

HK INSTRUMENTS

User-friendly measuring devices



Product catalog 2011

USER-FRIENDLY MEASUREMENT



DIFFERENTIAL PRESSURE TRANSMITTERS



DIFFERENTIAL PRESSURE SWITCHES



AIR FLOW AND VELOCITY METERS



MANOMETERS



DIFFERENTIAL PRESSURE GAUGES

RING DEVICES

Specialized performance

HK Instruments is highly specialized in developing technologically advanced measuring devices for HVAC applications. Our products are primarily used in air handling systems and building automation.

Thanks to the clear and practical user interfaces, installation of our devices is extremely easy and fast. Result being for the user, money saved.

Finnish expertise

Skillful and competent employees enable flexible product development and cost-effective manufacturing.

Together with our staff and continually expanding distributor network, we look forward to offering best in class products and service to our customers.

Solid foundation

The average growth of HK Instruments has been 30 % per year since 1999. We believe that steady growth is a sign of a healthy company. Still more important is, how we can continually help our customers' business with solid products.

Excellent results in indoor air quality and saving energy

Energy savings and better indoor climate conditions are reached through demand based control systems. With high accuracy, our devices enable precise measurements, which are necessary for these systems to be efficient.

More than 20 years of experience

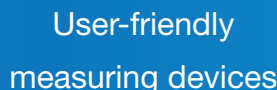
HK Instruments was founded in 1987 in Finland, from where our products have been distributed around the world ever since. Today, exports count 75% of the turnover and the products are sold in more than 45 countries.

Expanding the product offering

In the future we will serve our customers with broader product offering. We will continue to develop building automation devices that meet the cost pressures and environmental requirements of air handling unit manufacturing.



HK INSTRUMENTS



User-friendly
measuring devices

PRODUCT PORTFOLIO

User-friendly solutions to measuring air pressures, air flows, air velocities, liquid pressures and CO-gas within ventilation systems.

AIR PRESSURE TRANSMITTERS

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AIR PRESSURE GAUGES & MANOMETER

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MMU	U-tube manometer	28
MMK	Manometer with aluminum frame	28



DPT-R8 / DPT-R2 / DPT-SPAN /
DPT-2W



DPT-MOD (-IN)



DPI



PS



DPG



MM / MMU / MMK



FILTER ALERTS

FILTER ALERTS (DISPLAY + RELAY)

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AIR FLOW AND VELOCITY METERS

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 DPT-Q Differential pressure transmitter with flow linear output signal 9

LIQUID PRESSURE TRANSMITTERS

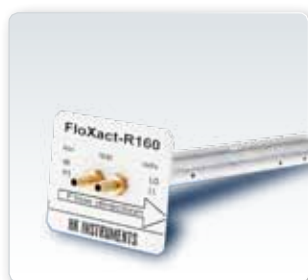
PTL Absolute pressure transmitters for liquids 46
 DPTL Differential pressure transmitters for liquids 46

CO-TRANSMITTERS

CMT Carbon monoxide transmitter 48



DPT-FLOW / DPT-FLOW-U



FloXact™



AVT



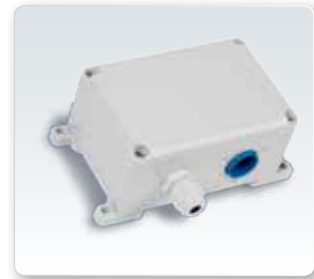
DPG+Flow scale



DPT-Q



DPTL / PTL



CMT

AIR PRESSURE TRANSMITTERS

DPT-series pressure transmitters represent the latest development in their class. Each device is individually temperature compensated to guarantee exact measurements in all conditions. Fully automated zero point calibration, *AZcalibration*, offers reliability in the most sensitive of applications. In addition, it provides cost savings over the lifetime of a building, as it makes the device completely maintenance free.

While DPT-R8 offers up-to eight measurement ranges in a single device, DPT-MOD makes two-way communication possible over Modbus network.



DPT-R8



DPT-R2



DPT-SPAN



DPT-2W

DPT-R8	Multi-range differential pressure transmitters	7
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DPT-MOD



DPT-MOD-IN



DIFFERENTIAL PRESSURE TRANSMITTERS

DPT-3W

The DPT series include electronic differential pressure transmitters that offer exceptional performance, high quality and economic pricing.

Usage & applications

The Differential Pressure Transmitter is used for measuring low pressures of air and non-combustible gasses in order to monitor and control building automation, HVAC and clean room systems.

Models

- R8:** 8-range model for general usage
- R2:** 2-range model for higher accuracy in very low measurement ranges
- SPAN:** for high accuracy applications
- Q:** flow linear output



DPT-R8

TECHNICAL DETAILS

Accuracy from range: $\pm 1,5\%$ or ($\pm 6\text{Pa}$ <250 Pa)
(including: general accuracy, temperature drift, linearity, hysteresis and repetition error)

Zero point calibration: automatic with autozero element (-AZ) or with push button

Long term stability, typical 1 year:

- ± 1 Pa with AZ,
- ± 8 Pa without AZ; model 2500
- ± 24 Pa without AZ; model 7000

Supply voltage: 24 VDC $\pm 10\%$ / 24 VAC $\pm 10\%$

Power consumption: < 1.0 W (<1.5W with Iout 20mA)

Output signals (3-wire):

- 0...10 VDC, Load R minimum 1K Ω
- 4...20 mA, maximum load 500 Ω

Ambient temperature: -10...+50 $^{\circ}\text{C}$

Response Time: 0,8 / 4 s

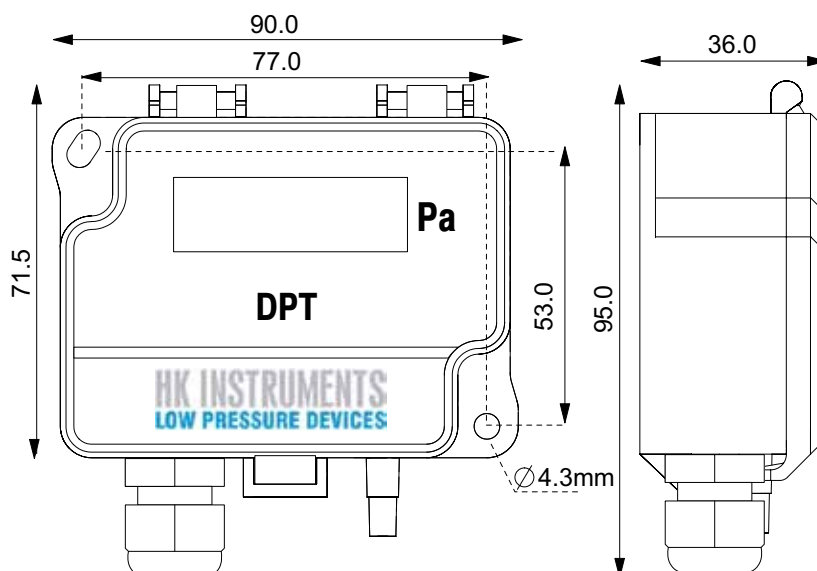
Protection standard: IP54

Selectable measurement range

			-100...+100 Pa	0...100 Pa	0...250 Pa	0...500 Pa	0...1000 Pa	0...1500 Pa	0...2000 Pa	0...2500 Pa	0...3000 Pa	0...4000 Pa	0...5000 Pa	0...7000 Pa
Model 2500	Product code	Product description*												
	103.007.023	DPT2500-R8	x	x	x	x	x	x	x	x				
	103.007.024	DPT2500-R8-D	x	x	x	x	x	x	x	x				
	103.007.025	DPT2500-R8-AZ	x	x	x	x	x	x	x	x				
	103.007.026	DPT2500-R8-AZ-D	x	x	x	x	x	x	x	x				
Model 7000	Product code	Product description*												
	103.016.003	DPT7000-R8					x	x	x	x	x	x	x	x
	103.016.004	DPT7000-R8-D					x	x	x	x	x	x	x	x
	103.016.005	DPT7000-R8-AZ					x	x	x	x	x	x	x	x
	103.016.006	DPT7000-R8-AZ-D					x	x	x	x	x	x	x	x

*R8 = number of measurement ranges per device, D = display, AZ = autozero element

Dimensions



ACCESSORIES
SEE PAGE 50

DPT-R2

TECHNICAL DETAILS

Accuracy from FS:	$\pm 1,5\%$ ($\pm 3\%$ for DPT ± 50 & DPT100) (including: general accuracy, temperature drift, linearity, hysteresis and repetition error)
Zero point calibration:	automatic with autozero element (-AZ)
Long term stability, typical 1 year:	<ul style="list-style-type: none"> ± 1 Pa
Supply voltage:	24 VDC $\pm 10\%$ / 24 VAC $\pm 10\%$
Power consumption:	< 1.0 W (<1.5W with I _{out} 20mA)
Output signals (3-wire):	<ul style="list-style-type: none"> 0...10 VDC, Load R minimum 1KΩ 4...20 mA, maximum load 500Ω
Ambient temperature:	-10...+50 °C
Response Time:	0,8 / 4 s
Protection standard:	IP54

2-range model for higher accuracy in very low measurement ranges

*R2 = number of measurement ranges per device, D = display, AZ = autozero element

DPT-R2

Product code	Product description	Measuring range (Pa)
103.002.003	DPT100-R2-AZ	0...50 /100
103.002.005	DPT 100-R2-D-AZ	0...50 /100
103.003.003	DPT ± 100 -R2-AZ	-50...+50 / -100...+100
103.003.005	DPT ± 100 -R2-D-AZ	-50...+50 / -100...+100
103.004.003	DPT 250-R2-AZ	0...100 /250
103.004.005	DPT 250-R2-D-AZ	0...100 /250

DPT-SPAN

TECHNICAL DETAILS

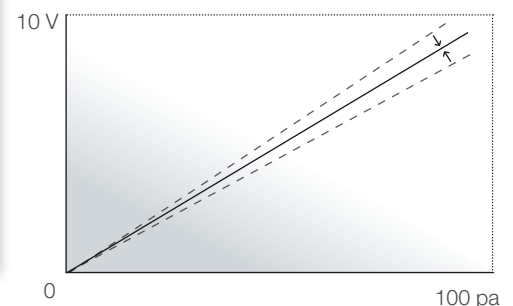
Accuracy from FS:	$\pm 0,7\%$ ($\pm 1,5\%$ for DPT100) (including: general accuracy, temperature drift, hysteresis and repetition error)
Long term stability, typical 1 year:	<ul style="list-style-type: none"> ± 1 Pa
Zero point calibration:	automatic with autozero element (-AZ)
Span point calibration:	with trimmer (see picture below)
Supply voltage:	24 VDC $\pm 10\%$ / 24 VAC $\pm 10\%$
Power consumption:	< 1.0 W (<1.5W with I _{out} 20mA)
Output signals (3-wire):	<ul style="list-style-type: none"> 0...10 VDC, Load R minimum 1KΩ 4...20 mA, maximum load 500Ω
Ambient temperature:	-10...+50 °C
Response Time:	0,8 / 4 s
Protection standard:	IP54



Reach the best accuracy!
Use a transmitter with span point calibration.

