



Catalogue | 2021



S+S REGELTECHNIK



EtherCAT[®] P

Modbus



SENSOR TECHNOLOGY & FIELD DEVICES

5 JAHRE GARANTIE
 ★★★★★
 YEARS WARRANTY
 MADE IN GERMANY

Full Catalogue Facility Engineering & Industrial Design



Scraping the Skies with S+S

In two decades, S+S Regeltechnik has clearly shown that innovative sensor technology 'made in Germany' is also highly competitive abroad. The latest expansion at our new site in Nuremberg underscores this claim and affirms our expectations for further growth in this market.

The rising demand for smart sensor and control devices is characterised by three strong trends, amongst others: interconnectivity, room air control, and digitalisation. Our current innovations are addressing these developments. With devices for cabinet-free automation using the fast EtherCAT P industrial bus, with particulate matter sensors for measuring and minimising respirable aerosols, and with providing product data for intelligent Building Information Modeling (BIM).

Take advantage of these advanced technologies in your planning and equipment of buildings and plants as well as in their efficient operation. And scrape the skies – with us, for our mutual success!

Tino Schulze

General Manager
S+S Regeltechnik GmbH®

Heiko Linke

General Manager
S+S Regeltechnik GmbH®





S+S REGELTECHNIK

S+S Continues to Grow

ON GOOD COURSE TO BECOMING THE #1 PLAYER IN THE MARKET

At the turn of the year and two decades after the foundation of S+S, we have commissioned our new gigafactory in the north of Nuremberg. And we are determined to establish ourselves at the very top of the market for high-quality sensor technology 'made in Germany'.

With the completion of the first construction phase, this is now backed by a 4000 m² production building with manufacturing facilities, test centre, warehouse and shipping area. Another 2000 m² are available for development, marketing, sales and administration.

The new plant has been custom-designed to support our vertical integration, which builds on lean structures, short response times and swift order processing. The manufacturing and development facilities are equipped with state-of-the-art technology. Underfloor heating and full air conditioning ensure a pleasant working climate.

In view of the rising demand for our sensor and control technology, the second construction phase is already in preparation to add another 2600 m². Altogether, this puts us in a perfect position to successfully implement our strategic growth targets.



The new S+S headquarters on the Nordostpark industrial grounds in Nuremberg, Bavaria, combines a seamlessly integrated environment for manufacturing and development with good access to the airport and to the motorway network



ETHER CAT P MEASURING TRANSDUCER



Temperature sensors

ATM 2 - EtherCATP	Outside temperature sensor	NEW	039
TM 65 - EtherCATP	Duct / immersion / screw-in temperature sensor	NEW	041
MWTM - EtherCATP	Mean-value temperature sensor	NEW	047
HFTM - EtherCATP	Sleeve sensor with cable	NEW	049
ALTM 2 - EtherCATP	Surface-contact temperature sensor with cable	NEW	051

Humidity sensors

AFTF - EtherCATP	On-wall humidity/temperature sensor	NEW	055
KFTF - EtherCATP	Duct humidity/temperature sensor	NEW	059

Pressure sensors

PREMASGARD® 612x - EtherCATP	Pressure measuring transducer (Differential pressure, volume flow)	NEW	063
---------------------------------	--	------------	-----

Special accessories

see chapter Accessories		NEW	619
-------------------------	--	------------	-----

EtherCAT[®] P

Fast standard industrial bus with communication and power on one cable



MODBUS MEASURING TRANSDUCER



Room control units

RYMASKON® 200	Room control units for room automation	075
RYMASKON® 400	Room control units for room automation	073
RFTF - Modbus-xx	Room control units, on-wall	077
RTM1 - Modbus	Room control units, on-wall	079
RFTM - CO2 - Modbus - P	Room control units, on-wall	125
FSFTM - Modbus-xx	Room control units, in-wall	101/127

Temperature sensors

RTM1 - Modbus	Room temperature sensor	079
RPTM1 - Modbus - T3	Room pendulum temperature sensor	095
RPTM2 - Modbus - T3	Room pendulum temperature sensor	097
HFTM - Modbus - T3	Sleeve sensor with cable	089
ALTM1 - Modbus - T3	Surface-contact temperature sensor	091
ALTM 2 - Modbus - T3	Surface-contact temperature sensor with cable	093
ATM 2 - Modbus - T3	Outside temperature sensor	081
TM 65 - Modbus - T3	Duct / immersion / screw-in sensor	083
MWTM - Modbus - T3	Mean-value temperature sensor	087

Humidity sensors

FSFTM - Modbus	In-wall humidity temperature sensor	101
RFTF - Modbus	Room humidity / temperature sensor	099
RPFTF - Modbus - T3	Room pendulum humidity temperature sensor	107
VFTF - Modbus - T3	Showcase humidity temperature sensor	109
AFTF - Modbus - T3	On-wall humidity temperature sensor	103
KFTF - Modbus - T3	Duct humidity temperature sensor	105
TW - Modbus - T3	Dew point control switch	113

Pressure sensors

PREMASGARD® 232x - Modbus - T3	Pressure measuring transducer (Differential pressure)	117
PREMASGARD® 841x - Modbus	Duct sensor for humidity, temperature with Pressure measuring transducer (differential pressure, volume flow)	121

CO2, VOC and fine dust sensor

FSFTM - CO2 - Modbus	In-wall sensor for moisture, temperature, Air quality (VOC), CO2	127
RFTM - LQ - PS - CO2 - Modbus	Room sensor for moisture, temperature, air quality (VOC), CO2 and fine dust (PM)	NEW 125
AFTM - LQ - CO2 - Modbus	On-wall sensor for humidity, temperature, Air quality (VOC), CO2	131
KFTM - LQ - CO2 - Modbus	Duct sensor for humidity, temperature, Air quality (VOC), CO2	135

Special accessories

LA - Modbus	Line termination device	NEW 137
KA2 - Modbus	Communication adapter	NEW 139
see chapter Accessories		NEW 618

**POWER IO
BUILDING AUTOMATION****Main components**

powerIO®-Box	Decentralised automation box	NEW	069
powerIO®-Line	Hybrid cable	NEW	069
powerIO®-Start Unit	Switch	NEW	069
powerIO®-Starter Set	Starter set with basic components	NEW	068

Expansion components

powerIO®-Bluetooth Dongle	Communication with powerIO®-App	NEW	070
powerIO®-Rio1	Expansion box	NEW	070
powerIO®-Hub	Distributor	NEW	070
powerIO®-C100_ETH	Expansion board Ethernet	NEW	070
powerIO®-C100_RS485	Expansion board RS485	NEW	070
powerIO®-C100_RS232	Expansion board RS232	NEW	070

Special accessories

see product page		NEW	071
------------------	--	------------	------------

power IO

The system for decentralised building automation

NEW**RADIO SENSOR
RADIO TRANSMITTER / RADIO RECEIVER****KYMASGARD® 9000****EnOcean radio transmitter**

RFTM-FSE	Room temperature radio sensor	581
RFTM-FSE-ST	Room control unit / Room temperature radio sensor	581
RFTM-LQ-FSE	Room radio sensor for humidity, temperature and air quality	581
RFTM-BW-FSE	Room radio sensor for humidity, temperature and motion	581

EnOcean radio transmitters

RTF2-FSE	Room temperature radio sensor	582
RFTF2-FSE	Room humidity / temperature radio sensor	582
RTF2-FSE-P	Room temperature radio sensor	583
RFTF2-FSE-P	Room humidity / temperature radio sensor	583
RTF2-FSE-PT	Room temperature radio sensor	584
RFTF2-FSE-PT	Room humidity / temperature radio sensor	584
RTF2-FSE-PD	Room temperature radio sensor	585
RFTF2-FSE-PD	Room humidity / temperature radio sensor	585
RTF2-FSE-PDT	Room temperature radio sensor	586
WT-FSE	Wall pushbutton	587
FK1-FSE	Door/window contact	589
HT4-FSE	Hand-held remote control unit	588
IN400-FSE-UP	Pushbutton interface, in-wall	596
AFTF-HK-FSE	Outside radio sensor for humidity, temperature and light intensity	600
AWFS-HK-FSE	Outside radio sensor for wind strength and light intensity	601

EnOcean radio signal receivers

JA100-FEM-UP	Venetian blind actuator, in-wall	591
SA100-FEM-UP	Switching actuator, in-wall	592
SA200-FEM-UP	Switching actuator, in-wall	593
TA100-FEM-UP	Thermostat actuator, in-wall	594
TA200-FEM-UP	Thermostat actuator, in-wall	595
JA200-FEM-UP	Venetian blind actuator, on-wall	597
SA400-FEM-UP	Switching actuator, on-wall	598
SV600-FEM-AP	Dimming actuator, on-wall	599

EnOcean Gateway

GW-RS485-FEM	Gateway for RS485 bus	590
---------------------	-----------------------	------------

EnOcean communication

USB-FEM	USB communication stick	579
----------------	-------------------------	------------



enocean®

TEMPERATURE SENSORS PASSIVE



Room sensors

DTF	In-ceiling temperature sensor	163
RTF	Room temperature sensor, on-wall	145
FSTF	Room temperature sensor, in-wall	155
RPTF 1	Room pendulum temperature sensor	224
RPTF 2	Room pendulum temperature sensor	225
RSTF	Room radiation temperature sensor	227
RTF-xx	Room control units, on-wall	148
FSTF-xx	Room control units, in-wall	156

Cable sensors, surface-contact sensors, outdoor sensors

TF 43/65-F	Immersion / duct / screw-in sensor	177
HTF	Sleeve temperature sensor with cable	214
OFTF	Surface temperature sensor	219
ALTF 1	Surface-contact temperature sensor	220
ALTF 2/02	Surface-contact temperature sensor	223/222
ATF 1/01	Outside temperature sensor	165/164
ATF 2	Outside temperature sensor	167

Duct, immersion, screw-in sensors

TF 43/65	Duct / immersion / screw-in sensor	172/170
TF 43/65-F	Duct / immersion / screw-in sensor with cable	177
TF 54	Duct / immersion / screw-in sensor	188
MWTF/SD	Mean-value temperature sensor	183
ETF 6	Screw-in sensor with neck tube	196
ETF 7	Screw-in sensor, fast-acting	185
RGTF 2	Smoke gas screw-in sensor	209
RGTF 1	Smoke gas duct sensor	203
HTF	Sleeve sensor with cable	214

Radiation temperature sensors

ASTF	On-wall radiation temperature sensor	226
------	--------------------------------------	-----

TEMPERATURE SENSOR ACTIVE MEASURING TRANSDUCER



Room sensors

RTM 1	Room temperature measuring transducer	231
FSTM	Room temperature sensor, in-wall	233
RPTM 1	Room pendulum temperature measuring transducer	291
RPTM 2	Room pendulum temperature measuring transducer	293
HSM	Top-hat rail measuring transducer	295

Cable sensors, surface-contact sensors, outdoor sensors

HFTM	Sleeve sensor with measuring transducer	275
HFTM-VA	Sleeve sensor with measuring transducer (Stainless steel housing Tyr 2E)	NEW 279
ALTM 1	Surface-contact temperature measuring transducer	281
ALTM 2	Surface-contact temperature measuring transducer	285
ALTM 2-VA	Surface-contact temperature measuring transducer (Stainless steel housing Tyr 2E)	NEW 289
ATM 2	Outside temperature measuring transducer	237
ATM 2-VA	Outside temperature measuring transducer (Stainless steel housing Tyr 2E)	NEW 241

Duct, immersion, screw-in sensors

TM 43/65	Duct / immersion / screw-in temperature measuring transducer	245
TM 54	Duct / immersion / screw-in temperature measuring transducer	255
MWTM/SD	Mean-value temperature measuring transducer	251
RGTM 1	Smoke gas temperature measuring transducer	263
RGTM 2	Smoke gas temperature measuring transducer	269

TEMPERATURE CONTROLLERS / THERMOSTATS



Room temperature controllers

RTR-B	Room temperature controller	299
RTR-S	Room temperature controller, fan coil controller	301
RTR-E-UP	Room temperature controller, clock thermostat	305
TET	Top hat rail measuring transducer	337

Built-in controllers, duct controllers

ETR	Built-in temperature controller	313
KTR	Duct temperature controller	319
TR 040/060	Temperature controller	306
TR 22	Temperature controller	307
TR 04040	Temperature controller, two-step	308
TR xx-F	Temperature controller with remote sensor	309

Thermostats

ALTR xx	Surface-contact thermostats	322/323
FST	Frost protection thermostat, mechanical	327
FST-K	Duct frost protection thermostat, mechanical	331
FS-20	2-phase frost protection thermostat, two-step, switching	335

HUMIDITY SENSORS

HUMIDITY CONTROLLERS / HYGROSTATS



Room sensors

RFF/RFTF	Room humidity sensor, on-wall	345
FSFM/FSFTM	Room humidity sensor, in-wall	347
RPFF-SD	Room pendulum humidity sensor	393
RPFF/RPFTF	Room pendulum humidity sensor	397
RPFF/RPFTF-25	Room pendulum humidity sensor, pluggable	401
VFF/VFTF	Showcase humidity sensor	405
DFF/DFTF	In-ceiling humidity sensor	351

On-wall sensors, outdoor sensors

AFF/AFTF-SD	On-wall humidity sensor	355
AFF/AFTF	On-wall humidity sensor	360
AFF/AFTF-20	On-wall humidity sensor	363
AFF/AFTF-25	On-wall humidity sensor, pluggable	361
AFTF-20-VA	On-wall humidity sensor (Stainless steel housing Tyr 2E)	NEW 369
AAVTF	On-wall humidity sensor	373

Duct sensors

KFF/KFTF-SD	Duct humidity sensor	378
KFF/KFTF	Duct humidity sensor	379
KFF/KFTF-20	Duct humidity sensor	381
KFTF-20-VA	Duct humidity sensor (Stainless steel housing Tyr 2E)	NEW 387
KAVTF	Duct humidity sensor	391

Hygrostats

RH-2	Room hygrostat, one-step	407
KH-10	Duct hygrostat, one-step	419
KH-40	Duct hygrostat, one-step	421
AH-40	On-wall hygrostat, one-step	413
RHT	Room hygrothermostat	406
RHT-30	Room hygrothermostat, two-step	411
KHT-30	Duct hygrothermostat, two-step	425
AHT-30	On-wall hygrothermostat, two-step	417

Control switches

KW/KW-SD	Condensation control switch	429/428
TW	Dew point control switch	433
LS	Leakage sensor	435



S+S REGELTECHNIK

**PRESSURE SENSORS
PRESSURE CONTROLLERS / SWITCHES****for gaseous media**

PREMASGARD® 111x / 112x / SD	Pressure measuring transducer [mbar/Pa], Differential pressure sensor	450/451
PREMASGARD® 211x / 212x / SD	Pressure measuring transducer [mbar/Pa], Differential pressure sensor	445/444
PREMASGARD® 711x	Pressure measuring transducer [mbar/Pa], Differential pressure sensor	457
PREMASGARD® 711x-VA	Pressure measuring transducer [mbar/Pa], Differential pressure sensor (Stainless steel housing Tyr 2E)	NEW 463
PREMASREG® 711x	Pressure measuring transducer [mbar/Pa], Differential pressure switch	469
PREMASREG® 711x-VA	Pressure measuring transducer [mbar/Pa], Differential pressure switch (Stainless steel housing Tyr 2E)	NEW 475
ALD	Measuring transducer [mbar] atmospheric pressure	489
DS1 / DS2	Differential pressure switch [mbar/Pa]	493
for volume flow		
PREMASREG® 716x	Pressure measuring transducer [mbar/Pa], Volume flow / differential pressure switch	481
PREMASREG® 716x-VA	Pressure measuring transducer [mbar/Pa], Volume flow / differential pressure switch (Stainless steel housing Tyr 2E)	NEW 487
for liquid media		
SHD / SHD-SD	Pressure measuring transducer [bar]	495
SHD400	Pressure measuring transducer [bar]	497

**LIGHT INTENSITY SENSORS
MOTION DETECTORS / PRESENCE DETECTORS****Light intensity sensors**

AHKF	Outdoor light intensity sensor	507
RHKF	Room light intensity sensor	506
DHKF	In-ceiling light intensity sensor	509

Motion detectors

ABWF	Outdoor motion detector	511
RBWF	Room motion detector	510
DBWF/DBWF-C	In-ceiling motion detector	513

Motion and light intensity sensors

ABWF/LF	Outdoor motion detector / light intensity sensor	517
RBWF/LF	Room motion detector / light intensity sensor	515
DBWF/LF/FTF	In-ceiling sensor for temperature, humidity, motion and light intensity	519

**IMMERSION SLEEVES
ACCESSORIES / SPARE PARTS****Immersion sleeves**

TH08	Immersion sleeves for temperature sensors	604
TH	Immersion sleeves for temperature sensors	606
THR	Immersion sleeves for temperature controllers	608
THE	Immersion sleeves for sleeve sensors	610

Mounting accessories

MF-xx	Mounting flanges	612/ 613
KRD-04	Capillary tube leadthrough, plastic	612
MK-xx	Mounting clamps	613
ESSH	Welding protection sleeve	614

Accessories for differential pressure switches **615**Protection hoods **616**Other accessories and spare parts **617****AIR QUALITY
SENSORS****Gas mixture sensor (VOC)** * W with changeover contact

RLQ-SD	Room air quality sensor	529
RLQ-W	Room air quality sensor	* 529
KLQ-SD	Room air quality sensor	557
KLQ-W	Room air quality sensor	* 557

Carbon dioxide sensor (CO2)

FSCO2	Room CO2 sensor, in-wall	545
FSTM-CO2	Room temperature / CO2 sensor, in-wall	545
RCO2-A NT ST	CO2 traffic light (table-top unit) / room CO2 sensor with LED display, wall power supply, metal support	NEW 531

RCO2-A NT	CO2 traffic light (wall unit) / room CO2 sensor with LED display, wall power supply	NEW 531
------------------	---	----------------

RCO2-A UPNT	CO2 traffic light (wall unit) / room CO2 sensor with LED display, in-wall power supply	NEW 531
--------------------	--	----------------

RCO2-SD	Room CO2 sensor	535
----------------	-----------------	------------

RCO2-W	Room CO2 sensor	* 535
---------------	-----------------	--------------

RTM-CO2-SD	Room temperature / CO2 sensor	539
-------------------	-------------------------------	------------

RFTM-CO2-W	Room humidity / temperature / CO2 sensor	* 539
-------------------	--	--------------

ACO2-SD	On-wall CO2 sensor	547
----------------	--------------------	------------

ACO2-W	On-wall CO2 sensor	* 547
---------------	--------------------	--------------

ATM-CO2-SD	On-wall temperature / CO2 sensor	553
-------------------	----------------------------------	------------

AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor	* 553
-------------------	---	--------------

KCO2-SD	Duct CO2 sensor	561
----------------	-----------------	------------

KCO2-W	Duct CO2 sensor	* 561
---------------	-----------------	--------------

KTM-CO2-SD	Duct temperature / CO2 sensor	567
-------------------	-------------------------------	------------

KFTM-CO2-W	Duct humidity / temperature / CO2 sensor	* 567
-------------------	--	--------------

Fine dust sensor (PM)

RPS-SD	Room fine dust sensor	NEW 543
---------------	-----------------------	----------------

RFTM-PS-W	Room humidity / temperature / fine dust sensor	NEW 543
------------------	---	----------------

**Multifunctional air quality sensor
(VOC / CO2 / PM)**

RLQ-CO2-W	Room air quality CO2 sensor	* 539
------------------	-----------------------------	--------------

RFTM-LQ-CO2-W	Room humidity / temperature / air quality / CO2 sensor	* 539
----------------------	---	--------------

RFTM-PS-CO2-W	Room humidity / temperature / fine dust / CO2 sensor	NEW* 543
----------------------	---	-----------------

ALQ-CO2-W	On-wall air quality / CO2 sensor	* 553
------------------	----------------------------------	--------------

AFTM-LQ-CO2-W	On-wall humidity / temperature / air quality / CO2 sensor	* 553
----------------------	--	--------------

KLQ-CO2-W	Duct air quality / CO2 sensor	* 567
------------------	-------------------------------	--------------

KFTM-LQ-CO2-W	Duct humidity / temperature / air quality / CO2 sensor	* 567
----------------------	---	--------------

**AIRFLOW MONITORS
FLOW SENSORS / CONTROLLERS****Airflow monitors**

KLGF	Duct airflow monitor, electronic	569
-------------	----------------------------------	------------

KLSW	Duct airflow monitor, electronic	569
-------------	----------------------------------	------------

SW	Flow monitor, mechanical	573
-----------	--------------------------	------------

TYPE		PAGE
A		
AAVTF	Outdoor humidity sensor	373
ABWF	Outdoor motion detector	511
ABWF/LF	Outdoor motion detector and light sensor	517
ACO2-Modbus	On-wall CO2 sensor	131
ACO2-SD	On-wall CO2 sensor	547
ACO2-W	On-wall CO2 sensor	547
AFF	On-wall humidity sensor	360
AFF-20	On-wall humidity sensor	363
AFF-25	On-wall humidity sensor, pluggable	361
AFF-SD	On-wall humidity sensor	355
AFTF	On-wall humidity / temperature sensor	360
AFTF-20	On-wall humidity / temperature sensor	363
AFTF-20-VA	On-wall humidity / temperature sensor in stainless steel housing	NEW 369
AFTF-25	On-wall humidity / temperature sensor, pluggable	361
AFTF-HK-FSE	Outdoor radio sensor for humidity, temperature and light intensity	600
AFTF-EtherCATP	On-wall humidity / temperature sensor	NEW 055
AFTF-Modbus-T3	On-wall humidity / temperature sensor	103
AFTF-SD	On-wall humidity / temperature sensor	355
AFTM-CO2-Modbus	On-wall humidity / temperature / CO2 sensor	131
AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor	553
AFTM-LQ-CO2-Modbus	On-wall humidity / temperature / Air quality / CO2 sensor	131
AFTM-LQ-CO2-W	On-wall humidity / temperature / air quality / CO2 sensor	553
AHKF	Outdoor light intensity sensor	507
AH-40	On-wall hygostat, one-step	413
AHT-30	On-wall hygrothermostat, two-step	417
ALD	Measuring transducer for atmospheric pressure	489
ALQ-CO2-Modbus	On-wall air quality / CO2 sensor	131
ALQ-CO2-W	On-wall air quality / CO2 sensor	553
ALTF 1	Surface-contact temperature sensor	220
ALTF 02	Surface-contact temperature sensor	222
ALTF 2	Surface-contact temperature sensor	223
ALTM 1	Surface-contact temperature measuring transducer	281
ALTM 1-Modbus-T3	Surface-contact temperature measuring transducer	091
ALTM 2	Surface-contact temperature measuring transducer	285
ALTM 2-EtherCATP	Surface-contact temperature measuring transducer	NEW 051
ALTM 2-Modbus-T3	Surface-contact temperature measuring transducer	093
ALTM 2-VA	Surface-contact temperature measuring transducer in stainless steel housing	NEW 289
ALTR 060	Surface-contact thermostats	322
ALTR 090	Surface-contact thermostats	322
ALTR 1	Surface-contact thermostats	323
ALTR 3	Surface-contact thermostats	323
ALTR 5	Surface-contact thermostats	323
ALTR 7	Surface-contact thermostats	323
ASTF	On-wall radiation temperature sensor	226

TYPE		PAGE
ATF 01	On-wall temperature sensor	164
ATF 1	On-wall temperature sensor	165
ATF 2	On-wall temperature sensor	167
ATM 2	On-wall temperature measuring transducer	237
ATM 2-EtherCATP	On-wall temperature measuring transducer	NEW 039
ATM 2-Modbus-T3	On-wall temperature measuring transducer	081
ATM 2-VA	On-wall temperature measuring transducer in stainless steel housing	NEW 241
ATM-CO2-SD	On-wall temperature / CO2 sensor	553
AWFS-HK-FSE	Outdoor radio sensor for wind strength and light intensity	601
D		
DBWF	In-ceiling motion detector	513
DBWF-C	In-ceiling motion detector	513
DBWF/LF/FTF	In-ceiling motion detector / light / temperature / humidity sensor	519
DFF	In-ceiling humidity sensor	351
DFTF	In-ceiling humidity sensor	351
DHKF	In-ceiling light intensity sensor	509
DTF	In-ceiling temperature sensor	163
DS 1	Differential pressure switch	493
DS 2	Differential pressure switch	493
E		
ETF 6	Screw-in sensor	196
ETF 7	Screw-in sensor	185
ETR	Built-in temperature controller	313
F		
FK 1-FSE	Door/window contact	589
FS-20	2-phase frost protection thermostat	335
FSCO2	In-wall CO2 sensor	545
FSFM	In-wall humidity sensor	347
FSFTM	In-wall humidity / temperature sensor	347
FSFTM-CO2-Modbus	In-wall humidity / temperature / CO2 sensor	127
FSFTM-Modbus	In-wall humidity / temperature sensor	101
FST	Frost protection thermostat, mechanical	327
FST-K	Duct frost protection thermostat, mechanical	331
FSTF	In-wall temperature sensor	155
FSTF-xx	Room control units, in-wall	156
FSTM	In-wall temperature sensor	233
FSTM-CO2	In-wall temperature / CO2 sensor	545
G		
GW-RS485-FEM	Gateway for RS485-Bus	590
H		
HFTM	Sleeve sensor with measuring transducer	275
HFTM-EtherCATP	Sleeve sensor with measuring transducer	NEW 049
HFTM-Modbus-T3	Sleeve sensor with measuring transducer	089
HFTM-VA	Sleeve sensor with measuring transducer in stainless steel housing	NEW 279
HSM	Top hat rail measuring transducer	295
HT4-FSE	Hand-held remote control unit	588
HTF-50	Sleeve temperature sensor	214
HTF-200	Sleeve temperature sensor, duct / immersion / screw-in sensor with cable	216
I		
IN 400-FSE-UP	Pushbutton interface, in-wall	596
J		
JA 100-FEM-UP	Venetian blind actuator, in-wall	591
JA 200-FEM-AP	Venetian blind actuator, on-wall	597
K		



TYPE		PAGE
KA2-Modbus	Communication adapter	NEW 139
KAVTF	Duct humidity sensor	391
KCO2-Modbus	Duct CO2 sensor	135
KCO2-SD	Duct CO2 sensor	561
KCO2-W	Duct CO2 sensor	561
KFF	Duct humidity sensor	379
KFF-20	Duct humidity sensor	381
KFF-SD	Duct humidity sensor	378
KFTF	Duct humidity / temperature sensor	379
KFTF-20	Duct humidity / temperature sensor	381
KFTF-20-VA	Duct humidity / temperature sensor in stainless steel housing	NEW 387
KFTF-EtherCATP	Duct humidity / temperature sensor	NEW 059
KFTF-Modbus-T3	Duct humidity / temperature sensor	105
KFTF-SD	Duct humidity sensor	378
KFTM-CO2-Modbus	Duct humidity / temperature / CO2 sensor	135
KFTM-CO2-W	Duct humidity / temperature / CO2 sensor	567
KFTM-LQ-CO2-Modbus	Duct humidity / temperature / air quality / CO2 sensor	135
KFTM-LQ-CO2-W	Duct humidity / temperature / air quality / CO2 sensor	567
KH-10	Duct hygostat, one-step	419
KH-40	Duct hygostat, one-step	421
KHT-30	Duct hygrothermostat, two-step	425
KLGF	Duct airflow monitor	569
KLSW	Duct airflow monitor	569
KLQ-CO2-Modbus	Duct air quality / CO2 sensor	135
KLQ-CO2-W	Duct air quality / CO2 sensor	567
KLQ-SD	Duct air quality sensor	557
KLQ-W	Duct air quality sensor	557
KTM-CO2-SD	Duct temperature / CO2 sensor	567
KTR	Duct temperature controller	319
KW	Condensation control switch	429
KW-SD	Condensation control switch	428
L		
LA-Modbus	Line termination device	NEW 137
LS	Leakage sensor	435
M		
MWTF	Mean-value temperature sensor	183
MWTF-SD	Mean-value temperature sensor	183
MWTM	Mean-value temperature measuring transducer	251
MWTM-SD	Mean-value temperature measuring transducer	251
MWTM-EtherCATP	Mean value temperature sensor	NEW 047
MWTM-Modbus-T3	Mean-value temperature sensor	087
O		
OFTF	Surface temperature sensor	219
P		
powerIO®	Installation system for building automation	NEW 068
PREMASGARD® 111x	Pressure measuring transducer, compact design	451
PREMASGARD® 112x	Pressure measuring transducer, compact design	451
PREMASGARD® 112x-SD	Pressure measuring transducer, compact design	450
PREMASGARD® 211x	Pressure measuring transducer, compact design	445
PREMASGARD® 212x	Pressure measuring transducer, compact design	445
PREMASGARD® 212x-SD	Pressure measuring transducer, compact design	444

TYPE		PAGE
PREMASGARD® 232x-Modbus-T3	Pressure measuring transducer	117
PREMASGARD® 612x-EtherCATP	Pressure measuring transducer (Differential pressure, volume flow)	NEW 063
PREMASGARD® 711x	Pressure measuring transducer	457
PREMASGARD® 711x-VA	Pressure measuring transducer in stainless steel housing	NEW 463
PREMASREG® 711x	Pressure measuring transducer / switch	469
PREMASREG® 711x-VA	Pressure measuring transducer / switch in stainless steel housing	NEW 475
PREMASREG® 716x	Volume flow sensor, Pressure measuring transducer / switch	481
PREMASREG® 716x-VA	Volume flow sensor, Pressure measuring transducer / switch in stainless steel housing	NEW 487
PREMASGARD® 814x-Modbus	Duct humidity / temperature sensor with pressure measuring transducer	121
R		
RBWF	Room motion detector	510
RBWF/LF	Room motion and light detector	515
RCO2-A NT	CO2 traffic light (wall unit) with wall power supply	NEW 531
RCO2-A NT ST	CO2 traffic light (table-top unit) with wall power supply, metal support	NEW 531
RCO2-A UPNT	CO2 traffic light (wall unit) with in-wall power supply	NEW 531
RCO2-Modbus	Room CO2 sensor	125
RCO2-SD	Room CO2 sensor	535
RCO2-W	Room CO2 sensor	535
RFF	Room humidity sensor	345
RFTF	Room humidity sensor	345
RFTF-Modbus	Room humidity / temperature sensor	099
RFTF-Modbus-xx	Room control units	077
RFTF2-FSE	Room humidity / temperature / radio sensor	582
RFTF2-FSE-P	Room humidity / temperature / radio sensor	583
RFTF2-FSE-PD	Room humidity / temperature / radio sensor	585
RFTF2-FSE-PT	Room humidity / temperature / radio sensor	584
RFTM-BW-FSE	Room humidity / temperature / motion radio sensor	581
RFTM-CO2-Modbus	Room humidity / temperature / CO2 sensor	125
RFTM-CO2-W	Room humidity / temperature / CO2 sensor	539
RFTM-FSE	Room humidity / temperature / radio sensor	581
RFTM-FSE-ST	Room control unit / Room humidity / temperature / radio sensor	581
RFTM-LQ-CO2-Modbus	Room humidity / temperature / air quality / CO2 sensor	125
RFTM-LQ-PS-CO2 Modbus	Room humidity / temperature / air quality / fine dust / CO2 sensor	NEW 125
RFTM-LQ-CO2-W	Room humidity / temperature / air quality / CO2 sensor	539
RFTM-LQ-FSE	Room humidity / temperature / VOC radio sensor	581
RFTM-PS-CO2-W	Room humidity / temperature / fine dust / CO2 sensor	NEW 543
RFTM-PS-W	Room humidity / temperature / fine dust sensor	NEW 543
RGTF 1	Smoke gas temperature sensor	203

TYPE		PAGE
RGTF2	Smoke gas temperature sensor	209
RGTM1	Smoke gas temperature measuring transducer	263
RGTM2	Smoke gas temperature measuring transducer	269
RH-2	Room hygrostat, one-step	407
RHKF	Room light intensity sensor	506
RHT	Room hygrothermostat	406
RHT-30	Room hygrothermostat, two-step	411
RLQ-CO2-Modbus	Room air quality CO2 sensor	125
RLQ-CO2-W	Room air quality CO2 sensor	539
RLQ-SD	Room air quality sensor	529
RLQ-W	Room air quality sensor	529
RPPF	Room pendulum humidity sensor	397
RPPF-25	Room pendulum humidity sensor, pluggable	401
RPPF-SD	Room pendulum humidity sensor	393
RPPTF	Room pendulum humidity / temperature sensor	397
RPPTF-25	Room pendulum humidity / temperature sensor, pluggable	401
RPPTF-Modbus-T3	Room pendulum humidity / temperature sensor	107
RPS-SD	Room fine dust sensor	NEW 543
RPTF1	Room pendulum temperature sensor	224
RPTF2	Room pendulum temperature sensor	225
RPTM1 291	Room pendulum temperature measuring transducer	
RPTM1-Modbus-T3	Room pendulum temperature sensor	095
RPTM2 293	Room pendulum temperature measuring transducer	
RPTM2-Modbus-T3	Room pendulum temperature sensor	097
RSTF	Room radiation temperature sensor	227
RTF	Room temperature sensor	145
RTF-xx	Room control units	148
RTF2-FSE	Room temperature radio sensor	582
RTF2-FSE-P	Room temperature radio sensor	583
RTF2-FSE-PD	Room temperature radio sensor	585
RTF2-FSE-PDT	Room temperature radio sensor	586
RTF2-FSE-PT	Room temperature radio sensor	584
RTM1	Room temperature measuring transducer	231
RTM1-Modbus	Room control units	079
RTM-CO2-SD	Room temperature CO2 sensor	539
RTR-B	Room temperature controller	299
RTR-S	Room temperature controller, fan coil controller	301
RTR-E-UP	Room temperature controller, clock thermostat	305
RYMASKON®200	Room control units for room automation	075
RYMASKON®400	Room control units for room automation	073
S		
SA100-FEM-UP	Switching actuator, in-wall	592
SA200-FEM-UP	Switching actuator, in-wall	593
SA400-FEM-AP	Switching actuator, on-wall	598
SHD	Pressure measuring transducer	495
SHD-SD	Pressure measuring transducer	495
SHD400	Differential pressure transmitter	497
SHD692	Differential pressure transmitter	499
SV600-FEM-AP	Dimming actuator, on-wall	599
SW	Flow monitor	573
T		
TA100-FEM-UP	Thermostat actuator, in-wall	594
TA200-FEM-UP	Thermostat actuator, in-wall	595
TET	Top hat rail measuring transducer	337
TF43	Duct / immersion / screw-in sensor	172
TF43-F	Duct / immersion / screw-in sensor with cable	177
TF54	Duct / immersion / screw-in sensor	188

TYPE		PAGE
TF65	Duct / immersion / screw-in sensor	170
TF65-F	Duct / immersion / screw-in sensor with cable	177
TM54	Duct / immersion / screw-in sensor	255
TM43	Duct / immersion / screw-in sensor	245
TM65	Duct / immersion / screw-in sensor	245
TM65-EtherCATP	Duct / immersion / screw-in sensor	NEW 041
TM65-Modbus-T3	Duct / immersion / screw-in sensor	083
TR22	Temperature controller	307
TR040	Temperature controller	306
TR04040	Temperature controller, two-step	308
TR060	Temperature controller	306
TRxx-F	Temperature controller with remote sensor	309
TW	Dew point control switch	433
TW-Modbus-T3	Dew point control switch	113
U		
USB-FEM	USB communication stick (radio program)	579
V		
VFF	Showcase humidity sensor	405
VFTF	Showcase humidity / temperature sensor	405
VFTF-Modbus-T3	Showcase humidity / temperature sensor	109
W		
WFS	Wind vane switch	571
WT-FSE	Wall pushbutton	587
Accessories		
ASD-06	Connection set	615
ASD-07	Connection nipple (90°)	615
ASS-UV	Connecting hose, UV-resistant	615
DAL	Pressure outlet	615
DS-MW	Mounting bracket, sheet steel	615
ESSH	Welding protection sleeve	614
HS-Adapter	Universal bracket (top-hat rails)	617
KRD-04	Capillary tube leadthrough, plastic	612
MF-xx-K	Mounting flanges, plastic	612
MF-xx-M	Mounting flanges, metal	613
MFT-20-K	Mounting flanges, plastic	612
MK-xx	Mounting clamps	613
Modbus-Y	Y-adapter for cable gland	617
SF-xx	Sinter filter, replaceable	617
TH-Adapter-HW	Immersion sleeve adapter	614
TH08	Immersion sleeves	604
TH	Immersion sleeves	606
THE	Immersion sleeves	610
THR	Immersion sleeves	608
PSW-09	Stainless steel paddle	617
PWFS-08	Stainless steel vane (WFS)	617
WLP-1	Heat-conductive paste, silicone-free	617
WS-xx	Protection hoods, stainless steel	616
BASIC	Preference programme	630 - 637



S+S Goes Digital

USE OUR ONLINE RESOURCES
FOR PLANNING AND SOURCING

BIM READY

Building Information Modeling (BIM) is the key to efficient planning, approval, maintenance and further development of operation-critical building systems. Our products are BIM ready and can be directly integrated in your BIM process. With detailed data for all devices and in standardised formats to create a precise digital image in your BIM system.



Benefits for architects, project designers, building contractors and owners:

- + Transparent planning and projecting
- + Speedy approvals, installation and commissioning
- + Fewer input errors
- + Efficient maintenance
- + Easy changes
- + Flexible extensions

24h

24-hours
shipment



DIRECT ONLINE ORDERING

www.SplusS.de/shop

For your convenience, you can order all items in our catalogue directly in our new web shop – 24/7 and with guaranteed shipment on working days within 24 hours.



The display of the **AERASGARD® RFTM-LQ-PS-CO2-Modbus** is individually programmable.



The **AERASGARD® RFTM-PS** active measuring transducer displays the measured value as well as the switch point status.



Against Fine Dust in Room Air

AERASGARD® ROOM CLIMATE MEASURING TRANSDUCERS WITH CONTAMINATION RESISTANT LASER SENSOR

The extended range of our **AERASGARD®** devices is now also capable of measuring hazardous fine dust or particulate matter, i.e. aerosols with particle sizes from 2.5 to 10 µm.

The fine dust load in the room air is measured by a highly contamination resistant laser sensor and displayed or read out in µg/m³.

The fine dust measuring transducers have been designed as room devices and are available in various configurations, from the basic version without display to multifunctional models for several measurands.

The Modbus capable version of our **AERASGARD®** room devices is available for up to five measurands – now also including particulate matter (PM).



Temperature



Humidity



Air Quality (VOC)



Carbon dioxide (CO₂)



Fine dust (PM)

On the bottom line, the **entire room climate** can be effectively monitored and controlled **with one single device**.
Details on pp. 122 / 540

NEW



S+S REGELTECHNIK



NEW



CO2 Traffic Light

AERASGARD® CO2 MEASURING DEVICES FOR PROPER ANTI-INFECTION VENTILATION IN SCHOOLS

A lot of breathing occurs where people meet in rooms. Next to the CO2 concentration in the room air, this also increases the number of aerosols which can carry pathogens, such as the coronavirus. The CO2 load is therefore considered an indicator for timely intermittent ventilation as an effective means of preventing infections.

To this end, we have extended the range of our proven CO2 measuring devices with the **AERASGARD® RCO2-A NT**. Equipped with an optical NDIR sensor (non-dispersive infrared technology), it measures the CO2 content in the room air from 0 to 3000 ppm, and displays the result with traffic light LEDs in graded light intensity:

- ≥ 1000 ppm = yellow range
- ≥ 2000 ppm = red range

For wall mounting:
AERASGARD® RCO2-A NT
with plug-in power supply unit,
or **AERASGARD® RCO2-A UPNT**
with in-wall flush-mount
power supply unit

Five colour LEDs indicate the current need for room ventilation **at a glance**.
Details on pp. 530



Mobile desktop device:
AERASGARD® RCO2-A NT ST
with plug-in power supply unit
and stainless steel stand





Automated Sensor Technology

S+S TEMPERATURE, HUMIDITY AND PRESSURE TRANSDUCERS FOR OPERATION ON THE ETHERCAT P INDUSTRIAL BUS

We have extended our bus-capable portfolio to include a range of sensor devices for consistent industrial automation solutions from field to control level using EtherCAT P. The 'P' stands for routing both real-time communication and power through one and the same cable. Standardised M8 connectors enable commissioning without the need for opening the device.

Our EtherCAT P capable products are perfectly tailored to cabinet-free automation in industrial process, plant and facility engineering. They are ideal for use in central energy management as well as for interconnected temperature, humidity and pressure control in poorly accessible areas.

Moreover, they offer superior added-value characteristics for configuration, data processing and display. All devices can also communicate using wireless Bluetooth technology. **Details on pp. 034**

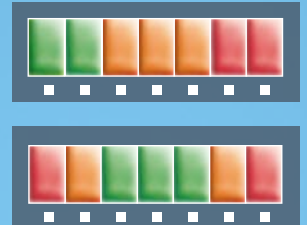


3 status LEDs show data flow and bus activity.

Single-cable solution for communication and power with standardised M8 connectors

NEW

Bar graph display for indication of working, limiting or fault ranges. Colour change and colour gradients of the 7 LEDs can be configured.



THERMASGARD[®]
ALTM2-EtherCATP
Surface-contact temperature transducer



HYGRASGARD[®]
KFTF-EtherCATP
Duct temperature and humidity transducer



HYGRASGARD[®]
AFTF-EtherCATP
On-wall temperature and humidity transducer



PREMASGARD[®]
612x-EtherCATP
Differential pressure transducer

S+S ADDED VALUE

- **Wireless communication option**
Bluetooth-capable devices
- **Writable LCD display**
large back-lit three-line display, individually programmable
- **Configurable LED display**
individually configurable bar graph with 7 colour LEDs (e.g. as traffic light indicator)
- **Additional configuration possibilities**
preset of process data objects (PDOs) to the controller using the ESI function module for measured value queries, filtering, sampling time, etc.
- **Extended sensor data**
e.g. retrievable history (min/max/mean) and service interval determination depending on stress and sensor type

ADVANTAGES AT A GLANCE

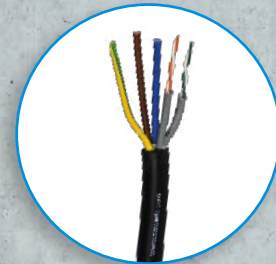
- **Single-cable solution with free choice of topology**
communication and power on one single cable, for combination with line, star and tree structures
- **Implicit EtherCAT bus configuration and diagnosis**
straightforward integration at PLC level using the EtherCAT Slave Information (ESI) configuration file of the device, and communication fault counter for quick localization of connection problems
- **Fast standard industrial bus (Industry 4.0)**
intelligent machine-to-machine communication
- **Standardised M8 connector**
minimal wiring thanks to safe and quick plug-screw connections



SYSTEM FOR FACILITY AUTOMATION 4.0 DECENTRAL. SIMPLE. ADVANCED.

The **powerIO®** system is a perfect solution for integrating sensors and actuators. It combines power and data and enables a completely decentralised facility installation design.

Instead of routing kilometres of cables from central cabinets to all sensors and actuators in a star topology with subsequent wiring of each individual connection, as in the past, the **powerIO®** system simplifies installation and minimises your time consumption, while at the same time offering more possibilities.



powerIO®-Line

Hybrid cable for data transmission (Ethernet TCP/IP, 100 Mbit/s) and power (230 V)

COST-EFFECTIVE

Reduction of cabling and cabinets by up to 70 %

- Fewer cables and up to 30 % lower installation costs
- High time savings thanks to less coordination and reduced construction times
- Reduced copper and PVC consumption, and lower M&C costs

FLEXIBLE

Open system for easy and fast expansion

- Freedom of implementation thanks to standardised protocols and free choice of control system
- Modular and decentral design for virtually any topology

DEPENDABLE

Better control, higher safety, fewer connection faults, more data

- Greater safety: significant reduction of fire load
- Better control: fewer connection faults
- High data traffic at faster transmission speeds



TCP-protocols

Free choice of DDC/PLC

www.powerio.com



Take a look at our 3D demo wall and see for yourself!

www.powerio.com/demowall



S+S REGELTECHNIK

powerIO®-Box

Decentral automation box,
serial-to-TCP conversion



4x RS485

M12 5-pin plug connections
with 24V voltage supply and bus



Ventilation technology

powerIO®-App

www.powerio.com/app



Single-room control



Control in compliance with IEC 61131-3

Optionally convert any powerIO®-Box
into a CODESYS® control.

powerIO® is the system for
decentralised facility automation.
Details on pp. 068



S+S Modbus Sensors

FURTHER DEVELOPMENT AND COMPLEMENTATION OF OUR BUS DEVICES

Innovative: Key features include a galvanically isolated RS485 Modbus interface, a selectable bus termination resistor, LEDs for telegram status indication as well as two DIP switches for bus parameter and bus address configuration also in de-energised state. In addition, there are two separate push-in terminals.

Safe: An integrated fault diagnosis function supports troubleshooting in the event of faults such as sensor breakage or sensor shorts. Error messages will be also be indicated on devices with display.



Convenient: The optional large back-lit three-line display can be individually programmed in both the 7-segment and the dot matrix range.



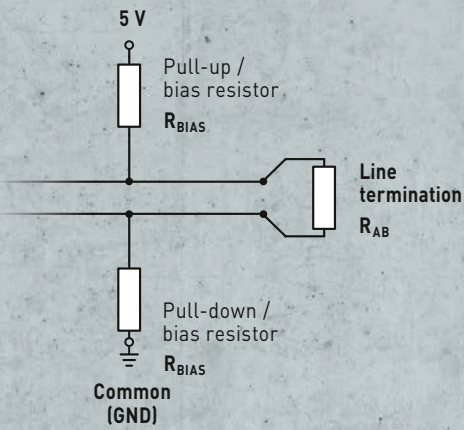
For standard connection, the housing provides **two separate cable glands** (M20, with sealing and strain relief).

Optionally available with **M12 screw-lock circular connectors** according to EN 61076-2-101.





S+S REGELTECHNIK



LA-MODBUS

ACTIVE BUS TERMINATION FOR RS485 NETWORKS

The new line termination device comprises a biasing termination resistor which predefines a safe value (failsafe biasing) for the bus signal level of the RS485 network when idle.

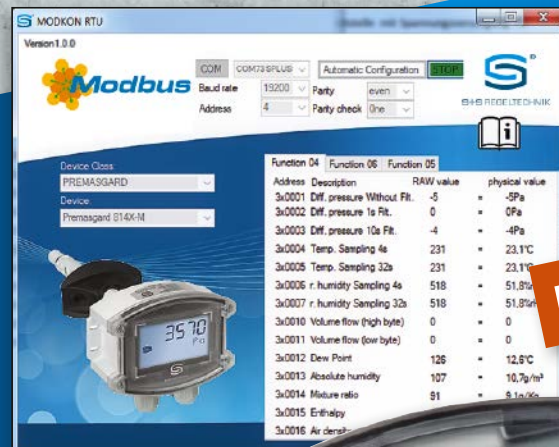
Termination resistor and/or biasing can be selected or deselected conveniently by means of DIP switches.



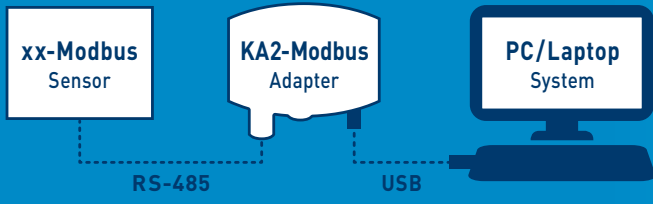
Details on pp. 136 / 138

KA2-MODBUS

COMMUNICATION ADAPTER FOR SYSTEM INTEGRATION



NEW



The new **KA2-Modbus** communication adapter serves to link a connected S+S sensor on the **RS485** network with your PC by using a standard **USB** port. There is no further power supply required.

In combination with the S+S **MODKON RTU** software (included in scope of delivery), the adapter enables a simple way of testing the response characteristics of the sensor. This provides an ideal start for gaining experience with Modbus technology and the connected S+S Modbus sensor.



RYMASKON®

MODBUS CAPABLE ROOM CONTROLLERS

As user configurable devices, **RYMASKON®** room controllers can be integrated in a Modbus network for automated surveillance and control of room climate and lighting. This enables an energy efficient, on-demand room climate control as part of an overall facility management system.

The Modbus control does not restrict the flexible room operation on site. The **RYMASKON® 400-Modbus** device can also be used as an autonomous single-room controller.



RYMASKON® 200 - Modbus

- > Modbus RTU interface (RS485)
- > Integrated temperature and humidity sensors
- > 3 digital and 1 universal input
- > Programmable LCD multi-function display with RGB backlight in configurable colour (7 basic settings possible), as well as intensity and overall brightness
- > 4 to 8 touch function keys
- > International icons
- > Menu supported configuration
- > Buzzer for key tone, fault warning and alarm



Details on pp. 072



LCD multi-function display with dimmable backlight

Touchpad with 6 freely assignable sensor buttons

Rotary encoder with central input key

IR diode for proximity sensor

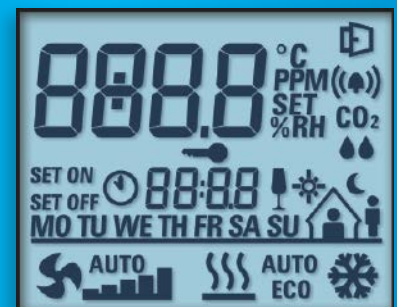
Glass front panel

Sensor keys for room control with standard icons for temperature, ventilation and/or sun screens and lights; the icons can be custom-configured by means of film templates



RYMASKON® 400 - Modbus

- > Modbus RTU interface (RS485)
- > Integrated temperature sensor
- > 2 digital inputs and 2 digital or analogue outputs
- > Suitable also for stand-alone single-room control
- > Flat housing with glass front panel in piano-like finish
- > Programmable LCD multi-function display with dimmable backlight
- > Menu supported configuration by means of recessed rotary encoder with central input key
- > 6 user assignable touch function keys
- > International icons
- > Infrared proximity sensor



Details on pp. 074

TYR 2

DIVERSITY BY **MODULAR** DESIGN –
FLEXIBLE AND CUSTOMIZED



Standard with
cable gland

Optionally
with/without display



Optionally with
M12 connector

TYR 2E Stainless Steel Housing for Higher Demands

- > Rugged housing (143x97x61mm) with non-distortion cover bolting, impact resistant, high **EMI** shielding
- > V4A (1.4571) **stainless steel**, corrosion and temperature resistant, UV and weathering resistant
- > High protection type **IP 69** (tested), provides safety against ingress of dust as well as snow, rain and power jet water
- > Large three-line **display** (70 x 40 mm) on film-hinged fold-out support
- > **Cable gland** with strain relief or **M12 connector**
- > **Modbus** versions also available

NEW



S+S REGELTECHNIK



Plastic sinter filter



Stainless steel sinter filter



Optionally with M12 connector

TYR2 Plastic Housing for High Demands

- > Proven housing (126x90x50mm) design with quick-release screws
- > Moulded in 30% glass bead filled **polyamide** resin, UV-stabilised, impact resistant and durable
- > Protection type **IP 65**, provides safety against ingress of dust as well as snow, rain and jet water
- > Large three-line **display** (70 x 40 mm) on film-hinged fold-out support
- > **Cable gland** with strain relief or **M12 connector**
- > **Modbus** and many housing variants also available



Modbus version
M12 connector
on demand

Uncompromising quality on each configuration level

Our portfolio of sensors and transducers is differentiated in three classes depending on the required functionality – without any limitations to their proven S+S quality, reliability and long service life.

S+S STANDARD ***

Tested Safety and Certified Quality



DIN tested/certified devices



RoHS conforming materials



ESD compliant manufacturing



CE compliance tested by external laboratories



TÜV certified engineering and manufacturing according to EN ISO 9001:2015



Backlit display

Rugged design with snap-on lid

Complete Programme for Basic Functions

- > Compact TYR 01 housing in IP 54 protection type (tested)
- > Up to 2 measuring variables
- > Very long product life
- > Passive or active outputs (U/I)
- > As needed with three-line display (36 x 15 mm) on fold-out film hinge support

S+S PREMIUM *****



Backlit display

4 quick-release
screws

Medium Configuration Level for Enhanced Functionality

- > Compact TYR 1 housing in IP 67 protection type (tested)
- > Captive quick-release screws (quarter turn) for zero distortion tight fit
- > Modbus capable versions
- > As needed with three-line display (36 x 15 mm) on fold-out film hinge support

S+S DELUXE *****

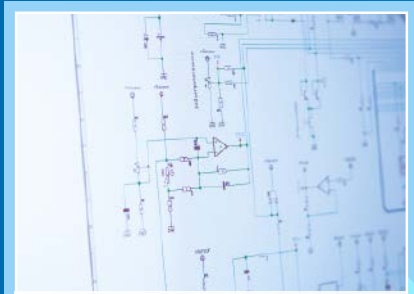


Large
connection space

Extra-wide
display

Maximum Configuration Level for Highest Demands

- > TYR 2 housing (126 x 90 x 50 mm) in IP 65 protection type
- > Multi-functional devices for up to 5 measuring variables
- > Modbus capable versions, analogue and digital outputs, change-over contacts
- > As needed with three-line display (70 x 40 mm) on fold-out film hinge support



Hard- & Software



Test Equipment



Production



Testing



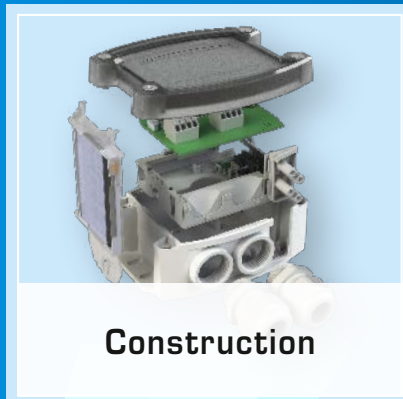
Shipping



S+S REGELTECHNIK



Toolmaking



Construction



Design

Everything from a Single Source

S+S ON THE OUTSIDE ALSO MEANS 100% S+S INSIDE



S+S REGELTECHNIK

S+S stands for a fully integral value chain. All products are designed, developed, manufactured and programmed in-house. Our new gigafactory in Nuremberg also includes a test centre with climate chambers, measuring benches and calibration facilities for all measurands.

In our test centre, we check all S+S measuring and control devices for faultless function, ruggedness and durability under the harshest conditions.

- 65 employees
- 4000 m² of production space, incl. test centre, warehousing and shipping area
- 2000 m² of office space for development, marketing, sales and administration
- 24 hours shipping service
- Made-to-order manufacturing



Five Benefits for Satisfied Customers

At S+S we are naturally proud of the outstanding performance of our products. However, we are not really satisfied before you too are fully convinced of our sensor technology and controllers.

For this reason, we will not rest on our laurels, but keep working hard on further innovating our portfolio. This performance claim is backed by five core principles:

+5

S+S INNOVATION



We think ahead and listen to the market. The result is advanced building sensor technology with maximum usability. Our Modbus and EtherCAT P devices, for instance, stand out for their added value characteristics to simplify configuration, support efficient data processing and provide various display options.



S+S EXPERTISE



Years of experience and creativity are the cornerstones of our business. With qualified technical expertise and openness to new solutions, we develop the sensor and controller technology of tomorrow – today.

S+S owns more than 35 patents, utility models and registered designs, which helps to maximize your security of investment.

PATENTED



S+S QUALITY

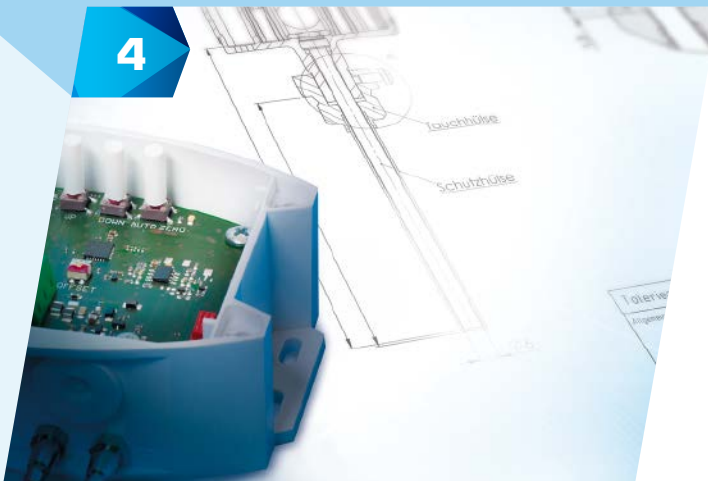
3



We measure ourselves against the highest standards – and continuously set new benchmarks ourselves. Our integral quality management system is certified to DIN EN ISO 9001:2015. We comply with the European and German regulations on the restricted use of hazardous substances in electrical and electronic equipment. In our own climate chambers, our products are tested under the toughest conditions for functionality, ruggedness and durability. This is backed by a 5-year warranty.

S+S PRECISION

4



Highest precision is our claim and our promise to you. This is why we develop and manufacture everything at our own facility – from the individual component and design to comprehensive system solutions, using tough and durable materials. Convince yourself, and benefit from the art of German engineering and our vertical manufacturing integration.

S+S FLEXIBILITY

5



In addition to our comprehensive range of STANDARD, PREMIUM and DELUXE devices available from stock, we also deliver sensors and controllers manufactured to your specifications. For instance in compliance with MIL, or with fully metal enclosures for applications according to FDA. At S+S, devices in smaller volumes down even to singular items are produced with the same precision as larger series.

Customers Worldwide Trust in S+S Regeltechnik

S+S products “Made in Germany” score high worldwide. The superior quality and reliability of our sensors, switches and controllers has been proven in many demanding projects in Germany and abroad.

Our customers value the high performance of our technology for sustainable energy management, efficient facility automation and economic total cost of ownership.



VINCOM CENTER
HO CHI MINH CITY, VIETNAM



MANFRED ROMMEL AIRPORT
STUTTART, GERMANY



HOTEL ELEPHANT
WEIMAR, GERMANY



VGU VIETNAM GERMANY UNIVERSITY
HO CHI MINH CITY, VIETNAM



AUDI SALES & MARKETING
INGOLSTADT, GERMANY



PULKOVO AIRPORT
ST. PETERSBURG, RUSSIA



METROPOLIS OFFICE BUILDING
HO CHI MINH CITY, VIETNAM



SCHAEFFLER FACTORY
BIEN HOA CITY, VIETNAM



GERMAN NATIONAL MUSEUM
NUREMBERG, GERMANY



PROXIMUS CENTER
BRUSSELS, BELGIUM



ERASMUS MEDICAL CENTER
ROTTERDAM, THE NETHERLANDS



DELTA EMEA HEADQUARTERS
HOOFDDORP, THE NETHERLANDS



VINFAST FACTORY
HAI PHONG, VIETNAM



PORSCHE CENTRE
LEIPZIG, GERMANY



CRUISE LINER, MSC CRUISES SA
GENEVA, SWITZERLAND



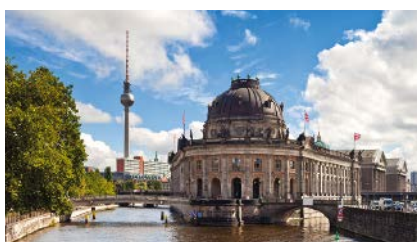
ZAVENTEM AIRPORT
BRUSSELS, BELGIUM



ZIZKOV TELEVISION TOWER
PRAGUE, CZECH REPUBLIC



EUROPEAN PATENT OFFICE
RIJSWIJK, THE NETHERLANDS



MUSEUM ISLAND
BERLIN, GERMANY

Catalogue Items 2021





ETHERCAT P

Bus-capable sensors for industrial automation

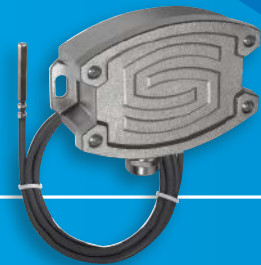
034 - 063



MODBUS

Bus-capable sensors and devices with programmable control

064 - 139



THERMASGARD® & THERMASREG®

Temperature sensors, temperature controllers and thermostats

140 - 337



HYGRASGARD® & HYGRASREG®

Humidity sensors, humidity controllers and hygrometers

338 - 435



PREMASGARD® & PREMASREG®

Pressure controllers, pressure regulators and switches

436 - 499



PHOTASGARD® & KINASGARD®

Light intensity sensors, motion detectors and presence detectors

500 - 519



AERASGARD® RHEASGARD® & RHEASREG®

Air quality and flow sensors, flow monitors and controllers

520 - 573



KYMASGARD®

Radio sensors, radio transmitters and radio signal receivers with EnOcean technology

574 - 601



Immersion sleeves & Accessories

Basic Programme, appendix, useful information

602 - 643





EtherCAT P

Industrial automation requires fast and integrated solutions for real-time communication from control to field level.

With our EtherCAT P bus-capable measuring transducers you can meet these higher demands also in the area of sensor technology.

APPLICATION RANGE

- > Industrial process and plant automation
- > Central energy management in the manufacturing industry and in process engineering
- > Networked measuring and control of temperature, humidity and pressure parameters in poorly accessible or distant areas



THERMASGARD[®], HYGRASGARD[®], PREMASGARD[®]

034 – 063

Temperature sensors

ATM 2-EtherCATP	Outside temperature sensor	NEW 039
TM 65-EtherCATP	Duct / immersion / screw-in temperature sensor	NEW 041
MWTM-EtherCATP	Mean-value temperature sensor	NEW 047
HFTM-EtherCATP	Sleeve sensor with cable	NEW 049
ALTM 2-EtherCATP	Surface-contact temperature sensor	NEW 051

Moisture and temperature sensors

AFTF-EtherCATP	On-wall humidity and temperature sensor	NEW 055
KFTF-EtherCATP	Duct humidity and temperature sensor	NEW 059

Pressure sensors

PREMASGARD[®] 612x-EtherCATP	Pressure sensor for differential pressure and volume flow	NEW 063
--	---	---------

Accessories

Special accessories for EtherCATP	NEW 619
For others see chapter Accessories	604



THERMASGARD[®], HYGRASGARD[®] & PREMASGARD[®] for industrial automation

Ultra-fast industrial bus

Our new EtherCAT P sensors are perfectly tailored for automation without switch cabinets in industrial process, system and facility engineering. For central energy management and for networked temperature, humidity and pressure control in areas that are difficult to access.

Optimum Precision

All devices are developed, manufactured and tested in accordance with the latest criteria. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Technical Highlights

- > EtherCAT compatible
- > Can be cascaded in all topologies
- > Dual power supply
- > Minimal amount of wiring due to MB connectors
- > Fewer fault sources

S+S ADDED VALUE

- > Large, three-line display, individually programmable
- > Configurable bar graph for displaying the measured value
- > Additional configuration facilities, e.g. measurand, filtering, sample time
- > Extended sensor data, e.g. retrievable history, maintenance interval determination

Certified Quality



Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.



GOST certified



EAC certified

Approved Safety



RoHS conforming materials

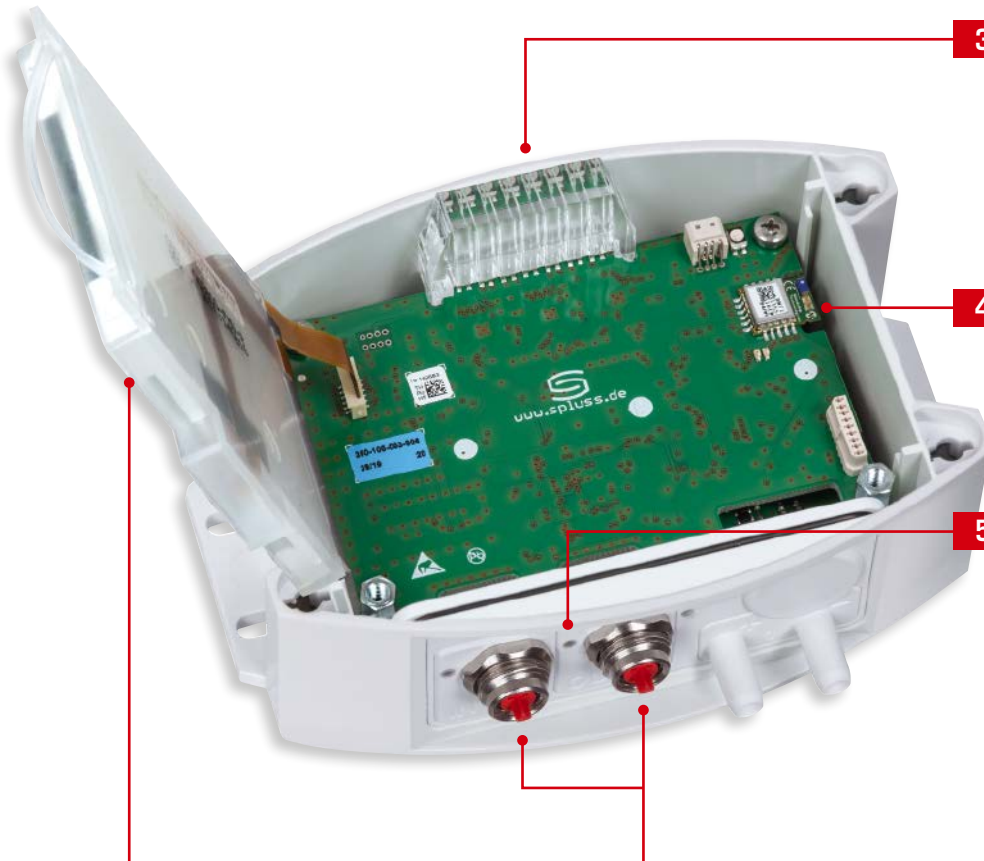


ESD compliant manufacturing



CE compliance tested by external laboratories


EtherCAT[®] TP



1 Illuminated display
Large, three-line display with background lighting, individually programmable

2 M8 connectors
Low wiring effort due to EtherCAT TP coded built-in connectors

3 Bargraph
Fibre optics with 7 LEDs, colours, colour change or colour gradient freely configurable, e.g. as traffic light display

4 Bluetooth 
Module for wireless communication

5 Status LEDs
for displaying the three EtherCAT operating statuses IN, OUT and RUN



S+S TECHNOLOGY FOR SMART BUILDINGS

On-wall / outdoor- / wet room temperature measuring transducers, Bluetooth-enabled, with EtherCAT P port

Networkable outdoor temperature measuring transducer **THERMASGARD® ATM2-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display and bar graph.

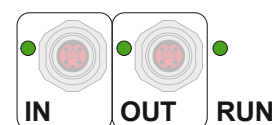
The on-wall sensor is used to detect the temperature in gaseous media. It is used outdoors or in wet rooms, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation on outside walls is preferably performed on the north side or in a protected place. In case of direct solar irradiation, the weather and sun protection hood **WS 03** (accessory) is to be used. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

ATM2-EtherCAT P



EtherCAT P
Cable connection and LED status display



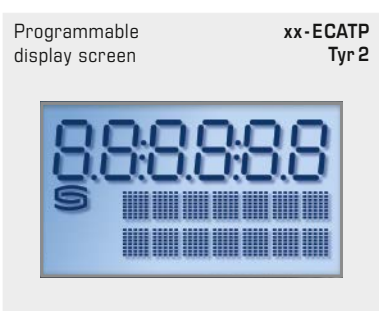
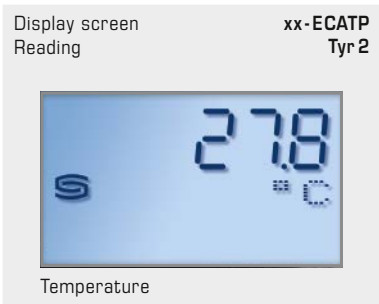
TECHNICAL DATA

Power supply:	24VDC via EtherCAT P (U _S)
Power consumption:	< 3W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Measuring range:	-50...+150°C
Deviation in temperature:	Typically ± 0.2K at +25°C
Medium:	Clean air and non-aggressive, non-combustible gases
Protective tube:	Stainless steel, V4A (1.4571), Ø = 6mm (see dimensional drawing)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr2)
Cable connection:	M8 plug-in connector , EtherCATP-encoded
Ambient temperature:	Measuring transducer -30...+70°C
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 3-line, customised programming, cutout approx. W 51 x H 29mm, to display the actual temperature or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.

ACCESSORIES See table

EtherCAT P	LED status display
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state

The status LEDs are next to the cable connection.



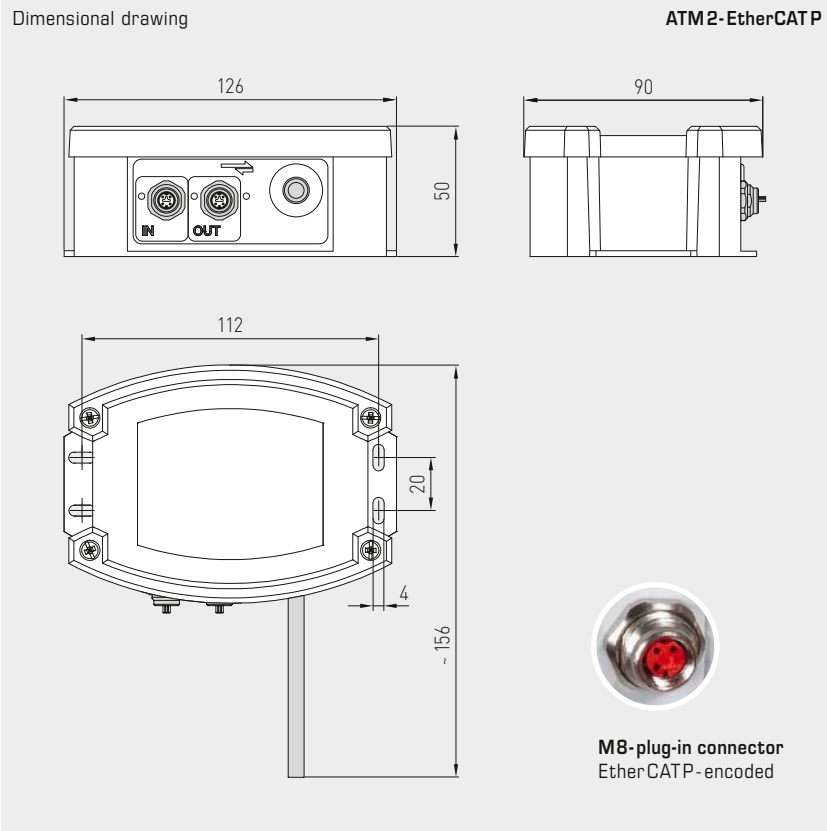


NEW

S+S REGELTECHNIK

THERMASGARD® ATM2 - EtherCAT P

On-wall / outdoor- / wet room temperature measuring transducers, Bluetooth-enabled, with EtherCAT P port



ATM2-EtherCAT P
with display and bar graph



WS-03

Weather and sun protection hood,
(optional)



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ATM2 - EtherCAT P		On-wall temperature sensor, with EtherCAT P port				
Type / WG02	Measuring Range Temperature	Sensor	Output	Bar graph Display	Item No.	Price
ATM2-ECATP xx						
ATM2-ECATP	-50...+150 °C	Pt1000	EtherCAT P		2001-6201-9100-001	304,98 €
ATM2-ECATP LCD	-50...+150 °C	Pt1000	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-6202-9100-001	345,77 €
Note:	Cable connection with M8 plug-in connector (EtherCAT P-encoded)					

ACCESSORIES		
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000 39,45 €

For further information, see last chapter Accessories!



Immersion / screw-in / duct
temperature measuring transducer, Bluetooth-enabled,
with EtherCATP port

Networkable temperature measuring transducer with sensor tube THERMASGARD®
TM65-EtherCATP with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled,
in an impact-resistant plastic housing with quick-locking screws, optionally with /without
display and bar graph.

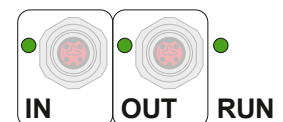
The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless
steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air
conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold
water systems, oil and lubrication cycle systems, machine and systems engineering and the entire
industry sector. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability:
includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication
failure counter), advanced settings options, access to historical data (min / max) and establishing the
sensor's service interval. Optionally with large illuminated display (3-line, customised programming in
the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical
display, e.g., as a traffic light indicator.

TM65-EtherCATP



EtherCATP
Cable connection and
LED status display



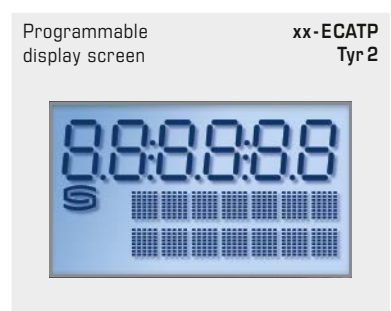
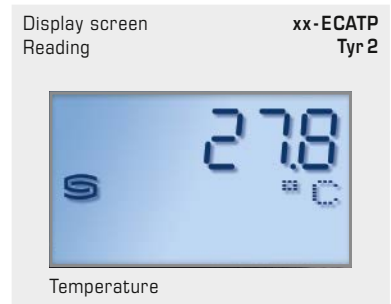
TECHNICAL DATA

Power supply:	24VDC via EtherCATP (U _S)
Power consumption:	< 3W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Measuring range:	-50...+150°C
Deviation in temperature:	Typically ± 0.2K at +25°C
Medium:	Clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Protective tube:	Stainless steel, V4A (1.4571), Ø = 6mm, installation length (IL) = 50-400mm (see table)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	M8 plug-in connector , EtherCATP-encoded
Ambient temperature:	Measuring transducer -30...+70°C
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 54 (according to EN 60529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.

