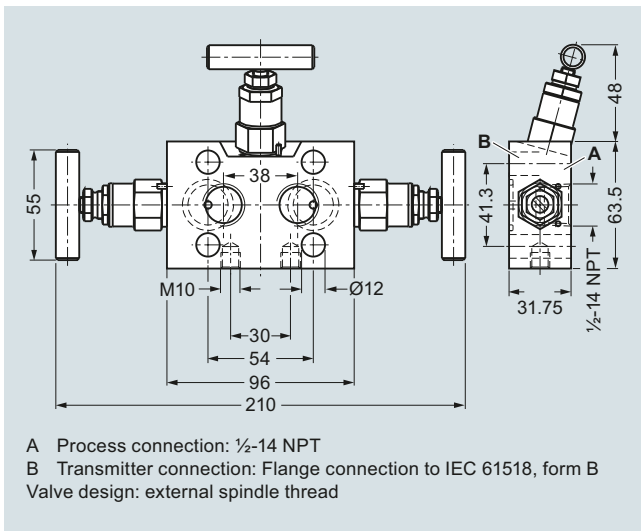
Valve manifolds PN 5 (7MF9411-5..), permissible working pressure as a function of the permissible working temperature



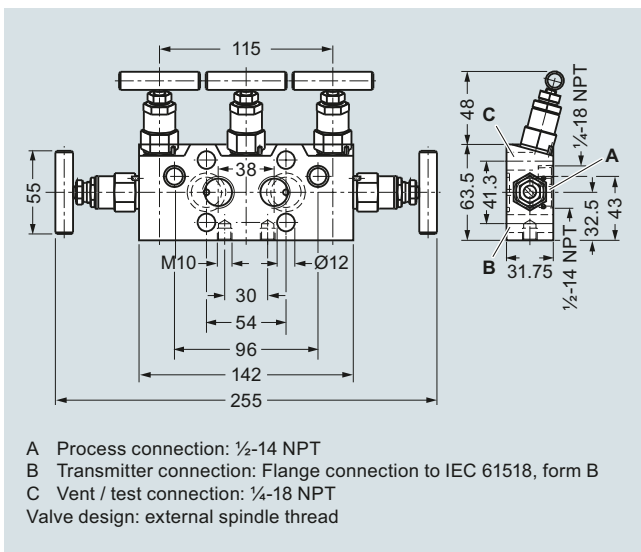
**Dimensional drawings**



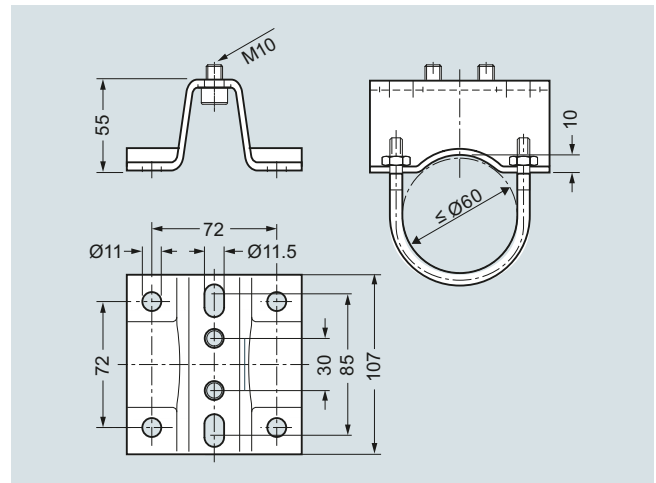
2-spindle valve manifold DN 5 (7MF9411-5A.), dimensions in mm



3-spindle valve manifold DN 5 (7MF9411-5B.), dimensions in mm

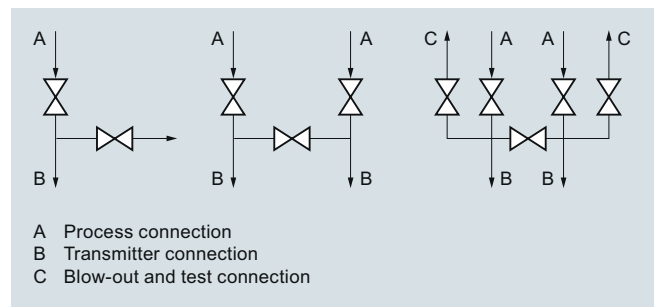


5-spindle valve manifold DN 5 (7MF9411-5C.), dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

**Schematics**



2-spindle, 3-spindle and 5-spindle valve manifold DN 5, connections

## Pressure Measurement

### Fittings

### Shut-off valves for differential pressure transmitters

## Multiway cocks PN 100

### Overview



Multiway cock PN 100 (1450 psi) (7MF9004-1P.) for differential pressure transmitters

The multiway cock PN 100 (1450 psi) can be flanged to pressure transmitters for differential pressure.

### Benefits

- Version available for aggressive liquids, gases and vapors
- Robust design
- Oil-free and grease-free version possible
- One-hand operation

### Application

The PN 100 (1450 psi) multiway cock is available in versions for aggressive and non-aggressive liquids, gases and vapors.

### Design

The multiway cock can be flanged with four screws to pressure transmitters for differential pressure.

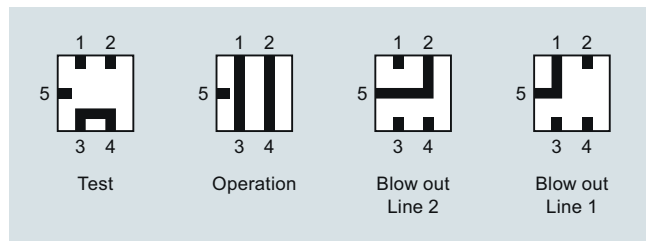
The PN 100 (1450 psi) has 2 process connections and one blow-out connection. A steel version of the multiway cock is available for non-aggressive media, and a stainless steel version for aggressive media. The enclosure is forged in one piece. The switching lever is removable.

Sealing can be improved during operation.

**Note:** An accessory set is always required for flanging of the multiway cock to a differential pressure transmitter.

### Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Testing the pressure transmitter zero



Cock positions; the symbols are printed on the cock

### Technical specifications

Multiway cocks PN 100		
<b>Medium</b>	<b>Water, non-aggressive liquids and gases</b>	<b>Aggressive liquids, gases and vapors</b>
Material	P250GH, mat. No.: 1.0460	X 6 CrNiMoTi 17 12 2, mat. No. 1.4571/316Ti
Connections	Steel, for pipe Ø 12 mm, L series	Stainless steel, for pipe Ø 12 mm, L series
• Process connection	2 bulkhead glands	
• Connection for blowing out	Pipe union with ferrule	
Max. permissible working temperature	200 °C (392 °F)	
Max. permissible working pressure	100 bar (1450 psi) (up to max. 60 °C (140 °F))	
Weight	2.5 kg	

### Selection and Ordering data

Multiway cock PN 100 (1450 psi)	Article No.
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a> for flanging to pressure transmitters, weight 2.5 kg (without accessory set), without certificate For water and non-aggressive gases and vapors For aggressive liquids, gases and vapors	<b>7MF9004-1P</b> <b>1P</b> <b>1Q</b>
<b>Accessories</b>	
Factory certificate according to EN 10204-2.2 Material inspection certificate EN 10204-3.1	<b>7MF9000-8AB</b> <b>7MF9000-8AD</b>

### Selection and Ordering data

	Order code	Article No.
<b>Further designs<sup>1)</sup></b> Please add "-Z" to Article No. and specify Order code.		
<b>Accessory set to EN</b> (required for flanging, weight 0.2 kg) 4x screws 7/16"-20 UNF x 1 inch to ASME B18.2.1; chromized steel 2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)	<b>L31</b>	<b>7MF9004-5CC</b>
<b>Accessory set to DIN</b> (required for flanging, weight 0.2 kg) 4x screws M10x25 to DIN EN 24017; chromized steel, 4x washers Ø 10.5 mm to DIN 125; 2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)	<b>L11</b> <b>L15</b>	<b>7MF9004-6AD</b> <b>7MF9004-6AE</b>
• Standard design • Version for oxygen (together with Order code S11)		
<b>Multiway cock in oil-free and grease-free design</b>	<b>S11</b>	
Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F), BAM-tested lubricant, gasket suitable for oxygen measurement (only with Article No. 7MF9004-1Q.Z)		
<b>Mounting bracket</b> Required for wall mounting or for securing on rack (72 mm grid), made of electrogalvanized sheet-steel, weight 0.85 kg	<b>M13</b>	<b>7MF9004-6AA</b>
<b>NACE MR-0175-certified</b> incl. inspection certificate 3.1 to EN 10204 (only available for version 7MF9004-1QA)	<b>D07</b>	

<sup>1)</sup> When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Article No.

**Accessories****Accessory set for multiway cock PN 100**

- L31: 4 screws  $7/16$ -20 UNF x 1 inch, 2 flat gaskets
- L11: 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets
- L15 (suitable for oxygen): 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets

Washers  $\varnothing$  10.5 to DIN 125

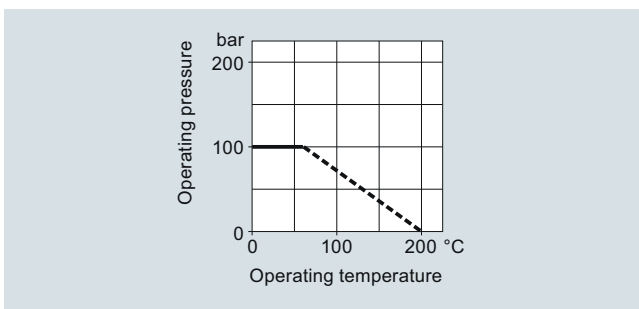
Flat gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

**Multiway cock in oil-free and grease-free design**

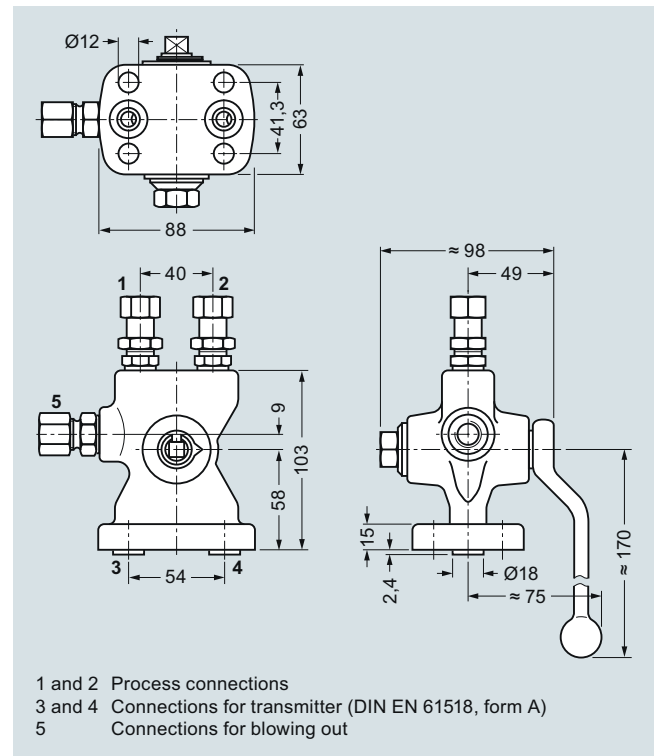
- S11 (only for aggressive liquids, gases and vapors (7MF9004-1Q.)): Max. PN 63 (914 psi) (instead of PN 100 (1450 psi)), BAM-tested lubricant, gasket suitable for oxygen

**Mounting brackets**

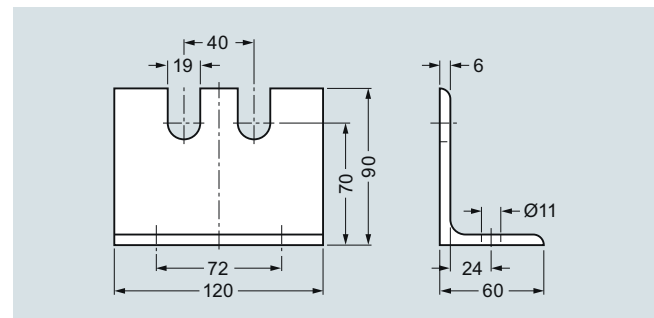
- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

**Characteristic curves**

Multiway cock PN 100 (1450 psi), permissible operating pressure as a function of the permissible operating temperature

**Dimensional drawings**

Multiway cock 7MF9004-1P, for flanging to pressure transmitters for differential pressure, dimensions in mm



Mounting bracket 7MF9004-6AA (M13), dimensions in mm

## Pressure Measurement

### Fittings

### Shut-off valves for differential pressure transmitters

#### 3-way and 5-way valve manifolds DN 5

1

#### Overview



The three-spindle and five-spindle valve manifolds DN 5 (7MF9410-1../-3..) are used to shut off the differential pressure lines and to check the transmitter zero.

In addition, the five-way valve manifold permits blowing out of the differential pressure lines.

#### Benefits

- Available for aggressive and non-aggressive liquids and gases
- Max. working pressure 420 bar (6092 psi), with version for oxygen max. 100 bar (1450 psi)

#### Application

The 3-way and 5-way valve manifolds are available in versions for aggressive and non-aggressive liquids and gases.

Mounting plates are available for wall mounting, for securing to mounting racks or for pipe mounting.

#### Design

The process connection of the 3-way and 5-way valve manifolds is a pipe union with ferrule.

Both valve manifolds have 2 flange connections for connecting a pressure transmitter.

In addition, the five-way valve manifold has 2 blow-out connections.

Depending on the version the valve manifold has either 3 or 5 valves, each with an internal spindle thread.

#### Materials used

Component	Material	For non-aggressive liquids and gases		For aggressive liquids and gases	
		Mat. No.	Material	Mat. No.	Material
Enclosure	P250GH	1.0460	X 6 CrNiMoTi17 12 2	1.4571/316Ti	
Head parts	C 35	1.0501			
Spindles	X 12 CrMoS 17	1.4104			
Cones	X 35 CrMo 17 hardened and tempered	1.4122			
Valve seats	X 6 CrNiMoTi 17 12 2	1.4571/316Ti			
Packings	PTFE	-	PTFE	-	

#### Function

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero
- In addition, the five-way valve manifold permits blowing out of the differential pressure lines.

#### Selection and Ordering data

Article No.