DPT-SPAN

Product code	Product description	Measuring range (Pa)
103.002.019	DPT SPAN 100-AZ	0...50 /100
103.002.020	DPT SPAN 100-D-AZ	0...50 /100
103.003.023	DPT SPAN ± 100 -AZ	-50...+50 / -100...+100
103.003.024	DPT SPAN ± 100 -D-AZ	-50...+50 / -100...+100
103.005.012	DPT SPAN 500-AZ	0...250 /500
103.005.013	DPT SPAN 500-D-AZ	0...250 /500

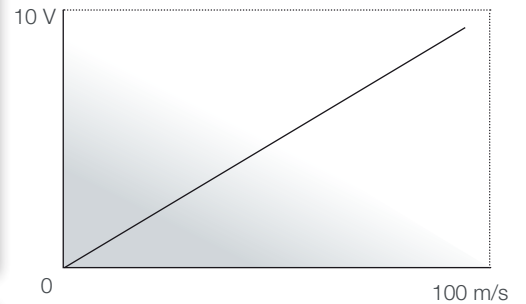


DPT-Q

TECHNICAL DETAILS

Accuracy from FS:	±1,5% (±3% for DPT±50 & DPT100) (including: general accuracy, temperature drift, linearity, hysteresis and repetition error)
Zero point calibration:	automatic with autozero element (-AZ) or with push button
Long term stability, typical 1 year:	<ul style="list-style-type: none"> • ± 1 Pa with AZ, • ± 8 Pa without AZ; model 2500 • ± 24 Pa without AZ; model 7000
Supply voltage:	24 VDC ±10 % / 24 VAC ±10 %
Power consumption:	< 1.0 W (<1.5W with Iout 20mA)
Output signals (3-wire)*:	<ul style="list-style-type: none"> • 0...10 VDC, Load R minimum 1KΩ • 4...20 mA, maximum load 500Ω
Ambient temperature:	-10...+50 °C
Response Time:	0,8 / 4 s
Protection standard:	IP54

Available with
**FLOW LINEAR
OUTPUT**

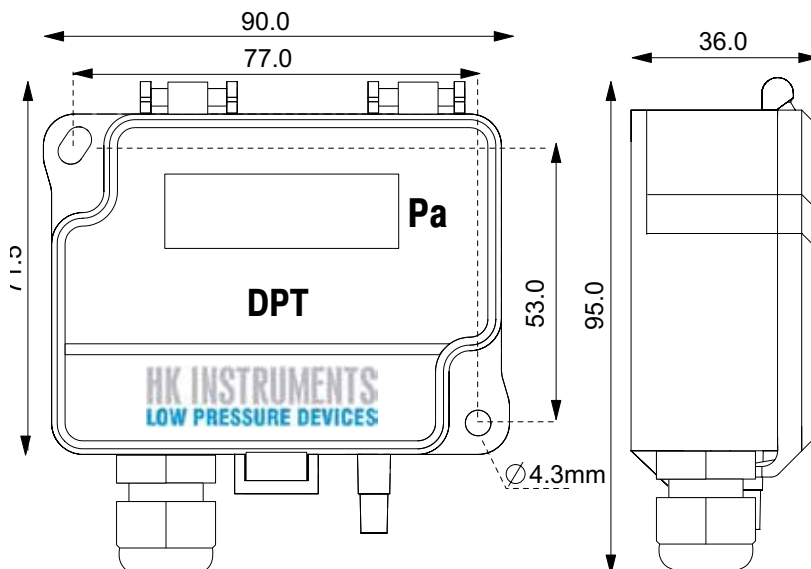


DPT-Q

Product code	Product description	Measuring range (Pa)
103.002.007	DPT100-R2-AZ-Q	see DPT-R2
103.002.008	DPT 100-R2-D-AZ-Q	see DPT-R2
103.003.007	DPT±100-R2-AZ-Q	see DPT-R2
103.003.008	DPT±100-R2-D-AZ-Q	see DPT-R2
103.004.007	DPT 250-R2-AZ-Q	see DPT-R2
103.004.008	DPT 250-R2-D-AZ-Q	see DPT-R2
103.007.037	DPT2500-R8-Q	see DPT-R8
103.007.038	DPT2500-R8-D-Q	see DPT-R8
103.007.039	DPT2500-R8-AZ-Q	see DPT-R8
103.007.040	DPT2500-R8-AZ-D-Q	see DPT-R8
103.016.011	DPT7000-R8-Q	see DPT-R8
103.016.012	DPT7000-R8-D-Q	see DPT-R8
103.016.013	DPT7000-R8-AZ-Q	see DPT-R8
103.016.014	DPT7000-R8-AZ-D-Q	see DPT-R8

*Available with 2-wire (2W) configuration also, see page XX

Dimensions



ACCESSORIES
SEE PAGE 50

DISPLAY

Whether you choose your transmitter with or without a display, it is easy to remove or add one afterwards even on-site. As simple as SNAP! INSTALL! GO!



SNAP OPEN & CHANGE THE COVER → INSTALL OR REMOVE THE DISPLAY
→ CLOSE & YOU ARE READY TO GO!

AZCALIBRATION

Autozero element makes the device maintenance free. Element automatically adjusts the transmitters zero point from time to time, this eliminates the zero point long term drift of the piezoresistive sensing element.

During zero point adjustment the output and display values will maintain the latest measured value. The automatic zero point adjustment takes 4 seconds. Zero point adjustment is normally carried out every 10 minutes.

If the device is not equipped with Autozero element, it is recommended to carry out the zero point adjustment every 12 months. Supply voltage must be connected one hour before the zero-point adjustment is carried out.



Choose stability and cost savings

- A device that calibrates itself periodically
- Fully automated zero point calibration
- Fully maintenance free device

“We are very pleased with the improvement HK Instruments has done with their product portfolio, changing the direction of the entire industry.”

“The overall improvement is dependent on remarkable development of transmitters over several years. This means in technical terms as well as in quality, lead-time and pricing of the differential pressure transmitters. With thanks to HK Instruments we have one of the best positions on the market for this kind of products. With the differential pressure transmitters, featuring as many as 8 ranges, temperature compensation and with lot of options like Modbus configuration, we have

a very nice program to offer to our customers on Swedish market. In addition, the fairly new flow transmitter (DPT FLOW) is much appreciated by our customers. We are very pleased with the improvement HK Instruments has done with their product portfolio changing the direction of the entire industry. We look forward to continue our successful cooperation with HK Instruments now and in the future.” **-Peter Thern, Thermokon-Danelko AB**

Thermokon-Danelko AB has been a dedicated partner of HK Instruments for almost 10 years. They work as our distributor, serving the Swedish HVAC and building automation market. Thermokon-Danelko AB is one of the leading companies within the industry in Sweden.



DIFFERENTIAL PRESSURE TRANSMITTERS

DPT-2W

The DPT-2W is a differential pressure transmitter with two wire configuration.

Usage & applications

The Differential Pressure Transmitter is used for measuring low pressures of air and non-combustible gasses in order to monitor and control building automation, HVAC and clean room systems.

Models

R8: 8-range model for general usage



DPT-2W

TECHNICAL DETAILS

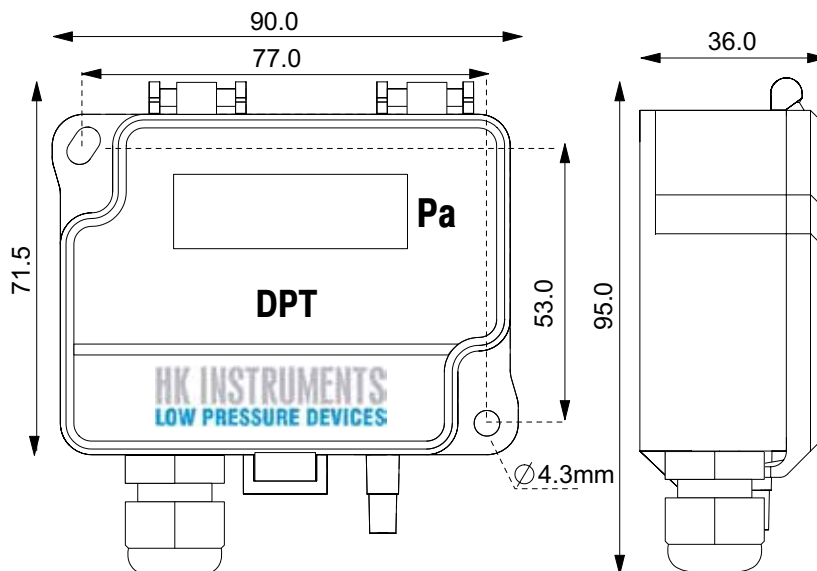
Accuracy from FS:	±1,5% or (±6Pa <250 Pa) (including: general accuracy, temperature drift, linearity, hysteresis and repetition error)
Long term stability, typical 1 year:	see table below
Zero point calibration:	with push button
Supply voltage:	10...35 VDC
Max. supply current:	32 mA
Output signal:	4...20 mA
Max output current:	32 mA
Ambient temperature:	-10...+50 °C
Response Time:	0.8 / 4 s
Protection standard:	IP54

Selectable measurement range

DPT-2W	Product code	Product description*	-100...+100 Pa	0...100 Pa	0...250 Pa	0...500 Pa	0...1000 Pa	0...1500 Pa	0...2000 Pa	0...2500 Pa	0...3000 Pa	0...4000 Pa	0...5000 Pa	0...7000 Pa
	104.007.005	DPT-2W-2500-R8	x	x	x	x	x	x	x	x				
	104.007.006	DPT-2W-2500-R8-D	x	x	x	x	x	x	x	x				
	104.007.007	DPT-2W-2500-R8-Q	x	x	x	x	x	x	x	x				
	104.007.008	DPT-2W-2500-R8-D-Q	x	x	x	x	x	x	x	x				

*R8 = number of measurement ranges per device, D = display, AZ = autozero element

Dimensions



ACCESSORIES
SEE PAGE 50

DIFFERENTIAL PRESSURE TRANSMITTERS WITH MODBUS INTERFACE

DPT-MOD

The DPT-MOD differential pressure transmitter for air is designed for Modbus (RTU) communication network. The measurements can be read over the Modbus (RTU) interface.

Usage & applications

The Modbus transmitter is used for measuring low pressures of air and non-combustible gasses in order to monitor and control building automation, HVAC and clean room systems.