ACCESSORIES See table

EtherCAT P	LED status display
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state

The status LEDs are next to the cable connection.



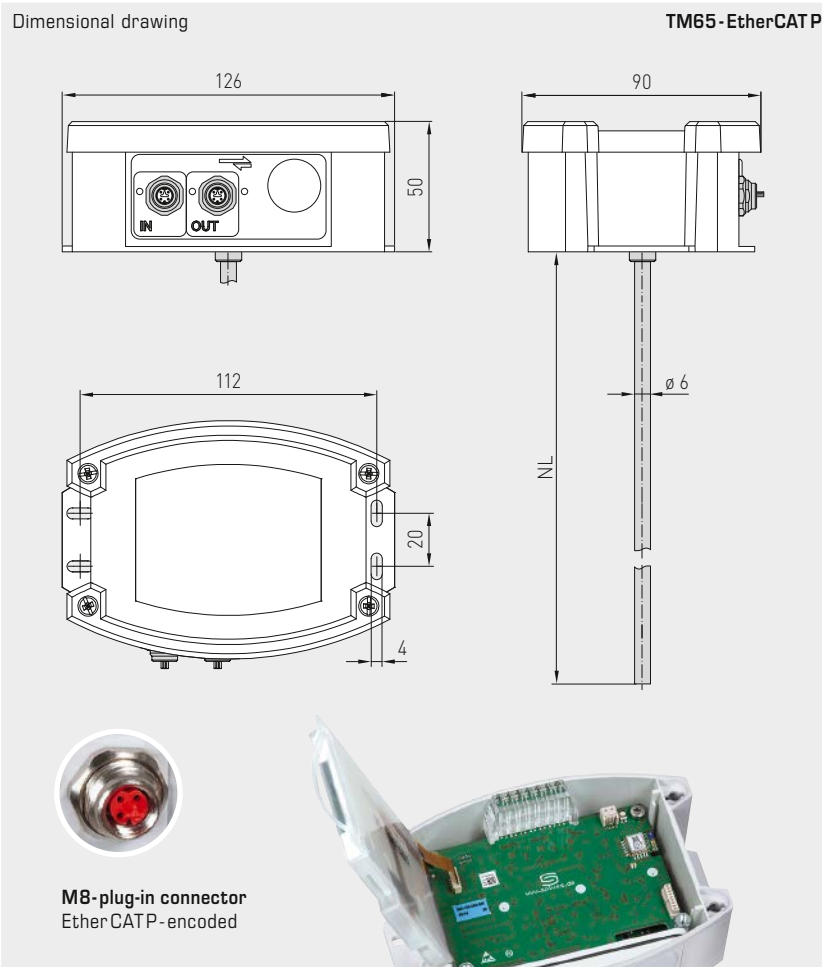


NEW

S+S REGELTECHNIK

THERMASGARD® TM65 - EtherCAT P

Immersion / screw-in / duct
temperature measuring transducer, Bluetooth-enabled,
with EtherCAT port



High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® TM65 - EtherCAT P		Temperature measuring transducer (basic unit), with EtherCAT port				
Type / WG02	Measuring Range Temperature	Output	Inserted Length (EL)	Bar graph Display	Item No.	Price
TM65-ECATP xx						
TM65-ECATP 50mm	-50...+150 °C	EtherCAT P	50 mm		2001-4201-9100-011	301,55 €
TM65-ECATP 50mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-011	342,34 €
TM65-ECATP 100mm	-50...+150 °C	EtherCAT P	100 mm		2001-4201-9100-021	301,93 €
TM65-ECATP 100mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-021	342,72 €
TM65-ECATP 150mm	-50...+150 °C	EtherCAT P	150 mm		2001-4201-9100-031	302,32 €
TM65-ECATP 150mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-031	343,11 €
TM65-ECATP 200mm	-50...+150 °C	EtherCAT P	200 mm		2001-4201-9100-041	302,70 €
TM65-ECATP 200mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-041	343,49 €
TM65-ECATP 250mm	-50...+150 °C	EtherCAT P	250 mm		2001-4201-9100-051	303,07 €
TM65-ECATP 250mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-051	343,86 €
TM65-ECATP 300mm	-50...+150 °C	EtherCAT P	300 mm		2001-4201-9100-061	303,46 €
TM65-ECATP 300mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-061	344,25 €
TM65-ECATP 400mm	-50...+150 °C	EtherCAT P	400 mm		2001-4201-9100-081	303,84 €
TM65-ECATP 400mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-081	344,63 €

Note: Cable connection with **M8 plug-in connector** (EtherCAT P-encoded)

Immersion / screw-in / duct
temperature measuring transducer, Bluetooth-enabled,
with EtherCAT P port

One basic device in four variants ...



**TM65-ECATP +
TH -ms /xx**

Immersion / screw-in
temperature sensor
with immersion sleeve,
brass, nickel-plated

**TM65-ECATP +
TH -VA /xx**

Immersion / screw-in
temperature sensor
with immersion sleeve,
stainless steel, V4A

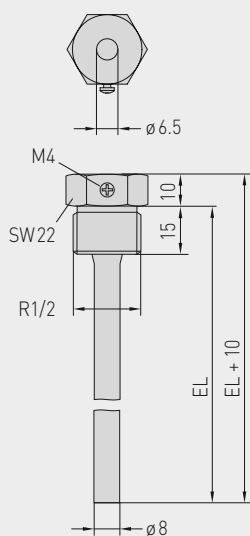
**TM65-ECATP +
TH -VA /xx /90**

Immersion / screw-in
temperature sensor with
immersion sleeve with
neck tube, stainless steel, V4A

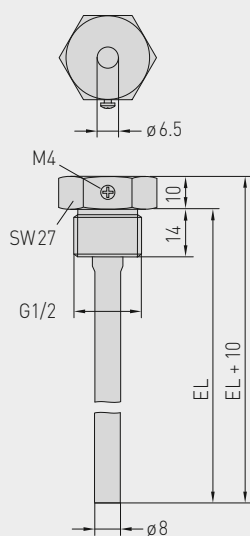
**TM65-ECATP +
MF-06-K**

Duct temperature sensor
with mounting flange,
plastic

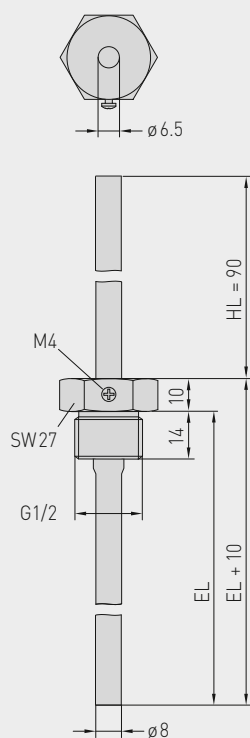
Dimensional drawing
TH -ms /xx



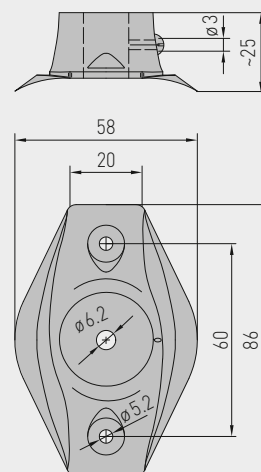
Dimensional drawing
TH -VA /xx



Dimensional drawing
TH -VA /xx /90



Dimensional drawing
MF-06-K





S+S REGELTECHNIK

NEW

THERMASGARD® TM65-EtherCAT P

Immersion / screw-in / duct
temperature measuring transducer, Bluetooth-enabled,
with EtherCAT port

... through combination with accessories:



TH - ms / xx

Immersion sleeve,
brass, nickel-plated,
thread-sealing, conical,
according to DIN 10226



TH - VA / xx

Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH - VA / xx / 90

Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF-06-K

Mounting flange,
plastic

THERMASGARD® TH Immersion sleeve Ø 8 mm (Accessories)					
Type / WG01	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.	Price
TH - ms / xx	Brass nickel-plated			without neck tube	
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	8,21 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	9,35 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	9,88 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	10,19 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	11,81 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	12,13 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	12,23 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	12,34 €
TH - VA / xx	Stainless steel V4A (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	17,88 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	19,76 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	21,23 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	22,38 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	27,82 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	29,07 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	29,27 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	29,79 €
TH - VA / xx / 90	Stainless steel V4A (1.4571)			with neck tube (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	25,61 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	26,76 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	28,07 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	29,27 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	30,68 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	33,25 €
Note:	inner diameter of socket 6.5 mm For further information see last chapter!				
Mounting flange (Accessories)					
Type / WG01				Item No.	Price
MF xx					
MF-06-K	Mounting flange, plastic, 56.8x84.3 mm, Ø 6.2 mm tube gland, T _{max} +100°C			7100-0030-1000-000	5,40 €
Note:	For information see last chapter!				

Mean value temperature measuring transducer, incl. mounting flange, Bluetooth-enabled, with EtherCAT port

Networkable mean value temperature measuring transducer **THERMASGARD® MWTM-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display and bar graph, with bendable sensor rod (0.4...20m, fully active) in a robust plastic-coated protective copper tube, incl. mounting flange.

The rod sensor is used to detect the mean temperature (mean value) in gaseous media. It is used in ventilation and air conditioning ducts over the entire cross-section or on a defined length (laid along a meandering route, it uniformly detects the surrounding temperature). For proper mounting of the rod, mounting clamps **MK-05-M** (accessory) are available. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

MWTM-EtherCAT P
Rod length
0,4 m



EtherCAT P
Cable connection and
LED status display

TECHNICAL DATA

Power supply:	24 V DC via EtherCATP (U _S)
Power consumption:	< 3 W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C T_{min} -50 °C, T_{max} +80 °C
Deviation in temperature:	Typically ±0.2 K at +25 °C
Medium:	Clean air and non-aggressive, non-combustible gases
Sensors:	active across the entire length (averaging)
Rod material:	protective tube made from copper, plastic-coated , with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m (nominal length optionally up to max. 20 m)
Rod laying:	Bending radius: > 35 mm Vibration load: ≤ 0.5 g Tensile load: < 480 N
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	M8 plug-in connector , EtherCATP-encoded
Process connection:	Using plastic mounting flange (included in the delivery scope) and mounting clamps MK-05-M (optional accessory)
Ambient temperature:	Measuring transducer -30...+70 °C
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.

ACCESSORIES See table

Display screen Reading **xx-ECATP Tyr 2**



Temperature

Programmable display screen **xx-ECATP Tyr 2**



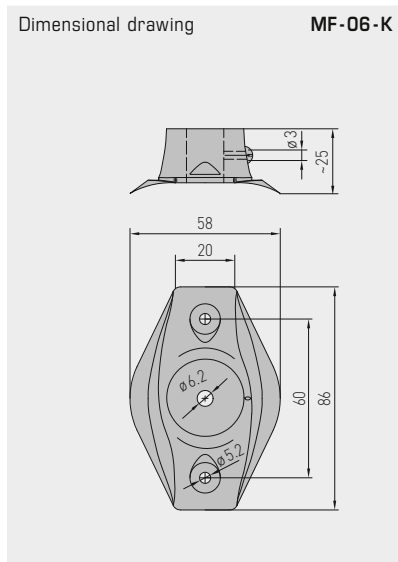
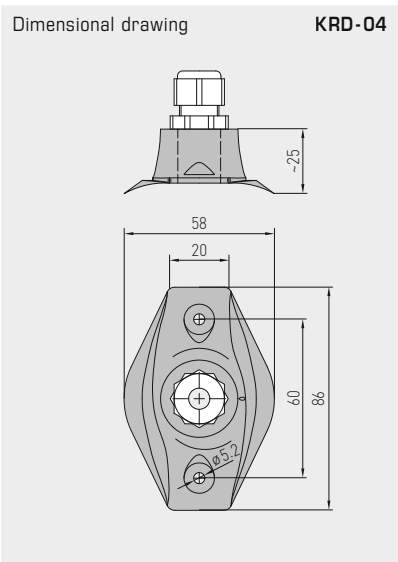
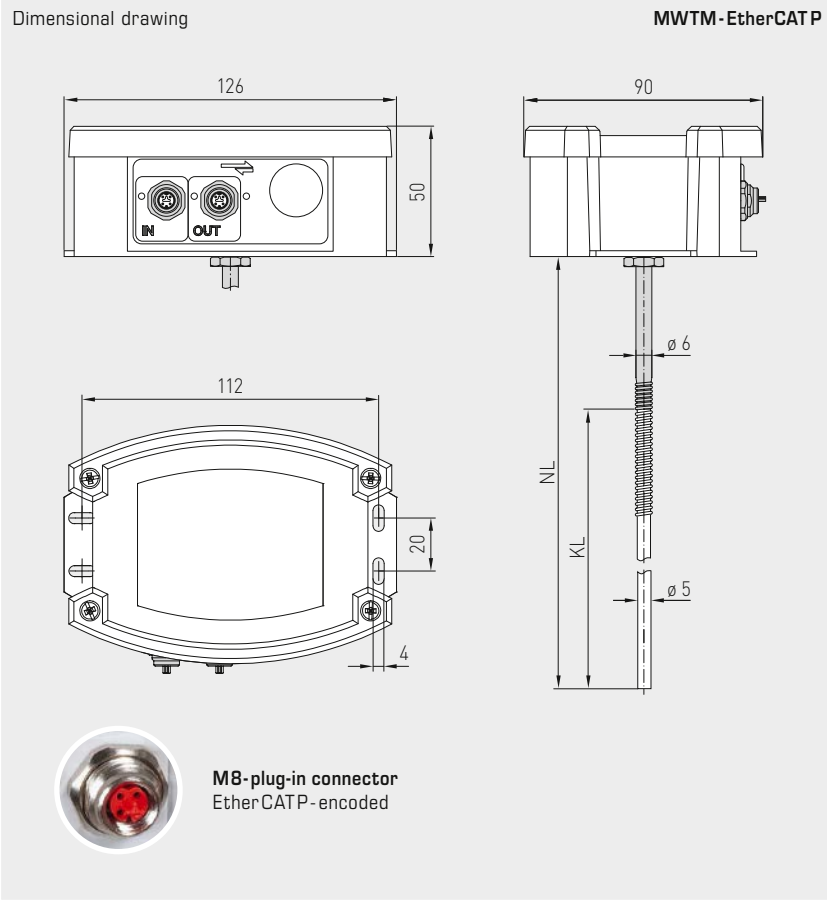


NEW

S+S REGELTECHNIK

Thermasgard® **MWTM-EtherCATP**

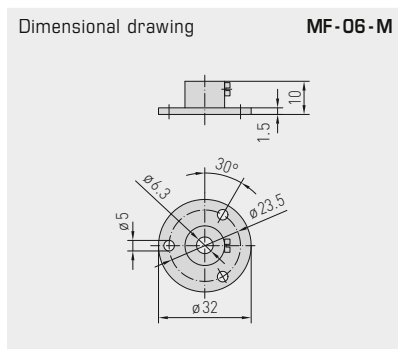
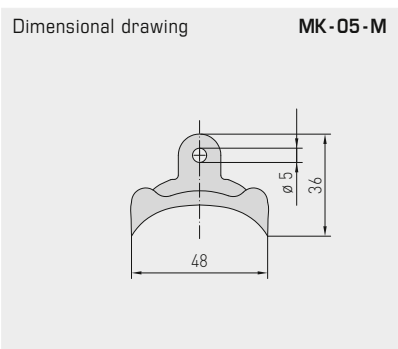
Mean value temperature measuring transducer,
incl. mounting flange, Bluetooth-enabled,
with EtherCATP port



MF-06-K
Mounting flange,
plastic
(included in the
scope of delivery)



KRD-04
Capillary tube
gland bracket,
plastic
(optional)



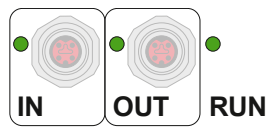
MF-06-M
Mounting flange,
metal
(optional)



MK-05-M
Galvanised steel
mounting clamps
(optional)



Mean value temperature measuring transducer,
incl. mounting flange, Bluetooth-enabled,
with EtherCAT P port



MWTM-EtherCAT P
with display and bar graph



EtherCAT P	LED status display
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	



NEW

S+S REGELTECHNIK

Mean value temperature measuring transducer,
incl. mounting flange, Bluetooth-enabled,
with EtherCAT port

MWTM-EtherCAT P

Rod length
3 m / 6 m

MWTM-EtherCAT P

Rod length
0,4 m



THERMASGARD® MWTM-EtherCAT P Mean value temperature measuring transducer with EtherCAT port

Type / WG02	Measuring Range Temperature	Output	Rod length	Bar graph Display	Item No.	Price
MWTM-ECATP xx						
MWTM-ECATP 0,4m	-50...+150 °C	EtherCAT P	0,4 m		2001-4211-9100-001	339,29 €
MWTM-ECATP 0,4m LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4212-9100-001	380,08 €
MWTM-ECATP 3,0m	-50...+150 °C	EtherCAT P	3,0 m		2001-4211-9100-011	369,79 €
MWTM-ECATP 3,0m LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4212-9100-011	410,58 €
MWTM-ECATP 6,0m	-50...+150 °C	EtherCAT P	6,0 m		2001-4211-9100-021	407,91 €
MWTM-ECATP 6,0m LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4212-9100-021	448,70 €
Note:	Cable connection with M8 plug-in connector (EtherCATP-encoded)					

ACCESSORIES

MF-06-K	Mounting flange, plastic (included in the scope of delivery)	7100-0030-1000-000	5,40 €
MF-06-M	Mounting flange, metal, galvanised steel, Ø = 35 mm	7100-0030-5000-000	8,43 €
KRD-04	Capillary tube gland bracket, plastic	7100-0030-7000-000	7,86 €
MK-05-M	Galvanised steel mounting clamps (6 pieces)	7100-0034-0000-000	8,71 €

For further information, see last chapter Accessories!



Sleeve sensor with temperature measuring transducer, Bluetooth-enabled, with EtherCATP port

Networkable sleeve temperature measuring transducer **THERMASGARD® HFTM-EtherCATP** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display and bar graph, cable sensor with stainless steel sleeve.

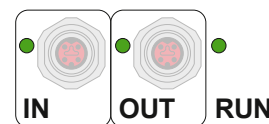
The sleeve sensor is used to detect the temperature in liquid and gaseous media. It is used as a duct sensor or, if installed in an immersion sleeve **THE** (accessory), as an immersion and screw-in sensor in liquids. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

HFTM-EtherCATP



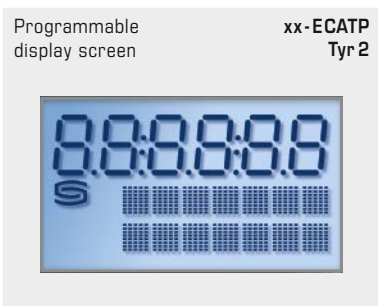
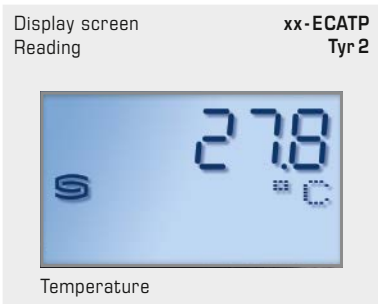
EtherCATP
Cable connection and LED status display



TECHNICAL DATA	
Power supply:	24 V DC via EtherCATP (U _S)
Power consumption:	< 3 W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection at IP68)
Measuring range:	-50...+150 °C; T_{max} bis +150 °C
Deviation in temperature:	Typically ± 0.2 K at +25 °C
Medium:	Clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Sensor protection:	Sensor sleeve made from stainless steel V4A (1.4571), Ø = 6 mm, nominal length (NL) = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, 2 x 0.25 mm ² ; cable length (CL) = 1.5 m (optionally also other lengths and measuring range limits, e.g., PTFE up to +250 °C or glass fibre with steel mesh up to +350 °C)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	M8 plug-in connector , EtherCATP-encoded
Ambient temperature:	Measuring transducer -30...+70 °C
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	IP 54 (according to EN 60 529)
Protection type sensor:	IP 65 (according to EN 60 529) sleeve humidity-tight (standard) IP 68 (according to EN 60 529) sleeve water-tight (optional) IP 54 (according to EN 60 529) with glass fibre cable (optional)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.

ACCESSORIES	
EtherCAT P	LED status display
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state

The status LEDs are next to the cable connection.





NEW

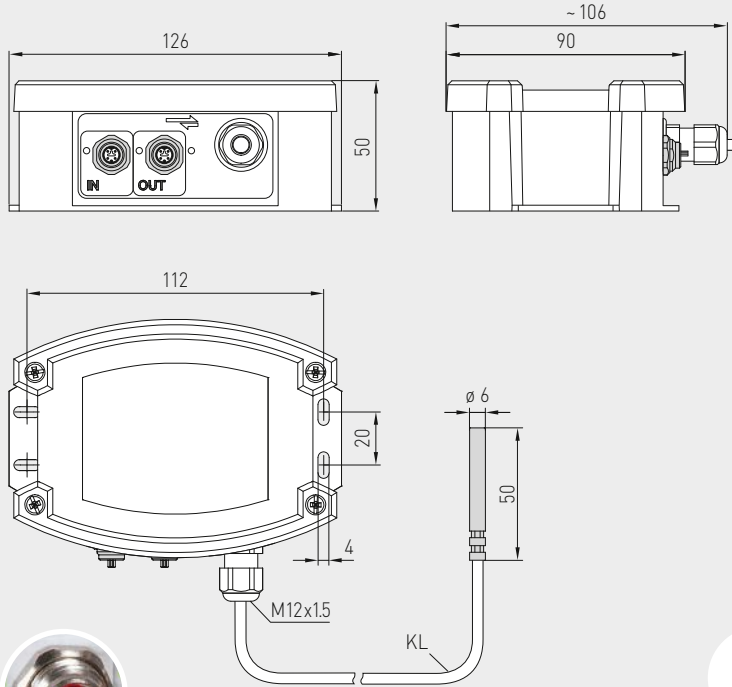
S+S REGELTECHNIK

THERMASGARD® HFTM - EtherCAT P

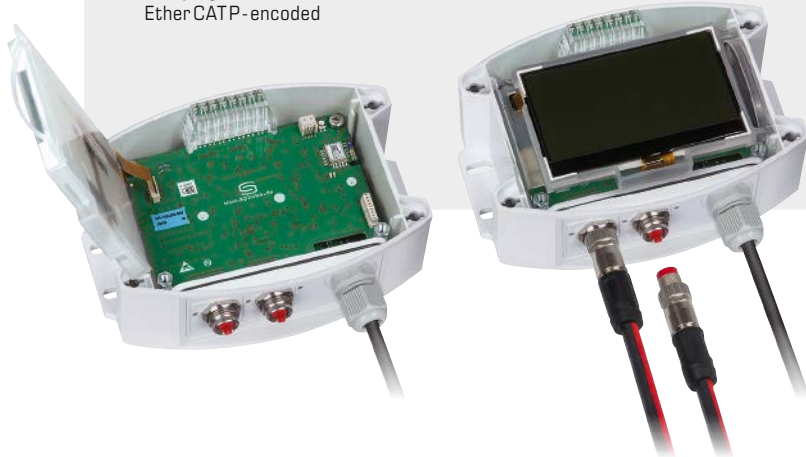
Sleeve sensor with temperature measuring transducer,
Bluetooth-enabled,
with EtherCAT port

Dimensional drawing

HFTM - EtherCAT P



M8-plug-in connector
EtherCAT P-encoded



HFTM - EtherCAT P
with display and bar graph



IP65 (standard)
humidity-tight

IP68 (optional)
watertight
Perfect Sensor Protection

IP54 (optional)
with glass fibre cable

High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD®
HFTM - EtherCAT P

Sleeve sensors with temperature measuring transducer
with EtherCAT port

Type / WG02	Measuring Range Temperature	Sensor	Output	Bar graph Display	Item No.	Price
HFTM-ECATP xx						
HFTM-ECATP	-50...+150 °C	Pt1000	EtherCAT P		2001-2161-9100-001	312,61 €
HFTM-ECATP LCD	-50...+150 °C	Pt1000	EtherCAT P	☐ ■	2001-2162-9100-001	353,40 €
Note:	Cable connection with M8 plug-in connector (EtherCAT P-encoded)					
Extra charge:	Protection type IP68 (sensor sleeve watertight compound-filled) per running metre of connecting lead (silicone / PTFE / glass fibre) other protection sleeve lengths (optional 30...400 mm)				on request on request	3,00 €

ACCESSORIES

THE-xx Immersion sleeve, stainless steel V4A (1.4571) or nickel-plated brass, Ø = 9 mm
For further information, see last chapter Accessories!

For further information, see last chapter Accessories!



Surface-contact temperature measuring transducer / pipe surface-contact sensor, with detached sensor, incl. strap, Bluetooth-enabled, with EtherCATP port

Networkable surface-contact temperature measuring transducer (detached version) THERMASGARD® ALTM2 - EtherCATP with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display and bar graph, cable sensor with pipe feeder, incl. strap.

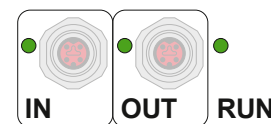
The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

ALTM2-EtherCATP



EtherCATP Cable connection and LED status display



TECHNICAL DATA

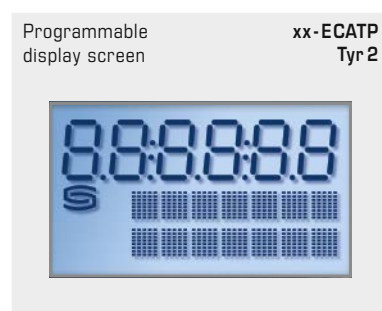
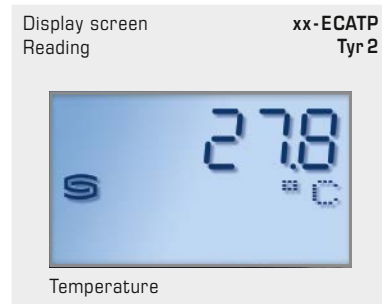
Power supply:	24 V DC via EtherCATP (U ₀)
Power consumption:	< 3 W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection at IP68)
Measuring range:	-50...+150 °C
Deviation in temperature:	typically ±0.2 K at +25 °C
Medium:	clean air and non-aggressive, non-combustible gases
Sensor protection:	pipe feeder made of stainless steel V4A (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	Silicone, SiHF, 2 x 0.25 mm ² ; cable length (CL) = 1.5 m (optionally also other lengths and measuring range limits, e.g., PTFE up to +250 °C or glass fibre with steel mesh up to +350 °C)
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	M8 plug-in connector , EtherCATP-encoded
Process connection:	Endless strap with metal tightener (included in delivery scope), Ø = 13-92 mm (1/4 - 3"), L = 300 mm
Ambient temperature:	Measuring transducer -30...+70 °C
Permitted humidity:	<95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	IP 54 (according to EN 60 529)
Protection type sensor:	IP 65 (according to EN 60 529) sleeve humidity-tight (standard) IP 68 (according to EN 60 529) sleeve water-tight (optional)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.

ACCESSORIES See table

EtherCAT P LED status display

1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state

The status LEDs are next to the cable connection.





NEW

S+S REGELTECHNIK

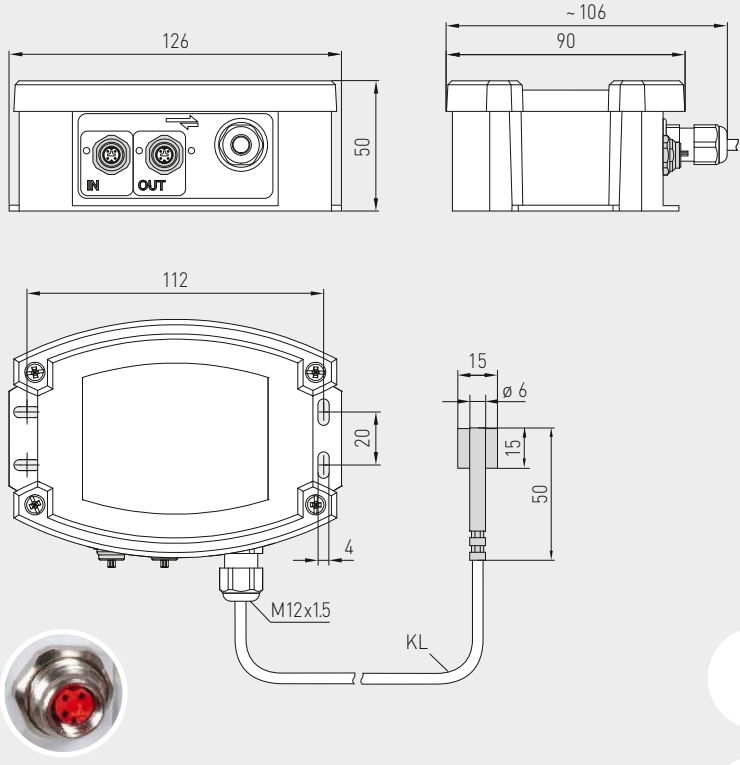
Thermasgard® **ALTM2-EtherCAT P**

Surface-contact temperature measuring transducer / pipe surface-contact sensor, with detached sensor, incl. strap, Bluetooth-enabled, with EtherCAT P port

Dimensional drawing

ALTM2-EtherCAT P

ALTM2-EtherCAT P with display and bar graph



M8-plug-in connector EtherCAT P-encoded



IP65 (standard) humidity-tight

IP68 (optional) watertight Perfect Sensor Protection

IP54 (optional) with glass fibre cable

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION



Thermasgard® ALTM2-EtherCAT P Surface-contact temperature measuring transducer with detached sensor, with EtherCAT P port

Type / WG02	Measuring Range Temperature	Sensor	Output	Bar graph Display	Item No.	Price
ALTM2-ECATP xx						
ALTM2-ECATP	-50...+150 °C	Pt1000	EtherCAT P		2001-2171-9100-001	315,42 €
ALTM2-ECATP LCD	-50...+150 °C	Pt1000	EtherCAT P	☐ ■	2001-2172-9100-001	356,21 €
Note:	Cable connection with M8 plug-in connector (EtherCAT P-encoded)					
Extra charge:	Protection type IP68 (sensor sleeve watertight compound-filled) per running metre of connecting lead (silicone/PTFE/glass fibre)					3,00 € on request

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	2,98 €

For further information, see last chapter Accessories!



**On-wall humidity and temperature sensor ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, Bluetooth-enabled, with EtherCATP port**

Networkable outdoor humidity and temperature sensor **HYGRASGARD® AFTF-EtherCATP** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display and bar graph, with plastic sinter filter (replaceable).

The sensor is used to detect various parameters in humidity measurement. It measures the **relative humidity** (0...100% r.H.) and the **temperature** ($-35...+80^{\circ}\text{C}$) of the ambient air. These measurands are used internally to calculate further output values: **absolute humidity** (0...80g/m³), **mixture ratio** (0...80g/kg), **dew point temperature** ($-20...+80^{\circ}\text{C}$) and **enthalpy** (0...85kJ/kg) while ignoring atmospheric air pressure. A long-term stable, digital sensor guarantees exact measurement results. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

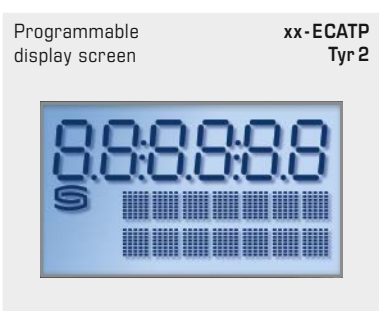
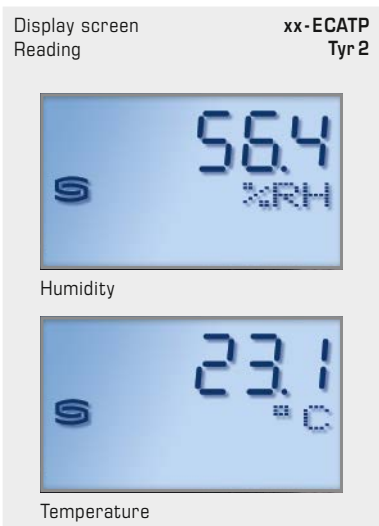
AFTF-EtherCATP



TECHNICAL DATA	
Power supply:	24VDC via EtherCATP (U _S)
Power consumption:	< 3W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Data points:	Temperature [$^{\circ}\text{C}$], relative humidity [% r.H.], dew point [$^{\circ}\text{C}$], absolute humidity [g/m ³], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	Digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100% r.H. (humidity) $-35...+80^{\circ}\text{C}$ (temperature)
Deviation in humidity:	Typically $\pm 2.0\%$ (20...80% r.H.) at $+25^{\circ}\text{C}$, otherwise $\pm 3.0\%$
Deviation in temperature:	Typically $\pm 0.4\text{K}$ at $+25^{\circ}\text{C}$
Long-term stability:	$\pm 1\%$ per year
Medium:	Clean air and non-aggressive, non-combustible gases
Sensor protection:	Plastic sinter filter, $\varnothing 14\text{mm}$, $l = 35\text{mm}$, replaceable (optionally metal sinter filter, $\varnothing 16\text{mm}$, $l = 32\text{mm}$)
Protective tube:	Stainless steel V2A (1.4301), $\varnothing 16\text{mm}$ (see dimensional drawing)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	M8 plug-in connector , EtherCATP-encoded
Process connection:	Using screw-in device on housing
Ambient temperature:	$-30...+70^{\circ}\text{C}$
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 3-line, customised programming, cutout approx. W 51 x H 29mm, to display actual humidity, actual temperature and/or an alternative characteristic value or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table



EtherCATP
Cable connection and LED status display





NEW

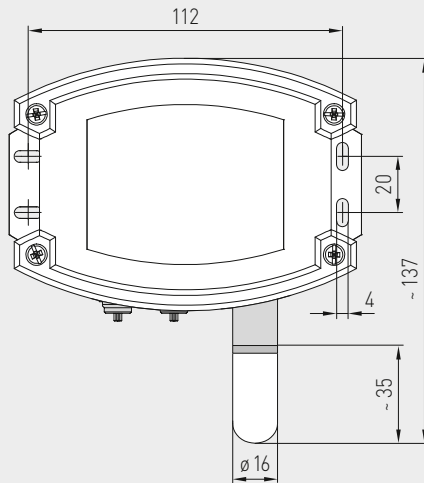
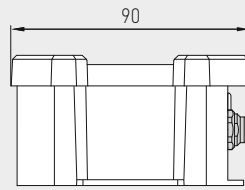
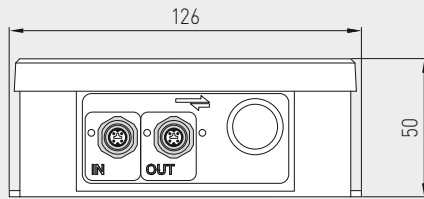
S+S REGELTECHNIK

HYGRASGARD® **AFTF-EtherCAT P**

On-wall humidity and temperature sensor ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, Bluetooth-enabled, with EtherCAT port

Dimensional drawing

AFTF-EtherCAT P



M8-plug-in connector
Ether CATP - encoded



SF-K
Plastic sinter filter
(standard)

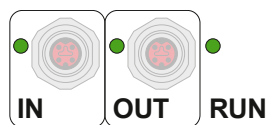


SF-M
Metal sinter filter
(optional)

AFTF-EtherCAT P
with display and bar graph



On-wall humidity and temperature sensor ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, Bluetooth-enabled, with EtherCAT port



WS-03
Weather and sun protection hood
(optional)



EtherCAT P	LED status display
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

Display screen Reading **xx-ECATP Tyr 2**



Humidity



Temperature

Display screen alternative output variables **xx-ECATP Tyr 2**



Absolute humidity



Mixture ratio



Dew point



Enthalpy

Programmable display screen **xx-ECATP Tyr 2**



Use the EtherCAT interface to program the **LCD display**.
With only one output value selected, the display is static;
with several values selected, the display is cyclical with one after the other.

In the **first line** the value is displayed and in the **second line** the corresponding unit.
The **third line** is empty by default if there are no customised inputs.

The entire display in the 7-segment range as well as in the dot-matrix range can be **customised**.



S+S REGELTECHNIK

NEW

HYGRASGARD® **AFTF-EtherCAT P**

On-wall humidity and temperature sensor ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, Bluetooth-enabled, with EtherCAT port

AFTF-EtherCAT P
with display and bar graph



**HYGRASGARD®
AFTF-EtherCAT P** On-wall humidity and temperature sensor ($\pm 2.0\%$),
with EtherCAT port

Type / WG02	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Bar graph Display	Item No.	Price
AFTF-ECATP xx						
AFTF-ECATP	0 ... 100% r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m ³ (a.F.) 0 ... 85 kJ / kg (ENT.) -20...+80 °C (TP)	-35...+80 °C	EtherCAT P		2003-6261-9100-001	324,04 €
AFTF-ECATP LCD	0 ... 100% r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m ³ (a.F.) 0 ... 85 kJ / kg (ENT.) -20...+80 °C (TP)	-35...+80 °C	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2003-6262-9100-001	364,83 €

Note: Cable connection with **M8 plug-in connector** (EtherCATP-encoded)

ACCESSORIES						
WS-03	Sun and ball-impact protection hood , 184x180x80 mm, stainless steel V2A (1.4301)				7100-0040-6000-000	39,45 €
SF-K	Plastic sinter filter , Ø 16 mm, L = 35 mm, exchangeable				7000-0050-2310-000	11,34 €
SF-M	Metal sinter filter , Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)				7000-0050-2200-100	37,32 €

For further information, see last chapter Accessories!



Duct humidity and temperature sensor ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, Bluetooth-enabled, with EtherCATP port

Networkable duct humidity and temperature sensor **HYGRASGARD® KFTF-EtherCATP** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display and bar graph, with plastic sinter filter (replaceable), incl. mounting flange.

The sensor is used to detect various parameters in humidity measurement. It measures the **relative humidity** (0...100% r.H.) and the **temperature** (-35...+80°C) of the ambient air. These measurands are used internally to calculate further output values: **absolute humidity** (0...80g/m³), **mixture ratio** (0...80g/kg), **dew point temperature** (-20...+80°C) and **enthalpy** (0...85kJ/kg) while ignoring atmospheric air pressure. A long-term stable, digital sensor guarantees exact measurement results. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.



KFTF-EtherCATP

TECHNICAL DATA

Power supply:	24 V DC via EtherCATP (U _S)
Power consumption:	< 3 W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Data points:	Temperature [°C], relative humidity [% r.H.], dew point [°C], absolute humidity [g/m³], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	Digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100% r.H. (humidity) -35...+80 °C (temperature)
Deviation in humidity:	Typically $\pm 2.0\%$ (20...80% r.H.) at +25 °C, otherwise $\pm 3.0\%$
Deviation in temperature:	Typically ± 0.4 K at +25 °C
Long-term stability:	$\pm 1\%$ per year
Medium:	Clean air and non-aggressive, non-combustible gases
Sensor protection:	Plastic sinter filter, \varnothing 14mm, l = 35 mm, replaceable (optionally metal sinter filter, \varnothing 16mm, l = 32mm)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, \varnothing 20mm, NL = 235mm, v _{max} = 30m/s (air) (option available on request in stainless steel V2A (1.4301), \varnothing 16mm)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	M8 plug-in connector , EtherCATP-encoded
Process connection:	By plastic mounting flange (included in the delivery scope)
Ambient temperature:	-30...+70 °C
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 3-line, customised programming, cutout approx. W 51 x H 29mm, to display actual humidity, actual temperature and/or an alternative characteristic value or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.

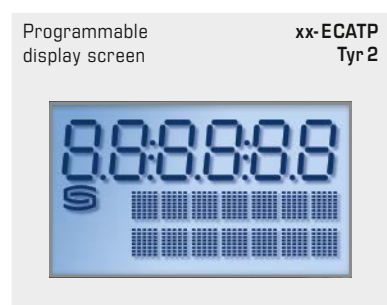
ACCESSORIES See table



EtherCATP
Cable connection and LED status display



Display screen Reading **xx-ECATP Tyr 2**



Programmable display screen **xx-ECATP Tyr 2**



NEW

S+S REGELTECHNIK

HYGRASGARD® **KFTF-EtherCAT P**

Duct humidity and temperature sensor ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, Bluetooth-enabled, with EtherCAT port

Dimensional drawing **KFTF-EtherCAT P**

Top view dimensions: 126 (width), 50 (height), 113.4 (flange depth), $\varnothing 20$ (tube diameter).

Side view dimensions: 90 (width), $\varnothing 32.3$ (flange diameter), ~200 (total length), ~35 (tube length).

Front view dimensions: 112 (width), 20 (height), 4 (thickness).

MB-plug-in connector
EtherCAT P-encoded

SF-K
Plastic sinter filter
(standard)

SF-M
Metal sinter filter
(optional)

Protective tube made from stainless steel
(optional on request)



Dimensional drawing **MFT-20-K**

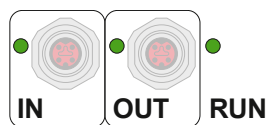
Top view dimensions: $\varnothing 3$ (hole diameter), ~25 (height).

Front view dimensions: 58 (width), 20 (width of top section), 60 (height), 86 (total height), $\varnothing 6.2$ (hole diameter), $\varnothing 5.2$ (hole diameter).

MFT-20-K
Mounting flange,
plastic
(included in the scope
of delivery)



Duct humidity and temperature sensor ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, Bluetooth-enabled, with EtherCAT port



EtherCAT P	LED status display
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

Display screen Reading **xx-ECATP Tyr 2**



Humidity



Temperature

Display screen alternative output variables **xx-ECATP Tyr 2**



Absolute humidity



Mixture ratio



Dew point



Enthalpy

Programmable display screen **xx-ECATP Tyr 2**



Use the EtherCAT interface to program the **LCD display**.
With only one output value selected, the display is static;
with several values selected, the display is cyclical with one after the other.

In the **first line** the value is displayed and in the **second line** the corresponding unit. The **third line** is empty by default if there are no customised inputs.

The entire display in the 7-segment range as well as in the dot-matrix range can be **customised**.



S+S REGELTECHNIK

NEW

HYGRASGARD® KFTF-EtherCAT P

Duct humidity and temperature sensor ($\pm 2.0\%$), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCAT port

KFTF-EtherCAT P with display and bar graph



HYGRASGARD® KFTF-EtherCAT P Duct humidity and temperature sensor ($\pm 2.0\%$), with EtherCAT port

Type / WG02	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Bar graph Display	Item No.	Price
KFTF-ECATP xx						
KFTF-ECATP	0 ... 100 % r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m ³ (a.F.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (TP)	-35 ... +80 °C	EtherCAT P		2003-4221-9100-001	343,11 €
KFTF-ECATP LCD	0 ... 100 % r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m ³ (a.F.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (TP)	-35 ... +80 °C	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2003-4222-9100-001	383,90 €

Note: Cable connection with M8 plug-in connector (EtherCATP-encoded)

ACCESSORIES

MFT-20-K	Mounting flange, plastic (included in the scope of delivery)	7000-0031-0000-000	8,43 €
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000	11,34 €
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €

For further information, see last chapter Accessories!



Pressure measuring transducer for differential pressure and volume flow,
incl. connection kit, Bluetooth-enabled,
with EtherCATP port

Networkable pressure measuring transducer **PREMASGARD® 612x-EtherCATP** (series) with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display and bar graph, nozzles for pressure hose (Ø 6mm), incl. connection kit **ASD-06** (2m connecting hose, two pressure port nipples, screws).

The on-wall sensor is used to measure positive, negative or differential pressure in clean air and gaseous media as well to calculate volume flows using the K-factor with function selection. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. The sensor is factory-calibrated.

It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. In case of direct solar irradiation, we recommend using our weather and sun protection hood **WS03** (accessory).

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

PREMASGARD® 612x-ECATP

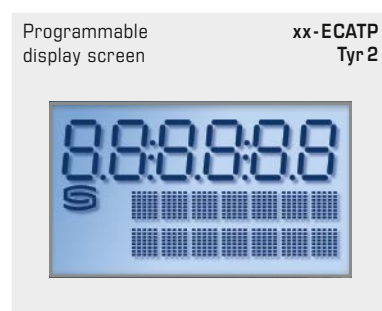


EtherCATP
Cable connection and
LED status display

TECHNICAL DATA

Power supply:	24VDC via EtherCATP (U _S)
Power consumption:	< 3W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Type of pressure:	Differential pressure [Pa], volume flow [m ³ /h]
Pressure port:	With nozzles for pressure hose Ø 6mm
Measuring range, pressure:	-500... +500 Pa or -7000...+7000 Pa depending on the device type, see table
Pressure accuracy:	Type 6128 (500 Pa): typically ± 3 Pa at +25°C type 6127 (7000 Pa): typically ± 35 Pa at +25°C compared to the calibrated reference device
Positive / negative pressure:	max. ± 50 kPa
Medium:	Clean air and non-aggressive, non-combustible gases
Parts in contact with media:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50°C (temperature-compensated 0...+50°C)
Hysteresis:	0.3% of final value
Linearity:	< ± 1% of final value
Temp. drift values:	± 0.1% / °C
Long-term stability:	± 1% per year
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL9016), enclosure cover for display is transparent!
Dimensions:	126 x 90 x 50mm (Tyr 2)
Cable connection:	M8 plug-in connector , EtherCATP-encoded
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual pressure or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.

ACCESSORIES See table





NEW

S+S REGELTECHNIK

PREMASGARD® 612x-EtherCAT P

Pressure measuring transducer for differential pressure and volume flow,
incl. connection kit, Bluetooth-enabled,
with EtherCAT port



Dimensional drawing

PREMASGARD® 612x-ECATP

M8-plug-in connector
EtherCAT P - encoded

PREMASGARD® 612x-ECATP
with display and bar graph

Dimensional drawing

ASD-06
Connection set

Dimensional drawing

ASD-07
Connection nipple

Dimensional drawing

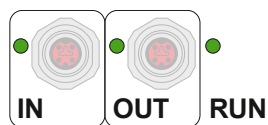
DAL-01
Pressure outlet

ASD-06
Connection set

ASD-07
Connection nipple

DAL-01
Pressure outlet

Pressure measuring transducer for differential pressure and volume flow,
incl. connection kit, Bluetooth-enabled,
with EtherCATP port

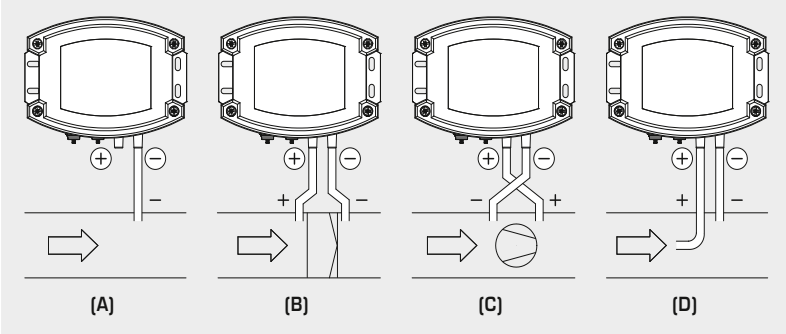


WS-03
Weather and sun protection hood,
(optional)



EtherCAT P	LED status display
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

Mounting diagram **PREMASGARD® 612x-ECATP**



TYPES OF MONITORING:

The pressure connections are on the housing with P1 (+) for higher pressure and P2 (-) for lower pressure.

- (A) Below-atmospheric pressure**
P1 (+) is not connected, but open to the atmosphere
P2 (-) connected to inside of duct
- (B) Filter**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
- (C) Ventilator**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator
- (D) Volume flow**
P1 (+) dynamic pressure, connected in flow direction
P2 (-) static pressure, connected free of dynamic pressure components

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWs
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWs
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWs
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWs
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWs
1 mWs	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWs



S+S REGELTECHNIK

NEW

PREMASGARD® 612x-EtherCAT P

Pressure measuring transducer for differential pressure and volume flow,
incl. connection kit, Bluetooth-enabled,
with EtherCAT port

PREMASGARD® 612x-ECATP
with display and bar graph



PREMASGARD® 612x-EtherCAT P		Pressure measuring transducer for differential pressure and volume flow, with EtherCAT port			
Type / WG02	Measuring Range / Readout Pressure	Output	Bar graph Display	Item No.	Price
Type 6128		- 500...+ 500 Pa			
PREMASGARD 6128-ECATP	-500...+ 500 Pa	EtherCAT P		2004-6271-9100-011	320,23 €
PREMASGARD 6128-ECATP LCD	-500...+ 500 Pa	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2004-6272-9100-011	361,02 €
Type 6127		- 7000...+ 7000 Pa			
PREMASGARD 6127-ECATP	-7000...+ 7000 Pa	EtherCAT P		2004-6271-9100-001	320,23 €
PREMASGARD 6127-ECATP LCD	-7000...+ 7000 Pa	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2004-6272-9100-001	361,02 €
Note:		Cable connection with M8 plug-in connector (EtherCATP-encoded)			

ACCESSORIES			
ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	6,74 €
ASD-07	2 connection nipples (at 90° angle) made of ABS	7100-0060-7000-000	6,74 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	31,55 €
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €

For further information, see last chapter Accessories!





Modbus

Against the background of rapidly increasing energy costs, the centralised measurement, monitoring, and control of power consumption in buildings is also becoming increasingly important. The networking of our Modbus-compatible temperature, moisture, pressure and VOC, CO₂ and fine dust (PM) measuring transducers leads to comprehensive energy efficiency and therefore saves money.

APPLICATION RANGE

- > Industrial and commercial facility automation
- > Central energy management in public and private facilities, such as hospitals, administration centers, schools and museums
- > Measurement and control of temperature, humidity, pressure and air quality parameters in poorly accessible or remote areas



THERMASGARD®, HYGRASGARD®, PREMASGARD® & AERASGARD®

064 – 139

Room control units, Room sensors

RYMASKON® 200-Modbus	Room control unit for room automation, on-wall	075
RYMASKON® 400-Modbus	Room control unit for room automation, on-wall	073
RFTF-Modbus-xx	Room control unit, on-wall	077
RTM 1-Modbus	Room sensor, on-wall	079
RFTM-CO2-Modbus-P	Room control units, on-wall	125
FSFTM-Modbus FSFTM-Modbus-P	Room sensors and Room control units, in-wall	101
FSFTM-CO2-Modbus FSFTM-CO2-Modbus-P	Room sensors and Room control units, in-wall	127

Air quality sensor VOC / CO₂ / fine dust (PM)

FSFTM-CO2-Modbus	In-wall sensor	127
RFTM-LQ-PS-CO2-Modbus	Room sensor	NEW 125
AFTM-LQ-CO2-Modbus	On-wall sensor	131
KFTM-LQ-CO2-Modbus	Duct sensor	135

Multifunctional sensor for humidity and temperature and air quality (VOC), fine dust (PM) and CO₂ content

Special accessories

powerIO®	Installation system	NEW 068
MODKON® LA-Modbus	Line termination device	NEW 137
MODKON® KA2-Modbus	Communication adapter	NEW 139
see chapter Accessories		604

Temperature sensors

RTM 1-Modbus	Room temperature sensor	079
RPTM 1-Modbus-T3	Pendulum room temperature sensor	095
RPTM 2-Modbus-T3	Pendulum room temperature sensor	097
HFTM-Modbus-T3	Sleeve sensor with cable	089
ALTM 1-Modbus-T3	Surface-contact temperature sensor	091
ALTM 2-Modbus-T3	Surface-contact temperature sensor with cable	093
ATM 2-Modbus-T3	Outside temperature sensor	081
TM 65-Modbus-T3	Duct / immersion / screw-in sensor	083
MWTM-Modbus-T3	Mean value temperature sensor	087

Humidity sensors

FSFTM-Modbus	In-wall humidity and temperature sensor	101
RFTF-Modbus	Room humidity and temperature sensor	099
RPFTF-Modbus-T3	Room humidity and temperature sensor	107
VFTF-Modbus-T3	Showcase humidity and temperature sensor	109
AFTF-Modbus-T3	On-wall humidity and temperature sensor	103
KFTF-Modbus-T3	Duct humidity and temperature sensor	105
TW-Modbus-T3	Dew point sensor	113

Pressure sensors

PREMASGARD® 232x-Modbus-T3	Pressure transducer	117
PREMASGARD® 814x-Modbus-T3	Duct humidity and temperature sensor with pressure measuring transducer	121

Modbus-Capable Measuring Transducers for multi-functional requirements

Broad Spectrum

All Modbus-compatible S+S temperature, pressure, and humidity sensors are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications.

Optimum Precision

All devices are developed, manufactured and tested in accordance with the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Technical Data

- > Galvanic isolation of the RS485 Modbus interface
- > Integrated selectable bus termination resistance
- > Display with backlighting and freely configurable
- > Offset adjustment with potentiometer
- > Temperature resolution: 16 bit AD converter, 0.1 K resolution
- > Measuring range: -50 to +150 °C
- > Accuracy: typically $\pm 0.2K$ at + 25 °C
- > Power supply: 15...36V DC; 24V AC $\pm 20\%$
- > All devices programmable and addressable even when not energized

Certified Quality



Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.



GOST certified



EAC certified

Approved Safety



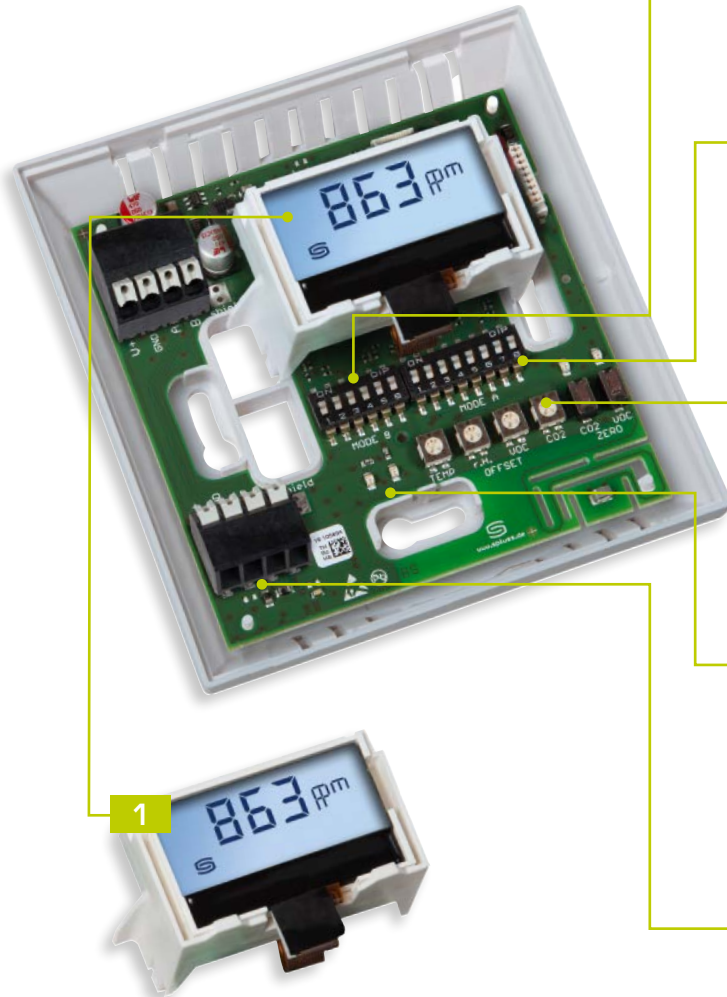
RoHS conforming materials



ESD compliant manufacturing



CE compliance tested by external laboratories

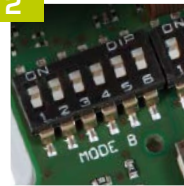


1

Illuminated Display

With backlighting as well as freely configurable 7/14 segment and 40-point matrix for display of individual measured values

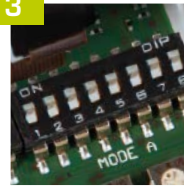
2



DIP Switches für Busparameter

Easy configuration of bus parameters: baud rate, parity, parity check and bus termination

3



DIP Switches for Bus Address

Up to 247 addresses possible, address can be configured even when the device is not energized

4



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

5



LED for Telegram Indication

(Green for Receive, Red for Error) Permits fast bus communication diagnosis

6



Bus Terminals

Push-in terminals (2x) for I/O



S+S TECHNOLOGY FOR SMART BUILDINGS

Building automation is used to control heating, ventilation and air conditioning equipment. The powerIO®-System provides more efficient control, better monitoring and more reliable operational management than previous conventional systems. And does this independently of control system providers.

The installation system has outstanding compatibility with all sensors and actuators from leading manufacturers, and can be enhanced with all of the popular protocols. The system mainly consists of three parts:

powerIO®-Line

A hybrid cable which transmits data via Ethernet (TCP/IP, 100 Mbit/s) and also power (230 V). This makes it possible to transmit data and provide sensors and actuators with power over long distances with a single cable.

powerIO®-Box

The powerIO®-Line connects the powerIO®-Boxes. Several communicative sensors and actuators can be connected over short distances with standardised industrial M12 plug-in connections with the boxes.



Control in accordance with IEC 61131-3

You can optionally create a CODESYS® controller from any powerIO®-Box and use HLK libraries from www.hvac-automation.com

powerIO®-App

The app turns your Smartphone into a measuring device. This gives you control over the communicative sensor system. You can start up and test devices independently of the manufacturer. Manual intervention and various service functions can be carried out using the Bluetooth connection or via WLAN.



Download the powerIO®-App

www.powerio.com/app

OVERVIEW OF THE ADVANTAGES:

Easy connection of the systems thanks to standardised M12 plug-in connectors. The error quota is reduced. A practical aid in times of skill shortages!

Fewer problems with interfaces. Coordination problems (cable installations, among other things) between electrical systems and measuring and control equipment are a thing of the past.

More reliability during operational management due to preventive messages. Optimum for predictive maintenance.

More information content can be transmitted. Ideal for communicative devices and intelligent sensors. Makes better system optimisation and monitoring possible.

Powerful, also for large systems.

And long distances can also be achieved due to the 230 V powerIO®-Line.

powerIO® System

Type / WG02!	Description	Item No.	Price
Starter set			
	powerIO®-Starter Set (T1.Z121)	3PI0-1502-0000-000	1530,00 €
	1 x (T1.B100) powerIO®-Box		
	1 x (T1.S110) powerIO®-Start Unit		
	1 x (T1.L100) powerIO®-Line, 20 m		
	1 x (T1.Z109) Installation cable, 5 m		
	1 x (T1.Z104) M12 connecting cable, 2 m		
	1 x (T1.Z105) M12 connecting cable, 5 m		
	1 x (T1.Z106) M12 connecting cable, 10 m		
	1 x (T1.Z107) M12 connecting cable, 2 m		
	1 x (T1.Z114) M12 flange connector, front-of-wall mounting		
	1 x (T1.Y200) powerIO®-Y distributor		
	1 x (T1.D100) powerIO®-Bluetooth Dongle		

Note: Only one starter set is available per customer. Product is not discountable.

powerIO®-Box

Decentralised automation box
Serial to TCP conversion



powerIO®-Line

Hybrid cable for transmitting data
(Ethernet TCP/IP, 100 Mbit/s) and power (230V)

2x 230V / 6A outputs



WLAN / Bluetooth service port

Plug-in location for expansion cards

4x RS485
M12, 5-pin plug-in connections with 24V power supply and bus

powerIO® System

Type / WG02I	Description	Item No.	Price
--------------	-------------	----------	-------

Main components



<p>powerIO®-Box (T1.B100)</p> <p>Decentralised automation box 230V voltage supply, Ethernet communication, Gateway functionn 2x 230V outputs up to 6A 4x M12 coupling, A-coded for RS485 connections incl. 24V / 2A DC voltage supply (ports 1 to 6) 1x optional plug-in location (port 5) 1x M12 service interface for commissioning with Smartphone app incl. shield terminal, Ethernet, fine fuse (4A). Dimensions 180 x 255 x 64 mm (W x H x D) (plus cable lead-in and M12 ports) Can be extended with a CODESYS® runtime licence and HVAC libraries.</p>	3PIO-1101-0000-000	1530,00 €
--	--------------------	-----------



<p>powerIO®-Line (T1.L100)</p> <p>Hybrid cable for connecting the powerIO®-Boxes Power: 3 x 4.00 mm² Data: 2 x (2 x 0.34 mm²), shielded Sold by the metre, minimum ordering quantity 10m</p>	3PIO-1201-0000-000	18,36 €/m
---	--------------------	-----------



<p>powerIO®-Starter Unit (T1.S110)</p> <p>Switch, allows connection of up to 3x powerIO®-Lines and 2x RJ45 Ethernet cables (e.g. for control, touch panel or network) Top-hat rail installation for switch cabinet or sub-distributor 4TE housing / dimensionsn 72 x 90 x 65 mm (B x H x T)</p>	3PIO-1102-0000-000	265,20 €
--	--------------------	----------

See next page for more information and accessories.

powerIO® System

Type / WG02I	Description	Item No.	Price
--------------	-------------	----------	-------

Expansion components



powerIO®-Bluetooth Dongle (T1.D100)	3PIO-1103-0000-000	201,96 €
Communication with powerIO®-App For plugging into service port of the powerIO®-Box. For commissioning/servicing the sensors/actuators.		



powerIO®-Rio1 (T1.R100)	3PIO-1104-0100-000	406,98 €
Expansion box for non-communicative sensors / actuators 6x Digital input 1x Analogue input 0–10 V 1x Analogue input, passive (PT1000) 3x Digital outputs pot.-free (I _{max} 16 A) 4x Digital outputs 24 V/0.5 A 1x Analogue outputs 0–10 V Each output with manual override (switch/potentiometer). Addressable using rotary switch. Connected via Modbus RTU. Dimensions 160 x 140 x 83 mm (W x H x D)		



powerIO®-Hub (T1.H100)	3PIO-1106-0000-000	173,40 €
Distributor for hybrid cable powerIO®-Line Input terminals for power and Ethernet CAT6 hybrid cable with shield terminals, output terminals for 2x power and Ethernet CAT 6, hybrid cable with shield terminals HUB functionality for Ethernet CAT6 distribution via connection to "Ethernet" additional card at powerIO®-Box. Dimensions 160 x 140 x 83 mm (W x H x D)		

Expansion cards powerIO®-Box T1



Expansion card "Ethernet" (T1.C100-ETH)	3PIO-1301-0000-000	201,96 €
M12, 4-pin D-coded Allows connection of an M12 Ethernet cable (T1.Z102). Incorporation of other IP subscribers with up to 100 Mbit/s.		



Expansion card "RS485" (T1.C100-RS485-24)	3PIO-1302-0000-000	201,96 €
M12, 5-pin A-coded Extends port 5 with an RS485 COM port. With 24 V on M12 pins as output voltage.		

Expansion card "RS232" (T1.C100-RS232-24)	3PIO-1303-0000-000	265,20 €
M12, 5-pin A-coded Extends port 5 with an RS232 COM port. With 24 V on M12 pins as output voltage.		

Installation board powerIO®-Box T1



Installation board (T1.Z119)	3PIO-1403-0000-000	53,04 €
Simple preinstallation for electrical installation, 4 threaded bolts for screwing on the powerIO®-Box (series T1) at a later date. Aluminium installation board with cut-out for installation to pipes using lashing straps .		

Installation board with magnets (T1.Z125)	3PIO-1404-0000-000	74,46 €
Simple preinstallation for electrical installation, 4 threaded bolts for screwing on the powerIO®-Box (series T1) at a later date. Aluminium installation board with pre-installed magnets for attaching to air ducts, for example.		

powerIO® Accessories			
Type / WG02	Description	Item No.	Price
Connecting cable			
	M12 connecting cable (ALG) PVC cable, shielded, 5-pin, A-coded, M12 connector <-> open end	ALG M12-A5 PVC xx	
		2 m	2000-9121-0000-031 24,19 €
		5 m	2000-9121-0000-041 31,02 €
		10 m	2000-9121-0000-051 42,71 €
	M12 connecting cable (VLG) PVC cable, shielded, 5-pin, A-coded, M12 connector <-> M12 socket	VLG M12-A5 PVC xx	
		2 m	2000-9111-0000-031 52,05 €
		5 m	2000-9111-0000-041 58,96 €
10 m	2000-9111-0000-051 70,81 €		
	M12 Ethernet cable (T1.Z102) M12 connector, 4-pin, D-coded <-> RJ45 connector Ethernet cable for direct connection to the powerIO®-"Ethernet" expansion card	3PIO-1601-0000-000	73,44 €
	M12 installation cable (T1.Z109) PVC cable, shielded, 5-pin (5 x 0.25 mm ²), open ended, same colour code as M12 cable Sold by the metre, minimum ordering quantity 10 m	3PIO-1202-0000-000	2,14 €/m
Connection accessories			
	M12-Y-distributor (T1.Z122) M12, 5-pin, A-coded, 1x connector -> 2x sockets For connecting two M12 connectors to one M12 socket. Bus and voltage are available at both connections. Can be plugged directly into the powerIO®-Box for connecting two sensors/actuators. Length 300 mm	3PIO-1602-0000-000	58,14 €
	M12-Y-adapter (T1.Z110) M12, 5-pin, A-coded. 1x socket / 1x connector -> 1x connector	3PIO-1603-0000-000	40,80 €
	M12 connector (T1.Z112) M12, 5-pin, A-coded For self-assembly.	3PIO-1605-0000-000	13,55 €
	M12 coupling (T1.Z111) M12, 5-pin, A-coded For self-assembly.	3PIO-1604-0000-000	14,69 €
	M12 protection cap (T1.Z117) Protection cap for unused M12 sockets	3PIO-1606-0000-000	3,06 €
	Ethernet connector (T1.Z101) Connector for the powerIO®-Line to the powerIO®-Box or powerIO®-Start Unit (included in scope of delivery of the powerIO®-Box)	3PIO-1402-0000-000	9,18 €
	Shield terminal (T1.Z100) for connecting the shield of the powerIO®-Line to the powerIO®-Box (included in scope of delivery of the powerIO®-Box)	3PIO-1401-0000-000	7,14 €

Room control unit for room automation, configurable, with multifunctional display and Modbus connection

RYMASKON® stands for a series of multifunctional room control units.

The individually configurable **RYMASKON® 400 - Modbus** enables automated monitoring and control of the indoor climate and illumination in a Modbus network. It has two digital inputs and two digital/analogue outputs. Room climate control and regulation can be accessed from a central point on a higher-level Modbus master and on-site operation can be selectively or completely disabled. Thanks to its internal outputs, the inputs and settings on the device do not necessarily have to be processed by the master. This means that it is also possible to have decentralised individual room control at any time. An internal sensor detects the room temperature.

Six freely assignable function buttons on the front panel of the unit can be used for on-site operation and configuration. An integrated rotary encoder with a central input button enables manual adjustment of settings and parameter assignment on location. Desired functions (such as "Light ON") and display values can be activated by triggering an approximation sensor when entering the room.

The dimmable multifunctional display is designed specifically for room operation and uses intuitive symbols for a clear view of all available spatial data. Besides the time, weekday and climate parameters (temperature, humidity, dew point, CO₂ content), it can also display additional features, such as heating/cooling and fan modes, window open, lighting, alarm, key lock or room occupancy.

RYMASKON® 412-Modbus
RYMASKON® 422-Modbus

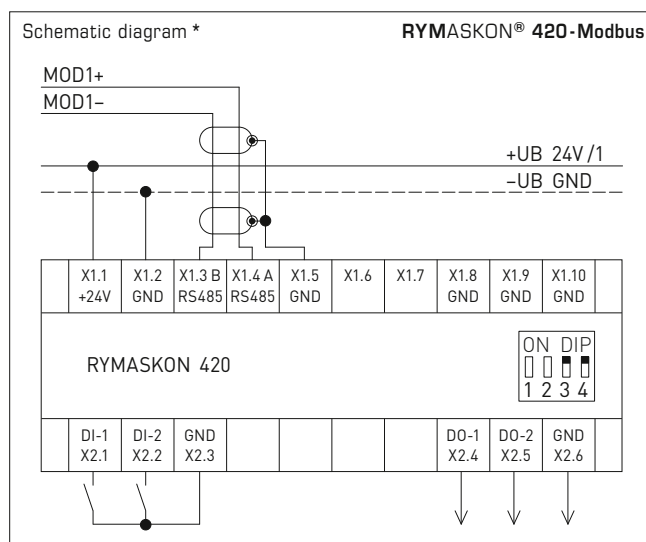
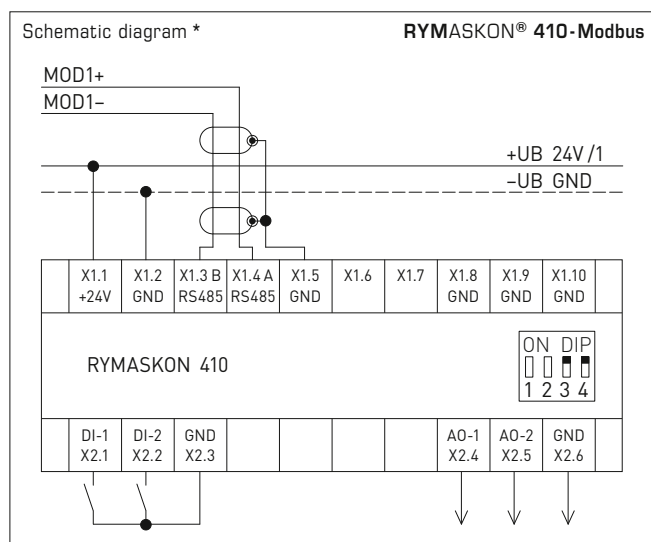


TECHNICAL DATA

Power supply:	24 V DC (± 10%)
Power consumption:	1.08 W at 100% backlighting 0.94 W at 15% backlighting 0.89 W without backlighting (without load at the actuator outputs)
Inputs:	2 digital inputs without additional 0 V output signal *
Outputs:	Type 410: 2 analogue outputs (0-10 V DC) rated current max. 4 mA Type 420: 2 digital outputs or PWM rated current 400 mA (short circuit max. 1.2 A)
Interface:	RS485 Modbus RTU Slave (57600, 38400, 19200, 9600 Baud), bus termination can be set via DIP switch
Sensor:	NTC 10 kΩ, 0...+70 °C, precision ±0.4 K
Operating elements:	multifunctional display, 6 touch buttons, 1 rotary encoder, 1 approximation sensor (IR)
Electrical connection:	0.14 - 1.5 mm ² , via plug-in screw terminals
Housing:	plastic, glass front panel, black or white colour
Dimensions:	88 x 173 x 30 mm (incl. connection terminals)
Mounting:	using a plastic mounting plate (see dimensional drawing), wall mounting or on in-wall flush double switch box
Ambient temperature:	+5...+40 °C (operation); -10...+50 °C (storage)
Permitted humidity:	0...85% r. H. (without dew formation)
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

* digital inputs (DI1 / DI2)

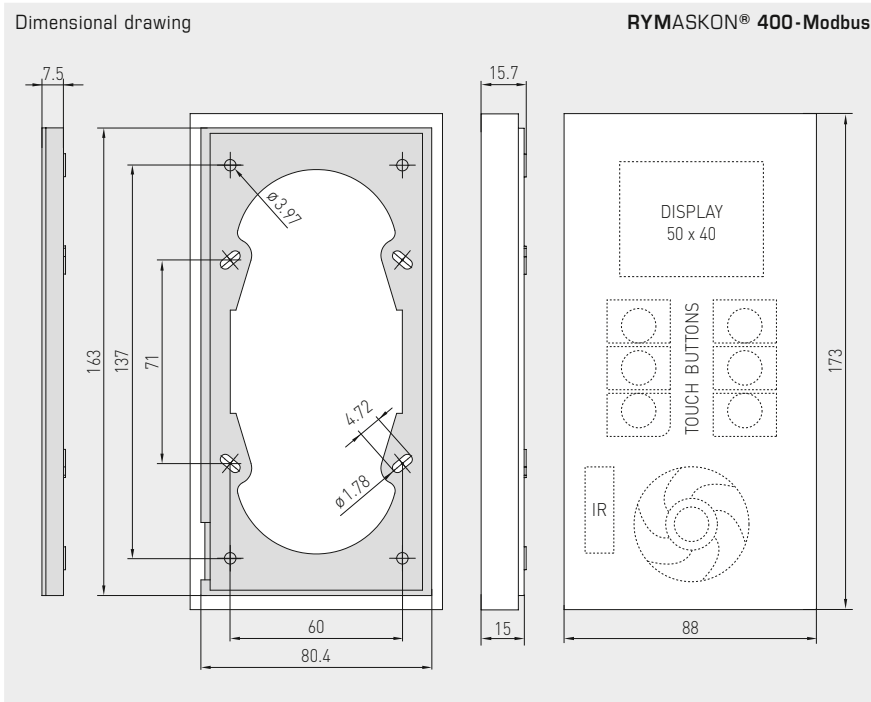
In order to connect potential-free contacts, a GND signal (e.g. terminal X2.3) should be routed to the desired input via the contact.





S+S REGELTECHNIK

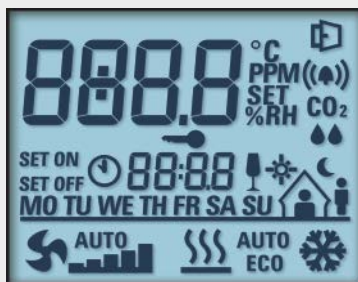
Room control unit for room automation, configurable, with multifunctional display and Modbus connection



RYMASKON® 411-Modbus
RYMASKON® 421-Modbus



Display symbols **RYMASKON® 400-Modbus**



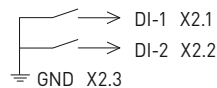
DIP Switch	RYMASKON® 400-Modbus	
RS485 bus termination	DIP 3	DIP 4
activated (default)	ON	ON
deactivated	OFF	OFF

Note:
Always configure the bus termination of the RS 485 interface (DIP 3 and DIP 4) in pairs!