##### 3-way valve manifold DN 5

7MF9410 - A

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

For flanging to pressure transmitters for differential pressure, process connection: Pipe union with ferrule, max. working pressure 420 bar (6092 psi), weight 2.9 kg (order accessory set and mounting plate with Order code), without certificate

- for non-aggressive liquids and gases
- for aggressive liquids and gases

1 E  
1 F

##### 5-way valve manifold DN 5

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

For flanging to pressure transmitters for differential pressure, process connection: Pipe union with ferrule, max. working pressure 420 bar (6092 psi), weight 4.4 kg (order accessory set and mounting plate with Order code), without certificate

- for non-aggressive liquids and gases
- for aggressive liquids and gases

3 E  
3 F

#### Accessories

Factory certificate according to EN 10204-2.2

7MF9000-8AB

Material inspection certificate EN 10204-3.1

7MF9000-8AD

Selection and Ordering data	Order code	Article No.	Accessories
<b>Further designs<sup>1)</sup></b> Please add "-Z" to Article No. and specify Order code.			
<b>Accessory set to EN</b> (required for flanging, weight 0.2 kg)  4x screws 7/16-20 UNF x 2 1/8 inch to ASME B18.2; chromized steel 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	<b>B31</b>	<b>7MF9010-5CC</b>	<b>Accessory set for 3-way and 5-way valve manifold DN 5 for flanging</b> <ul style="list-style-type: none"> <li>B31: 4 screws 7/16-20 UNF x 2 1/8 inch to ASME B18.2.1, 2 flat gaskets</li> <li>B34: 4 screws 7/16-20 UNF x 2 1/8 inch to ASME B18.2.1, 2 O-rings (FPM 90)</li> <li>B11: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets</li> <li>B15 (suitable for oxygen): 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets</li> <li>B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)</li> </ul> Washers Ø 10.5 to DIN 125 Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)
4x screws 7/16-20 UNF x 2 1/8 inch to ASME B18.2; chromized steel 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)	<b>B34</b>	<b>7MF9410-5CA</b>	
<b>Accessory set to DIN<sup>2)</sup></b> (required for flanging, weight 0.2 kg)  4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)			O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. 420 bar (6092 psi), 120 °C (248 °F) <b>Note:</b> M10 screws only permissible up to PN 160 (2320 psi)! <b>Mounting plate</b> Made of electrogalvanized sheet-steel <ul style="list-style-type: none"> <li>M11: For wall mounting or for securing on rack (72 mm grid) Scope of delivery: - 1 mounting plate 7MF9006-6EA with bolts for mounting on valve manifold</li> <li>M12: For pipe mounting Scope of delivery: - 1 mounting plate M11 - 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm</li> </ul> <b>Valve manifold 100 bar, suitable for oxygen</b> S12: Only in combination with versions for aggressive liquids and gases
<ul style="list-style-type: none"> <li>Standard design</li> <li>Version for oxygen</li> </ul>	<b>B11</b>	<b>7MF9010-6AD</b>	
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)	<b>B15</b> <b>B16</b>	<b>7MF9010-6AE</b> <b>7MF9010-6CC</b>	
<b>Mounting plate</b> for valve manifold, made of electrogalvanized sheet-steel <b>for wall mounting</b> or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold	<b>M11</b>	<b>7MF9006-6EA</b>	
<b>for pipe mounting</b> , weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)	<b>M12</b>	<b>7MF9006-6GA</b>	
<b>valve manifold 100 bar</b> suitable for oxygen for 7MF9410-1F	<b>S13</b>		
for 7MF9410-3F	<b>S14</b>		
<b>NACE MR-0175-certified</b> incl. inspection certificate 3.1 to EN 10204 (only available for version 7MF9410-1FA and -3FA)	<b>D07</b>		

1) When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.

2) Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)

# Pressure Measurement

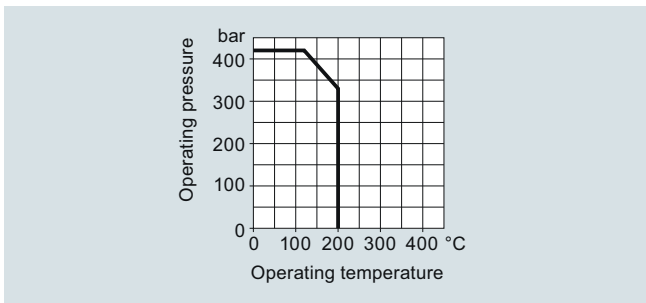
## Fittings

### Shut-off valves for differential pressure transmitters

#### 3-way and 5-way valve manifolds DN 5

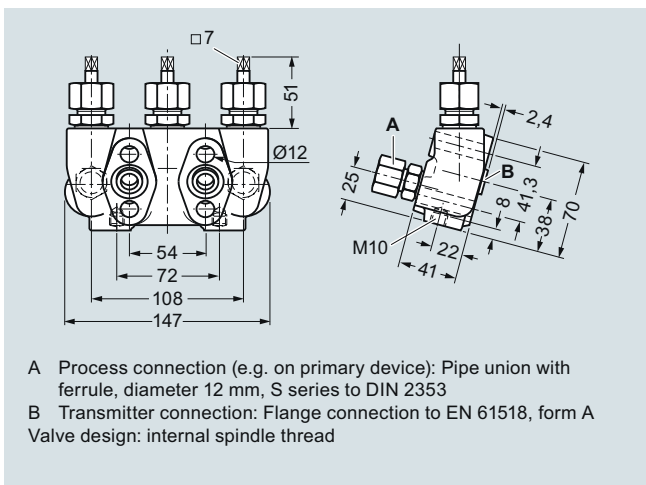
1

#### Characteristic curves

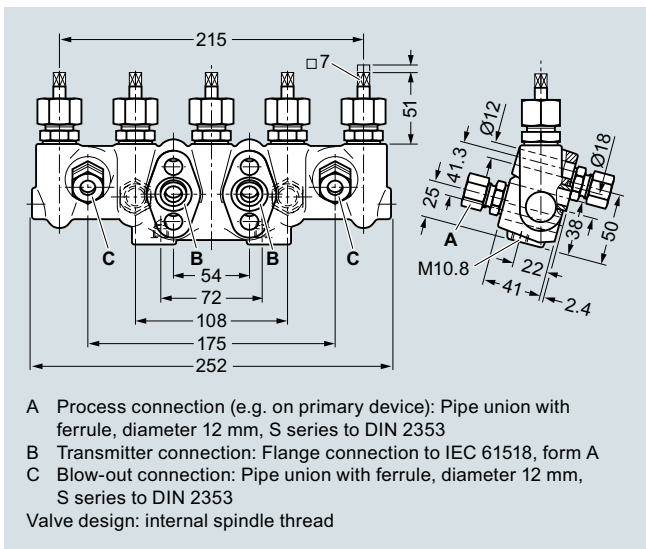


Permissible operating pressure as a function of the permissible operating temperature

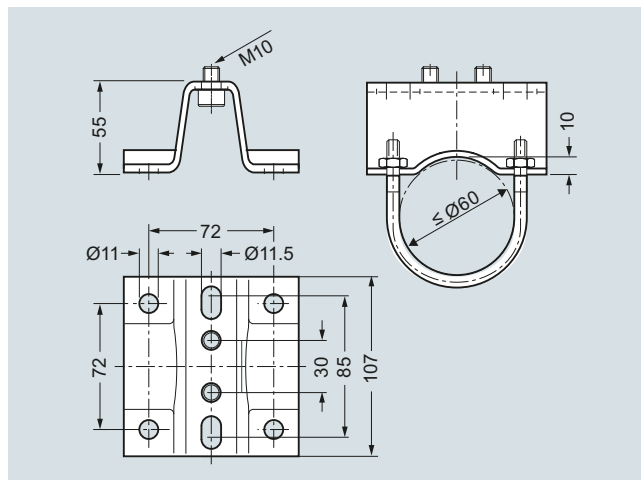
#### Dimensional drawings



3-way valve manifold DN 5 (7MF9410-1..), dimensions in mm

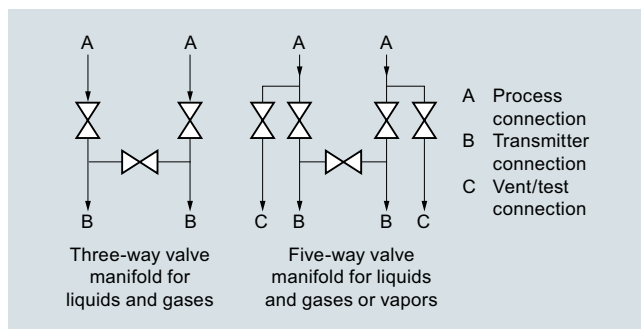


5-way valve manifold DN 5 (7MF9410-3..), dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

#### Schematics



3-way and 5-way valve manifolds, connections

**Overview**

The 3-way valve manifold DN 8 (7MF9416-1../-2..) is for pressure transmitters for differential pressure. It is used to shut off and blow out differential pressure lines and to test the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to test the pressure transmitter characteristic.

**Benefits**

- For aggressive and non-aggressive liquids and gases
- The maximum working pressure is 420 bar (6092 psi).

**Application**

The 3-way valve manifold is available in versions for aggressive and non-aggressive liquids and gases.

Mounting plates are available for wall mounting, for securing to mounting racks or for pipe mounting.

**Design**

For the process connection on the version for non-aggressive media it is possible to choose between a pipe union with ferrule and welding pins.

The version for aggressive media always has a pipe union with ferrule.

Both versions are available optionally with a test connection M20x1.5.

The valves have an internal spindle thread.

**Materials used**

Component	For non-aggressive liquids and gases		For aggressive liquids and gases	
	Material	Mat. No.	Material	Mat. No.
Enclosure	P250GH	1.0460	X 6 CrNiMoTi17 12 2	1.4571/316Ti
Head parts	C 35	1.0501		
Spindles	X 12 CrMoS 17	1.4104		
Cones	X 35 CrMo 17 hardened and tempered	1.4122		
Valve seats	X 6 CrNiMoTi 17 12 2	1.4571/316Ti		
Packings	PTFE	-	PTFE	-

**Function**

The 3-way valve manifold DN 8 performs two functions as standard:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

All versions are also available with a test connection, to which a test device for checking the pressure transmitter characteristic can be connected.

**Selection and Ordering data**

Article No.

**3-way valve manifold DN 8**

7MF9416 - A

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

For flanging to pressure transmitters for differential pressure, max. working pressure 420 bar (6092 psi), (order accessory set and mounting plate with Order code), without certificate

For non-aggressive liquids and gases process connection: Pipe union with ferrule Ø 12 mm

- without test connection
- with test connection

1 B

1 C

For non-aggressive liquids and gases process connection: Welding pin Ø 14 x 2.5

- without test connection
- with test connection

2 C

2 D

For aggressive liquids and gases process connection: Pipe union with ferrule Ø 12 mm

- without test connection
- with test connection

1 D

1 E

**Accessories**

Factory certificate according to EN 10204-2.2

7MF9000-8AB

Material inspection certificate EN 10204-3.1

7MF9000-8AD

# Pressure Measurement

## Fittings

### Shut-off valves for differential pressure transmitters

#### 3-way valve manifold DN 8

1

Selection and Ordering data	Order code	Article No.
<i>Further designs<sup>1)</sup></i>		
Please add "-Z" to Article No. and specify Order code.		
<b>Accessory set to EN</b> (required for flanging, weight 0.2 kg)  4x screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	<b>B31</b>	<b>7MF9010-5CC</b>
4x screws $7/16$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2; chromized steel 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)	<b>B34</b>	<b>7MF9410-5CA</b>
<b>Accessory set to DIN<sup>2)</sup></b> (required for flanging, weight 0.2 kg)  4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	<b>B11</b>	<b>7MF9010-6AD</b>
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)	<b>B16</b>	<b>7MF9010-6CC</b>
<b>Mounting plate</b> For valve manifold, made of electrogalvanized sheet-steel  <b>for wall mounting</b> or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold	<b>M11</b>	<b>7MF9006-6EA</b>
<b>for pipe mounting</b> , weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)	<b>M12</b>	<b>7MF9006-6GA</b>
<b>NACE MR-0175-certified</b> incl. inspection certificate 3.1 to EN 10204 (only available for version 7MF9416-1DA and -1EA)	<b>D07</b>	

- 1) When ordering accessory set or mounting together with the valve manifold, please use Order code; otherwise use Article No.  
 2) Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

#### Accessories

##### Accessory set for 3-way valve manifold DN 8 for flanging

- B31: 4 screws  $7/16$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2.1, 2 flat gaskets
- B34: 4 screws  $7/16$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B11: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

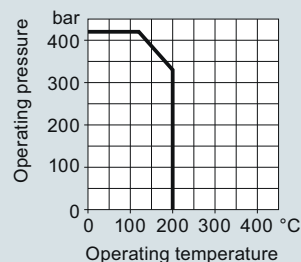
**Note:** M10 screws only permissible up to PN 160 (2320 psi)!

##### Mounting plate

Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid)  
 Scope of delivery:  
 - 1 mounting plate with bolts for mounting on valve manifold
- M12: For pipe mounting  
 Scope of delivery:  
 - 1 mounting plate M11  
 - 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

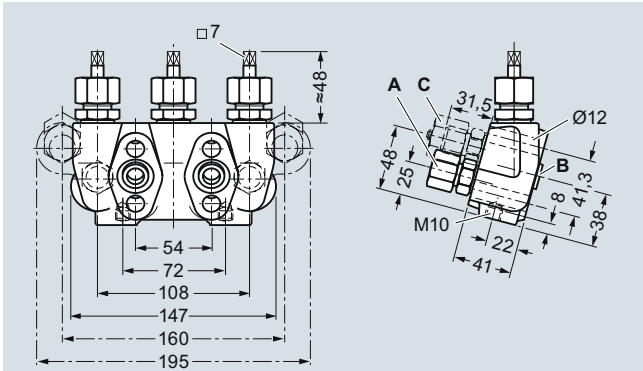
#### Characteristic curves



3-way valve manifold DN 8, permissible working pressure as a function of the permissible working temperature

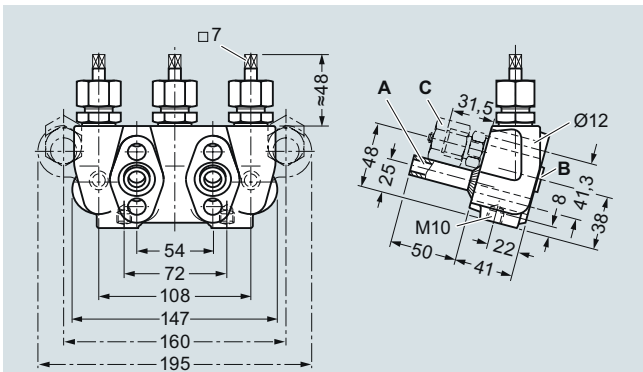


Dimensional drawings



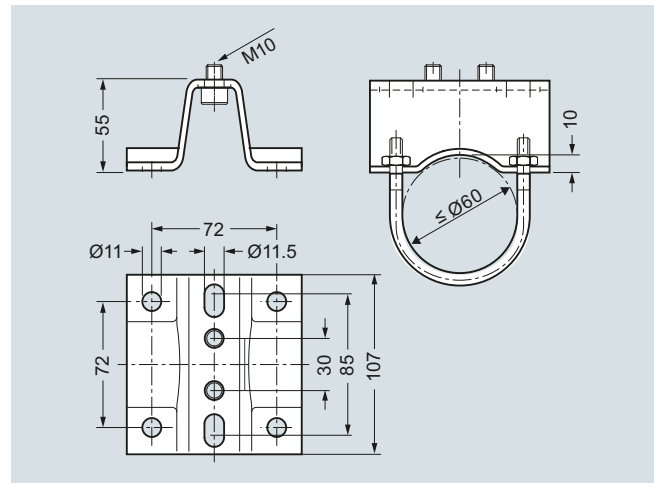
- A Process connection (e.g. on primary device): Pipe union with ferrule, diameter 12 mm, S series to DIN 2353
  - B Transmitter connection: Flange connection to EN 61518, form A
  - C Test connection: M20 x 1,5
- Valve design: internal spindle thread

3-way valve manifold DN 8 (7MF9416-1..) with pipe union, dimensions in mm



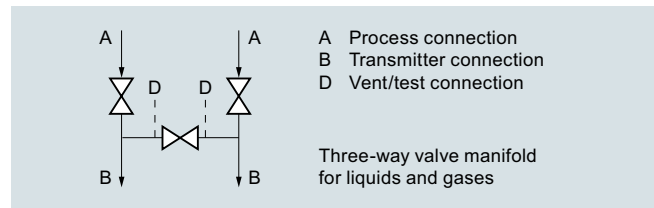
- A Process connection (e.g. on primary device): Welding pin, diameter 14 x 2,5
  - B Transmitter connection: Flange connection to EN 61518, form A
  - C Test connection: M20 x 1,5
- Valve design: internal spindle thread

3-way valve manifold DN 8 (7MF9416-2..) with welding pin, dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

Schematics



3-way valve manifold DN 8, connections

## Pressure Measurement

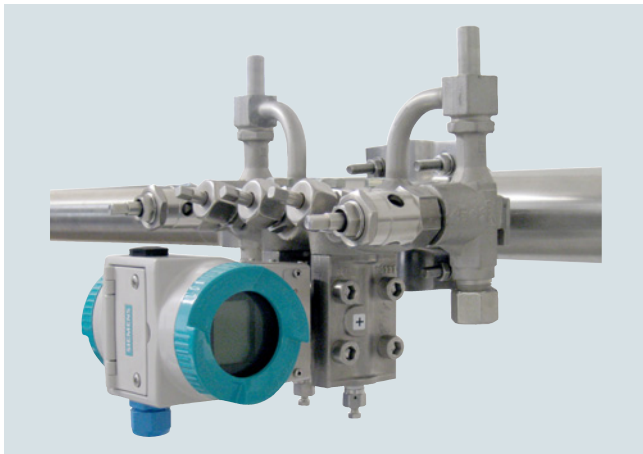
Fittings

Shut-off valves for differential pressure transmitters

### Valve manifold combination DN 5/DN 8

1

#### Overview



The valve manifold combination DN 5/DN 8 (7MF9416-6..) is for pressure transmitters for differential pressure.