DPT-MOD

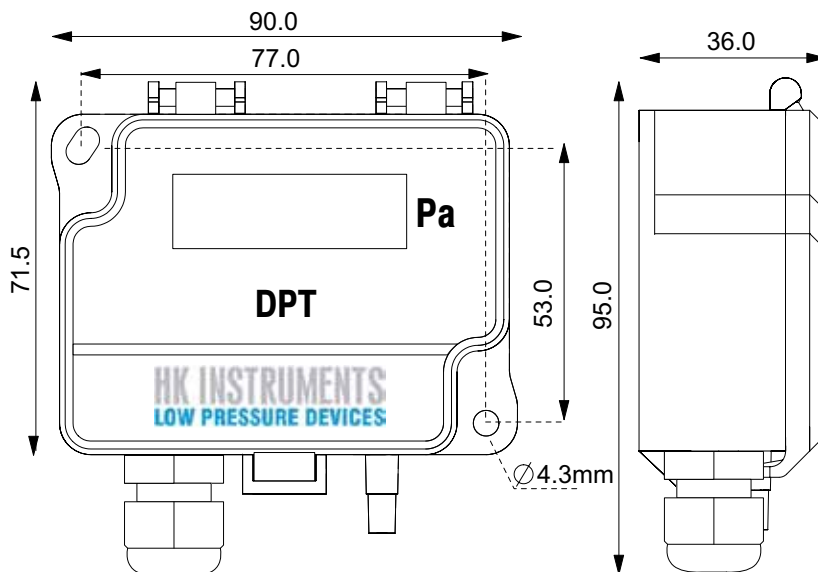
TECHNICAL DETAILS

Communication:	RS-485 Modbus (RTU)
Accuracy from range:	$\pm 1,5\%$ ($\pm 6\text{Pa}$ <250 Pa) (including: general accuracy, temperature drift, linearity, hysteresis and repetition error)
Long term stability, typical 1 year:	<ul style="list-style-type: none"> • ± 1 Pa with AZ, • ± 8 Pa without AZ; model 2500 • ± 24 Pa without AZ; model 7000
Zero point adjustment:	via Modbus or by push button, automatic with optional autozero element (-AZ)
Supply voltage:	24 VDC $\pm 10\%$ / 24 VAC $\pm 10\%$
Power consumption:	< 1.3 W
Output signal:	via Modbus (RTU)
Ambient temperature:	-10...+50 °C
Response Time:	0,8 / 2 / 10 s
Protection standard:	IP54

DPT-MOD

Code	Product description	Measuring range (Pa)
114.001.001	DPT-MOD 2000	0...100/250/500/1000/2000
114.002.001	DPT-MOD 5000	0...1000/2000/3000/5000
114.001.006	DPT-MOD-2000-AZ	0...100/250/500/1000/2000
114.002.004	DPT-MOD-5000-AZ	0...1000/2000/3000/5000

Dimensions



ACCESSORIES
SEE PAGE 50

INPUT-MODULE

FOR MODBUS TRANSMITTERS

DPT-MOD-IN

Input module is a fixed assembled expansion board for external signal conversion into modbus.

Usage & applications

The input module is a plug-in module that can be assembled into DPT-MOD afterwards, even in the field and on site. Input signals can be read over Modbus via DPT MOD RS484 interface.



Input module turns your differential pressure transmitter into multi featured transmitter that can be used as a temperature transmitter for example.

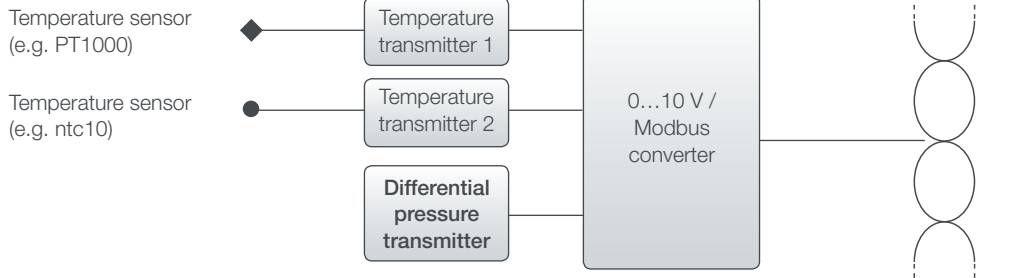
TECHNICAL DETAILS

Communication: RS-485 Modbus (RTU)
Output signal: via Modbus (RTU)
Supported input signals: 0...10V, ntc10k, Pt1000, Ni1000/(-LG), BIN IN (potential free contact)
Number of input terminals: 2
 Both terminals can be configured independently.

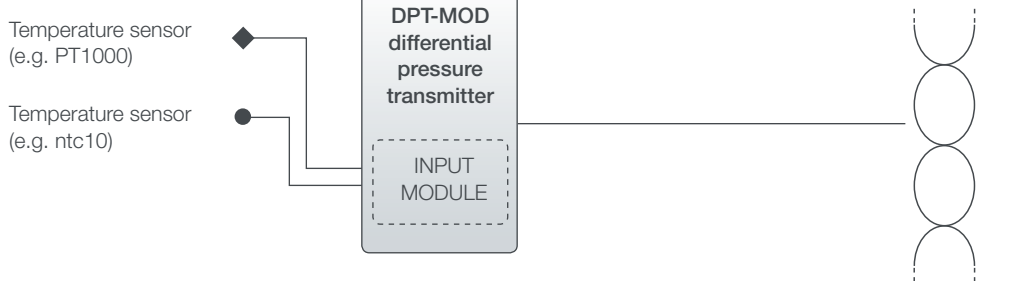
DPT-MOD

Code	Product description	Measuring range (Pa)
114.001.007	DPT-MOD-2000-IN	0...100/250/500/1000/2000
114.002.005	DPT-MOD-5000-IN	0...1000/2000/3000/5000
114.001.008	DPT-MOD-2000-IN-AZ	0...100/250/500/1000/2000
114.002.006	DPT-MOD-5000-IN-AZ	0...1000/2000/3000/5000

Traditional system:



New system with DPT-MOD-IN



Benefits: When using DPT-MOD-IN, you can replace temperature transmitters with temperature sensors such as PT1000 or ntc10 and you won't need a separate converter for Modbus. As a result you will save in costs of the devices and in the installation costs.

AIR PRESSURE SWITCHES

Our offering includes two kinds of differential pressure switches.

The mechanical differential pressure switches (PS) offer a cost effective solution for filter monitoring and other applications, where on/off information is required.

The electronic differential pressure switches (DPI) offer up to two relay outputs, each of which can be configured independently, together with 0-10 V output. Therefore, it is the right option for more sophisticated building automation systems. It is an ideal device for example in cleanroom applications and in staircase pressure monitoring.



PS



DPI

PS	Mechanical differential pressure switch	20
DPI	Electronic differential pressure switch with 2 relays and 0-10 V output	22



DIFFERENTIAL PRESSURE SWITCH

PS

The PS is a robust, easy to use, differential pressure switch for air and non-combustible gasses.

Usage

The pressure switches are used in ventilation and air conditioning systems to monitor changes in over pressure, under pressure and differential pressure.

Applications

- monitoring filters and fans
- monitoring vacuum and over pressure in air ducts
- controlling defrosting functions



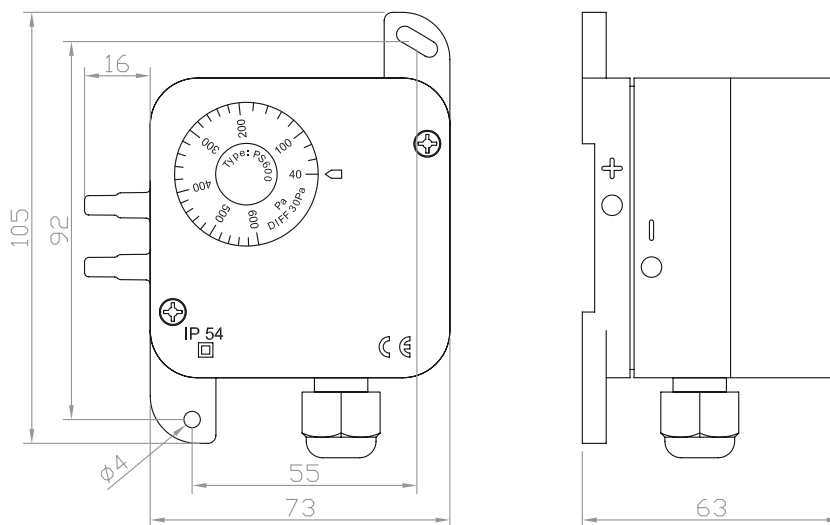
TECHNICAL DETAILS

Accuracy of switching point (low limit typ.):	±5 Pa (PS1500: ±10 Pa, PS4500: ±50 Pa)
Service life:	over 1 000 000 switching operations
Ambient temperature:	-20...+60 °C
Protection standard:	IP54

PS

Code	Product	Measuring range (Pa)	Electrical rating (resistive load)	Electrical rating (inductive load)
105.001.001	PS200	20...200 Pa	0,1A / 250VAC	--
105.002.001	PS300	30...300 Pa	3A / 250VAC	2A / 250VAC
105.003.001	PS500	30...500 Pa	3A / 250VAC	2A / 250VAC
105.004.001	PS600	40...600 Pa	3A / 250VAC	2A / 250VAC
105.005.001	PS1500	100...1500 Pa	3A / 250VAC	2A / 250VAC
105.006.001	PS4500	500...4500 Pa	5A / 250VAC	2A / 250VAC

Dimensions



DIFFERENTIAL PRESSURE INDICATOR

DPI

The DPI is an electronic differential pressure transmitter with up to two relay outputs.

Usage & applications

The Differential Pressure Indicator is used for measuring and indicating low pressures of air and non-combustible gasses in order to monitor and control building automation, HVAC and clean room systems.



Need an alarm?

Select DPI - A transmitter with relay output!

TECHNICAL DETAILS

Accuracy from range:	see model selection table
Long term stability, typical 1 year:	• ± 1 Pa (± 8 Pa without autozero element -AZ)
Zero point calibration:	automatic with autozero element (-AZ) or with push button
Supply voltage:	<ul style="list-style-type: none"> • 18-35 VDC / 24 VAC $\pm 10\%$ (without -AZ option) • 24 VDC $\pm 10\%$ / 24 VAC $\pm 10\%$ (with -AZ option)
Current consumption:	35mA + relays (7mA each) + AZ (20mA) + 0...10V output (10mA)
Output signals:	<ul style="list-style-type: none"> • 0...10V, L min 1kΩ • Relay output 1 (250VAC / 30VDC / 6A) • Optional relay output 2 (250VAC / 30VDC / 6A)
Ambient temperature:	-10...+50 °C
Response Time:	0,8...20 s
Protection standard:	IP54

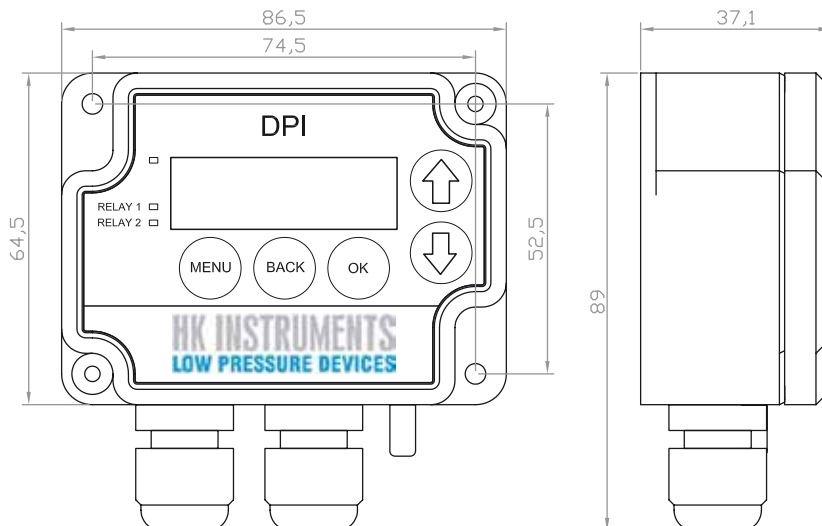
DPI

Product code	Product description	Measuring range (Pa)	Accuracy from range
118.001.001	DPI+/-500	± 100 / ± 250 / ± 300 / ± 500	$\pm 1,5\%$ or (± 3 Pa <250 Pa)
118.001.002	DPI+/-500-AZ	± 100 / ± 250 / ± 300 / ± 500	$\pm 1,5\%$ or (± 3 Pa <250 Pa)
118.001.003	DPI+/-500-2R	± 100 / ± 250 / ± 300 / ± 500	$\pm 1,5\%$ or (± 3 Pa <250 Pa)
118.001.004	DPI+/-500-AZ-2R	± 100 / ± 250 / ± 300 / ± 500	$\pm 1,5\%$ or (± 3 Pa <250 Pa)
118.002.001	DPI2500	100 / 250 / 1000 / 2500	$\pm 1,5\%$ or (± 6 Pa <250 Pa)
118.002.002	DPI2500-AZ	100 / 250 / 1000 / 2500	$\pm 1,5\%$ or (± 6 Pa <250 Pa)
118.002.003	DPI2500-2R	100 / 250 / 1000 / 2500	$\pm 1,5\%$ or (± 6 Pa <250 Pa)
118.002.004	DPI2500-AZ-2R	100 / 250 / 1000 / 2500	$\pm 1,5\%$ or (± 6 Pa <250 Pa)

* AZ for autozero element, -2R for 2 relays

** including: general accuracy, temperature drift, linearity, hysteresis and repetition error

Dimensions



AIR PRESSURE GAUGES & MANOMETERS

Mechanical differential pressure gauges and manometers offer a reliable and cost effective solution for pressure monitoring in HVAC systems.