Connecting diagram **RYMASKON® 410-Modbus**

	X2	
Input 1	1	DI-1 (digital) 0 V
Input 2	2	DI-2 (digital) 0 V
	3	GND
Output 1	4	AO-1 (analogue) 0-10 V DC
Output 2	5	AO-2 (analogue) 0-10 V DC
	6	GND

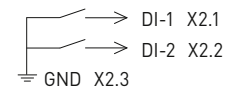
	X1	
	1	+UB 24 V DC
	2	-UB GND
	3	RS485 - B (Modbus RTU)
	4	RS485 - A (Modbus RTU)
	5	GND
	6	GND
	7	GND
	8	GND
	9	GND
	10	GND



Connecting diagram **RYMASKON® 420-Modbus**

	X2	
Input 1	1	DI-1 (digital) 0 V
Input 2	2	DI-2 (digital) 0 V
	3	GND
Output 1	4	DO-1 (digital / PWM)
Output 2	5	DO-2 (digital / PWM)
	6	GND

	X1	
	1	+UB 24 V DC
	2	-UB GND
	3	RS485 - B (Modbus RTU)
	4	RS485 - A (Modbus RTU)
	5	GND
	6	GND
	7	GND
	8	GND
	9	GND
	10	GND



RYMASKON® 400-Modbus Room control unit for room automation

Type / WG02	Communication	Output	Colour	Display	Item No.	Price
RYMASKON® 410-Modbus						
RYMASKON 411	RS485	2x (analog) 0-10V	black	■	1901-5121-2101-000	475,71 €
RYMASKON 412	RS485	2x (analog) 0-10V	white	■	1901-5121-2102-000	475,71 €
RYMASKON® 420-Modbus						
RYMASKON 421	RS485	2x (digital / PWM)	black	■	1901-5121-2201-000	475,71 €
RYMASKON 422	RS485	2x (digital / PWM)	white	■	1901-5121-2202-000	475,71 €

PWM = pulse-width modulation

ACCESSORIES

KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	70,38 €

Room control unit for room automation, configurable, with multifunctional display and Modbus connection

RYMASKON® stands for a series of multifunctional room control units.

The individually configurable **RYMASKON® 200-Modbus** enables automated monitoring and control of the indoor climate and illumination in a Modbus network. It provides three digital inputs and a universal input, which allows connection of up to four external push buttons or switches. It can be configured remotely from a higher-level Modbus master and integrated into a cross-building room climate monitoring and data acquisition system. Internal sensors record room temperature, relative humidity and dew point.

Up to eight capacitive function buttons on the front panel of the compact unit can be used for on-site operation and configuration. A buzzer sounds to acknowledge button use and can also be used as an acoustic fault or alarm warning.

The dimmable multifunctional display is designed specifically for room operation and uses intuitive symbols for a clear view of all available spatial data. Besides the time, date and climate parameters (temperature, humidity, dew point, CO₂ content), it can also display additional features, such as fan mode or room occupancy. The back light colour can be adapted to the room design.

RYMASKON® 200-Modbus
Type 232



TECHNICAL DATA

Power supply:	24 V DC (± 10%)
Power consumption:	max. 0.8 W
Inputs:	3 digital inputs (for standard push buttons or switches) 1 universal input (can be configured for connecting NTC10K temperature sensors or as additional digital input for the connection of standard push buttons or switches)
Bus interface:	RS485 Modbus RTU slave (57600, 38400, 19200, 9600 Baud), bus termination can be set via DIP switch, configurable speed 1200-115200 bit/s (typically 57600 bit/s), adjustable transfer mode (typically "8E1", 1 start bit, 8 data bits, even parity, 1 stop bit)
Equipment:	1 NFC (Near Field Communication) 1 infra-red receiver (NEC protocol) 1 buzzer
Operating elements:	1 backlit multifunctional display (individually programmable RGB colour selection) 4 / 6 / 8 touch buttons, type-dependent

TEMPERATURE

Sensor:	CMOS temperature sensor
Measuring Range:	-40...+125 °C, resolution: 0.1 °C
Accuracy:	typically ±0.5 °C (at +5...+60 °C)

HUMIDITY

Sensor:	capacitive humidity sensor
Measuring Range:	0...100 % r.H., resolution: 0.1 % r.H.
Accuracy:	typically ±2 % r.H. (at +25 °C, 20...80 % r.H.) typically ±3 % r.H. (at +25 °C, 0...20 % r.H. or 80...100 % r.H.)

Electrical connection:	0.2 - 1.5 mm ² , via plug-in screw terminals
Housing:	plastic, black or white colour
Dimensions:	approx. 94.5 x 110 x 19.5 mm
Mounting:	using a plastic mounting plate (see dimensional drawing), on in-wall flush box, Ø 55 mm
Ambient temperature:	0...+50 °C (operation)
Permitted humidity:	0...90 % r.H. (without dew formation)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 50491, EMC directive 2014 / 30 / EU

CONTROL

Type 210:	Temperature up/down, Room occupancy, Menu
Type 220:	Temperature up/down, Fan speed up/down, Room occupancy, Menu
Type 230:	Temperature up/down, Fan speed up/down, Light on/off, Room occupancy, Menu
Type 240:	Temperature up/down, Sun protection up/down, Light on/off, Room occupancy, Menu
Type 250:	Temperature up/down, Fan speed up/down, Sun protection up/down, Room occupancy, Menu
Type 260:	Temperature up/down, Fan speed up/down, Sun protection up/down, Light, Menu

ACCESSORIES

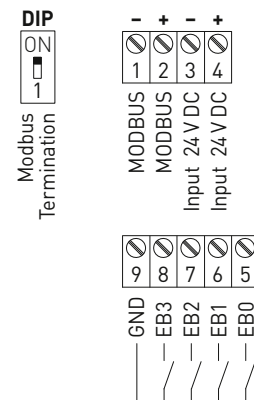
see table

Display symbols RYMASKON® 200-Modbus



DIP Switch	RYMASKON® 200-Modbus
RS 485 bus termination	DIP 1
activated (default)	ON
deactivated	OFF

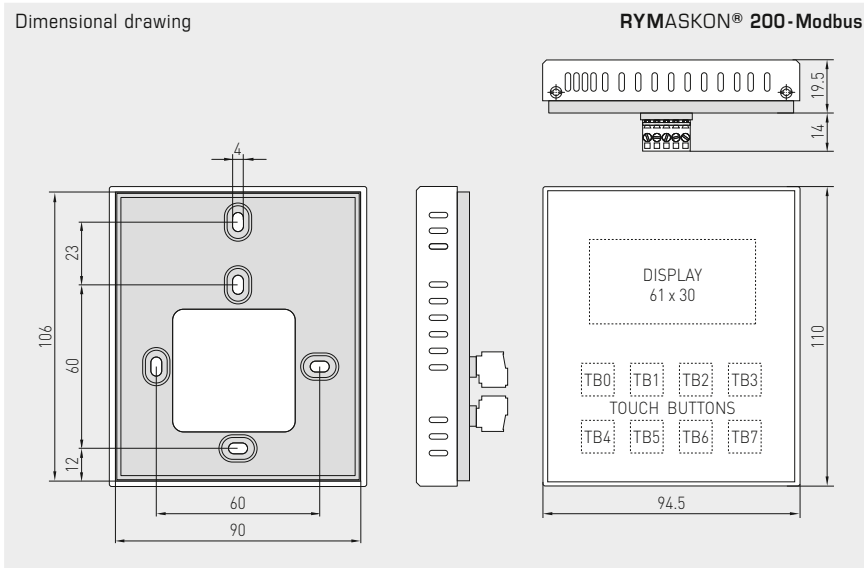
Connecting diagram RYMASKON® 200-Modbus





S+S REGELTECHNIK

Room control unit for room automation, configurable, with multifunctional display and Modbus connection



RYMASKON® 200-Modbus Type 231



RYMASKON® 200-Modbus Room control unit for room automation

Type / WG02	Communication	Buttons	Control	Colour	Display	Item No.	Price
RYMASKON® 210-Modbus							
RYMASKON 211	RS485, NFC, NEC	4	T - - - R M	black	■	1901-5111-3011-001	296,19 €
RYMASKON 212	RS485, NFC, NEC	4	T - - - R M	white	■	1901-5111-3012-001	306,64 €
RYMASKON® 220-Modbus							
RYMASKON 221	RS485, NFC, NEC	6	T V - - R M	black	■	1901-5111-3011-002	296,19 €
RYMASKON 222	RS485, NFC, NEC	6	T V - - R M	white	■	1901-5111-3012-002	306,64 €
RYMASKON® 230-Modbus							
RYMASKON 231	RS485, NFC, NEC	8	T V - L R M	black	■	1901-5111-3011-003	296,19 €
RYMASKON 232	RS485, NFC, NEC	8	T V - L R M	white	■	1901-5111-3012-003	306,64 €
RYMASKON® 240-Modbus							
RYMASKON 241	RS485, NFC, NEC	8	T - S L R M	black	■	1901-5111-3011-004	296,19 €
RYMASKON 242	RS485, NFC, NEC	8	T - S L R M	white	■	1901-5111-3012-004	306,64 €
RYMASKON® 250-Modbus							
RYMASKON 251	RS485, NFC, NEC	8	T V S - R M	black	■	1901-5111-3011-005	296,19 €
RYMASKON 252	RS485, NFC, NEC	8	T V S - R M	white	■	1901-5111-3012-005	306,64 €
RYMASKON® 260-Modbus							
RYMASKON 261	RS485, NFC, NEC	8	T V S L - M	black	■	1901-5111-3011-006	296,19 €
RYMASKON 262	RS485, NFC, NEC	8	T V S L - M	white	■	1901-5111-3012-006	306,64 €
Control:	T = Temperature	V = Ventilation	R = Room occupancy				
	S = Sun protection	L = Light	M = Menu				
ACCESSORIES							
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100	70,38 €

Roomoperating humidity and temperature sensor ($\pm 2.0\%$), on-wall,
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,
calibratable, with Modbus connection

The calibratable room sensor **HYGRASGARD® RFTF-Modbus** with Modbus connection, with/without optional display in an elegant housing (BalduR2) measures the relative humidity and temperature of the room air. These measurands are used to internally calculate various parameters. The Modbus can be used to retrieve the following parameters: relative humidity [% r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and room temperature [°C].

As operating element you can choose between a potentiometer, a 5-pole rotary switch or a presence button. For the temperature/relative humidity / absolute humidity / dew point / mixture ratio / enthalpy or setpoint output devices with LCD display are optionally available for displaying readings. Operating status can be displayed via a maximum of 5 multi-coloured LEDs. These displays (LCDs), as well as the retrieval of measurement and control values, are controlled via the Modbus interface.

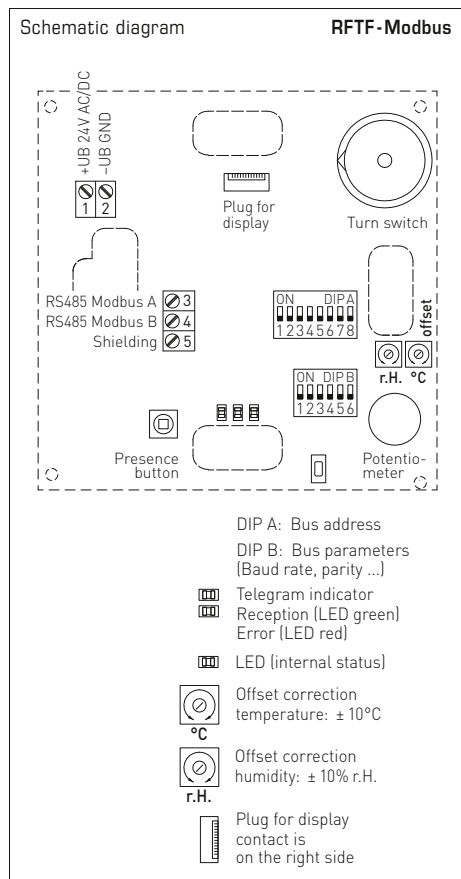
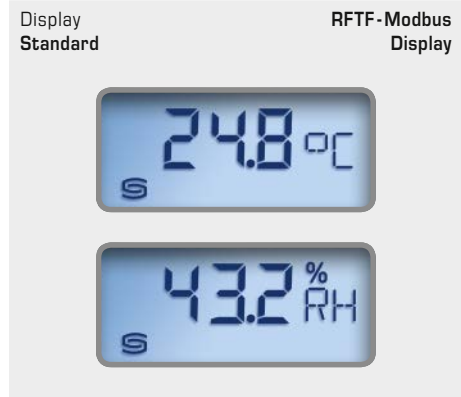
RFTF-Modbus-PTD5 5L

with potentiometer, push-buttons,
rotary switches and LED display



TECHNICAL DATA

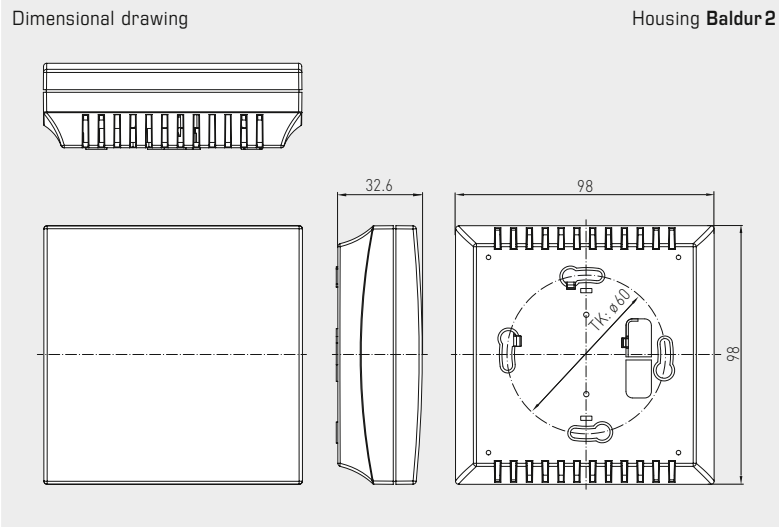
Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Sensor:	Digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability
Data points:	Temperature, relative humidity, absolute humidity, dew point, mixture ratio, enthalpy and setpoint potentiometer, rotary switch and presence button
Measuring range:	0...100% r.H. (humidity) 0...+50 °C (temperature)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r. H.) at +25 °C, otherwise $\pm 3.0\%$
Temperature deviation:	typically $\pm 0.2\text{K}$ at +25 °C
Zero point offset:	$\pm 10\%$ r.H. (humidity) $\pm 10\text{ °C}$ (temperature) adjustable using potentiometer
Ambient temperature:	Storage $-35\text{...}+85\text{ °C}$; Operation $0\text{...}+50\text{ °C}$
Medium:	clean air and other non-aggressive , non-combustible gases
Bus protocol:	Modbus (RTU mode), address range $0\text{...}247$ selectable, LEDs colour-programmable
Signal filtering:	4 s / 32 s
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (BalduR2)
Installation:	wall mounting or on in-wall flush box, $\varnothing 55\text{ mm}$, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Long-term stability:	$\pm 1\%$ / year
Permissible air humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014/30/EU, according to EN 61 326
Features:	Display with illumination , two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value
ACCESSORIES	see table





S+S REGELTECHNIK

Roomoperating humidity and temperature sensor ($\pm 2.0\%$), on-wall,
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,
calibratable, with Modbus connection



RFTF-Modbus-PT 5L
with display, potentiometer,
push-buttons and LED display



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). For improved legibility, backlighting is provided.

The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

The **Modbus configuration** can be used to program an alternative output variable instead of the standard display. In this case, the first line displays the value and index while the second line displays the corresponding unit. The index identifies the display type:

- Index 1 = temperature in °C
- Index 2 = setpoint potentiometer in %
- Index 3 = dew point in °C
- Index 4 = relative humidity in % r.H.
- Index 5 = absolute humidity in g/m³
- Index 6 = mixture ratio in g/kg
- Index 7 = enthalpy in kJ/kg

HYGRASGARD® RFTF-Modbus Roomoperating humidity and temperature sensor						
Type / WG01	Measuring Range / Readout	Temperature	Output	Display	Item No.	Price
RFTF-Modbus-xx						
RFTF-Modbus P	0...100% r. H. (default) 0...80 g/kg (MR) 0...80 g/m ³ (A.H.) 0...85 kJ/kg (ENT.) -20...+80 °C (DP)	0...+50 °C	Modbus		1201-42B6-6001-005	176,81 €
RFTF-Modbus P LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7001-005	210,48 €
RFTF-Modbus P 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6119-005	227,99 €
RFTF-Modbus P 5L LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7119-005	261,67 €
RFTF-Modbus P D5	(5x as above)	(1x as above)	Modbus		1201-42B6-6012-841	203,47 €
RFTF-Modbus P D5 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6120-841	256,79 €
RFTF-Modbus P T D5 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6121-841	269,59 €
RFTF-Modbus P T	(5x as above)	(1x as above)	Modbus		1201-42B6-6047-005	187,47 €
RFTF-Modbus P T LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7047-005	221,15 €
RFTF-Modbus P T 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6051-005	240,79 €
RFTF-Modbus P T 5L LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7051-005	274,46 €
Equipment:	P = Potentiometer (setpoint setter) T = Presence push-buttons		D5 = Rotary switch, 5-step 5L = LED display, multi-colour (5x)			
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485)				1906-1200-0000-100	188,70 €

**Room operating temperature sensor ($\pm 2.0\%$), on-wall,
for temperature, relative humidity, dew point,
calibratable, with Modbus connection**

Calibratable room temperature measuring transducer **THERMASGARD® RTM1-Modbus** with Modbus connection, with/without optional display for displaying the actual temperature, in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment, for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry.

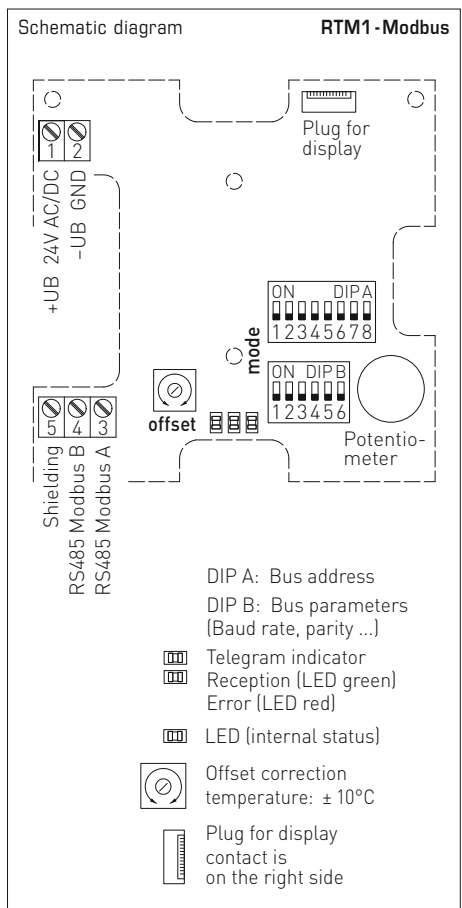
The calibrateable room operating sensor measures the temperature of non-aggressive gases, particularly air. In this case, a setpoint potentiometer is available as an operating element. For temperature/humidity/dew point or setpoint readings, optional devices with LCD displays for displaying readings are available. The displays (LCD), as well as the retrieval of measurement and control values, are triggered via the Modbus interface.

RTM1 - Modbus
Standard



TECHNICAL DATA

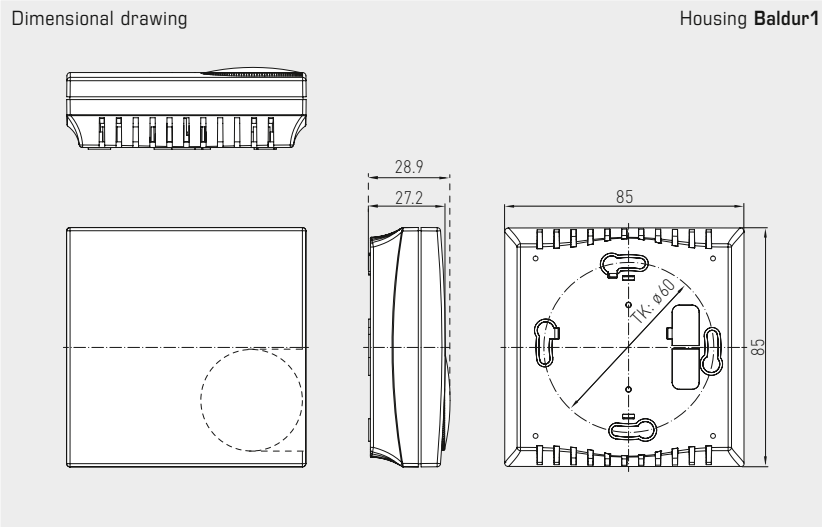
Voltage supply:	24 V AC ($\pm 20\%$) and 15...36V DC
Power consumption:	< 1.0 VA / 24 V DC < 2.2 VA / 24 V AC
Sensor:	digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability
Data points:	temperature, relative humidity, dew point, setpoint potentiometer
Measuring range:	0...+50 °C
Deviation, humidity:	typically $\pm 2.0\%$ (20...80 % r. H.) at +25 °C, otherwise $\pm 3.0\%$
Temperature deviation:	typically $\pm 0.2\text{K}$ at +25 °C
Zero point offset:	$\pm 10\text{ °C}$, adjustable by potentiometer
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Process connection:	by screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, \varnothing 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Permissible air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014/30/EU
Optional:	two-line display with illumination , programmable, cutout approx. 36 x 15 mm (W x H), for displaying the actual temperature or an individually programmable display value (The Modbus interface allows the display to be individually configured in the 7-segment area and in the dot-matrix area.)
ACCESSORIES	see table





S+S REGELTECHNIK

Room operating temperature sensor ($\pm 2.0\%$), on-wall,
for temperature, relative humidity, dew point,
calibratable, with Modbus connection



RTM1-Modbus
with display



RTM1-Modbus-P
with display and
potentiometer



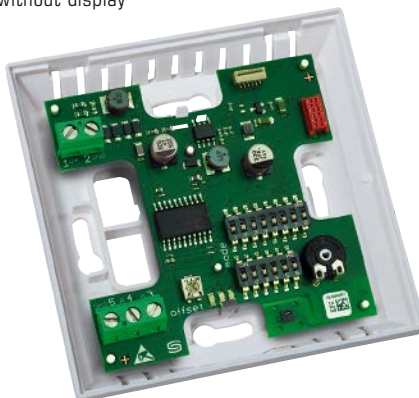
RTM1-Modbus-P
with potentiometer



RTM1-Modbus
with display



RTM1-Modbus
without display



THERMASGARD® RTM 1 - Modbus Room operating temperature sensor

Type / WG01	Sensor	Output	Equipment	Display	Item No.	Price
RTM 1 - Modbus					IP30	
RTM1-Modbus	digital	Modbus	–		1101-42A6-0000-000	101,60 €
RTM1-Modbus LCD	digital	Modbus	–	■	1101-42A6-2000-000	150,44 €
RTM 1 - P - Modbus					IP30	
RTM1-Modbus P	digital	Modbus	potentiometer		1101-42A6-0001-005	133,59 €
RTM1-Modbus P LCD	digital	Modbus	potentiometer	■	1101-42A6-2001-005	240,58 €
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100	70,38 €

**Outside temperature / wet room
temperature measuring transducers, calibratable,
with Modbus connection**

Calibratable outside temperature measurement transducer **THERMASGARD®**
ATM 2 - Modbus - T3 with Modbus connection, in an impact-resistant plastic housing
with quick-locking screws, optionally with /without display.

The on-wall sensor is used to detect the temperature in gaseous media. It is used outside
or in wet rooms, in cold storage buildings and greenhouses, in the industrial sector and in
agriculture. Installation on outside walls is preferably performed on the north side or in a
protected place. In case of direct solar irradiation, we recommend using our sun and
ball-impact protection hood **WS01** or **WS04** (accessories).

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable
bus termination resistance, DIP switch for setting the bus parameters and bus address in
current-free state, LEDs for telegram status display, two separate push-in terminals and
large three-line display (illuminated,
with customised programming in the 7-segment range and dot-matrix range). Uses **internal
diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages
can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated;
an environmental precision adjustment by an expert is possible.

ATM 2 - Modbus - T3

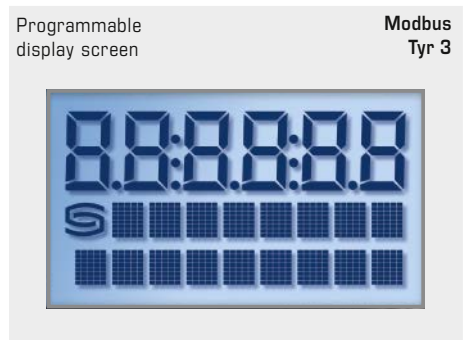
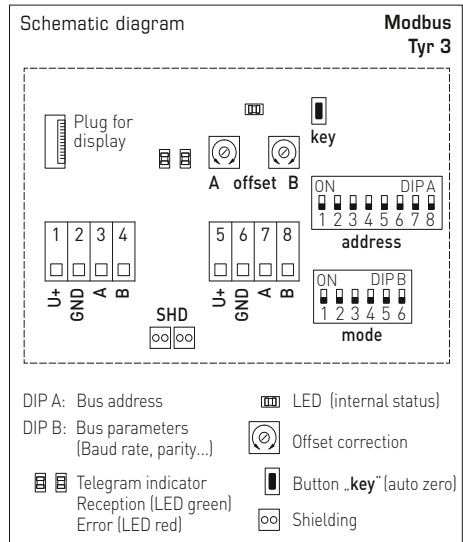


Device variant
with **M12 connector**
(optional on request)



TECHNICAL DATA

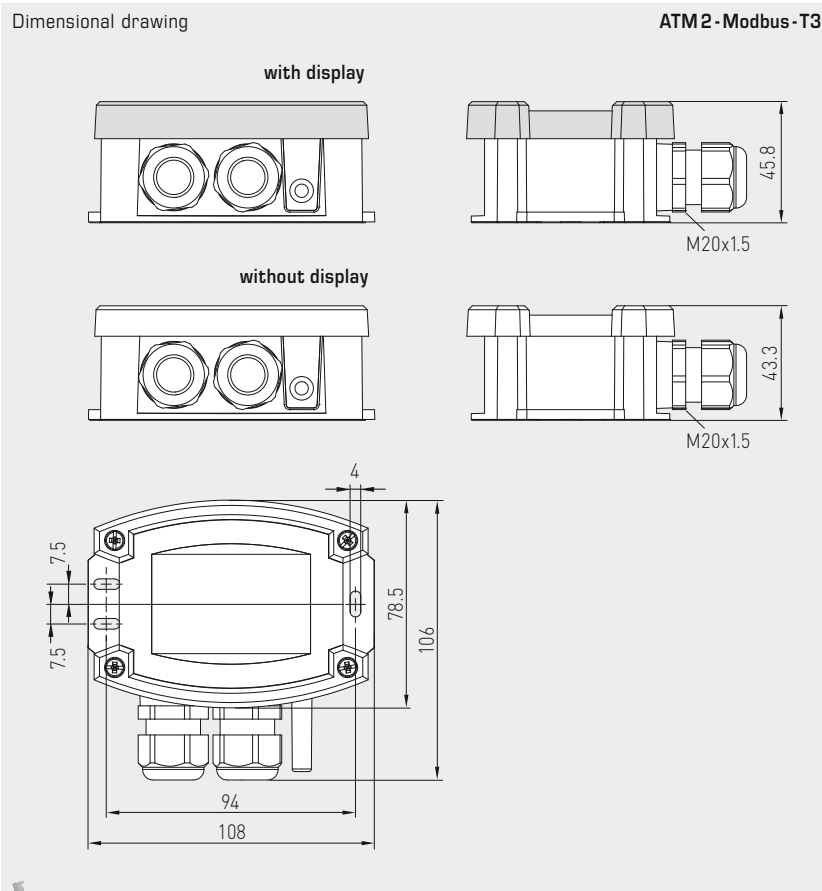
Voltage supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	0.3 s / 1 s / 10 s
Process connection:	by screws
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Permissible air humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Equipment:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit
ACCESSORIES	see table





S+S REGELTECHNIK

Outside temperature / wet room
temperature measuring transducers, calibratable,
with Modbus connection



ATM 2-Modbus-T3
with display



THERMASGARD® ATM 2-Modbus-T3 Outside temperature / wet room temperature measuring transducers

Type / WG01	Sensor	Output	Display	Item No.	Price
ATM 2-Modbus-T3					
ATM2-Modbus-T3	Pt1000	Modbus		1101-12C6-0000-000	113,28 €
ATM2-Modbus-T3 LCD	Pt1000	Modbus	■	1101-12C6-4000-000	161,08 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request	

ACCESSORIES

KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)			1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks			1906-1300-0000-100	70,38 €
WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)			7100-0040-2000-000	28,02 €
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)			7100-0040-7000-000	33,06 €

For further information, see last chapter Accessories!

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection

Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

Calibratable temperature measuring transducer with sensor tube THERMASGARD® TM 65 - Modbus - T3 with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, stainless steel-protective tube (50–400 mm).

The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, machine and systems engineering and the entire industry sector.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TM 65 - Modbus - T3

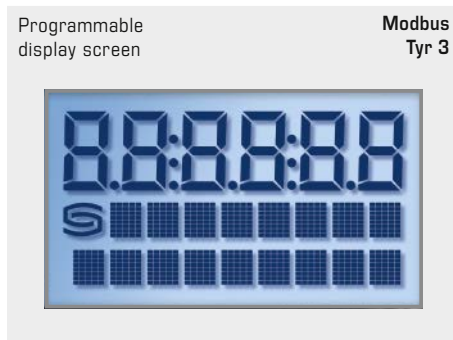
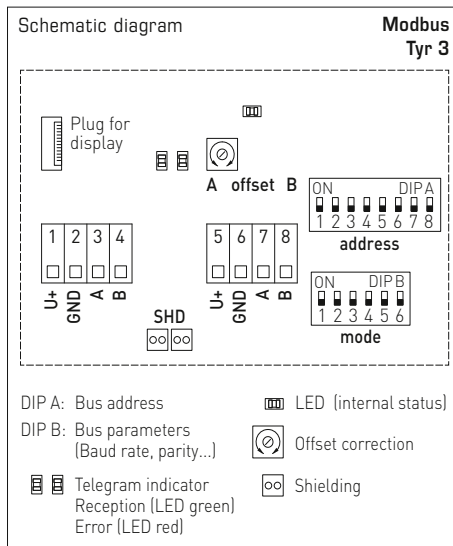


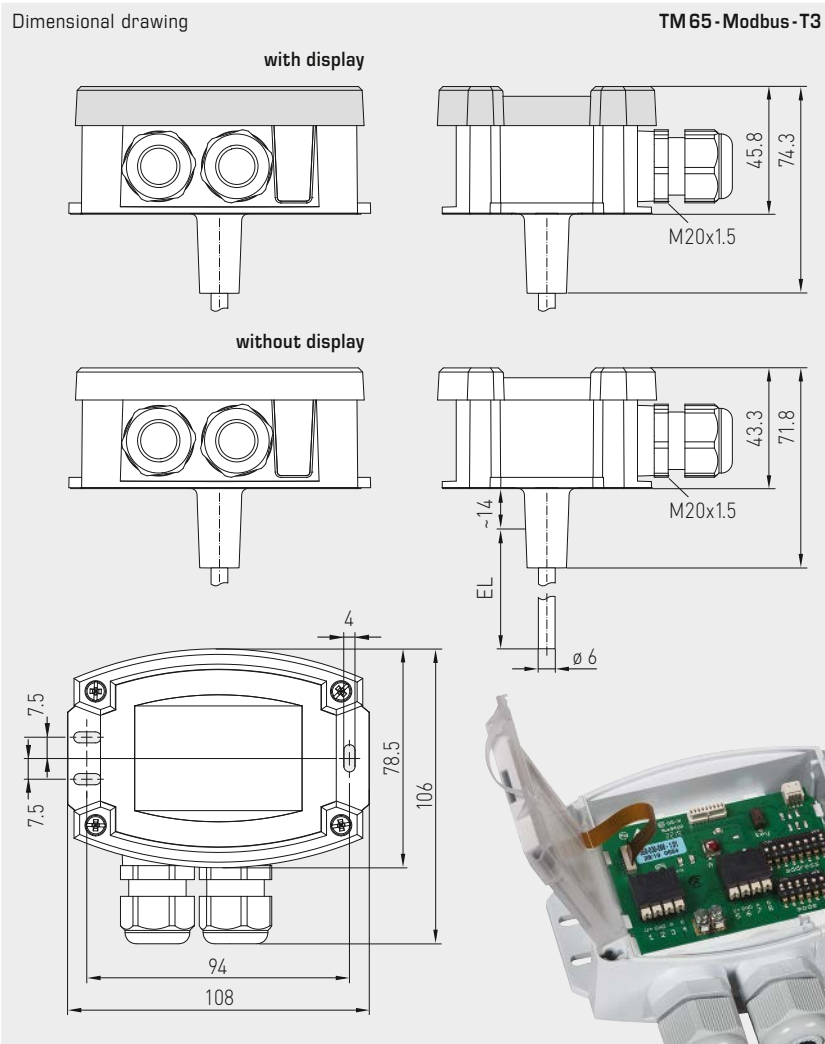
Device version with **M12 connector** (optional on request)



TECHNICAL DATA

Voltage supply:	24 V AC (± 20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Measuring range:	-50...+150 °C
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer -30...+70 °C
Medium:	depending on selected immersion sleeve
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Signal filtering:	0.3 s / 1 s / 10 s
Protective tube:	stainless steel, V4A (1.4571), Ø = 6 mm, inserted length (EL) = 50-400 mm (see table)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Equipment:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit
ACCESSORIES	see table





High-performance encapsulation against vibration, mechanical stress and humidity
PS-PROTECTION
 PERFECT SENSOR PROTECTION



THERMASGARD® TM 65 - Modbus - T3 Temperature sensor (basic device)

Type / WG01	Output	Inserted Length [EL]	Display	Item No.	Price
TM65 - Modbus - T3					
TM65-Modbus-T3 50mm	Modbus	50 mm		1101-7236-0010-000	112,97 €
TM65-Modbus-T3 50mm LCD	Modbus	50 mm	■	1101-7236-4010-000	160,76 €
TM65-Modbus-T3 100mm	Modbus	100 mm		1101-7236-0020-000	113,22 €
TM65-Modbus-T3 100mm LCD	Modbus	100 mm	■	1101-7236-4020-000	161,01 €
TM65-Modbus-T3 150mm	Modbus	150 mm		1101-7236-0030-000	113,42 €
TM65-Modbus-T3 150mm LCD	Modbus	150 mm	■	1101-7236-4030-000	161,24 €
TM65-Modbus-T3 200mm	Modbus	200 mm		1101-7236-0040-000	113,62 €
TM65-Modbus-T3 200mm LCD	Modbus	200 mm	■	1101-7236-4040-000	161,42 €
TM65-Modbus-T3 250mm	Modbus	250 mm		1101-7236-0050-000	113,90 €
TM65-Modbus-T3 250mm LCD	Modbus	250 mm	■	1101-7236-4050-000	161,71 €
TM65-Modbus-T3 300mm	Modbus	300 mm		1101-7236-0060-000	114,60 €
TM65-Modbus-T3 300mm LCD	Modbus	300 mm	■	1101-7236-4060-000	162,39 €
TM65-Modbus-T3 350mm	Modbus	350 mm		1101-7236-0070-000	115,52 €
TM65-Modbus-T3 350mm LCD	Modbus	350 mm	■	1101-7236-4070-000	163,34 €
TM65-Modbus-T3 400mm	Modbus	400 mm		1101-7236-0080-000	116,45 €
TM65-Modbus-T3 400mm LCD	Modbus	400 mm	■	1101-7236-4080-000	164,29 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request	
ACCESSORIES					
KA2-Modbus	Communication adapter (USB/RS485) for system connection			1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination			1906-1300-0000-100	70,38 €

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection

S+S REGELTECHNIK

One basic device in four variants ...



PATENTED

TM 65 - Modbus - T3 + TH08 - ms / xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated

TM 65 - Modbus - T3 + TH08 - VA / xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A

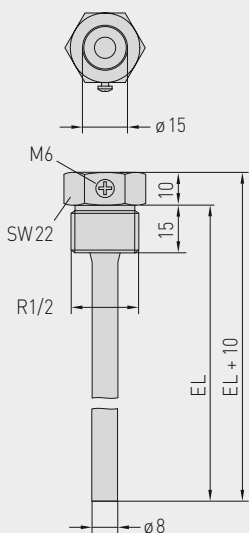
TM 65 - Modbus - T3 + TH08 - VA / xx / 90

Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A

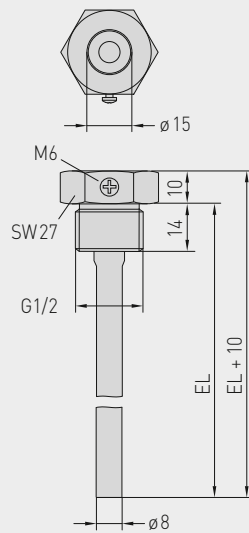
TM 65 - Modbus - T3 + MF - 15 - K

Duct temperature sensor with mounting flange, plastic sleeve

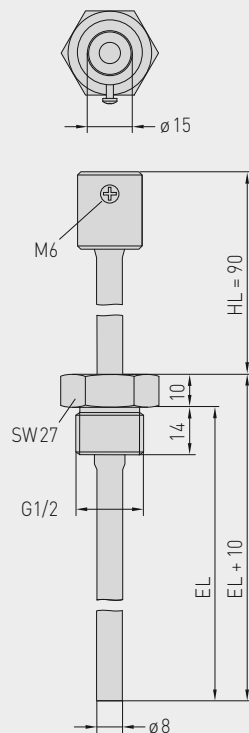
Dimensional drawing TH08 - ms / xx



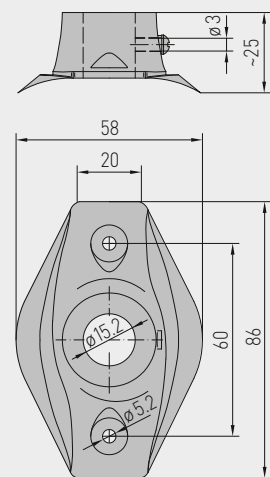
Dimensional drawing TH08 - VA / xx



Dimensional drawing TH08 - VA / xx / 90



Dimensional drawing MF - 15 - K





... through combination with accessories:



TH08-ms/xx
Immersion sleeve, brass, nickel-plated, thread-sealing, conical, according to DIN 10226



TH08-VA/xx
Immersion sleeve, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



TH08-VA/xx/90
Immersion sleeve with neck tube, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



MF-15-K
Mounting flange, plastic

THERMASGARD® TH08 Immersion sleeve Ø 8 mm (Accessories)

Type / WG01B	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.	Price
TH08-ms/xx	Brass nickel-plated			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	8,21 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	9,35 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	9,88 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	10,19 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	11,81 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	12,13 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	12,23 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	12,34 €
TH08-VA/xx	Stainless steel V4A (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	17,88 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	19,76 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	21,23 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	22,38 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	27,82 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	29,07 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	29,27 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	29,79 €
TH08-VA/xx/90	Stainless steel V4A (1.4571)			with neck tube (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	25,61 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	26,76 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	28,07 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	29,27 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	30,68 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	33,25 €

Note: inner diameter of socket 15.0 mm
For further information see last chapter!

Mounting flange (Accessories)

Type / WG01B	Item No.	Price
MF		
MF-15-K	7100-0032-0000-000	5,40 €
Mounting flange, plastic, 56.8x84.3mm, Ø 15.2mm tube gland, T _{max} +100°C		

Note: For information see last chapter!

Mean value temperature measuring transducers,
incl. mounting flange, calibratable,
with Modbus connection

Calibratable mean value temperature measuring transducer **THERMASGARD® MWTM-Modbus-T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, with flexible sensor rod (0.4...20m, fully active) in a robust protective plastic-coated copper tube, incl. mounting flange.

The rod sensor is used to detect the mean temperature (mean value) in gaseous media. It is used in ventilation and air conditioning ducts over the entire cross-section or on a defined length (laid along a meandering route, it uniformly detects the surrounding temperature). For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

MWTM-Modbus-T3
Rod length
3m / 6m

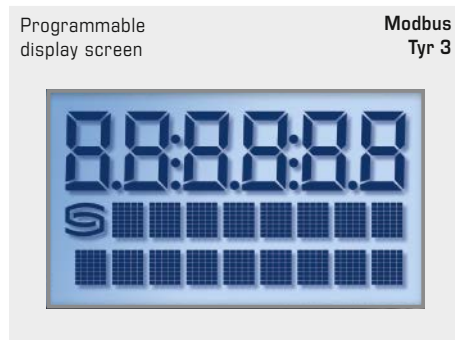
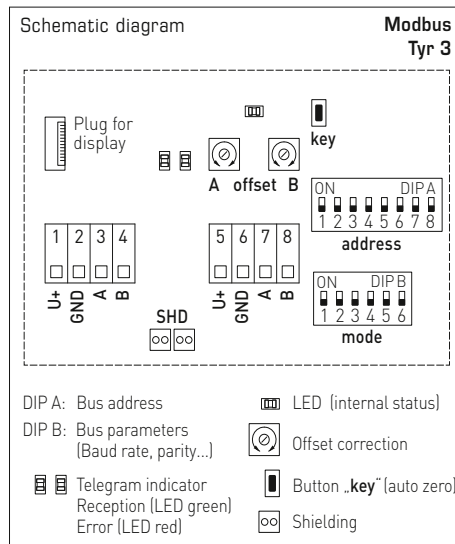


Device version with **M12 connector** (optional on request)



TECHNICAL DATA

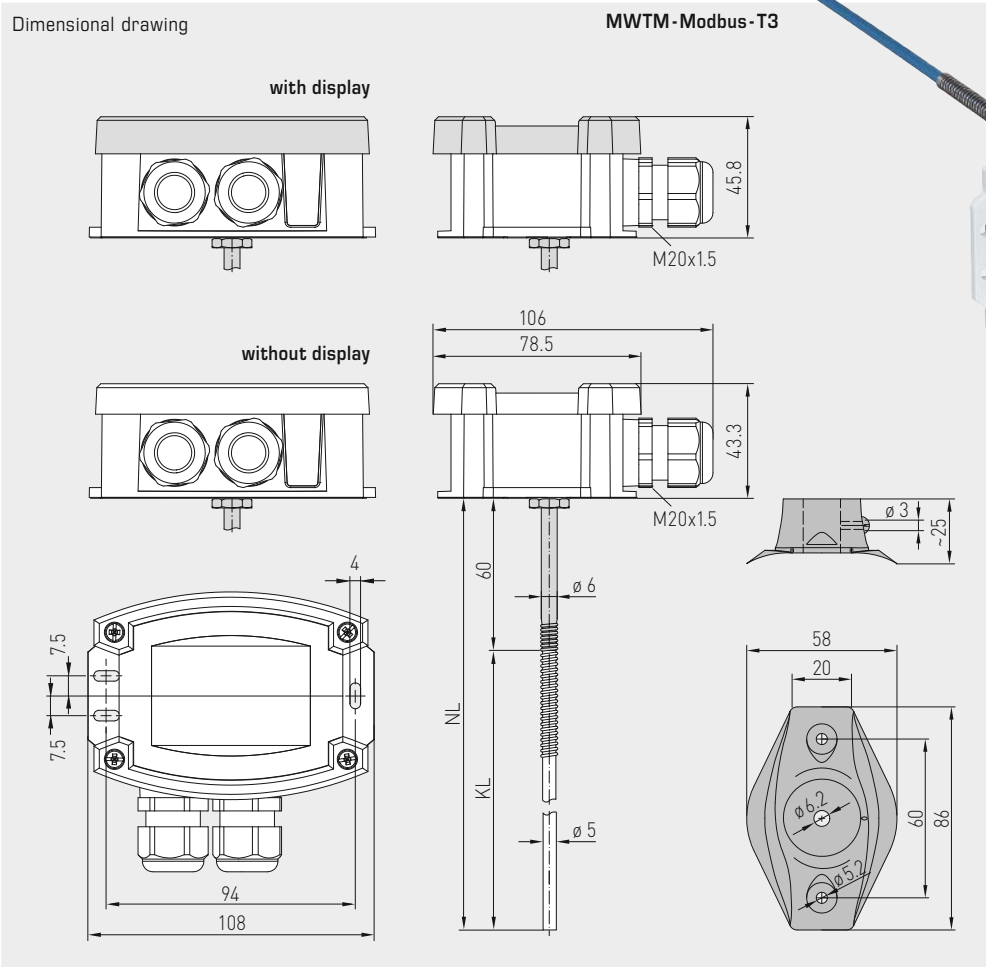
Voltage supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C; T_{min} -50 °C, T_{max} +80 °C
Temperature deviation:	typically ±0.2 K at +25 °C
Zero point offset:	±10 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	0.3 s / 1 s / 10 s
Sensors:	active across the entire length (averaging)
Rod material:	protective tube made from copper, plastic-coated , with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m (nominal length optional up to max. 20 m)
Rod laying:	Bending radius: > 35 mm Vibration load: ≤ 0.5 g Tensile load: < 480 N
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Process connection:	by mounting flange, plastic (galvanised steel optional, see accessories) and mounting clamps MK-05-M
Ambient temperature:	Measuring transducer -30...+70 °C
Permissible air humidity:	<95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Equipment:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit
ACCESSORIES	see table





S+S REGELTECHNIK

Mean value temperature measuring transducers,
incl. mounting flange, calibratable,
with Modbus connection



MWTM-Modbus-T3
Rod length
0.4 m



MF-06-K
Mounting flange,
plastic
(included in the scope of delivery)



MK-05-M
Galvanised steel
mounting clamps
(optional)



MF-06-M
Mounting flange,
metal
(optional)



KRD-04
Capillary tube
gland bracket, plastic
(optional)



THERMASGARD® MWTM-Modbus-T3 Mean value temperature measuring transducers

Type / WG01	Sensor	Output	Rod length (NL)	Display	Item No.	Price
MWTM-Modbus-T3					IP65	
MWTM-Modbus-T3 0,4m	Pt1000	Modbus	0,4 m		1101-3266-0080-000	177,61 €
MWTM-Modbus-T3 0,4m LCD	Pt1000	Modbus	0,4 m	■	1101-3266-4080-000	225,02 €
MWTM-Modbus-T3 3m	Pt1000	Modbus	3,0 m		1101-3266-0230-000	224,32 €
MWTM-Modbus-T3 3m LCD	Pt1000	Modbus	3,0 m	■	1101-3266-4230-000	272,20 €
MWTM-Modbus-T3 6m	Pt1000	Modbus	6,0 m		1101-3266-0260-000	257,86 €
MWTM-Modbus-T3 6m LCD	Pt1000	Modbus	6,0 m	■	1101-3266-4260-000	306,04 €
Extra charge:	Per meter sensor cable (from 6 m to max. 20 m)				on request	
	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	

ACCESSORIES

KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100	70,38 €
MF-06-K	Mounting flange, plastic (included in the scope of delivery)				7100-0030-1000-000	5,40 €
MF-06-M	Mounting flange, metal, galvanised steel, Ø = 35 mm				7100-0030-5000-000	8,43 €
KRD-04	Capillary tube gland bracket, plastic				7100-0030-7000-000	7,86 €
MK-05-M	Galvanised steel mounting clamps (6 pieces)				7100-0034-0000-000	8,71 €

For further information, see last chapter Accessories!

Sleeve sensor with temperature measuring transducer, calibratable, with Modbus connection

Calibratable sleeve temperature measuring transducer **THERMASGARD® HFTM - Modbus - T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, cable sensor with a stainless steel sleeve.

The sleeve sensor is used to detect the temperature in liquid and gaseous media. It is used as a duct sensor or, if installed in immersion sleeve **THE** (accessories), as an immersion and screw-in sensor in liquids.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

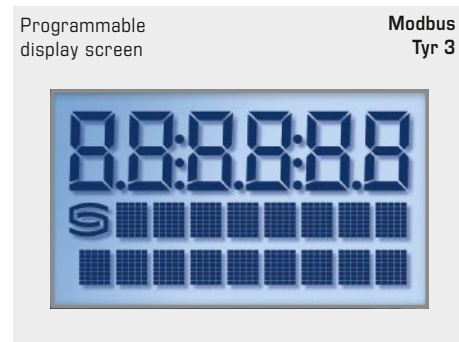
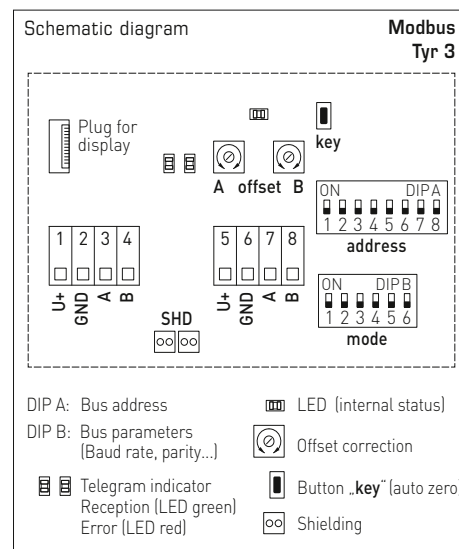
HFTM - Modbus - T3

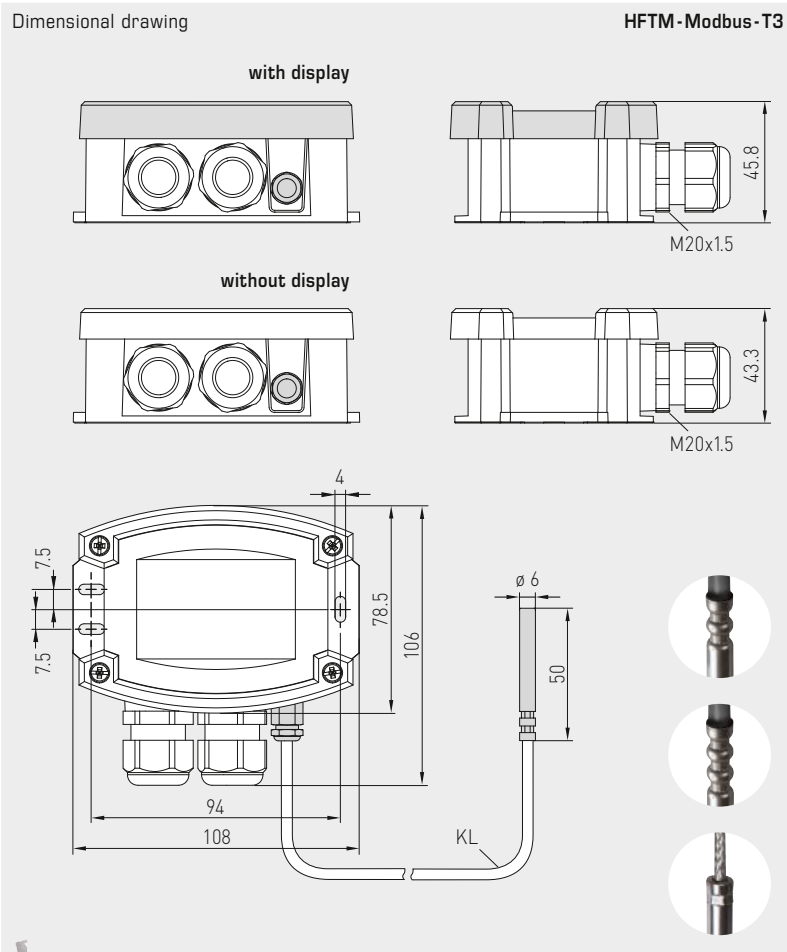


Device version with **M12 connector** (optional on request)



TECHNICAL DATA	
Voltage supply:	24 V AC (±20%) and 15...36V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection with IP68)
Measuring range:	-50...+150 °C
Temperature deviation:	typically ±0.2 K at +25 °C
Zero point offset:	±10 °C
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	0.3 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Sensor protection:	Sensor sleeve made from stainless steel V4A (1.4571), Ø = 6 mm, nominal length (NL) = 50 mm (optional 30...400 mm)
Sensor cable:	silicone, SiHF, 2 x 0.25 mm ² , cable length (KL) = 1.5 m (other lengths and range limits optional, e.g. PTFE leads up to +250 °C or glass fibre with steel wire mesh up to +350 °C)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Ambient temperature:	Measuring transducer -30...+70 °C
Permissible air humidity:	<95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	IP65 (according to EN 60 529)
Protection type sensor:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional) IP54 (according to EN 60 529) with glass fibre cable (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Equipment:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit
ACCESSORIES	see table





HFTM-Modbus-T3 with display



IP65 (standard)
humidity-tight

IP68 (optional)
water-tight
Perfect Sensor Protection

IP54 (optional)
with **glass fibre** cable



High-performance encapsulation against vibration, mechanical stress and humidity



THERMASGARD® HFTM - Modbus - T3 Sleeve sensor with temperature measuring transducer

Type / WG01	Sensor	Output	Type	Display	Item No.	Price
HFTM-Modbus-T3						
HFTM-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-62A6-0210-000	116,90 €
HFTM-Modbus-T3 LCD	Pt1000	Modbus	Remote sensor	■	1101-62A6-4210-000	164,75 €
Extra charge:	Protection type IP68 (sensor sleeve watertight compound-filled) per running metre of connecting lead (silicone/PTFE/glass fibre) other protection sleeve lengths optional				on request	3,00 €
	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100	70,38 €
THE-xx	Immersion sleeve , stainless steel V4A (1.4571) or nickel-plated brass, Ø=9mm, inner diameter of socket 5.2 mm, with adjusting screw M12 x1.5					
For further information, see last chapter Accessories!						

Surface contact temperature / tube contact temperature measuring transducers, incl. strap, compact variant, calibratable, with Modbus connection

Calibratable surface-contact temperature measuring transducer (compact variant)
THERMASGARD® ALTM1-Modbus-T3 with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, incl. strap.

The surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ALTM 1 - Modbus-T3

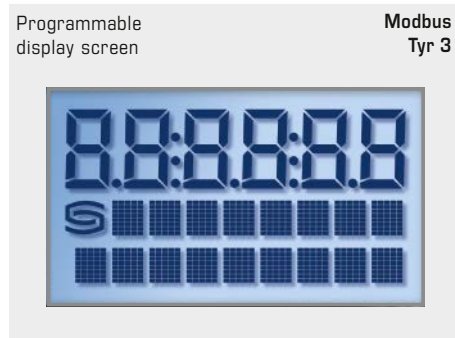
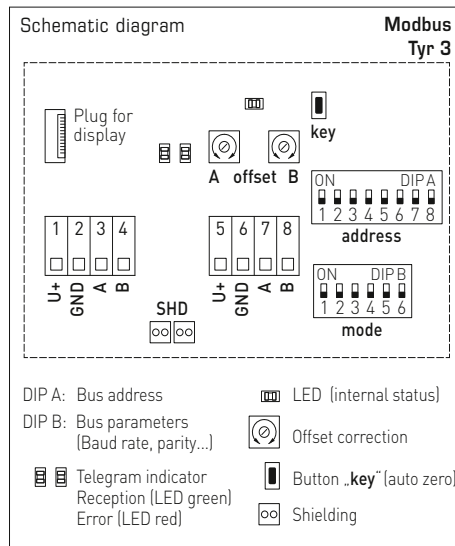


Device version with **M12 connector** (optional on request)



TECHNICAL DATA

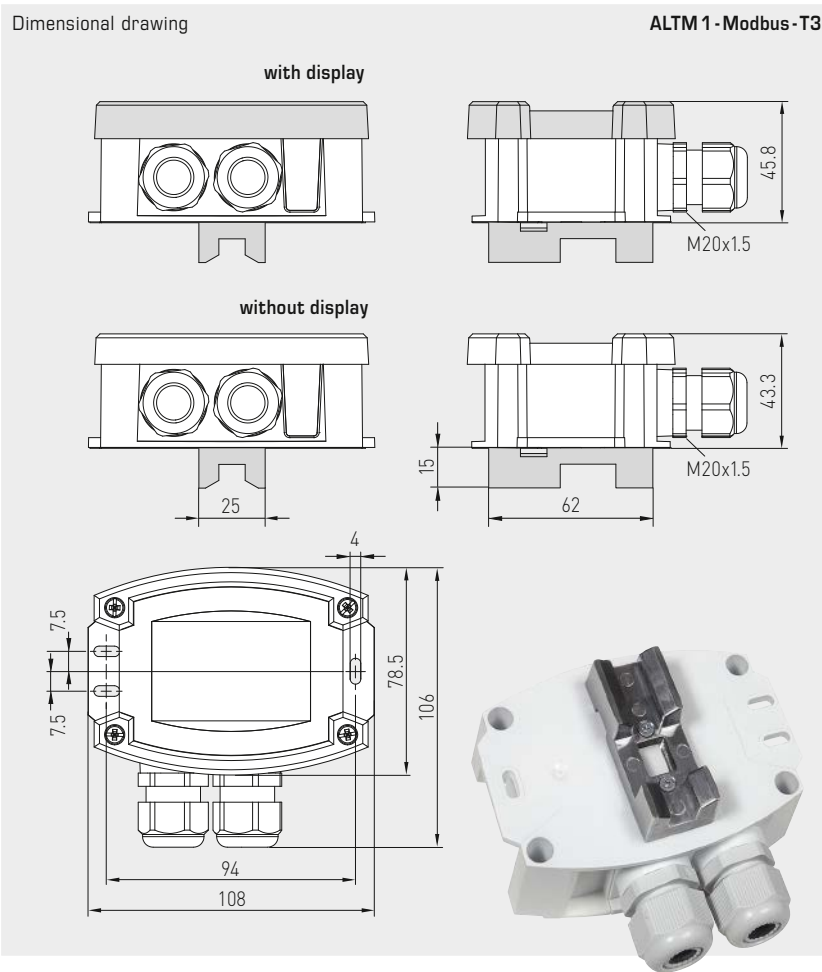
Voltage supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C T_{max} up to +100 °C (compact variant)
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Process connection:	Endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Ambient temperature:	Measuring transducer -30...+70 °C
Permissible air humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014/30/EU
Equipment:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit
ACCESSORIES	see table





S+S REGELTECHNIK

Surface contact temperature / tube contact temperature measuring transducers, incl. strap, compact variant, calibratable, with Modbus connection



ALTM1 - Modbus - T3 with display



THERMASGARD® ALTM 1 - Modbus - T3 Surface contact temperature / tube contact temperature measuring transducers

Type / WG01	Sensor	Output	Type	Display	Item No.	Price
ALTM 1 - Modbus - T3						
ALTM1-Modbus-T3	Pt1000	Modbus	Compact		1101-12B6-0000-000	117,37 €
ALTM1-Modbus-T3 LCD	Pt1000	Modbus	Compact	■	1101-12B6-4000-000	166,32 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	

ACCESSORIES

KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	70,38 €
WLP-1	Heat-conductive paste , silicone-free	7100-0060-1000-000	2,98 €

For further information, see last chapter Accessories!

Surface contact temperature / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with Modbus connection

Calibratable surface-contact temperature measuring transducer (detached variant) **THERMASGARD® ALTM2-Modbus-T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, cable sensor with a pipe feeder, incl. strap.

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ALTM 2 - Modbus - T3

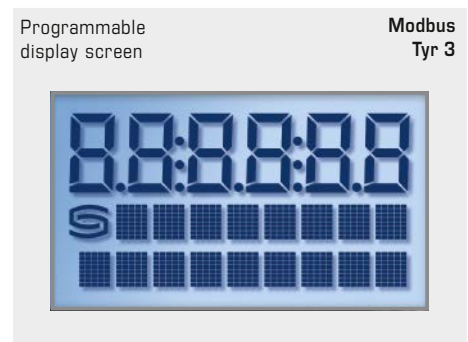
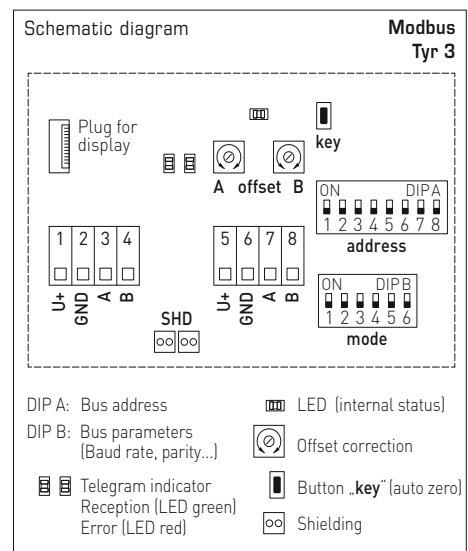


Device version with **M12 connector** (optional on request)



TECHNICAL DATA

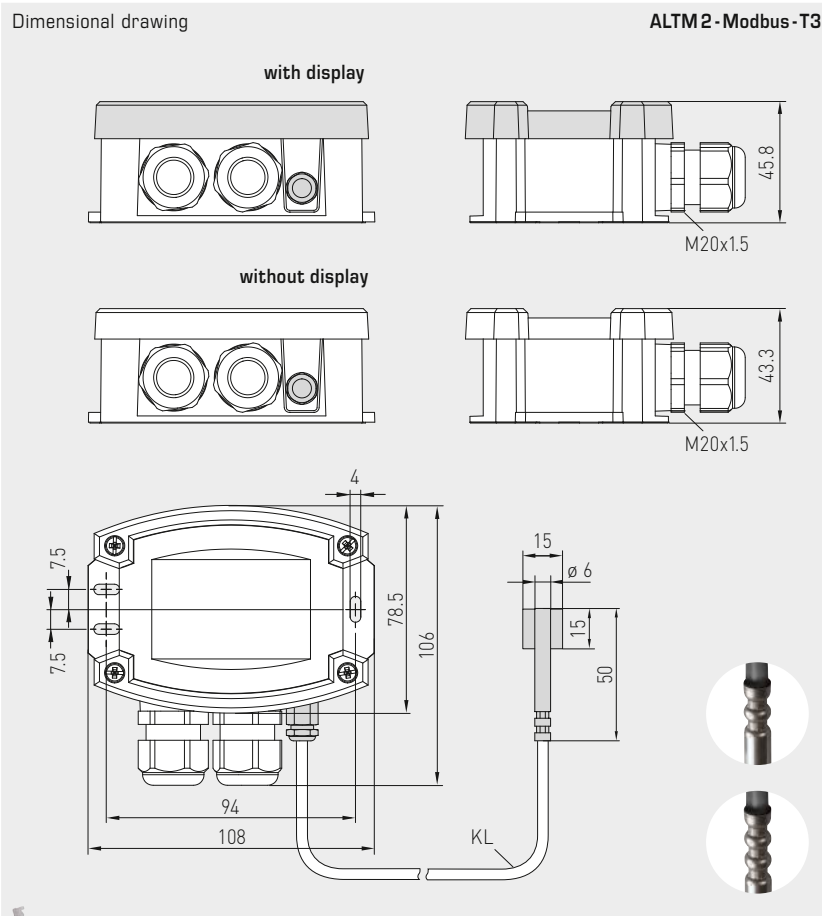
Voltage supply:	24 V AC (± 20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection with IP68)
Measuring range:	-50...+150 °C, T_{max} to +150 °C (detached sensor variant)
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	0.3 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Sensor protection:	pipe feeder made of stainless steel V4A (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	silicone, SiHF, 2 x 0.25 mm ² , cable length (KL) = 1.5 m (other lengths and range limits optional, e.g. PTFE leads up to + 250 °C or glass fibre with steel wire mesh up to + 350 °C)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Process connection:	Endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Ambient temperature:	Measuring transducer -30...+70 °C
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	IP65 (according to EN 60 529)
Protection type sensor:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Equipment:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit
ACCESSORIES	see table





S+S REGELTECHNIK

Surface contact temperature / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with Modbus connection



ALTM 2 - Modbus - T3
with display



IP65 (standard)
humidity-tight

IP68 (optional)
water-tight
Perfect Sensor Protection



High-performance encapsulation against vibration, mechanical stress and humidity



THERMASGARD® ALTM 2 - Modbus - T3 Surface contact temperature / tube contact temperature measuring transducers

Type / WG01	Sensor	Output	Type	Display	Item No.	Price	
ALTM 2 - Modbus - T3							
ALTM2-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-62B6-0210-000	123,73 €	
ALTM2-Modbus-T3 LCD	Pt1000	Modbus	Remote sensor	■	1101-62B6-4210-000	171,63 €	
Extra charge:	Protection type IP68 (sensor sleeve watertight compound-filled) per running metre of connecting lead (silicone / PTFE / glass fibre) Cable connection with M12 connector according to DIN EN 61076-2-101					on request on request	3,00 €

ACCESSORIES

KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	70,38 €
WLP-1	Heat-conductive paste , silicone-free	7100-0060-1000-000	2,98 €

For further information, see last chapter Accessories!

Pendulum room temperature measuring transducer, (with stainless steel sleeve), calibratable, with Modbus connection

Calibratable room pendulum temperature measuring transducer (with sleeve)

THERMASGARD® RPTM1 -Modbus -T3 with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable).

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable us termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

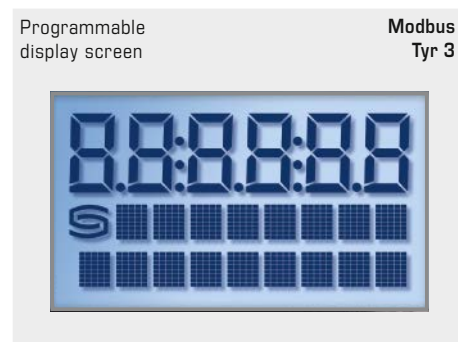
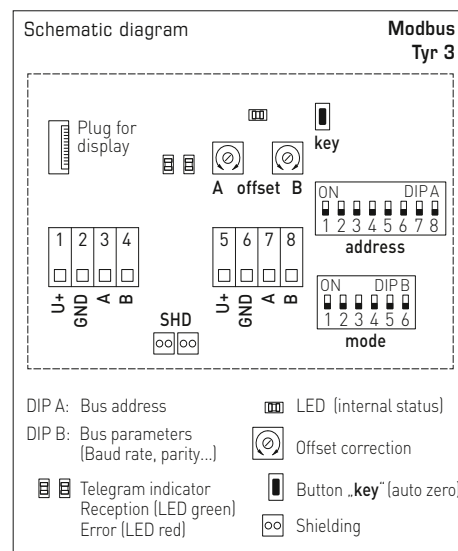
RPTM1 -Modbus-T3



Device version with **M12 connector** (optional on request)

TECHNICAL DATA

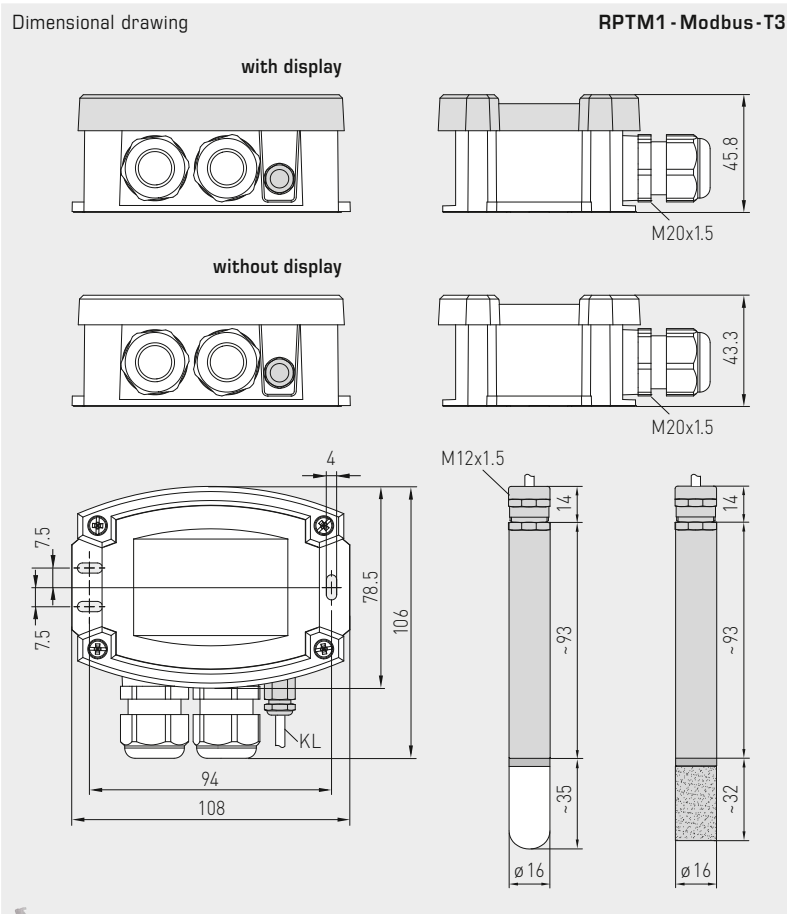
Voltage supply:	24 V AC (±20%) and 15...36V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range:	-50...+150 °C
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr3 without display) 108 x 78.5 x 45.8 mm (Tyr3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm ² , cable length (KL) = approx. 1.5 m (other lengths optional)
Protective tube:	stainless steel V2A (1.4301), Ø=16 mm, NL = 142mm
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Permissible air humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Equipment:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit
ACCESSORIES	see table





S+S REGELTECHNIK

Pendulum room temperature measuring transducer,
(with stainless steel sleeve), calibratable,
with Modbus connection



RPTM1 - Modbus - T3
with display



MF-16-K
Mounting flange,
plastic (optional)



SF-K
with plastic sinter filter
(standard)



SF-M
with metal sinter filter
(optional)



THERMASGARD® RPTM1 - Modbus - T3 Pendulum room temperature measuring transducer (with stainless steel sleeve)

Type / WG01	Sensor	Output	Type	Display	Item No.	Price
RPTM1 - Modbus - T3						
RPTM1-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-6286-0210-000	154,96 €
RPTM1-Modbus-T3 LCD	Pt1000	Modbus	Remote sensor	■	1101-6286-4210-000	203,26 €
Extra charge:	per running metre of connecting lead (PVC)				on request	
	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	

ACCESSORIES

KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100	70,38 €
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)				7000-0050-2200-100	37,32 €
MF-16-K	Mounting flange plastic (optional)				7100-0030-0000-000	8,43 €

For further information, see last chapter Accessories!