The combination is used to shut off and blow out differential pressure lines and to test the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to test the pressure transmitter characteristic.

#### Benefits

- Max. working pressure 420 bar (6092 psi)

#### Application

The valve manifold combination DN 5/DN 8 is designed for vapors.

#### Design

The valve manifold combination DN 5/DN 8 has a process connection with welding pins.

The connection for the pressure transmitter is designed as a flange connection, while the blow-out connection is designed as a pipe union with ferrule.

The manifold valves have an internal spindle thread, while the blow-out valves have an external spindle thread.

The optional test connections are M20x1.5.

#### Materials used

Component	Valve manifold DN 5		Blow-out valves DN 8	
	Material	Mat. No.	Material	Mat. No.
Enclosure	P250GH	1.0460	16 Mo 3	1.5415
Head parts	C 35	1.0501	21 CrMo V57	1.7709
Spindles	X 12 CrMoS 17	1.4104	X 20 Cr 13	1.4021
Cones	X 35 CrMo 17	1.4122	X 35 CrMo 17 hardened and tem- pered	1.4122
Valve seats	X 6 CrNiMoTi	1.4571/316Ti	X 20 Cr 13	1.4021
Packings	PTFE	-	Pure graphite	-
Welding pins	-	-	16 Mo 3	1.5415

#### Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Checking the pressure transmitter zero

As an option it is possible to order a version with a test connection, to which a test device for checking the transmitter characteristic can be connected.

#### Selection and Ordering data

Valve manifold combination DN 5/DN 8 for vapors

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

For flanging to pressure transmitters for differential pressure, max. working pressure 420 bar (6092 psi), also available in stainless steel on request (order accessory set with Order code), without certificate

- without test connection
- with test connection M20 × 1.5

#### Accessories

Factory certificate according to EN 10204-2.2

Material inspection certificate EN 10204-3.1

Article No.

7MF9416-6-**A**

**A**

**C**

**D**

#### Selection and Ordering data

##### Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

##### Accessory set to EN

(required for flanging, weight 0.2 kg)

4x screws  $7/16$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2; chromized steel  
2x O-rings to DIN 3771,  
20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)

**B34**

**7MF9410-5CA**

##### Accessory set to DIN<sup>2)</sup>

(required for flanging, weight 0.2 kg)

4x screws M10x55 to DIN EN 24014; chromized steel  
4x washers Ø 10.5 mm to DIN 125;  
2x O-rings to DIN 3771,  
20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F); Flange connection to DIN 19213 only permissible up to PN 160!

**B16**

**7MF9010-6CC**

<sup>1)</sup> When ordering accessory set together with the valve manifold combination, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)

### Accessories

#### Accessory set for valve manifold combination DN 5/DN 8 for flanging

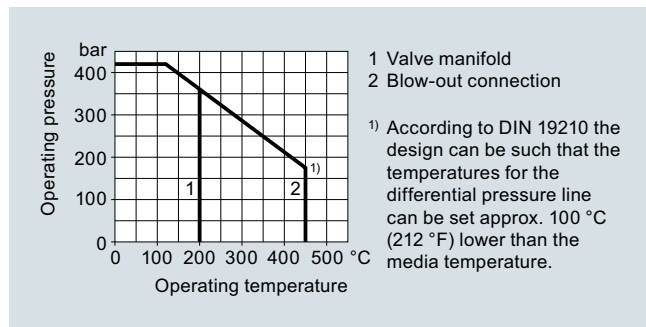
- B34: 4 screws  $7/16$ -20 UNF x  $2\frac{1}{8}$  inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers  $\varnothing$  10.5 to DIN 125

O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

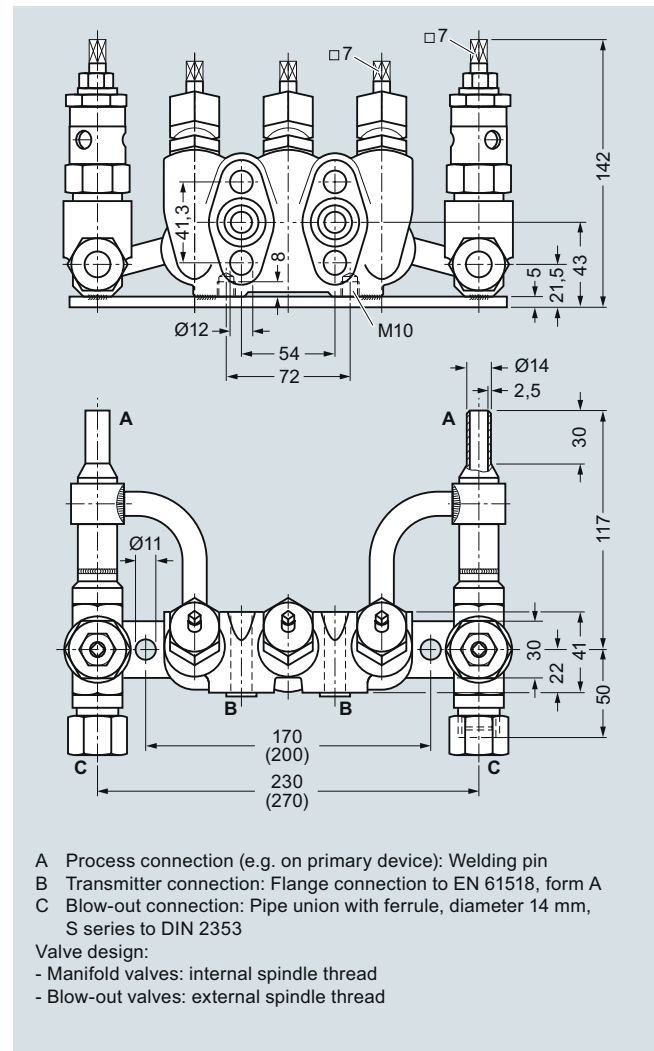
**Note:** M10 screws only permissible up to PN 160 (2321 psi)!

### Characteristic curves



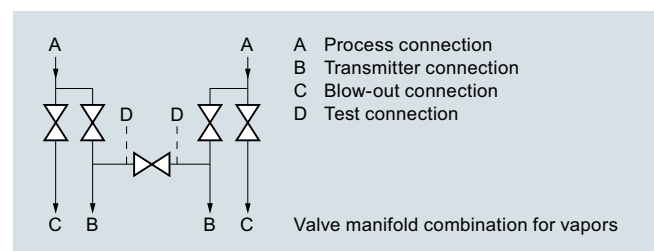
Permissible operating pressure as a function of the permissible operating temperature

### Dimensional drawings



Valve manifold combination DN 5/DN 8 (7MF9416-6C.), dimensions in mm (deviating dimensions for 7MF9416-6D. shown in brackets)

### Schematics



Valve manifold combination DN 5/DN 8, connections

## Pressure Measurement

### Fittings

### Shut-off valves for differential pressure transmitters

#### Valve manifold combination DN 8

1

#### Overview



The valve manifold combination DN 8 (7MF9416-4..) is for pressure transmitters for differential pressure.

It is used to shut off and blow out the differential pressure lines and to check the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to check the pressure transmitter characteristic.

#### Benefits

- Max. working pressure 420 bar (6092 psi)

#### Application

The valve manifold combination DN 8 is designed for vapors.

#### Design

The valve manifold combination DN 8 has a process connection with welding pins.

The connection for the pressure transmitter is designed as a flange connection, while the blow-out connection is designed as a pipe union with ferrule.

The manifold valves have an internal spindle thread, while the blow-out valves have an external spindle thread.

The optional test connection is M20x1.5.

The valve manifold combination DN 8 is supplied with a mounting plate.

#### Materials used

Component	Valve manifold		Blow-out valves	
	Material	Mat. No.	Material	Mat. No.
Enclosure	P250GH	1.0460	16 Mo 3	1.5415
Head parts	C 35	1.0501	21 CrMo V57	1.7709
Spindles	X 12 CrMoS 17	1.4104	X 20 Cr 13	1.4021
Cones	X 35 CrMo 17	1.4122	X 35 CrMo 17 hardened and tem- pered	1.4122
Valve seats	X 6 CrNiMoTi	1.4571/316Ti	X 20 Cr 13	1.4021
Packings	PTFE	-	Pure graphite	-
Welding pins	-	-	16 Mo 3	1.5415

#### Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Checking the pressure transmitter zero

As an option it is possible to order a version with a test connection, to which a test device for checking the pressure transmitter characteristic can be connected.

#### Selection and Ordering data

##### Valve manifold combination DN 8 for vapors

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

for flanging to pressure transmitters for differential pressure, with mounting plate, max. working pressure 420 bar (6092 psi), also available in stainless steel on request (order accessory set with Order code), without certificate

- without test connection
- with test connection M20 × 1.5

#### Accessories

Factory certificate according to EN 10204-2.2

Material inspection certificate EN 10204-3.1

Article No.

7MF9416-4A

4C

4D

7MF9000-8AB

7MF9000-8AD

#### Selection and Ordering data

Order code

Article No.

##### Further designs<sup>1)</sup>

Please add "-Z" to Article No. and specify Order code.

##### Accessory set to EN

(required for flanging, weight 0.2 kg)

4x screws 7/16-20 UNF x 2 1/8 inch to ASME B18.2; chromized steel  
2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)

B34

7MF9410-5CA

##### Accessory set to DIN<sup>2)</sup>

(required for flanging, weight 0.2 kg)

4x screws M10x55 to DIN EN 24014; chromized steel  
4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)  
Flange connection to DIN 19 213 only permissible up to PN 160!

B16

7MF9010-6CC

<sup>1)</sup> When ordering accessory set together with the valve manifold combination, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)

#### Accessories

##### Accessory set for valve manifold combination DN 8 for flanging

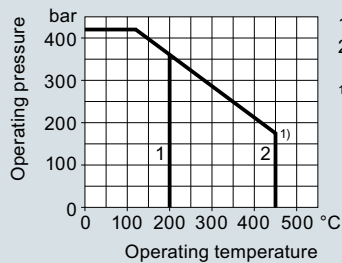
- B34: 4 screws 7/16-20 UNF x 2 1/8 inch to ASME B 18.2.1, 2 O-rings (FPM 90)
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

O-ring to DIN 3771, 20 x 2.65 – S – FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

**Note:** M10 screws only permissible up to PN 160 (2321 psi)!

## Characteristic curves

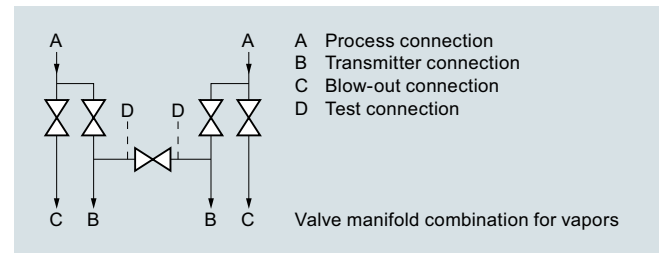


- 1 Valve manifold  
2 Blow-out connection

<sup>1)</sup> According to DIN 19210 the design can be such that the temperatures for the differential pressure line can be set approx. 100 °C (212 °F) lower than the media temperature.

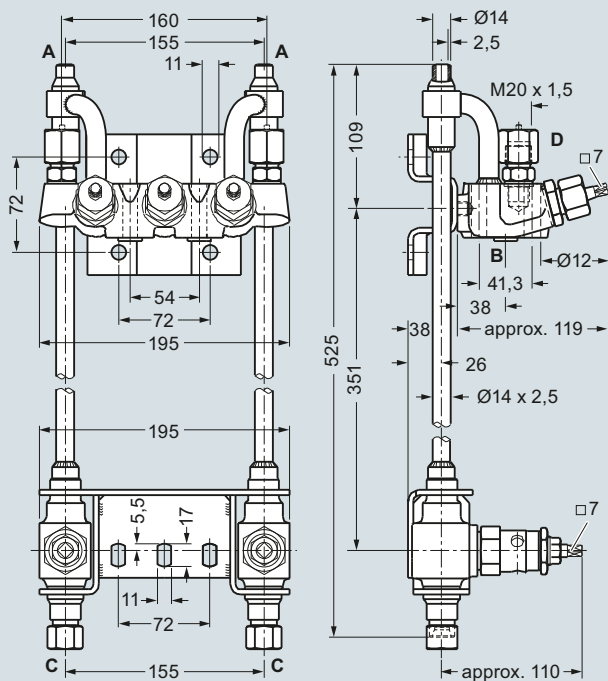
Permissible operating pressure as a function of the permissible operating temperature

## Schematics



Valve manifold combination DN 8, connections

## Dimensional drawings



- A Process connection (e.g. on primary device): Welding pin  
B Transmitter connection: Flange connection to EN 61518, form A  
C Blow-out connection: Pipe union with ferrule, diameter 14 mm, S series to DIN 2353  
D Test connection (only with Article No. 7MF9416-4D.): M20 x 1,5
- Valve design:  
- Manifold valves: internal spindle thread  
- Blow-out valves: external spindle thread

Valve manifold combination DN 8 (7MF9416-4..), dimensions in mm

## Pressure Measurement

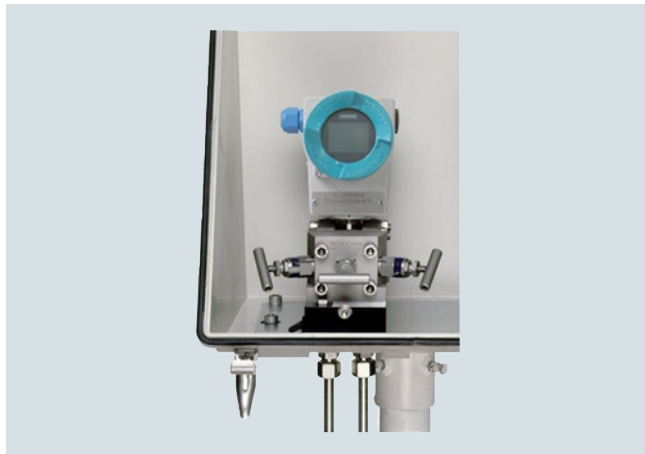
### Fittings

### Shut-off valves for differential pressure transmitters

#### 2-, 3- and 5-spindle valve manifolds for protective box

1

#### Overview



The 2-spindle, 3-spindle and 5-spindle valve manifolds (7MF9412-1..) are used to shut off the differential pressure lines and to check the transmitter zero point.

The 2-spindle and the 5-spindle valve manifolds also enable venting on the transmitter side and checking of the pressure transmitter characteristic.

These valve manifolds are designed for installation in protective boxes. However, using a mounting bracket, they can also be used for wall, frame or tube mounting.