DPG	Differential pressure gauge	26
MM	Liquid column manometer with leakage protection system	29
MMU	U-tube manometer	29
MMK	Manometer with aluminum frame	29



DPG



MM



MMU

RS



MMK



DIFFERENTIAL PRESSURE GAUGE

DPG

DPG

The DPG is a standard pressure gauge for measuring over pressure, under pressure and differential pressure.

Usage

The DPG is used to measure low pressures of air and non-combustible gasses mainly in HVAC systems.

Applications

- monitoring filters and ventilators
- monitoring vacuum, over pressure and pressure difference in air ducts, air-handling units, clean rooms and laminar flow cabinets
- monitoring air flow on ventilators and in air ducts (special flow scales available separately)



DPG with flow scale, a cost effective solution for on-site air flow measurement

DPG

TECHNICAL DETAILS

Accuracy from FS (20°C): $\leq \pm 2\%$ (DPG60 $\leq \pm 4\%$; DPG100 $\leq \pm 3\%$)

Ambient temperature: $-5\dots+60\text{ }^\circ\text{C}$

Zero point adjustment screw: external in the plastic cover

Mounting: surface mounting or flush mounting

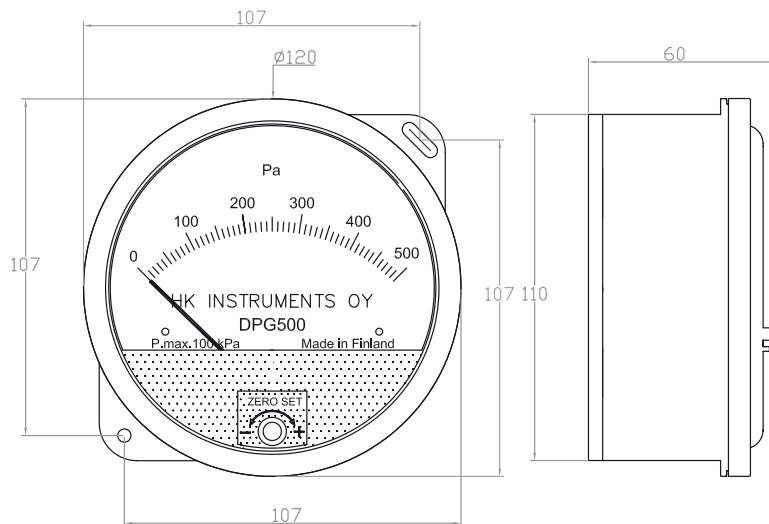
Mounting position: vertical

Measuring air flow: special flow scales available separately, easy to install on-site

DPG

Code	Product description	Measuring range (Pa)
106.001.001	DPG60	0-60 Pa
106.002.001	DPG100	0-100 Pa
106.003.001	DPG120	0-120 Pa
106.004.001	DPG200	0-200 Pa
106.005.001	DPG250	0-250 Pa
106.006.001	DPG300	0-300 Pa
106.022.001	DPG400	0-400 Pa
106.007.001	DPG500	0-500 Pa
106.008.001	DPG600	0-600 Pa
106.009.001	DPG800	0-800 Pa
106.010.001	DPG1k	0-1 kPa
106.011.001	DPG1,5k	0-1,5 kPa
106.012.001	DPG2k	0-2 kPa
106.013.001	DPG3k	0-3 kPa
106.014.001	DPG5k	0-5 kPa

Dimensions



Interchangeable flow scales



Snap!



Install!



Go!

LIQUID COLUMN MANOMETERS

MM, MMU & MMK

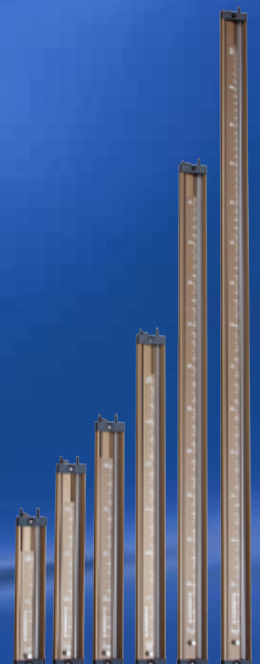


Reliable inclined column manometer
with leakage protection system



Traditional U-tube
manometer with easy
zero point calibration

Extremely robust mano-
meters used e.g. in vessels



Liquid column manometers are reliable and inexpensive traditional pressure meters. The manometers are good for measuring and indicating small over-pressure, under pressure and differential pressure of air and non-aggressive gases in low pressure ranges.

Liquid column manometers are ideal for general-purpose work in air-conditioning and ventilation, monitoring of air filters for contamination and monitoring of airflow and air velocity.

MM

MM			
Code	Product	Measuring range (Pa)	Accuracy
107.001.001	MM±50 *)	-50...0... +50 Pa	1 Pa
107.002.001	MM100 *)	-20...0... +100 Pa	1 Pa
107.003.001	MM±100500	-100...0... +500 Pa	5 Pa/25 Pa
107.004.001	MM200600	0...200...600 Pa	5 Pa/25 Pa
107.005.001	MM5001500	0...500...1500 Pa	10 Pa/50 Pa

*) The types are delivered with level bubble

Optional level bubble is available to all models on request!

MMU

MMU			
Code	Product	Measuring range (Pa)	Accuracy
113.002.001	MMU±500	±500 Pa	10 Pa

MMK

MMK			
Code	Product	Measuring range (Pa)	Accuracy
108.001.001	MM1K	0...1 000 Pa	10 Pa
108.002.001	MM1,5K	0...1 500 Pa	10 Pa
108.003.001	MM2K	0...2 000 Pa	10 Pa
108.004.001	MM3K	0...3 000 Pa	10 Pa
108.005.001	MM5K	0...5 000 Pa	10 Pa
108.006.001	MM7K	0...7 000 Pa	10 Pa
108.07.01	MM10K	0...10 000 Pa	10 Pa

Available with photoelectric limit switch. 10...30VDC.



FILTER ALERTS (DISPLAY + RELAY)

In many situations filter monitoring requires an alarm signal and a local display. Our filter alerts is the right solution for these situations. The filter alerts combine differential pressure switches with gauges and manometers into one practical product offering.

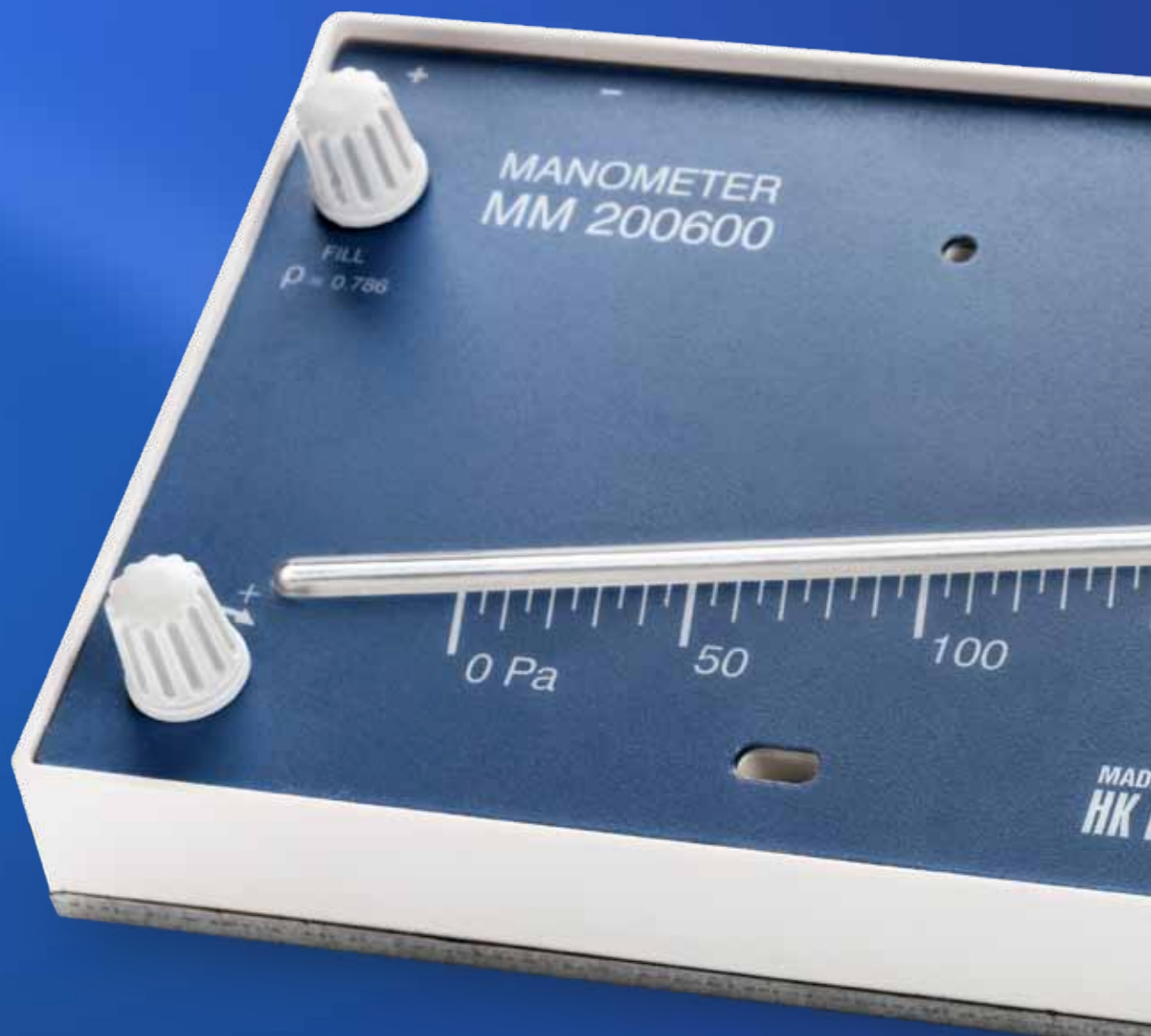
- DPG/PS** Combination of differential pressure gauge and differential pressure switch 33
- MM/PS** Combination of liquid column manometer and differential pressure switch 33