**Pendulum room temperature measuring transducer,
(with globe), calibratable,
with Modbus connection**

Calibratable room pendulum temperature measuring transducer (with globe) **THERMASGARD® RPTM2 - Modbus - T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, cable sensor with a black plastic globe.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer (globe thermometer) achieves a very good, representative measurement result due to its positioning in the room. The dark radiation sensor determines the effective radiation heat at the measured location. This is relevant for calculating the thermal comfort (operative room temperature) taking into account the co-action of thermal radiation and thermal convection. The ratio of globe temperature / air temperature is approx. 70% / 30%.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPTM2 - Modbus - T3

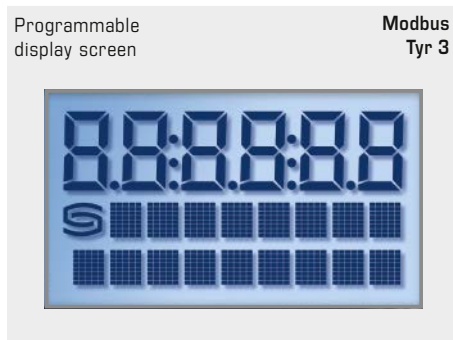
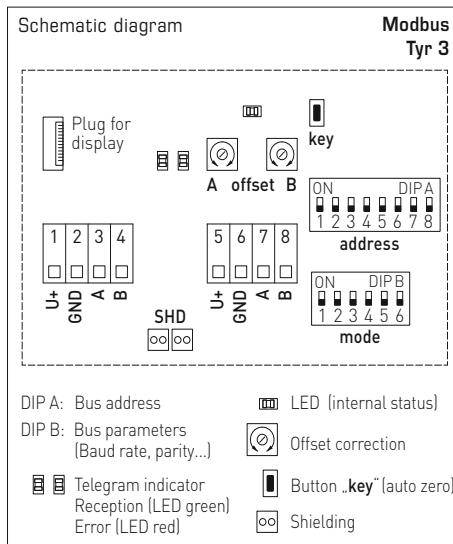


Device version with **M12 connector** (optional on request)



TECHNICAL DATA

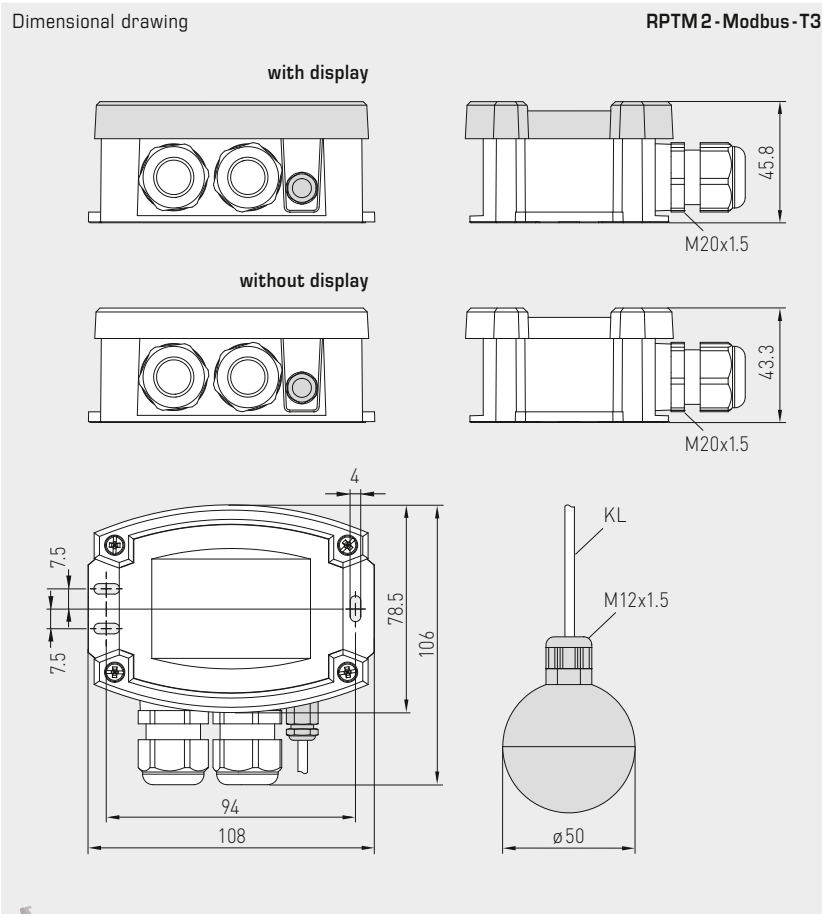
Voltage supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C T_{min} -50 °C, T_{max} +80 °C
Temperature deviation:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm ² , cable length (KL) = approx. 1.5 m (other lengths optional)
Globe:	plastic, colour black, Ø = 50 mm
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Permissible air humidity:	<95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Equipment:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit
ACCESSORIES	see table





S+S REGELTECHNIK

Pendulum room temperature measuring transducer,
(with globe), calibratable,
with Modbus connection



RPTM2-Modbus-T3
with display



THERMASGARD® RPTM 2 - Modbus - T3 Pendulum room temperature measuring transducer (with globe)						
Type / WG01	Sensor	Output	Type	Display	Item No.	Price
RPTM2 - Modbus - T3						
RPTM2-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-6296-0210-000	160,72 €
RPTM2-Modbus-T3 LCD	Pt1000	Modbus	Remote sensor	■	1101-6296-4210-000	209,10 €
Extra charge:	per running metre of connecting lead (PVC)				on request	
	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	

ACCESSORIES						
KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	70,38 €

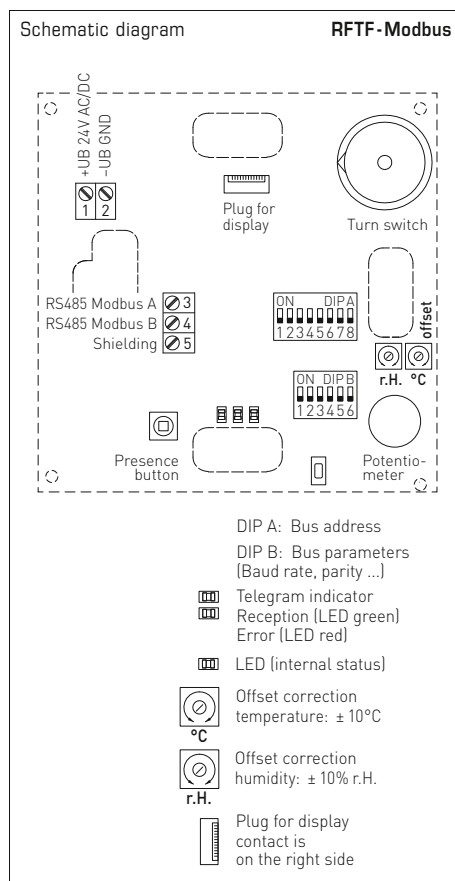
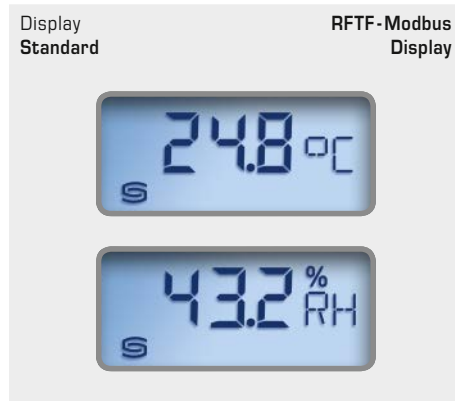
**Room humidity and temperature sensor ($\pm 2.0\%$), on-wall,
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,
calibratable, with Modbus connection**

**RFTF-Modbus
Standard**

The calibratable room sensor **HYGRASGARD® RFTF-Modbus** with Modbus connection, with/without optional display in an elegant housing (Baldur 2) measures the relative humidity and temperature of the room air. These measurands are used to internally calculate various parameters. The Modbus can be used to retrieve the following parameters: relative humidity [% r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and room temperature [°C].



TECHNICAL DATA	
Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Sensor:	Digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability
Data points:	Temperature, relative humidity, absolute humidity, dew point, mixture ratio, enthalpy and setpoint potentiometer, rotary switch and presence button
Measuring range:	0...100% r.H. (humidity) 0...+50 °C (temperature)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r. H.) at +25 °C, otherwise $\pm 3.0\%$
Temperature deviation:	typically $\pm 0.2\text{K}$ at +25 °C
Zero point offset:	$\pm 10\%$ r.H. (humidity) $\pm 10\text{ °C}$ (temperature) adjustable using potentiometer
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Medium:	clean air and other non-aggressive , non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, $\varnothing 55\text{ mm}$, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Long-term stability:	$\pm 1\%$ / year
Permissible air humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014/30/EU, according to EN 61 326
Features:	Display with illumination , two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value
ACCESSORIES	see table





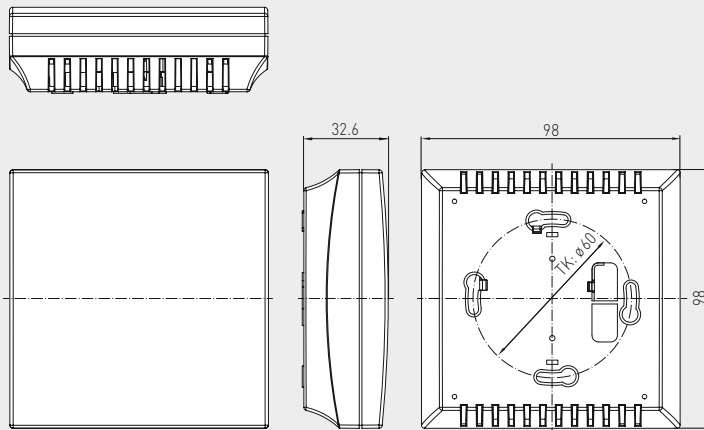
S+S REGELTECHNIK

Room humidity and temperature sensor ($\pm 2.0\%$), on-wall,
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,
calibratable, with Modbus connection

Dimensional drawing

Housing Baldur 2

RFTF-Modbus
with display



Display
alternative output variables

RFTF-Modbus
Display



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). For improved legibility, backlighting is provided.

The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

The **Modbus configuration** can be used to program an alternative output variable instead of the standard display.

In this case, the first line displays the value and index while the second line displays the corresponding unit.

The index identifies the display type:

- Index 1** = temperature in °C
- Index 2** = setpoint potentiometer in %
- Index 3** = dew point in °C
- Index 4** = relative humidity in % r.H.
- Index 5** = absolute humidity in g/m³
- Index 6** = mixture ratio in g/kg
- Index 7** = enthalpy in kJ/kg

HYGRASGARD® RFTF-Modbus		Room humidity and temperature sensor					
Type / WG01	Measuring Range / Readout	Temperature	Output	Display	Item No.	Price	
RFTF-Modbus							
RFTF-Modbus	0...100 % r. H. (default) 0...80 g/kg (MR) 0...80 g/m ³ (A.H.) 0...85 kJ/kg (ENT.) -20...+80 °C (DP)	0...+50 °C	Modbus		1201-42B6-6000-000	144,81 €	
RFTF-Modbus LCD	0...100 % r. H. (default) 0...80 g/kg (MR) 0...80 g/m ³ (A.H.) 0...85 kJ/kg (ENT.) -20...+80 °C (DP)	0...+50 °C	Modbus	■	1201-42B6-7000-000	178,49 €	
ACCESSORIES							
KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	188,70 €	
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	70,38 €	

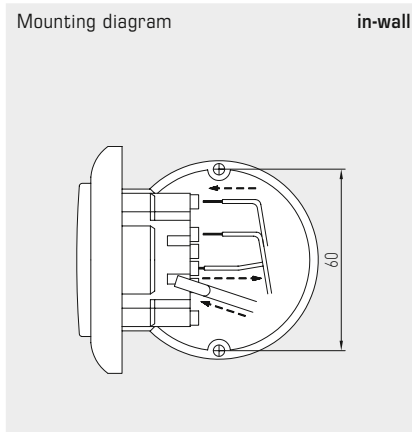
Room, humidity and temperature sensor or measuring transducer for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, in-wall in the panel switch programme, with Modbus connection

The room sensor and measuring transducer **HYGRASGARD® FSFTM - Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the relative humidity and temperature of the air, and for setpoint adjustment. The following parameters are calculated internally from the measured values: relative humidity [% r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and room temperature [°C]. The parameters are queried via the Modbus interface.

A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% r. H.] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC ; < 2.2 VA / 24 V AC
Data points:	temperature [°C], relative humidity [% r. H.] absolute humidity [g/m³], dew point [°C], mixing ratio [g/kg], enthalpy [kJ/kg] and setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Signal filtering:	4 s / 32 s

HUMIDITY

Sensor:	digital humidity sensor, with integrated temperature sensor, low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity::	0...100 % r. H.
Operating range, humidity:	0...95 % r. H. (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20...80 % r. H.) at +25 °C, otherwise ± 5.0 %

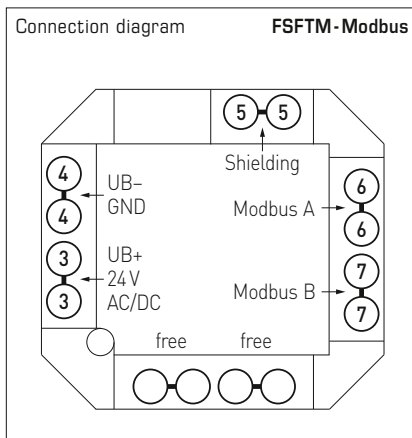
TEMPERATURE

Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C

Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % r.H., non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

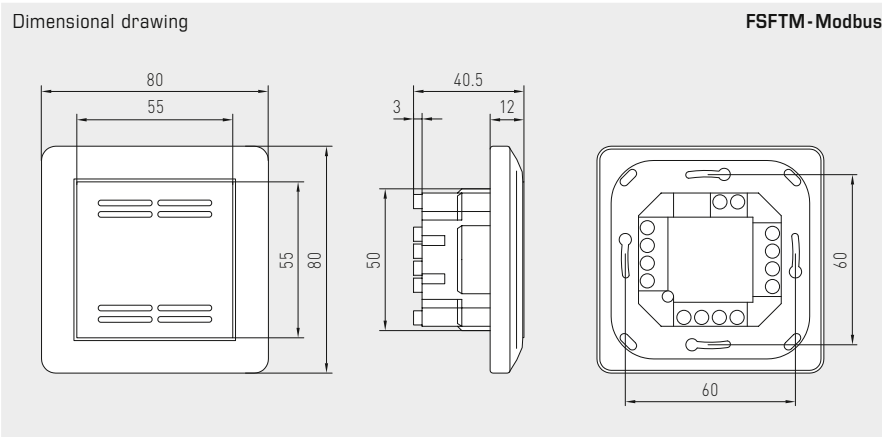
SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

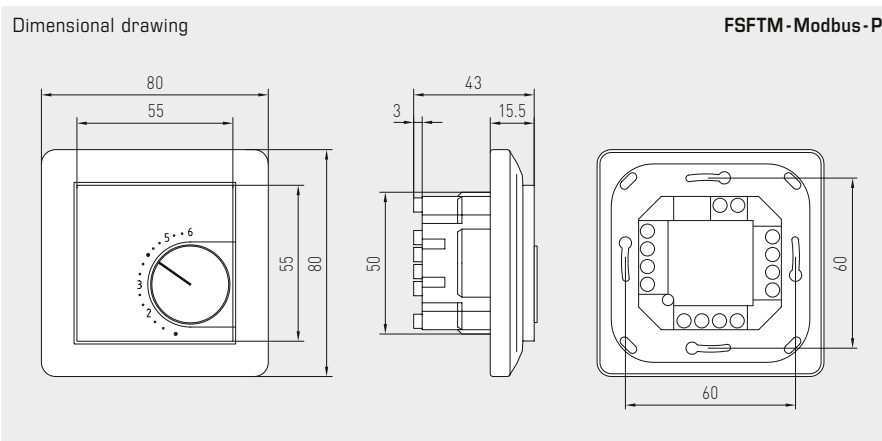




Room, humidity and temperature sensor or measuring transducer for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, in-wall in the panel switch programme, with Modbus connection



FSFTM-Modbus Standard



FSFTM-Modbus-P with potentiometer



HYGRASGARD® FSFTM-Modbus Room temperature and humidity sensor, in-wall

Type / WG02	Measuring Range	Temperature	Control element	Output	Item No.	Price
FSFTM-Modbus	Humidity (base value)					
FSFTM-Modbus	0...100% r. H. (default) 0...80 g / kg (MV) 0...80 g / m ³ (a.F.) 0...85 kJ / kg (ENT.) -20...+80 °C (TP)	0...+50 °C	-	Modbus	1201-9226-1000-162	256,15 €
FSFTM-Modbus P	0...100% r. H. (default) 0...80 g / kg (MV) 0...80 g / m ³ (a.F.) 0...85 kJ / kg (ENT.) -20...+80 °C (TP)	0...+50 °C	Potentiometer	Modbus	1201-9226-1400-282	277,06 €

Data points: relative humidity [% r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure), temperature [°C] and setpoint potentiometer

ACCESSORIES

KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)	1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks	1906-1300-0000-100	70,38 €

**On-wall-humidity- and temperature sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection**

Calibratable outside humidity and temperature sensor **HYGRASGARD® AFTF-Modbus-T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, with a plastic sinter filter (exchangeable).

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature ($-35...+80\text{ }^{\circ}\text{C}$) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [% r.H.], absolute humidity [g/m^3], mixture ratio [g/kg], dew point temperature [$^{\circ}\text{C}$], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [$^{\circ}\text{C}$]. A long-term stable, digital sensor guarantees exact measurement results.

The on-wall sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFTF-Modbus-T3

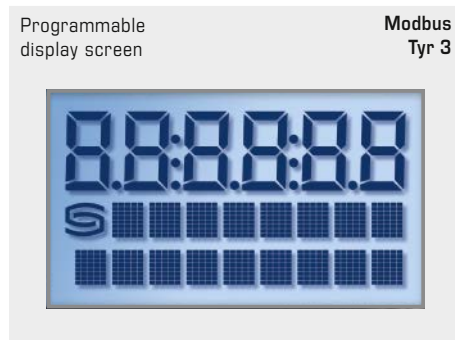
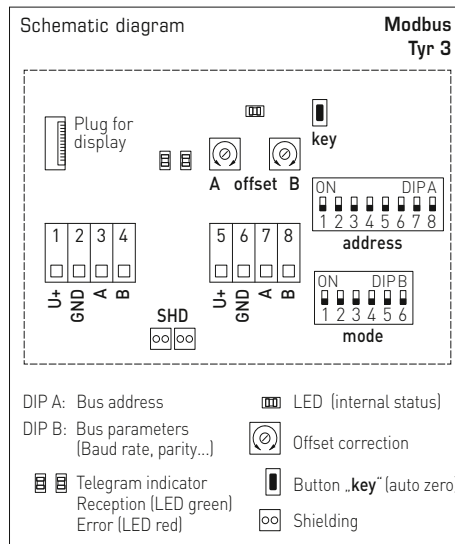


Device version with **M12 connector** (optional on request)



TECHNICAL DATA

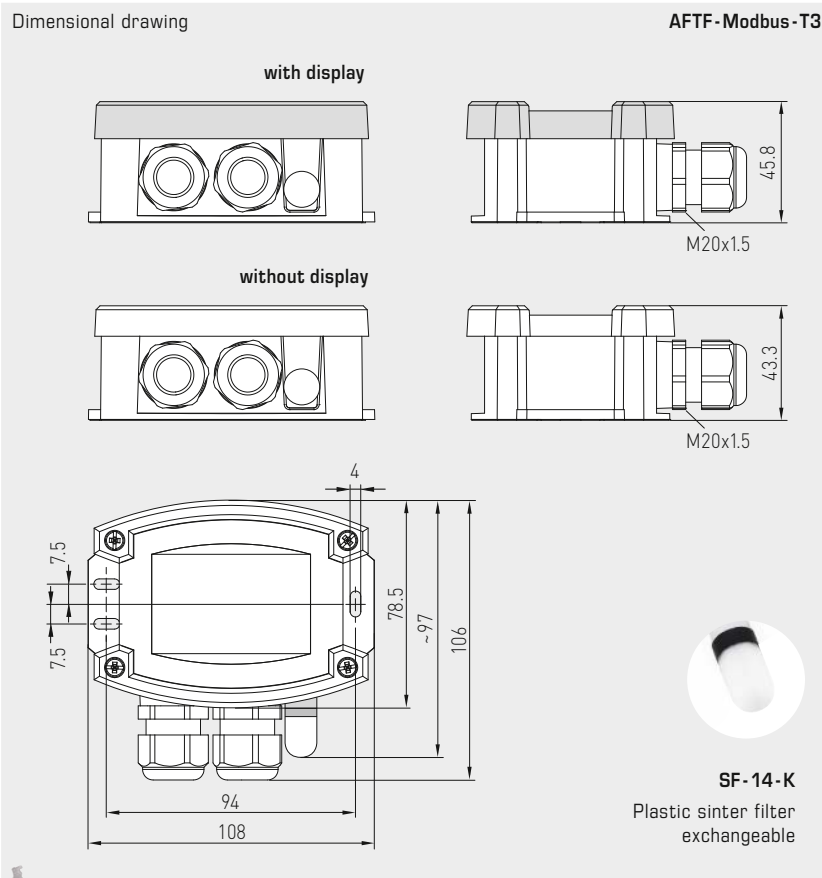
Voltage supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [$^{\circ}\text{C}$], relative humidity [% r.H.], dew point [$^{\circ}\text{C}$], absolute humidity [g/m^3], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 14\text{ mm}$, L = 25 mm, exchangeable
Measuring range:	0...100% r.H. (humidity) $-35...+80\text{ }^{\circ}\text{C}$ (temperature)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$
Temperature deviation:	typically $\pm 0.4\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ r.H. (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30...+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Housing:	plastic, UV-resistant material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Process connection:	by screws
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Long-term stability:	$\pm 1\%$ / year
Permissible air humidity:	< 95% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table





S+S REGELTECHNIK

On-wall-humidity- and temperature sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection



AFTF-Modbus-T3
with display



WS-04
Weather and sun
protection hood
(optional)



HYGRASGARD® AFTF - Modbus - T3 On-wall-humidity- and temperature sensors ($\pm 2.0\%$)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
AFTF - Modbus-T3						
AFTF-Modbus-T3	0 ... 100% r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m ³ (a.F.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (TP)	-35 ... +80 °C	Modbus		1201-12C6-1000-000	186,16 €
AFTF-Modbus-T3 LCD	(5x as above)	(1x as above)	Modbus	■	1201-12C6-1400-000	234,67 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	

ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100	70,38 €
WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)				7100-0040-2000-000	28,02 €
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)				7100-0040-7000-000	33,06 €

For further information, see last chapter Accessories!

HYGRASGARD® KFTF-Modbus-T3

HYGRASGARD® KFTF-20-Modbus-T3



S+S REGELTECHNIK

Duct humidity- and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Calibratable duct humidity and temperature sensor **HYGRASGARD® KFTF-Modbus-T3** ($\pm 2.0\%$) or **KFTF-20-Modbus-T3** ($\pm 1.8\%$), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, with a plastic sinter filter (exchangeable), incl. mounting flange.

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature ($-35...+80\text{ }^{\circ}\text{C}$) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [% r.H.], absolute humidity [g/m^3], mixture ratio [g/kg], dew point temperature [$^{\circ}\text{C}$], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [$^{\circ}\text{C}$]. A long-term stable, digital sensor guarantees exact measurement results. The duct sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

KFTF-Modbus-T3 ($\pm 2.0\%$)
KFTF-20-Modbus-T3 ($\pm 1.8\%$)



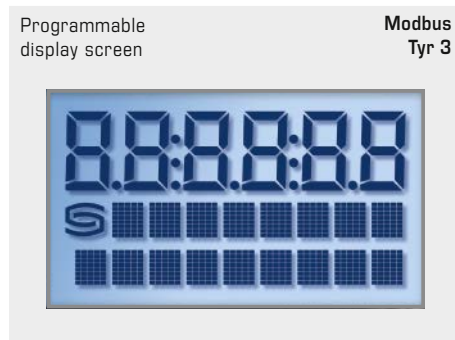
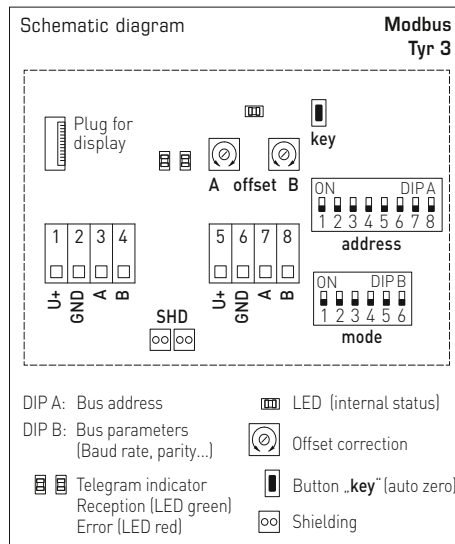
Device version with **M12 connector** (optional on request)



TECHNICAL DATA

Voltage supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [$^{\circ}\text{C}$], relative humidity [% r.H.], dew point [$^{\circ}\text{C}$], absolute humidity [g/m^3], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter , \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter , \varnothing 16 mm, L = 32 mm)
Measuring range:	0...100% r.H. (humidity) $-35...+80\text{ }^{\circ}\text{C}$ (temperature)
Deviation, humidity:	KFTF-Modbus: typically $\pm 2.0\%$ (20...80% r.H.) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$ KFTF-20-Modbus: typically $\pm 1.8\%$ (10...90% r.H.) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 2.0\%$
Temperature deviation:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ r.H. (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30...+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, \varnothing 20 mm, NL = 235 mm, $v_{\text{max}} = 30\text{ m/s}$ (air) (on request, optional stainless steel V2A (1.4301), \varnothing 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Long-term stability:	$\pm 1\%$ / year
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Permissible air humidity:	< 95% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

ACCESSORIES see table



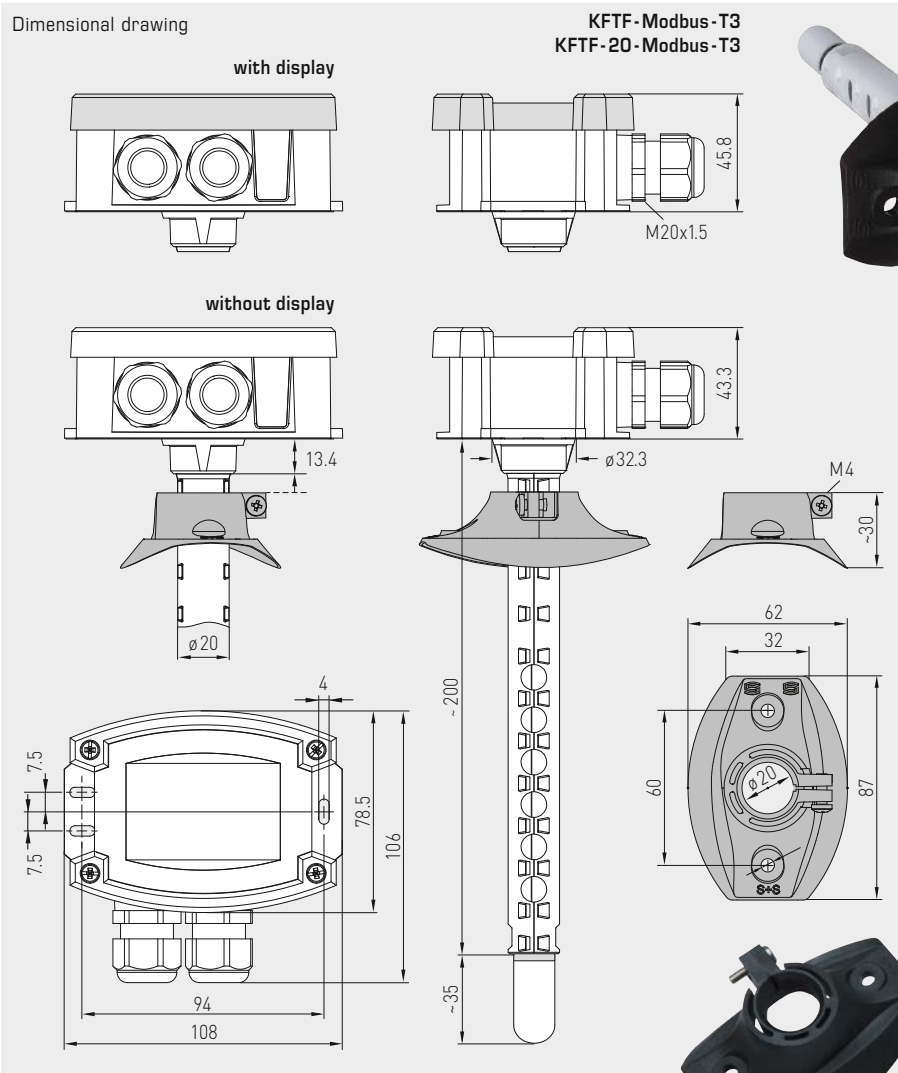


S+S REGELTECHNIK

HYGRASGARD® KFTF-Modbus-T3 HYGRASGARD® KFTF-20-Modbus-T3

Duct humidity- and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Dimensional drawing



KFTF-Modbus-T3 ($\pm 2,0\%$)
KFTF-20-Modbus-T3 ($\pm 1,8\%$)
with display



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



**stainless steel
protective tube**
(optional on request)

MFT-20-K
Mounting flange,
plastic



HYGRASGARD® KFTF-Modbus-T3 Duct humidity- and temperature sensors ($\pm 2.0\%$)
HYGRASGARD® KFTF-20-Modbus-T3 Duct humidity- and temperature sensors ($\pm 1.8\%$)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
KFTF-Modbus-T3					($\pm 2,0\%$)	
KFTF-Modbus-T3	0 ... 100% r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m ³ (a.F.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (TP)	-35 ... +80 °C	Modbus		1201-32C6-1000-029	188,43 €
KFTF-Modbus-T3 LCD	(5x as above)	(1x as above)	Modbus	■	1201-32C6-1400-029	232,93 €
KFTF-20-Modbus-T3					($\pm 1,8\%$)	
KFTF-20-Modbus-T3	(5x as above)	(1x as above)	Modbus		1201-32C6-1000-030	241,08 €
KFTF-20-Modbus-T3 LCD	(5x as above)	(1x as above)	Modbus	■	1201-32C6-1400-030	363,21 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100	70,38 €
SF-M	Metal sinter filter , \varnothing 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)				7000-0050-2200-100	37,32 €
MFT-20-K	Mounting flange , plastic (included in the scope of delivery)					

For further information, see last chapter Accessories!

HYGRASGARD® RPFTF - Modbus-T3

HYGRASGARD® RPFTF - 20 - Modbus-T3



S+S REGELTECHNIK

Pendulum room humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Calibratable room pendulum humidity and temperature sensor **HYGRASGARD® RPFTF-Modbus-T3** ($\pm 2.0\%$) or **RPFTF-20-Modbus-T3** ($\pm 1.8\%$), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, cable sensor with a stainless steel pendulum and a plastic sinter filter (exchangeable).

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature ($-35...+80\text{ }^\circ\text{C}$) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [% r.H.], absolute humidity [g/m^3], mixture ratio [g/kg], dew point temperature [$^\circ\text{C}$], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [$^\circ\text{C}$]. A long-term stable, digital sensor guarantees exact measurement results.

The pendulum sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPFTF-Modbus-T3 ($\pm 2,0\%$)
RPFTF-20-Modbus-T3 ($\pm 1,8\%$)



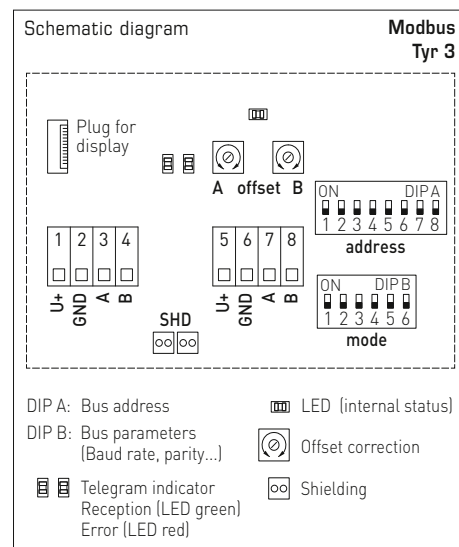
Device version with **M12 connector** (optional on request)

TECHNICAL DATA

Voltage supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [$^\circ\text{C}$], relative humidity [% r.h.], dew point [$^\circ\text{C}$], absolute humidity [g/m^3], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter , $\varnothing 16\text{ mm}$, $L = 35\text{ mm}$, exchangeable (optional metal sinter filter , $\varnothing 16\text{ mm}$, $L = 32\text{ mm}$)
Measuring range:	0...100% r.H. (humidity) $-35...+80\text{ }^\circ\text{C}$ (temperature)
Deviation, humidity:	RPFTF-Modbus: typically $\pm 2.0\%$ (20...80% r.h.) at $+25\text{ }^\circ\text{C}$, otherwise $\pm 3.0\%$ RPFTF-20-Modbus: typically $\pm 1.8\%$ (10...90% r.h.) at $+25\text{ }^\circ\text{C}$, otherwise $\pm 2.0\%$
Temperature deviation:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^\circ\text{C}$
Zero point offset:	$\pm 10\%$ r.h. (humidity); $\pm 5\text{ }^\circ\text{C}$ (temperature)
Ambient temperature:	$-30...+70\text{ }^\circ\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, LiYY, 6 x 0.14 mm ² , cable length (KL) = approx. 2 m (other lengths optional)
Protective tube:	stainless steel V2A (1.4301), $\varnothing 16\text{ mm}$, $NL = 142\text{ mm}$
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Permissible air humidity:	< 95% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

ACCESSORIES

see table



Programmable display screen **Modbus Tyr 3**

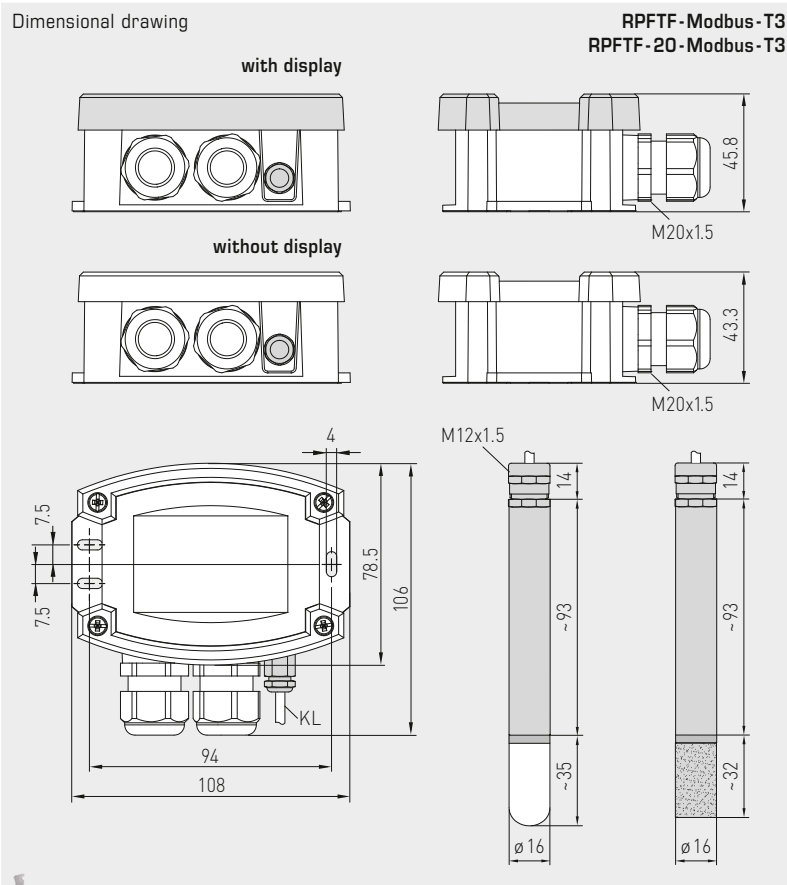




S+S REGELTECHNIK

HYGRASGARD® RPFTF-Modbus-T3 HYGRASGARD® RPFTF-20-Modbus-T3

Pendulum room humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection



RPFTF-Modbus-T3 ($\pm 2,0\%$)
RPFTF-20-Modbus-T3 ($\pm 1,8\%$)
with display



MF-16-K
Mounting flange,
plastic (optional)



SF-K
plastic sinter filter
(standard)



SF-M
metal sinter filter
(optional)



HYGRASGARD® RPFTF-Modbus-T3 Pendulum room humidity and temperature sensors ($\pm 2.0\%$)
HYGRASGARD® RPFTF-20-Modbus-T3 Pendulum room humidity and temperature sensors ($\pm 1.8\%$)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
RPFTF-Modbus-T3					($\pm 2,0\%$)	
RPFTF-Modbus-T3	0 ... 100% r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m ³ (a.F.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (TP)	-35...+80 °C	Modbus		1201-6246-1000-000	261,31 €
RPFTF-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus	■	1201-6246-1400-000	309,55 €
RPFTF-20-Modbus-T3					($\pm 1,8\%$)	
RPFTF-20-Modbus-T3	(5 x as above)	(1 x as above)	Modbus		1201-6246-1000-001	313,47 €
RPFTF-20-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus	■	1201-6246-1400-001	362,20 €
Extra charge:	per running metre of connecting lead (PVC) Cable connection with M12 connector according to DIN EN 61076-2-101				on request on request	
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100	70,38 €
SF-M	Metal sinter filter , \varnothing 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)				7000-0050-2200-100	37,32 €
MF-16-K	Mounting flange made of plastic (optional)				7100-0030-0000-000	8,43 €

Showcase humidity and temperature sensor ($\pm 2.0\%$), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Calibratable display cases humidity and temperature sensor **HYGRASGARD® VFTF-Modbus-T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, cable sensor with a flat stainless steel probe (pluggable).

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature ($-35...+80\text{ }^\circ\text{C}$) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [% r.H.], absolute humidity [g/m^3], mixture ratio [g/kg], dew point temperature [$^\circ\text{C}$], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [$^\circ\text{C}$]. A long-term stable, digital sensor guarantees exact measurement results.

The display cases sensor is applied in a non-aggressive, dust-free environment and is specially suitable for installation in ceilings, walls, display cases or showcases. It is used in museums, galleries, cinemas, lecture halls or laboratories.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [$^\circ\text{C}$], relative humidity [% r.H.], dew point [$^\circ\text{C}$], absolute humidity [g/m^3], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring Range:	0...100% r.H. (humidity) $-35...+80\text{ }^\circ\text{C}$ (temperature)
Deviation in humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at $+25\text{ }^\circ\text{C}$, otherwise $\pm 3.0\%$
Deviation in temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^\circ\text{C}$
Zero point offset:	$\pm 10\%$ r.H. (humidity); $\pm 5\text{ }^\circ\text{C}$ (temperature)
Ambient temperature:	$-30...+70\text{ }^\circ\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = approx. 2 m (other lengths optional)
Sensor protection:	probe made of stainless steel, V4A (1.4571), pluggable ; sensor head $\varnothing = 17\text{ mm}$, H = approx. 2.5 mm; protective sleeve $\varnothing = 10\text{ mm}$, NL = approx. 25 mm, M10 x 1.0; with plastic plug connector $\varnothing = \text{approx. } 11\text{ mm}$, NL = approx. 25 mm
Mounting (sensor):	cut-out $\varnothing = 11 - 15\text{ mm}$, inserted length (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Permissible air humidity:	< 95% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

VFTF-Modbus-T3

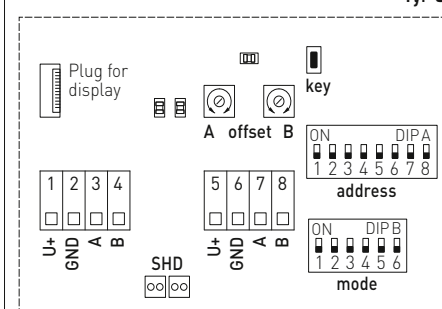


Device version with **M12 connector** (optional on request)



Schematic diagram

Modbus Tyr 3



- DIP A: Bus address
- DIP B: Bus parameters (Baud rate, parity...)
- Telegram indicator Reception (LED green) Error (LED red)
- LED (internal status)
- Offset correction
- Button „key“ (auto zero)
- Shielding

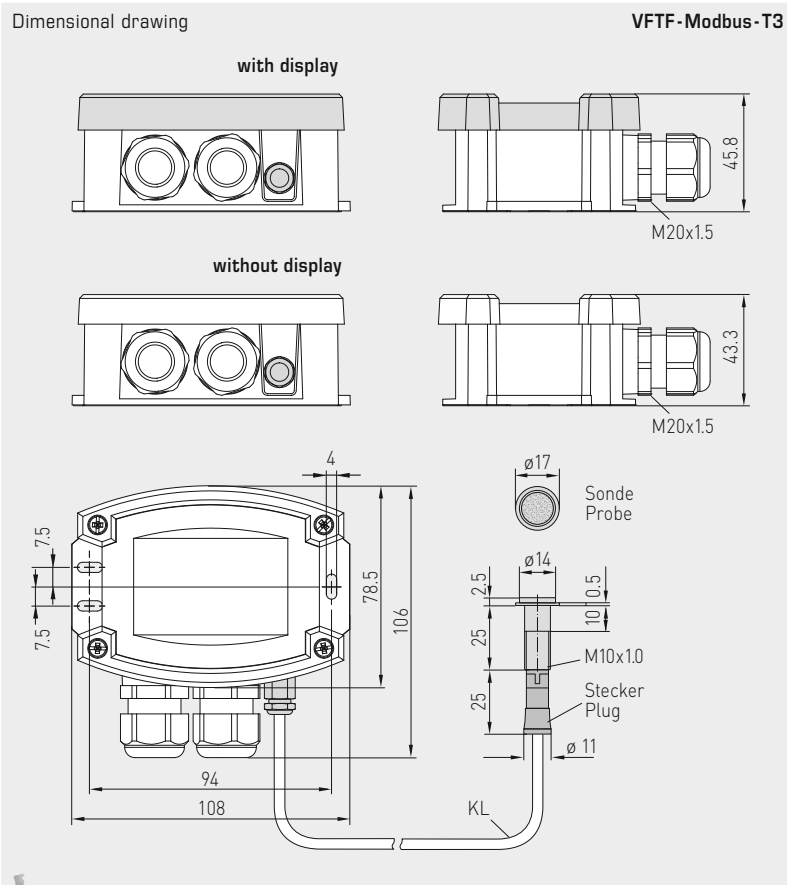
Programmable display screen

Modbus Tyr 3





Showcase humidity and temperature sensor ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection



VFTF-Modbus-T3
with display



Probe
made of stainless steel,
pluggable



HYGRASGARD® VFTF-Modbus-T3 Showcase humidity and temperature sensor ($\pm 2.0\%$), Premium

Type/WG01	Measuring Range/Readout Humidity (switchable)	Temperature	Output	Display	Item no.	Price
VFTF-Modbus-T3						
VFTF-Modbus-T3	0...100% r. H. (default) 0...80 g/kg (MV) 0...80 g/m ³ (a.F.) 0...85 kJ/kg (ENT.) -20...+80 °C (TP)	-35...+80 °C	Modbus		1201-6256-1000-000	449,82 €
VFTF-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus	■	1201-6256-1400-000	501,26 €
Extra charge:	cable length (KL = approx. 2 m), other lengths optional				on request	
	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	

ACCESSORIES

KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	70,38 €

Dew point control switches, incl. strap / with detached sensor head ($\pm 2.0\%$), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Patented quality product

(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

Calibratable dew point control switch **HYGRASGARD® TW-Modbus-T3** (compact variant incl. strap) or **TW-Modbus-external** (detached variant), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display. It reliably detects the formation of dew due to its patented measuring method, the **pro-dynamic cross-convection** (no conductivity measurement).

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature ($-35...+80\text{ }^{\circ}\text{C}$) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [% r.H.], absolute humidity [g/m^3], mixture ratio [g/kg], dew point temperature [$^{\circ}\text{C}$], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [$^{\circ}\text{C}$]. A long-term stable, digital sensor guarantees exact measurement results.

The surface-contact sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC ($\pm 20\%$); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [$^{\circ}\text{C}$], relative humidity [% r.H.], dew point [$^{\circ}\text{C}$], absolute humidity [g/m^3], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	Digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	membrane filter
Measuring range:	0...100% r.H. (humidity) $-35...+80\text{ }^{\circ}\text{C}$ (temperature)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$
Deviation, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ r.H. (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30...+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Process connection:	endless strap with metal tightener, 300 mm, for pipes up to 3"
Installation:	TW-Modbus with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) TW-Modbus-external with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Permissible air humidity:	< 95% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	Display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

ACCESSORIES

see table

TW-Modbus-T3
(compact variant)



Device version with **M12 connector** (optional on request)

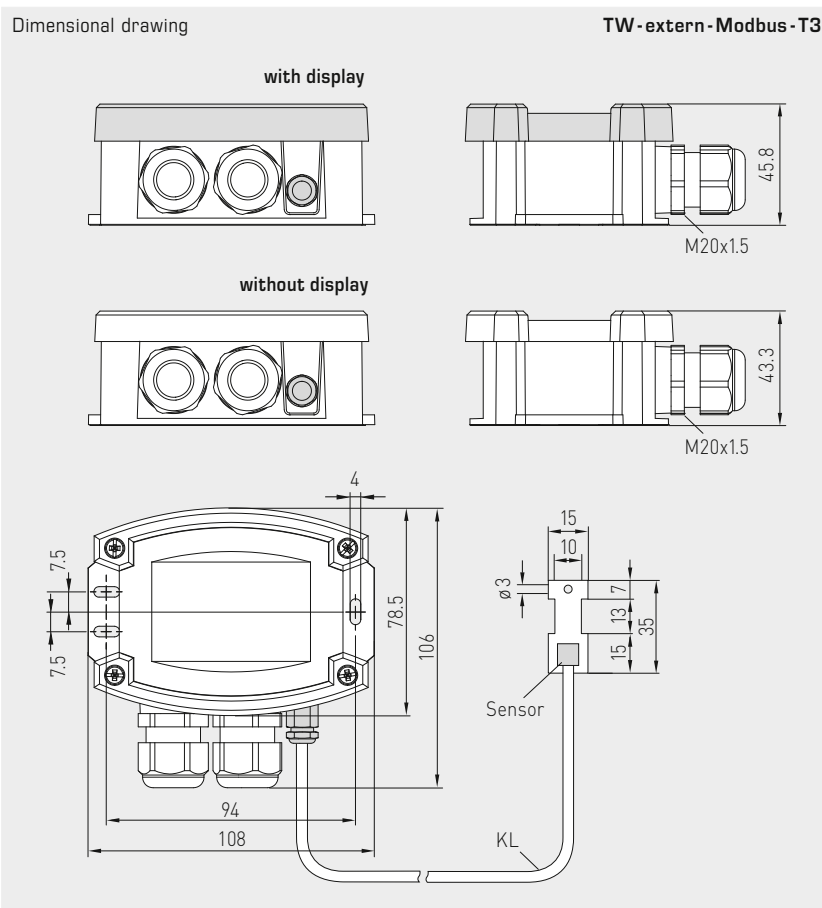
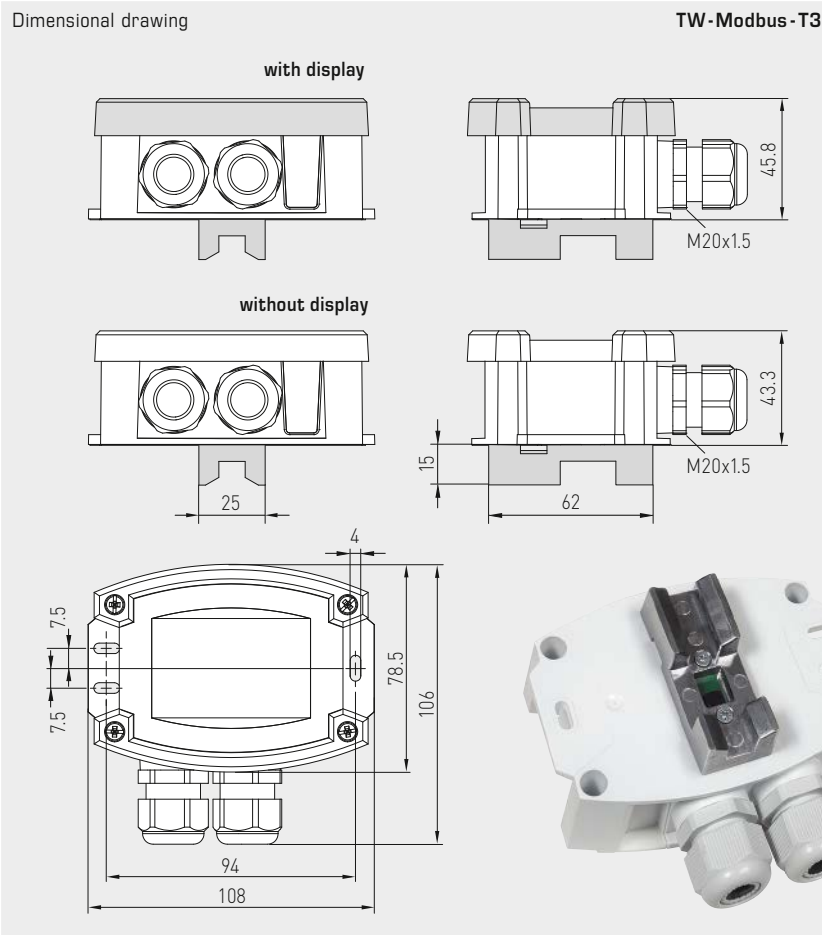


TW-extern-Modbus-T3
(detached variant)





Dew point control switches, incl. strap /with detached sensor head ($\pm 2.0\%$), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

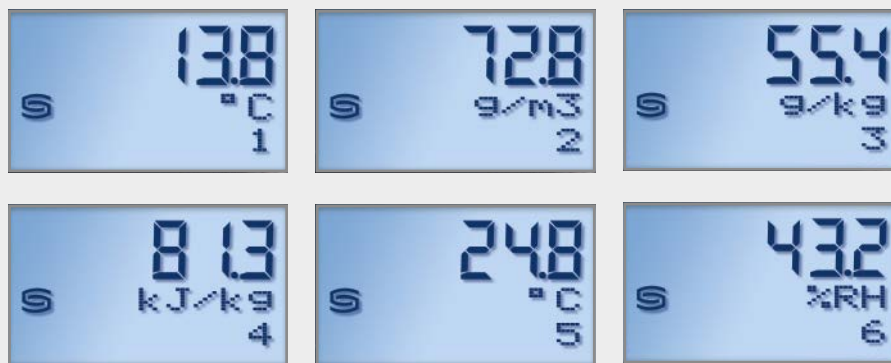


Dew point control switches, incl. strap/with detached sensor head ($\pm 2.0\%$), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Display screen (cyclic) standard



Display screen (static) alternative output variables



HYGRASGARD® Modbus-T3

By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). For improved legibility, backlighting is provided.

The Modbus interface can be used to program an **alternative output variable** instead of the standard display. In this case, the first line indicates the value while the second line indicates the corresponding unit **statically**. The index in the third line indicates the display type:

- Index 1** = dew point [°C]
- Index 2** = absolute humidity [g/m³]
- Index 3** = mixture ratio [g/kg]
- Index 4** = enthalpy [kJ/kg]
- Index 5** = temperature [°C]
- Index 6** = relative humidity [% r.H.]

Programmable display screen

Modbus Tyr 3



The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

TW - Modbus - T3 pro-dynamic cross convection

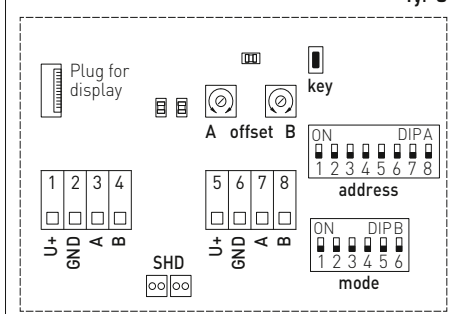


PATENTED



Schematic diagram

Modbus Tyr 3



- DIP A: Bus address
- DIP B: Bus parameters (Baud rate, parity...)
- Telegram indicator Reception (LED green) Error (LED red)
- LED (internal status)
- Offset correction
- Button „key“ (auto zero)
- Shielding



Dew point control switches, incl. strap /with detached sensor head ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection

TW-Modbus-T3
with display



HYGRASGARD® TW - Modbus - T3 Dew point control switches, incl. strap ($\pm 2.0\%$)
HYGRASGARD® TW - external - Modbus - T3 Dew point control switches, with detached sensor head ($\pm 2.0\%$)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
TW - Modbus - T3						
TW-Modbus-T3	0 ... 100% r. H. (default) 0 ... 80 g / kg (MR) 0 ... 80 g / m ³ (A.H.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (DP)	-35 ... +80 °C	Modbus		1201-1281-3001-020	167,95 €
TW-Modbus-T3 LCD	(5x as above)	(1x as above)	Modbus	■	1201-1281-3401-020	216,27 €
TW - external - Modbus - T3						
TW-extern-Modbus-T3	0 ... 100% r. H. (default) 0 ... 80 g / kg (MR) 0 ... 80 g / m ³ (A.H.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (DP)	-35 ... +80 °C	Modbus		1201-1281-3001-030	183,76 €
TW-extern-Modbus-T3 LCD	(5x as above)	(1x as above)	Modbus	■	1201-1281-3401-030	219,60 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request

ACCESSORIES

KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)	1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks	1906-1300-0000-100	70,38 €

**Pressure and differential pressure measuring transducers,
incl. connection set,
with Modbus connection**

S+S REGELTECHNIK

Maintenance-free pressure measuring transducer **PREMASGARD® 232x - Modbus - T3** (Series), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, nozzles for pressure hose (Ø 6 mm), incl. connection set **ASD-06** (2m connecting hose, two pressure port nipples, screws).

The on-wall sensor is used to measure positive, negative or differential pressure in clean air (non-precipitating) or gaseous, non-aggressive, non-combustible media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® 232x - Modbus - T3



TECHNICAL DATA

Power supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Type of pressure:	differential pressure
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Measuring ranges:	-500... +500 Pa or -7000...+7000 Pa depending on the type of device, see table
Accuracy:	Type 2328 (500 Pa): typically ± 3 Pa at +25 °C Type 2327 (7000 Pa): typically ±35 Pa at +25 °C compared to the calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 5 % measuring range
Medium:	clean air and other non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Hysteresis:	0.3% of final value
Linearity:	< ± 1 % of final value
Temperature drift values:	± 0.1 % / °C
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Permissible air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	Display with illumination , three-line, programmable, cut-out approx. 51 x 29 mm (W x H), for displaying the ACTUAL pressure or an individually programmable display value
ACCESSORIES	see table

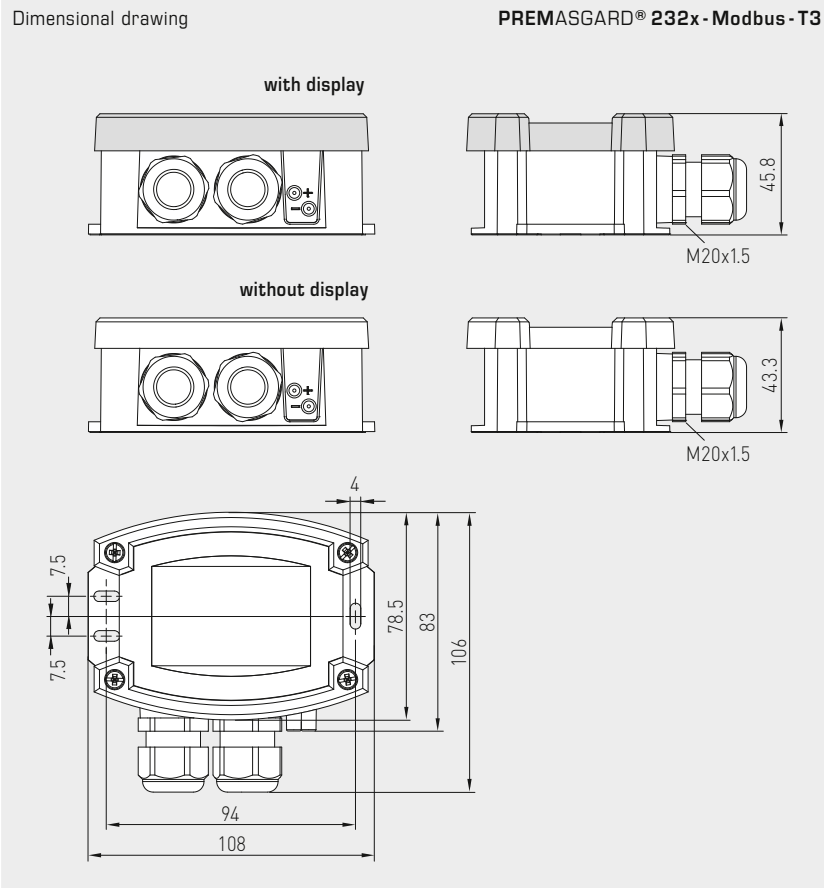
Device version with **M12 connector** (optional on request)



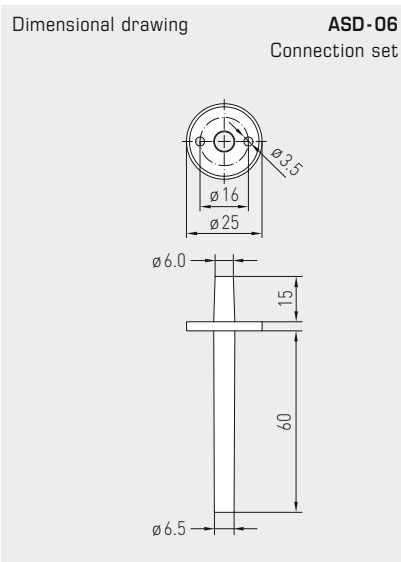
Programmable display screen

Modbus Tyr 3

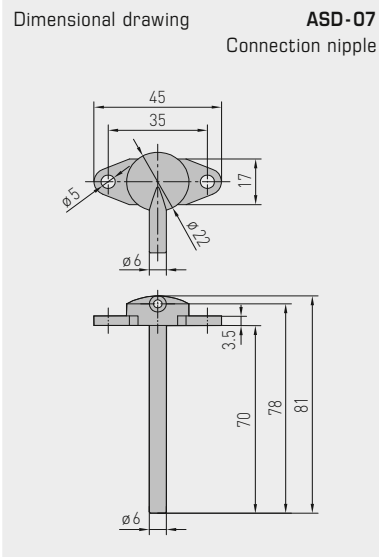




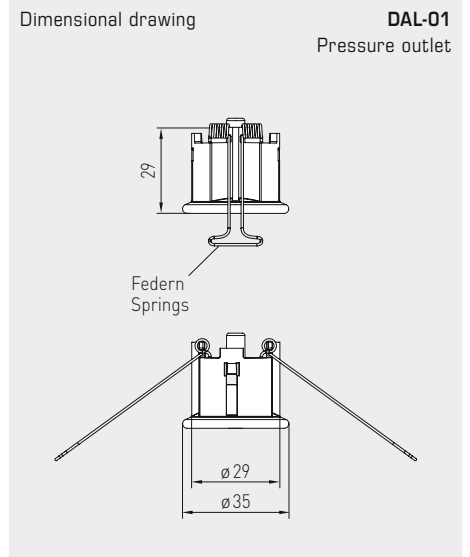
PREMASGARD® 232x - Modbus - T3 with display



ASD-06 Connection set



ASD-07 Connection nipple



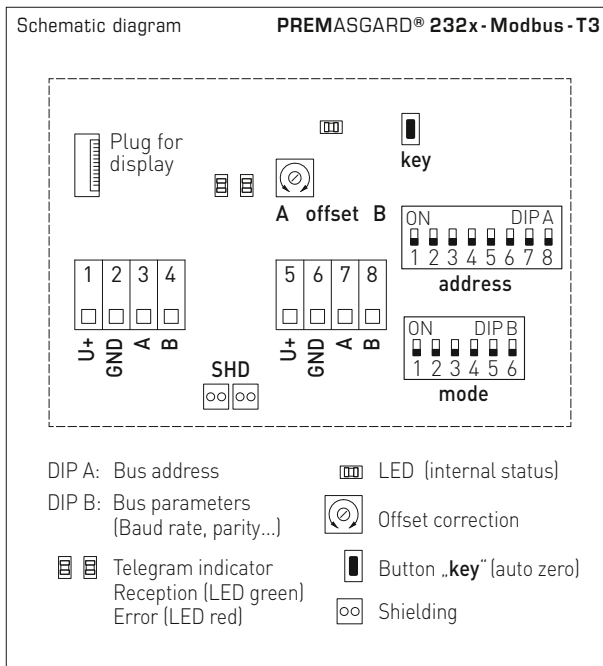
DAL-01 Pressure outlet



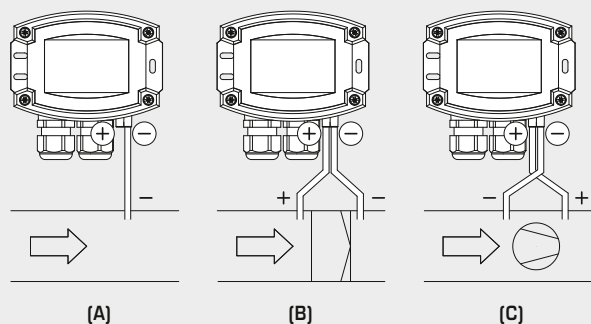
Pressure and differential pressure measuring transducers,
incl. connection set,
with Modbus connection

WS-04

Weather and sun protection hood
(optional)



Mounting diagram **PREMASGARD® 232x - Modbus - T3**



TYPES OF MONITORING:

- (A) **Below-atmospheric pressure:**
P1 (+) is not connected
but open against atmosphere
P2 (-) connected to inside of duct
- (B) **Filter:**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
- (C) **Ventilator:**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (-) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH ₂ O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH ₂ O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH ₂ O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH ₂ O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH ₂ O
1 mH ₂ O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH ₂ O



S+S REGELTECHNIK

Pressure and differential pressure measuring transducers, incl. connection set, with Modbus connection

PREMASGARD® 232x - Modbus - T3 with display



PREMASGARD® 232x - Modbus - T3 Pressure and differential pressure measuring transducers

Type / WG01	Measuring Range Pressure range	Output	Display	Item No.	Price
PREMASGARD® 2328 - Modbus - T3	- 500...+ 500 Pa				
PREMASGARD 2328	-500...+ 500 Pa	Modbus		1301-12C4-0910-200	142,69 €
PREMASGARD 2328 LCD	-500...+ 500 Pa	Modbus	■	1301-12C4-4910-200	188,87 €
PREMASGARD® 2327 - Modbus - T3	- 7000...+ 7000 Pa				
PREMASGARD 2327	-7000...+ 7000 Pa	Modbus		1301-12C4-0950-200	142,69 €
PREMASGARD 2327 LCD	-7000...+ 7000 Pa	Modbus	■	1301-12C4-4950-200	188,87 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request	

ACCESSORIES

KA2-Modbus	Communication adapter (USB/RS485) for system connection			1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination			1906-1300-0000-100	70,38 €
ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws			7100-0060-3000-000	6,74 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	6,74 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)			7300-0060-3000-001	31,55 €
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)			7100-0040-7000-000	33,06 €

For further information, see last chapter Accessories!



Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection

Maintenance-free microprocessor-controlled **PREMASGARD® 814x-Modbus** (Series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, with a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0...100% r.H.) and the temperature (-35...+80 °C) in ducts and to measure the differential pressure (max. -7000...7000 Pa) in air. Incl. mounting flange and connection set **ASD-06** (2m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters.

A long-term stable, **digital humidity and temperature sensor** and a **pressure sensor** with piezoresistive measuring element guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: temperature [°C], relative humidity [% r. H.], dew point [°C], absolute humidity [g/m³], mixture ratio [g/kg], enthalpy [kJ/kg] (ignoring atmospheric air pressure), differential pressure [Pa], volume flow [m³/h], air density [kg/m³].

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® 814x-Modbus
with plastic sinter filter
(standard)



TECHNICAL DATA

Power supply:	24 V AC (± 20%) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Data points:	differential pressure [Pa], temperature [°C], relative humidity [% r.h.], dew point [°C], absolute humidity [g/m³], mixing ratio [g/kg], enthalpy [kJ/kg], volume flow [m³/h], air density [kg/m³]

HUMIDITY

Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter , Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter , Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% r. H.
Operating range, humidity:	0...95% r. H. (without dew formation)
Deviation in humidity:	typically ± 2.0% (20...80% r. H.) at +25 °C, otherwise ± 3.0%

TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Deviation in temperature:	typically ± 0.2 K at +25 °C

PRESSURE

Type of pressure:	differential pressure
Pressure connection:	with metal connection nozzles for pressure hose Ø 6 mm (optional on request with quick connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	-500... +500 Pa or -7000...+7000 Pa depending on the type of device, see table

Accuracy, pressure:	Type 8148 (500 Pa): typically ± 3 Pa at +25 °C Type 8147 (7000 Pa): typically ± 35 Pa at +25 °C compared to the calibrated reference device
---------------------	--

Above-/below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % of final value
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, thermoset plastic, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % / °C
Long-term stability:	± 1 % per year

Continued on next page!

Display screen (cyclic/static) **Modbus Tyr 2**



Pressure



Temperature



Humidity

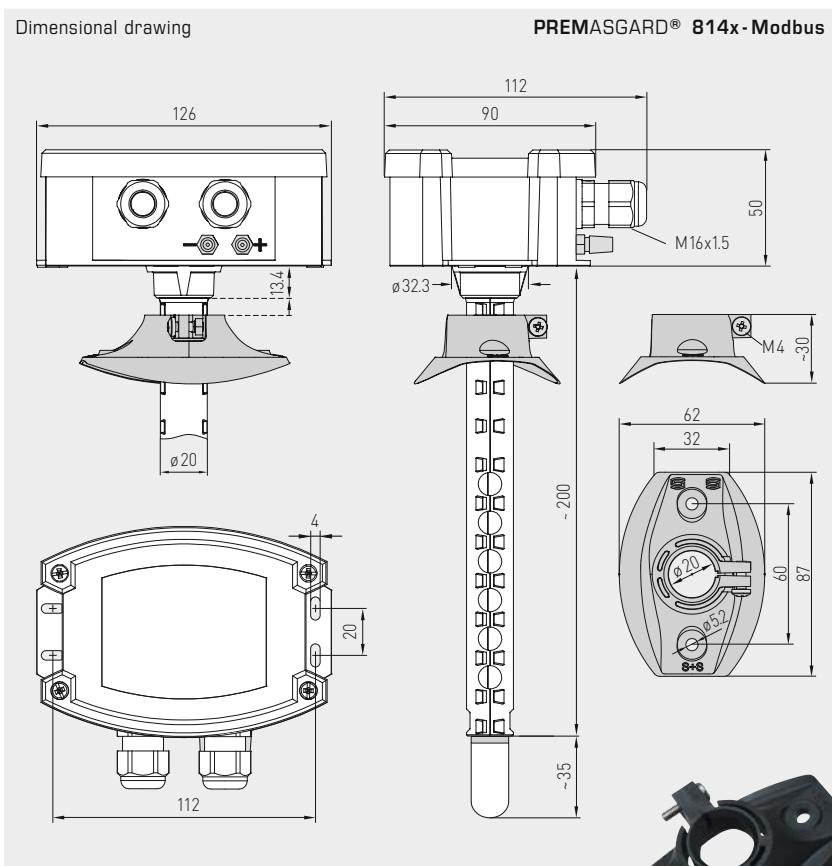


Volume flow rate

Programmable display screen **Modbus Tyr 2**



Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection



MFT-20-K
Mounting flange, plastic

PREMASGARD® 814x-Modbus
with display and plastic sinter filter (standard)



Device version with **M12 connector** (optional on request)



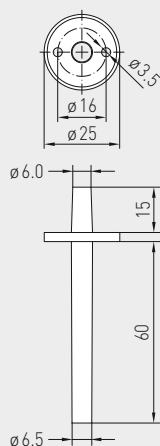
TECHNICAL DATA (continued)

Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	4 s / 32 s at temperature / humidity 0 s / 1 s / 10 s at pressure
Ambient temperature:	-30...+70 °C
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	PLEUROFORM™ , material: polyamide (PA6), with torsion protection, $v_{max} = 30$ m/s (air), Ø 20 mm, (on request, optional stainless steel V2A (1.4301), Ø 16 mm) with plastic sinter filter: NL = 235 mm (optional with metal sinter filter: NL = 227 mm)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) housing only! (PLEUROFORM IP 30)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	three-line display with illumination , programmable, cut-out approx. 70 x 40 mm (W x H), for display actual humidity, actual temperature and ACTUAL pressure (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table
ASD-06	Connection set (nipple straight) – (included in the scope of delivery)
MFT-20K	Mounting flange plastic (included in the scope of delivery)

Multifunctional duct sensors and measuring transducers
for humidity, temperature, pressure, differential pressure and volume flow,
incl. mounting flange and connection set,
calibratable, with Modbus connection



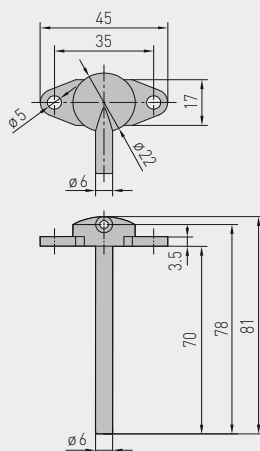
Dimensional drawing ASD-06 Connection set



ASD-06 Connection set



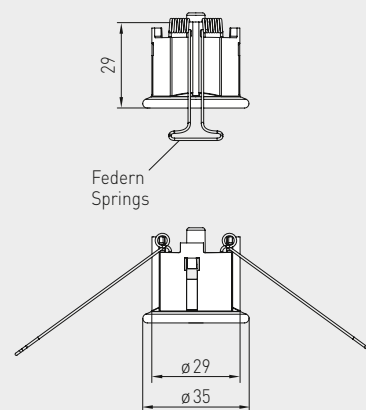
Dimensional drawing ASD-07 Connection nipple



ASD-07 Connection nipple



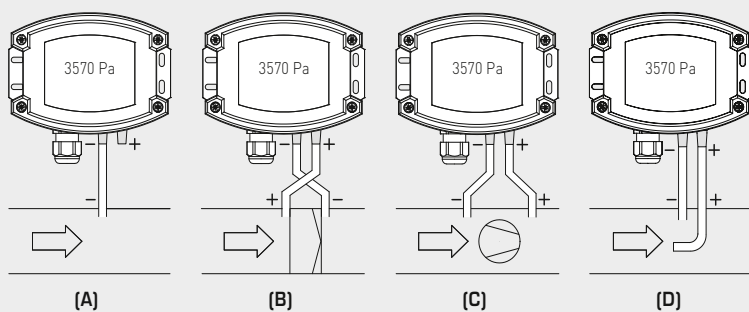
Dimensional drawing DAL-01 Pressure outlet



DAL-01 Pressure outlet



Mounting diagram PREMASGARD® 814x-Modbus



TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

- (A) **Below-atmospheric pressure**
P1 (+) is not connected, but open to the atmosphere
P2 (-) connected to inside of duct
- (B) **Filter**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
- (C) **Ventilator**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator
- (D) **Volume flow**
P1 (+) dynamic pressure, connected in flow direction
P2 (-) static pressure, connected free of dynamic pressure components

Conversion table for pressure values:

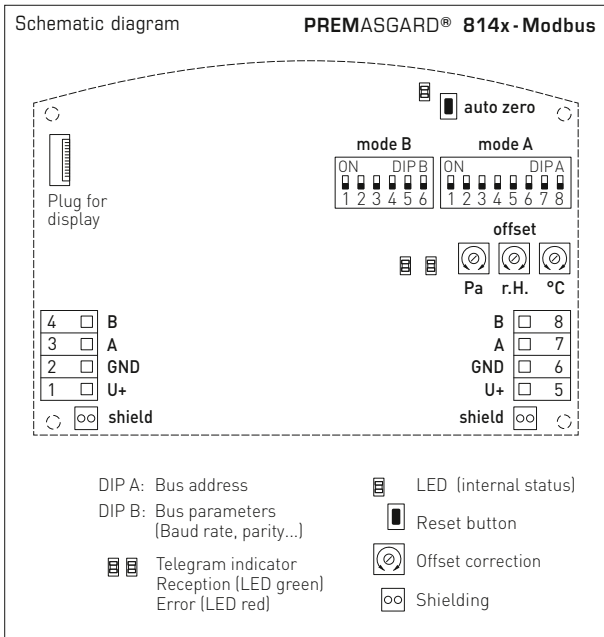
Unit =	bar	mbar	Pa	kPa	mH ₂ O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH ₂ O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH ₂ O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH ₂ O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH ₂ O
1 mH ₂ O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH ₂ O



S+S REGELTECHNIK

PREMASGARD® 814x-Modbus

Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection



PREMASGARD® 814x-Modbus with display



SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)
stainless steel protective tube (optional on request)

PREMASGARD® 814x-Modbus Multifunctional duct sensor for humidity, temperature, pressure, differential pressure and volume flow rate, *Deluxe*

Type / WG02	Measuring ranges	Humidity	Temperature	Output	Display	Item no.	Price
PREMASGARD® 8148-Modbus	- 500...+ 500 Pa						
PREMASGARD 8148-Modbus	-500...+ 500 Pa	0...100%r.H.	-35...+80°C	Modbus		1301-8144-0910-20V	455,30 €
PREMASGARD 8148-Modbus LCD	-500...+ 500 Pa	0...100%r.H.	-35...+80°C	Modbus	■	1301-8144-4910-20V	497,22 €
Equipped as standard with automatic zero point calibration							
PREMASGARD® 8147-Modbus	- 7000...+ 7000 Pa						
PREMASGARD 8147-Modbus	-7000...+ 7000 Pa	0...100%r.H.	-35...+80°C	Modbus		1301-8144-0950-200	402,52 €
PREMASGARD 8147-Modbus LCD	-7000...+ 7000 Pa	0...100%r.H.	-35...+80°C	Modbus	■	1301-8144-4950-200	444,96 €
Extra charge:	with optional automatic zero point calibration (please specify in your order)						63,98 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101						on request

ACCESSORIES			
KA2-Modbus	Communication adapter (USB/RS485) for system connection		1906-1200-0000-100 188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination		1906-1300-0000-100 70,38 €
ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws		7100-0060-3000-000 6,74 €
ASD-07	2 connection nipples (at 90° angle) made of ABS		7100-0060-7000-000 6,74 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)		7300-0060-3000-001 31,55 €
SF-M	Metal sinter filter , Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)		7000-0050-2200-100 37,32 €
MFT-20-K	Mounting flange , plastic (included in the scope of delivery)		7000-0031-0000-000 8,43 €

For further information see last chapter!

Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO₂ content, calibratable, with Modbus connection

Multifunctional indoor climate sensor **AERASGARD® RFTM-LQ-PS-CO₂ Modbus** (maximum expansion level) with Modbus connection, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with / without display, type variant **RFTM-CO₂ Modbus** optionally with / without setpoint potentiometer.

The room sensor is used to detect the measurands air humidity (0...100% r.H.), temperature (0...+50°C), air quality (0...100% VOC), fine dust (PM) (0...1000 µg/m³) and CO₂ content (0...5000 ppm) as well as a room control unit (% setpoint).

Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The air quality is determined based on a (VOC) **mixed gas sensor**. The CO₂ content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology). An optical **particulate sensor** precisely detects **fine dust (PM)** of the size category 0.3 to 10 micrometers. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in the currentless state, LEDs for telegram status display and two-line display (illuminated; with customised programming in the 7-segment and dot-matrix range).