SITRANS P DS III and SITRANS P500 transmitters can be operated and read from the front if these valve manifolds are used..

#### Application

The valve manifolds DN 5 are designed for liquids and vapors and for installing in protective boxes.

Each is available in a version for oxygen on request

#### Design

All versions of the spindle manifolds have a process connection 1/2-14 NPT.

The connection for the pressure transmitter is always designed as a flange connection to IEC 61518/DIN EN 61518, Form A.

The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection 1/4-18 NPT.

The valves have an external spindle thread.

#### Materials used

Components	Material	Mat. No.
Enclosure	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

#### Functions

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

#### Selection and Ordering data

##### Valve manifolds DN 5 for mounting in protective boxes

Article No.

7MF9412 - ■ ■ A

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

for liquids and gases  
for flanging to pressure transmitters for absolute and differential pressure  
Material: stainless steel, mat. No: 1.4404/316L  
max. working pressure 420 bar (6092 psi)  
(order accessory set with Order code),  
without certificate

- 2-spindle valve manifold with rotating sleeve G1/2 **1 B**
- 2-spindle valve manifold with flange connection **1 C**
- 3-spindle valve manifold **1 D**
- 5-spindle valve manifold **1 E**

#### Accessories

Factory certificate according to EN 10204-2.2

7MF9000-8AB

Material inspection certificate EN 10204-3.1

7MF9000-8AD

#### Selection and Ordering data

Order code

Article No.

##### Further designs<sup>1)</sup>

Please add **"-Z"** to Article No. and specify Order code.

##### Accessory set to EN

(connection between valve manifold and pressure transmitter)

for valve manifold 7MF9412-1C.

2x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel  
1x O-ring to DIN 3771,  
20 x 2.65 - S - FPM90,  
max. permissible 420 bar (6092 psi),  
120 °C (248 °F)

F32

7MF9412-6CA

2x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel  
1x gasket made of PTFE,  
max. permissible 420 bar (6092 psi),  
80 °C (176 °F)<sup>2)</sup>

F35

7MF9412-6DA

for valve manifold 7MF9412-1D and -1E.

4x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel  
2x O-rings to DIN 3771,  
20 x 2.65 - S - FPM90,  
max. permissible 420 bar (6092 psi),  
120 °C (248 °F)<sup>2)</sup>

F34

7MF9412-6GA

4x screws 7/16-20 UNF x 2 inch to ASME B18.2.1; chromized steel  
2x flat gaskets made of PTFE,  
max. permissible 420 bar (6092 psi),  
80 °C (176 °F)<sup>2)</sup>

F36

7MF9412-6HA

Selection and Ordering data	Order code	Article No.
<b>Further designs<sup>1)</sup></b>		
Please add <b>"-Z"</b> to Article No. and specify Order code.		
<b>Accessory set to DIN</b> (connection between valve manifold and pressure transmitter) <u>For valve manifold 7MF9412-1C.</u>		
2x screws M10x50 to DIN EN 24014; chromized steel 2x washers Ø 10.5 mm to DIN 125; 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F) <sup>2)</sup>	<b>F12</b>	<b>7MF9412-6AA</b>
2x screws M10x50 to DIN EN 24014; chromized steel 2x washers Ø 10.5 mm to DIN 125; 1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) <sup>2)</sup>	<b>F15</b>	<b>7MF9412-6BA</b>
<u>For valve manifold 7MF9412-1D and -1E.</u>		
4x screws M10x50 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F) <sup>2)</sup>	<b>F14</b>	<b>7MF9412-6EA</b>
4x screws M10x50 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) <sup>2)</sup>	<b>F16</b>	<b>7MF9412-6FA</b>
<b>Mounting bracket</b> required for wall mounting or for securing to mounting rack, with bolts for mounting on valve manifold		
• for valve manifolds 7MF9412-1B. and -1C.	<b>M14</b>	<b>7MF9006-6LA</b>
• for valve manifold 7MF9412-1D.	<b>M17</b>	<b>7MF9006-6NA</b>
• for valve manifold 7MF9412-1E.	<b>M18</b>	<b>7MF9006-6PA</b>
<b>Mounting clip</b> 2 off, to secure mounting bracket to pipe	<b>M16</b>	<b>7MF9006-6KA</b>
<b>Valve manifold 100 bar</b> Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)		
• for valve manifolds 7MF9412-1B. and -1C.	<b>S12</b>	
• for valve manifold 7MF9412-1D.	<b>S13</b>	
• for valve manifold 7MF9412-1E.	<b>S14</b>	
<b>NACE MR-0175-certified</b> incl. inspection certificate 3.1 to EN 10204	<b>D07</b>	

- 1) When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.  
2) Flange connections with M10 screws only permissible up to PN 160 (2321 psi)!

## Accessories

### Accessory set for 2-, 3- and 5-spindle valve manifolds (Connection between valve manifold and transmitter)

#### 2-spindle valve manifold DN 5 with flange connection

- F32: 2 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 1 O Ring (FPM90)
- F35: 2 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 1 flat-gasket
- F12: 2 screws M10x50 to DIN EN 24014, 2 washers, 1 O-ring (FPM90)
- F15: 2 screws M10x50 to DIN EN 24014, 2 washers, 1 flat gasket

#### 3-spindle and 5-way valve manifold DN 5

- F34: 4 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 2 O-rings (FPM90)
- F36: 4 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 2 flat-gaskets
- F14: 4 screws M10x50 to DIN EN 24014, 4 washers, 2 O-rings (FPM90)
- F16: 4 screws M10x50 to DIN EN 24014, 4 washers, 2 flat-gaskets

Washers Ø 10.5 to DIN 125

Flat-gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

O-ring to DIN 3771, 20 x 2.65 - S - FPM90; max. 420 bar (6092 psi), 120 °C (248 °F)

#### Note:

Flange connections with M10 screws only permissible up to PN 160 (2321 psi)!

### Mounting bracket for wall mounting or for securing to mounting rack

With bolts for mounting on valve manifold

- M14: For 2-spindle valve manifold DN 5
- M17: For 3-spindle valve manifold DN 5
- M18: For 5-spindle valve manifold DN 5

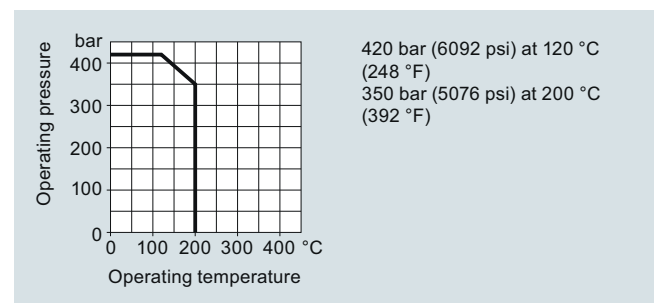
### Mounting clips (2 off)

- M16: For securing the mounting brackets M14, M17 and M18 to pipe

### Valve manifold 100 bar, suitable for oxygen

- S12: For 2-spindle valve manifold DN 5
- S13: For 3-spindle valve manifold DN 5
- S14: For 5-spindle valve manifold DN 5

## Characteristic curves



Permissible operating pressure as a function of the permissible operating temperature

# Pressure Measurement

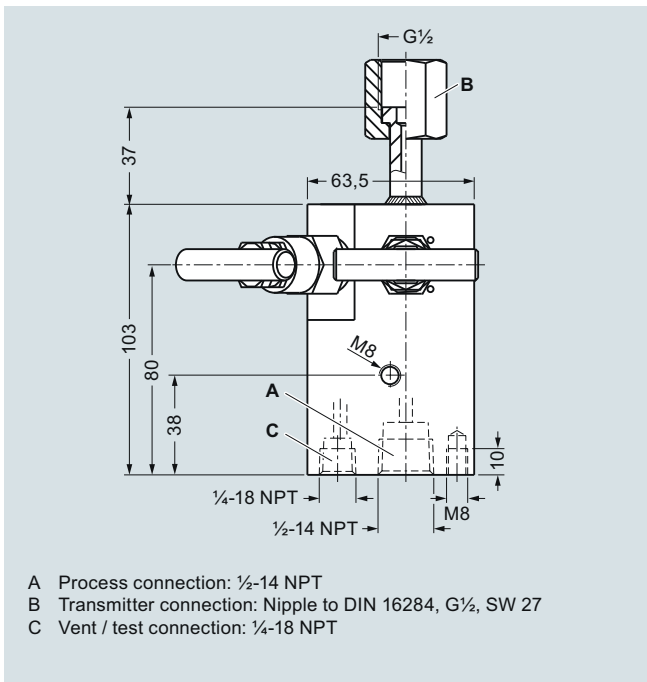
## Fittings

### Shut-off valves for differential pressure transmitters

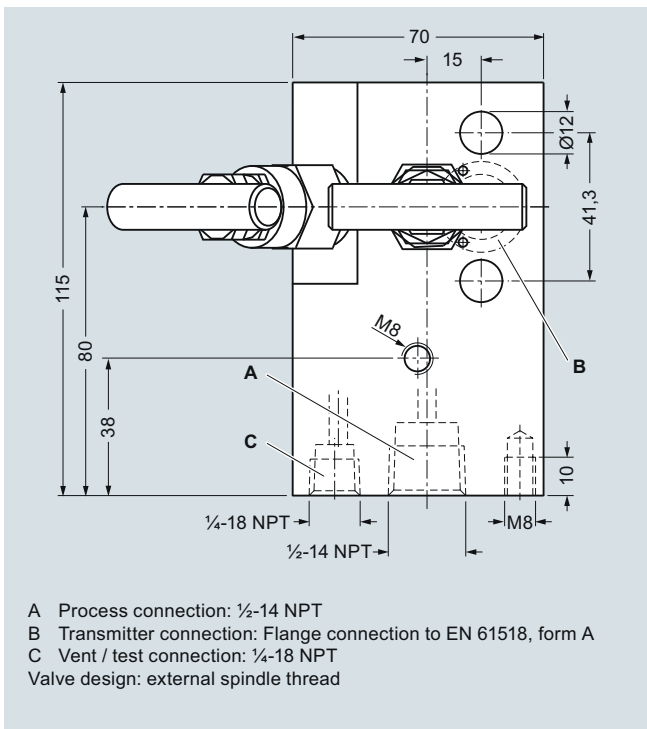
#### 2-, 3- and 5-spindle valve manifolds for protective box

1

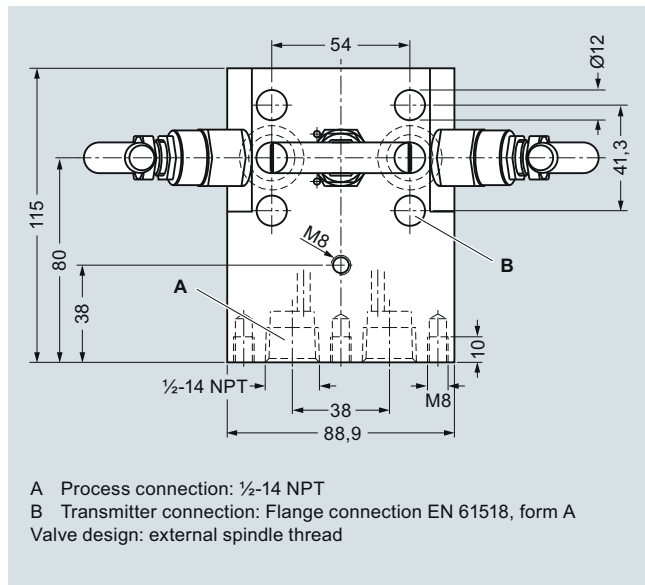
#### Dimensional drawings



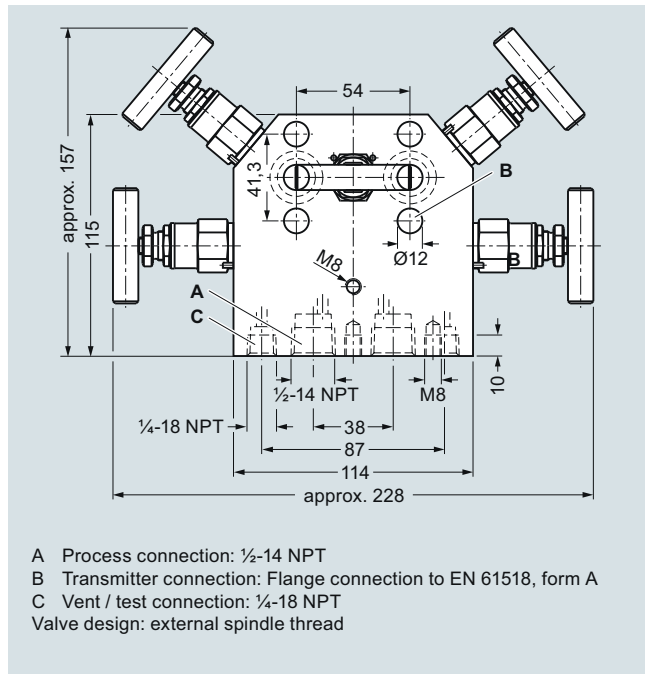
2-spindle valve manifold DN 5 (7MF9412-1B..) with rotating sleeve, dimensions in mm



2-spindle valve manifold DN 5 (7MF9412-1C..), dimensions in mm

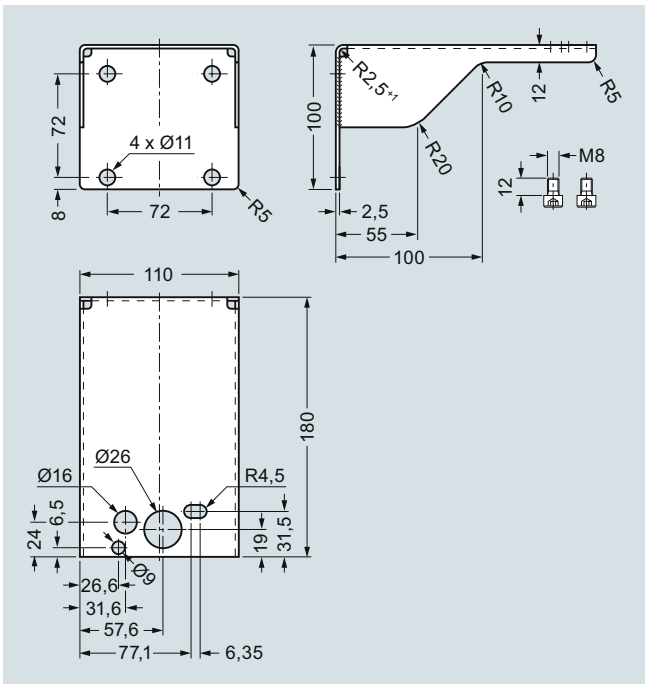


3-spindle valve manifold DN 5 (7MF9412-1D..), dimensions in mm

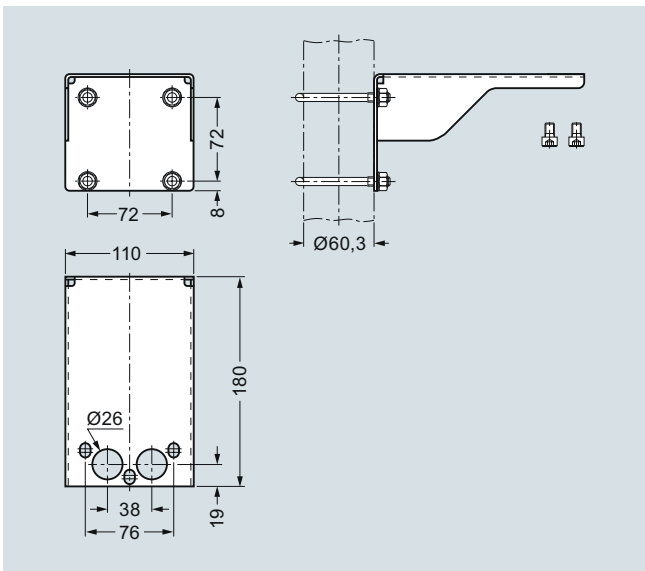


5-spindle valve manifold DN 5 (7MF9412-1E..), dimensions in mm

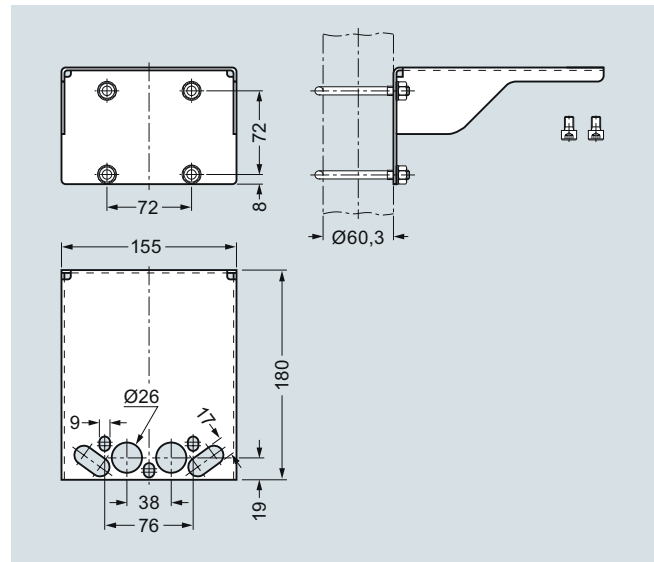




Mounting bracket (7MF9006-6LA)/(M14) for 2-spindle valve manifold, dimensions in mm