DPG/PS



MM/PS



MANOMETER
MM 200600

FILL
 $\rho = 0.756$

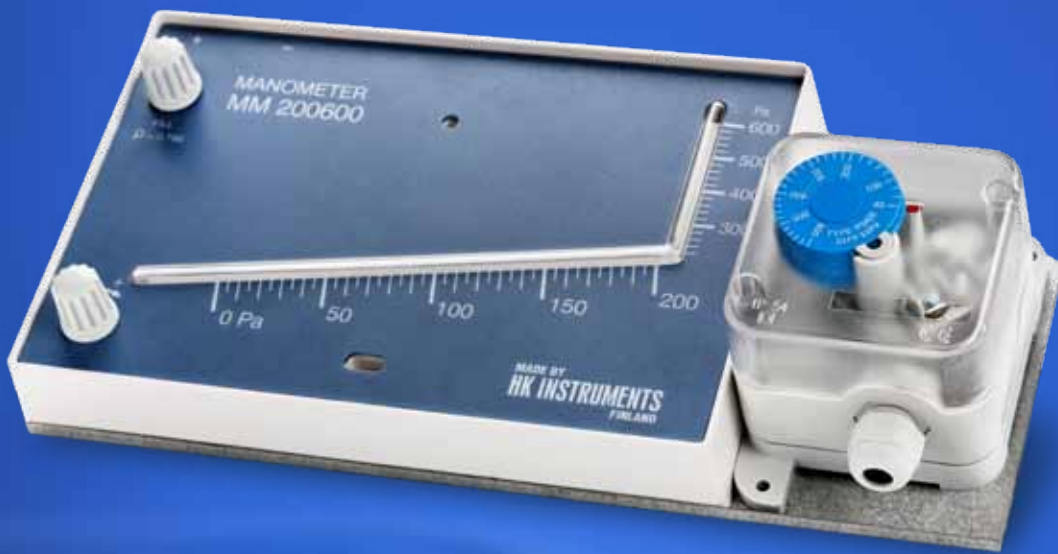
0 Pa 50 100

MAD
HK

FILTER ALERTS

The filter alerts are solution for systems requiring visual indication of pressure at site, together with switching point signal. The filter alerts are ideal for general-purpose work in air-conditioning and ventilation, especially in monitoring of air filters for contamination.

The available combinations include pressure gauge and pressure switch combination (DPG/PS), and inclined tube manometer and pressure switch combination (MM/PS).



MM/PS

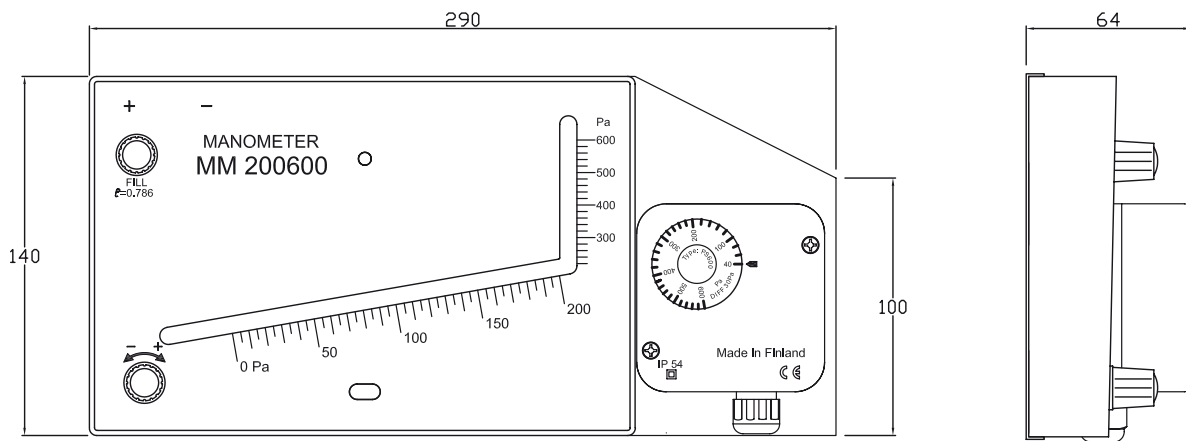
MM/PS

Code	Product	MM range (Pa)	PS range (Pa)
110.001.001	MM200600/PS600	0... 600 Pa	40...600 Pa
110.002.001	MM5001500/PS1500	0...1500 Pa	100...1500 Pa

Accessories

Same as for MM and PS

Dimensions



DGP/PS

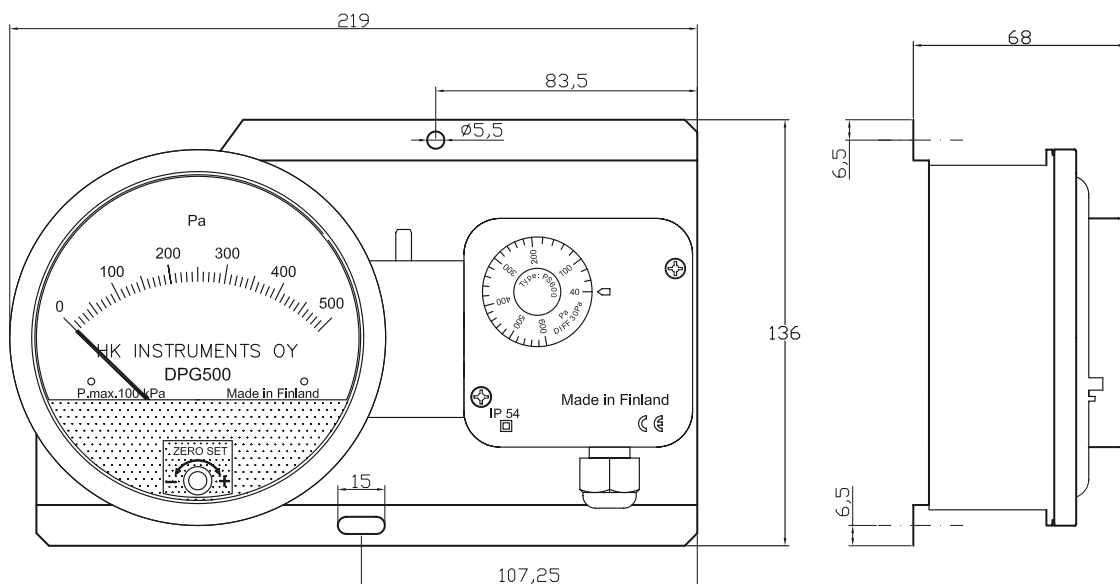
DGP/PS

Code	Product	DPG range (Pa)	PS range (Pa)
109.001.001	DPG200/PS200	0... 200Pa	20...200 Pa
109.002.001	DPG600/PS600	0... 600 Pa	40...600 Pa
109.003.001	DPG1,5K/PS1500	0...1500 Pa	100...1500 Pa

Accessories

Same as for DPG and PS

Dimensions



ACCESSORIES
SEE PAGE 50

AIR FLOW AND VELOCITY METERS

These unique devices make measuring air flow and air velocity easier than ever before. Designed for centrifugal fans, DPT-Flow provides the flow rate of a fan in matter of seconds. Whereas, DPT-Flow-U transmitter, together with FloXact measurement probes, is the right option when measuring flow in duct. Again, if you wish to measure air velocity, your selection would be AVT, which offers multiple measurement ranges in a single device together with relay and temperature output signals.

DPT-Flow	Flow meter for centrifugal fans	38
DPT-Flow-U	Universal flow meter for measuring flow in duct.	40
FloXact™	Multi-point pitot tube for flow measurements.	42
AVT	All-in-one air velocity transmitter with temperature and relay outputs	44
DPG+flowscale	Differential pressure gauge with air flow scale.	26
DPT-Q	Differential pressure transmitter with flow linear output signal.	9



DPT-Flow



DPT-Flow-U



FloXact™



AVT



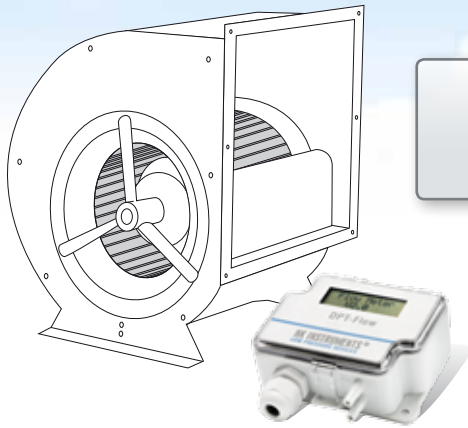
DPG+flowscale



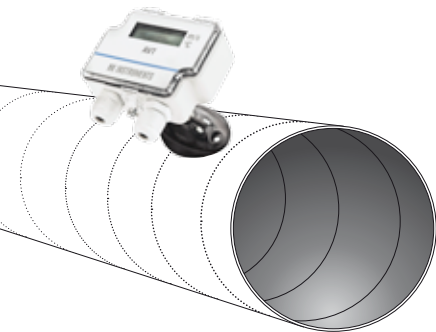
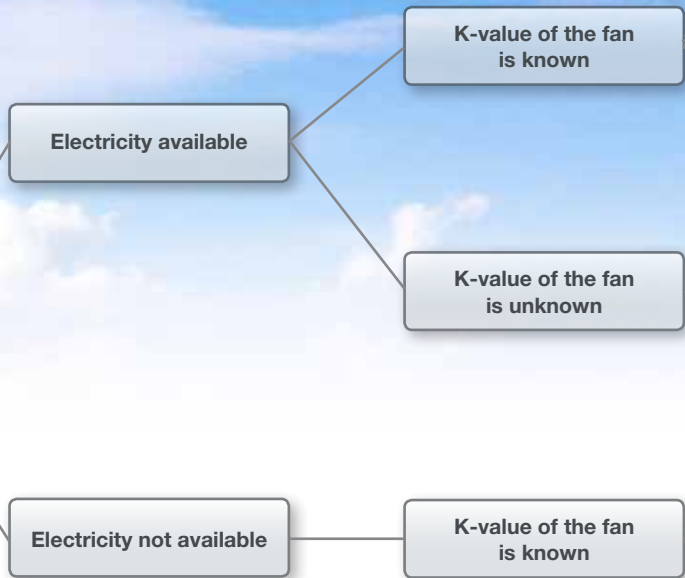
DPT-Q