RFTM-CO₂ - Modbus - P
with display and potentiometer



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
Data points:	temperature [°C], relative humidity [% r.H.], air quality (VOC) [%,ppb], fine dust (PM) [µg/m ³], carbon dioxide (CO ₂) [ppm], setpoint potentiometer [%]

HUMIDITY & TEMPERATURE

Sensor (RH / °C):	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Deviation (RH):	typically ± 2.0 % (20...80% r.H.) at +25 °C, otherwise ± 3.0 %
Deviation (°C):	typically ± 0.2 K at +25 °C

AIR QUALITY (VOC)

Sensor (VOC):	VOC sensor (metal oxide) with automatic calibration (VOC = volatile organic compounds)
Measuring range (VOC):	0...100% air quality; with reference to calibration gas; multi-range switching VOC sensitivity low, medium, high
Measuring accuracy (VOC):	typically ± 20 % final value (with reference to the calibration gas)
Service life (VOC):	> 60 months (under normal load conditions)

FINE DUST (PM)

Sensor (PM):	optical fine-dust sensor (PM = particulate matter) , particulate sensor with laser- and soiling-resistant technology
Measuring range (PM):	0...1000 µg/m ³
Particle size (PM):	PM 2.5 (0.3...2.5 µm); PM 10 (0.3...10 µm)
Measuring accuracy (PM):	typically ± 10 µg/m³ (± 10 % of measured value) at PM 2.5 typically ± 25 µg/m³ (± 25 % of measured value) at PM 10
Long-term stability (PM):	± 1.25 µg/m³ (± 1.25 % of measured value/year)
Service life (PM):	> 10 years

CARBON DIOXIDE (CO₂)

Sensor (CO ₂):	optical NDIR sensor (non-dispersive infra-red technology) with automatic and manual calibration
Measuring range (CO ₂):	0...5000 ppm
Measuring accuracy (CO ₂):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO ₂):	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is greater)
Pressure dependence (CO ₂):	± 0.13 % / mm Hg
Long-term stability (CO ₂):	< 2 % in 15 years
Gas exchange (CO ₂):	Diffusion

Continued on next page!

Display screen **standard** Modbus (Balduf)



Carbon dioxide (CO₂)



Air quality (VOC)



Temperature



Humidity



Fine dust (PM)

Display screen **programmable** Modbus (Balduf)



Symbols



NEW

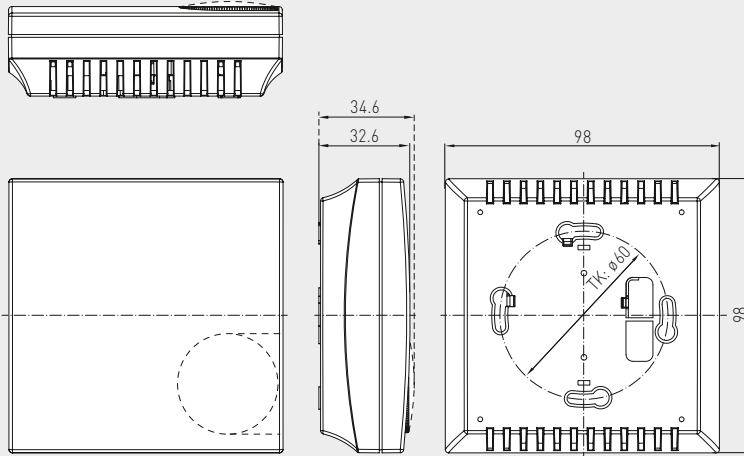
S+S REGELTECHNIK

AERASGARD® RCO₂ / RLQ - CO₂ - Modbus AERASGARD® RFTM - LQ - PS - CO₂ - Modbus

Multifunctional room sensor and measuring transducer
for humidity, temperature, air quality (VOC), fine dust (PM) and CO₂ content,
calibratable, with Modbus connection

Dimensional drawing

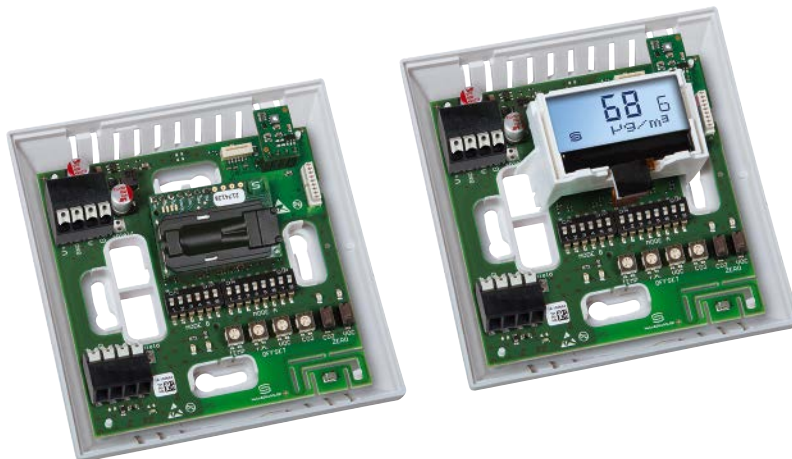
Housing Baldur2



R x x CO₂ - Modbus
without display



RFTM - LQ - PS - CO₂ - Modbus
with display



TECHNICAL DATA

(continued)

Ambient temperature:	0...+50 °C
Permitted humidity:	0...95% r. H. (non-precipitating air)
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur2)
Mounting:	wall mounting or on in-wall flush box, Ø55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	Display with illumination , 2-line, cutout approx. 36 x 15 mm (W x H), to display actual humidity, actual temperature, air quality, of the fine-dust and CO ₂ content (cyclic) or a selectable parameter (static) or an individually programmable display value

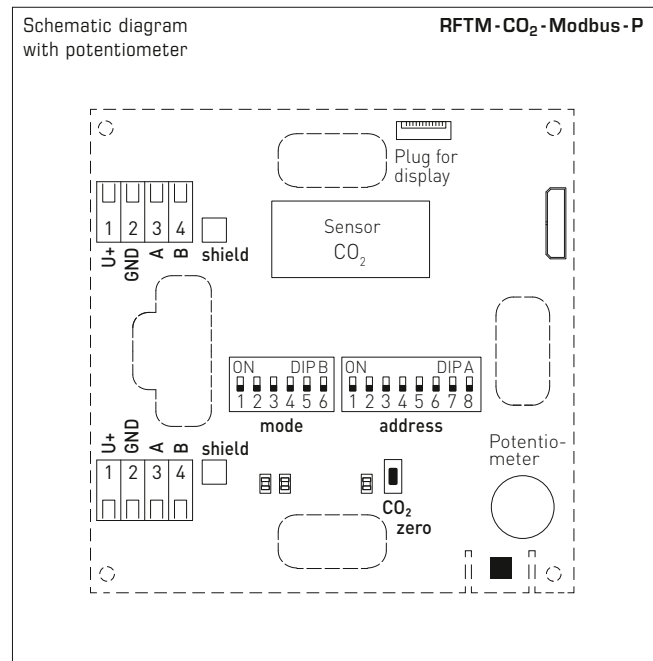
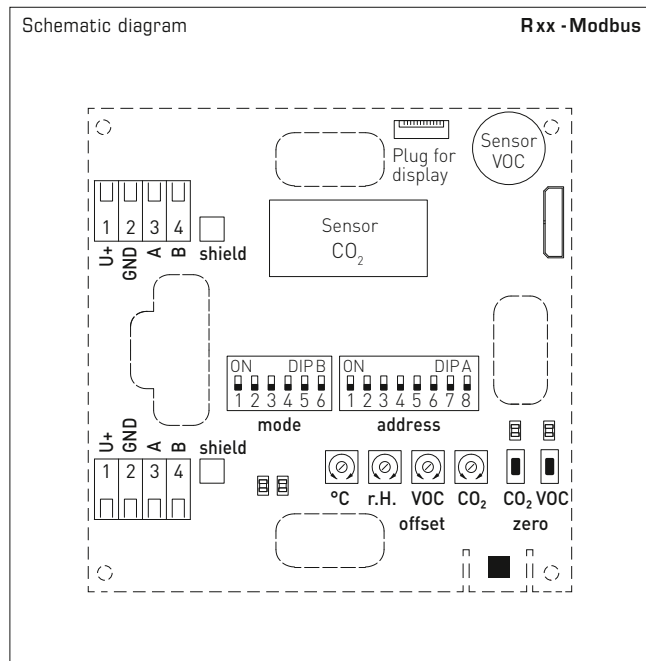
AERASGARD® RCO₂ / RLQ-CO₂-Modbus
AERASGARD® RFTM-LQ-PS-CO₂-Modbus

NEW



S+S REGELTECHNIK

Multifunctional room sensor and measuring transducer
 for humidity, temperature, air quality (VOC), fine dust (PM) and CO₂ content,
 calibratable, with Modbus connection



Display screen
standard (cyclic)



Carbon dioxide (CO₂)



Air quality (VOC)



Temperature



Humidity



Fine dust (PM)

Display screen
alternative (static)



Carbon dioxide (CO₂)



Air quality (VOC)



Temperature



Humidity



Fine dust (PM)

Display screen
programmable

Modbus
 (Balduur)



Symbols

The Modbus interface allows the display to be **individually** configured both in the 7-segment range and in the dot-matrix range. For improved legibility, backlighting is provided.

By default, the display indicates the measurements with the corresponding units **cyclically** and consecutively:

CO₂ content in ppm, **air quality (VOC)** in %, **temperature** in °C, **relative humidity** in % r.H., **fine dust (PM)** in µg/m³.

The **Modbus** configuration can be used to program an **alternative output variable** instead of the standard display. In this case, the first line indicates the value and index while the second line indicates the corresponding unit **statically**. The index identifies the display type:

- Index 1** = carbon dioxide (CO₂) [ppm]
- Index 2** = air quality (VOC) [%]
- Index 3** = temperature [°C]
- Index 4** = relative humidity [% r.H.]
- Index 6** = fine dust (PM) [µg/m³]



NEW

S+S REGELTECHNIK

AERASGARD® RCO₂ / RLQ - CO₂ - Modbus
AERASGARD® RFTM - LQ - PS - CO₂ - Modbus

Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO₂ content, calibratable, with Modbus connection

RFTM - CO₂ - Modbus - P
with setpoint potentiometer (room control unit)



RFTM - LQ - PS - CO₂ - Modbus
with display



Rxx CO₂ - Modbus
without display



AERASGARD® Rxx - Modbus Room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO₂ content, *Deluxe*

Type / WG02	Measuring Range				Display ☼=P	Item No.	Price
	Humidity	Temperature	PM	CO ₂			
RCO₂ - Modbus							
RCO2-Modbus	-	-	-	5000 ppm	-	1501-61B0-6001-200	240,40 €
RCO2-Modbus LCD	-	-	-	5000 ppm	■	1501-61B0-6021-200	284,35 €
RLQ - CO₂ - Modbus							
RLQ-CO2-Modbus	-	-	-	5000 ppm	0...100%	1501-61B1-6001-500	352,38 €
RLQ-CO2-Modbus LCD	-	-	-	5000 ppm	0...100%	1501-61B1-6021-500	396,32 €
RFTM - PS - Modbus							
RFTM-PS-Modbus	0...100% r.H.	0...+50 °C	0...1000 µg/m ³	-	-	1501-2116-6001-200	327,64 €
RFTM-PS-Modbus LCD	0...100% r.H.	0...+50 °C	0...1000 µg/m ³	-	-	1501-2116-6021-200	376,47 €
RFTM - CO₂ - Modbus							
RFTM-CO2-Modbus	0...100% r.H.	0...+50 °C	-	5000 ppm	-	1501-61B6-6001-200	283,66 €
RFTM-CO2-Modbus LCD	0...100% r.H.	0...+50 °C	-	5000 ppm	-	1501-61B6-6021-200	327,39 €
RFTM - CO₂ - Modbus - P							
RFTM-CO2-Modbus-P	0...100% r.H.	0...+50 °C	-	5000 ppm	- ☼	1501-61B6-6501-271	313,91 €
RFTM-CO2-Modbus-P LCD	0...100% r.H.	0...+50 °C	-	5000 ppm	- ☼ ■	1501-61B6-6521-271	357,85 €
RFTM - LQ - CO₂ - Modbus							
RFTM-LQ-CO2-Modbus	0...100% r.H.	0...+50 °C	-	5000 ppm	0...100%	1501-61B8-6001-500	384,38 €
RFTM-LQ-CO2-Modbus LCD	0...100% r.H.	0...+50 °C	-	5000 ppm	0...100%	1501-61B8-6021-500	428,32 €
RFTM - LQ - PS - CO₂ - Modbus							
RFTM-LQ-PS-CO2-Modbus	0...100% r.H.	0...+50 °C	0...1000 µg/m ³	5000 ppm	0...100%	1501-2119-6001-500	496,58 €
RFTM-LQ-PS-CO2-Modbus LCD	0...100% r.H.	0...+50 °C	0...1000 µg/m ³	5000 ppm	0...100%	1501-2119-6021-500	540,52 €
Housing variant "P":	Room control unit with potentiometer (standard printing is a widening arrow with central position unfilled)						
Note:	These units must not be used as safety-relevant devices!						

ACCESSORIES			
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	70,38 €

Room humidity, temperature and CO₂ sensor or measuring transducer, in-wall in the panel switch programme, with Modbus connection

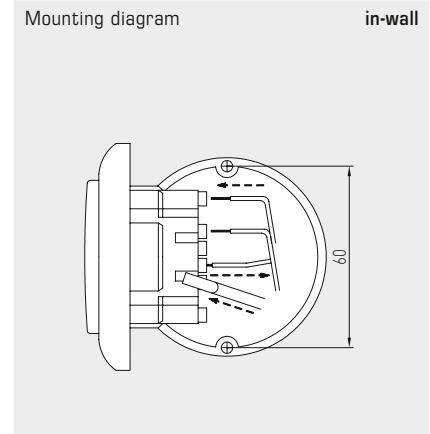
The room sensor and measuring transducer **AERASGARD® FSFTM - CO₂ - Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the CO₂ content, relative humidity and temperature of the air, and for setpoint adjustment. The measured values are queried via the Modbus interface.

The CO₂ content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% r.H.] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

Mounting diagram in-wall



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.4 W / 24 V DC ; < 6.4 VA / 24 V AC
Data points:	relative humidity [% r.H.], temperature [°C], CO ₂ content of the air (ppm) as well as setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s

CARBON DIOXIDE (CO₂)

Sensor, CO ₂ :	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration (fixed)
Long-term stability:	< 2 % in 15 years
Measuring range, CO ₂ :	0...5000 ppm
Measuring accuracy, CO ₂ :	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO ₂ :	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes

HUMIDITY

Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity::	0...100 % r. H.
Operating range, humidity:	0...95 % r. H. (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20...80 % r. H.) at +25 °C, otherwise ± 5.0 %

TEMPERATURE

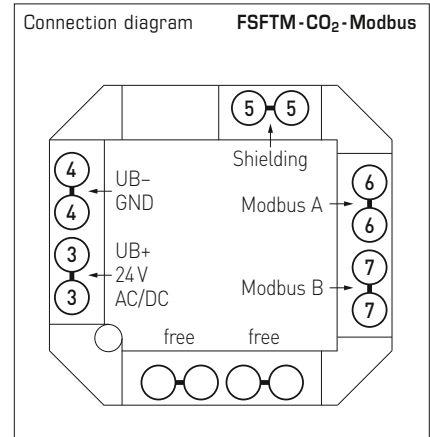
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C

Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % r.H., non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram **FSFTM - CO₂ - Modbus**

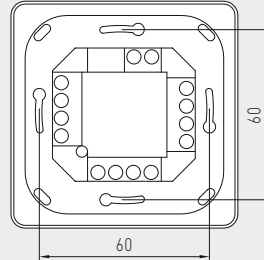
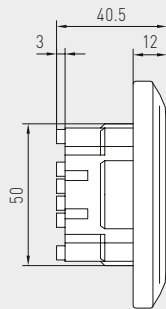
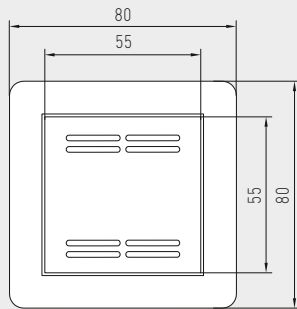




S+S REGELTECHNIK

Room humidity, temperature and CO₂ sensor or measuring transducer, in-wall in the panel switch programme, with Modbus connection

Dimensional drawing

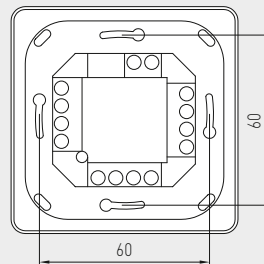
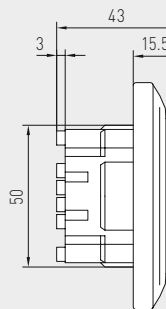
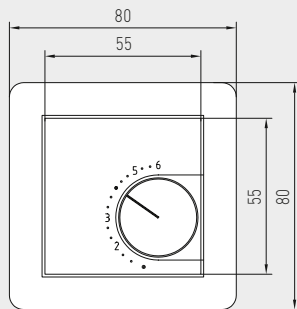


FSFTM - CO₂ - Modbus

FSFTM - CO₂ - Modbus
Standard



Dimensional drawing



FSFTM - CO₂ - Modbus - P

FSFTM - CO₂ - Modbus - P
with potentiometer



AERASGARD® FSTFM - CO₂ - Modbus Room temperature humidity and CO₂ sensor, in-wall

Type / WG02	Measuring Range CO ₂	Humidity	Temperature	Control element	Output	Item No.	Price
FSTFM - CO₂ - Modbus							
FSFTM-CO2-Modbus	0...5000 ppm	0...100% r. H.	0...+50 °C	-	Modbus	1501-9226-6001-162	330,38 €
FSFTM-CO2-Modbus P	0...5000 ppm	0...100% r. H.	0...+50 °C	Potentiometer	Modbus	1501-9226-6501-282	407,75 €

Data points: relative humidity [% r. H.], temperature [°C], CO₂ content of the air [ppm] and setpoint potentiometer

ACCESSORIES

KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)	1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks	1906-1300-0000-100	70,38 €

AERASGARD® ACO₂ / ALQ-CO₂ - Modbus

AERASGARD® AFTM-(LQ)-CO₂ - Modbus



S+S REGELTECHNIK

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO₂ content and air quality (VOC), calibratable, with Modbus connection

The maintenance-free, microprocessor-controlled **AERASGARD® AFTM-LQ-CO₂-Modbus** and **ACO₂ / ALQ-CO₂ / AFTM-CO₂-Modbus** with Modbus connection, with/without optional display, is designed for on-wall installation and is used to monitor all measurands of relevance to the climate inside a room. These are the measurands air humidity, temperature, CO₂ concentration as well as air quality (VOC). By using a single device to monitor all four measurands, it is possible to effectively monitor and regulate the entire room climate. It measures CO₂ in the range of 0...5000 ppm, VOC at one of three selectable sensitivity levels LOW / MEDIUM / HIGH, temperatures in the range of -35...+80 °C, as well as relative air humidity from 0...100% r.H.

A digital, long-term stable sensor used as measuring element for relative air humidity and temperature guarantees exact measurement results. The Modbus can be used to retrieve the following parameters: Temperature [°C], relative humidity [% r.H.], air quality (VOC) [%], carbon dioxide (CO₂) [ppm] and atmospheric pressure [hPa].

The CO₂ content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). The detection range of the sensors is calibrated for standard applications such as monitoring residential rooms and conference rooms. Room ventilation on an as-needed basis, improved well-being and customer benefit, increased comfort as well as reduced operating costs through energy conservation are just some of the benefits of employing the AERASGARD® CO₂ sensor.

The explanations above demonstrate that there are applications for CO₂ measurements, for VOC measurements, but from our perspective, above all, for a combination of both measurands. The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. An NDIR CO₂ measuring instrument measures selectively and cannot detect any VOC; a VOC mixed gas sensor cannot recognize CO₂ molecules.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10%)
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Data points:	Temperature [°C], relative humidity [% r.H.], air quality (VOC) [%], carbon dioxide (CO ₂) [ppm], atmospheric pressure [hPa]

HUMIDITY

Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% r. H.
Operating range, humidity:	0...95% r. H. (without dew formation)
Deviation of humidity:	typically ± 2.0% (20...80% r. H.) at +25 °C, otherwise ± 3.0%

TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Deviation, temperature:	typically ± 0.4 K at 25 °C

AIR QUALITY (VOC)

Sensor, VOC:	VOC sensor (metal oxide) with automatic calibration (VOC = volatile organic compounds)
Measuring range, VOC:	0...100% air quality; referred to calibrating gas; multi-range switching VOC sensitivity low, medium, high
Measuring accuracy, VOC:	± 20% of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions)

CARBON DIOXIDE (CO₂)

Sensor, CO ₂ :	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) with automatic and manual calibration
Measuring range, CO ₂ :	0...5000 ppm
Measuring accuracy, CO ₂ :	typically ± 30 ppm ± 3% of measured value
Temperature dependence, CO ₂ :	± 5 ppm / °C or ± 0.5% of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13% / mm Hg
Long-term stability:	< 2% in 15 years
Gas exchange:	by diffusion

(continued on next page!)

Display screen (cyclic) Modbus Tyr 2



Temperature



Humidity



Air quality (VOC)



Carbon dioxide (CO₂)

Display screen (static) Modbus Tyr 2



Carbon dioxide (CO₂)



Atmospheric pressure

Programmable display screen Modbus Tyr 2



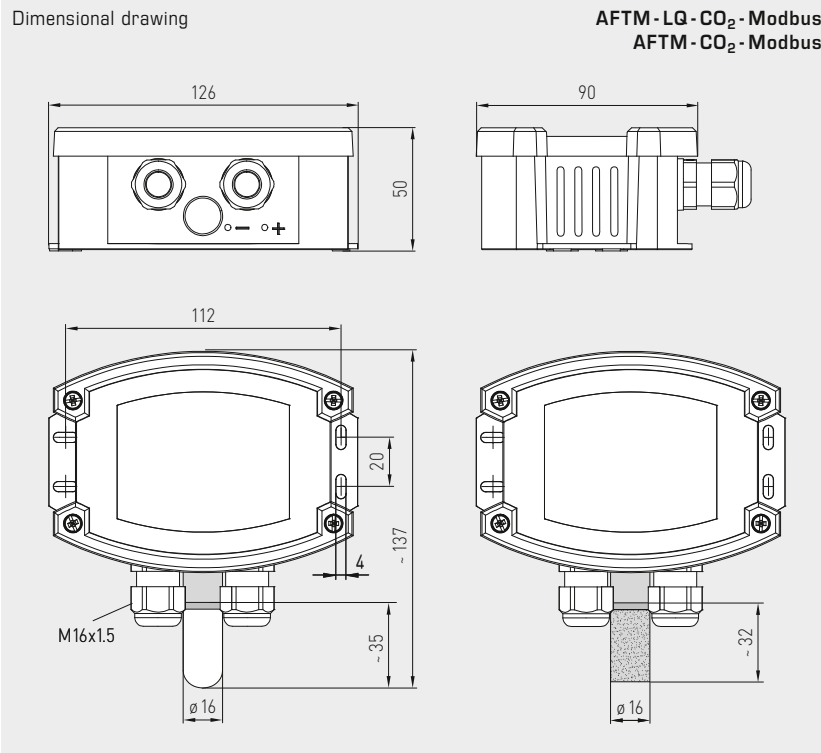


S+S REGELTECHNIK

AERASGARD® ACO₂ / ALQ - CO₂ - Modbus
 AERASGARD® AFTM - (LQ) - CO₂ - Modbus

Multifunctional on-wall sensors and measuring transducers,
 for humidity, temperature, CO₂ content and air quality (VOC),
 calibratable, with Modbus connection

Dimensional drawing



AFTM - LQ - CO₂ - Modbus
 AFTM - CO₂ - Modbus

AFTM - LQ - CO₂ - Modbus
 AFTM - CO₂ - Modbus
 with plastic sinter filter
 (standard)



AFTM - LQ - CO₂ - Modbus
 AFTM - CO₂ - Modbus
 with display and
 plastic sinter filter
 (standard)



SF-K
 Plastic sinter filter
 (standard)



SF-M
 Metal sinter filter
 (optional)

TECHNICAL DATA

(continued)

Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Ambient temperature:	-10...+60 °C
Response time:	< 2 minutes
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	Display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO ₂ content (cyclic) or a selectable parameter (static) or an individually programmable display value (The Modbus interface allows the display to be individually configured in the 7-segment area and in the dot-matrix area.)

ACCESSORIES see table

AERASGARD® ACO₂ / ALQ - CO₂ - Modbus
AERASGARD® AFTM - (LQ) - CO₂ - Modbus

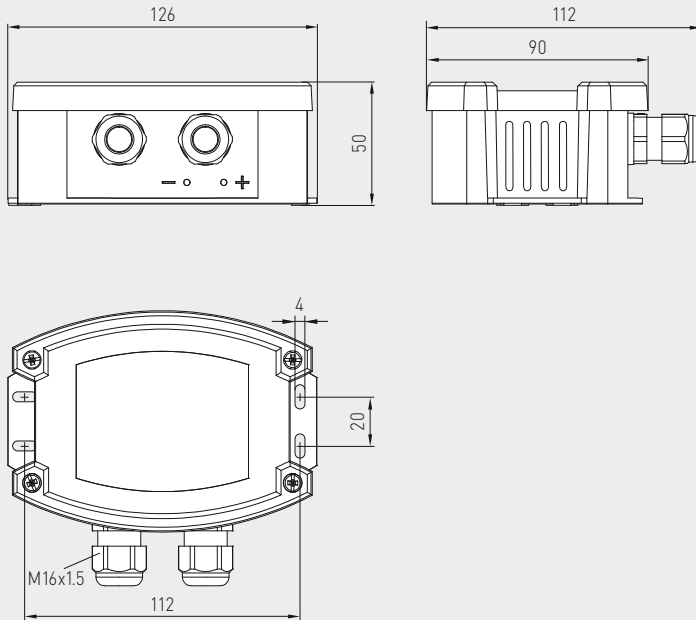


S+S REGELTECHNIK

Multifunctional on-wall sensors and measuring transducers,
 for humidity, temperature, CO₂ content and air quality (VOC),
 calibratable, with Modbus connection

Dimensional drawing

ACO₂-Modbus
 ALQ - CO₂-Modbus

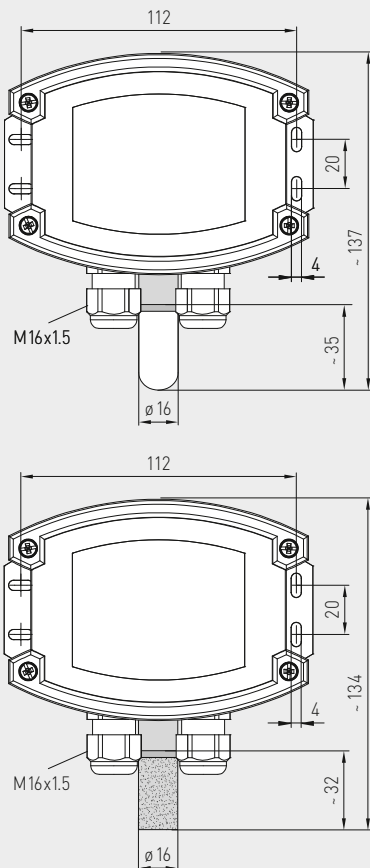


ACO₂-Modbus
 ALQ - CO₂-Modbus



Dimensional drawing

AFTM - LQ - CO₂ - Modbus
 AFTM - CO₂ - Modbus



SF-K
 plastic sinter filter
 (standard)

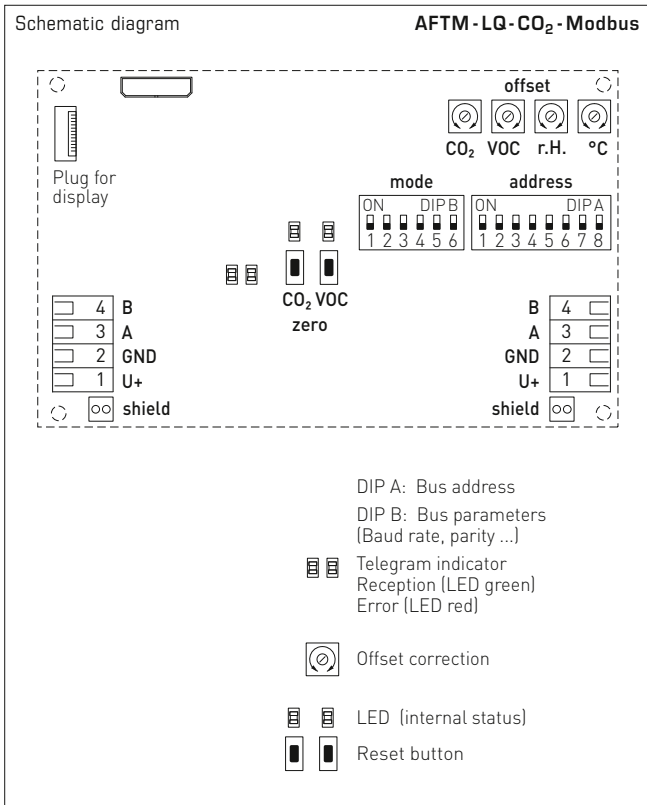


SF-M
 metal sinter filter
 (optional)



AFTM - LQ - CO₂ - Modbus
 AFTM - CO₂ - Modbus
 with metal sinter filter
 (optional)





AFTM-LQ-CO₂-Modbus with display



AERASGARD® ACO ₂ - Modbus	On-wall sensor for CO ₂ content, <i>Deluxe</i>
AERASGARD® ALQ - CO ₂ - Modbus	On-wall sensor for CO ₂ content and air quality (VOC), <i>Deluxe</i>
AERASGARD® AFTM - CO ₂ - Modbus	Multifunctional on-wall sensor for humidity, temperature and CO ₂ content, <i>Deluxe</i>
AERASGARD® AFTM - LQ - CO ₂ - Modbus	Multifunctional on-wall sensor for humidity, temperature, CO ₂ content and air quality (VOC), <i>Deluxe</i>

Type / WG02	Measuring Range				Display	Item No.	Price
	Humidity	Temperature	CO ₂	VOC			
ACO₂-Modbus							
ACO2-Modbus	–	–	5000 ppm	–		1501-7110-6001-200	331,05 €
ACO2-Modbus LCD	–	–	5000 ppm	–	■	1501-7110-6071-200	394,36 €
ALQ - CO₂-Modbus							
ALQ-CO2-Modbus	–	–	5000 ppm	0..100%		1501-7111-6001-500	446,22 €
ALQ-CO2-Modbus LCD	–	–	5000 ppm	0..100%	■	1501-7111-6071-500	521,93 €
AFTM - CO₂-Modbus							
AFTM-CO2-Modbus	0..100% r.H.	–35...+80 °C	5000 ppm	–		1501-7116-6001-200	415,29 €
AFTM-CO2-Modbus LCD	0..100% r.H.	–35...+80 °C	5000 ppm	–	■	1501-7116-6071-200	497,41 €
AFTM - LQ - CO₂-Modbus							
AFTM-LQ-CO2-Modbus	0..100% r.H.	–35...+80 °C	5000 ppm	0..100%		1501-7118-6001-500	530,69 €
AFTM-LQ-CO2-Modbus LCD	0..100% r.H.	–35...+80 °C	5000 ppm	0..100%	■	1501-7118-6071-500	627,51 €
Note:	This unit must not be used as safety-relevant device!						
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request	
ACCESSORIES							
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100	188,70 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100	70,38 €
SF-M	Metal sinter filter , Ø 16 mm, L = 32 mm, exchangeable/stainless steel V4A (1.4404)					7000-0050-2200-100	37,32 €
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)					7100-0040-6000-000	39,45 €
For further information see last chapter!							

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO₂ content and air quality (VOC), calibratable, with Modbus connection

Patented quality product (patent no. DE 10 2014 010 719.1)

The maintenance-free, microprocessor-controlled **AERASGARD® AFTM - LQ - CO₂ - Modbus** and **KCO₂ / KLQ - CO₂ / KFTM - CO₂ - Modbus** with Modbus connection, with/without optional display, is designed for duct installation and is used to monitor all measurands of relevance to the climate inside a room. These are the measurands air humidity, temperature, CO₂ concentration as well as air quality (VOC). By using a single device to monitor all four measurands, it is possible to effectively monitor and regulate the entire room climate. It measures CO₂ in the range of 0...5000 ppm, VOC at one of three selectable sensitivity levels LOW / MEDIUM / HIGH, temperatures in the range of -35...+80 °C, as well as relative air humidity from 0...100% r.H.

A digital, long-term stable sensor used as measuring element for relative air humidity and temperature guarantees exact measurement results. The Modbus can be used to retrieve the following parameters: Temperature [°C], relative humidity [% r.H.], air quality (VOC) [%], carbon dioxide (CO₂) [ppm] and atmospheric pressure [hPa].

The CO₂ content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). The detection range of the sensors is calibrated for standard applications such as monitoring residential rooms and conference rooms. Room ventilation on an as-needed basis, improved well-being and customer benefit, increased comfort as well as reduced operating costs through energy conservation are just some of the benefits of employing the AERASGARD® CO₂ sensor.

The explanations above demonstrate that there are applications for CO₂ measurements, for VOC measurements, but from our perspective, above all, for a combination of both measurands. The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. An NDIR CO₂ measuring instrument measures selectively and cannot detect any VOC; a VOC mixed gas sensor cannot recognize CO₂ molecules.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Data points:	Temperature [°C], relative humidity [% r.H.], air quality (VOC) [%], carbon dioxide (CO ₂) [ppm], atmospheric pressure [hPa]

HUMIDITY

Sensors:	digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% r. H.
Operating range, humidity:	0...95% r. H. (without dew formation)
Deviation of humidity:	typically ± 2.0% (20...80% r. H.) at +25 °C, otherwise ± 3.0%

TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Deviation, temperature:	typically ± 0.2 K at 25 °C

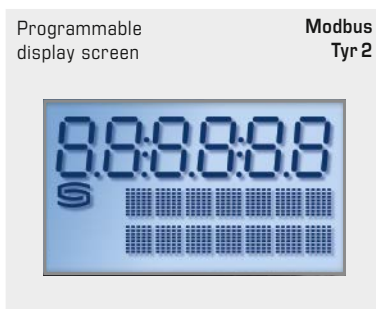
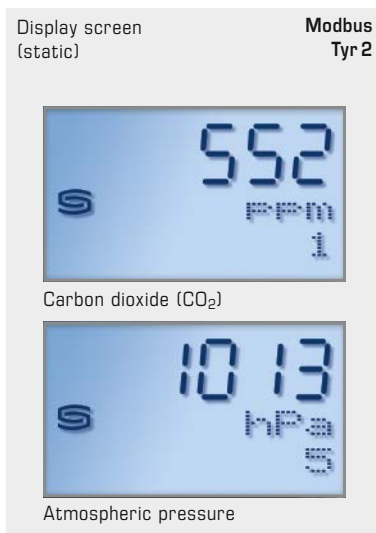
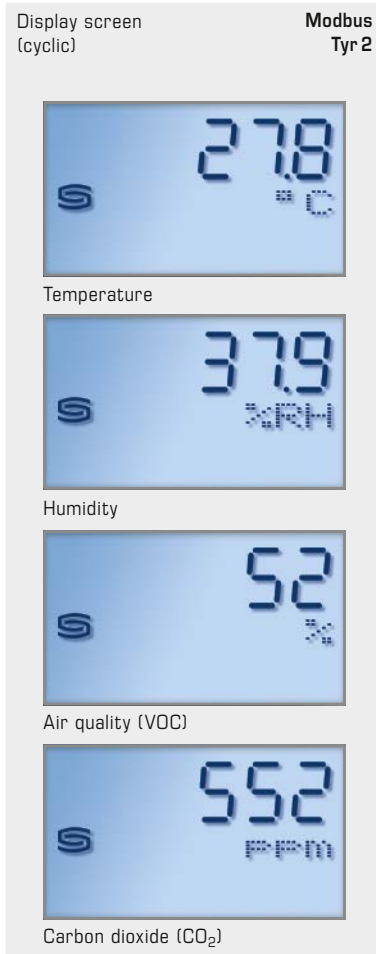
AIR QUALITY (VOC)

Sensor, VOC:	VOC sensor (metal oxide) with automatic calibration (VOC = volatile organic compounds)
Measuring range, VOC:	0...100% air quality; referred to calibrating gas; multi-range switching VOC sensitivity low, medium, high
Measuring accuracy, VOC:	± 20% of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions)

CARBON DIOXIDE (CO₂)

Sensor, CO ₂ :	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) with automatic and manual calibration
Measuring range, CO ₂ :	0...5000 ppm
Measuring accuracy, CO ₂ :	typically ± 30 ppm ± 3% of measured value
Temperature dependence, CO ₂ :	± 5 ppm / °C or ± 0.5% of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13% / mm Hg
Long-term stability:	< 2% in 15 years
Gas exchange:	by diffusion

(continued on next page!)

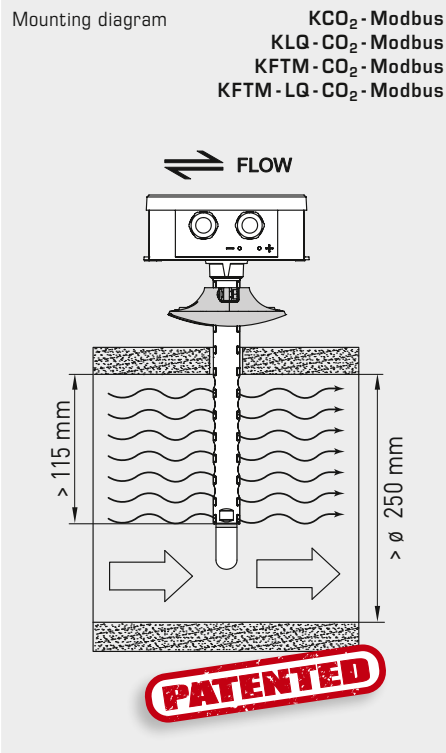




S+S REGELTECHNIK

AERASGARD® KCO₂ / KLQ - CO₂ - Modbus AERASGARD® KFTM - (LQ) - CO₂ - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO₂ content and air quality (VOC), calibratable, with Modbus connection



MFT-20-K
Mounting flange,
plastic



KFTM - CO₂ - Modbus
KFTM - LQ - CO₂ - Modbus
with plastic sinter filter
(standard)



KFTM - CO₂ - Modbus
KFTM - LQ - CO₂ - Modbus
with display and
plastic sinter filter
(standard)



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)

TECHNICAL DATA		(continued)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable	
Signal filtering:	4 s / 32 s	
Ambient temperature:	-10...+60 °C	
Response time:	< 2 minutes, minimal flow velocity 0.3 m/s (air)	
Electrical connection:	0.2 - 1.5 mm ² , ia push-in terminal	
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!	
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)	
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)	
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, v _{max} = 30 m/s (air) without filter: NL = 202.5 mm / with plastic filter: NL = 235 mm (optional with metal filter: NL = 227 mm)	
Process connection:	via mounting flange made of plastic (included in scope of delivery)	
Protection class:	III (according to EN 60730)	
Protection type:	IP 65 (according to EN 60529) housing in the built-in state (permeable PLEUROFORM: IP30)	
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, EMC Directive 2014/30/EU	
Optional:	Display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO ₂ content (cyclic) or a selectable parameter (static) or an individually programmable display value (The Modbus interface allows the display to be individually configured in the 7-segment area and in the dot-matrix area.)	
ACCESSORIES	see table	

AERASGARD® KCO₂ / KLQ-CO₂-Modbus
AERASGARD® KFTM-(LQ)-CO₂-Modbus



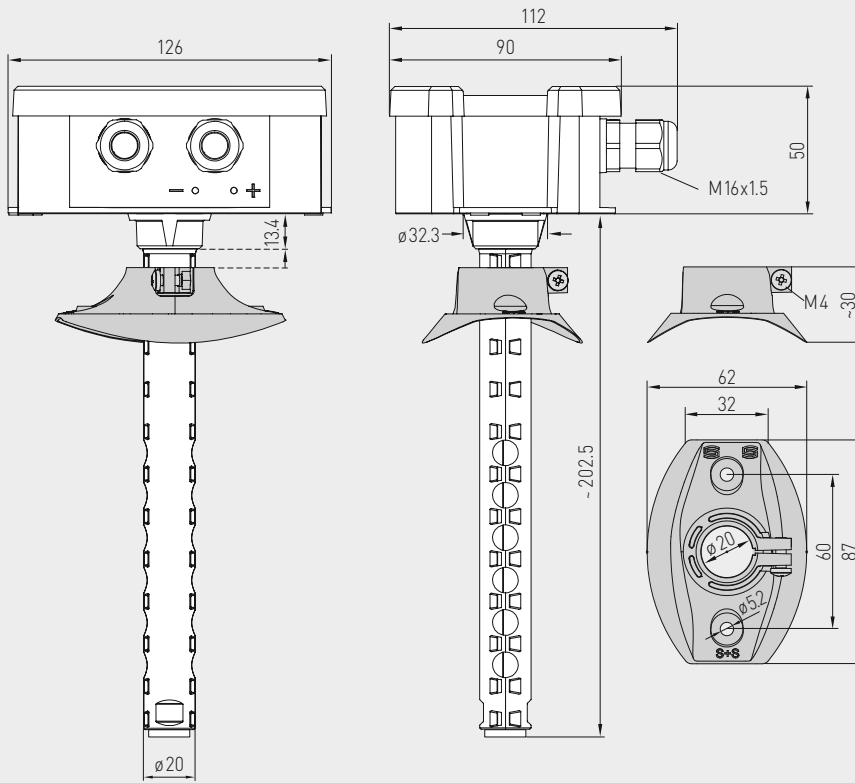
Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO₂ content and air quality (VOC), calibratable, with Modbus connection

S+S REGELTECHNIK

Dimensional drawing

KCO₂-Modbus
KLQ-CO₂-Modbus

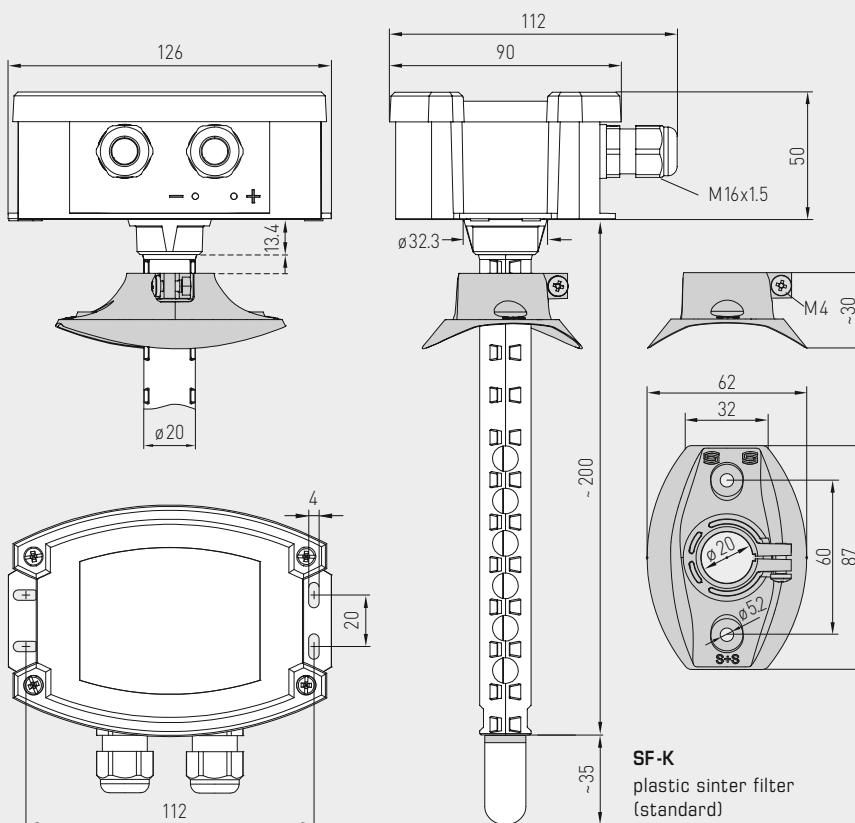
KCO₂-Modbus
KLQ-CO₂-Modbus



Dimensional drawing

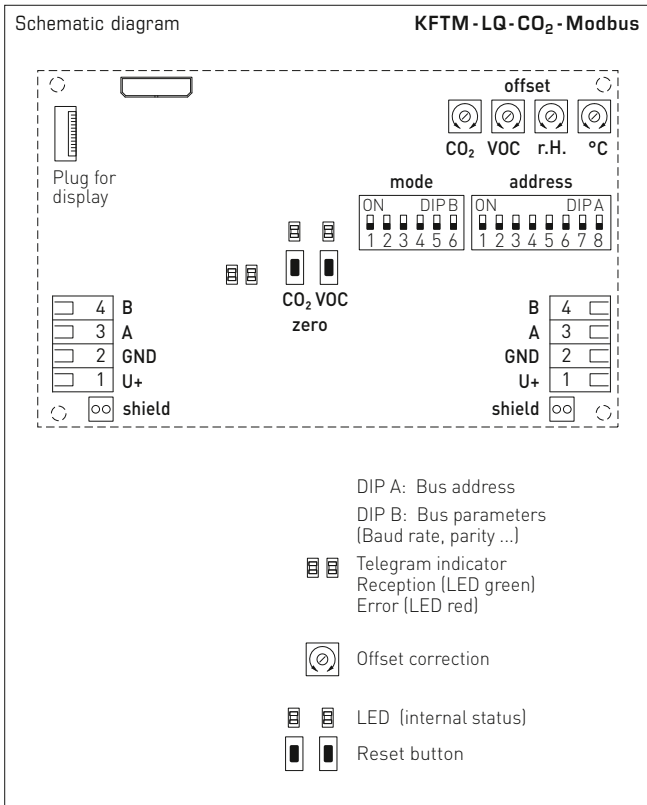
KFTM-CO₂-Modbus
KFTM-LQ-CO₂-Modbus

KFTM-CO₂-Modbus
KFTM-LQ-CO₂-Modbus



SF-M
 metal sinter filter
 (optional)

SF-K
 plastic sinter filter
 (standard)



KFTM - LQ - CO₂ - Modbus with display



AERASGARD® KCO ₂ - Modbus	Duct sensor for CO ₂ content, <i>Deluxe</i>
AERASGARD® KLQ - CO ₂ - Modbus	Duct sensor for air quality (VOC) and CO ₂ content, <i>Deluxe</i>
AERASGARD® KFTM - CO ₂ - Modbus	Multifunctional duct sensor for humidity, temperature and CO ₂ content, <i>Deluxe</i>
AERASGARD® KFTM - LQ - CO ₂ - Modbus	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO ₂ content, <i>Deluxe</i>

Type / WG02	Measuring Range				Display	Item No.	Price
	Humidity	Temperature	CO ₂	VOC			
KCO₂ - Modbus							
KCO2-Modbus	–	–	5000 ppm	–		1501-8110-6001-200	331,05 €
KCO2-Modbus LCD	–	–	5000 ppm	–	■	1501-8110-6071-200	384,16 €
KLQ - CO₂ - Modbus							
KLQ-CO2-Modbus	–	–	5000 ppm	0...100%		1501-8111-6001-500	373,71 €
KLQ-CO2-Modbus LCD	–	–	5000 ppm	0...100%	■	1501-8111-6071-500	436,62 €
KFTM - CO₂ - Modbus							
KFTM-CO2-Modbus	0...100% r.H.	–35...+80 °C	5000 ppm	–		1501-8116-6001-200	339,58 €
KFTM-CO2-Modbus LCD	0...100% r.H.	–35...+80 °C	5000 ppm	–	■	1501-8116-6071-200	414,23 €
KFTM - LQ - CO₂ - Modbus							
KFTM-LQ-CO2-Modbus	0...100% r.H.	–35...+80 °C	5000 ppm	0...100%		1501-8118-6001-500	444,09 €
KFTM-LQ-CO2-Modbus LCD	0...100% r.H.	–35...+80 °C	5000 ppm	0...100%	■	1501-8118-6071-500	521,93 €
Note:	This unit must not be used as safety-relevant device!						
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request	
ACCESSORIES							
KA2 - Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100	188,70 €
LA - Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100	70,38 €
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)					7000-0050-2200-100	37,32 €
MFT-20-K	Mounting flange, plastic (included in the scope of delivery)					7000-0031-0000-000	8,43 €

For further information, see last chapter Accessories!

**Line termination device with terminating resistor
for the active bus termination of RS485 networks**

LA-Modbus

Line termination device **MODKON® LA-Modbus T3** with terminating resistor, in an impact-resistant plastic housing with quick-locking screws.

The line termination serves as an active bus termination for RS485 networks (ANSI TIA/EIA-485), such as Modbus RTU. It contains a terminating resistor with a biasing network, which pre-defines the bus signals to a safe value (fail-safe biasing) during bus idle time.

The bus termination can be fully switched on or off via DIP switches. This allows various operating scenarios to be tested in a simple manner whenever servicing is needed.

For very long network cables, both end points can also be provided with an active bus termination to improve interference immunity under harsh environmental conditions.



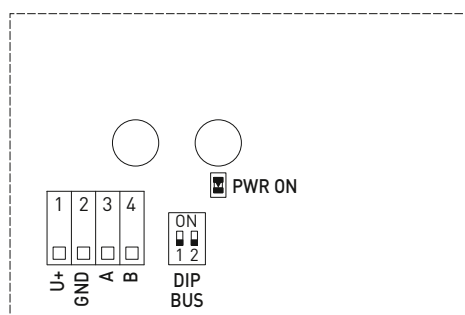
TECHNICAL DATA

Power supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 0.5 W / 24 V DC; < 0.5 VA / 24 V AC
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display)
Cable connection:	Cable gland, plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529)
Operation display:	Status LED PWR ON (supply voltage)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU

DIP 1	DIP 2	Resistance (type adjustable)	Bus termination (explanation)
ON	ON	R_{AB} active and R_{BIAS} active	Line termination and BIAS active
ON	OFF	R_{AB} active	Line termination active
OFF	OFF	Deactivated	Bus termination switched off

Connecting diagram

LA-Modbus



- Push-in terminal**
- +UB** Terminal 1: +UB 24V
- GND** Terminal 2: -UB GND
- A/B** Terminal 3/4: RS485 Modbus
- Status LED**
- PWR ON** Supply voltage
- DIP switch**
- DIP BUS** Activation or deactivation of the bus termination

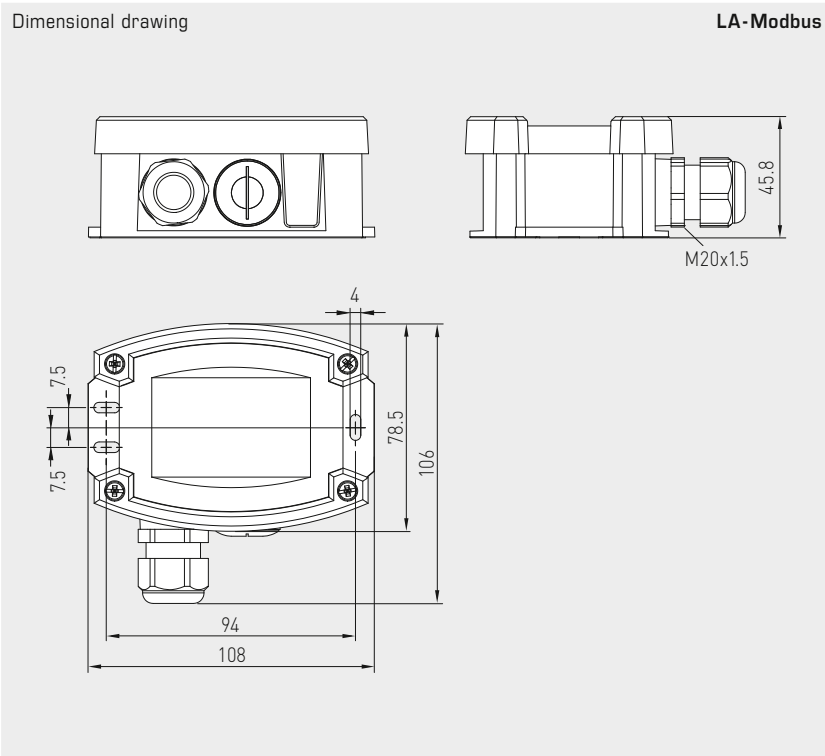


NEW

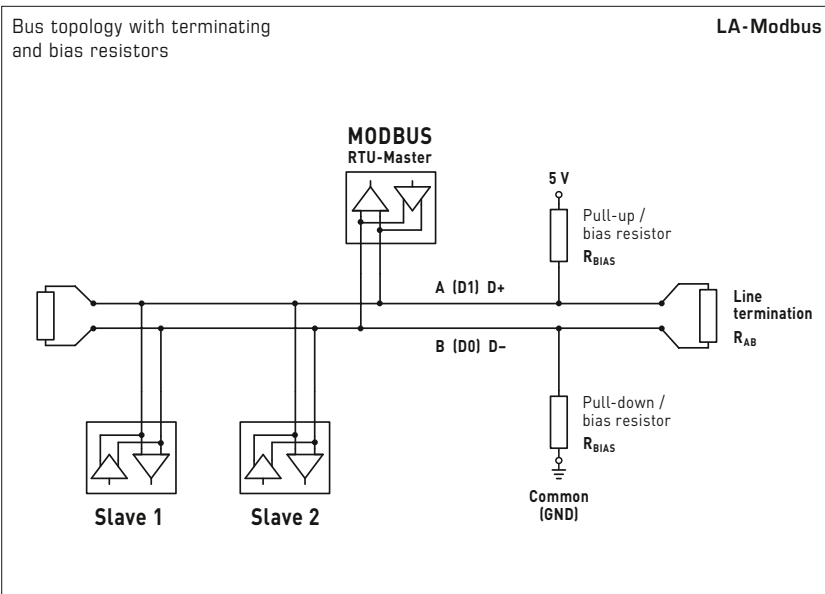
S+S REGELTECHNIK

MODKON® LA-Modbus

Line termination device with terminating resistor for the active bus termination of RS485 networks



LA-Modbus



MODKON® LA-Modbus Line termination device with terminating resistor			
Type / WG01	Bus termination (adjustable)	Item No.	Price
LA-Modbus	1. Line termination and BIAS active 2. Line termination active 3. Bus termination deactivated	1906-1300-0000-100	70,38 €

Note: The bus termination can be fully switched on or off (via DIP switches).

Communication adapter incl. software MODKON RTU,
with USB and RS485 interface,
for system connection of S+S Modbus sensors

KA2-Modbus

Communication adapter **MODKON® KA2-Modbus T3** with USB and RS485 interface, in an impact-resistant plastic housing with quick-locking screws, incl. software.

The communication adapter serves as connecting element between an S+S Modbus sensor and a PC (Windows). A standard USB port enables quick and straightforward connection to the system; there is no need for an additional power supply.

When used in combination with the S+S software **MODKON RTU** (included in delivery), it offers a very convenient way to test the response behaviour of the sensor.

The Auto Scan function of the software automatically detects the device type, the device address and the set bus parameters. In this way, communication with the connected S+S Modbus sensor is possible without the need for additional settings. The ideal first step to gain experience with Modbus technology.

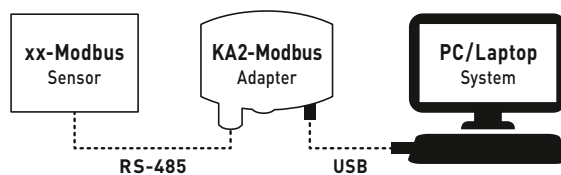


TECHNICAL DATA

Power supply:	Takes place via USB connection
Output:	Voltage: 15 V; Current: 100 mA
Interfaces:	Standard USB port for system connection, power supply RS485 interface for connection of an S+S Modbus sensor
Compatibility:	S+S Modbus sensors for the device classes THERMASGARD® , HYGRASGARD® , PREMASGARD® , AERASGARD®
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 45.8 mm (Tyr 3)
Cable connection:	Cable gland, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) housing only!
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU

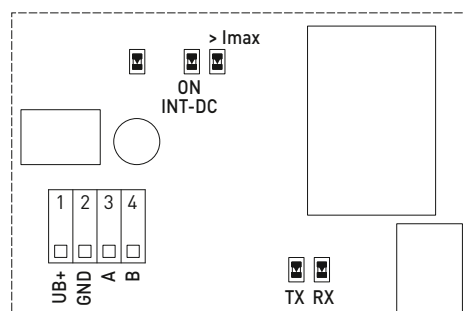
Mounting diagram

KA2-Modbus



Connecting diagram

KA2-Modbus



- Push-in terminal**
- +UB** Output supply for S+S Modbus sensor
- GND** approx. 15V (max. 100mA) with supply via USB
- A/B** RS485 Modbus
- Status LEDs**
- >Imax** Electronic fuse approx. 150mA
- INT-DC** Internal supply (USB)
- TX** Transmit telegrams
- RX** Receive telegrams

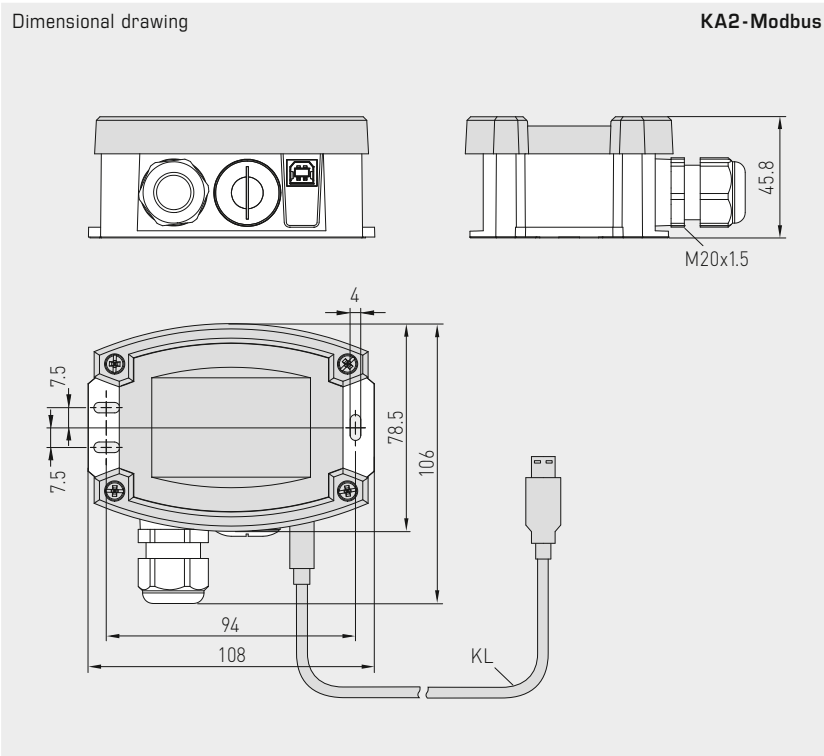


NEW

S+S REGELTECHNIK

MODKON® KA2-Modbus

Communication adapter incl. software MODKON RTU, with USB and RS485 interface, for system connection of S+S Modbus sensors



KA2-Modbus

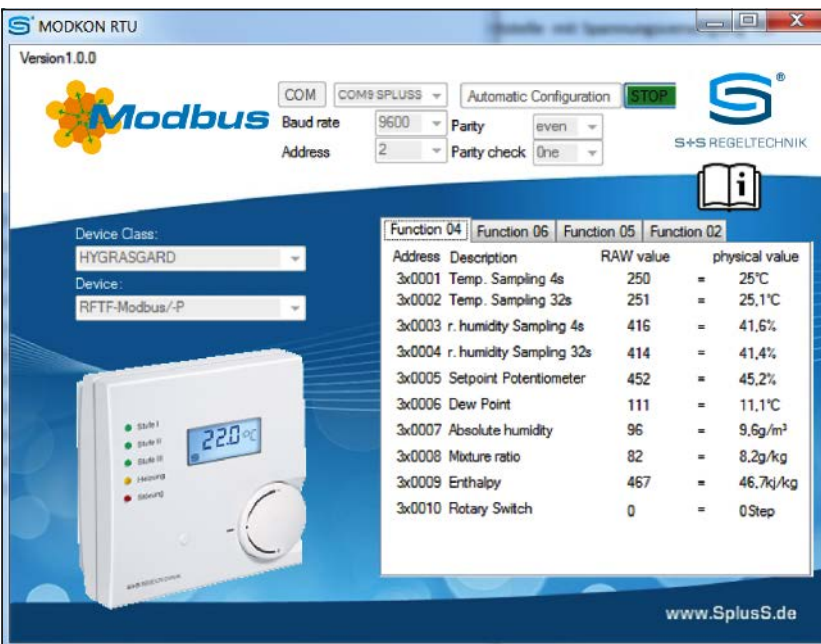


Fig. shows the input screen of the S+S software MODKON RTU (included in the scope of delivery) based on the example of the S+S Modbus sensor HYGRASGARD® RFTF-Modbus

MODKON® KA2-Modbus Communication adapter incl. software				
Type / WG01	Interfaces	Software	Item No.	Price
KA2-Modbus	USB + RS485	MODKON RTU	1906-1200-0000-100	188,70 €

Note: You can find information on how to operate the software on the USB stick included or in the online shop.



Temperature PASSIVE SENSORS

Our passive **THERMASGARD®** temperature sensors have a proven fit in countless applications across all areas of temperature measurement. Technology for best measuring results you can rely on. Available in various different models and individual versions to meet your precise requirements.

APPLICATION RANGE

- > Hospitals, museums, schools, hotels and administration buildings
- > Power plants and district heating facilities
- > Pharmaceutical and food industry
- > Production plants
- > Heating systems



THERMASGARD®

140 – 227

Room sensors

DTF	In-ceiling temperature sensor	163
RTF	Room temperature sensor, on-wall	145
RTF 1	Room temperature sensor, on-wall	146
FSTF	Room temperature sensor, in-wall	155
FSTF 1	Room temperature sensor, in-wall	157
RPTF 1	Pendulum room temperature sensor	224
RPTF 2	Pendulum room temperature sensor	225
RSTF	Room radiation temperature sensor	227
RTF-xx	Room control units, on-wall	148
FSTF-xx	Room control units, in-wall	156

Outdoor sensor, on-wall sensor

ATF01	Outside temperature sensor	164
ATF 1	Outside temperature sensor	165
ATF 2	Outside temperature sensor	167
ASTF	On-wall radiation temperature sensor	226

Duct sensors, surface-contact sensors

HTF	Sleeve temperature sensor with cable	214
OFTF	Surface temperature sensor	219
ALTF 1	Surface-contact temperature sensor with cable	220
ALTF02	Surface-contact temperature sensor	222
ALTF 2	Surface-contact temperature sensor	223

Duct, immersion, screw-in sensors

TF 43	Duct / immersion / screw-in sensor	172
TF 65	Duct / immersion / screw-in sensor	170
TF 54	Duct / immersion / screw-in sensor	188
TF 43-F	Duct / immersion / screw-in sensor with cable	177
TF 65-F	Duct / immersion / screw-in sensor with cable	177
MWTF	Mean-value temperature sensor	183
MWTF-SD	Mean-value temperature sensor	183
ETF 6	Screw-in sensor with neck tube	196
ETF 7	Screw-in sensor, fast-acting	185
RGTF 2	Smoke gas screw-in sensor	209
RGTF 1	Smoke gas duct sensor	203
HTF	Duct / immersion / screw-in sensor with cable	216

Immersion sleeves and accessories

see chapter Accessories	604
-------------------------	------------



Temperature



THERMASGARD® & THERMASREG®

Multifunctional sensor technology for heat and cold

Broad Spectrum

All our temperature measuring transducers are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

Optimum Precision

The devices are tested according to the latest criteria and are calibrated and 100 % tested in our climatic exposure test cabinets. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Approved Safety

The **THERMASGARD® 1101-I** with current output (Test No. 69871-01939-1) and the **THERMASGARD® 1101-U** with voltage output (Test No. 69871-01940-1) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.

THERMASREG® ETR and **KTR** are tested and certified to DIN EN 14597:2015-01.



DIN tested/certified devices



RoHS conforming materials



ESD compliant manufacturing



CE compliance tested by external laboratories

Certified Quality



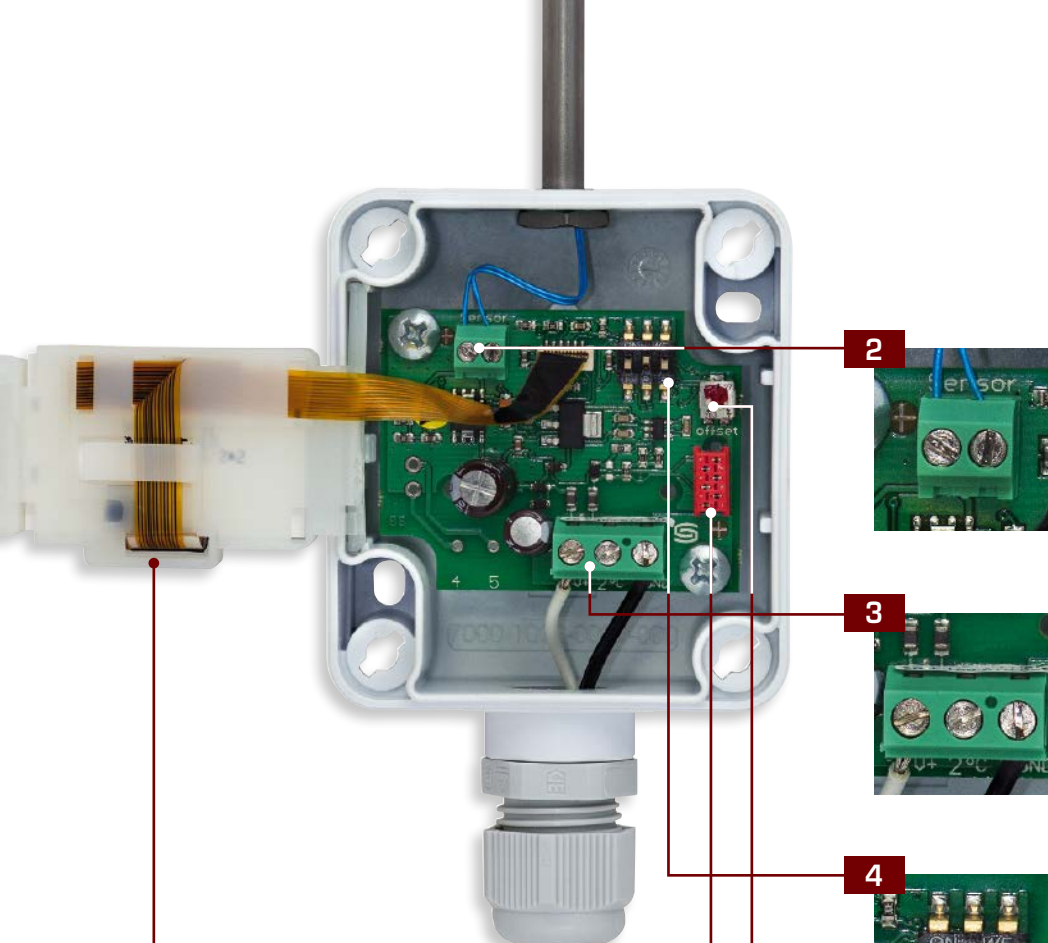
Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.



GOST certificates

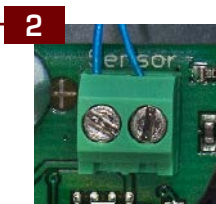


EAC certified



Illuminated Display

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units



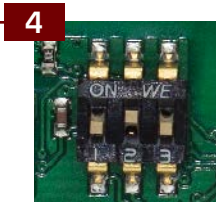
Sensors

Internal sensors / external sensors



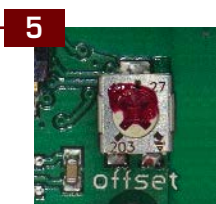
Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched as well as passive outputs (e.g. Pt1000, Ni1000 etc.)



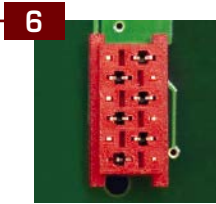
DIP Switches

For multi-range toggling and setting of measuring ranges



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration



Quality Assurance

Calibration and balancing are done by means of the bus system in climate cabinets



Configuration variants of room operating units

Room temperature sensors and measuring transducers, on-wall, device series Baldur

Housing temperature sensors are electric contact thermometers for measuring temperatures in the gases (air) surrounding them on all sides. Room temperature sensors/measuring transducers are used for measuring air temperature (in non-precipitating air), for changing setpoint values, for presence detection, or as operating panels with push-buttons, switches, potentiometers, status indicators (LEDs) in residential, working, office and business facilities as well as in the industrial sector.

Here are some design and configuration examples of variants of the new Baldur series devices that can be individually customized ...

DEVICE SERIES

- Baldur 1 (85 x 85 x 27 mm)
- Baldur 2 (98 x 98 x 33 mm)

Baldur lying



Baldur 1 without operating elements



Baldur 1 with display



Baldur 1 with display and potentiometer



Baldur 1 with potentiometer, push-button, and LED



Baldur 1 with potentiometer and rocker switch



Baldur 1 with potentiometer and push-buttons



Baldur 1 with potentiometer and LEDs

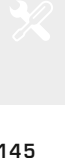
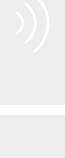
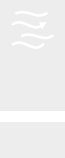


Baldur 1 with potentiometer and LEDs



Baldur 1 with potentiometer and LEDs





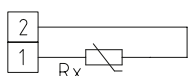
Room temperature sensors and measuring transducers, on-wall

Room temperature sensor **THERMASGARD® RTF 1** with passive output, in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, or in enclosures made of stainless steel (top and bottom part are of stainless steel, the lid is screwed on), vandal-proof version e.g. for schools, military barracks, and public buildings. This residential room temperature sensor is used to detect/display temperatures in closed dry rooms, in apartments, in cinemas, supermarkets, storage rooms, office and business facilities.