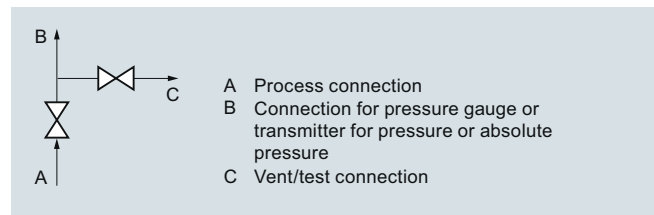


Mounting bracket (7MF9006-6NA)/(M17) for 3-spindle valve manifold, dimensions in mm

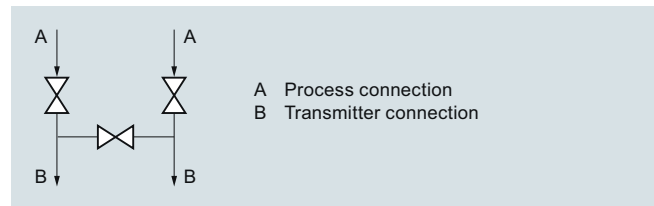


Mounting bracket (7MF9006-6PA)/(M18) for 5-spindle valve manifold, dimensions in mm

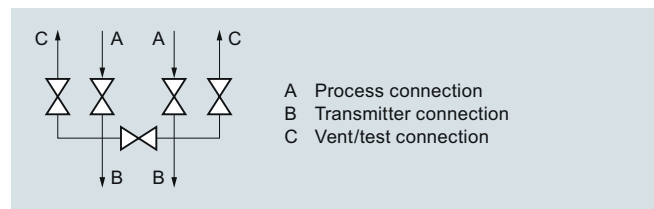
**Schematics**



2-spindle valve manifold DN 5 (with rotating sleeve G½ or flange connection), connections



3-spindle valve manifold DN 5, connections



5-spindle valve manifold DN 5, connections

## Pressure Measurement

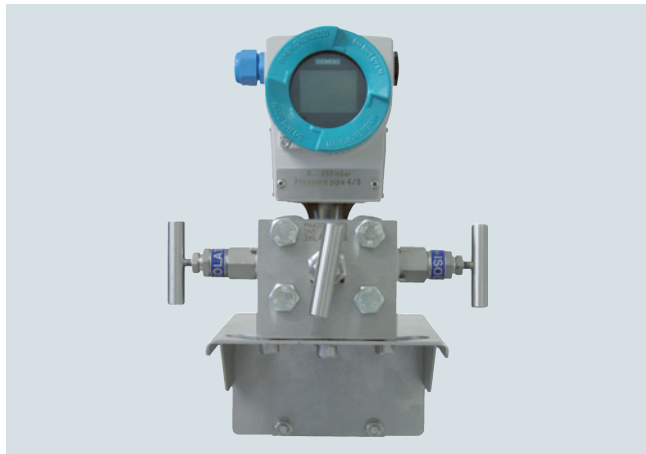
### Fittings

### Shut-off valves for differential pressure transmitters

1

## 3- and 5-spindle valve manifolds for vertical angular differential pressure lines

### Overview



These 3-spindle and 5-spindle valve manifolds 7MF9413-1.. were developed specially for vertical differential pressure lines.

The valve manifolds are used to shut off the differential pressure lines and to check the pressure transmitter zero.

The 5-spindle valve manifold permits venting on the transmitter side and checking of the pressure transmitter characteristic.

### Benefits

- For vertical differential pressure lines
- Max. operating pressure 420 bar (6092 psi)
- Transmitters of the DS series can be operated and read from the front.

### Application

The 3-spindle and 5-spindle valve manifolds for vertical differential pressure lines are for liquids and gases. The valve manifolds are flanged on the pressure transmitter.

### Design

All versions of the spindle valve manifolds have a process connection 1/2-14 NPT.

The connection for the pressure transmitter is always designed as a flange connection to IEC 61518/DIN EN 61518, form B.

The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection 1/4-18 NPT.

Materials used:

Component	Material	Mat. No.
Enclosure	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

### Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

### Selection and Ordering data

Article No.

#### Valve manifolds for vertical differential pressure lines

7MF9413 - **A**

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

for liquids and gases  
for flanging to pressure transmitters for absolute and differential pressure  
Material: stainless steel, mat. No: 1.4404/316L  
max. working pressure 420 bar (6092 psi)  
(order accessory set with Order code),  
without certificate

- 3-spindle valve manifold
- 5-spindle valve manifold

1 D  
1 E

#### Accessories

Factory certificate according to EN 10204-2.2

7MF9000-8AB

Material inspection certificate EN 10204-3.1

7MF9000-8AD

### Selection and Ordering data

Order code

Article No.

#### Further designs<sup>1)</sup>

Please add **"-Z"** to Article No. and specify Order code.

#### Accessory set to EN

(connection between valve manifold and pressure transmitter)

4x screws 7/16-20 UNF x 1 3/4 inch to ASME B18.2.1; chromized steel  
2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

K36

7MF9411-5DB

#### Accessory set to DIN<sup>2)</sup>

(connection between valve manifold and pressure transmitter)

4x screws M10x45 to DIN EN 24014; chromized steel  
4x washers Ø 10.5 mm to DIN 125;  
2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F); Flange connection with M10 screws only permissible up to PN 160 (2321 psi).

K16

7MF9411-6BB

#### Mounting bracket

required **for wall mounting** or for securing to mounting rack, with bolts for mounting on valve manifold

- for valve manifold 7MF9413-1D.
- for valve manifold 7MF9413-1E.

M17

7MF9006-6NA

M18

7MF9006-6PA

required **for mounting on 2" stand-pipe**, with bolts for mounting on valve manifold

- for valve manifold 7MF9413-1D.

M19

7MF9006-6QA

#### Mounting clip

2 off, to secure mounting bracket to pipe

M16

7MF9006-6KA

#### valve manifold 100 bar (1450 psi)

suitable for oxygen

- for valve manifold 7MF9413-1D.
- for valve manifold 7MF9413-1E.

S13

S14

#### NACE MR-0175-certified

incl. inspection certificate 3.1 to EN 10204

D07

<sup>1)</sup> When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

**Accessories****Accessory set (connection between valve manifold and transmitter)**

- K36: 4 screws  $7/16$ -20 UNF x 1 $\frac{3}{4}$  inch to ASME B18.2.1, 2 flat gaskets
- K16: 4 screws M10x45 to DIN EN 24014, 4 washers, 2 flat gaskets

Washers  $\varnothing$  10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

**Note:** Flange connection with M10 screws only permissible up to PN 160 (2321 psi)!

**Mounting bracket for wall mounting or for securing to mounting rack**

With bolts for mounting on valve manifold

- M17: For 3-spindle valve manifold
- M18: For 5-spindle valve manifold

**Mounting bracket for mounting on 2" standpipe**

With bolts for mounting on valve manifold

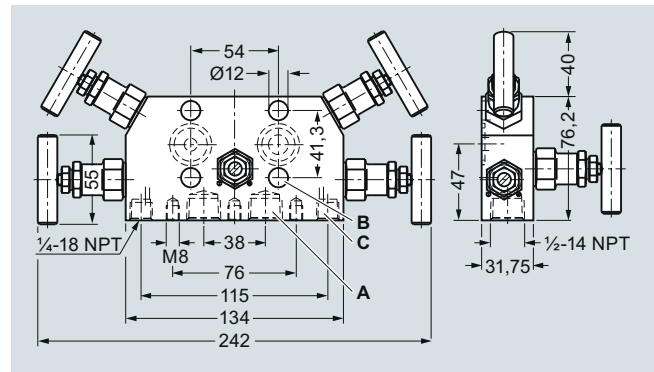
- M19: For 3-spindle valve manifold

**Mounting clips (2 off)**

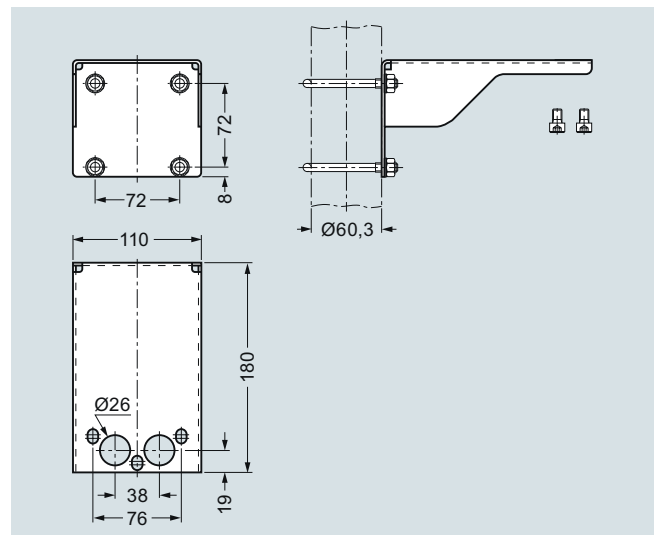
For securing the mounting brackets M17, M18 and M19 to pipe

**Valve manifold 100 bar, suitable for oxygen**

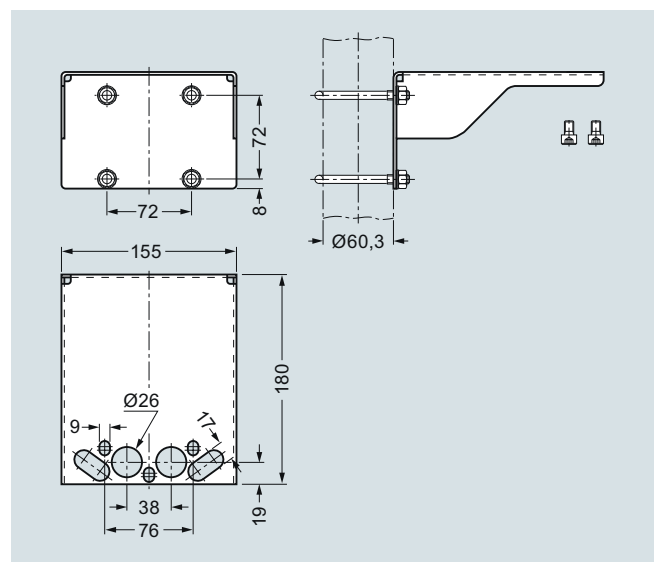
- For 3-spindle valve manifold
- For 5-spindle valve manifold



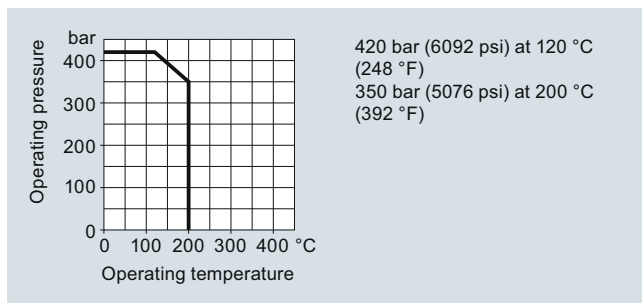
5-spindle valve manifold 7MF9413-1E, for vertical differential pressure lines, dimensions in mm



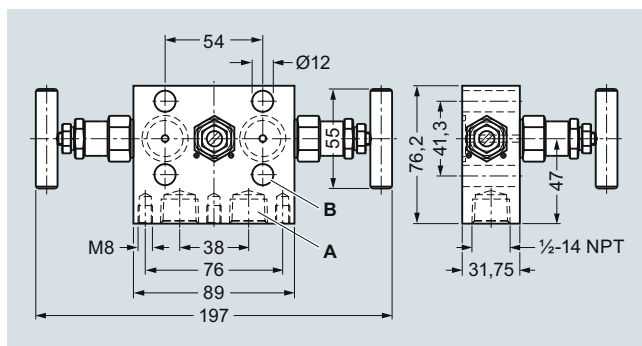
Mounting bracket (7MF9006-6NA)/(M17) for 3-spindle valve manifold, dimensions in mm



Mounting bracket (7MF9006-6PA)/(M18) for 5-spindle valve manifold, dimensions in mm

**Characteristic curves**

Permissible operating pressure as a function of the permissible operating temperature

**Dimensional drawings**

3-spindle valve manifold 7MF9413-1D, for vertical differential pressure lines, dimensions in mm

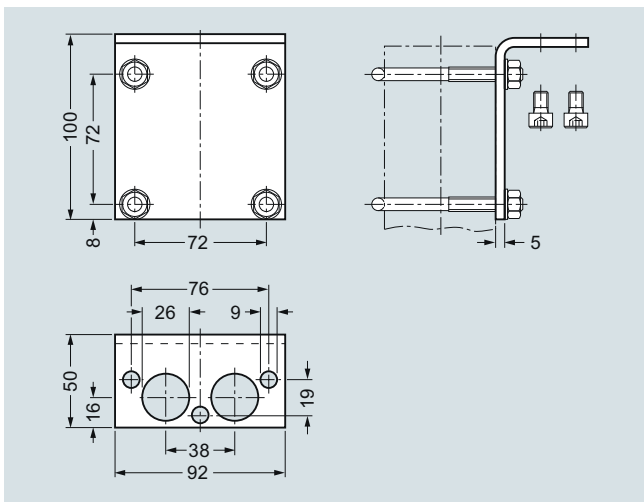
# Pressure Measurement

## Fittings

### Shut-off valves for differential pressure transmitters

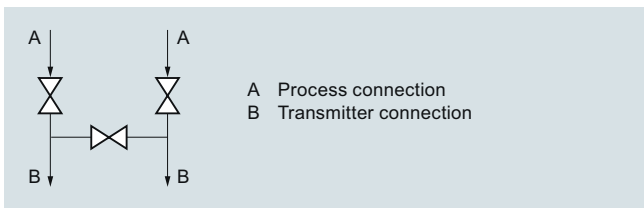
1

#### 3- and 5-spindle valve manifolds for vertical angular differential pressure lines

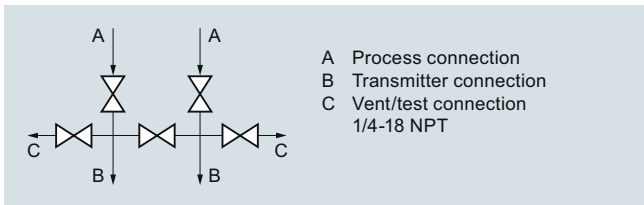


Mounting bracket (7MF9006-6QA)/(M19) for 3-spindle valve manifold, dimensions in mm

#### Schematics



3-spindle valve manifold for vertical differential pressure lines, connections



5-spindle valve manifold for vertical differential pressure lines, connections

## Overview



The low-pressure multiway cock 7MF9004-4CA/-4DA can be flanged to pressure transmitters for differential pressure.