FLOW MEASUREMENT

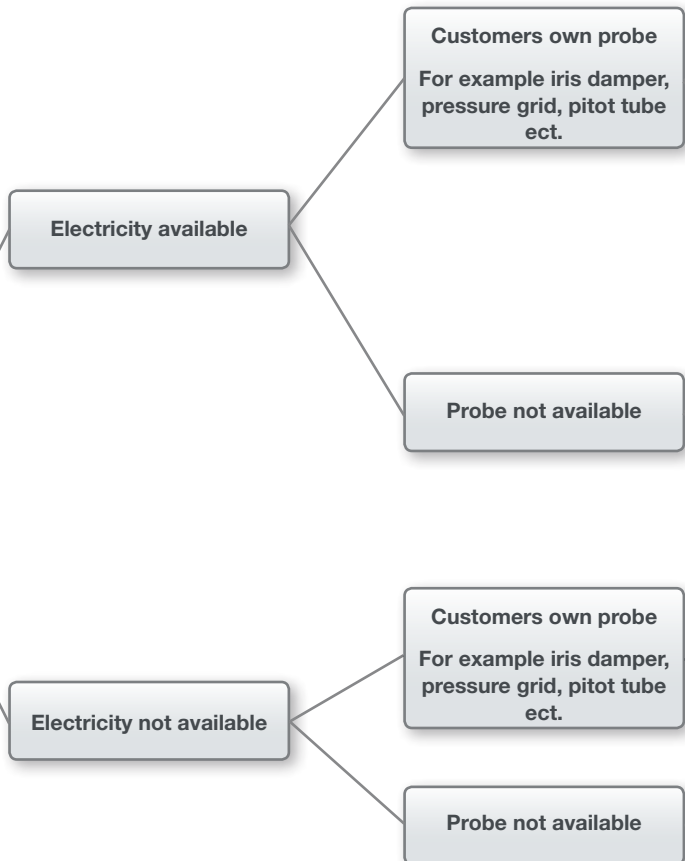
Product Selection Guide



Fan flow measurement
(Measuring inlets in the fan)



Flow in duct



Note:
Check the K-value from the fan's technical sheet

Fan manufacturers:
Fläkt Woods, Rosenberg,
Nicotra, Comerfi, Ziehl
Abegg, EBM-Papst, Gerhard

Other fan types with formula
 $Q = K * \sqrt{\Delta P}$

DTP FLOW
Fan flow meter

Info:
Air flow display and output

DTP FLOW-U
Universal flow meter

Info:
Air flow display and output

DTP-Q
Differential pressure transmitter with flow linear output signal

Info:
Flow linear output signal instead of pressure linear

Fixed scale, specific type of fan

DPG+FLOW SCALE
Mechanical flow meter

Flexible

DPT FLOW BATT
Fan flow meter with battery

Supported fan manufacturers:
Fläkt Woods, Rosenberg,
Nicotra, Comerfi, Ziehl
Abegg, EBM-Papst, Gerhard

K-value is known

DTP FLOW-U
Universal flow meter

Info:
Air flow display and output

K-value is unknown

DTP-Q
Differential pressure transmitter with flow linear output signal

Info:
Pressure display and flow linear output

Air volume measurement

DPT FLOW-U +FLOXACT
Universal flow meter with probe

Info:
Based on multipoint measurement, high accuracy

Air velocity and temperature measurement with optional relay output

AVT
Air velocity transmitter

Info:
Based on hot wire technique, no need for external probes or tubes

DPG+FLOW SCALE
Mechanical flow meter

DPG+FLOW SCALE +FLOXACT
Mechanical flow meter with probe

FLOW METER FOR FAN CONTROL

DPT-FLOW

DPT-FLOW is a flow meter that provides a new and easy way to measure the flow rate on centrifugal fans. One device is suitable for a range of different fan types.

Usage

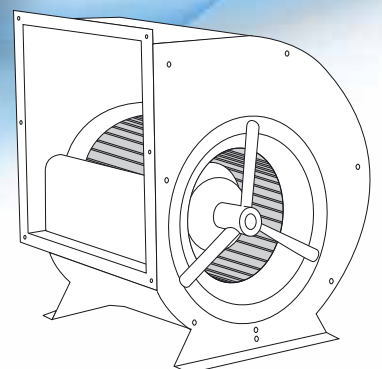
The DPT Flow is designed for air handling units to measure the air flow on centrifugal fans. The DPT Flow can be used as an on-site display for flow or as a transmitter to regulate the air flow on the selected fan or blower.

Applications

The DPT Flow is an ideal instrument for both air flow monitoring and control, and fan and blower control.



Take fan monitoring and control
into a new level with DPT-FLOW



DPT-FLOW

TECHNICAL DETAILS

Accuracy from range:	<ul style="list-style-type: none"> • $\pm 5\text{Pa} + \pm 1,5\%$ from reading (DPT-Flow-1000, DPT-Flow-2000) • $\pm 7\text{Pa} + \pm 1,5\%$ from reading (DPT-Flow-5000, DPT-Flow-7000) <p>(including: general accuracy, temperature drift, linearity, hysteresis and repetition error)</p>
Long term stability, typical 1 year:	<ul style="list-style-type: none"> • $\pm 1\text{ Pa}$ (with autozero element AZ) • ± 8 without autozero element AZ (DPT-Flow-1000, DPT-Flow-2000) • $\pm 24\text{ Pa}$ without autozero element AZ (DPT-Flow-5000, DPT-Flow-7000)
Zero point calibration:	automatic with autozero element (-AZ) or with push button
Supply voltage:	24 VAC $\pm 10\%$ / 24 VDC $\pm 10\%$
Power consumption:	< 1.0 W
Output signals (3-wire):	Vout 0...10 VDC, Load R minimum 1k Ω Pout 0...10 VDC, Load R minimum 1k Ω
Ambient temperature:	-5...+50 °C
Response Time:	1...20 s
Protection standard:	IP54

Ideal product for applications that use EC fan technology

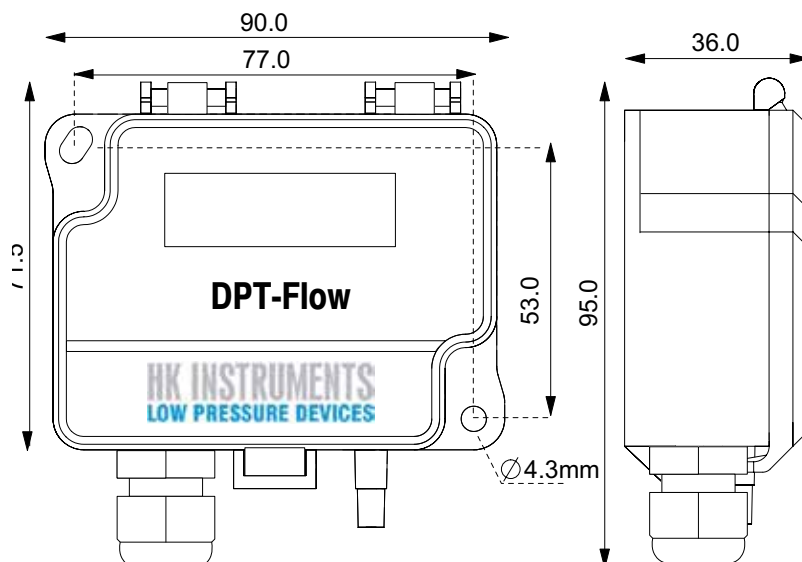
Supported fan manufacturers

Fläkt Woods, Rosenberg, Nicotra, Comefri, Ziehl, Ebm-Papst, Gebhardt

DPT-FLOW

Product code	Product description	Measuring range (Pa)
102.001.012	DPT Flow-1000-D	0...1000
102.002.009	DPT Flow-2000-D	0...2000
102.004.012	DPT Flow-5000-D	0...5000
102.006.013	DPT Flow-7000-D	0...7000
102.001.002	DPT Flow-1000-D-AZ	0...1000
102.002.002	DPT Flow-2000-D-AZ	0...2000
102.004.003	DPT Flow-5000-D-AZ	0...5000
102.006.002	DPT Flow-7000-D-AZ	0...7000

Dimensions



ACCESSORIES
SEE PAGE 50

UNIVERSAL FLOW METER

DPT-FLOW-U

DPT-FLOW-U is a flow meter that provides a new and easy way to measure flow rate in duct system. The device is supplied with an optional FloXact averaging measurement probe.

Usage

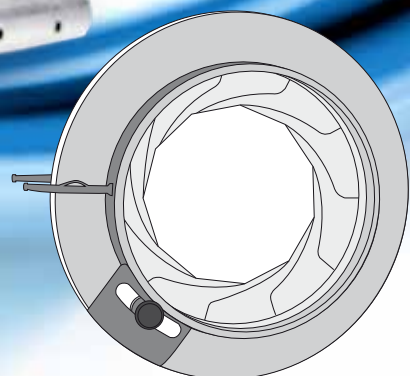
The DPT Flow can be used in the duct system or in air-handling units as an on-site display for flow or as a transmitter to regulate the air flow in the duct. The device can be used with several different measurement probes such as FloXact or pitot tube, and air dampers. The requirement is that the K-value of the measurement probe or damper is known.

Applications

The DPT Flow is an ideal instrument for air flow monitoring and control.



DPT-FLOW-U, for easy air flow measurements with FloXact measurement probes or across dampers



DPT-FLOW-U

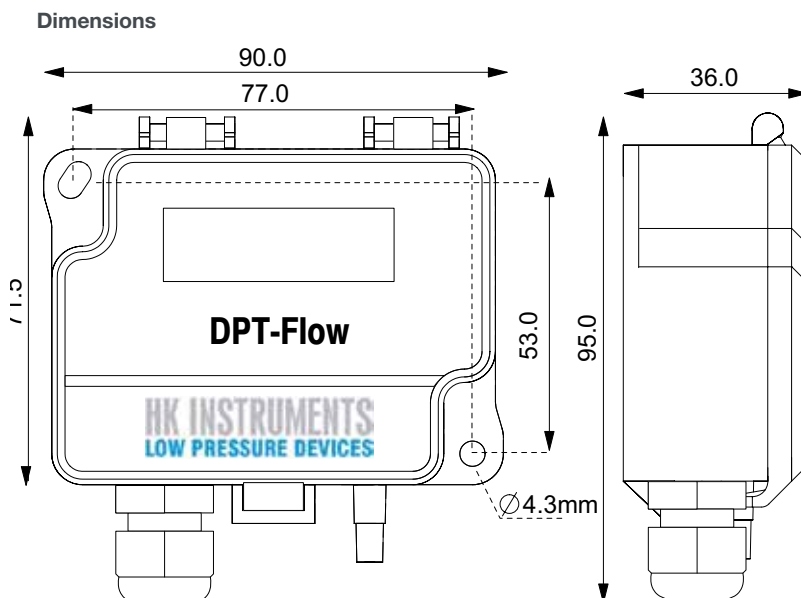
TECHNICAL DETAILS

Flow and velocity ranges included:	0-1...50 m ³ /s 0-4000 ... 200000 m ³ /h 0-2000 ... 100000 cfm 0-1000 ... 50000 l/s 0-10...100 m/s 0-2000...20000 f/min
Accuracy:	<ul style="list-style-type: none"> • ±5Pa + ±1,5% from reading (DPT Flow-U-1000 & DPT Flow-U-2000) • ±7Pa + ±1,5% from reading (DPT Flow-U-5000 & DPT Flow-U-7000) (including: general accuracy, temperature drift, linearity, hysteresis and repetition error)
Long term stability, typical 1 year:	<ul style="list-style-type: none"> • ± 1 Pa (with autozero element AZ) • ± 8 without autozero element AZ (DPT-Flow-U-1000, DPT-Flow-U-2000) • ± 24 Pa without autozero element AZ (DPT-Flow-U-5000, DPT-Flow-U-7000)
Zero point calibration:	automatic with autozero element (-AZ) or with push button
Supply voltage:	24 VAC ±10% / 24 VDC ±10%
Power consumption:	< 1.0 W
Output signals (3-wire):	Vout 0...10 VDC, Load R minimum 1kΩ Pout 0...10 VDC, Load R minimum 1kΩ
Ambient temperature:	-5...+50 °C
Response Time:	selectable
Protection standard:	IP54
Calculation formula:	$V = k * \sqrt{\Delta P(Pa)}$

DPT-FLOW-U

Code	Product description	Pressure range (Pa)
102.001.013	DPT Flow-U-1000-D	0...1000
102.002.014	DPT Flow-U-2000-D	0...2000
102.004.014	DPT Flow-U-5000-D	0...5000
102.006.018	DPT Flow-U-7000-D	0...7000
102.001.014	DPT Flow-U-1000-D-AZ	0...1000
102.002.013	DPT Flow-U-2000-D-AZ	0...2000
102.004.013	DPT Flow-U-5000-D-AZ	0...5000
102.006.014	DPT Flow-U-7000-D-AZ	0...7000

Ideal product for measuring air flow in duct or across a damper



ACCESSORIES
SEE PAGE 50

FloXact™

Application

The FloXact™ probe is a differential air pressure device designed to measure air velocities in a duct. It includes multiple sensing points to measure total and static pressures. The FloXact™ Stick incorporates a unique design to amplify the differential pressure by approximately 2.5 times for accurate measurement of lower air velocities down to 200 fpm. It is easy to install and cost effective.