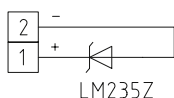
TECHNICAL DATA

Measuring range:	-30...+70 °C
Sensor / output:	see table, passive
Connection type:	2-wire connection (4-wire connection on PT100/PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Process connection:	by screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), optional stainless steel V2A (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) Standard 98 x 98 x 33 mm (Baldur 2) optional 75 x 75 x 25 mm (stainless steel V2A (1.4301) optional
Installation:	wall mounting or on in-wall flush box Ø55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Electrical connection:	0.14 - 1.5 mm ² via terminal screws, secured against loss due to unscrewing, on safety extra-low voltage max. 24 V DC only
Humidity:	max. 90% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
ACCESSORIES	see last chapter

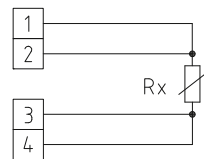
1x two-wire connection standard



1x two-wire connection LM235Z (KP10)

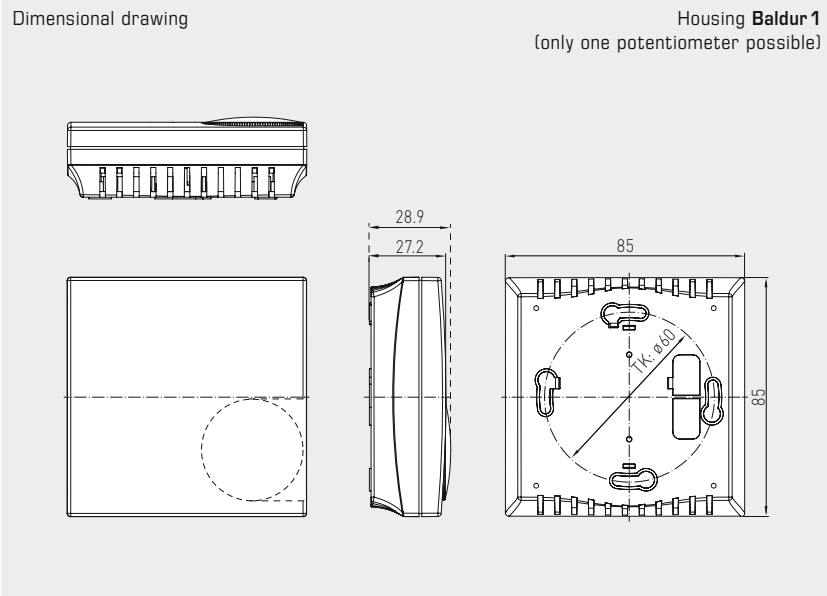


1x four-wire connection (optional)

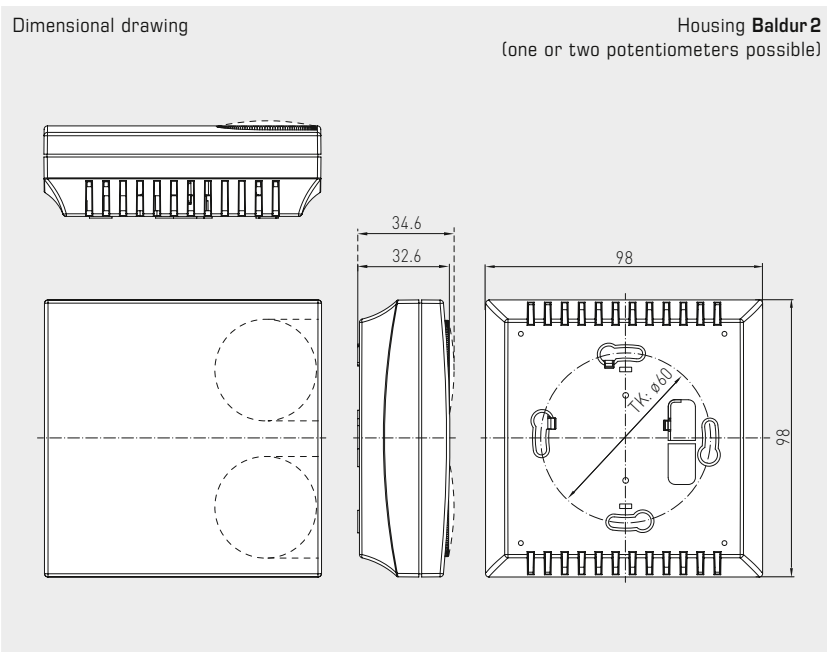


THERMASGARD® RTF 1 Room temperature sensors (Standard)

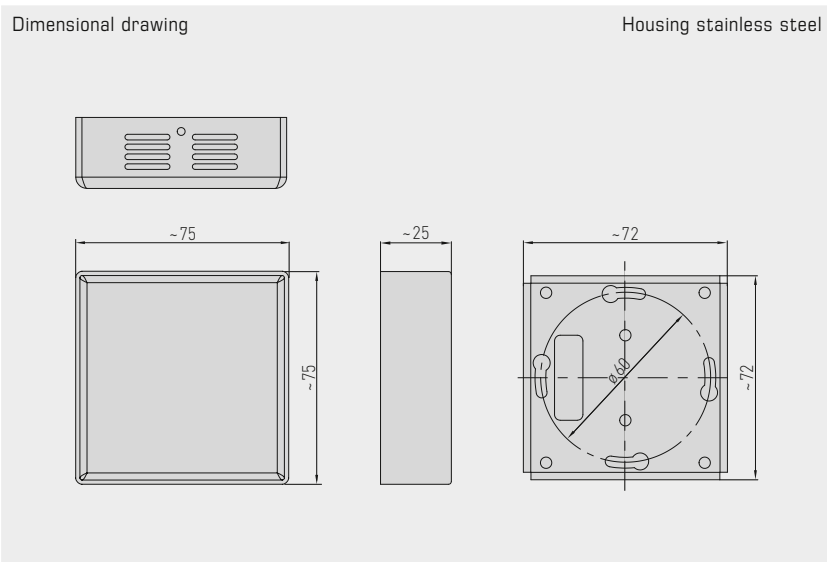
Type / WG03	Sensor / Output	Item No.	Price
RTF1 xx	passive	IP 30 (-30...+70 °C)	
RTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1003-000	20,59 €
RTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5000-000	22,90 €
RTF1 Pt1000A	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-40A0-6003-000	24,47 €
RTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-40A0-9000-000	22,58 €
RTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-40A1-0000-000	22,58 €
RTF1 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-40A2-1000-000	21,12 €
RTF1 NTC1,8K	NTC 1.8K	1101-40A1-2000-000	19,24 €
RTF1 NTC10K	NTC 10K	1101-40A1-5000-000	19,24 €
RTF1 NTC20K	NTC 20K	1101-40A1-6000-000	19,24 €
Extra charge:	Stainless steel housing optional Other sensors optional		96,72 € on request



RTF
(Baldur 1)



RTF
(Baldur 2)



RTF
(stainless steel)



Room temperature sensors and measuring transducers,
on-wall, different versions

TECHNICAL DATA

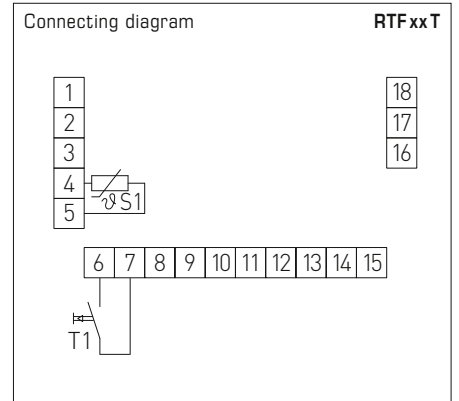
Measuring ranges:	-30...+70 °C (passive sensors) and 0...+50 °C (for U-variant)
Sensor:	for types, see table
Potentiometer:	standard 1kΩ, max. 0.1 W other ratings optional on request, e. g. 100 Ω, 2.5 kΩ, 5 kΩ, 10 kΩ, (optional potentiometer 0...10 V, linear), with angle of rotation limiter
Turn switch:	max. 24 V AC / DC, max. 130 mA, up to 5 steps (0, Auto, I, II, III), with angle of rotation limiter
Rocker switch:	max. 24 V AC / DC, max. 130 mA
Push-buttons:	normally open contact, max. 24 V DC, max. 10 mA
LEDs:	max. 24 V DC (optional max. 24 V AC), standard green (optional red, yellow, or two-colour)
Housing:	plastic, ABS, pure white (similar to RAL 9010), (optional stainless steel V2A (1.4301))
Dimensions:	85 x 85 x 27 mm (Baldur 1) Standard 98 x 98 x 33 mm (Baldur 2) 75 x 75 x 25 mm (stainless steel V2A (1.4301))
Installation:	wall mounting or on in-wall flush box Ø55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Electrical connection:	0.14 - 1.5 mm ² via terminal screws, on safety extra-low voltage max. 24 V DC only
Humidity:	max. 90 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Lettering:	standard is swelling arrow with centre position, unfilled (optional special printing – see last chapter "Accessories")
ACCESSORIES	see last chapter

Potentiometer and
turn switch with
limited angle of rotation





RTF xx T
(Baldur 1)
Version with sensor and
push-button (max. 24 V DC, max. 10 mA)

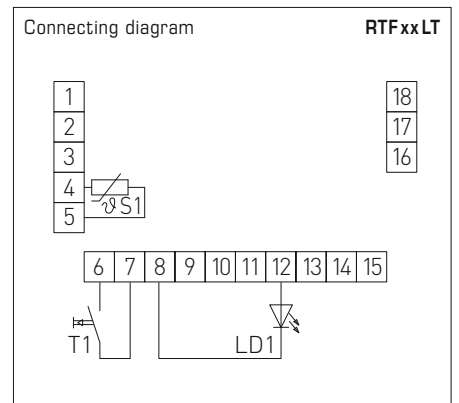


THERMASGARD® RTF xx T Room temperature sensors

Type /WG01	Sensor /Output	Item No.	Price
RTF xx T	passive	IP30 (-30...+70 °C)	
RTF Pt100 T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1617-000	39,29 €
RTF Pt1000 T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5617-000	39,29 €
RTF Ni1000 T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9617-000	40,86 €
RTF NiTK T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-40A1-0617-000	41,88 €
RTF LM235Z T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1617-000	41,43 €
RTF NTC1,8K T	NTC 1.8K	1101-40A1-2617-000	41,66 €
RTF NTC10K T	NTC 10K	1101-40A1-5617-000	38,73 €
RTF NTC20K T	NTC 20K	1101-40A1-6617-000	38,73 €



RTF xx LT
(Baldur 1)
Version with sensor, LED (green) and
push-button (max. 24 V DC, max. 10 mA)



THERMASGARD® RTF xx LT Room temperature sensors

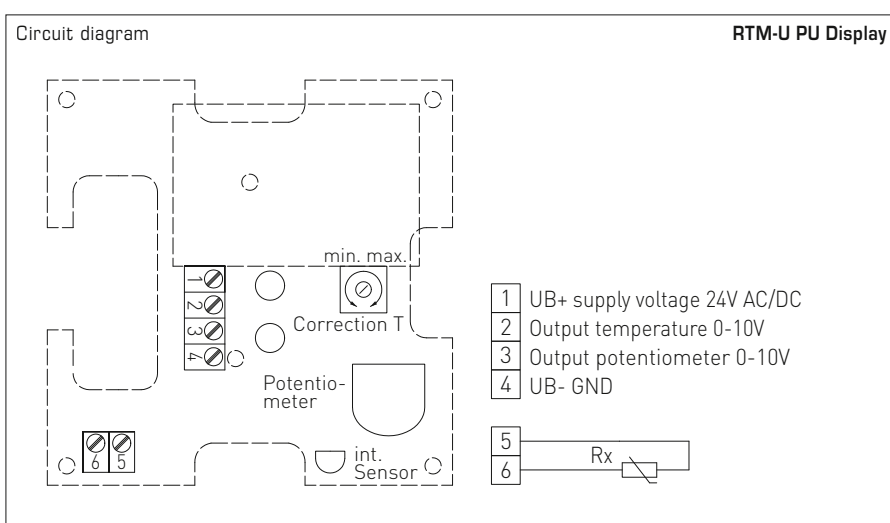
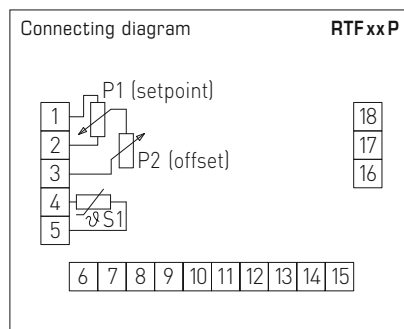
Type /WG01	Sensor /Output	Item No.	Price
RTF xx LT	passive	IP30 (-30...+70 °C)	
RTF Pt100 L T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1593-002	41,53 €
RTF Pt1000 L T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5593-002	43,05 €
RTF Ni1000 L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9593-002	43,34 €
RTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-40A1-0593-002	46,53 €
RTF LM235Z L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1593-002	42,50 €
RTF NTC1,8K L T	NTC 1.8K	1101-40A1-2593-002	46,26 €
RTF NTC10K L T	NTC 10K	1101-40A1-5593-002	41,93 €
RTF NTC20K L T	NTC 20K	1101-40A1-6593-002	41,93 €



RTF xx P
RTF xx PU

RTM-U PU
(Baldur 1)

Version with sensor and
potentiometer (1 kOhm, max. 0.1 W)



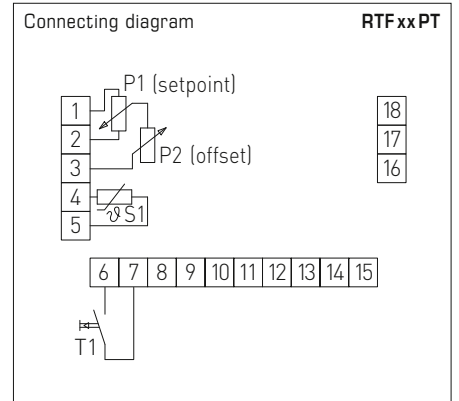
THERMASGARD® RTF xx P Room temperature sensors

Type/WG01	Sensor/Output	Display	Item No.	Price
RTF xx P	passive		IP 30 (-30...+70 °C)	
RTF Pt100 P	Pt100 (according to DIN EN 60751, class B)		1101-40A0-1001-345	41,53 €
RTF Pt1000 P	Pt1000 (according to DIN EN 60751, class B)		1101-40A0-5001-345	42,66 €
RTF Ni1000 P	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)		1101-40A0-9001-345	43,79 €
RTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm/K, LG-Ni1000)		1101-40A1-0001-345	44,36 €
RTF LM235Z P	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10		1101-40A2-1001-345	42,66 €
RTF NTC1,8K P	NTC 1.8K		1101-40A1-2001-345	42,77 €
RTF NTC10K P	NTC 10K		1101-40A1-5001-345	41,53 €
RTF NTC20K P	NTC 20K		1101-40A1-6001-345	41,53 €
RTF xx PU	passive / active		IP 30 (0...+50 °C)	
RTF Pt1000 PU	Pt1000 / 0 - 10V (potentiometer)*		1101-40A0-5004-345	98,79 €
RTF Pt1000 PU	Pt1000 / 0 - 10V (potentiometer, central position)*		1101-40A0-5004-642	98,79 €
RTF Pt1000 PU	Pt1000 / 0 - 10V (potentiometer, marking points)*		1101-40A0-5004-050	98,79 €
RTM PU	aktive		IP 30 (0...+50 °C)	
RTM-U PU	0 - 10V (temperature and potentiometer)*		1101-41A1-0004-346	129,44 €
RTM-U PU LCD	0 - 10V (temperature and potentiometer)*	■	1101-41A1-1004-346	219,25 €
For special orders please specify:	Ohm rating of potentiometer (standard is 1kOhm; optional 100 Ohm, 2.5kOhm, 5kOhm, 10kOhm, 0-10V), type of swelling arrow* (standard = wedge-shaped, optional with central position or marking points) and differing specific wiring requests			



RTF xxPT
(Baldur 1)

Version with sensor, potentiometer (1 kOhm, max. 0.1 W) and push-button (max. 24 V DC, max. 10 mA)



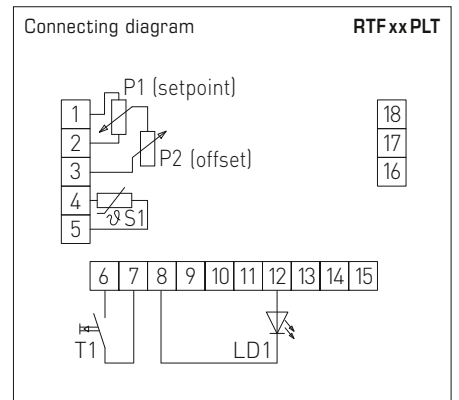
THERMASGARD® RTF xxPT Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
RTF xx PT	passive	IP30 (-30...+70 °C)	
RTF Pt100 P T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1021-345	45,93 €
RTF Pt1000 P T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5021-345	45,58 €
RTF Ni1000 P T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9021-345	47,94 €
RTF NiTK P T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-40A1-0021-345	49,96 €
RTF LM235Z P T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1021-345	49,40 €
RTF NTC1,8K P T	NTC 1.8 K	1101-40A1-2021-345	49,50 €
RTF NTC10K P T	NTC 10K	1101-40A1-5021-345	48,22 €
RTF NTC20K P T	NTC 20K	1101-40A1-6021-345	48,22 €
RTF xx PUT	passive / active	IP30 (0...+50 °C)	
RTF Pt1000 PU T	Pt1000 / 0 - 10 V (potentiometer)	1101-40B0-5033-345	105,64 €



RTF xxPLT
(Baldur 1)

Version with sensor, potentiometer (1 kOhm, max. 0.1 W), LED (green) and push-button (max. 24 V DC, max. 10 mA)



THERMASGARD® RTF xxPLT Room temperature sensors

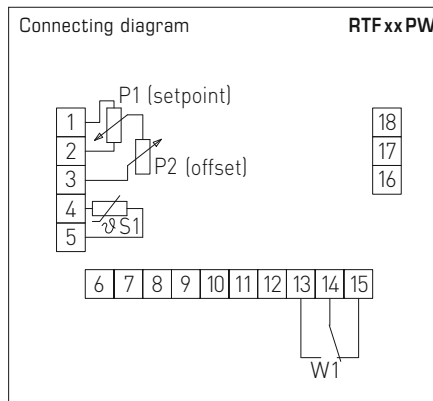
Type / WG01	Sensor / Output	Item No.	Price
RTF xx PLT	passive	IP30 (-30...+70 °C)	
RTF Pt100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1663-347	58,54 €
RTF Pt1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5663-347	61,47 €
RTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9663-347	61,75 €
RTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-40A1-0663-347	64,43 €
RTF LM235Z P L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1663-347	60,29 €
RTF NTC1,8K P L T	NTC 1.8 K	1101-40A1-2663-347	63,98 €
RTF NTC10K P L T	NTC 10K	1101-40A1-5663-347	58,54 €
RTF NTC20K P L T	NTC 20K	1101-40A1-6663-347	58,54 €
RTF xx PULT	passive / active	IP30 (-30...+70 °C)	
RTF Pt1000 PU L T	Pt1000 / 0 - 10 V (potentiometer)	1101-40B0-5669-347	121,25 €

Room temperature sensors and measuring transducers,
on-wall, different versions



RTF xxPW
(Baldur 1)

Version with sensor,
potentiometer (1 kOhm, max. 0.1 W) and
rocker switch (max. 24 V AC/DC, max. 130 mA)



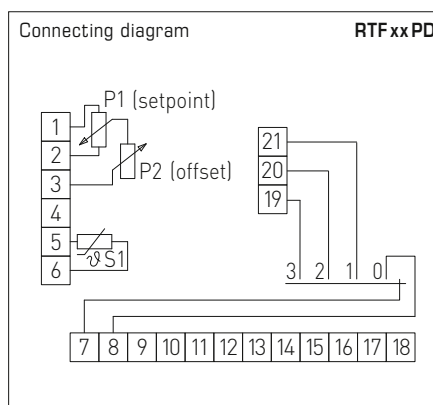
THERMASGARD® RTF xxPW Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
RTF xx PW	passive	IP 30 (-30...+70 °C)	
RTF Pt100 P W	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1061-348	46,59 €
RTF Pt1000 P W	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5061-348	48,27 €
RTF Ni1000 P W	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-40A0-9061-348	48,73 €
RTF NiTK P W	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-40A1-0061-348	50,52 €
RTF LM235Z P W	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-40A2-1061-348	49,96 €
RTF NTC1,8K P W	NTC 1.8K	1101-40A1-2061-348	50,42 €
RTF NTC10K P W	NTC 10K	1101-40A1-5061-348	48,85 €
RTF NTC20K P W	NTC 20K	1101-40A1-6061-348	48,85 €
RTF xx PUW	passive / active	IP 30 (0...+50 °C)	
RTF Pt1000 PU W2	Pt1000 / 0-10 V (potentiometer)	1101-40B0-5067-348	106,20 €



RTF xx PD
(Baldur 2)

Version with sensor,
potentiometer (1 kOhm, max. 0.1 W) and
and turn switch (max. 24 V AC/DC, max. 130 mA)



THERMASGARD® RTF xxPD Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
RTF xx PD	passive	IP 30 (-30...+70 °C)	
RTF Pt100 P D4	Pt100 (according to DIN EN 60 751, class B)	1101-40B0-1007-349	47,05 €
RTF Pt1000 P D4	Pt1000 (according to DIN EN 60 751, class B)	1101-40B0-5007-349	48,78 €
RTF Ni1000 P D4	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-40B0-9007-349	49,05 €
RTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-40B1-0007-349	51,08 €
RTF LM235Z P D4	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-40B2-1007-349	50,52 €
RTF NTC1,8K P D4	NTC 1.8K	1101-40B1-2007-349	50,62 €
RTF NTC10K P D4	NTC 10K	1101-40B1-5007-349	49,35 €
RTF NTC20K P D4	NTC 20K	1101-40B1-6007-349	49,35 €
RTF xx PUD	passive / active	IP 30 (0... +50 °C)	
RTF Pt1000 PU D4	Pt1000 / 0-10 V (potentiometer)	1101-40B0-5019-349	106,64 €

Operating elements Baldur 1	Possible combinations	1	2	3	4	5	6
Sensor 1		●	●	●	●	●	●
Sensor 2		●		●			
Sensor 3 LM235Z with calibrating pot (4-wire)		●			●	●	
Potentiometer 1 with/without series resistor		●	●	●	●		
Potentiometer 2 with calibrating pot						●	●
LED 1 (max. one LED)							
LED 2 (max. two LEDs)							
LED 3 (max. three LEDs)							
LED 4 (max. four LEDs)		●	●	●	●	●	●
Rocker switch			●	●			●
Push-button 1 (max. one button)		●		●		●	●
Push-button 2 (max. two buttons)			●	●			

Please specify in your order:

Ohm rating of potentiometer
(e. g. 100 Ohm, 1 kOhm, 2.5 kOhm, 5 kOhm, 10 kOhm)

Colour of LED
(e. g. green, red, yellow)

Printing, form of swelling arrow
(wedge-shaped or with central position, points or numerical scale)

Requested features regarding operating and/or display elements and wiring

We offer special designs on request in written form including approval drawing.

Special printing:
See last chapter "Accessories"

Sensor 3 to be used with 4-wire connection, thereby max. 3 LEDs possible.
LM235Z with calibrating pot = calibration of sensor output signal.
Satchwell switching possible with sensor 2.
Turn switches are not possible with Baldur 1!

Operating elements Baldur 2	Possible combinations	1	2	3	4	5	6	7	8	9	10
Sensor 1		●	●	●	●	●	●	●	●	●	●
Sensor 2 LM235Z with calibrating pot		●						●			
Sensor 3 with heat sink (4-wire)											
Potentiometer 1 (at bottom) with/without series resistor		●	●		●		●	●	●		●
Potentiometer 2 (at top)			●						●		
Key switch (at bottom)				●						●	
Turn switch 1 (at top) with/without series resistor					●						●
Turn switch 2 (at bottom)						●					
LED 1 (max. one LED)											
LED 2 (max. two LEDs)											
LED 3 (max. three LEDs)			●						●		
LED 4 (max. four LEDs)					●						●
LED 5 (max. five LEDs)		●		●		●		●		●	
LED 6 (max. six LEDs)							●				
Rocker switch		●	●	●	●	●	●				
Push-button 1 (max. one button)											
Push-button 2 (max. two buttons)		●	●	●		●	●				●
Push-button 3 (max. three buttons)											
Push-button 4 (max. four buttons)								●	●	●	

Sensor 3 can also be used instead of sensor 1.
LM235Z with calibrating pot = calibration of sensor output signal.
In the case cascade connections with turn switch 1, LEDs are not possible!
With the Baldur 2 housing, only one operating element is possible at each of the positions "[at bottom]" and "[at top]"!

Configuration variants of room operating units

Room temperature sensors and measuring transducers
in-wall, panel switch programme

An overview of various versions ...

with potentiometer,
rocker switch and LED



with push-buttons and LEDs



Room temperature sensor



with push-buttons and LEDs



with potentiometer



with potentiometer



with potentiometer,
push-button, and LED



with potentiometer,
push-button, and LEDs



with potentiometer,
push-buttons, and LEDs





with potentiometer,
push-buttons, and LEDs



with potentiometer,
push-button, and LED



with potentiometer and turn switch



with potentiometer,
push-buttons, and LEDs



with potentiometer,
push-button, and LED



with potentiometer,
turn switch, and LEDs



with potentiometer
and rocker switch



with potentiometer,
push-button, and LED



with potentiometer,
push-button, and LEDs

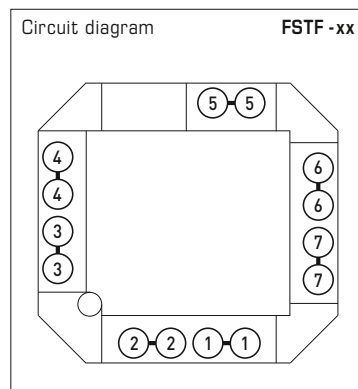


Room temperature sensors
in-wall, panel switch programme,
general

A room temperature sensor **THERMASGARD® FSTF** is used for air temperature measurement or setpoint adjustment, for presence detection or as room control and operating panel with temperature sensor, push-buttons, potentiometers, status indicators (LEDs).

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

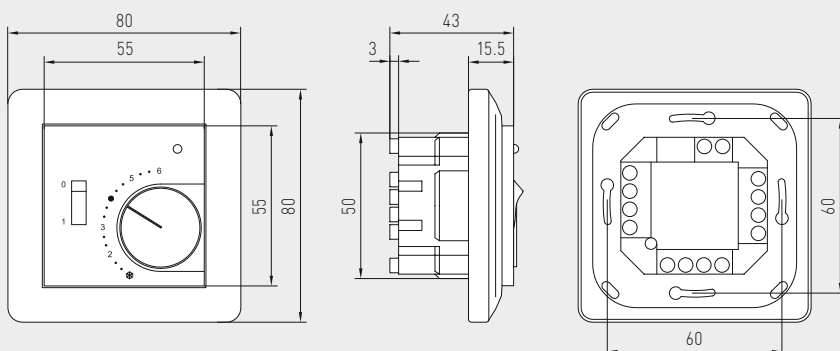


TECHNICAL DATA

Measuring ranges:	-30...+60 °C
Sensor / output:	see table, assembled on board, passive
Range suppression:	in the button
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Potentiometers:	standard 1 kΩ, max. 0.1 W (other ratings optional on request, e. g. 100 Ω, 2.5 kΩ, 5 kΩ, 10 kΩ optional 0-10V linear)
Turn switches:	max. 24 V AC / DC, max. 130 mA, max. 5 steps (0, Auto, I, II, III)
Rocker switch:	max. 24 V AC / DC, max. 130 mA
Push-buttons:	normally open contact, max. 24 V DC / 10 mA
LEDs:	max. 24 V DC (optional max. 24 V AC), standard green (red, yellow or two-colour optional)
Installation:	in in-wall flush box Ø 55 mm
Electrical connection:	via plug terminals, 0.14 - 1.5 mm ² , on safety extra-low voltage only, max. 42 V AC, 60 V DC
Humidity:	max. 90% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to EN 60 529)
SWITCH PROGRAMMES	
Manufacturer:	GIRA System 55 Standard (other switch programmes, manufacturers, and prices upon request)
Housing:	plastic, colour pure white glossy (similar to RAL 9010) (other colours are possible on request with colour variants depending on the respective switch programme)

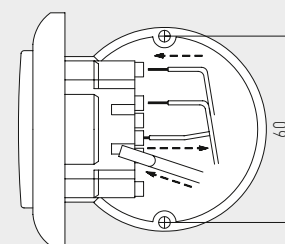
Dimensional drawing

FSTF -xx



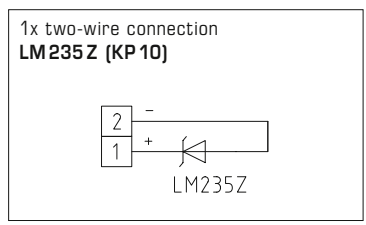
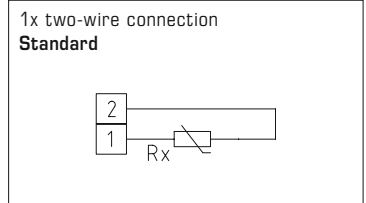
Installation scheme

FSTF -xx



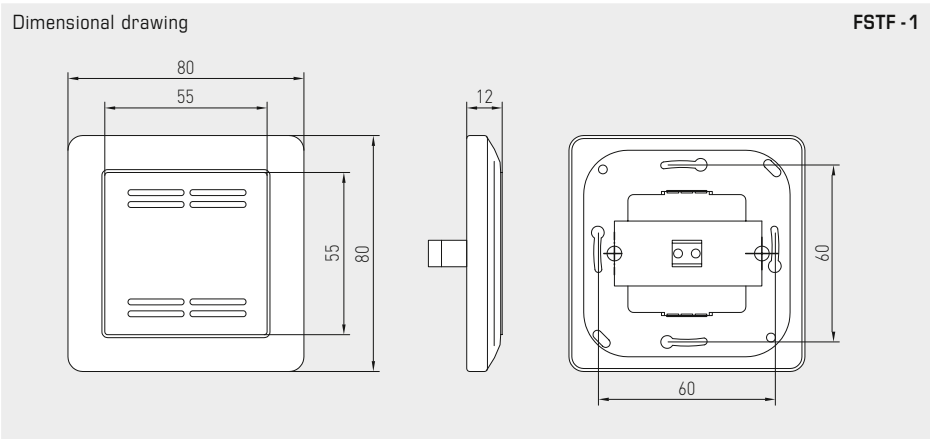


FSTF 1
Standard version
with sensor



THERMASGARD® FSTF 1 Room temperature sensors

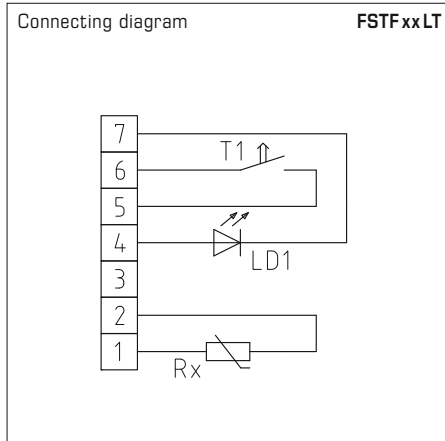
Type / WG01	Sensor / Output	Item No.	Price
FSTF1	passive	IP20 (-30...+60 °C)	
FSTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1000-162	44,79 €
FSTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5000-162	44,79 €
FSTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9000-162	46,13 €
FSTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0000-162	48,27 €
FSTF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1000-162	44,91 €
FSTF1 NTC1,8K	NTC 1.8K	1101-5021-2000-162	44,36 €
FSTF1 NTC10K	NTC 10K	1101-5021-5000-162	43,90 €
FSTF1 NTC20K	NTC 20K	1101-5021-6000-162	43,90 €



Room temperature sensors
in-wall, panel switch programme,
different versions



FSTFxxLT
Version with sensor,
LED (green), and push-button
(max. 24 V DC, max. 10 mA)

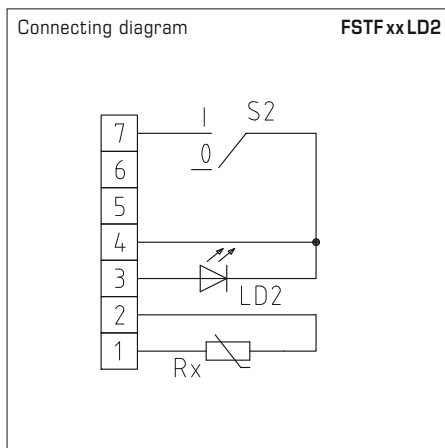


THERMASGARD® FSTFxxLT Room temperature sensors

Type/WG01	Sensor/Output	Item No.	Price
FSTFxxLT	passive	IP 20 (-30...+60 °C)	
FSTF Pt100 L T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1593-350	58,95 €
FSTF Pt1000 L T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5593-350	58,95 €
FSTF Ni1000 L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9593-350	60,62 €
FSTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0593-350	60,62 €
FSTF LM235Z L T	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1593-350	59,50 €
FSTF NTC1,8K L T	NTC 1.8K	1101-5021-2593-350	58,95 €
FSTF NTC10K L T	NTC 10K	1101-5021-5593-350	58,38 €
FSTF NTC20K L T	NTC 20K	1101-5021-6593-350	58,38 €

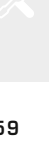
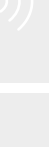
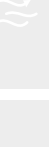
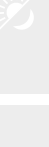
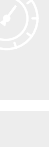
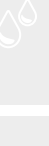


FSTFxxLD2
Version with sensor,
LED (green), and turn switch (2-step)
(max. 24 V AC/DC, max. 130 mA)

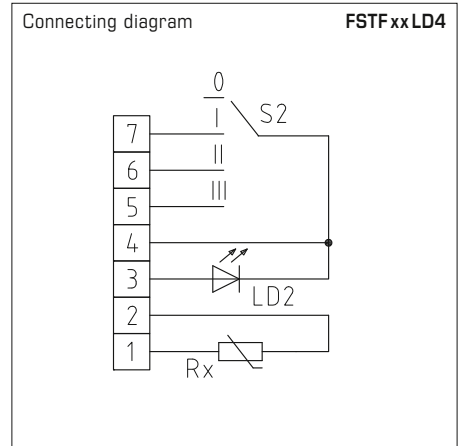


THERMASGARD® FSTFxxLD2 Room temperature sensors

Type/WG01	Sensor/Output	Item No.	Price
FSTFxxLD2	passive	IP 20 (-30...+60 °C)	
FSTF Pt100 D2 L	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1631-351	67,46 €
FSTF Pt1000 D2 L	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5631-351	67,46 €
FSTF Ni1000 D2 L	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9631-351	69,59 €
FSTF NiTK D2 L	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0631-351	69,59 €
FSTF LM235Z D2 L	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1631-351	67,92 €
FSTF NTC1,8K D2 L	NTC 1.8K	1101-5021-2631-351	67,92 €
FSTF NTC10K D2 L	NTC 10K	1101-5021-5631-351	67,36 €
FSTF NTC20K D2 L	NTC 20K	1101-5021-6631-351	67,36 €



FSTFxxLD4
Version with sensor,
LED (green) and turn switch (4-step)
(max. 24 V AC / DC, max. 130 mA)

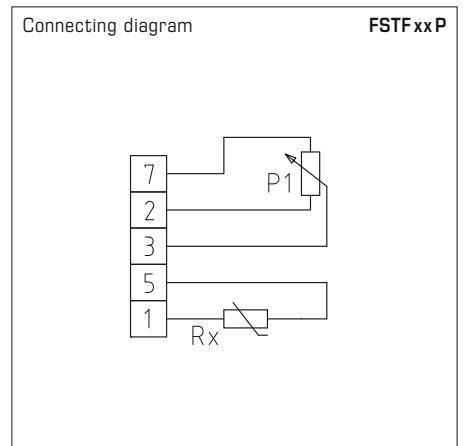


THERMASGARD® FSTFxxLD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTFxxLD4	passive	IP20 (-30...+60 °C)	
FSTF Pt100 D4 L	Pt100 (according to DIN EN 60751, class B)	1101-5020-1643-352	70,18 €
FSTF Pt1000 D4 L	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5643-352	70,18 €
FSTF Ni1000 D4 L	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9643-352	71,85 €
FSTF NiTK D4 L	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0643-352	71,85 €
FSTF LM235Z D4 L	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1643-352	70,73 €
FSTF NTC1,8K D4 L	NTC 1.8K	1101-5021-2643-352	70,18 €
FSTF NTC10K D4 L	NTC 10K	1101-5021-5643-352	69,59 €
FSTF NTC20K D4 L	NTC 20K	1101-5021-6643-352	69,59 €



FSTFxxP
Version with sensor
and potentiometer
(1 kOhm, max. 0.1 W)



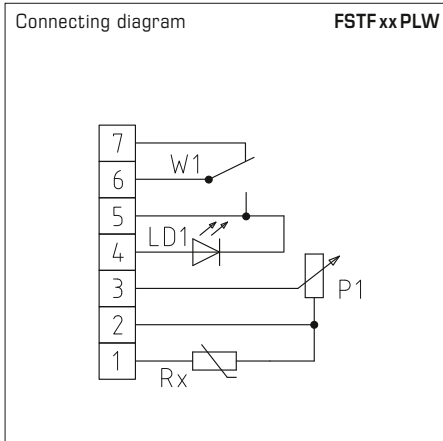
THERMASGARD® FSTFxxP Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTFxxP	passive	IP20 (-30...+60 °C)	
FSTF Pt100 P	Pt100 (according to DIN EN 60751, class B)	1101-5020-1001-282	72,41 €
FSTF Pt1000 P	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5001-162	72,41 €
FSTF Ni1000 P	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9001-162	73,09 €
FSTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0001-162	75,56 €
FSTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1001-162	69,04 €
FSTF NTC1,8K P	NTC 1.8K	1101-5021-2001-162	70,18 €
FSTF NTC10K P	NTC 10K	1101-5021-5001-162	69,04 €
FSTF NTC20K P	NTC 20K	1101-5021-6001-162	69,04 €

Room temperature sensors
in-wall, panel switch programme,
different versions



FSTFxxPLW
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
LED (green), and rocker switch
(max. 24 V AC/DC, max. 130 mA)

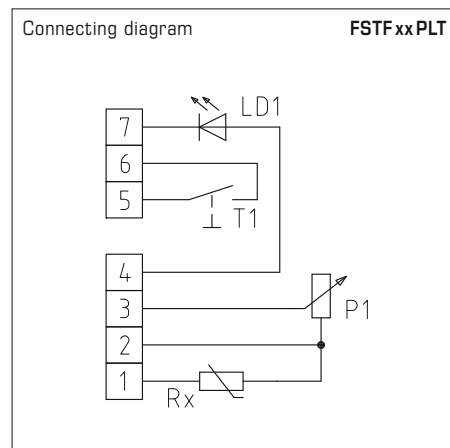


THERMASGARD® FSTF xx PLW Room temperature sensors

Type/WG01	Sensor/Output	Item No.	Price
FSTFxxPLW	passive	IP 20 (-30...+60 °C)	
FSTF Pt100 P L W	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1655-353	91,89 €
FSTF Pt1000 P L W	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5655-353	94,19 €
FSTF Ni1000 P L W	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9655-353	94,75 €
FSTF NiTK P L W	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0655-353	97,04 €
FSTF LM235Z P L W	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1655-353	92,45 €
FSTF NTC1,8K P L W	NTC 1.8K	1101-5021-2655-353	97,50 €
FSTF NTC10K P L W	NTC 10K	1101-5021-5655-353	91,89 €
FSTF NTC20K P L W	NTC 20K	1101-5021-6655-353	91,89 €



FSTFxxPLT
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
LED (green), and push-button
(max. 24 V DC, max. 10 mA)

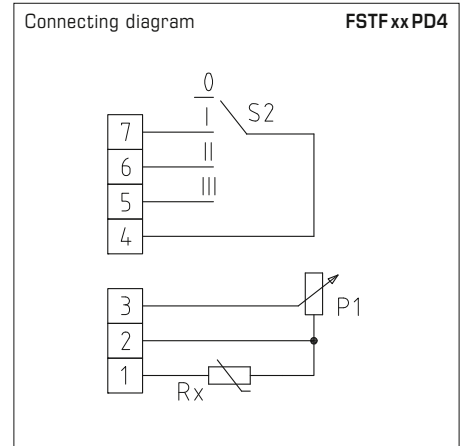


THERMASGARD® FSTF xx PLT Room temperature sensors

Type/WG01	Sensor/Output	Item No.	Price
FSTFxxPLT	passive	IP 20 (-30...+60 °C)	
FSTF Pt100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1663-162	91,83 €
FSTF Pt1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5663-162	94,14 €
FSTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9663-350	94,69 €
FSTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0663-350	96,99 €
FSTF LM235Z P L T	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1663-350	92,39 €
FSTF NTC1,8K P L T	NTC 1.8K	1101-5021-2663-350	97,44 €
FSTF NTC10K P L T	NTC 10K	1101-5021-5663-350	91,83 €
FSTF NTC20K P L T	NTC 20K	1101-5021-6663-350	91,83 €



FSTF xx PD4
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W)
and turn switch
(max. 24 V AC / DC, max. 130 mA)

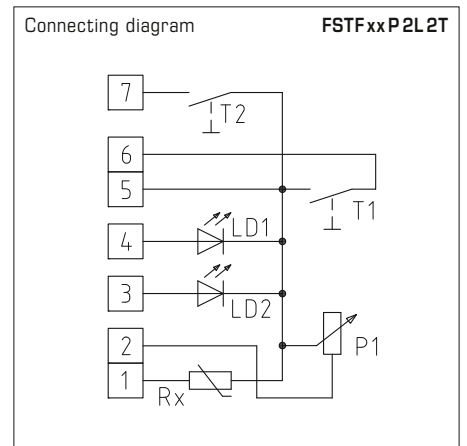


THERMASGARD® FSTF xx PD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx PD4	passive	IP20 (-30...+60 °C)	
FSTF Pt100 P D4	Pt100 (according to DIN EN 60751, class B)	1101-5020-1007-354	94,70 €
FSTF Pt1000 P D4	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5007-354	97,00 €
FSTF Ni1000 P D4	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9007-354	97,57 €
FSTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0007-354	99,88 €
FSTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1007-354	94,70 €
FSTF NTC1,8K P D4	NTC 1.8K	1101-5021-2007-354	96,41 €
FSTF NTC10K P D4	NTC 10K	1101-5021-5007-354	94,14 €
FSTF NTC20K P D4	NTC 20K	1101-5021-6007-354	94,14 €



FSTF xx P 2L 2T
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
2 LEDs (green, red), and 2 push-buttons (max.
24 V DC, max. 10 mA)

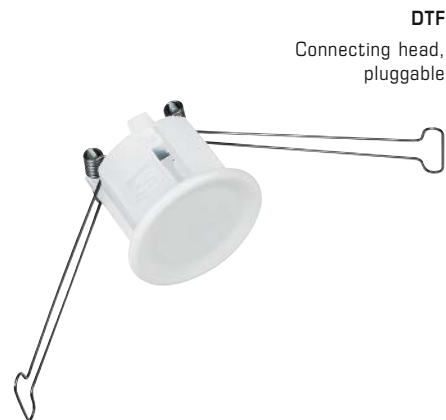


THERMASGARD® FSTF xx P 2L 2T Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx P 2L 2T	passive	IP20 (-30...+60 °C)	
FSTF Pt100 P 2L 2T	Pt100 (according to DIN EN 60751, class B)	1101-5020-1672-256	96,99 €
FSTF Pt1000 P 2L 2T	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5672-256	100,13 €
FSTF Ni1000 P 2L 2T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9672-256	103,39 €
FSTF NiTK P 2L 2T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0672-256	105,30 €
FSTF LM235Z P 2L 2T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1672-256	99,24 €
FSTF NTC1,8K P 2L 2T	NTC 1.8K	1101-5021-2672-256	102,40 €
FSTF NTC10K P 2L 2T	NTC 10K	1101-5021-5672-256	97,44 €
FSTF NTC20K P 2L 2T	NTC 20K	1101-5021-6672-256	97,44 €

**In-ceiling temperature sensors
with passive output**

THERMASGARD® DTF is a small in-ceiling resistance thermometer with passive output for in-wall installation, e.g. in plasterboard walls or suspended ceilings. The in-ceiling temperature sensor DTF is preferably installed in ceilings and walls, blends in seamlessly with the overall architectural design and detects the temperature at the surface. The connecting head is pluggable for quick, easy mounting.



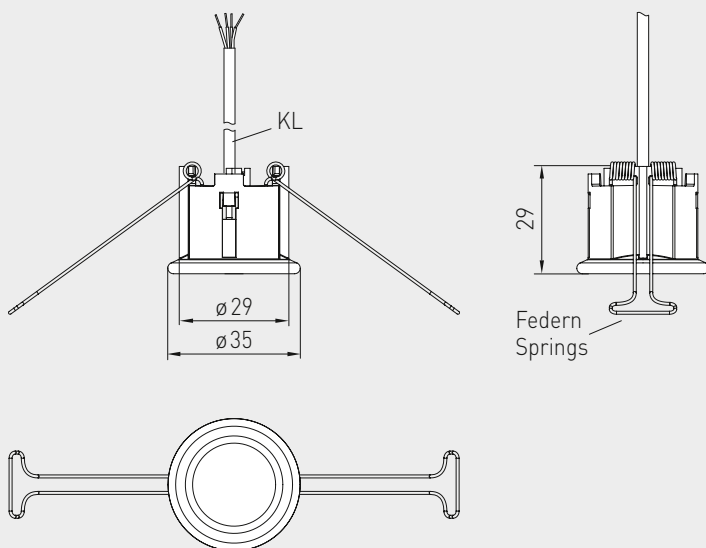
DTF
Connecting head,
pluggable

TECHNICAL DATA

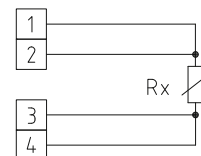
Measuring range:	-20...+90 °C
Sensors / output:	see table, passive
Connection type:	4-wire connection terminal 1 / 2: + (marked red, wire colours: yellow, brown) terminal 3 / 4: - (marked black, wire colours: white, green)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connecting head:	plastic, material polycarbonate (PC), colour white (can be painted as an option), pluggable
Connecting cable:	PVC, LiYY, 4 x 0.14 mm ² , KL = approx. 2 m
Process connection:	inside suspended ceiling, ceiling cutout Ø = 30 mm, cover Ø = < 35 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500V DC)
Humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according EN 60 529) Sensor in the built-in state

Dimensional drawing

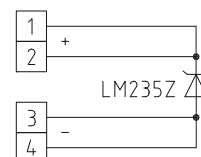
DTF



1x four-wire connection
standard

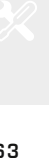
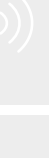
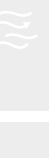
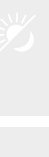


1x four-wire connection
LM235Z (KP 10)





DTF



THERMASGARD® DTF		In-ceiling temperature sensors	
Type / WG03	Sensor / Output	Item No.	Price
DTF		IP30	
DTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-60C0-1003-000	35,93 €
DTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-60C0-5003-000	35,93 €
DTF Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)	1101-60C0-9003-000	35,69 €
DTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-60C1-0003-000	39,19 €
DTF LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-60C2-1003-000	36,76 €
DTF NTC1,8K	NTC 1.8K	1101-60C1-2003-000	36,76 €
DTF NTC10K	NTC 10K	1101-60C1-5003-000	36,76 €
DTF NTC20K	NTC 20K	1101-60C1-6003-000	36,76 €
Note:	Other sensors optional	on request	

**Outside temperature sensors / wet room temperature sensors
with passive output**

Outside wall resistance thermometer / weather sensor **THERMASGARD® ATF 1** (internal sensor) with passive output, housing made of impact-resistant plastic and quick-locking screws.

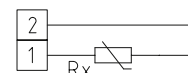
Outside wall resistance thermometer / weather sensor **THERMASGARD® ATF 01** (internal sensor) with passive output, housing made of impact-resistant plastic and snap-on lid.

It is used to measure outside temperatures, temperatures in wet room areas, e.g. as an outdoor sensor, weather sensor for installation on outside walls, in cold storage buildings and greenhouses, in halls, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In cases of direct solar irradiation, we recommend the use of our **WS01** or **WS04** sun protection hood (accessory).

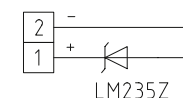
TECHNICAL DATA

Measuring range:	-50...+90 °C
Sensors / output:	passive (see table), sensors internal
Connection type:	2-wire connection (4-wire connection on PT100/PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016), ATF01 with snap-on lid, ATF1 with quick-locking screws (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	ATF01 IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) ATF1 IP 67 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

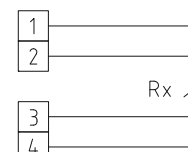
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP 10)



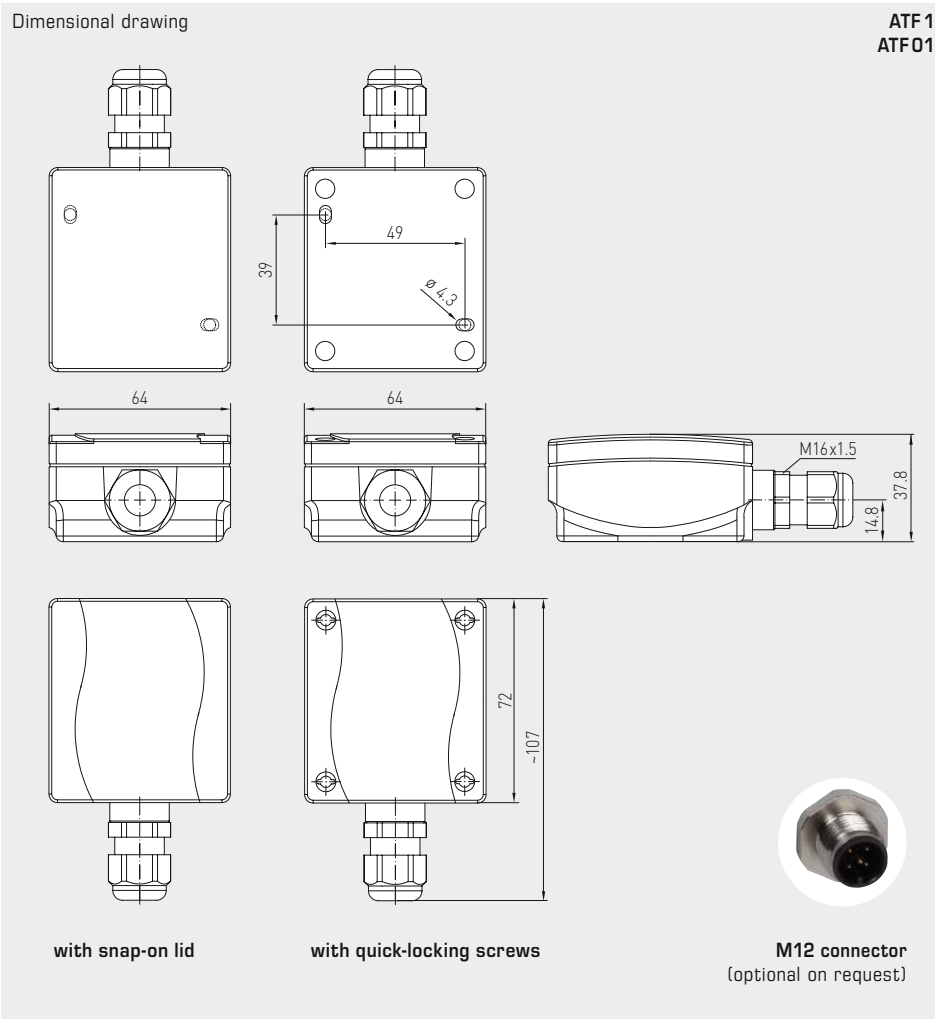
1x four-wire connection
(optional)



THERMASGARD® ATF 01 Outside temperature sensors / wet room temperature sensors, *Standard*
with snap-on lid

Type/WG03	Sensor/Output	Item No.	Price
ATF01		IP 54	
ATF01 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1030-1003-000	13,48 €
ATF01 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1030-5001-000	15,79 €
ATF01 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1030-9001-000	16,49 €
ATF01 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1031-0001-000	19,14 €
ATF01 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1032-1001-000	13,90 €
ATF01 NTC1,8K	NTC 1.8K	1101-1031-2001-000	12,81 €
ATF01 NTC10K	NTC 10K	1101-1031-5001-000	12,81 €
ATF01 NTC20K	NTC 20K	1101-1031-6001-000	12,81 €
Extra charge:	Other sensors optional Cable connection with M12 connector according to DIN EN 61076-2-101		on request on request
ACCESSORIES			
WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000	28,02 €
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000	33,06 €

For further information see last chapter!



ATF 01
with snap-on lid
(IP54)



ATF 1
with quick-locking screws
(IP67)



THERMASGARD® ATF 1 Outside temperature sensors / wet room temperature sensors, Premium with quick-locking screws

Type / WG03	Sensor / Output	Item No.	Price
ATF 1		IP67	
ATF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1040-1003-000	15,58 €
ATF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1040-5001-000	17,88 €
ATF1 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1040-6003-000	20,91 €
ATF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1040-9001-000	17,46 €
ATF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-1041-0001-000	21,23 €
ATF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1042-1001-000	15,99 €
ATF1 NTC1,8K	NTC 1.8K	1101-1041-2001-000	14,22 €
ATF1 NTC10K	NTC 10K	1101-1041-5001-000	14,22 €
ATF1 NTC20K	NTC 20K	1101-1041-6001-000	14,22 €
Extra charge::	Other sensors optional Cable connection with M12 connector according to DIN EN 61076-2-101	on request on request	
ACCESSORIES			
WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000	28,02 €
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000	33,06 €

For further information see last chapter!

**Outside temperature sensors / wet room temperature sensors
with passive output**

Outside wall resistance thermometers / weather sensors **THERMASGARD® ATF 2** (external sensor) with passive output and housing made of impact-resistant plastic and with quick-locking screws.

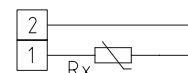
It is used to measure outside temperatures, temperatures in wet room areas, e.g. as a weather sensor, for installation on outside walls, in cold storage buildings and greenhouses, in halls, in the industrial sector and in agriculture. Outdoor installation should preferably be performed at the north side of a building or in a protected place.

In cases of direct solar irradiation, we recommend the use of our **WS01** or **WS04** sun protection hood (accessory) or the device version with installed sun protection hood **SS02** (available upon request).

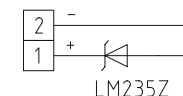
TECHNICAL DATA

Measuring range:	-50...+90 °C
Sensors / output:	passive (see table), sensor inside external sensor tube, stainless steel V4A (1.4571) (Perfect Sensor Protection)
Connection type:	2-wire connection (4-wire connection on PT100/PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Permissible humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Optional:	with sun protection hood SS02 (available on request)

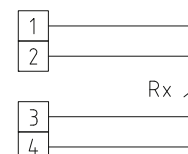
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP 10)

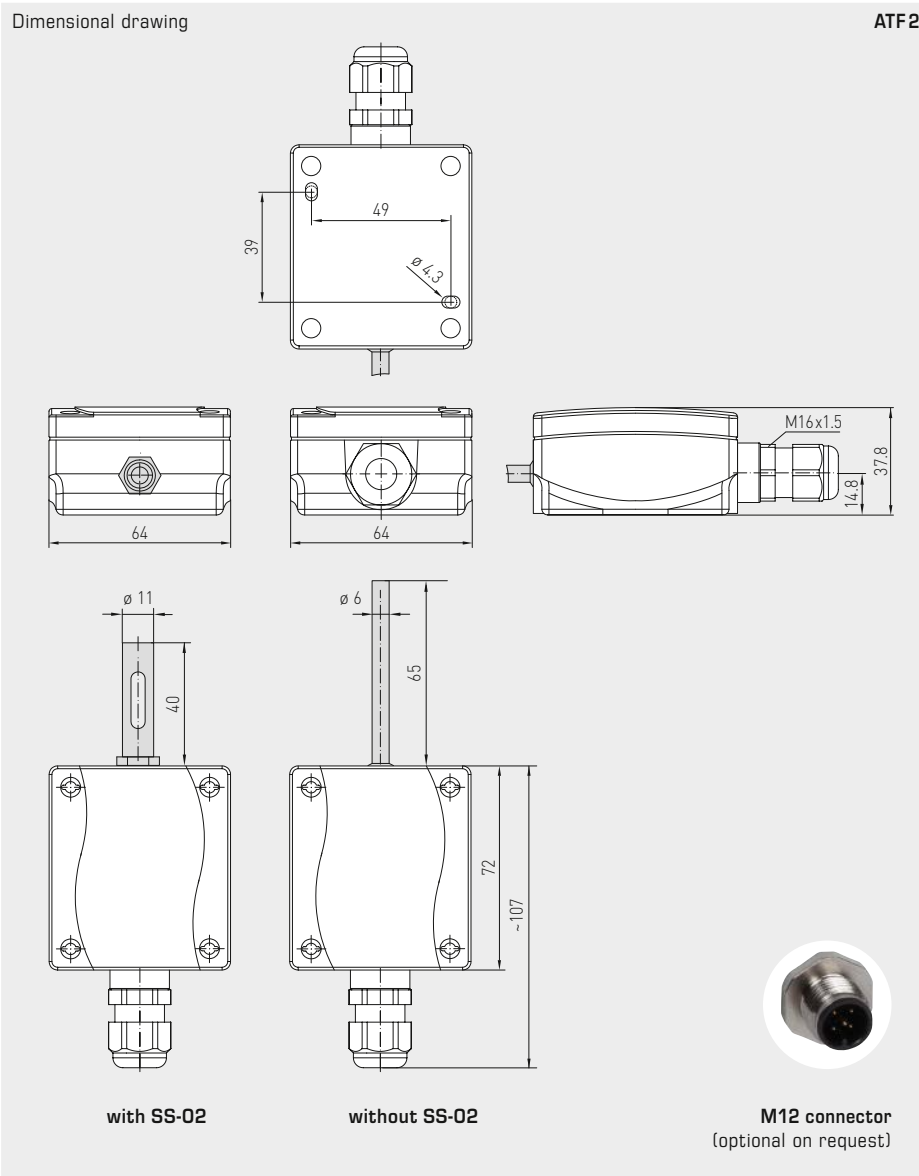


1x four-wire connection
(optional)



High-performance encapsulation against
vibration, mechanical stress and humidity





THERMASGARD® ATF 2 Outside temperature sensors / wet room temperature sensors

Type / WG03	Sensor / Output	Item No.	Price
ATF 2			
ATF2 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1050-1003-000	33,98 €
ATF2 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1050-5001-000	33,98 €
ATF2 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1050-6003-000	42,20 €
ATF2 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1050-9001-000	35,97 €
ATF2 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1051-0001-000	35,97 €
ATF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1052-1001-000	33,46 €
ATF2 NTC1,8K	NTC 1.8 K	1101-1051-2001-000	32,78 €
ATF2 NTC10K	NTC 10K	1101-1051-5001-000	32,78 €
ATF2 NTC20K	NTC 20K	1101-1051-6001-000	32,78 €
Extra charge:	Other sensors optional	on request	
	with sun protection hood SS02	on request	8,59 €
	Cable connection with M12 connector according to DIN EN 61076-2-101	on request	
ACCESSORIES			
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000	28,02 €
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000	33,06 €

For further information see last chapter!

**Immersion / screw-in / duct temperature sensors
with passive output**

Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

THERMASGARD® TF 43 is a resistance thermometer with a passive output, housing made from impact-resistant plastic with snap-on lid, and straight protective tube.

THERMASGARD® TF 65 is a resistance thermometer with a passive output, housing made from impact-resistant plastic with quick-locking screws, and straight protective tube.

These immersion / screw-in / duct temperature sensors are electric contact thermometers for temperature measurement in liquids and gases, which are installed for example in piping systems and vessels. For aggressive media, stainless steel immersion sleeves must be used.

Applications of these temperature sensors in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector.

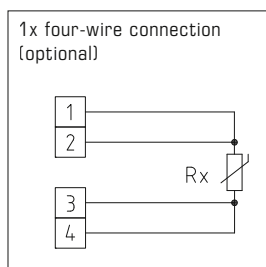
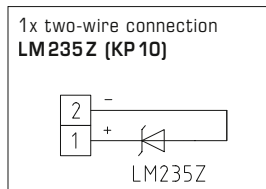
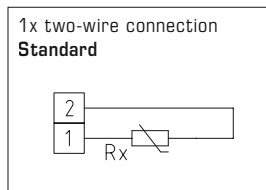
TECHNICAL DATA

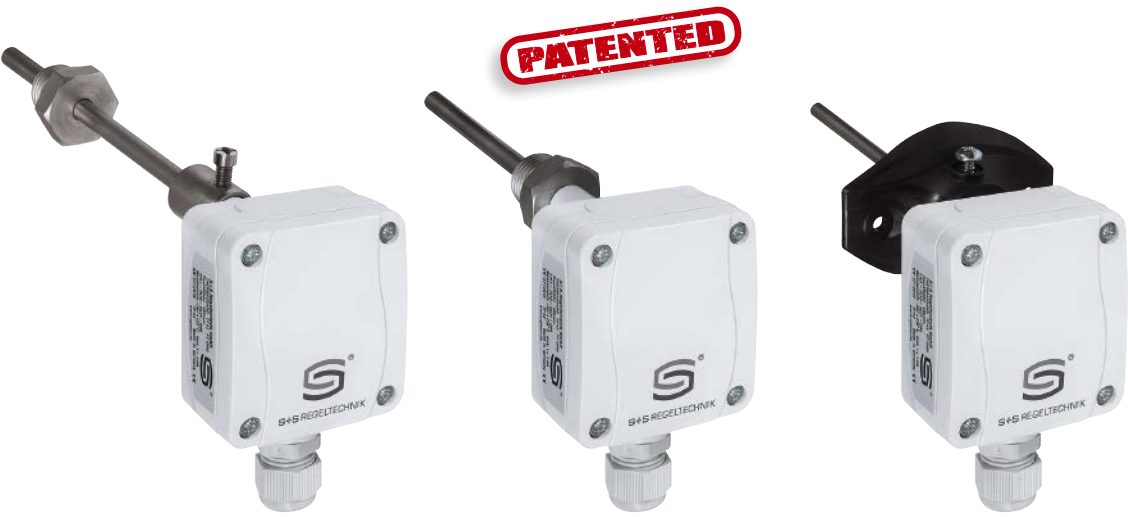
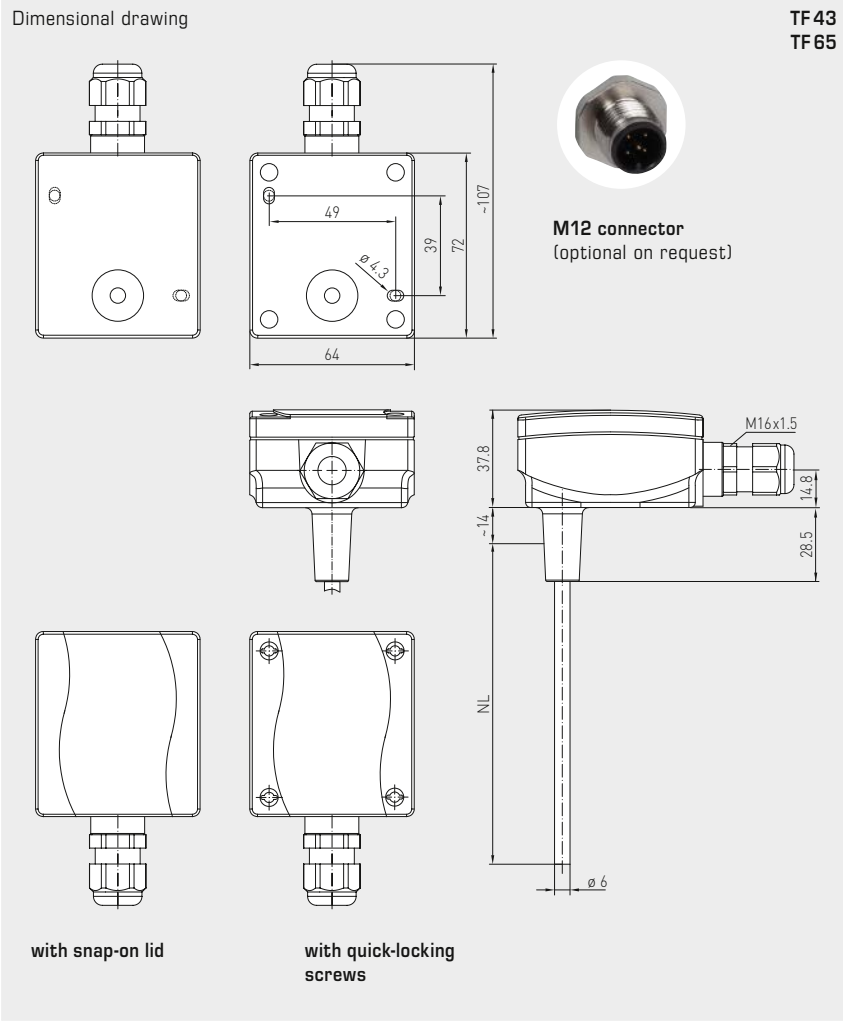
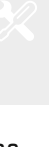
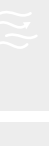
Measuring range:	-30...+150 °C (T _{max} NTC = +150 °C, T _{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (Perfect Sensor Protection) (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100/PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Ambient temperature:	-20...+100 °C
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016) TF 43 with snap-on lid TF 65 with quick-locking screws (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Protective tube:	stainless steel, V4A (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Permissible humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	TF 43 IP 54 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) TF 65 IP 67 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state

ACCESSORIES

MF-15-K	Mounting flange , plastic, 56.8 x 84.3 mm, Ø = 15.2 mm tube gland, T _{max} = +100 °C
TH08-ms/xx	Immersion sleeve , brass, nickel-plated, Ø = 8 mm, T _{max} = +150 °C, p _{max} = 10 bar
TH08-VA/xx	Immersion sleeve , stainless steel, V4A (1.4571), Ø = 8 mm, T _{max} = +600 °C, p _{max} = 40 bar
TH08-VA/xx/90	Immersion sleeve , stainless steel, V4A (1.4571), with neck tube (90 mm), Ø = 8 mm, T _{max} = +600 °C, p _{max} = 40 bar

High-performance encapsulation against
vibration, mechanical stress and humidity





THERMASGARD® TF 65 Temperature sensors (Basic device with quick-locking screws), *Premium*

Type / WG03 / EL	Sensor / Output	Item No.	Price
TF65 PT100 xx	Pt100	IP 67	
TF65 Pt100 50mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1013-000	33,35 €
TF65 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1023-000	34,71 €
TF65 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1033-000	36,07 €
TF65 Pt100 200mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1043-000	36,60 €
TF65 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1053-000	38,27 €
TF65 Pt100 300mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1063-000	39,53 €
TF65 Pt100 350mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1073-000	40,25 €
TF65 Pt100 400mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1083-000	41,20 €
TF65 PT1000 xx	Pt1000	IP 67	
TF65 Pt1000 50mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5011-000	35,65 €
TF65 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5021-000	37,02 €
TF65 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5031-000	38,37 €
TF65 Pt1000 200mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5041-000	38,89 €
TF65 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5051-000	40,57 €
TF65 Pt1000 300mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5061-000	41,82 €
TF65 Pt1000 350mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5071-000	42,34 €
TF65 Pt1000 400mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5081-000	43,07 €
TF65 PT1000A xx	Pt1000A	IP 67	
TF65 Pt1000A 50mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6013-000	37,36 €
TF65 Pt1000A 100mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6023-000	37,96 €
TF65 Pt1000A 150mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6033-000	39,94 €
TF65 Pt1000A 200mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6043-000	40,46 €
TF65 Pt1000A 250mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6053-000	42,14 €
TF65 Pt1000A 300mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6063-000	43,49 €
TF65 Pt1000A 350mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6073-000	44,85 €
TF65 Pt1000A 400mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6083-000	45,06 €
TF65 Ni1000 xx	Ni1000	IP 67	
TF65 Ni1000 50mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7020-9011-000	35,03 €
TF65 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7020-9021-000	36,70 €
TF65 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7020-9031-000	38,06 €
TF65 Ni1000 200mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7020-9041-000	38,58 €
TF65 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7020-9051-000	40,25 €
TF65 Ni1000 300mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7020-9061-000	41,50 €
TF65 Ni1000 350mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7020-9071-000	42,34 €
TF65 Ni1000 400mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7020-9081-000	42,87 €
TF65 NI1000TK xx	Ni1000 TK5000	IP 67	
TF65 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7021-0011-000	35,03 €
TF65 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7021-0021-000	36,70 €
TF65 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7021-0031-000	38,06 €
TF65 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7021-0041-000	38,58 €
TF65 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7021-0051-000	40,25 €
TF65 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7021-0061-000	41,50 €
TF65 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7021-0071-000	42,34 €
TF65 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7021-0081-000	39,14 €

Continued on next page...

High-performance encapsulation against
vibration, mechanical stress and humidity





THERMASGARD® TF 65 Temperature sensors (Basic device with quick-locking screws), <i>Premium</i>			
Type/WG03/EL	Sensor/Output	Item No.	Price
TF65 LM235Z xx	LM235Z	IP67	
TF65 LM235Z 50mm	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-7022-1011-000	33,87 €
TF65 LM235Z 100mm	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-7022-1021-000	35,13 €
TF65 LM235Z 150mm	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-7022-1031-000	36,49 €
TF65 LM235Z 200mm	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-7022-1041-000	37,02 €
TF65 LM235Z 250mm	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-7022-1051-000	38,79 €
TF65 LM235Z 300mm	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-7022-1061-000	40,05 €
TF65 LM235Z 350mm	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-7022-1071-000	40,78 €
TF65 LM235Z 400mm	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-7022-1081-000	41,30 €
TF65 NTC 1.8K xx	NTC 1.8K	IP67	
TF65 NTC1,8K 50mm	NTC 1.8K	1101-7021-2011-000	32,00 €
TF65 NTC1,8K 100mm	NTC 1.8K	1101-7021-2021-000	33,35 €
TF65 NTC1,8K 150mm	NTC 1.8K	1101-7021-2031-000	34,71 €
TF65 NTC1,8K 200mm	NTC 1.8K	1101-7021-2041-000	35,13 €
TF65 NTC1,8K 250mm	NTC 1.8K	1101-7021-2051-000	36,90 €
TF65 NTC1,8K 300mm	NTC 1.8K	1101-7021-2061-000	38,16 €
TF65 NTC1,8K 350mm	NTC 1.8K	1101-7021-2071-000	38,84 €
TF65 NTC1,8K 400mm	NTC 1.8K	1101-7021-2081-000	39,73 €
TF65 NTC10K xx	NTC 10K	IP67	
TF65 NTC10K 50mm	NTC 10K	1101-7021-5011-000	32,00 €
TF65 NTC10K 100mm	NTC 10K	1101-7021-5021-000	33,35 €
TF65 NTC10K 150mm	NTC 10K	1101-7021-5031-000	34,71 €
TF65 NTC10K 200mm	NTC 10K	1101-7021-5041-000	35,13 €
TF65 NTC10K 250mm	NTC 10K	1101-7021-5051-000	36,90 €
TF65 NTC10K 300mm	NTC 10K	1101-7021-5061-000	38,16 €
TF65 NTC10K 350mm	NTC 10K	1101-7021-5071-000	38,84 €
TF65 NTC10K 400mm	NTC 10K	1101-7021-5081-000	39,73 €
TF65 NTC20K xx	NTC 20K	IP67	
TF65 NTC20K 50mm	NTC 20K	1101-7021-6011-000	32,00 €
TF65 NTC20K 100mm	NTC 20K	1101-7021-6021-000	33,35 €
TF65 NTC20K 150mm	NTC 20K	1101-7021-6031-000	34,71 €
TF65 NTC20K 200mm	NTC 20K	1101-7021-6041-000	35,13 €
TF65 NTC20K 250mm	NTC 20K	1101-7021-6051-000	36,80 €
TF65 NTC20K 300mm	NTC 20K	1101-7021-6061-000	38,16 €
TF65 NTC20K 350mm	NTC 20K	1101-7021-6071-000	38,84 €
TF65 NTC20K 400mm	NTC 20K	1101-7021-6081-000	39,73 €
Note:	Other sensors optional	on request	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101	on request	



THERMASGARD® TF 43 Temperature sensors (Basic device with snap-on lid), *Standard*

Type / WG03 / EL	Sensor / Output	Item No.	Price
TF43 PT100 xx	Pt100	IP 54	
TF43 Pt100 50mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1013-000	24,93 €
TF43 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1023-000	25,04 €
TF43 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1033-000	25,83 €
TF43 Pt100 200mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1043-000	26,56 €
TF43 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1053-000	27,91 €
TF43 Pt100 300mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1063-000	30,20 €
TF43 Pt100 350mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1073-000	31,13 €
TF43 Pt100 400mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1083-000	32,12 €
TF43 PT1000 xx	Pt1000	IP 54	
TF43 Pt1000 50mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5011-000	24,93 €
TF43 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5021-000	25,04 €
TF43 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5031-000	25,83 €
TF43 Pt1000 200mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5041-000	26,56 €
TF43 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5051-000	27,91 €
TF43 Pt1000 300mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5061-000	30,20 €
TF43 Pt1000 350mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5071-000	31,13 €
TF43 Pt1000 400mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5081-000	32,12 €
TF43 PT1000A xx	Pt1000A	IP 54	
TF43 Pt1000A 50mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7010-6013-000	26,49 €
TF43 Pt1000A 100mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7010-6023-000	26,61 €
TF43 Pt1000A 150mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7010-6033-000	27,40 €
TF43 Pt1000A 200mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7010-6043-000	28,12 €
TF43 Pt1000A 250mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7010-6053-000	29,47 €
TF43 Pt1000A 300mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7010-6063-000	31,77 €
TF43 Pt1000A 350mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7010-6073-000	32,70 €
TF43 Pt1000A 400mm	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7010-6083-000	33,69 €
TF43 Ni1000 xx	Ni 1000	IP 54	
TF43 Ni1000 50mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7010-9011-000	25,55 €
TF43 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7010-9021-000	27,96 €
TF43 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7010-9031-000	28,17 €
TF43 Ni1000 200mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7010-9041-000	28,79 €
TF43 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7010-9051-000	29,59 €
TF43 Ni1000 300mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7010-9061-000	31,55 €
TF43 Ni1000 350mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7010-9071-000	32,44 €
TF43 Ni1000 400mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-7010-9081-000	33,90 €
TF43 Ni1000TK xx	Ni1000 TK5000	IP 54	
TF43 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7011-0011-000	25,59 €
TF43 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7011-0021-000	28,02 €
TF43 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7011-0031-000	28,31 €
TF43 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7011-0041-000	28,91 €
TF43 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7011-0051-000	29,69 €
TF43 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7011-0061-000	31,67 €
TF43 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7011-0071-000	32,66 €
TF43 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-7011-0081-000	34,02 €

Continued on next page...

High-performance encapsulation against
vibration, mechanical stress and humidity



THERMASGARD® TF 43 Temperature sensors (Basic device with snap-on lid), <i>Standard</i>			
Type/WG03/EL	Sensor/Output	Item No.	Price
TF43 LM235Z xx	LM235Z	IP54	
TF43 LM235Z 50mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1011-000	26,05 €
TF43 LM235Z 100mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1021-000	26,33 €
TF43 LM235Z 150mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1031-000	27,29 €
TF43 LM235Z 200mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1041-000	27,91 €
TF43 LM235Z 250mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1051-000	28,23 €
TF43 LM235Z 300mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1061-000	30,65 €
TF43 LM235Z 350mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1071-000	31,02 €
TF43 LM235Z 400mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1081-000	32,96 €
TF43 NTC 1.8K xx	NTC 1.8K	IP54	
TF43 NTC1,8K 50mm	NTC 1.8K	1101-7011-2011-000	24,93 €
TF43 NTC1,8K 100mm	NTC 1.8K	1101-7011-2021-000	26,28 €
TF43 NTC1,8K 150mm	NTC 1.8K	1101-7011-2031-000	26,94 €
TF43 NTC1,8K 200mm	NTC 1.8K	1101-7011-2041-000	27,57 €
TF43 NTC1,8K 250mm	NTC 1.8K	1101-7011-2051-000	28,91 €
TF43 NTC1,8K 300mm	NTC 1.8K	1101-7011-2061-000	29,86 €
TF43 NTC1,8K 350mm	NTC 1.8K	1101-7011-2071-000	30,87 €
TF43 NTC1,8K 400mm	NTC 1.8K	1101-7011-2081-000	31,67 €
TF43 NTC10K xx	NTC 10K	IP54	
TF43 NTC10K 50mm	NTC 10K	1101-7011-5011-000	24,93 €
TF43 NTC10K 100mm	NTC 10K	1101-7011-5021-000	26,28 €
TF43 NTC10K 150mm	NTC 10K	1101-7011-5031-000	26,94 €
TF43 NTC10K 200mm	NTC 10K	1101-7011-5041-000	27,57 €
TF43 NTC10K 250mm	NTC 10K	1101-7011-5051-000	28,91 €
TF43 NTC10K 300mm	NTC 10K	1101-7011-5061-000	29,86 €
TF43 NTC10K 350mm	NTC 10K	1101-7011-5071-000	30,87 €
TF43 NTC10K 400mm	NTC 10K	1101-7011-5081-000	31,67 €
TF43 NTC20K xx	NTC 20K	IP54	
TF43 NTC20K 50mm	NTC 20K	1101-7011-6011-000	24,93 €
TF43 NTC20K 100mm	NTC 20K	1101-7011-6021-000	26,28 €
TF43 NTC20K 150mm	NTC 20K	1101-7011-6031-000	26,94 €
TF43 NTC20K 200mm	NTC 20K	1101-7011-6041-000	27,57 €
TF43 NTC20K 250mm	NTC 20K	1101-7011-6051-000	28,91 €
TF43 NTC20K 300mm	NTC 20K	1101-7011-6061-000	29,86 €
TF43 NTC20K 350mm	NTC 20K	1101-7011-6071-000	30,87 €
TF43 NTC20K 400mm	NTC 20K	1101-7011-6081-000	31,67 €
Note	Other sensors optional	on request	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101	on request	

TF43
with snap-on lid
(IP54)



Immersion / screw-in / duct temperature sensors
 with passive output

One basic device in four variants...