## Benefits

- Robust design
- For liquids and gases
- One-hand operation

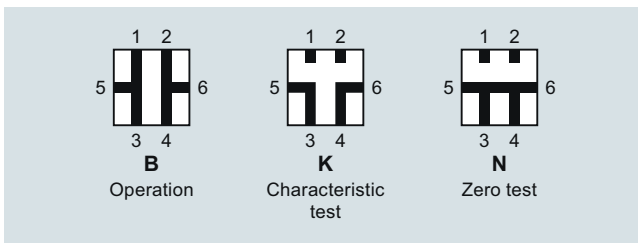
## Design

The multiway cock has 2 process connections and 2 test connections, which are available in 2 versions (with sealing screws  $G^{3/8}$  or quick-release couplings). The enclosure is made of hot-pressed brass CuZn39Pb3, CW 614N. Test connections with sealing screws or with self-sealing quick-release couplings.

**Note:** An accessory set is always required for flanging of the multiway cock to a differential pressure transmitter.

## Function

- Shutting off the differential pressure lines
- Testing the pressure transmitter zero
- Testing the pressure transmitter characteristic



Cock positions; the symbols are printed on the cock

## Selection and Ordering data

Article No.

## Low-pressure multiway cock

for liquids and gases, for flanging to pressure transmitters, max. working pressure 25 bar (363 psi), max. working temperature 60 °C (140 °F) (up to 80 °C (176 °F) for a short time), weight 1.75 kg (without accessory set)

## Test connections

2x sealing screws  $G^{3/8}$

7MF9004-4CA

2x quick-release couplings

7MF9004-4DA

## Accessories

Factory certificate according to EN 10204-2.2

7MF9000-8AB

Material inspection certificate to EN 10204-3.1

7MF9000-8AD

## Selection and Ordering data

Order code

Article No.

Further designs<sup>1)</sup>

Please add **"-Z"** to Article No. and specify Order code.

## Accessory set to EN

(required for flanging, weight 0.2 kg)

4x screws  $7/16$ -20 UNF x 1 inch to ASME B18.2.1; chromized steel  
2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

L31

7MF9004-5CC

## Accessory set to DIN

(required for flanging, weight 0.2 kg)

4x screws M10x25 to DIN EN 24017; chromized steel  
4x washers  $\varnothing$  10.5 mm to DIN 125;  
2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

• Standard design

L11

7MF9004-6AD

• Version for oxygen

L15

7MF9004-6AE

## Multiway cock in oil-free and grease-free design

BAM-tested lubricant, gasket suitable for oxygen

S11

## Mounting bracket

required for wall mounting or for securing on rack (72 mm grid), made of electrogalvanized sheet-steel, weight 0.85 kg

M13

7MF9004-6AA

<sup>1)</sup> When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Article No.

## Pressure Measurement

### Fittings

### Shut-off valves for differential pressure transmitters

#### Low-pressure multiway cock

##### Accessories

###### Accessory set for low-pressure multiway cock

- L31: 4 screws  $7/16$ -20 UNF x 1 inch, 2 flat gaskets
- L11: 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets
- L15 (suitable for oxygen): 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets

Washers  $\varnothing$  10.5 to DIN 125

Flat gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

###### Multiway cock in oil-free and grease-free design

- S11: BAM-tested lubricant, gasket suitable for oxygen

###### Mounting brackets

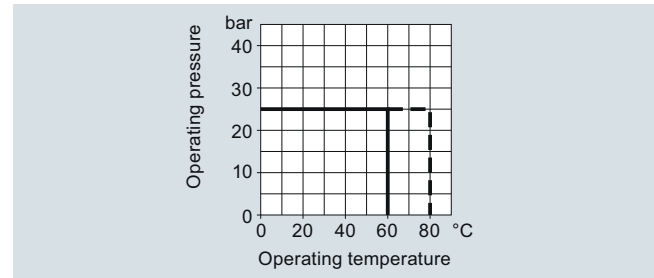
- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

##### Options

Test connections

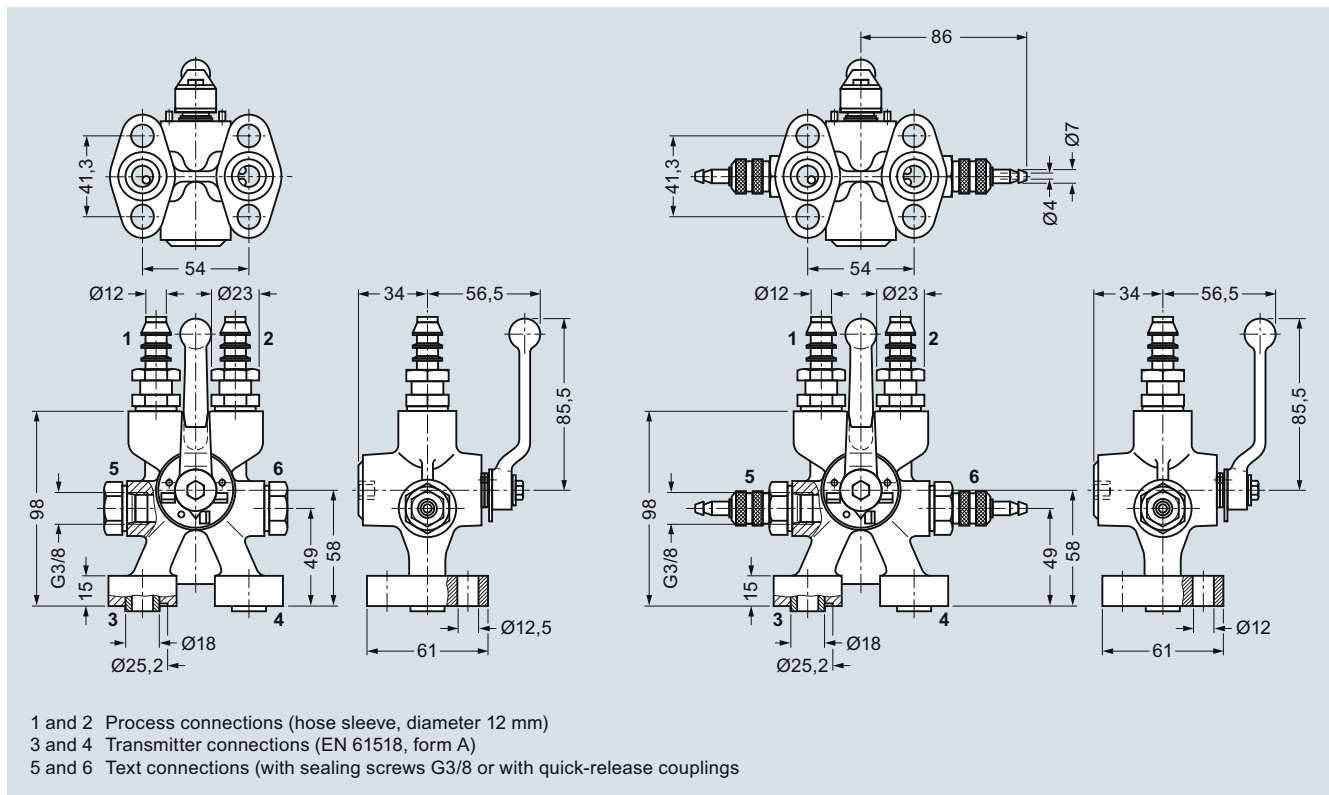
- 2 sealing screws  $G^{3/8}$
- 2 quick-release couplings

##### Characteristic curves

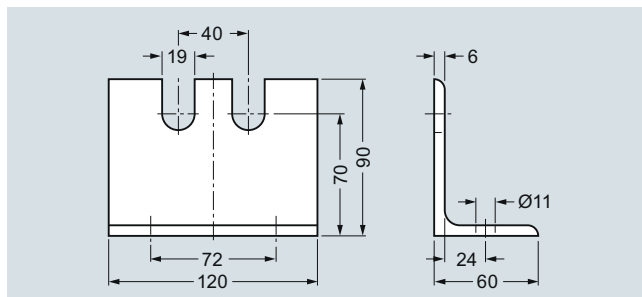


Low-pressure multiway cock, permissible operating pressure as a function of the permissible operating temperature

#### Dimensional drawings



Low-pressure multiway cock 7MF9004-4CA/-4DA for direct flanging to pressure transmitters for differential pressure, dimensions in mm



Mounting bracket 7MF9004-6AA (M13), dimensions in mm

**Overview**


The oval flange 7MF9408-2C, for pressure transmitters for absolute pressure and differential pressure has a ½-14 NPT female thread and is designed for max. operating pressure 400 bar (5800 psi).

**Accessories**
**Accessory set for oval flange**

- E36: 2 screws  $\frac{7}{16}$ -20 UNF x 1½ inch to ASME B18.2.1, 1 flat gasket
- E34: 2 screws  $\frac{7}{16}$ -20 UNF x 1½ inch to ASME B18.3, 1 O-ring (FPM 90)
- E13: 2 screws M10x40 to DIN EN 4762, 2 washers, 1 O-ring (FPM 90)
- E16: 2 screws M10x40 to DIN EN ISO 4762, 2 washers, 1 flat gasket

Washers  $\varnothing$  10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

O-ring to DIN 3771, 20 x 2.65 – S – FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

**Note:** M10 screws only permissible up to PN 160 (2321 psi)!

**Selection and Ordering data**

Article No.

**Oval flange**

with female thread ½-14 NPT, max. working pressure 420 bar (6092 psi), flange connection to IEC 61518/DIN EN 61518, form A

**Material**

P250GH, mat. No.: 1.0460

X 2 CrNiMo 17 13 2, mat. No. 1.4404/316L

**7MF9408-2CE**
**7MF9408-2CL**
**Selection and Ordering data**

Order code

Article No.

**Further designs<sup>1)</sup>**

Please add **"-Z"** to Article No. and specify Order code.

**Accessory set to EN**

2x screws  $\frac{7}{16}$ -20 UNF x 1½ inch to ASME B 18.2.3; chromized steel  
 1x flat gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)

**E36**
**7MF9408-5DA**

2x screws  $\frac{7}{16}$ -20 UNF x 1½ inch to ASME B 18.2.3; chromized steel  
 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)

**E34**
**7MF9408-5CA**
**Accessory set to DIN**

2x screws M10x40 to DIN EN ISO 4762; chromized steel  
 2x washers  $\varnothing$  10.5 mm to DIN 125;  
 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 160 bar (2321 psi), 120 °C (248 °F)<sup>2)</sup>

**E13**
**7MF9408-6AA**

2x screws M10x40 to DIN EN ISO 4762; chromized steel  
 2x washers  $\varnothing$  10.5 mm to DIN 125;  
 1x flat gasket made of PTFE, max. permissible 160 bar (2321 psi), 80 °C (176 °F)<sup>2)</sup>

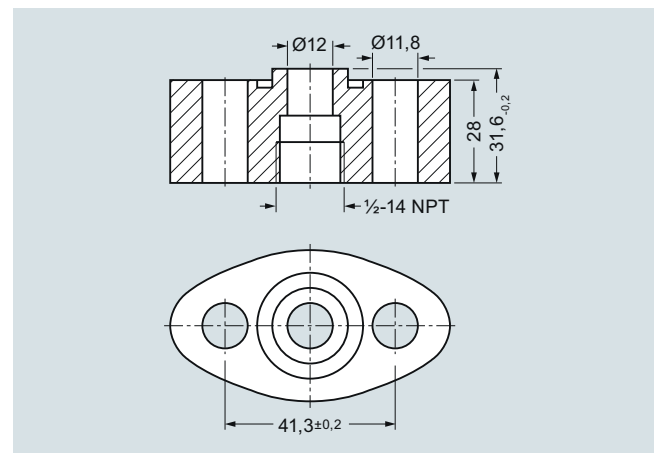
**E16**
**7MF9408-6BA**
**NACE MR-0175-certified**

incl. inspection certificate 3.1 to EN 10204

**D07**

<sup>1)</sup> When ordering accessory set together with the oval flange, please use Order code; otherwise use Article No.

<sup>2)</sup> Flange connections with M10 screws only permissible up to PN 160 (2321 psi)

**Dimensional drawings**


Oval flange 7MF9408-2C., dimensions in mm

# Pressure Measurement

## Fittings

### Accessories

1

## Adapters

### Overview

Adapters enable e.g. a transition from medium connections with NPT thread to shut-off valves to DIN 16270 ... 16272 or pipes in conjunction with a connection gland (e.g. 7MF9008).

### Design

The adapters are made of X 6 CrNiMoTi 17 12 2, mat. No. 1.4571 and available in 3 versions

- Thread 1/4-18 NPT and connection shank G1/2 to DIN EN 837-1
- Thread 1/2-14 NPT and connection shank G1/2 to DIN EN 837-1
- Thread 1/2-14 NPT and thread 1/2-14 NPT

### Selection and Ordering data

Article No.

#### Adapters

Max. operating pressure: 689 bar (10 000 psi),  
Weight: 0.2 kg

with thread 1/4-18 NPT – G1/2

**7MF9001-1AA**

with thread 1/2-14 NPT – G1/2

**7MF9001-1CA**

with thread 1/2-14 NPT – 1/2-14 NPT

**7MF9001-1DA**

with thread 1/2-14 NPT – M20 x 1.5

**7MF9001-1EA**

with pipe union with ferrule 12 S,  
max. operating pressure 630 bar (9 100 psi),  
Ø 12 mm – 1/2-14 NPT

- 9 SMnPb 28, mat. No. 1.0718

**7MF9008-1CA**

- X 6 CrNiMoTi 17 122, mat. No. 1.4571

**7MF9008-1CB**

with pipe union with ferrule 14 S,  
max. operating pressure 630 bar (9 100 psi),  
Ø 14 mm – 1/2-14 NPT

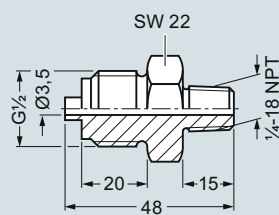
- 9 SMnPb 28, mat. No. 1.0718

**7MF9008-1CC**

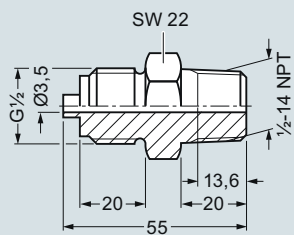
- X 6 CrNiMoTi 17 122, mat. No. 1.4571

**7MF9008-1CD**

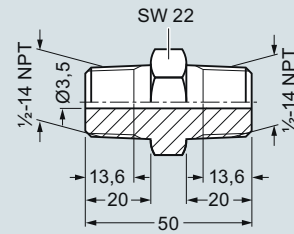
### Dimensional drawings



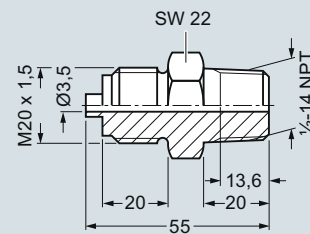
Adapter with thread 1/4-18 NPT and connection shank G1/2 (7MF9001-1AA), dimensions in mm



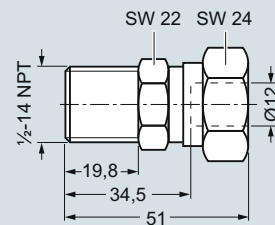
Adapter with thread 1/2-14 NPT and connection shank G1/2 (7MF9001-1CA), dimensions in mm



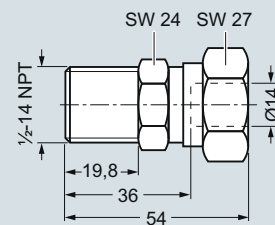
Adapter with thread 1/2-14 NPT and thread 1/2-14 NPT (7MF9001-1DA), dimensions in mm



Adapter with thread 1/2-14 NPT and connection shank M20 x 1.5 (7MF9001-1EA), dimensions in mm



Adapter with pipe union with ferrule 12 S, Ø 12 mm and thread 1/2-14 NPT (7MF9008-1CA and -1CB), dimensions in mm



Adapter with pipe union with ferrule 14 S, Ø 14 mm and thread 1/2-14 NPT (7MF9008-1CC and -1CD), dimensions in mm



**Overview**

Connection glands to connect medium or differential pressure lines to collars G $\frac{1}{2}$  to DIN EN 837-1

- For rated pressures up to PN 630 (9137psi)
- For oxygen only up to PN 250 (3626 psi)

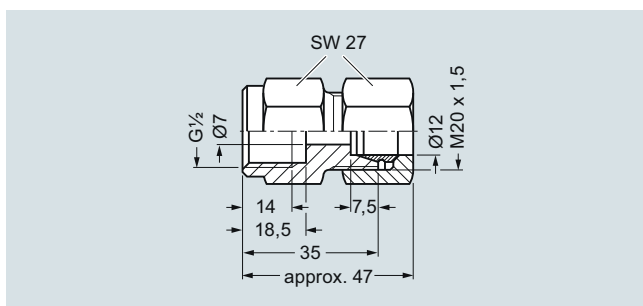
**Selection and Ordering data**

Article No.