Design features

- Multiple sensing points for greater accuracy
- Easy installation
- Chamfered sensing points for consistent readings
- 2% accuracy
- 2.5X signal amplification
- Accepts 1/4" OD tubing

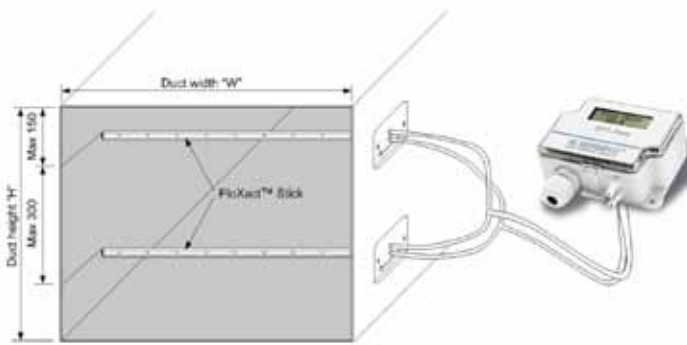


Figure 1. FloXact™-L mounting

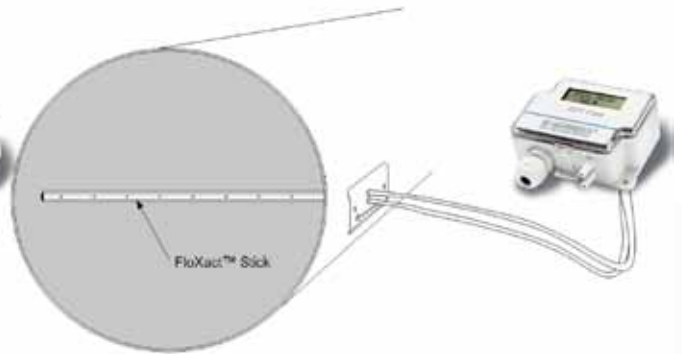
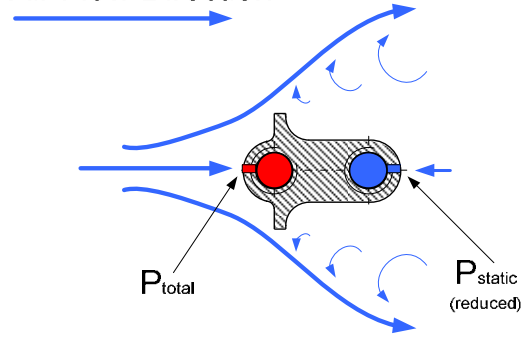


Figure 2. FloXact™-R mounting



Air Flow Direction

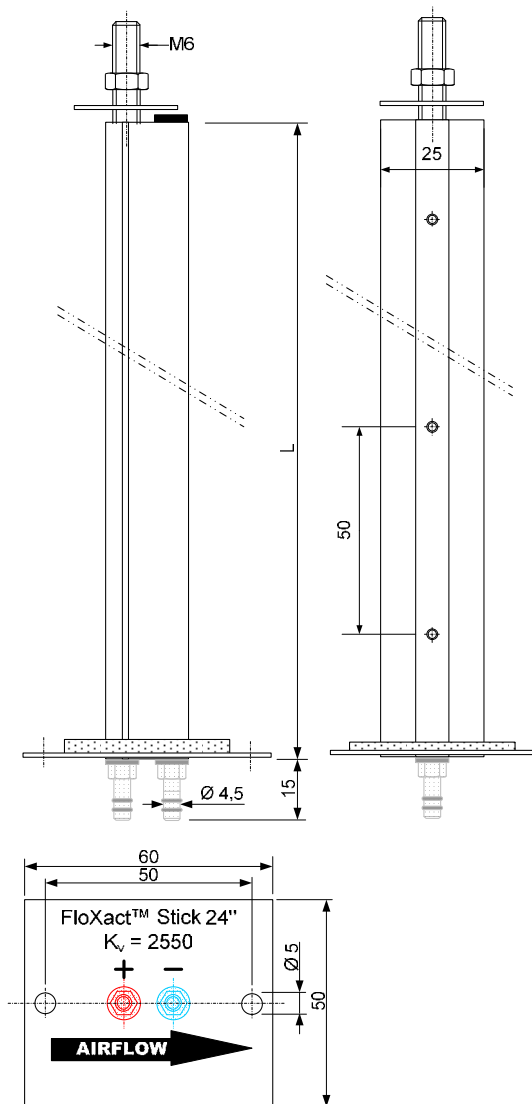
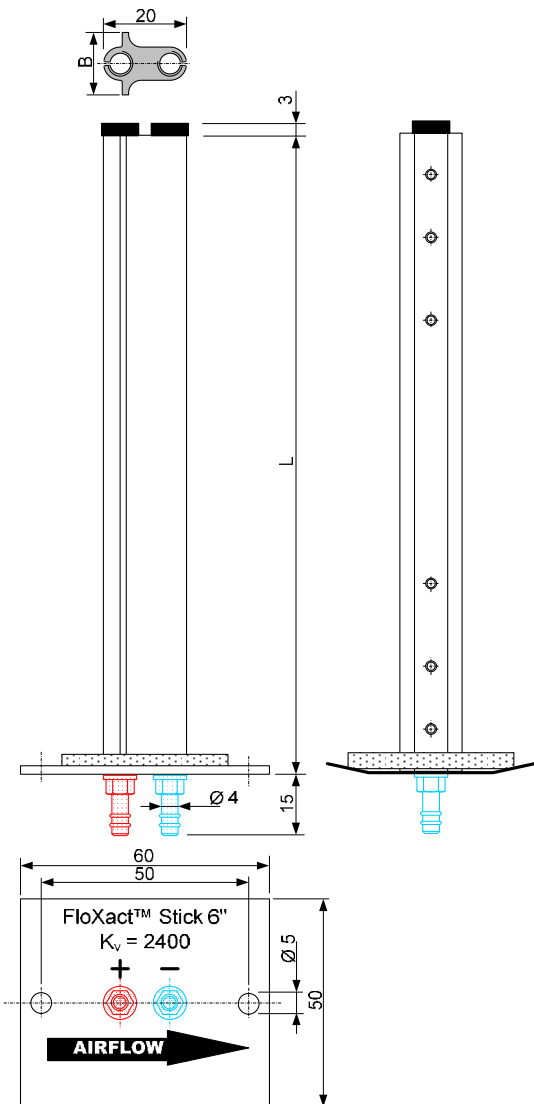


Operation of the FloXact™

Dimensions

FloXact™-R available models :
100, 125, 160, 200, 250, 315, 400 and 450

FloXact™-L available models :
250, 300, ... 1200 (50mm steps)



AIR VELOCITY TRANSMITTER

AVT

The AVT is an electronic air velocity and temperature transmitter with optional relay output for air and non-combustible gasses.

Usage

AVT is used in HVAC and building automation systems.

Applications

Monitoring air velocity and temperature in ducts and laminar flow cabinets, and at ventilators and dampers.



Air velocity and temperature transmitter with relay output

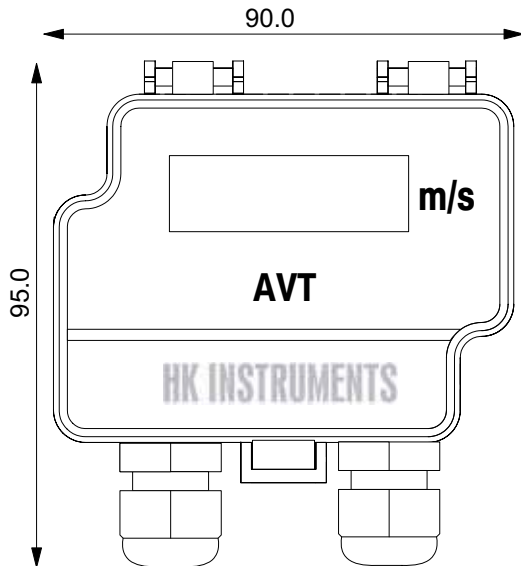
TECHNICAL DETAILS

Accuracy:	Range 0...2 m/s <0,1m/s +5% from reading Range 0...10 m/s <0,5m/s +5% from reading Range 0...20 m/s <1,0m/s +5% from reading
Supply voltage:	24 VDC \pm 10% / 24 VAC \pm 10%
Power consumption:	35mA (50mA with relay) + 40mA with mA outputs
Output signal 1:	0...10V (linear to °C), L min 1k Ω or 4...20mA (linear to °C), L max 400 Ω
Output signal 2:	0...10V (linear to m/s), L min 1k Ω or 4...20mA (linear to m/s), L max 400 Ω
Optional relay output:	Potential free SPDT 250VAC, 6A / 30VDC, 6A with adjustable switching point and hysteresis
Ambient temperature:	0...+50 °C
Probe:	Adjustable Immersion length 50...190mm, mounting flange included
Protection standard:	IP54

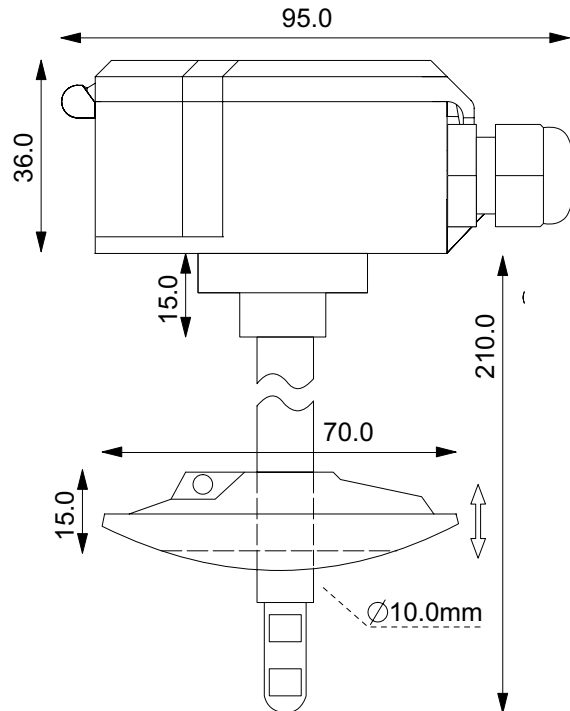
AVT

Product code	Product description	Measuring range (Pa)
117.004.001	AVT	0...2 / 0...10 / 0...20 m/s
117.004.002	AVT-D	0...2 / 0...10 / 0...20 m/s
117.004.003	AVT-R	0...2 / 0...10 / 0...20 m/s

Dimensions



Dimensions of probe



ACCESSORIES
SEE PAGE 50

LIQUID PRESSURE TRANSMITTERS

These robust devices are the right choice when looking for reliable pressure instruments for liquids.