PATENTED

TFxx + TH08 -ms /xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated

TFxx + TH08 -VA /xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A

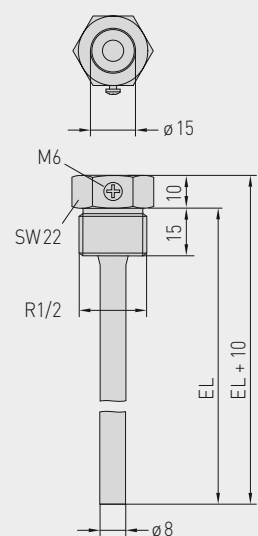
TFxx + TH08 -VA /xx /90

Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A

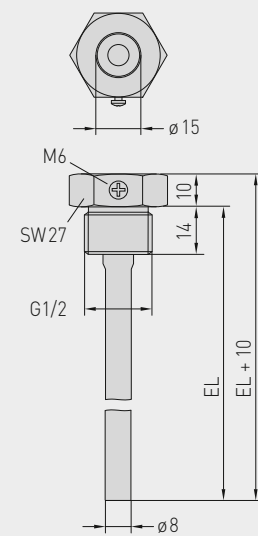
TFxx + MF-15-K

Duct temperature sensor with mounting flange, plastic

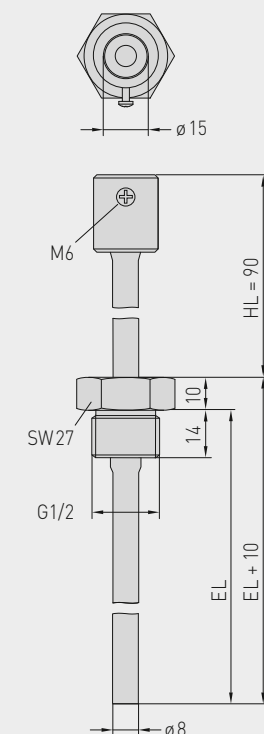
Dimensional drawing TH08 -ms /xx



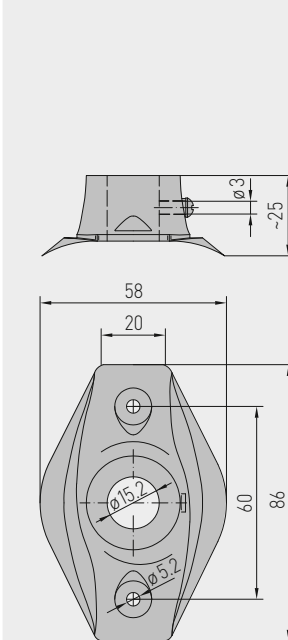
Dimensional drawing TH08 -VA /xx



Dimensional drawing TH08 -VA /xx /90



Dimensional drawing MF-15-K



...through combination with accessories:



TH08-ms/xx
Immersion sleeve,
brass, nickel-plated,
thread-sealing, conical,
according to DIN 10226



TH08-VA/xx
Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH08-VA/xx/90
Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF-15-K
Mounting flange,
plastic

THERMASGARD® TH08 Immersion sleeve Ø 8 mm (Accessories)					
Type / WG01B	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.	Price
TH08-ms/xx Brass, nickel-plated					
without neck tube					
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	8,21 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	9,35 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	9,88 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	10,19 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	11,81 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	12,13 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	12,23 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	12,34 €
TH08-VA/xx Stainless steel, V4A (1.4571)					
without neck tube					
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	17,88 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	19,76 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	21,23 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	22,38 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	27,82 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	29,07 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	29,27 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	29,79 €
TH08-VA/xx/90 Stainless steel, V4A (1.4571)					
with neck tube (90 mm)					
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	25,61 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	26,76 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	28,07 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	29,27 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	30,68 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	33,25 €
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				

Mounting flange (Accessories)				
Type / WG01B		T _{max}	Item No.	Price
MF				
MF-15-K	Mounting flange, plastic, 56.8x84.3 mm, Ø 15.2 mm tube gland	+100 °C	7100-0032-0000-000	5,40 €
Note:	For further information see last chapter!			

Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

THERMASGARD® TF 43-F is a resistance thermometer with a passive output, housing made from impact-resistant plastic with snap-on lid, with sensor sleeve and flexible cable length.

THERMASGARD® TF 65-F is a resistance thermometer with a passive output, housing made from impact-resistant plastic with quick-locking screws, with sensor sleeve and flexible cable length.

These built-in temperature sensors / immersion temperature sensors are electric contact thermometers for temperature measurement in liquids and gases, which are installed for example in piping systems and vessels. For aggressive media, stainless steel immersion sleeves must be used. Applications of these temperature sensors in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector.

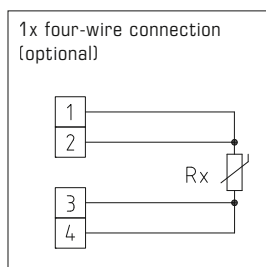
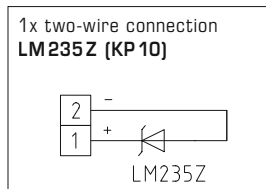
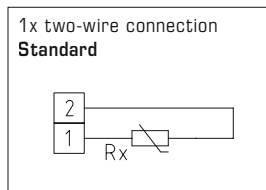
TECHNICAL DATA

Measuring range:	-50...+180 °C
Sensors / output:	see table, passive (Perfect Sensor Protection) (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 0.3 mA (Ni1000)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Ambient temperature:	-20...+100 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016) TF 43-F with snap-on lid TF 65-F with quick-locking screws (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Connecting cable:	silicone, SiHF, 2 x 0.25 mm ² , cable length (KL) = flexible, inserted length (EL) > 50 mm
Sensor sleeve:	stainless steel V4A (1.4571), Ø = 6 mm, nominal length = 50 mm
Permissible humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	TF 43-F IP54 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) TF 65-F IP65 (according to EN 60 529)* * Housing in the built-in state
Protection type sensor:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional)

ACCESSORIES

TH08-ms/xx	Immersion sleeve , brass, nickel-plated, Ø = 8 mm, T _{max} = +150 °C, p _{max} = 10 bar
TH08-VA/xx	Immersion sleeve , stainless steel, V4A (1.4571), Ø = 8 mm, T _{max} = +600 °C, p _{max} = 40 bar
TH08-VA/xx/90	Immersion sleeve , stainless steel, V4A (1.4571), with neck tube (90 mm), Ø = 8 mm, T _{max} = +600 °C, p _{max} = 40 bar

High-performance encapsulation against vibration, mechanical stress and humidity



IP65 (standard)
humidity-tight



IP68 (optional)
water-tight
Perfect Sensor Protection

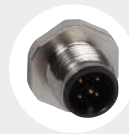
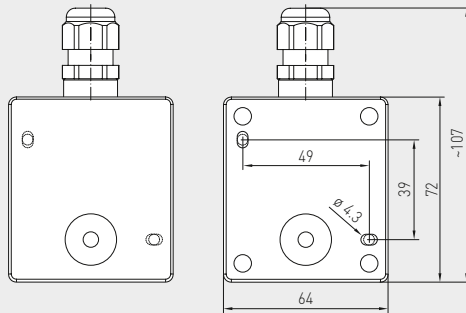


S+S REGELTECHNIK

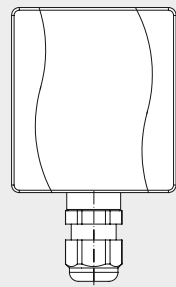
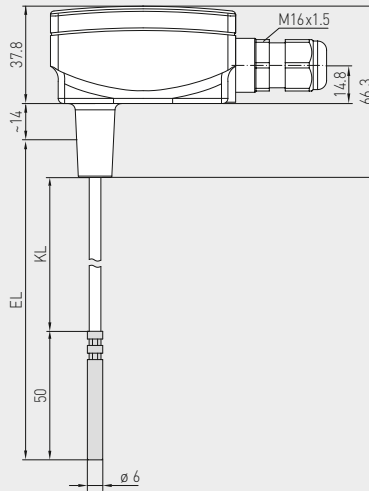
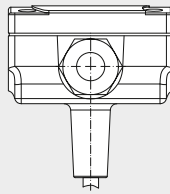
THERMASGARD® TF 43-F
THERMASGARD® TF 65-F

Flexible sleeve / cable temperature sensors,
immersion / screw-in temperature sensors,
with passive output

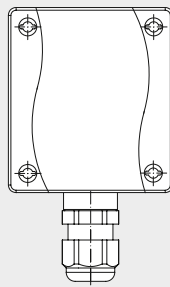
Dimensional drawing



M12 connector
(optional on request)



with snap-on lid



with quick-locking
screws

TF43-F
TF65-F



TF43-F
with snap-on lid
(IP54)



TF65-F
with quick-locking screws
(IP65)

THERMASGARD® TF 43 F Flexible cable temperature sensor (basic unit with snap-on lid), *Standard*

Type / WG01 / EL	Sensor / Output	Sensor / Output	Price
TF43-F xx		IP54	
TF43-F Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-3080-5051-000	38,16 €
TF43-F Pt1000 450mm	Pt1000 (according to DIN EN 60 751, class B)	1101-3080-5091-000	39,21 €
TF43-F Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-3080-9051-000	40,57 €
TF43-F Ni1000 450mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-3080-9091-000	41,62 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101	on request	
Note:	flexible cable length (EL > 50 mm)		

THERMASGARD® TF 65-F Flexible cable temperature sensor (basic unit with quick-locking screws), *Premium*

Type / WG01 / EL	Sensor / Output	Sensor / Output	Price
TF65-F xx		IP65	
TF65-F Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-3060-5051-000	44,10 €
TF65-F Pt1000 450mm	Pt1000 (according to DIN EN 60 751, class B)	1101-3060-5091-000	45,16 €
TF65-F Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-3060-9051-000	46,51 €
TF65-F Ni1000 450mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-3060-9091-000	47,56 €
Extra charge:	Other sensors and cable lengths optional	on request	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101	on request	
Note:	flexible cable length (EL > 50 mm)		

Flexible sleeve / cable temperature sensors,
 immersion / screw-in temperature sensors,
 with passive output

A basic unit with flexible cable length in three variants...



TFxx-F + TH08-ms/xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated

TFxx-F + TH08-VA/xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A

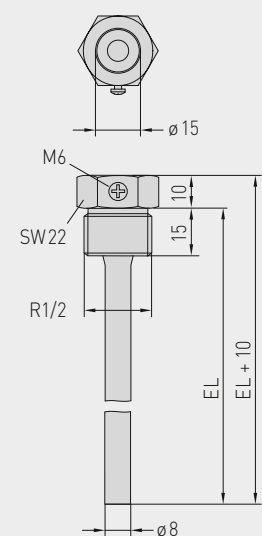
TFxx-F + TH08-VA/xx/90

Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A

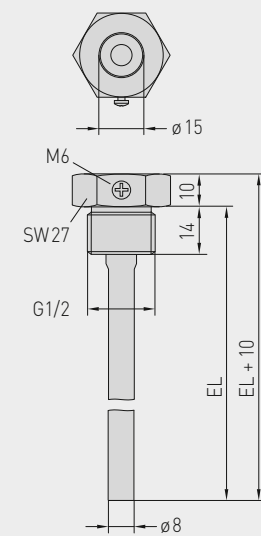
TFxx-F Basic unit

Flexible cable length through cable entry in the housing

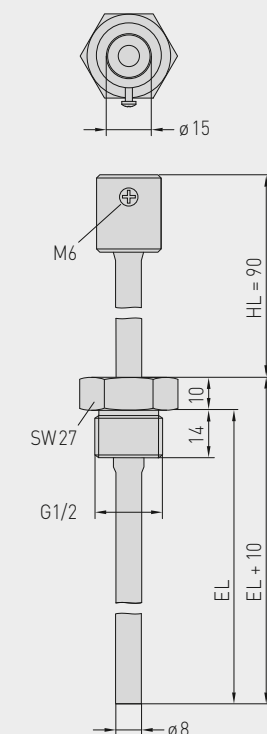
Dimensional drawing TH08-ms/xx



Dimensional drawing TH08-VA/xx



Dimensional drawing TH08-VA/xx/90





...through combination with accessories:



TH08-ms/xx

Immersion sleeve,
brass, nickel-plated,
thread-sealing, conical,
according to DIN 10226



TH08-VA/xx

Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH08-VA/xx/90

Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228

THERMASGARD® TH08 Immersion sleeve Ø 8 mm (Accessories)					
Type / WG01B	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.	Price
TH08-ms/xx	Brass, nickel-plated			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	8,21 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	9,35 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	9,88 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	10,19 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	11,81 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	12,13 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	12,23 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	12,34 €
TH08-VA/xx	Stainless steel, V4A (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	17,88 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	19,76 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	21,23 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	22,38 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	27,82 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	29,07 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	29,27 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	29,79 €
TH08-VA/xx/90	Stainless steel, V4A (1.4571)			with neck tube (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	25,61 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	26,76 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	28,07 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	29,27 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	30,68 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	33,25 €
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				

Mean value / rod / duct temperature sensor including mounting flange, with passive output

Mean-value temperature sensor **THERMASGARD® MWTF** (rod sensor 0.4...20 m) with passive output, in an impact-resistant plastic housing with quick-locking screws, with bendable sensor rod (fully active), protective tube made from copper, plastic-coated, and anti-kink spring, incl. mounting flange.

Mean-value temperature sensor **THERMASGARD® MWTF-SD** (rod sensor 3 m / 6 m) with passive output, in an impact-resistant plastic housing with snap-on lid, with bendable sensor rod (fully active), protective tube made from reinforced thermoplastic hose and anti-kink spring, incl. mounting flange.

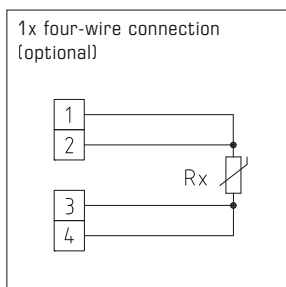
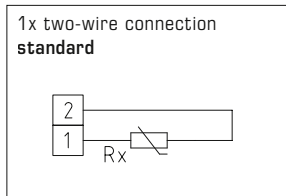
The sensor is used to detect the mean temperature (mean value) in gaseous media, e.g. in ventilation and air conditioning ducts over the entire cross section or over a defined length. Laid along a meandering route, it uniformly detects the surrounding temperature, as a duct temperature sensor. For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available.

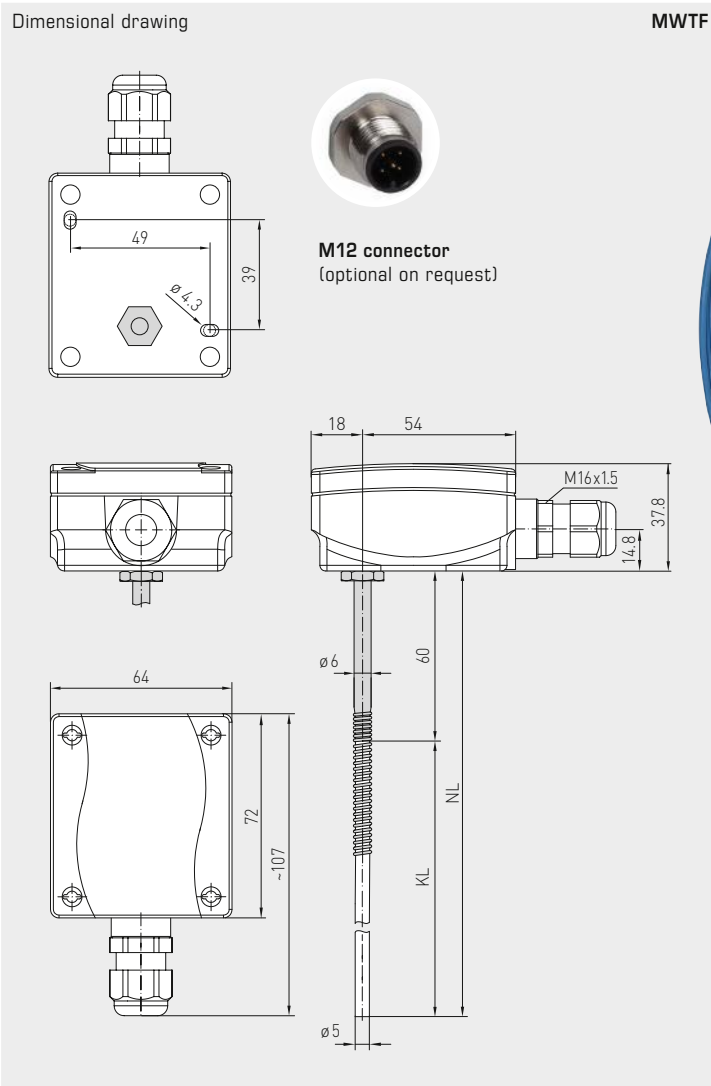
MWTF
 Rod length 0,4 m
 (IP 65)



TECHNICAL DATA

Measuring range:	-30...+80 °C
Sensors / output:	see table, passive
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000)
Sensor:	active over the entire length (averaging)
Rod material:	protective tube made from copper, plastic-coated, (MWTF) (made from reinforced thermoplastic hose on the MWTF-SD , with anti-kink spring and sleeve, stainless steel, V4A (1.4571))
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m, see table (nominal length optionally up to max. 20 m)
Rod laying:	Observe the admissible values! Bending radius: > 35 mm Vibration load: ≤ 0.5 g Tensile load: < 480 N for the MWTF < 100 N for the MWTF-SD
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Process connection:	by mounting flange, plastic, (galvanised steel optional, see accessories) and mounting clamps MK-05-M
Ambient temperature:	-20...+80 °C
Humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) for the MWTF-SD IP 65 (according to EN 60 529) for the MWTF Housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
ACCESSORIES	see table





MWTF
Rod length 3 m / 6 m
(IP65)

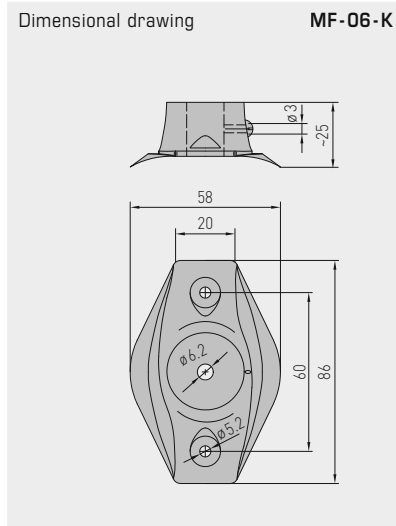
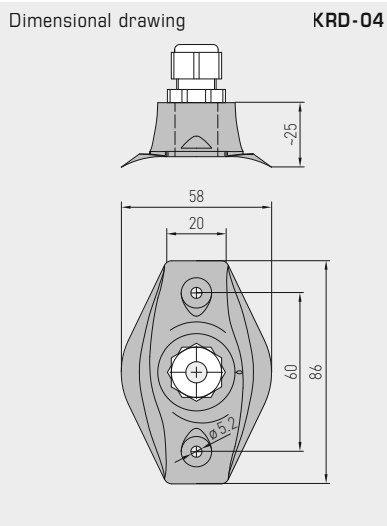


MWTF-SD
Rod length 3 m / 6 m
(IP54)



Mean value / rod / duct temperature sensor
 including mounting flange, with passive output

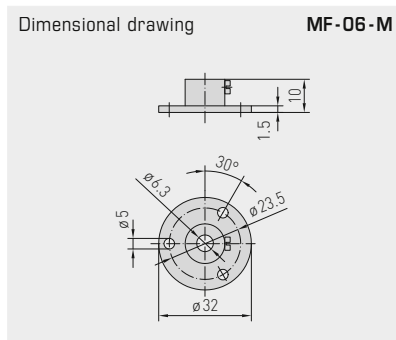
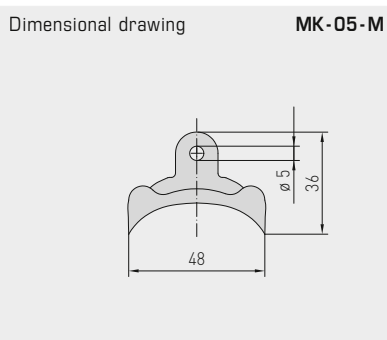
MWTF
 Rod length 0,4 m
 (IP 65)



MF-06-K
 Mounting flange,
 plastic
 (Included in the
 scope of delivery)



KRD-04
 Capillary tube
 bushing, plastic
 (optional)



MF-06-M
 Mounting flange,
 metal
 (optional)



MK-05-M
 Mounting clamps,
 galvanised steel
 (from 3 m rod length,
 included in the scope
 of delivery)





THERMASGARD® MWTF-SD		Mean-value temperature sensor with rod made from reinforced thermoplastic hose, <i>Standard</i>		
Type / WG03B	Sensor / Output	Rod length	Item No.	Price
MWTF-SD	Pt1000		IP54	
MWTF-SD Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	3.0 m	1101-3050-5231-200	83,44 €
MWTF-SD Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	6.0 m	1101-3050-5261-200	92,84 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request	

THERMASGARD® MWTF		Mean-value temperature sensor with rod made from copper, plastic-coated, <i>Premium</i>		
Type / WG03	Sensor / Output	Rod length	Item No.	Price
MWTF	Pt100		IP65	
MWTF Pt100 0,4m	Pt100 (according to DIN EN 60 751, class B)	0.4 m	1101-3050-1083-000	72,98 €
MWTF Pt100 3m	Pt100 (according to DIN EN 60 751, class B)	3.0 m	1101-3050-1233-000	127,97 €
MWTF Pt100 6m	Pt100 (according to DIN EN 60 751, class B)	6.0 m	1101-3050-1263-000	171,77 €
MWTF	Pt1000		IP65	
MWTF Pt1000 0,4m	Pt1000 (according to DIN EN 60 751, class B)	0.4 m	1101-3050-5081-000	72,98 €
MWTF Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	3.0 m	1101-3050-5231-000	127,97 €
MWTF Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	6.0 m	1101-3050-5261-000	171,77 €
MWTF	Ni1000		IP65	
MWTF Ni1000 0,4m	Ni1000 (according to DIN EN 43 760, class B)	0.4 m	1101-3050-9081-000	72,98 €
MWTF Ni1000 3m	Ni1000 (according to DIN EN 43 760, class B)	3.0 m	1101-3050-9231-000	134,16 €
MWTF Ni1000 6m	Ni1000 (according to DIN EN 43 760, class B)	6.0 m	1101-3050-9261-000	171,77 €
Extra charge:	Per meter sensor cable (from 6 m to max. 20 m)		on request	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request	

ACCESSORIES			
MF-06-K	Mounting flange, plastic (included in the scope of delivery)	7100-0030-1000-000	5,40 €
MF-06-M	Mounting flange, metal, galvanised steel, Ø = 35 mm	7100-0030-5000-000	8,43 €
KRD-04	Capillary tube gland bracket, plastic	7100-0030-7000-000	7,86 €
MK-05-M	Mounting clamps, galvanised steel (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000	8,71 €

For further information see last chapter!

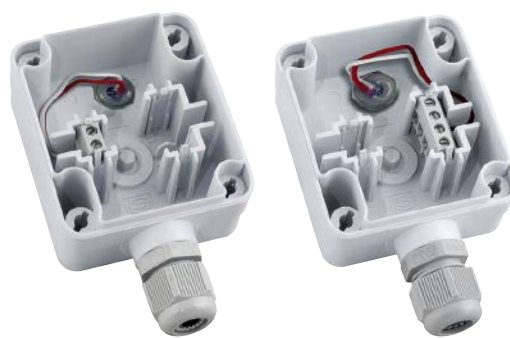
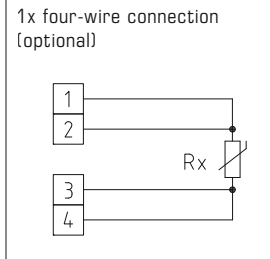
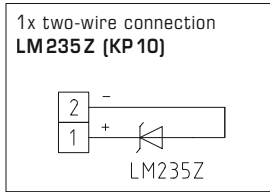
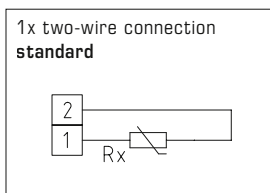
**Screw-in/immersion temperature sensors
with neck tube (stepped once)
with passive output**

ETF 7

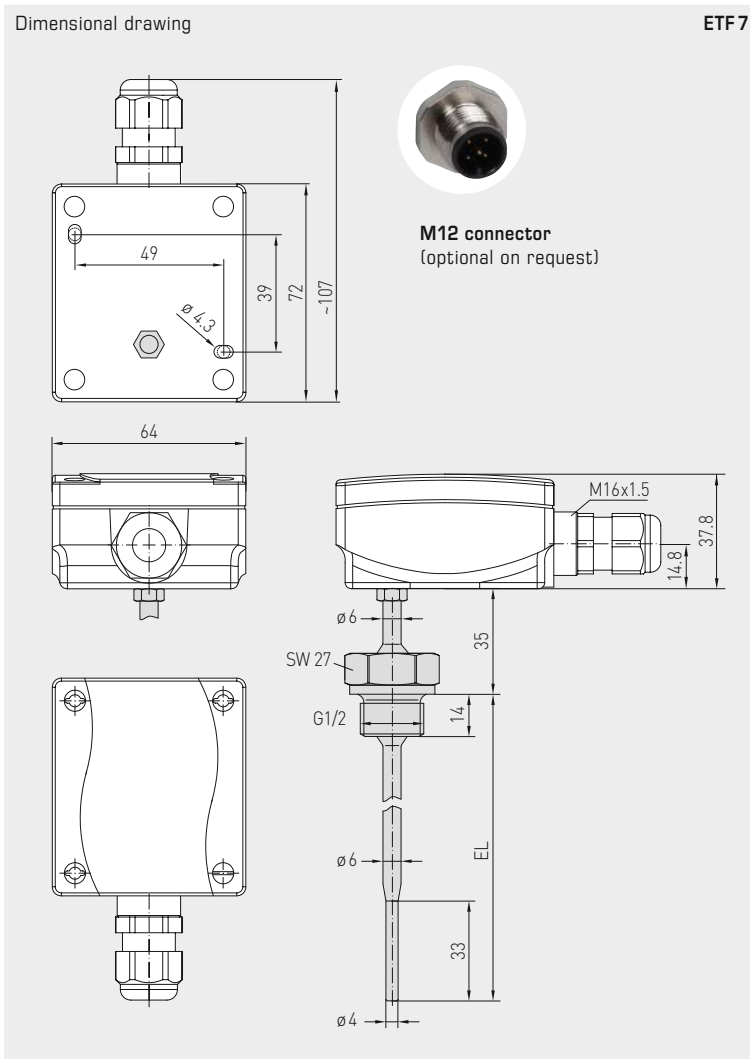
Very quickly responding screw-in resistance thermometer/immersion temperature sensor **THERMASGARD® ETF 7** with passive output, neck tube and a single-tapered stainless steel protective tube, housing cover with quick-locking screws, very short reaction time, particularly suitable for very quick temperature changes and control operations, e.g. in hydraulic systems.

TECHNICAL DATA

Measuring range:	-35...+150 °C
Sensors / output:	see table, passive (Perfect Sensor Protection)
Response times:	$t_{0,5} = 2.8$ s $t_{0,9} = 10$ s (for water at a flow rate of 2 m/s)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Protective tube:	stainless steel V4A (1.4571), G ½" straight pipe thread, wrench size 27 mm, $p_{max} = 6$ bar, $\varnothing = 6$ mm, single-tapered to $\varnothing = 4$ mm (see dimensional drawing) length of neck tube (HL) = 25 mm inserted length (EL) = 100 - 250 mm (see table)
Process connection:	screwed socket with G ½" straight pipe thread
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)



High-performance encapsulation against vibration, mechanical stress and humidity
PS-PROTECTION
PERFECT SENSOR PROTECTION



ETF 7

THERMASGARD® ETF 7		Screw-in / immersion temperature sensor with neck tube	
Type / WG01	Sensor / Output	Item No.	Price
ETF7 Pt100 xx	Pt100		
ETF7 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1023-000	125,84 €
ETF7 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1033-000	127,09 €
ETF7 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1053-000	129,99 €
ETF7 Pt1000 xx	Pt1000		
ETF7 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5021-000	127,19 €
ETF7 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5031-000	128,03 €
ETF7 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5051-000	130,61 €
ETF7 Ni1000 xx	Ni1000		
ETF7 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2021-000	140,28 €
ETF7 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2031-000	141,63 €
ETF7 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2051-000	143,41 €
ETF7 Ni1000TK xx	Ni1000 TK5000		
ETF7 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0021-000	132,23 €
ETF7 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0031-000	132,58 €
ETF7 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0051-000	133,81 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101	on request	

**Immersion / screw-in / duct temperature sensor,
with passive output**

TF 54
Basic unit

Resistance thermometer / temperature sensor **THERMASGARD® TF 54** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, heating engineering, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, mechanical, apparatus and plant engineering and throughout the industrial sector.



TECHNICAL DATA

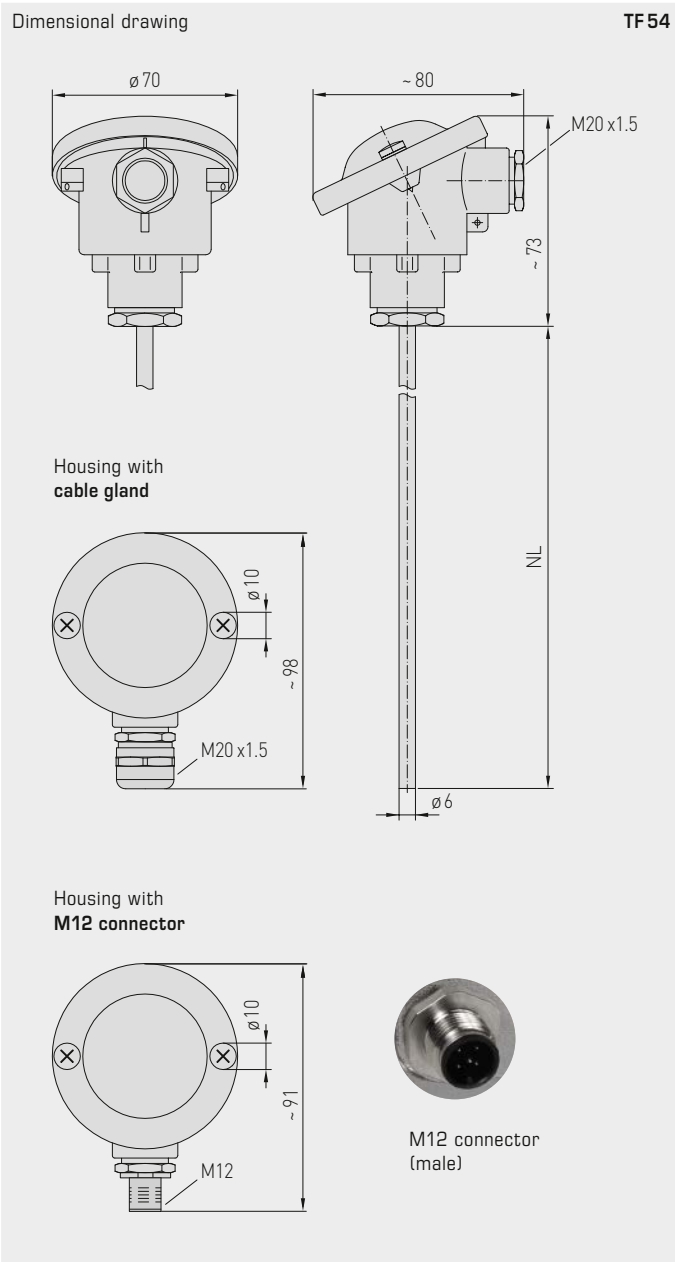
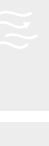
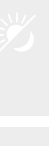
Measuring range:	-35...+180 °C (T_{max} NTC = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (Perfect Sensor Protection) (optionally also with two or other sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm ² , via terminal screws on ceramic base
Cable connection:	TF 54 (standard) adjusting screw made of metal (M20 x 1,5) TF 54-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) TF 54-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL 9006), ambient temperature -20...+100 °C
Protective tube:	stainless steel, V4A (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) TF 54 IP 65 (according to EN 60 529) TF 54-KV / TF 54-Q
ACCESSORIES	(see table)
TH-ms / xx	Immersion sleeve, brass, nickel-plated, Ø = 8 mm, T_{max} = +150 °C, p_{max} = 10 bar
TH-VA / xx	Immersion sleeve, stainless steel, V4A (1.4571), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
TH-VA / xx / 90	Immersion sleeve, stainless steel, V4A (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
MF-06-M	Mounting flange, metal, galvanised steel, Ø = 32 mm, Ø = 6.3 mm tube gland, T_{max} = +700 °C



2-wire connection



4-wire connection



High-performance encapsulation against vibration, mechanical stress and humidity



TF 54
Standard
(IP 54)



TF 54-KV
with cable gland
(IP 65)

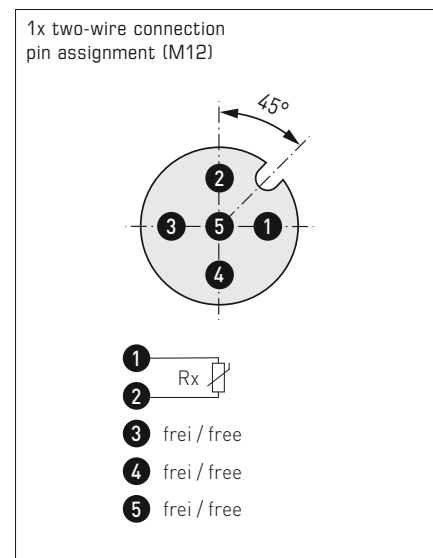
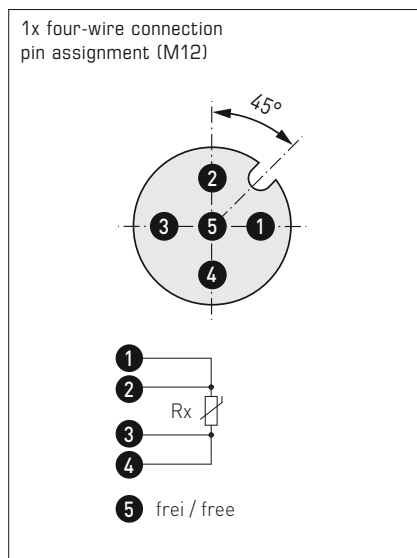
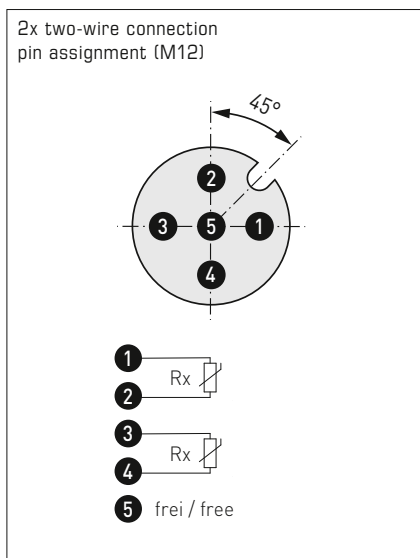
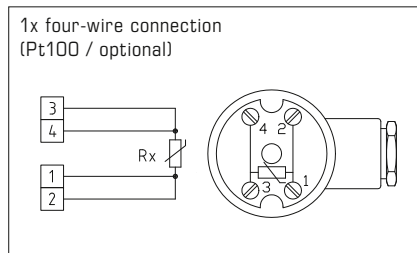
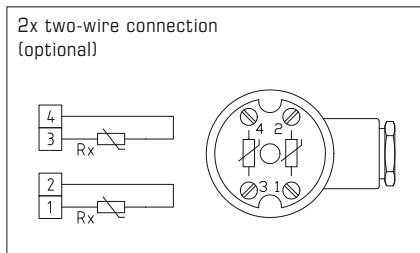
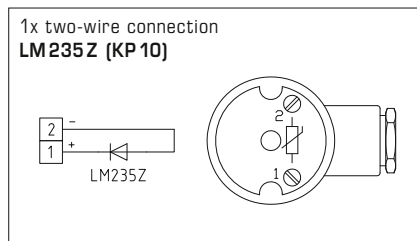
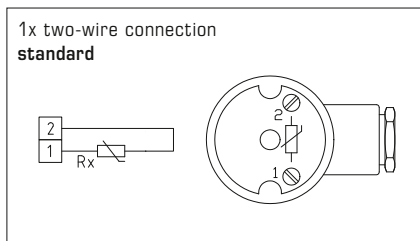


TF 54-Q
with M12 connector
(IP 65)



Immersion / screw-in / duct temperature sensor,
with passive output

TM54
standard
(IP 54)



THERMASGARD® Temperature sensor
TF 54 (Basic unit)

Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
TF 54 Pt100 xx	Pt100 (according to DIN EN 60751, class B)		IP 54, 4-wire	
TF54 Pt100 50mm	Pt100	50 mm	1101-7050-1013-000	58,54 €
TF54 Pt100 100mm	Pt100	100 mm	1101-7050-1023-000	59,95 €
TF54 Pt100 150mm	Pt100	150 mm	1101-7050-1033-000	61,24 €
TF54 Pt100 200mm	Pt100	200 mm	1101-7050-1043-000	63,60 €
TF54 Pt100 250mm	Pt100	250 mm	1101-7050-1053-000	63,87 €
TF54 Pt100 300mm	Pt100	300 mm	1101-7050-1063-000	64,10 €
TF54 Pt100 400mm	Pt100	400 mm	1101-7050-1083-000	64,99 €
TF 54 Pt1000 xx	Pt1000 (according to DIN EN 60751, class B)		IP 54, 2-wire	
TF54 Pt1000 50mm	Pt1000	50 mm	1101-7050-5011-000	58,54 €
TF54 Pt1000 100mm	Pt1000	100 mm	1101-7050-5021-000	59,95 €
TF54 Pt1000 150mm	Pt1000	150 mm	1101-7050-5031-000	61,24 €
TF54 Pt1000 200mm	Pt1000	200 mm	1101-7050-5041-000	63,60 €
TF54 Pt1000 250mm	Pt1000	250 mm	1101-7050-5051-000	63,93 €
TF54 Pt1000 300mm	Pt1000	300 mm	1101-7050-5061-000	64,10 €
TF54 Pt1000 400mm	Pt1000	400 mm	1101-7050-5081-000	64,99 €

Continued on next page...



THERMASGARD® TF 54		Temperature sensor (Basic unit)		
Type/WG03	Sensor/Output	Installation length (EL)	Item No.	Price
TF 54 Ni1000 xx	Ni 1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)		IP 54, 2-wire	
TF54 Ni1000 50mm	Ni1000	50 mm	1101-7050-9011-000	59,55 €
TF54 Ni1000 100mm	Ni1000	100 mm	1101-7050-9021-000	61,25 €
TF54 Ni1000 150mm	Ni1000	150 mm	1101-7050-9031-000	62,24 €
TF54 Ni1000 200mm	Ni1000	200 mm	1101-7050-9041-000	63,65 €
TF54 Ni1000 250mm	Ni1000	250 mm	1101-7050-9051-000	64,05 €
TF54 Ni1000 300mm	Ni1000	300 mm	1101-7050-9061-000	64,28 €
TF54 Ni1000 400mm	Ni1000	400 mm	1101-7050-9081-000	65,23 €
TF 54 Ni1000TK xx	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000		IP 54, 2-wire	
TF54 NiTK 50mm	Ni1000 TK5000	50 mm	1101-7051-0011-000	59,79 €
TF54 NiTK 100mm	Ni1000 TK5000	100 mm	1101-7051-0021-000	61,97 €
TF54 NiTK 150mm	Ni1000 TK5000	150 mm	1101-7051-0031-000	63,01 €
TF54 NiTK 200mm	Ni1000 TK5000	200 mm	1101-7051-0041-000	63,88 €
TF54 NiTK 250mm	Ni1000 TK5000	250 mm	1101-7051-0051-000	64,28 €
TF54 NiTK 300mm	Ni1000 TK5000	300 mm	1101-7051-0061-000	64,48 €
TF54 NiTK 400mm	Ni1000 TK5000	400 mm	1101-7051-0081-000	65,45 €
TF 54 LM235Z xx	LM235Z (TCR = 10 mV/K; 2.73 V at 0°C), KP10		IP 54, 2-wire	
TF54 LM235Z 50mm	LM235Z	50 mm	1101-7052-1011-000	59,74 €
TF54 LM235Z 100mm	LM235Z	100 mm	1101-7052-1021-000	60,12 €
TF54 LM235Z 150mm	LM235Z	150 mm	1101-7052-1031-000	60,23 €
TF54 LM235Z 200mm	LM235Z	200 mm	1101-7052-1041-000	60,91 €
TF54 LM235Z 250mm	LM235Z	250 mm	1101-7052-1051-000	62,48 €
TF54 LM235Z 300mm	LM235Z	300 mm	1101-7052-1061-000	62,99 €
TF54 LM235Z 400mm	LM235Z	400 mm	1101-7052-1081-000	64,05 €
TF 54 NTC 1,8K xx	NTC 1,8K		IP 54, 2-wire	
TF54 NTC1,8K 50mm	NTC 1,8K	50 mm	1101-7051-2011-000	59,45 €
TF54 NTC1,8K 100mm	NTC 1,8K	100 mm	1101-7051-2021-000	62,99 €
TF54 NTC1,8K 150mm	NTC 1,8K	150 mm	1101-7051-2031-000	63,31 €
TF54 NTC1,8K 200mm	NTC 1,8K	200 mm	1101-7051-2041-000	63,76 €
TF54 NTC1,8K 250mm	NTC 1,8K	250 mm	1101-7051-2051-000	64,83 €
TF54 NTC1,8K 300mm	NTC 1,8K	300 mm	1101-7051-2061-000	65,45 €
TF54 NTC1,8K 400mm	NTC 1,8K	400 mm	1101-7051-2081-000	65,69 €
TF 54 NTC10K xx	NTC 10K		IP 54, 2-wire	
TF54 NTC10K 50mm	NTC 10K	50 mm	1101-7051-5011-000	59,45 €
TF54 NTC10K 100mm	NTC 10K	100 mm	1101-7051-5021-000	62,99 €
TF54 NTC10K 150mm	NTC 10K	150 mm	1101-7051-5031-000	63,31 €
TF54 NTC10K 200mm	NTC 10K	200 mm	1101-7051-5041-000	63,76 €
TF54 NTC10K 250mm	NTC 10K	250 mm	1101-7051-5051-000	64,83 €
TF54 NTC10K 300mm	NTC 10K	300 mm	1101-7051-5061-000	65,45 €
TF54 NTC10K 400mm	NTC 10K	400 mm	1101-7051-5081-000	65,69 €
TF 54 NTC20K xx	NTC 20K		IP 54, 2-wire	
TF54 NTC20K 50mm	NTC 20K	50 mm	1101-7051-6011-000	59,45 €
TF54 NTC20K 100mm	NTC 20K	100 mm	1101-7051-6021-000	62,99 €
TF54 NTC20K 150mm	NTC 20K	150 mm	1101-7051-6031-000	63,31 €
TF54 NTC20K 200mm	NTC 20K	200 mm	1101-7051-6041-000	63,76 €
TF54 NTC20K 250mm	NTC 20K	250 mm	1101-7051-6051-000	64,83 €
TF54 NTC20K 300mm	NTC 20K	300 mm	1101-7051-6061-000	65,45 €
TF54 NTC20K 400mm	NTC 20K	400 mm	1101-7051-6081-000	65,69 €
Housing variant:	equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or M12 connector (IP 65) see the next page!			
Extra charge:	optionally also with two or other sensors		on request	

Immersion/screw-in/duct temperature sensor,
with passive output

TF 54 - Q
with M12 connector
(IP 65)



THERMASGARD®		Temperature sensor (Basic unit with M12 connector)			
Type/WG03	Sensor/Output	Installation length (EL)	Q	Item No.	Price
TF 54 Pt100 xx Q	Pt100 (according to DIN EN 60751, class B)		●	IP 65, 4-wire	
TF54 Pt100 50mm Q	Pt100	50 mm	●	2Z01-4111-0100-011	95,50 €
TF54 Pt100 100mm Q	Pt100	100 mm	●	2Z01-4111-0100-021	96,92 €
TF54 Pt100 150mm Q	Pt100	150 mm	●	2Z01-4111-0100-031	98,22 €
TF54 Pt100 200mm Q	Pt100	200 mm	●	2Z01-4111-0100-041	100,56 €
TF54 Pt100 250mm Q	Pt100	250 mm	●	2Z01-4111-0100-051	100,84 €
TF54 Pt100 300mm Q	Pt100	300 mm	●	2Z01-4111-0100-061	101,07 €
TF54 Pt100 400mm Q	Pt100	400 mm	●	2Z01-4111-0100-081	101,97 €
TF 54 Pt1000 xx Q	Pt1000 (according to DIN EN 60751, class B)		●	IP 65, 2-wire	
TF54 Pt1000 50mm Q	Pt1000	50 mm	●	2Z05-4111-0100-011	95,50 €
TF54 Pt1000 100mm Q	Pt1000	100 mm	●	2Z05-4111-0100-021	96,92 €
TF54 Pt1000 150mm Q	Pt1000	150 mm	●	2Z05-4111-0100-031	98,22 €
TF54 Pt1000 200mm Q	Pt1000	200 mm	●	2Z05-4111-0100-041	100,56 €
TF54 Pt1000 250mm Q	Pt1000	250 mm	●	2Z05-4111-0100-051	100,84 €
TF54 Pt1000 300mm Q	Pt1000	300 mm	●	2Z05-4111-0100-061	101,07 €
TF54 Pt1000 400mm Q	Pt1000	400 mm	●	2Z05-4111-0100-081	101,97 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)				
Extra charge:	optionally also with two or other sensors			on request	

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



TF54 - KV
with cable gland
(IP 65)



THERMASGARD® TF 54 - KV		Temperature sensor (Basic unit with cable gland)		
Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
TF54 Pt100 xx KV	Pt100 (according to DIN EN 60751, class B)		IP65, 4-wire	
TF54 Pt100 50mm KV	Pt100	50 mm	1101-7070-1013-000	66,85 €
TF54 Pt100 100mm KV	Pt100	100 mm	1101-7070-1023-000	68,26 €
TF54 Pt100 150mm KV	Pt100	150 mm	1101-7070-1033-000	69,55 €
TF54 Pt100 200mm KV	Pt100	200 mm	1101-7070-1043-000	69,03 €
TF54 Pt100 250mm KV	Pt100	250 mm	1101-7070-1053-000	72,19 €
TF54 Pt100 300mm KV	Pt100	300 mm	1101-7070-1063-000	72,41 €
TF54 Pt100 400mm KV	Pt100	400 mm	1101-7070-1083-000	73,32 €
TF54 Pt1000 xx KV	Pt1000 (according to DIN EN 60751, class B)		IP65, 2-wire	
TF54 Pt1000 50mm KV	Pt1000	50 mm	1101-7070-5011-000	66,86 €
TF54 Pt1000 100mm KV	Pt1000	100 mm	1101-7070-5021-000	68,26 €
TF54 Pt1000 150mm KV	Pt1000	150 mm	1101-7070-5031-000	66,69 €
TF54 Pt1000 200mm KV	Pt1000	200 mm	1101-7070-5041-000	71,92 €
TF54 Pt1000 250mm KV	Pt1000	250 mm	1101-7070-5051-000	72,20 €
TF54 Pt1000 300mm KV	Pt1000	300 mm	1101-7070-5061-000	69,72 €
TF54 Pt1000 400mm KV	Pt1000	400 mm	1101-7070-5081-000	73,32 €
Housing variant "KV":	Cable connection with cable gland			
Extra charge:	optionally also with two or other sensors			on request

Immersion / screw-in / duct temperature sensor,
with passive output

One basic device in four variants...



**TF 54 +
TH -ms/xx**

Immersion / screw-in
temperature sensor
with immersion sleeve,
brass, nickel-plated

**TF 54 +
TH -VA/xx**

Immersion / screw-in
temperature sensor
with immersion sleeve,
stainless steel, V4A

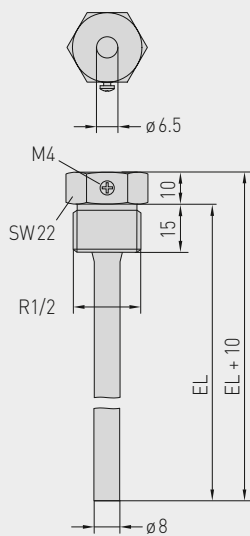
**TF 54 +
TH -VA/xx/90**

Immersion / screw-in
temperature sensor with
immersion sleeve with
neck tube, stainless steel, V4A

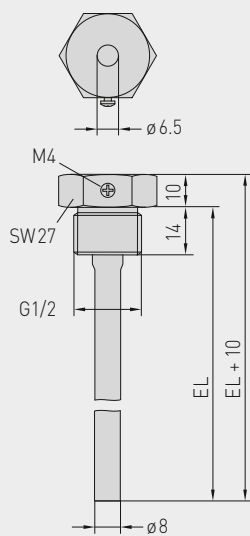
**TF 54 +
MF-06-M**

Duct temperature sensor
with mounting flange, metal

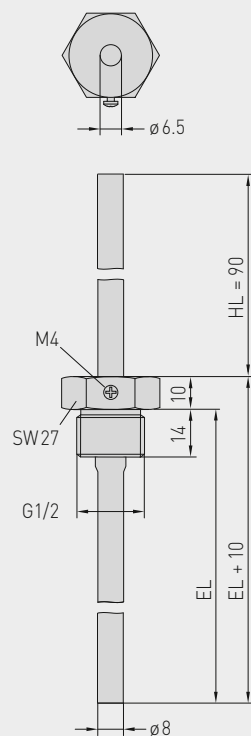
**Dimensional drawing
TH -ms/xx**



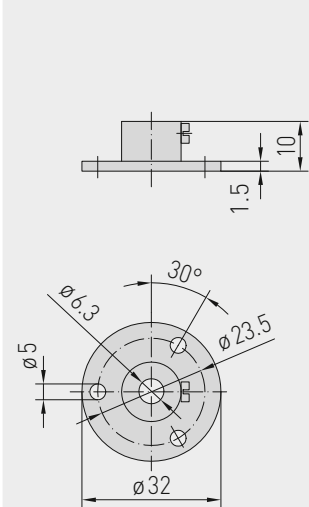
**Dimensional drawing
TH -VA/xx**



**Dimensional drawing
TH -VA/xx/90**



**Dimensional drawing
MF-06-M**



...through combination with accessories:



TH - ms / xx
Immersion sleeve,
brass, nickel-plated,
thread-sealing, conical,
according to DIN 10226



TH - VA / xx
Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH - VA / xx / 90
Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF-06-M
Mounting flange,
metal

THERMASGARD® TH Immersion sleeve Ø 8 mm (accessories)					
Type / WG01	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.	Price
TH - ms / xx Brass nickel-plated					
without neck tube					
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	8,21 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	9,35 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	9,88 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	10,19 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	11,81 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	12,13 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	12,23 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	12,34 €
TH - VA / xx Stainless steel, V4A (1.4571)					
without neck tube					
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	17,88 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	19,76 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	21,23 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	22,38 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	27,82 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	29,07 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	29,27 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	29,79 €
TH - VA / xx / 90 Stainless steel, V4A (1.4571)					
with neck tube (90 mm)					
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	25,61 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	26,76 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	28,07 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	29,27 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	30,68 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	33,25 €
Note:	inner diameter of socket 6.5 mm For further information see last chapter!				
Mounting flange (accessories)					
Type / WG01		T _{max}		Item No.	Price
MF					
MF-06-M	Mounting flange, metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm		+700 °C	7100-0030-5000-000	8,43 €
Note:	For further information see last chapter!				

**Screw-in/immersion temperature sensor with neck tube,
with passive output**
ETF 6
standard

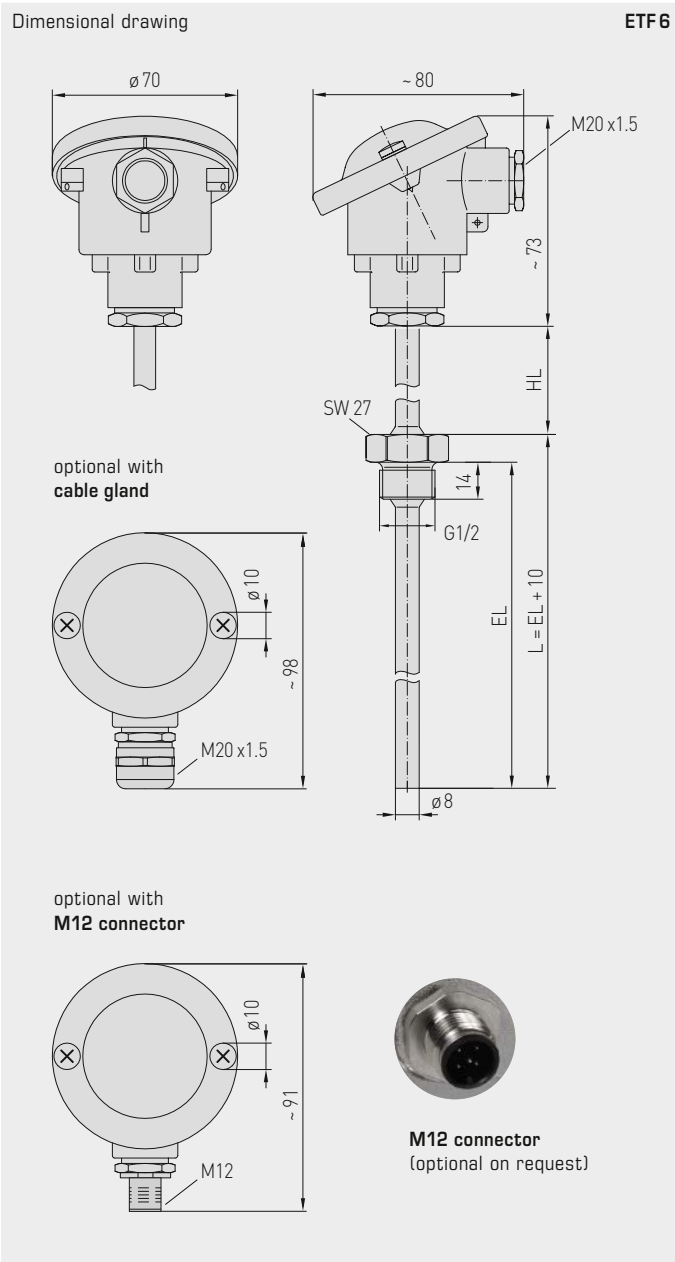
Screw-in resistance thermometer / temperature sensor with neck tube
THERMASGARD® ETF 6 with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, tanks or storage systems, preferably where tubes or tanks must be isolated.

TECHNICAL DATA

Measuring range:	-35...+180 °C (T_{\max} NTC = +150 °C, T_{\max} LM235Z = +125 °C)
Sensors / output:	see table, passive (Perfect Sensor Protection) (optionally also with two or other sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm ² , via terminal screws on ceramic base
Cable connection:	ETF 6 (standard) adjusting screw made of metal (M20 x 1,5) ETF 6-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) ETF 6-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL 9006), ambient temperature -20...+100 °C
Protective tube:	stainless steel V4A (1.4571), G ½" straight pipe thread, wrench size 27 mm, p_{\max} = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 400 mm (see table)
Process connection:	screwed socket with G ½"
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) ETF 6 IP 65 (according to EN 60 529) ETF 6-KV / ETF 6-Q





High-performance encapsulation against vibration, mechanical stress and humidity



ETF 6 standard (IP 54)



ETF 6-KV with cable gland (IP 65)



ETF 6-Q with M12 connector (IP 65)

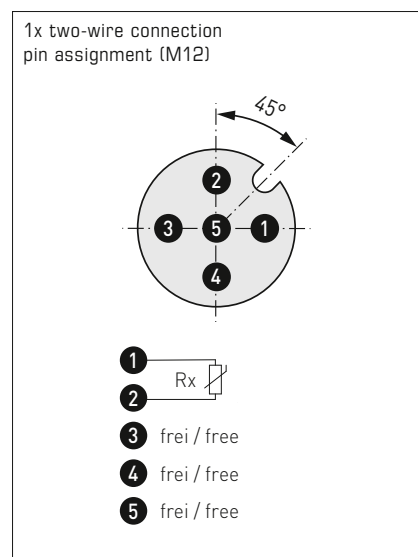
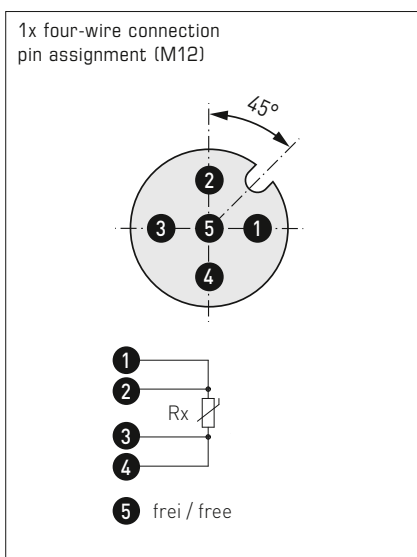
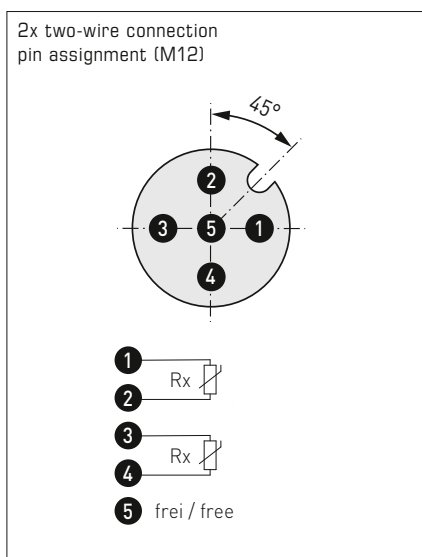
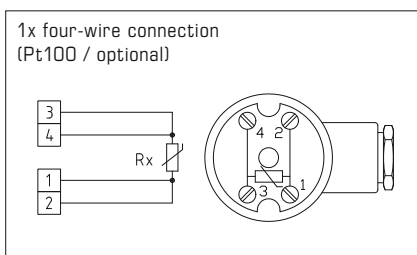
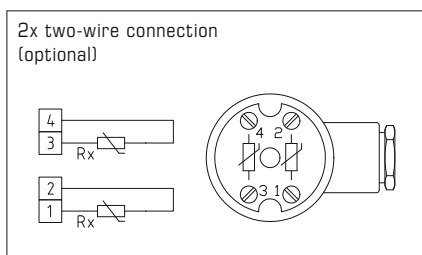
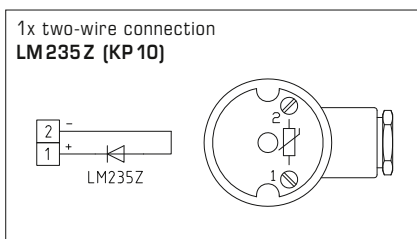
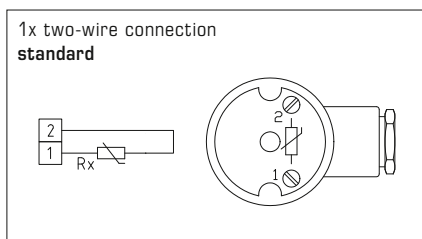


Screw-in/immersion temperature sensor with neck tube,
with passive output

S+S REGELTECHNIK



ETF6
standard
(IP 54)



THERMASGARD® Screw-in / immersion temperature sensor with neck tube
ETF 6 (standard)

Type/WG03	Sensor/Output	Installation length (EL)	Item No.	Price
ETF6 Pt100 xx	Pt100 (according to DIN EN 60751, class B)		IP 54, 4-wire	
ETF6 Pt100 100/80	Pt100	100 mm	1101-2070-1023-000	74,67 €
ETF6 Pt100 150/80	Pt100	150 mm	1101-2070-1033-000	78,59 €
ETF6 Pt100 200/80	Pt100	200 mm	1101-2070-1043-000	80,82 €
ETF6 Pt100 250/80	Pt100	250 mm	1101-2070-1053-000	82,96 €
ETF6 Pt100 400/80	Pt100	400 mm	1101-2070-1083-000	85,56 €
ETF6 Pt1000 xx	Pt1000 (according to DIN EN 60751, class B)		IP 54, 2-wire	
ETF6 Pt1000 100/80	Pt1000	100 mm	1101-2070-5021-000	76,45 €
ETF6 Pt1000 150/80	Pt1000	150 mm	1101-2070-5031-000	80,82 €
ETF6 Pt1000 200/80	Pt1000	200 mm	1101-2070-5041-000	82,11 €
ETF6 Pt1000 250/80	Pt1000	250 mm	1101-2070-5051-000	83,08 €
ETF6 Pt1000 400/80	Pt1000	400 mm	1101-2070-5081-000	86,38 €

Continued on next page...



THERMASGARD® ETF 6		Screw-in / immersion temperature sensor with neck tube (standard)		
Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
ETF6 Ni1000 xx	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)		IP 54, 2-wire	
ETF6 Ni1000 100/80	Ni1000	100 mm	1101-2070-9021-000	79,35 €
ETF6 Ni1000 150/80	Ni1000	150 mm	1101-2070-9031-000	80,76 €
ETF6 Ni1000 200/80	Ni1000	200 mm	1101-2070-9041-000	82,94 €
ETF6 Ni1000 250/80	Ni1000	250 mm	1101-2070-9051-000	83,37 €
ETF6 Ni1000 400/80	Ni1000	400 mm	1101-2070-9081-000	87,57 €
ETF6 Ni1000TK xx	Ni1000 TK5000 (TCR = 5000 ppm/K, LG-Ni1000)		IP 54, 2-wire	
ETF6 NiTK 100/80	Ni1000 TK5000	100 mm	1101-2071-0021-000	79,71 €
ETF6 NiTK 150/80	Ni1000 TK5000	150 mm	1101-2071-0031-000	81,58 €
ETF6 NiTK 200/80	Ni1000 TK5000	200 mm	1101-2071-0041-000	83,70 €
ETF6 NiTK 250/80	Ni1000 TK5000	250 mm	1101-2071-0051-000	86,27 €
ETF6 NiTK 400/80	Ni1000 TK5000	400 mm	1101-2071-0081-000	88,46 €
ETF6 LM235Z xx	LM235Z (TCR = 10mV/K; 2.73V at 0°C), KP10		IP 54, 2-wire	
ETF6 LM235Z 100/80	LM235Z	100 mm	1101-2072-1021-000	75,79 €
ETF6 LM235Z 150/80	LM235Z	150 mm	1101-2072-1031-000	79,14 €
ETF6 LM235Z 200/80	LM235Z	200 mm	1101-2072-1041-000	80,82 €
ETF6 LM235Z 250/80	LM235Z	250 mm	1101-2072-1051-000	81,95 €
ETF6 LM235Z 400/80	LM235Z	400 mm	1101-2072-1081-000	87,12 €
ETF6 NTC 1,8K xx	NTC 1,8K		IP 54, 2-wire	
ETF6 NTC1,8K 100/80	NTC 1,8K	100 mm	1101-2071-2021-000	79,48 €
ETF6 NTC1,8K 150/80	NTC 1,8K	150 mm	1101-2071-2031-000	80,67 €
ETF6 NTC1,8K 200/80	NTC 1,8K	200 mm	1101-2071-2041-000	81,90 €
ETF6 NTC1,8K 250/80	NTC 1,8K	250 mm	1101-2071-2051-000	85,43 €
ETF6 NTC1,8K 400/80	NTC 1,8K	400 mm	1101-2071-2081-000	87,84 €
ETF6 NTC10K xx	NTC 10K		IP 54, 2-wire	
ETF6 NTC10K 100/80	NTC 10K	100 mm	1101-2071-5021-000	79,48 €
ETF6 NTC10K 150/80	NTC 10K	150 mm	1101-2071-5031-000	80,67 €
ETF6 NTC10K 200/80	NTC 10K	200 mm	1101-2071-5041-000	81,90 €
ETF6 NTC10K 250/80	NTC 10K	250 mm	1101-2071-5051-000	85,43 €
ETF6 NTC10K 400/80	NTC 10K	400 mm	1101-2071-5081-000	87,84 €
ETF6 NTC20K xx	NTC 20K		IP 54, 2-wire	
ETF6 NTC20K 100/80	NTC 20K	100 mm	1101-2071-6021-000	79,48 €
ETF6 NTC20K 150/80	NTC 20K	150 mm	1101-2071-6031-000	80,67 €
ETF6 NTC20K 200/80	NTC 20K	200 mm	1101-2071-6041-000	81,90 €
ETF6 NTC20K 250/80	NTC 20K	250 mm	1101-2071-6051-000	85,43 €
ETF6 NTC20K 400/80	NTC 20K	400 mm	1101-2071-6081-000	87,84 €
Housing variant:	equipped as standard with pressure screw (IP54), optional housing variants with cable gland (IP65) or M12 connector (IP65) see the next page!			
Extra charge:	optionally also with two or other sensors			on request

Screw-in / immersion temperature sensor with neck tube,
with passive output

S+S REGELTECHNIK

ETF6-Q
with M12 connector
(IP65)



THERMASGARD® ETF 6-Q		Screw-in / immersion temperature sensor with neck tube (with M12 connector)			
Type / WG03	Sensor / Output	Installation length (EL)	Q	Item No.	Price
ETF6 Pt100 xx Q		Pt100 (according to DIN EN 60751, class B)		IP 65, 4-wire	
ETF6 Pt100 100/80mm Q	Pt100	100 mm	●	2Z01-4121-0100-041	111,64 €
ETF6 Pt100 150/80mm Q	Pt100	150 mm	●	2Z01-4121-0100-051	115,56 €
ETF6 Pt100 200/80mm Q	Pt100	200 mm	●	2Z01-4121-0100-061	117,80 €
ETF6 Pt100 250/80mm Q	Pt100	250 mm	●	2Z01-4121-0100-071	119,93 €
ETF6 Pt100 400/80mm Q	Pt100	400 mm	●	2Z01-4121-0100-101	122,61 €
ETF6 Pt1000 xx Q		Pt1000 (according to DIN EN 60751, class B)		IP 65, 2-wire	
ETF6 Pt1000 100/80mm Q	Pt1000	100 mm	●	2Z05-4121-0100-041	111,64 €
ETF6 Pt1000 150/80mm Q	Pt1000	150 mm	●	2Z05-4121-0100-051	115,56 €
ETF6 Pt1000 200/80mm Q	Pt1000	200 mm	●	2Z05-4121-0100-061	117,80 €
ETF6 Pt1000 250/80mm Q	Pt1000	250 mm	●	2Z05-4121-0100-071	119,93 €
ETF6 Pt1000 400/80mm Q	Pt1000	400 mm	●	2Z05-4121-0100-101	122,52 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)				
Extra charge:	optionally also with two or other sensors				on request

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



ETF6 - KV
with cable gland
(IP65)



THERMASGARD® ETF 6 - KV		Screw-in / immersion temperature sensor with neck tube (with cable gland)		
Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
ETF6 Pt100 xx KV		Pt100 (according to DIN EN 60751, class B)	IP65, 4-wire	
ETF6 Pt100 100/80mm KV	Pt100	100 mm	1101-20C0-1023-000	82,99 €
ETF6 Pt100 150/80mm KV	Pt100	150 mm	1101-20C0-1033-000	86,91 €
ETF6 Pt100 200/80mm KV	Pt100	200 mm	1101-20C0-1043-000	89,15 €
ETF6 Pt100 250/80mm KV	Pt100	250 mm	1101-20C0-1053-000	91,28 €
ETF6 Pt100 400/80mm KV	Pt100	400 mm	1101-20C0-1083-000	93,87 €
ETF6 Pt1000 xx KV		Pt1000 (according to DIN EN 60751, class B)	IP65, 2-wire	
ETF6 Pt1000 100/80mm KV	Pt1000	100 mm	1101-20C0-5021-000	84,77 €
ETF6 Pt1000 150/80mm KV	Pt1000	150 mm	1101-20C0-5031-000	89,15 €
ETF6 Pt1000 200/80mm KV	Pt1000	200 mm	1101-20C0-5041-000	90,43 €
ETF6 Pt1000 250/80mm KV	Pt1000	250 mm	1101-20C0-5051-000	91,40 €
ETF6 Pt1000 400/80mm KV	Pt1000	400 mm	1101-20C0-5081-000	94,70 €
Housing variant "KV":	Cable connection with cable gland			
Extra charge:	optionally also with two or other sensors		on request	

Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

RGTF 1
standard

Resistance thermometer / smoke gas temperature sensor **THERMASGARD® RGTF 1** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube, incl. mounting flange.

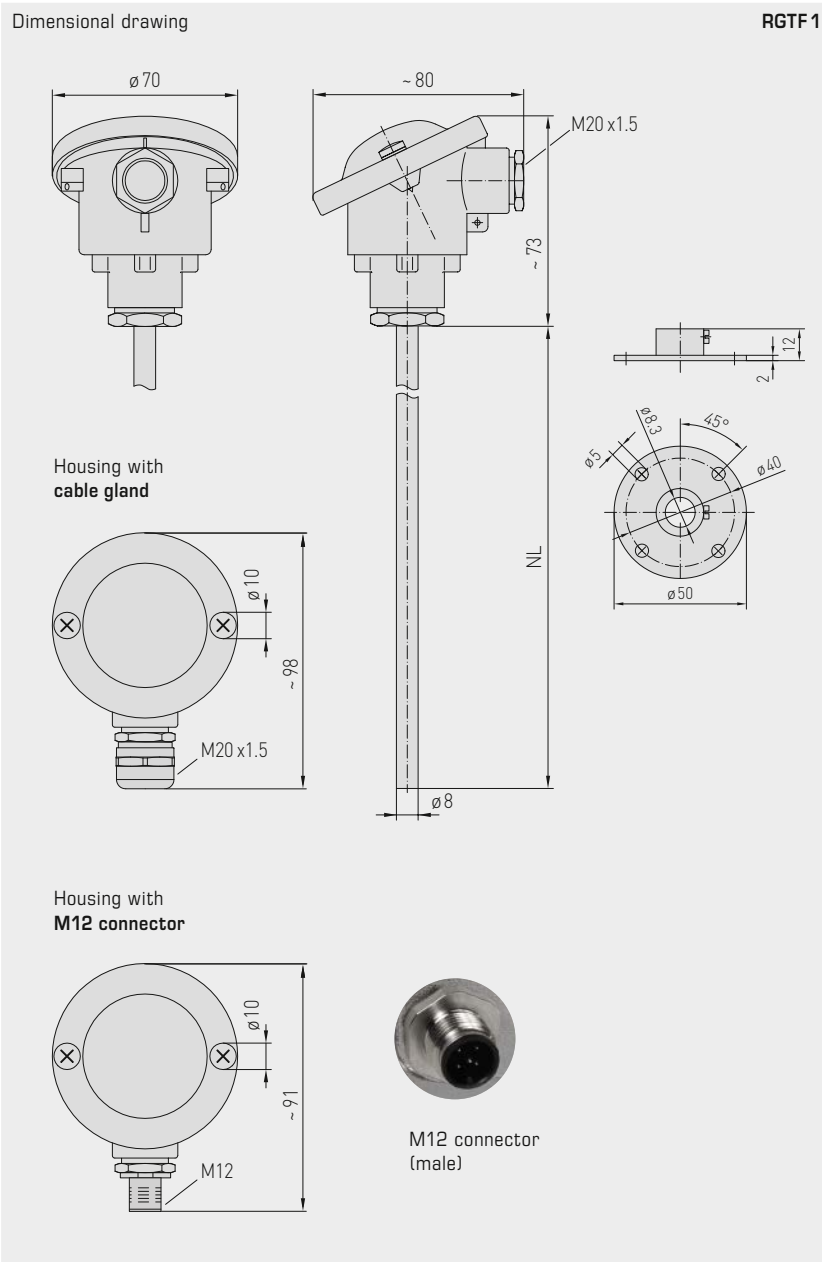
The duct sensor is used to detect relatively high temperatures in gaseous media, eg, for exhaust air and smoke gas temperature measurement.