**Connection screwed gland  
for pipelines**

(weight 0.2 kg)

Material	Design	Article No.
11SMn30 (mat. No. 1.0715)	Standard	<b>7MF9008-1GA</b>
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	Standard	<b>7MF9008-1GB</b>
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	Grease-free	<b>7MF9008-1GC</b>

**Dimensional drawings**


Connection gland 7MF9008-1G., dimensions in mm

# Pressure Measurement

## Fittings

### Accessories

1

#### Connection parts G 1/2

##### Overview

Connection parts G $\frac{1}{2}$  for pressure gauges and shut-off fittings are available in 3 versions:

- Nipple connection
- Clamping sleeve
- Collar connection piece

##### Selection and Ordering data

Article No.

###### Adapters G $\frac{1}{2}$

for pressure gauges and shut-off fittings

###### Nipple connection

G $\frac{1}{2}$  to DIN 16284 (union nut with nipple and gasket); max. working pressure 400 bar (5802 psi); weight 0.1 kg; connection: G $\frac{1}{2}$  to DIN EN 837-1; Female thread G $\frac{1}{2}$

Material	Mat. No.	
CuZn39Pb3	CW 614N	<b>M56340-A0001</b>

Union nut 9 SMn 28 k	1.0715	<b>M56340-A0002</b>
Nipple: RSt 37-2	1.0037	

Union nut X 8 CrNiS 18 9	1.4305	<b>M56340-A0003</b>
Nipple: X 6 CrNiMoTi 17 12 2	1.4571/316Ti	

###### Nipple connection

M20 x 1.5 to DIN 16284 (union nut with nipple and gasket); max. working pressure 400 bar (5802 psi); weight 0.1 kg; connection: M20 x 1.5 to DIN EN 837-1; Female thread M20 x 1.5

Material	Mat. No.	
Union nut X 8 CrNiS 18 9	1.4305	<b>M56340-A0008</b>

Nipple: X 6 CrNiMoTi 17 12 2	1.4571/316Ti	
---------------------------------	--------------	--

###### Clamping sleeve

G $\frac{1}{2}$  to DIN 16283; max. working pressure 400 bar (5802 psi); weight 0.1 kg; Connections: G $\frac{1}{2}$  to DIN EN 837-1; Female thread: G $\frac{1}{2}$  right-hand G $\frac{1}{2}$  left-hand

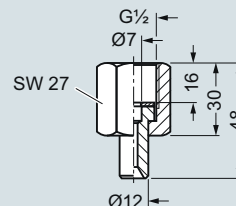
Material	Mat. No.	
CuZn39Pb3	CW614N	<b>M56340-A0004</b>
9 SMn 28 k	1.0715	<b>M56340-A0005</b>

###### Collar-adapter

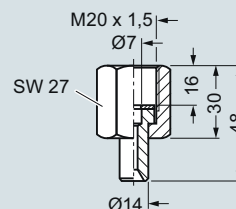
max. working pressure; weight 0.1 kg; Connections: G $\frac{1}{2}$  to DIN EN 837-1; Male thread: G $\frac{1}{2}$ , G $\frac{1}{2}$

Material	Mat. No.	
CuZn39Pb3	CW614N	<b>M56340-A0006</b>
9 SMn 28 k	1.0715	<b>M56340-A0007</b>

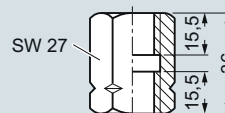
##### Dimensional drawings



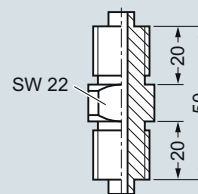
Nipple connection G $\frac{1}{2}$  (M56340-A0001 to -A0003), dimensions in mm



Nipple connection M20 x 1.5 (M56340-A0008), dimensions in mm



Clamping sleeve (M56340-A0004/-A0005), dimensions in mm



Collar connection piece (M56340-A0006/-A0007), dimensions in mm

**Overview**

Water traps protect pressure gauges and shut-off fittings from heating up (e.g. by steam) by the water column produced by the water trap.

The max. working temperature is 120 °C (248 °F) at 100 bar (1450 psi), 300 °C (572 °F) at 80 bar (1160 psi) or 400 °C (752 °F) at 63 bar (914 psi). If the temperature of the measured medium is higher, a sufficiently long line has to be connected up-stream of the trap to enable heat dissipation.

**Design**

The water traps are available in U shape (type B) or circular shape (type D) to DIN 16282. They have a weld-on end  $\varnothing$  20 mm  $\times$  2.6 mm on the measurement side. The connection on the device side is a clamping sleeve  $G\frac{1}{2}$  to DIN 16283.

The water traps are made of steel (P250GH) or stainless steel (X 6 CrNiMoTi 17 12 2)

Water traps are designed as standard for max. operating temperature 120 °C (248 °F) at max. operating pressure 100 bar (1450 psi) (300 °C (572 °F) at 80 bar (1160 psi), 400 °C (752 °F) at 63 bar (914 psi)). Water traps for higher operating pressures and temperatures are available on request.

**Selection and Ordering data**

Article No.

**Water traps**

for pressure gauges and pressure transmitters, max. working temperature 120 °C (248 °F), max. working pressure 100 bar (1450 psi) (or 300 °C (572 °F) at 80 bar (1160 psi), or 400 °C (752 °F) at 63 bar (914 psi)), weight 0.7 kg

**Water trap B to DIN 16282**

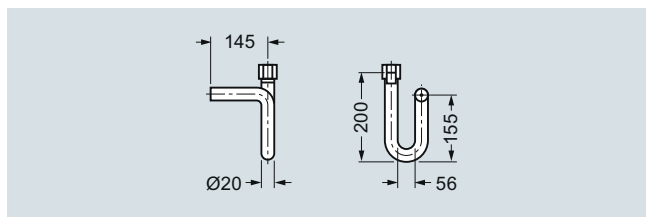
Material	Mat. No.
P235GH	1.0345
X 6 CrNiMoTi 17 12 2	1.4571/316Ti

P235GH	1.0345	<b>M56340-A0043</b>
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	<b>M56340-A0061</b>

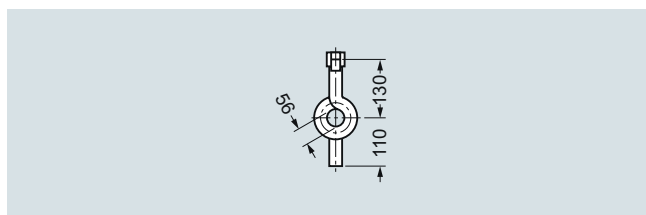
**Water trap D to DIN 16282**

Material	Mat. No.
P235GH	1.0345
X 6 CrNiMoTi 17 12 2	1.4571/316Ti

P235GH	1.0345	<b>M56340-A0045</b>
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	<b>M56340-A0063</b>

**Dimensional drawings**


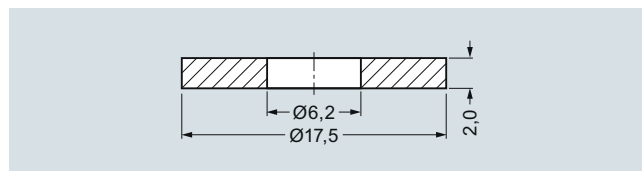
Water traps, type B, M56340-A0043/-A0061, dimensions in mm



Water traps, type D, M56340-A0045/-A0063, dimensions in mm

**Overview**

The sealing rings to EN 837-1 are required to seal measuring instruments for pressure with the process connection  $G\frac{1}{2}B$ .

**Dimensional drawings**


Sealing ring 7MF9007-7A, to EN 837-1, dimensions in mm

**Selection and Ordering data**

Article No.

**Sealing ring to EN 837-1 for thread  $G\frac{1}{2}$  made of**

(packing unit 100 pcs)

- Copper
- Soft iron
- Stainless steel, mat.-No. 1.4571
- PTFE

**7MF9007-7AA****7MF9007-7AB****7MF9007-7AC****7MF9007-7AD**
**Accessories**

Factory certificate according to EN 10204-2.2

**7MF9000-8AB**

Material inspection certificate to EN 10204-3.1

**7MF9000-8AD**

## Pressure Measurement

Fittings

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### Pressure surge reducers

#### Overview

The pressure surge reducer protects the pressure gauge against damage, premature wear and tear and inaccurate/fluctuating indications.

#### Application

The pressure reducer is used when pulsations occur in the measured medium (e.g. in slow-running vapor engines, piston pumps and compressors), or if drastic fluctuations are likely to occur in the measured medium (e.g. in hydraulic presses and tensile testing machines).

#### Design

- Enclosure made of brass or stainless steel (mat. no. 1.4571)
- Adjustable nozzle
- Sleeve for connection to the measuring instrument
- Pin for connection to supply lead

#### Selection and Ordering data

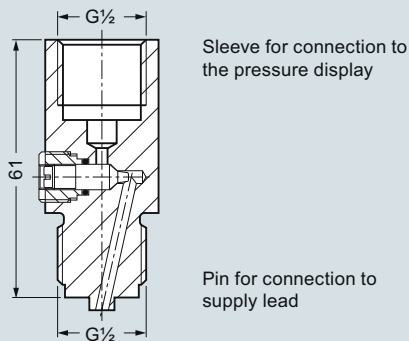
Article No.

##### Pressure surge reducer

Weight approx. 0.21 kg

Material	Full-scale value	Weight approx. in kg	Article No.
Brass	250 bar (3626 psi)	0.21	<b>M56340-A54</b>
Stainless steel	600 bar (8702 psi)	0.21	<b>M56340-A59</b>

#### Dimensional drawings



Pressure surge reducer, dimensions in mm

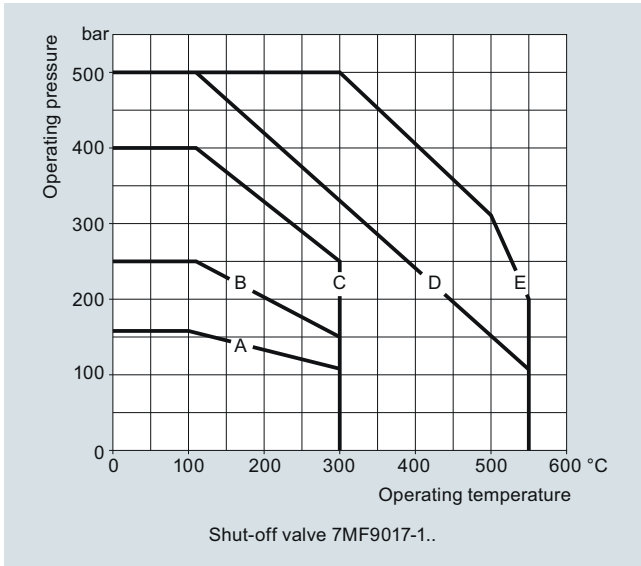
### Overview

Primary shut-off valves are available in the following versions:

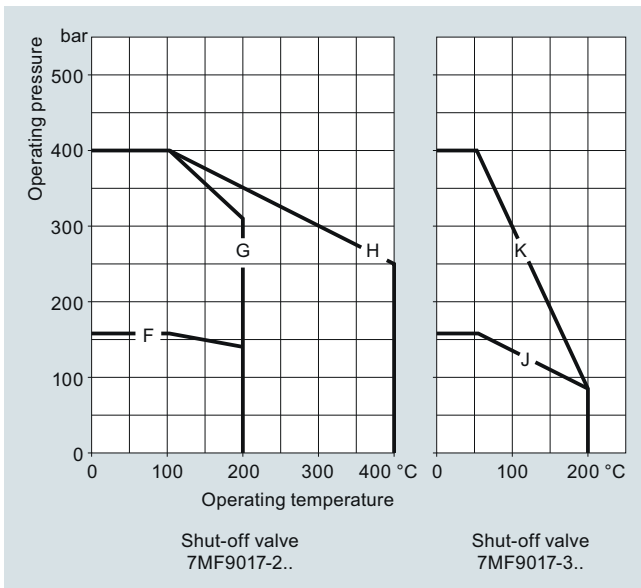
- For non-corrosive liquids, gases and vapors
- For corrosive liquids and gases
- Grease-free for oxygen

The shut-off valves are available in various materials and with various connections (see Selection and Ordering data)

### Characteristic curves

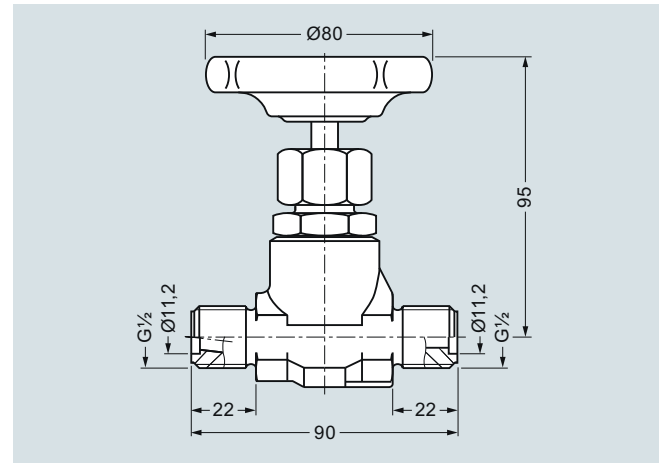


Shut-off valve 7MF9017-1.., permissible working pressure as a function of the permissible working temperature