PTL	Absolute pressure transmitters for liquids	47
DPTL	Differential pressure transmitters for liquids	47



PTL



DPTL

PTL

The PTL is a pressure transmitter for pressure detection in liquids for air-conditioning, heating and water systems. Suitable for plants that use refrigerants.

TECHNICAL DETAILS

Accuracy (typ.):	±0,7%
Power:	15...24VDC/VAC
Output:	0...10V or 4-20 mA
Housing:	IP65
Pressure connector:	G1/4" (G1/2" adaptor included)
Ambient temperature:	-40...105°C

DPTL

Code	Product	Measuring range (bar)
112.001.001	PTL4/V	0...4bar
112.002.001	PTL6/V	0...6bar
112.003.001	PTL10/V	0...10bar
112.004.001	PTL16/V	0...16bar
112.005.001	PTL25/V	0...25bar
112.001.002	PTL4/A	0...4bar
112.002.002	PTL6/A	0...6bar
112.003.002	PTL10/A	0...10bar
112.004.002	PTL16/A	0...16bar
112.005.002	PTL25/A	0...25bar



DPTL

The DPTL is made for differential pressure detection in liquids for air-conditioning, heating and water systems. The equipment can withstand mildly corrosive substances and liquids.

TECHNICAL DETAILS

Accuracy from FS:	±1%
Power:	15...24VDC/VAC
Output:	0...10V or 4-20 mA
Housing:	IP54
Pressure connector:	inside thread G1/4"
Ambient temperature:	-10...50°C

DPTL

Code	Product	Measuring range (bar)
111.001.001	DPTL1/V	0...1bar
111.002.001	DPTL2,5/V	0...2,5bar
111.003.001	DPTL4/V	0...4bar
111.004.001	DPTL6/V	0...6bar
111.001.002	DPTL1/A	0...1bar
111.002.002	DPTL2,5/A	0...2,5bar
111.003.002	DPTL4/A	0...4bar
111.004.002	DPTL6/A	0...6bar



ACCESSORIES
SEE PAGE 50

CO-TRANSMITTERS

Environments such as parking garages can be extremely dangerous if the ventilation is not working properly. Therefore, it is absolutely necessary to have the right instruments to monitor the CO-gas levels.

CMT	Carbon monoxide transmitter	49
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CMT

CMT

The CMT is an easy-to-use, reliable transmitter for detecting CO-gas. It is commonly used in places where air includes CO-gas emissions, such as parking garages.

TECHNICAL DETAILS

Power:	20...28 Vdc
Output:	4-20 mA (2-wire)
Housing:	IP65
Ambient temperature:	-10...40°C

CMT

Code	Product	Measuring range	Linearity	Cross sensitivity
115.001.001	CMT	0...300 ppm CO	≤ 2% on 300 ppm CO	≤ 2% on 300 ppm CO



ACCESSORIES
SEE PAGE 50

ACCESSORIES

		DPT (all models)	DPT-FLOW (-U)	DPI	AVT	PS	DPG	MM	MMU	MMK	DPTL	PTL	CMT
STANDARD ACCESSORIES*													
Product code	Product description												
T00122	Mounting screw	x	x	x	x	x	x	x	x	x			x
T00109	PVC tube 4/7 matt finish 2m	x	x	x	x	x	x	x	x	x			
T00104	Duct connector, plastic for d=4mm tube (80mm)	x	x	x	x	x	x		x				
T00102	Gauge fluid 0,786 30ml (Red)						x	x	x				
T00112	Attention stickers red/green						x						
T00123	Adaptor G1/4" to G1/2"											x	
*Supplied with single packed product													
OPTIONAL ACCESSORIES**													
Product code	Product description												
T00100	Calibration certificate (0, 50%, 100%)	x	x	x	x	x	x	x	x	x			
T00121	Display, DPT	x		x	x								
T00118	Display, DPT-FLOW		x										
T00120	PVC tube 4/7 matt (100m)	x	x	x		x	x	x	x	x			
T00110	Accessory pack (tube, duct connectors)	x	x	x		x	x	x	x	x			
T00111	Accessory pack for DPG flush mounting						x						
T00114	Mounting plate, PS, aluminium					x							
T00103	Gauge fluid 0,786 250ml (Red)							x	x	x			
T00103	Gauge fluid 1,870 20ml (Blue)							x					
T00105	Duct connector, metallic for d=4mm tube (40mm)	x	x	x		x	x	x	x	x			
T00106	Duct connector, metallic for d=4mm tube (100mm)	x	x	x		x	x	x	x	x			
T00107	T-connector for d=4mm tube	x	x	x		x	x	x	x	x			
T00115	Mounting screw for PS/DPG/DPT ZN M4x20 (1000pcs)	x	x	x	x	x	x	x	x	x			x
139xxx	Flow scale					x							
T00124	Screw connection set 8mm bras										x		

**to be ordered separately



HK INSTRUMENTS – TERMS AND CONDITIONS

1. Applicability of the Terms and Conditions. These terms and conditions shall be applied to trade in devices, components and accessories between HK Instruments Oy and the customer, unless the parties have otherwise mutually agreed in writing. These conditions do not apply to trade by agents, to which the manufacturer's conditions of sale shall be applied.

2. Price. The prices in effect at the time the offer is made form the basis of pricing. All prices exclude VAT. If changes occur in customs, freight, VAT or other general payments related to the delivery before the date of delivery, the seller has the right to change the price of the goods in the same proportion that said changed prices or payments affected the price of the goods.

3. Offer. The seller's offer is binding and it is valid for 30 days unless otherwise agreed. Provided the seller's offer is tendered under intermediary terms and conditions of sale, an immediate in storage offer is denoted whereby the goods may be sold to a third party during the period the offer is valid and the seller does not guarantee the inventory is sufficient.

4. Contract. A contract between the seller and the buyer is deemed to have been established when

- the parties have signed a written contract (purchase agreement)
- the buyer has approved a binding offer in writing (order) or
- the seller has confirmed in writing as such an order other than one based on an offer or an order different from the offer (order confirmation)

5. Drawings and Descriptions. The information on prices, measurements, weights and performances given in descriptions, photos, memos, drawings, directories and price lists and other information containing technical and other details have been given without obligations, unless specifically referred to in the offer. All technical drawings and documents needed for the manufacture of the product or its component, which one party has provided to the other party prior to, or after the signing of the contract, shall remain the property of the provider. The receiving party may not, without the provider's consent, use, copy, surrender or divulge by other means information regarding them to a third party.

6. Condition of Delivery. The condition of delivery is free seller's storage (re: Incoterms 2000 EXW) unless otherwise agreed.

7. Packaging. The prices stated in price lists and directories apply to unpacked products.

8. Time of Delivery. Unless the time of delivery is agreed, the seller shall stipulate the time of delivery. The goods are considered to have been delivered when handed over to a freight carrier for forwarding to the purchaser. When, according to the terms of the contract, the buyer has to collect the goods from the seller or from a place designated by the seller, the goods are deemed conveyed when the seller has notified the buyer that the goods are ready for delivery.

9. Conveyance and Examination of the Goods. On acceptance of the goods, the customer must make sure that the delivered goods correspond with the packing list and are externally undamaged. Before using, connecting, or installing the goods, the customer must again examine the goods to ensure their flawless condition. Complaints regarding errors or deficiencies must be made to the seller without delay, at the latest within 8 days of the conveyance of the goods.

10. Force Majeure. The seller is not liable to fulfill the contract if an obstacle the seller is unable to overcome exists regarding the contract, or if fulfilling the contract would require sacrifices that are unreasonable compared to the advantage for the buyer should the seller fulfill the contract. If said obstacle or disparity ceases to exist within a reasonable period of time, the

buyer has the right to demand that the seller fulfill the contract. When the manufacturer or the party from which the seller obtains the goods has not fulfilled the terms of his contract thus causing the seller's delivery to be delayed or not completed, the seller is not obligated to compensate the buyer for any potential losses. The buyer does not have the right to request a new delivery to replace a flawed product if an obstacle as noted in this section exists for the seller. When completion of the contract within a reasonable period of time becomes impossible due to factors noted in this section, both parties are entitled to cancel the contract with no liability to compensate by notifying the other party of their intentions in writing.

11. Payment. The payment period starts from the invoice date. In case of a delay in payment, the buyer is liable for compensating the seller according to his/her rate of interest and paying the expenses arising from the collection of payment.

12. Warranty. The seller is obligated to provide a warranty of 24 months for the delivered goods regarding material and manufacturing. The warranty period is considered to start on the delivery date of the product. If a defect in raw materials or a production flaw is found, the seller is obligated, when the product is sent to the seller without delay or before expiration of the warranty, to amend the mistake at his/her discretion either by repairing the defective product or by delivering free of charge to the buyer a new flawless product and sending it to the buyer. Delivery costs for repair under warranty will be paid by the buyer and the return costs by the seller. The warranty does not comprise damages caused by accident, lightning, flood or other natural phenomenon, normal wear and tear, improper or careless handling, abnormal use, overloading, improper storage, incorrect care or reconstruction, or changes and installation work not done by the seller or his/her authorized representative. The selection of materials for devices prone to corrosion is the buyer's responsibility, unless otherwise is legally agreed upon. Should the manufacturer alter the structure of the device, the seller is not obligated to make comparable changes to devices already purchased. Appealing for warranty requires that the buyer has correctly fulfilled his/her duties arisen from the delivery and stated in the contract. The seller will give a new warranty for goods that have been replaced or repaired within the warranty, however only to the expiration of the original product's warranty time. The warranty includes the repair of a defective part or device, or if needed, a new part or device, but not installation or exchange costs. Under no circumstance is the seller liable for damages compensation for indirect damage.

13. Returns. The sale made is binding and irrevocable and the seller is not liable to accept the return of a product. Products delivered according to contract are taken back and products reimbursed up to 70% provided the seller has, prior to the return of the product, agreed to it. Returned products may be taken back and credited provided they are in the original package and in original condition.

14. Notifications. The sender is responsible for ensuring the arrival of notifications sent to the other party.

15. Ownership. Ownership of the product is passed to the buyer when the price is paid in full.

16. Disagreements. Disagreements concerning contracts and related stipulations should be settled primarily by the parties to the contract. In case a settlement cannot be reached, the dispute shall be resolved in Finland in the lower court at the domicile of the seller.

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