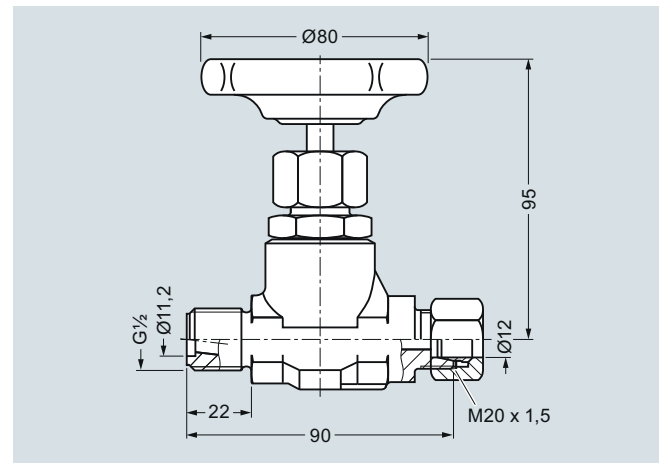


Shut-off valve 7MF9017-2.. and -3.., permissible working pressure as a function of the permissible working temperature

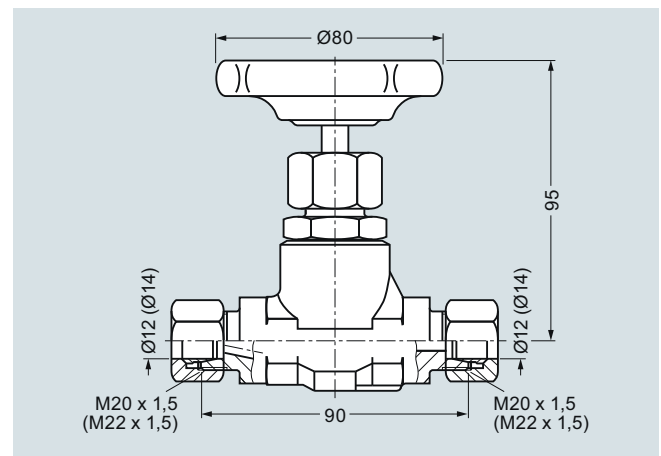
### Dimensional drawings



Shut-off valve 7MF9017-1A., dimensions in mm



Shut-off valve 7MF9017-1B. and -2B., dimensions in mm



Shut-off valves 7MF9017-1C., -1D. and -2C., dimensions in mm

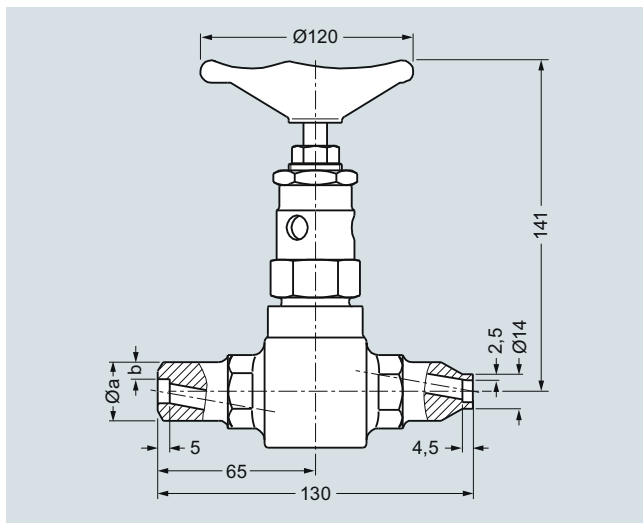
# Pressure Measurement

## Fittings

### Accessories

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#### Primary shut-off valves



Shut-off valves 7MF9017-, dimensions in mm

Ø A x b	7MF9017-
14 mm x 2.5 mm	1F. and 1G.
21.3 mm x 6.3 mm	1H. and 2H.
24 mm x 7.1 mm	1J., 1K. and 2J.

#### Selection and Ordering data

##### Primary shut-off valves, without certificate

Max. working pressure	Charac-teristic <sup>1)</sup>	Material	Mat. No.	Spindle thread	Connections	Approx. weight kg	Article No.
<b>Shut-off valve for non-aggressive liquids, gases and vapors</b>							<b>7MF9017-1</b>
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.							
160 bar (2321 psi)	A	P250GH	1.0460	Internal	Threaded socket G½ form R, DIN 19207	0.8	A
160 bar (2321 psi)	A	P250GH	1.0460	Internal	Threaded socket G½ form R, DIN 19207 and pipe union with ferrule for pipe Ø 12 mm, S series	0.8	B
400 bar (5800 psi)	C	P250GH	1.0460	Internal	Pipe union with ferrule for pipe Ø 12 mm, S series	1	C
400 bar (5800 psi)	C	P250GH	1.0460	Internal	Pipe union with ferrule for pipe Ø 14 mm, S series	1	D
500 bar (7252 psi)	D	16 Mo 3	1.5415	External	Welding sleeves Ø 14 mm x 2.5 mm	1.6	F
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	External	Welding sleeves Ø 14 mm x 2.5 mm	1.6	G
500 bar (7252 psi)	D	16 Mo 3	1.5415	External	Welding sleeves Ø 21.3 mm x 6.3 mm and Ø 14 mm x 2.5 mm	1.6	H
500 bar (7252 psi)	D	16 Mo 3	1.5415	External	Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm	1.6	J
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	External	Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm	1.6	K
<b>Shut-off valve for aggressive liquids and gases</b>							<b>7MF9017-2</b>
160 bar (2321psi)	F	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	Internal	Threaded socket G½ form R, DIN 19207 and pipe union with ferrule for pipe Ø 12 mm, S series	0.8	B
400 bar (5800 psi)	G	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	Internal	Pipe union with ferrule for pipe Ø 12 mm, S series	1	C
400 bar (5800 psi)	H	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	External	Welding sleeves Ø 21.3 mm x 6.3 mm and Ø 14 mm x 2.5 mm	1.6	H
400 bar (5800 psi)	H	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	External	Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm	1.6	J

#### Accessories

Factory certificate according to EN 10204-2.2

Material inspection certificate EN 10204-3.1

**7MF9000-8AB**  
**7MF9000-8AD**

<sup>1)</sup> See Figure "Permissible working pressure as a function of the permissible working temperature"

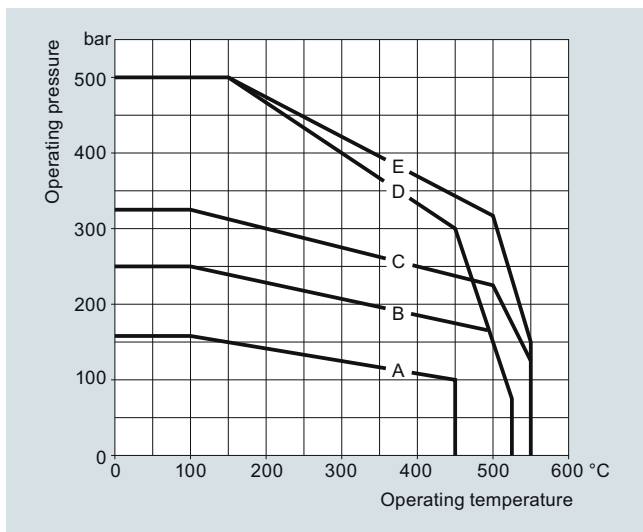
### Overview

The compensation vessels prevent the level difference which occurs with pressure changes in the pressure lines and which falsifies the measurement.

According to DIN 19211, the temperature in the compensation vessel must be assumed to be 50 K less than the steam temperature in the pipe when calculating the wall thicknesses. This is because the temperature in the compensation vessel during operation can only rise up to the saturated steam temperature.

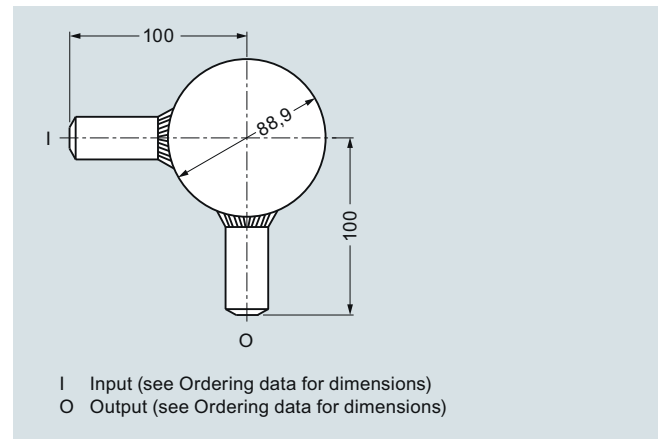
A material inspection certificate A to EN 10204-3.1 is available for the materials from which the compensation vessels are made.

### Characteristic curves

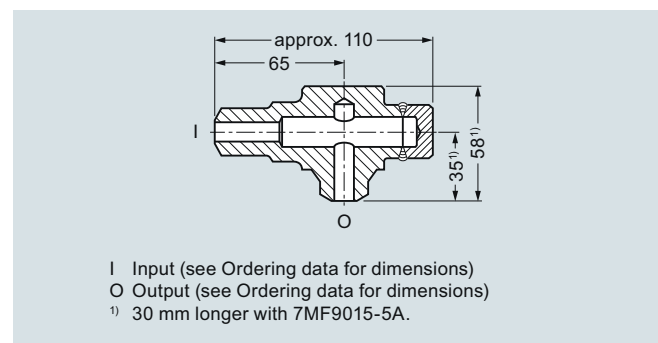


Permissible operating pressure as a function of the permissible operating temperature

### Dimensional drawings



Compensation vessel 7MF9015-1..., dimensions in mm



Compensation vessel 7MF9015-5..., dimensions in mm

### Selection and Ordering data

#### Compensation vessel, without certificate

Max. working pressure	Charac- teristic <sup>1)</sup>	Material	Mat. No.	Connections Input	Output	Approx. contents cm <sup>3</sup>	Approx. weight kg	Article No.
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.								
160 bar (2321 psi)	A	16 Mo 3	1.5415	Threaded socket G $\frac{1}{2}$ , form R, DIN 19207	Threaded socket G $\frac{1}{2}$ , form V, DIN 19207	250	0.8	<b>7MF9015-1A</b>
250 bar (3626 psi)	B	16 Mo 3	1.5415	Welding sleeve Ø 21.3 mm × 6.3 mm	Welding sleeve Ø 21.3 mm × 6.3 mm	250	0.8	<b>7MF9015-1B</b>
250 bar (3626 psi)	B	16 Mo 3	1.5415	Welding sleeve Ø 24 mm × 7.1 mm	Welding sleeve Ø 24 mm × 7.1 mm	250	1	<b>7MF9015-1C</b>
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	Welding sleeve Ø 24 mm × 7.1 mm	Welding sleeve Ø 24 mm × 7.1 mm	170	1	<b>7MF9015-1D</b>
250 bar (3626 psi)	B	16 Mo 3	1.5415	Welding sleeve Ø 33.7 mm × 4.5 mm	Welding sleeve Ø 24 mm × 7.1 mm	700	0.7	<b>7MF9015-1E</b>
160 bar (2321 psi)	A	16 Mo 3	1.5415	Threaded socket G $\frac{1}{2}$ , form R, DIN 19207	Threaded socket G $\frac{1}{2}$ , form V, DIN 19207	20	1.6	<b>7MF9015-5A</b>
500 bar (7252 psi)	D	16 Mo 3	1.5415	Welding sleeve Ø 21.3 mm × 6.3 mm	Welding sleeve Ø 21.3 mm × 6.3 mm	20	1.6	<b>7MF9015-5B</b>
500 bar (7252 psi)	D	16 Mo 3	1.5415	Welding sleeve Ø 24 mm × 7.1 mm	Welding sleeve Ø 24 mm × 7.1 mm	20	1.6	<b>7MF9015-5C</b>
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	Welding sleeve Ø 24 mm × 7.1 mm	Welding sleeve Ø 24 mm × 7.1 mm	20	1.6	<b>7MF9015-5D</b>

#### Accessories

Factory certificate according to EN 10204-2.2

Material inspection certificate EN 10204-3.1

<sup>1)</sup> See Figure "Permissible working pressure as a function of the permissible working temperature"

**7MF9000-8AB**  
**7MF9000-8AD**

# Pressure Measurement

## Fittings

### Accessories

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## Connection parts

### Overview

Connection parts are available in the following versions:

- Threaded flange pair G $\frac{1}{2}$  with stainless steel gasket
- Nipple G $\frac{1}{2}$  form V to DIN 19207
- Union nut G $\frac{1}{2}$  made of C 35 to DIN 16284
- Gasket B $\frac{1}{2}$  (grooved) to DIN 19207

All connection parts are also available grease-free for oxygen.

### Selection and Ordering data

Article No.

#### Threaded flange pair G $\frac{1}{2}$

- with stainless steel gasket
- grease-free for oxygen, with stainless steel gasket

Scope of delivery:

2x threaded flanges G $\frac{1}{2}$  to DIN 19207; material: P250GH (mat. No. 1.0460)

4x hexagon screws M10x45 to DIN EN 24014; Material: C35E (mat. No. 1.1181)

4x hexagon screws M10x50 to DIN EN 24032

1x gasket G $\frac{1}{2}$  (7MF9007-6BA) grooved, to DIN 19207;

Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

Only for 7MF9007-4CA!

1x gasket G $\frac{1}{2}$  (7MF9007-6CA), grease-free for oxygen, grooved, to DIN 19207;

Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

Only for 7MF9007-4DA!

7MF9007-4CA

7MF9007-4DA

#### Nipple G $\frac{1}{2}$

to DIN 19207

- Material: 16 Mo 3 (mat. No. 1.5415)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

7MF9007-4KA

7MF9007-4LA

#### Union nut G $\frac{1}{2}$

to DIN 16284

- Material: C35E (mat. No. 1.1181)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

7MF9007-4MA

7MF9007-4NA

#### Gasket G $\frac{1}{2}$

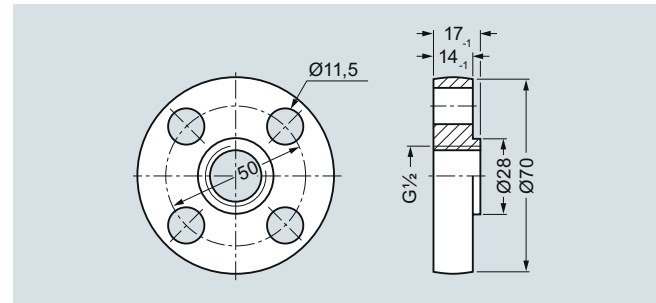
to DIN 19207, grooved

- Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

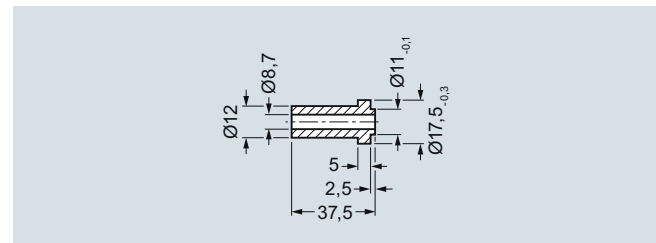
7MF9007-6BA

7MF9007-6CA

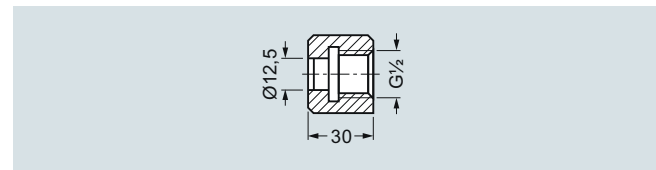
### Dimensional drawings



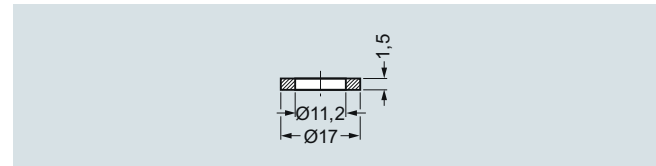
Threaded flange 7MF9007-4CA/-4DA, dimensions in mm



Nipple G $\frac{1}{2}$  7MF9007-4KA/-4LA, dimensions in mm



Union nut G $\frac{1}{2}$  7MF9007-4MA/-4NA, dimensions in mm



Gasket 7MF9007-6BA/-6CA, dimensions in mm