TECHNICAL DATA

Measuring range:	-35...+600 °C (extended range limits from -100...+750 °C optional)
Sensor / output:	Pt100/Pt1000 (according to DIN EN 60 751, class B) (Perfect Sensor Protection)
Connection type:	2-wire connection (Pt1000) 4-wire connection (Pt100 / Pt1000 optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm ² via terminal screws on ceramic base
Cable connection:	RGTF 1 (standard) adjusting screw made of metal (M20 x 1.5); RGTF 1-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTF 1-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -20...+100 °C
Protective tube:	stainless steel V4A (1.4571), Ø = 8 mm inserted length (EL) = 200 - 500 mm (see table)
Process connection:	by mounting flange, stainless steel V2A (1.4305) (included in the scope of delivery)
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) RGTF 1 IP 65 (according to EN 60 529) RGTF1-KV / RGTF1-Q



RGTF 1
Measuring insert with
ceramic tubelet



RGTF 1
standard
(IP 54)



RGTF 1 - KV
with cable gland
(IP 65)



RGTF 1 - Q
with M12 connector
(IP 65)



High-performance encapsulation against vibration, mechanical stress and humidity



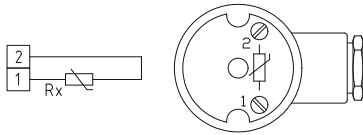
Duct temperature sensors / smoke gas temperature sensors,
including mounting flange, with passive output

2-wire connection
(Pt1000)

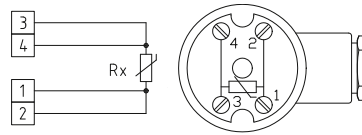
4-wire connection
(Pt100 / Pt1000 optional)



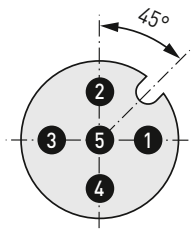
1x two-wire connection
(Pt1000)



1x four-wire connection
(Pt100 / Pt1000 optional)

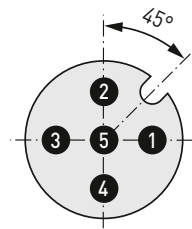


1x two-wire connection
pin assignment (M12)



- 1 Rx
- 2
- 3 frei / free
- 4 frei / free
- 5 frei / free

1x four-wire connection
pin assignment (M12)



- 1
- 2 Rx
- 3
- 4
- 5 frei / free



Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

RGTF 1
standard
(IP54)



THERMASGARD® RGTF 1		Duct temperature sensors / smoke gas temperature sensors, including mounting flange (Standard)		
Type / WG01	Sensor / Output	Installation length (EL)	Item No.	Price
RGTF1 Pt100 xx	Pt100 (according to DIN EN 60751, class B)		IP54, 4-wire	
RGTF1 Pt100 200mm	Pt100	200 mm	1101-3040-1043-000	162,67 €
RGTF1 Pt100 250mm	Pt100	250 mm	1101-3040-1053-000	164,36 €
RGTF1 Pt100 300mm	Pt100	300 mm	1101-3040-1063-000	168,06 €
RGTF1 Pt100 500mm	Pt100	500 mm	1101-3040-1103-000	181,09 €
RGTF1 Pt1000 xx	Pt1000 (according to DIN EN 60751, class B)		IP54, 2-wire	
RGTF1 Pt1000 200mm	Pt1000	200 mm	1101-3040-5041-000	157,16 €
RGTF1 Pt1000 250mm	Pt1000	250 mm	1101-3040-5051-000	158,85 €
RGTF1 Pt1000 300mm	Pt1000	300 mm	1101-3040-5061-000	162,55 €
RGTF1 Pt1000 500mm	Pt1000	500 mm	1101-3040-5101-000	167,37 €
Housing variant:	equipped as standard with pressure screw (IP54), optional housing variants with cable gland (IP65) or M12 connector (IP65) see the next page!			
Extra charge:	other measuring ranges optional			22,40 €

Duct temperature sensors / smoke gas temperature sensors,
including mounting flange, with passive output

S+S REGELTECHNIK

RGTF 1 - Q
with M12 connector
(IP 65)



THERMASGARD® RGTF 1 - Q		Duct temperature sensors / smoke gas temperature sensors, including mounting flange (with M12 connector)			
Type / WG03	Sensor / Output	Installation length (EL)	Q	Item No.	Price
RGTF1 Pt100 xx Q	Pt100 (according to DIN EN 60751, class B)		●	IP 65, 4-wire	
RGTF1 Pt100 200mm Q	Pt100	200 mm	●	2Z01-4131-0100-011	194,04 €
RGTF1 Pt100 250mm Q	Pt100	250 mm	●	2Z01-4131-0100-021	195,82 €
RGTF1 Pt100 300mm Q	Pt100	300 mm	●	2Z01-4131-0100-031	199,51 €
RGTF1 Pt100 500mm Q	Pt100	500 mm	●	2Z01-4131-0100-041	204,35 €
RGTF1 Pt1000 xx Q	Pt1000 (according to DIN EN 60751, class B)			IP 65, 2-wire	
RGTF1 Pt1000 200mm Q	Pt1000	200 mm	●	2Z05-4131-0100-011	194,04 €
RGTF1 Pt1000 250mm Q	Pt1000	250 mm	●	2Z05-4131-0100-021	195,82 €
RGTF1 Pt1000 300mm Q	Pt1000	300 mm	●	2Z05-4131-0100-031	199,51 €
RGTF1 Pt1000 500mm Q	Pt1000	500 mm	●	2Z05-4131-0100-041	204,35 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)				
Extra charge:	other measuring ranges optional				22,40 €

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



Duct temperature sensors / smoke gas temperature sensors,
including mounting flange, with passive output

RGTF 1 - KV
with cable gland
(IP 65)



THERMASGARD® RGTF 1 - KV		Duct temperature sensors / smoke gas temperature sensors, including mounting flange (with cable gland)		
Type / WG01	Sensor / Output	Installation length (EL)	Item No.	Price
RGTF1 Pt100 xx KV	Pt100 (according to DIN EN 60751, class B)		IP65, 4-wire	
RGTF1 Pt100 200mm KV	Pt100	200 mm	1101-30D0-1043-000	165,48 €
RGTF1 Pt100 250mm KV	Pt100	250 mm	1101-30D0-1053-000	167,18 €
RGTF1 Pt100 300mm KV	Pt100	300 mm	1101-30D0-1063-000	170,87 €
RGTF1 Pt100 500mm KV	Pt100	500 mm	1101-30D0-1103-000	175,70 €
RGTF1 Pt1000 xx KV	Pt1000 (according to DIN EN 60751, class B)		IP65, 2-wire	
RGTF1 Pt1000 200mm KV	Pt1000	200 mm	1101-30D0-5041-000	165,48 €
RGTF1 Pt1000 250mm KV	Pt1000	250 mm	1101-30D0-5051-000	167,18 €
RGTF1 Pt1000 300mm KV	Pt1000	300 mm	1101-30D0-5061-000	170,87 €
RGTF1 Pt1000 500mm KV	Pt1000	500 mm	1101-30D0-5101-000	175,70 €
Housing variant "KV":	Cable connection with cable gland			
Extra charge:	other measuring ranges optional			22,40 €

Screw-in temperature sensors / smoke gas temperature sensors with neck tube and passive output

RGTF 2
standard

Screw-in resistance thermometer / smoke gas temperature sensor with neck tube
THERMASGARD® RGTF 2 with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

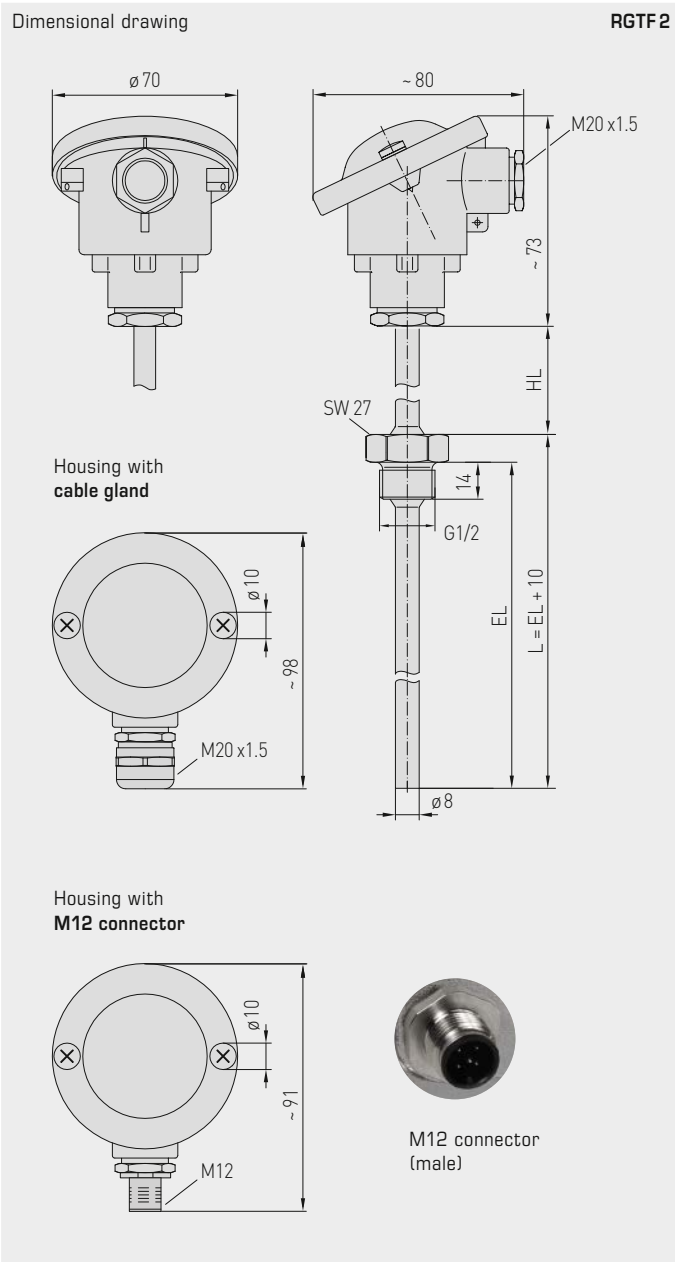
The duct sensor is used to detect relatively high temperatures in liquid or gaseous media, eg, for exhaust air and smoke gas temperature measurement..

TECHNICAL DATA

Measuring range:	-35...+600 °C (extended range limits from -100...+750 °C optional)
Sensor / output:	Pt100/Pt1000 (according to DIN EN 60 751, class B) (Perfect Sensor Protection)
Connection type:	2-wire connection (Pt1000) 4-wire connection (Pt100 / Pt1000 optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm ² via terminal screws on ceramic base
Cable connection:	RGTF 2 (Standard) adjusting screw made of metal (M20 x 1.5); RGTF 2-KV (optional) cable gland , brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTF 2-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -20...+100 °C
Protective tube:	stainless steel V4A (1.4571), G ½" straight pipe thread, wrench size 27 mm, p _{max} = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 500 mm (see table)
Process connection:	screwed socket with G ½" straight pipe thread
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) RGTF 2 IP 65 (according to EN 60 529) RGTF 2-KV / RGTF 2-Q



RGTF 2
Measuring insert with ceramic tubelet



High-performance encapsulation against vibration, mechanical stress and humidity



RGTF 2
standard
(IP 54)



RGTF 2-KV
with cable gland
(IP 65)



RGTF 2-Q
with M12 connector
(IP 65)



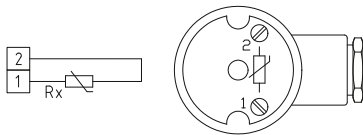
Screw-in temperature sensors / smoke gas temperature sensors
with neck tube and passive output

2-wire connection
(Pt1000)

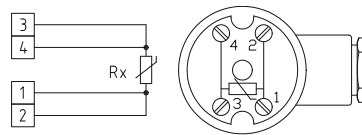
4-wire connection
(Pt100 / Pt1000 optional)



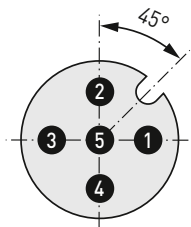
1x two-wire connection
(Pt1000)



1x four-wire connection
(Pt100 / Pt1000 optional)

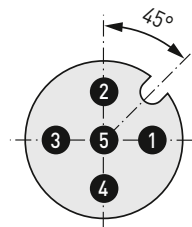


1x two-wire connection
pin assignment (M12)

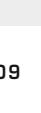
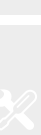


- 1 Rx
- 2 Rx
- 3 frei / free
- 4 frei / free
- 5 frei / free

1x four-wire connection
pin assignment (M12)



- 1 Rx
- 2 Rx
- 3 frei / free
- 4 frei / free
- 5 frei / free

RGTF2
standard
(IP54)

THERMASGARD® RGTF 2		Screw-in temperature sensors / smoke gas temperature sensors with neck tube (standard)		
Type / WG01	Sensor / Output	Installation length (EL)	Item No.	Price
RGTF2 Pt100 xx	Pt100 (according to DIN EN 60751, class B)		IP54, 4-wire	
RGTF2 Pt100 100/80mm	Pt100	100 mm	1101-2090-1023-000	180,64 €
RGTF2 Pt100 150/80mm	Pt100	150 mm	1101-2090-1033-000	181,64 €
RGTF2 Pt100 200/80mm	Pt100	200 mm	1101-2090-1043-000	187,25 €
RGTF2 Pt100 250/80mm	Pt100	250 mm	1101-2090-1053-000	182,98 €
RGTF2 Pt100 300/80mm	Pt100	300 mm	1101-2090-1063-000	196,23 €
RGTF2 Pt100 500/80mm	Pt100	500 mm	1101-2090-1103-000	208,59 €
RGTF2 Pt1000 xx	Pt1000 (according to DIN EN 60751, class B)		IP54, 2-wire	
RGTF2 Pt1000 100/80	Pt1000	100 mm	1101-2090-5021-000	175,12 €
RGTF2 Pt1000 150/80	Pt1000	150 mm	1101-2090-5031-000	176,25 €
RGTF2 Pt1000 200/80	Pt1000	200 mm	1101-2090-5041-000	181,87 €
RGTF2 Pt1000 250/80	Pt1000	250 mm	1101-2090-5051-000	182,99 €
RGTF2 Pt1000 300/80	Pt1000	300 mm	1101-2090-5061-000	190,83 €
RGTF2 Pt1000 500/80	Pt1000	500 mm	1101-2090-5101-000	203,19 €
Housing variant:	equipped as standard with pressure screw (IP54), optional housing variants with cable gland (IP65) or M12 connector (IP65) see the next page!			
Extra charge:	other measuring ranges optional		on request	22,40 €

Screw-in temperature sensors / smoke gas temperature sensors
with neck tube and passive output

S+S REGELTECHNIK

RGTF2 - Q
with M12 connector
(IP65)



THERMASGARD® RGTF 2 - Q		Screw-in temperature sensors / smoke gas temperature sensors with neck tube (with M12 connector)			
Type / WG03	Sensor / Output	Installation length (EL)	Q	Item No.	Price
RGTF2 Pt100 xx Q	Pt100 (according to DIN EN 60751, class B)		●	IP 65, 4-wire	
RGTF2 Pt100 100/80mm Q	Pt100	100 mm	●	2Z01-4141-0100-011	212,09 €
RGTF2 Pt100 150/80mm Q	Pt100	150 mm	●	2Z01-4141-0100-021	213,22 €
RGTF2 Pt100 200/80mm Q	Pt100	200 mm	●	2Z01-4141-0100-031	218,83 €
RGTF2 Pt100 250/80mm Q	Pt100	250 mm	●	2Z01-4141-0100-041	219,95 €
RGTF2 Pt100 300/80mm Q	Pt100	300 mm	●	2Z01-4141-0100-051	227,81 €
RGTF2 Pt100 500/80mm Q	Pt100	500 mm	●	2Z01-4141-0100-061	240,16 €
RGTF2 Pt1000 xx Q	Pt1000 (according to DIN EN 60751, class B)		●	IP 65, 2-wire	
RGTF2 Pt1000 100/80mm Q	Pt1000	100 mm	●	2Z05-4141-0100-011	212,09 €
RGTF2 Pt1000 150/80mm Q	Pt1000	150 mm	●	2Z05-4141-0100-021	213,22 €
RGTF2 Pt1000 200/80mm Q	Pt1000	200 mm	●	2Z05-4141-0100-031	218,83 €
RGTF2 Pt1000 250/80mm Q	Pt1000	250 mm	●	2Z05-4141-0100-041	219,95 €
RGTF2 Pt1000 300/80mm Q	Pt1000	300 mm	●	2Z05-4141-0100-051	227,81 €
RGTF2 Pt1000 500/80mm Q	Pt1000	500 mm	●	2Z05-4141-0100-061	240,16 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)				
Extra charge:	other measuring ranges optional			on request	22,40 €

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



RGTF2 - KV
with cable gland
(IP65)



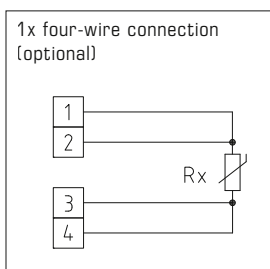
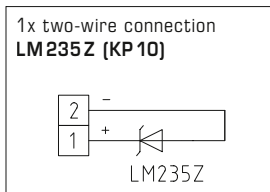
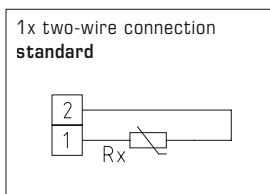
THERMASGARD® RGTF 2 - KV		Screw-in temperature sensors / smoke gas temperature sensors with neck tube (with cable gland)		
Type / WG01	Sensor / Output	Installation length (EL)	Item No.	Price
RGTF2 Pt100 xx KV	Pt100 (according to DIN EN 60751, class B)		IP65, 4-wire	
RGTF2 Pt100 100/80mm KV	Pt100	100 mm	1101-20D0-1023-000	183,45 €
RGTF2 Pt100 150/80mm KV	Pt100	150 mm	1101-20D0-1033-000	184,57 €
RGTF2 Pt100 200/80mm KV	Pt100	200 mm	1101-20D0-1043-000	190,19 €
RGTF2 Pt100 250/80mm KV	Pt100	250 mm	1101-20D0-1053-000	191,30 €
RGTF2 Pt100 300/80mm KV	Pt100	300 mm	1101-20D0-1063-000	199,16 €
RGTF2 Pt100 500/80mm KV	Pt100	500 mm	1101-20D0-1103-000	211,52 €
RGTF2 Pt1000 xx KV	Pt1000 (according to DIN EN 60751, class B)		IP65, 2-wire	
RGTF2 Pt1000 100/80mm KV	Pt1000	100 mm	1101-20D0-5021-000	183,45 €
RGTF2 Pt1000 150/80mm KV	Pt1000	150 mm	1101-20D0-5031-000	184,57 €
RGTF2 Pt1000 200/80mm KV	Pt1000	200 mm	1101-20D0-5041-000	190,19 €
RGTF2 Pt1000 250/80mm KV	Pt1000	250 mm	1101-20D0-5051-000	191,30 €
RGTF2 Pt1000 300/80mm KV	Pt1000	300 mm	1101-20D0-5061-000	199,16 €
RGTF2 Pt1000 500/80mm KV	Pt1000	500 mm	1101-20D0-5101-000	211,52 €
Housing variant "KV":	Cable connection with cable gland			
Extra charge:	other measuring ranges optional		on request	22,40 €

Sleeve sensor / cable temperature sensor
duct / immersion / screw-in temperature sensor,
with passive output

The sleeve sensor / cable sensor **THERMASGARD® HTF** is used to measure temperatures in liquid and gaseous media. It can be used as a duct sensor and - if installed in an immersion sleeve - as an immersion and screw-in sensor. The sleeve length varies, depending on request, from 30..400 mm (standard is 50 mm respectively 200 mm), the cable length is arbitrary (standard is 1.5 m). Depending on application, with silicone, glass fibre, or PVC leads, for two-wire or four-wire connection. For direct, continuous use in liquids, please use our **THE** immersion sleeves (see type table).

TECHNICAL DATA

Measuring ranges:	-35...+105 °C PVC , LiYY, 2 x 0.25 mm ² -50...+180 °C Silicone , SiHF, 2 x 0.25 mm ² -50...+250 °C PTFE , 2 x 1.0 mm ² -50...+350 °C glass fibre , 2 x 0.25 mm ² ends stripped with wire end sleeves (extended measuring range limits optional, depending on connection leads, T_{max} Ni1000 = +180 °C, T_{max} NTC / Ni1000 TK5000 = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (optional also with 2 sensors) (Perfect Sensor Protection with IP68)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Protective tube	sensor sleeve made of stainless steel, V4A (1.4571), Ø = 6 mm HTF50 nominal length (NL) = 50 mm HTF200 nominal length (NL) = 200 mm (other optional dimensions also available, nominal length (NL) = 30...400 mm)
Connection cable:	cable length (KL) = 1.5 m (optional also 3 m, 5 m, 8 m, 10 m)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	using immersion sleeves THE (see table) or mounting flange, plastic (see table) (optionally in galvanised steel, see chapter Accessories)
Permitted humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional) IP54 (according to EN 60 529) with glass fibre cable (optional)
ACCESSORIES	
MF-06-K	Mounting flange , plastic, 56.8 x 84.3 mm, Ø = 6.2 mm tube gland, T _{max} = +100 °C (is not included in scope of delivery)
THE-ms/xx	Immersion sleeve, brass, nickel-plated , Ø = 9 mm, inserted length (EL) = 50 - 250 mm (see table), inner diameter of socket Ø = 5.2 mm, with adjusting screw M12 x 1.5 T _{max} = +130 °C, p _{max} = 16 bar
THE-VA/xx	Immersion sleeve, stainless steel, V4A (1.4571), Ø = 9 mm, inserted length (EL) = 50 - 400 mm (see table), inner diameter of socket Ø = 5.2 mm, with adjusting screw M12 x 1.5 T _{max} = +200 °C, p _{max} = 40 bar



IP65 (standard)
 humidity-tight



IP68 (optional)
 water-tight
Perfect Sensor Protection



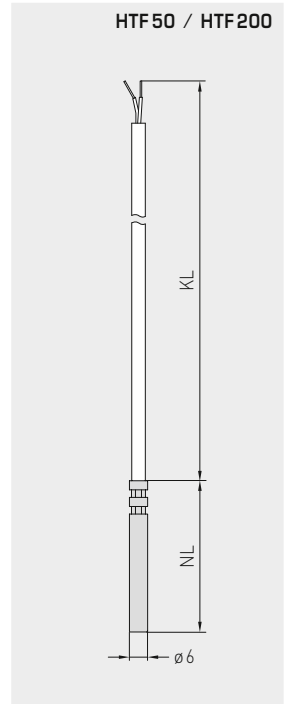
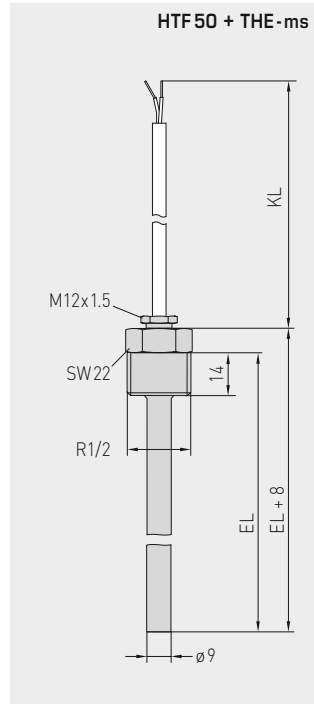
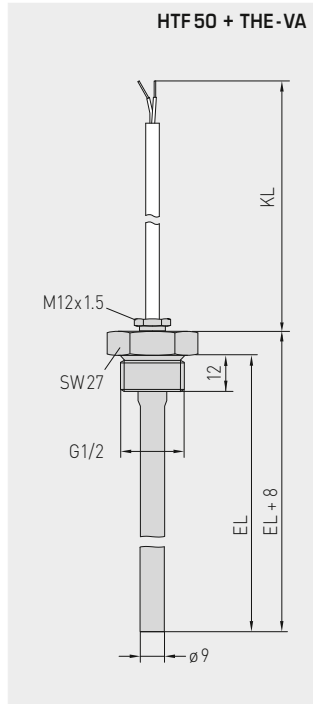
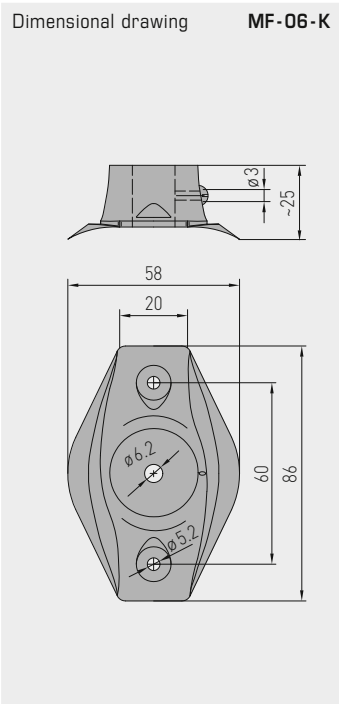
IP54 (optional)
 with **glass fibre** cable

MF-06-K
 Mounting flange,
 plastic
 (optional)



High-performance encapsulation against
 vibration, mechanical stress and humidity

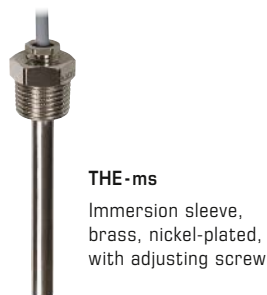
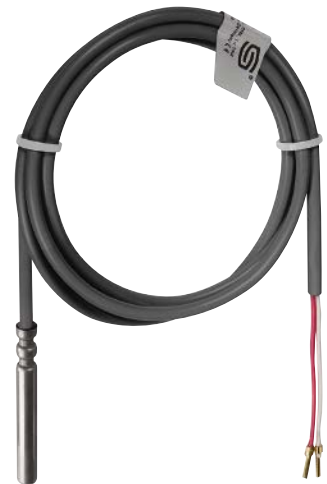
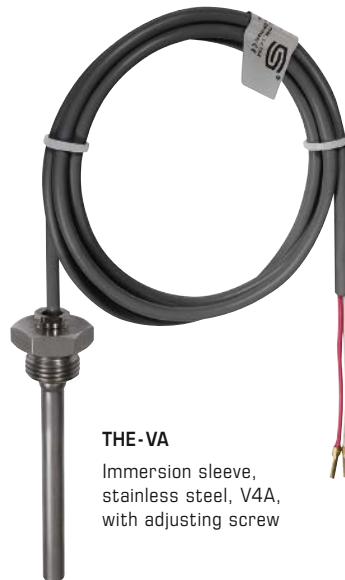




HTF 200 + MF-06-K
with accessory mounting flange
(see type table)
as duct temperature sensor

HTF 50 + THE-xx
with accessory immersion sleeve
(see type table)
as immersion / screw-in temperature sensor

HTF 50
with PVC / silicone cable
(standard)



Sleeve sensor / cable temperature sensor
 duct / immersion / screw-in temperature sensor,
 with passive output

THERMASGARD® HTF 50 sleeve sensor / cable temperature sensor (NL = 50 mm)

Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
					Pt 100, class B	
HTF50 PT100						
HTF50 Pt100 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-1211-110	12,07 €
HTF50 Pt100 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-1211-120	15,17 €
HTF50 Pt100 PTFE 1,5M	PTFE	1.5 m	-50...+250 °C	IP65 *	1101-6030-1211-140	36,91 €
HTF50 Pt100	Glass Fibre	1.5 m	-50...+350 °C	IP54	1101-6030-1211-050	42,28 €
HTF50 Pt100 PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6030-1231-110	14,61 €
HTF50 Pt100 Silikon 3M	Silicone	3 m	-50...+180 °C	IP65 *	1101-6030-1231-120	18,92 €
HTF50 Pt100 PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6030-1251-110	17,98 €
HTF50 Pt100 Silikon 5M	Silicone	5 m	-50...+180 °C	IP65 *	1101-6030-1251-120	23,93 €
HTF50 Pt100 PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6030-1281-110	23,06 €
HTF50 Pt100 Silikon 8M	Silicone	8 m	-50...+180 °C	IP65 *	1101-6030-1281-120	31,45 €
HTF50 Pt100 PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6030-1301-110	26,43 €
HTF50 Pt100 Silikon 10M	Silicone	10 m	-50...+180 °C	IP65 *	1101-6030-1301-120	36,48 €
					Pt 1000, class B	
HTF50 PT1000						
HTF50 Pt1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-5211-110	14,21 €
HTF50 Pt1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-5211-120	17,46 €
HTF50 Pt1000 PTFE 1,5M	PTFE	1.5 m	-50...+250 °C	IP65 *	1101-6030-5211-140	38,81 €
HTF50 Pt1000	Glass Fibre	1.5 m	-50...+350 °C	IP54	1101-6030-5211-050	42,28 €
HTF50 Pt1000 PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6030-5231-110	16,75 €
HTF50 Pt1000 Silikon 3M	Silicone	3 m	-50...+180 °C	IP65 *	1101-6030-5231-120	21,23 €
HTF50 Pt1000 PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6030-5251-110	20,12 €
HTF50 Pt1000 Silikon 5M	Silicone	5 m	-50...+180 °C	IP65 *	1101-6030-5251-120	26,24 €
HTF50 Pt1000 PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6030-5281-110	25,19 €
HTF50 Pt1000 Silikon 8M	Silicone	8 m	-50...+180 °C	IP65 *	1101-6030-5281-120	33,76 €
HTF50 Pt1000 PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6030-5301-110	28,57 €
HTF50 Pt1000 Silikon 10M	Silicone	10 m	-50...+180 °C	IP65 *	1101-6030-5301-120	38,77 €
					Pt 1000 A, class A-TGA	
HTF50 PT1000 A						
HTF50 Pt1000A PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-6211-110	20,84 €
HTF50 Pt1000A Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-6211-120	23,94 €
					Ni 1000	
HTF50 NI1000						
HTF50 Ni1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-9211-110	13,81 €
HTF50 Ni1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-9211-120	17,19 €
HTF50 Ni1000 PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6030-9231-110	16,35 €
HTF50 Ni1000 Silikon 3M	Silicone	3 m	-50...+180 °C	IP65 *	1101-6030-9231-120	20,94 €
HTF50 Ni1000 PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6030-9251-110	19,73 €
HTF50 Ni1000 Silikon 5M	Silicone	5 m	-50...+180 °C	IP65 *	1101-6030-9251-120	25,95 €
HTF50 Ni1000 PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6030-9281-110	24,80 €
HTF50 Ni1000 Silikon 8M	Silicone	8 m	-50...+180 °C	IP65 *	1101-6030-9281-120	33,48 €
HTF50 Ni1000 PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6030-9301-110	28,17 €
HTF50 Ni1000 Silikon 10M	Silicone	10 m	-50...+180 °C	IP65 *	1101-6030-9301-120	38,49 €
					Ni 1000 TK 5000	
HTF50 NITK						
HTF50 NiTK PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6031-0211-110	17,41 €
HTF50 NiTK Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6031-0211-120	20,54 €
HTF50 NiTK PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6031-0231-110	19,95 €
HTF50 NiTK Silikon 3M	Silicone	3 m	-50...+150 °C	IP65 *	1101-6031-0231-120	24,31 €
HTF50 NiTK PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6031-0251-110	23,33 €
HTF50 NiTK Silikon 5M	Silicone	5 m	-50...+150 °C	IP65 *	1101-6031-0251-120	29,31 €
HTF50 NiTK PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6031-0281-110	28,40 €
HTF50 NiTK Silikon 8M	Silicone	8 m	-50...+150 °C	IP65 *	1101-6031-0281-120	36,84 €
HTF50 NiTK PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6031-0301-110	31,77 €
HTF50 NiTK Silikon 10M	Silicone	10 m	-50...+150 °C	IP65 *	1101-6031-0301-120	41,85 €
					LM235Z	
HTF50 LM235Z						
HTF50 LM235Z PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6032-1211-110	12,36 €
HTF50 LM235Z Silikon 1,5M	Silicone	1.5 m	-40...+125 °C	IP65 *	1101-6032-1211-120	15,73 €
HTF50 LM235Z PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6032-1231-110	14,89 €
HTF50 LM235Z Silikon 3M	Silicone	3 m	-40...+125 °C	IP65 *	1101-6032-1231-120	19,48 €
HTF50 LM235Z PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6032-1251-110	18,28 €
HTF50 LM235Z Silikon 5M	Silicone	5 m	-40...+125 °C	IP65 *	1101-6032-1251-120	24,49 €
HTF50 LM235Z PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6032-1281-110	23,34 €
HTF50 LM235Z Silikon 8M	Silicone	8 m	-40...+125 °C	IP65 *	1101-6032-1281-120	32,03 €
HTF50 LM235Z PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6032-1301-110	26,72 €
HTF50 LM235Z Silikon 10M	Silicone	10 m	-40...+125 °C	IP65 *	1101-6032-1301-120	37,04 €

Continued on next page ...



THERMASGARD® HTF 50 sleeve sensor / cable temperature sensor (NL = 50 mm)						
Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
HTF50 NTC1.8K					NTC 1.8K	
HTF50 NTC1,8K PVC 1,5M	PVC	1.5 m	-35...+105°C	IP65 *	1101-6031-2211-110	11,68 €
HTF50 NTC1,8K Silikon 1,5M	Silicone	1.5 m	-50...+150°C	IP65 *	1101-6031-2211-120	13,42 €
HTF50 NTC1,8K PVC 3M	PVC	3 m	-35...+105°C	IP65 *	1101-6031-2231-110	14,22 €
HTF50 NTC1,8K Silikon 3M	Silicone	3 m	-50...+150°C	IP65 *	1101-6031-2231-120	17,19 €
HTF50 NTC1,8K PVC 5M	PVC	5 m	-35...+105°C	IP65 *	1101-6031-2251-110	17,60 €
HTF50 NTC1,8K Silikon 5M	Silicone	5 m	-50...+150°C	IP65 *	1101-6031-2251-120	22,20 €
HTF50 NTC1,8K PVC 8M	PVC	8 m	-35...+105°C	IP65 *	1101-6031-2281-110	22,66 €
HTF50 NTC1,8K Silikon 8M	Silicone	8 m	-50...+150°C	IP65 *	1101-6031-2281-120	29,71 €
HTF50 NTC1,8K PVC 10M	PVC	10 m	-35...+105°C	IP65 *	1101-6031-2301-110	26,04 €
HTF50 NTC1,8K Silikon 10M	Silicone	10 m	-50...+150°C	IP65 *	1101-6031-2301-120	34,73 €
HTF50 NTC10K					NTC 10K	
HTF50 NTC10K PVC 1,5M	PVC	1.5 m	-35...+105°C	IP65 *	1101-6031-5211-110	11,68 €
HTF50 NTC10K Silikon 1,5M	Silicone	1.5 m	-50...+150°C	IP65 *	1101-6031-5211-120	13,42 €
HTF50 NTC10K PVC 3M	PVC	3 m	-35...+105°C	IP65 *	1101-6031-5231-110	14,22 €
HTF50 NTC10K Silikon 3M	Silicone	3 m	-50...+150°C	IP65 *	1101-6031-5231-120	17,19 €
HTF50 NTC10K PVC 5M	PVC	5 m	-35...+105°C	IP65 *	1101-6031-5251-110	17,60 €
HTF50 NTC10K Silikon 5M	Silicone	5 m	-50...+150°C	IP65 *	1101-6031-5251-120	22,20 €
HTF50 NTC10K PVC 8M	PVC	8 m	-35...+105°C	IP65 *	1101-6031-5281-110	22,66 €
HTF50 NTC10K Silikon 8M	Silicone	8 m	-50...+150°C	IP65 *	1101-6031-5281-120	29,71 €
HTF50 NTC10K PVC 10M	PVC	10 m	-35...+105°C	IP65 *	1101-6031-5301-110	26,04 €
HTF50 NTC10K Silikon 10M	Silicone	10 m	-50...+150°C	IP65 *	1101-6031-5301-120	34,73 €
HTF50 NTC20K					NTC 20K	
HTF50 NTC20K PVC 1,5M	PVC	1.5 m	-35...+105°C	IP65 *	1101-6031-6211-110	11,68 €
HTF50 NTC20K Silikon 1,5M	Silicone	1.5 m	-50...+150°C	IP65 *	1101-6031-6211-120	13,42 €
HTF50 NTC20K PVC 3M	PVC	3 m	-35...+105°C	IP65 *	1101-6031-6231-110	14,22 €
HTF50 NTC20K Silikon 3M	Silicone	3 m	-50...+150°C	IP65 *	1101-6031-6231-120	17,19 €
HTF50 NTC20K PVC 5M	PVC	5 m	-35...+105°C	IP65 *	1101-6031-6251-110	17,60 €
HTF50 NTC20K Silikon 5M	Silicone	5 m	-50...+150°C	IP65 *	1101-6031-6251-120	22,20 €
HTF50 NTC20K PVC 8M	PVC	8 m	-35...+105°C	IP65 *	1101-6031-6281-110	22,66 €
HTF50 NTC20K Silikon 8M	Silicone	8 m	-50...+150°C	IP65 *	1101-6031-6281-120	29,71 €
HTF50 NTC20K PVC 10M	PVC	10 m	-35...+105°C	IP65 *	1101-6031-6301-110	26,04 €
HTF50 NTC20K Silikon 10M	Silicone	10 m	-50...+150°C	IP65 *	1101-6031-6301-120	34,73 €
Extra charge:	* Protection type IP68 (Sensor sleeve watertight compound-filled) Other sensors optional Cable length (KL) 3 m, 5 m, 8 m, 10 m (standard lengths) Connection type 4-wire (4-conductor)					3,00 € on request on request on request
For special orders please specify: (possible for 25 or more pieces)	Type sensor length (NL), sensor, cable material, connection type, cable length (KL), protection type e.g. HTF-30mm, Pt1000, PVC, 2-wire, 10m, IP68; HTF-50mm, Ni1000 TK5000, silicon, 4-wire, 5m, IP65					

HTF 50
(NL = 50 mm)
with PVC / silicone cable

HTF 50
(NL = 50 mm)
with glass fibre cable



IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection



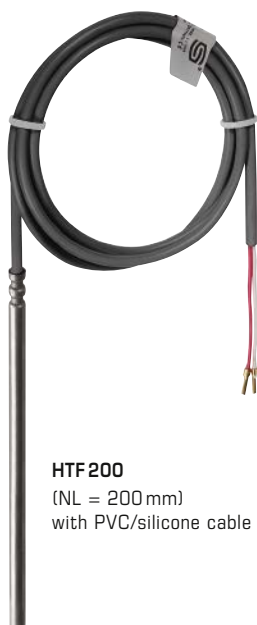
IP 54 (optional)
with glass fibre cable



Sleeve sensor / cable temperature sensor
 duct / immersion / screw-in temperature sensor,
 with passive output

THERMASGARD® HTF 200 sleeve sensor / cable temperature sensor (NL = 200 mm)

Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
HTF200 PT100					Pt 100, class B	
HTF200 Pt100 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-1211-110	17,96 €
HTF200 Pt100 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-1211-120	21,33 €
HTF200 PT1000					Pt 1000, class B	
HTF200 Pt1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-5211-110	17,96 €
HTF200 Pt1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-5211-120	21,33 €
HTF200 PT1000 A					Pt 1000 A, class A-TGA	
HTF200 Pt1000A PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-6211-110	24,44 €
HTF200 Pt1000A Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-6211-120	27,83 €
HTF200 Ni1000					Ni 1000	
HTF200 Ni1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-9211-110	18,31 €
HTF200 Ni1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-9211-120	21,33 €
HTF200 NiTK					Ni 1000 TK 5000	
HTF200 NiTK PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-0211-110	19,20 €
HTF200 NiTK Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-0211-120	22,23 €
HTF200 LM235Z					LM 235 Z	
HTF200 LM235Z PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6092-1211-110	18,52 €
HTF200 LM235Z Silikon 1,5M	Silicone	1.5 m	-40...+125 °C	IP65 *	1101-6092-1211-120	21,90 €
HTF200 NTC1,8K					NTC 1.8K	
HTF200 NTC1,8K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-2211-110	17,96 €
HTF200 NTC1,8K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-2211-120	21,33 €
HTF200 NTC10K					NTC 10K	
HTF200 NTC10K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-5211-110	17,96 €
HTF200 NTC10K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-5211-120	21,33 €
HTF200 NTC20K					NTC 20K	
HTF200 NTC20K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-6211-110	17,96 €
HTF200 NTC20K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-6211-120	21,33 €
Extra charge:	* Protection type IP68 (Sensor sleeve watertight compound-filled) Other sensors optional Cable length (KL) 3 m, 5 m, 8 m, 10 m (standard lengths) Connection type 4-wire (4-conductor)					3,00 € on request on request on request
For special orders please specify: (possible for 25 or more pieces)	Type sensor length (NL), sensor, cable material, connection type, cable length (KL), protection type e.g. HTF-200 mm, Pt1000, PVC, 2-wire, 10 m, IP68; HTF-400 mm, Ni1000 TK5000, silicon, 4-wire, 5 m, IP65					



HTF 200
 (NL = 200 mm)
 with PVC/silicone cable



IP65 (standard)
 humidity-tight



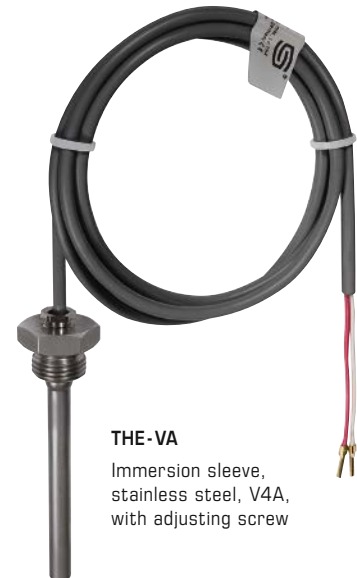
IP68 (optional)
 water-tight
Perfect Sensor Protection

THERMASGARD® HTF 50 accessory as immersion / screw-in sensor temperature sensor (ESTF)				
Type / WG01	Description		Item No.	Price
THE- ms / xx				
	Immersion sleeve, brass, nickel-plated, Ø 9 mm, inner diameter of socket Ø=5.2 mm, with adjusting screw M12 x1.5			
THE-MS 50MM	$p_{max} = 16 \text{ bar}$, $T_{max} = +130 \text{ °C}$	EL = 50 mm	7100-0011-6010-002	9,22 €
THE-MS 100MM	$p_{max} = 16 \text{ bar}$, $T_{max} = +130 \text{ °C}$	EL = 100 mm	7100-0011-6020-002	9,96 €
THE-MS 150MM	$p_{max} = 16 \text{ bar}$, $T_{max} = +130 \text{ °C}$	EL = 150 mm	7100-0011-6030-002	10,33 €
THE-MS 200MM	$p_{max} = 16 \text{ bar}$, $T_{max} = +130 \text{ °C}$	EL = 200 mm	7100-0011-6040-002	11,06 €
THE-MS 250MM	$p_{max} = 16 \text{ bar}$, $T_{max} = +130 \text{ °C}$	EL = 250 mm	7100-0011-6050-002	12,39 €
THE- VA / xx				
	Immersion sleeve, stainless steel, V4A (1.4571), Ø 9 mm, inner diameter of socket Ø=5.2 mm, with adjusting screw M12 x1.5			
THE-VA 50MM	$p_{max} = 40 \text{ bar}$, $T_{max} = +200 \text{ °C}$	EL = 50 mm	7100-0012-6010-002	18,25 €
THE-VA 100MM	$p_{max} = 40 \text{ bar}$, $T_{max} = +200 \text{ °C}$	EL = 100 mm	7100-0012-6020-002	20,16 €
THE-VA 150MM	$p_{max} = 40 \text{ bar}$, $T_{max} = +200 \text{ °C}$	EL = 150 mm	7100-0012-6030-002	21,65 €
THE-VA 200MM	$p_{max} = 40 \text{ bar}$, $T_{max} = +200 \text{ °C}$	EL = 200 mm	7100-0012-6040-002	22,83 €
THE-VA 250MM	$p_{max} = 40 \text{ bar}$, $T_{max} = +200 \text{ °C}$	EL = 250 mm	7100-0012-6050-002	28,38 €
THE-VA 300MM	$p_{max} = 40 \text{ bar}$, $T_{max} = +200 \text{ °C}$	EL = 300 mm	7100-0012-6060-002	29,65 €
THE-VA 400MM	$p_{max} = 40 \text{ bar}$, $T_{max} = +200 \text{ °C}$	EL = 400 mm	7100-0012-6080-002	30,61 €
xx = (EL)	Other installation lengths on request			

HTF 50
(NL = 50 mm)
with THE immersion sleeve
as immersion / screw-in temperature sensor



THE- ms
Immersion sleeve,
brass, nickel-plated,
with adjusting screw



THE- VA
Immersion sleeve,
stainless steel, V4A,
with adjusting screw

MF-06-K
Mounting flange,
plastic
(optional)



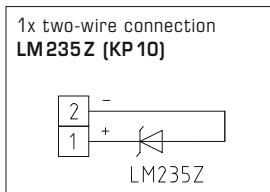
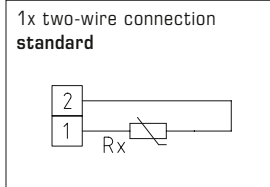
THERMASGARD® HTF 50 accessories (standard)				
THERMASGARD® HTF 200 accessories (standard)				
Type / WG01	Description	T_{max}	Item No.	Price
MF				
MF-06-K	Mounting flange plastic, 56.8 x 84.3 mm, Ø 6.2 mm tube gland (not included in scope of delivery)	+100 °C	7100-0030-1000-000	5,40 €
Note:	For further information see last chapter!			

Surface contact temperature sensors /
surface temperature sensors,
with passive output

Small surface contact resistance thermometer in aluminium enclosure (cable sensor).
The surface sensor **THERMASGARD® OFTF** is used for temperature detection on flat or slightly convex surfaces, for instance for surface temperature measurement at windows, for monitoring formation of condensate, or as heating surface sensor, e.g. at windows or walls.

TECHNICAL DATA

Measuring range:	-30...+105 °C
Sensors / output:	see table, passive (Perfect Sensor Protection with IP68)
Connection type:	2-wire connection
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Process connection:	attachment to the surface to be measured through fixing hole in the sensor head or by suitable adhesive
Protective sleeve:	aluminium
Dimensions:	8 x 8 x 50 mm
Connecting cable:	PVC; 1.5 m, LiYY, 2 x 0.25 mm ² , ends stripped with wire end sleeves (optional with silicone cable SiHF, up to +180 °C)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Permissible air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional)



IP65 (standard)
humidity-tight



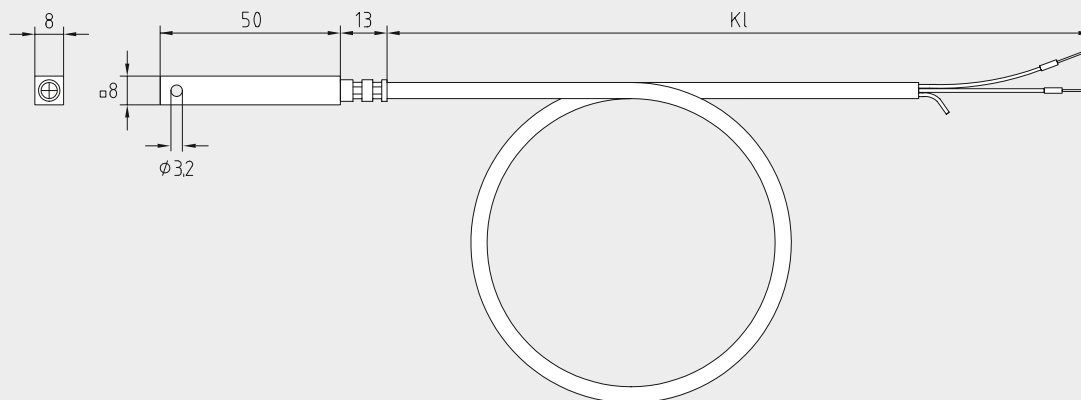
IP68 (optional)
water-tight
Perfect Sensor Protection

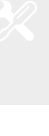
High-performance encapsulation against
vibration, mechanical stress and humidity



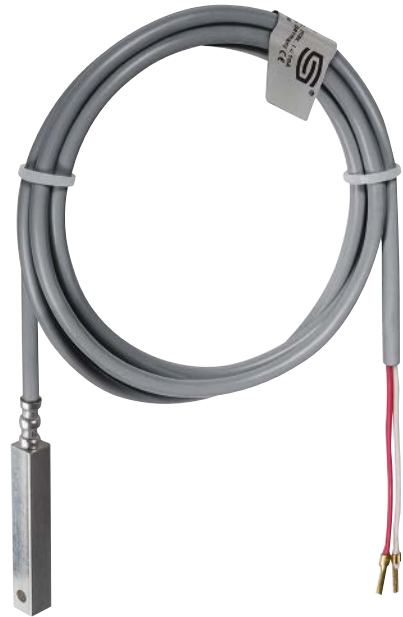
Dimensional drawing

OFTF





OUTF



THERMASGARD® OUTF Surface contact temperature sensors / surface temperature sensors			
Type / WG03	Sensor / output	Item No.	Price
OUTF		IP65	
OUTF Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6010-1211-110	32,62 €
OUTF Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6010-5211-110	32,62 €
OUTF Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6010-9211-110	34,51 €
OUTF NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-6011-0211-110	38,16 €
OUTF LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6012-1211-110	33,25 €
OUTF NTC1,8K PVC 1,5M	NTC 1.8K	1101-6011-2211-110	31,37 €
OUTF NTC10K PVC 1,5M	NTC 10K	1101-6011-5211-110	31,37 €
OUTF NTC20K PVC 1,5M	NTC 20K	1101-6011-6211-110	31,37 €
Extra charge:	Protection type IP68 (sensor sleeve watertight compound-filled) 2-wire connecting leads (PVC/silicone) per running metre 4-wire connecting leads (PVC/silicone) per running metre	on request on request	3,00 €
For special orders please specify:	Type, sensor type, cable length e.g. OUTF Pt100, 3m; OUTF Pt100 1 / 3 DIN, 4m; OUTF KTY 81-210, 6m		

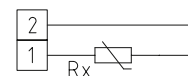
Surface contact temperature sensors / tube contact temperature sensors, including strap, with passive output

THERMASGARD® ALTF 1 surface contact sensors are electric contact thermometers and are used for measuring surface temperatures of solids, having at least one so-called contact area that is brought into contact with the surface to be measured. The surface contact temperature sensor ALTF 1 with connection cable and passive output determines the temperature of a medium flowing inside a pipe (e.g. water temperature) via the surface temperature. ALTF 1 is a tube contact resistance thermometer with strap and axial feeler tube for measuring temperature on piping and tubes (e.g. cold-water and hot-water), or at heating sections for heating system control.

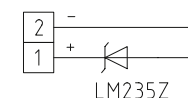
TECHNICAL DATA

Measuring range:	-35...+105 °C PVC -35...+180 °C silicone (T_{max} NTC = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (optional also with 2 sensors) (Perfect Sensor Protection with IP68)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connecting cable:	PVC; 1.5 m, LiYY, 2 x 0.25 mm ² or silicone, SiHF, 2 x 0.25 mm ² ends stripped, with wire end sleeves
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	pipe feeder made of stainless steel V4A (1.4571), Ø = 6 mm, L = 50 mm
Process connection:	with endless strap with metal tightener (included in the scope of delivery) Ø = 13-92 mm (¼ - 3"); length 300 mm
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional)

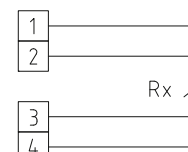
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP 10)



1x four-wire connection
(optional)



IP65 (standard)
humidity-tight



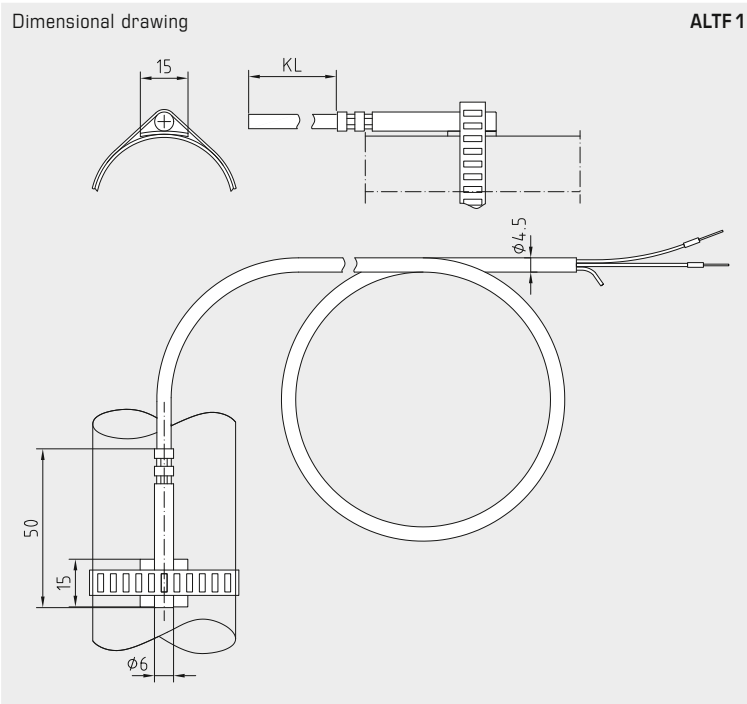
IP68 (optional)
water-tight
Perfect Sensor Protection

THERMASGARD® ALTF 1 Surface contact temperature sensors / tube contact temperature sensors (PVC)

Type / WG03	Sensor / Output	Item No.	Price
ALTF 1 xx PVC		IP65, PVC	
ALTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6020-1211-110	17,86 €
ALTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6020-5211-110	17,86 €
ALTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6020-9211-110	18,52 €
ALTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6021-0211-110	19,20 €
ALTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6022-1211-110	18,86 €
ALTF1 NTC1,8K PVC 1,5M	NTC 1.8K	1101-6021-2211-110	18,31 €
ALTF1 NTC10K PVC 1,5M	NTC 10K	1101-6021-5211-110	18,31 €
ALTF1 NTC20K PVC 1,5M	NTC 20K	1101-6021-6211-110	18,31 €
Note:	including strap, connecting cable PVC (KL = 1.5 m)		
Extra charge:	Protection type IP68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (PVC) Other sensors optional	on request on request	3,00 €

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	2,98 €
--------------	--------------------------------------	--------------------	---------------



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTF 1 Surface contact temperature sensors / tube contact temperature sensors (silicone)			
Type / WG03	Sensor / Output	Item No.	Price
ALTF 1 xx SILIKON		IP 65, silicone	
ALTF1 Pt100 Silikon 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6020-1211-120	18,52 €
ALTF1 Pt1000 Silikon 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6020-5211-120	18,52 €
ALTF1 Ni1000 Silikon 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6020-9211-120	19,77 €
ALTF1 NiTK Silikon 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6021-0211-120	20,78 €
ALTF1 LM235Z Silikon 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6022-1211-120	19,20 €
ALTF1 NTC1,8K Silikon 1,5M	NTC 1.8K	1101-6021-2211-120	19,09 €
ALTF1 NTC10K Silikon 1,5M	NTC 10K	1101-6021-5211-120	19,09 €
ALTF1 NTC20K Silikon 1,5M	NTC 20K	1101-6021-6211-120	19,09 €
Note:	including strap, connecting cable silicone (KL = 1.5 m)		
Extra charge:	Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone) Other sensors optional	on request on request	3,00 €

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	2,98 €

Surface contact temperature sensors /
tube contact temperature sensors, including strap,
with passive output

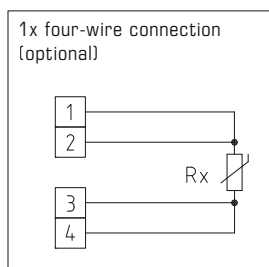
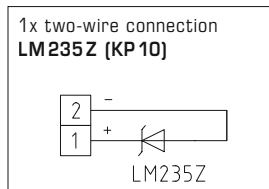
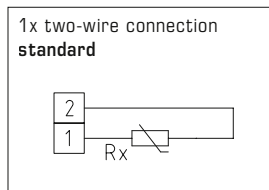
THERMASGARD® ALTF 2 is a tube contact resistance thermometer with passive output, in an impact-resistant plastic housing with quick-locking screws, incl.strap.

THERMASGARD® ALTF 02 is a cost-saving tube contact resistance thermometer with passive output, in an impact-resistant plastic housing with snap-on lid, incl.strap.

Surface contact sensors are electric contact thermometers used for surface temperature measurement on solids, having at least one so-called contact area that is brought into contact with the surface to be measured. This surface contact temperature sensor measures the temperature of a medium flowing inside a pipe (e.g. the water temperature). This tube surface sensor is used for measuring temperature on piping and tubes (e.g. cold-water and hot-water), wor on heating sections for heating system control.

TECHNICAL DATA

Measuring range:	-30...+110 °C
Sensors / output:	see table, passive (Perfect Sensor Protection) (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100/PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), ALTF 02 with snap-on lid, ALTF 2 with quick-locking screws (slotted / Phillips head combination)
Dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Process connection:	with endless strap with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (1/4 - 3"), length L = 300 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	ALTF 02 IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) ALTF 2 IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)



THERMASGARD® ALTF 02 Surface contact temperature sensors / tube contact temperature sensors, *Standard* including strap, with snap-on lid

Type / WG03B	Sensor / Output	Item No.	Price
ALTF 02		IP 54	
ALTF02 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1010-1003-000	19,09 €
ALTF02 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1010-5001-000	19,09 €
ALTF02 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1010-9001-000	19,42 €
ALTF02 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-1011-0001-000	22,23 €
ALTF02 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1012-1001-000	19,65 €
ALTF02 NTC1,8K	NTC 1.8K	1101-1011-2001-000	18,52 €
ALTF02 NTC10K	NTC 10K	1101-1011-5001-000	18,52 €
ALTF02 NTC20K	NTC 20K	1101-1011-6001-000	18,52 €
Extra charge:	two or other sensors optional cable connection with M12 connector according to DIN EN 61076-2-101		on request on request

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	2,98 €
--------------	--------------------------------------	--------------------	---------------

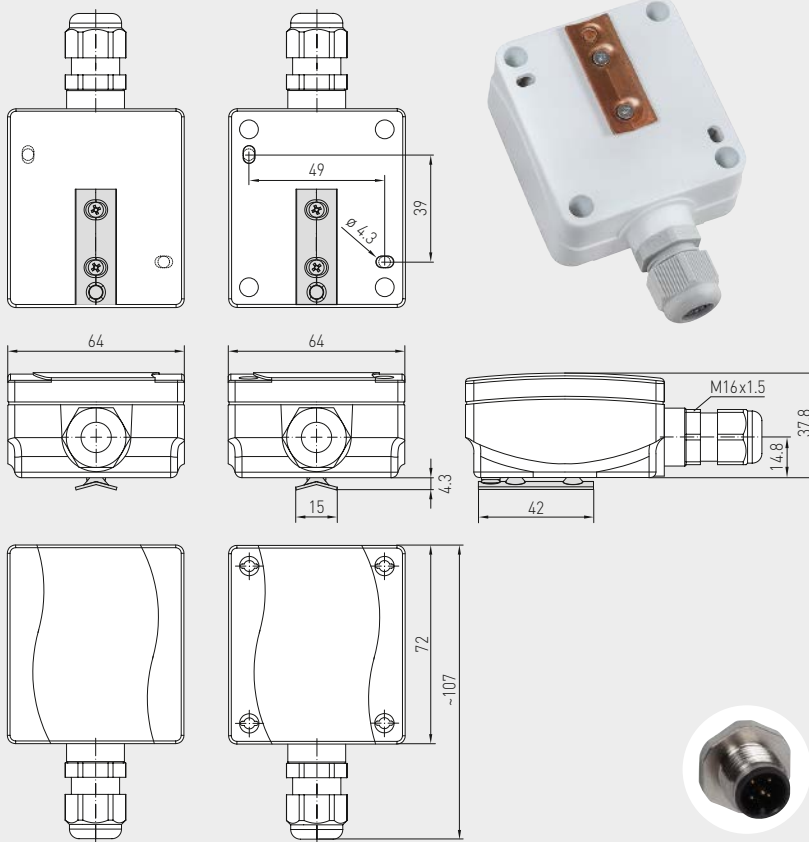


S+S REGELTECHNIK

THERMASGARD® ALTF 2
THERMASGARD® ALTF 02

Surface contact temperature sensors /
tube contact temperature sensors, including strap,
with passive output

Dimensional drawing



ALTF 2
ALTF 02

with snap-on lid

with quick-locking
screws

M12 connector
(optional on request)

ALTF 02
with snap-on lid
(IP54)



ALTF 2
with quick-locking
screws
(IP65)



High-performance encapsulation against
vibration, mechanical stress and humidity



THERMASGARD® ALTF 2 Surface contact temperature sensors / tube contact temperature sensors, *Premium*
including strap, with quick-locking screws

Type / WG03	Sensor / Output	Item No.	Price
ALTF 2		IP 65	
ALTF2 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1020-1003-000	22,17 €
ALTF2 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1020-5001-000	22,80 €
ALTF2 Pt1000A	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-1020-6003-000	25,93 €
ALTF2 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1020-9001-000	22,48 €
ALTF2 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1021-0001-000	26,35 €
ALTF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1022-1001-000	21,75 €
ALTF2 NTC1,8K	NTC 1.8K	1101-1021-2001-000	18,92 €
ALTF2 NTC10K	NTC 10K	1101-1021-5001-000	18,92 €
ALTF2 NTC20K	NTC 20K	1101-1021-6001-000	18,92 €
Extra charge:	two or other sensors optional cable connection with M12 connector according to DIN EN 61076-2-101	on request on request	

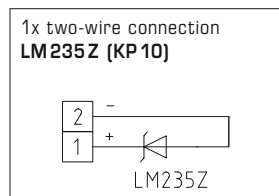
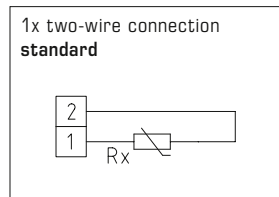
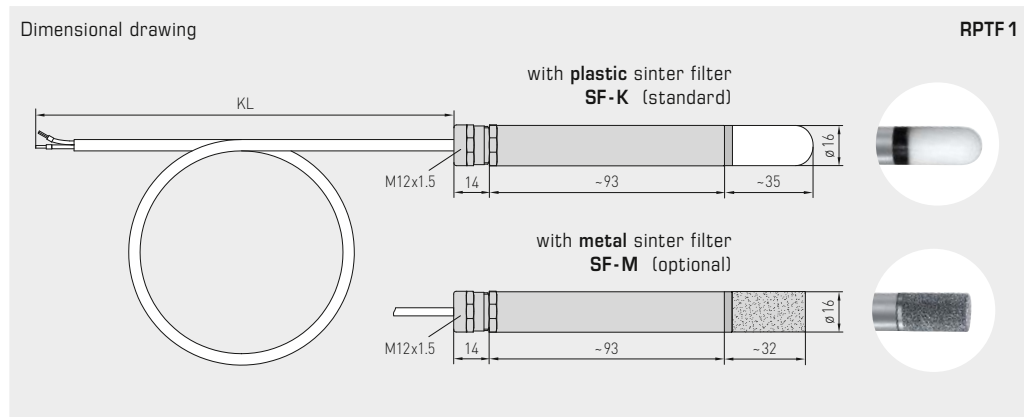
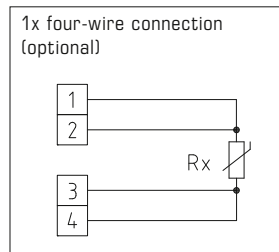
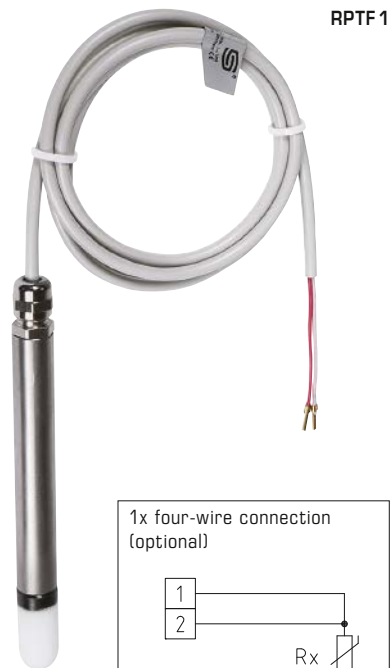
ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	2,98 €
--------------	--------------------------------------	--------------------	---------------

**Pendulum room temperature sensors
with passive output**

Resistance thermometer **THERMASGARD® RPTF 1** with passive output is specifically used for temperature detection in larger rooms and halls. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, excellent and room-representative measuring results are achieved as ambient air of the room is steadily washing around the sensor.

TECHNICAL DATA	
Measuring range:	-5...+60 °C
Sensors / output:	see table, passive (optional also with two sensors)
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm ² , ends stripped with wire end sleeves KL = approx. 1.5 m (other lengths optional)
Protective tube:	stainless steel V2A (1.4301), Ø=16 mm, NL = 142 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95% r. H.
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)



THERMASGARD® RPTF 1 Pendulum room temperature sensors (with metal sleeve)

Type / WG03	Sensor / Output	Item No.	Price
RPTF 1		IP 65	
RPTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6060-1211-010	51,75 €
RPTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6060-5211-010	54,46 €
RPTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-6060-9211-010	53,55 €
RPTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-6061-0211-010	56,92 €
RPTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-6062-1211-110	51,88 €
RPTF1 NTC1,8K PVC 1,5M	NTC 1.8K	1101-6061-2211-010	56,70 €
RPTF1 NTC10K PVC 1,5M	NTC 10K	1101-6061-5211-010	56,70 €
RPTF1 NTC20K PVC 1,5M	NTC 20K	1101-6061-6211-010	56,70 €

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
Extra charge:	2-wire connecting leads, per running meter (PVC) 4-wire connecting leads, per running meter (PVC)		on request on request
For special orders please specify:	Type, sensor type and cable length e.g. RPTF1 Pt100, 3m; RPTF1 Pt1000, 4m; RPTF1 KTY 81-210, 6m		

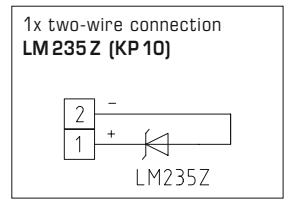
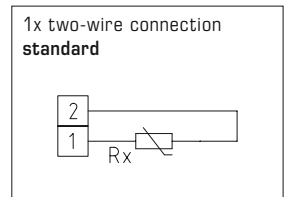
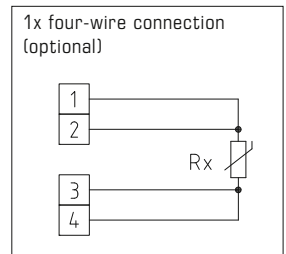
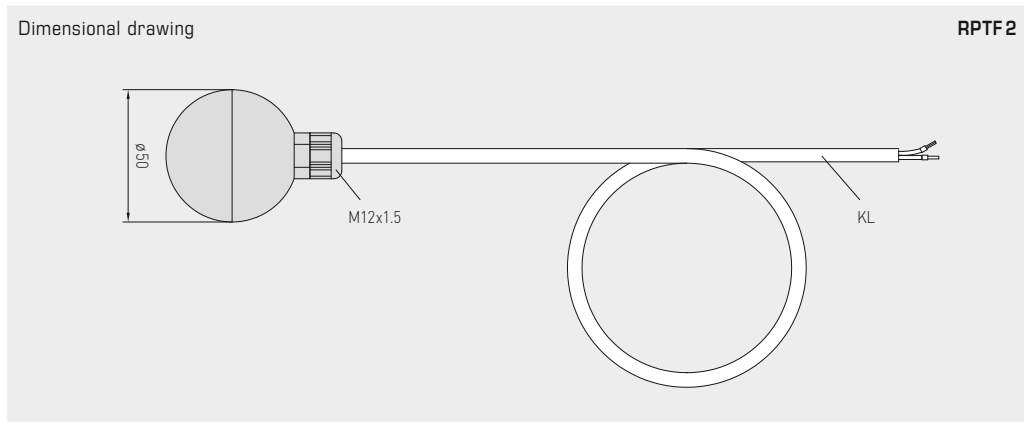


Resistance thermometer **THERMASGARD® RPTF 2** with passive output is specifically used for temperature detection in larger rooms and halls, as dark radiation sensor for example. The pendulum room sensor RPTF-2 (globe thermometer) determines the effective portion of active radiation or also the effective radiant heat at the measured location. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, an excellent and room-representative measuring result is achieved. The globe temperature is determined to take heat radiation into consideration and to estimate the degree of thermal comfort (operative room temperature). The operative room temperature describes the coaction of heat radiation and heat convection (the ratio of globe temperature / air temperature is approx. 70% / 30%).

TECHNICAL DATA	
Measuring range:	-5...+60 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Globe:	plastic, colour black, Ø = 50 mm
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm ² , ends stripped with wire end sleeves KL = approx. 1.5 m (other lengths optional)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95% r. H.
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)



RPTF 2



THERMASGARD® RPTF 2 Pendulum room temperature sensors (with globe)			
Type / WG03	Sensor / Output	Item No.	Price
RPTF 2		IP 65	
RPTF2 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6070-1211-010	51,88 €
RPTF2 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6070-5211-010	54,56 €
RPTF2 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-6070-9211-010	53,65 €
RPTF2 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-6071-0211-010	57,02 €
RPTF2 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV/K; 2.73V at 0 °C), KP10	1101-6072-1211-010	51,98 €
RPTF2 NTC1,8K PVC 1,5M	NTC 1.8K	1101-6071-2211-010	56,81 €
RPTF2 NTC10K PVC 1,5M	NTC 10K	1101-6071-5211-010	56,81 €
RPTF2 NTC20K PVC 1,5M	NTC 20K	1101-6071-6211-010	56,81 €
Extra charge::	2-wire connecting leads, per running meter (PVC) 4-wire connecting leads, per running meter (PVC)	on request on request	
For special orders please specify:	Type, sensor type and cable length e. g. RPTF2 Pt100, 3m; RPTF2 Pt1000, 4m; RPTF2 KTY 81-210, 6m		

On-wall radiation temperature sensors with passive output

ASTF

Resistance thermometer **THERMASGARD® ASTF** with passive output, terminal box housing made of impact-resistant plastic and housing cover with quick-locking screws. This radiation sensor is specifically designed for temperature detection in wet areas or in larger rooms or halls. The on-wall radiation temperature sensor ASTF determines the effective portion of active radiation or the effective radiant heat at the measured location. Due to the measuring method employed by the dark radiation temperature sensor, excellent and room-representative measuring results are achieved.

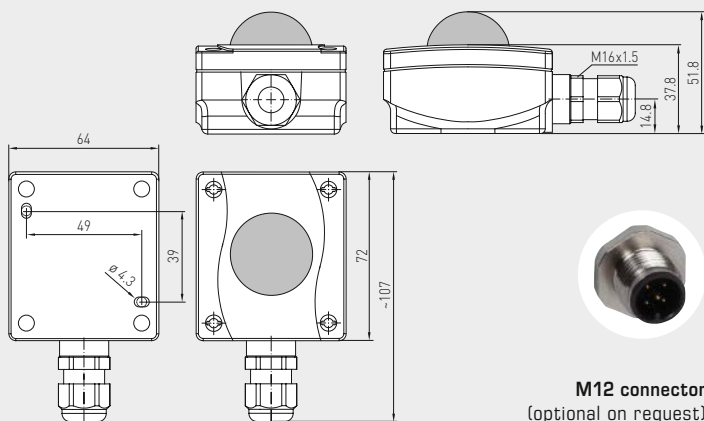


TECHNICAL DATA

Measuring range:	-30 ...+75 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	by screws
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), semi-globe: black
Housing dimensions:	72 x 64 x 37.8 (51.8) mm (Tyr 1)
Cable connection:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % r. H.
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

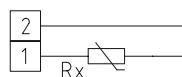
Dimensional drawing

ASTF

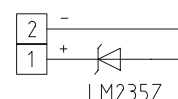


M12 connector
(optional on request)

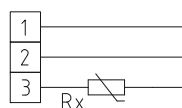
1x two-wire connection standard



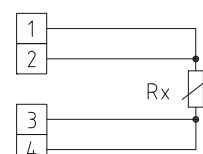
1x two-wire connection LM235Z (KP 10)



1x three-wire connection (optional)



1x four-wire connection (optional)



THERMASGARD® ASTF On-wall radiation temperature sensors

Type / WG03	Sensor / Output	Item No.	Price
ASTF		IP65	
ASTF Pt100	Pt100 (according to DIN EN 60 751, B)	1101-1060-1003-000	62,16 €
ASTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1060-5001-000	62,16 €
ASTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1060-9001-000	63,25 €
ASTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG- Ni1000	1101-1061-0001-000	65,34 €
ASTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1062-1001-000	61,01 €
ASTF NTC1,8K	NTC 1.8K	1101-1061-2001-000	65,34 €
ASTF NTC10K	NTC 10K	1101-1061-5001-000	65,34 €
ASTF NTC20K	NTC 20K	1101-1061-6001-000	65,34 €
Extra charge:	two or other sensors optional cable connection with M12 connector according to DIN EN 61076-2-101		on request on request

Resistance thermometer **THERMASGARD® RSTF** with passive output in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, specifically used for temperature detection in larger rooms. The room radiation temperature sensor RSTF determines the effective portion of active radiation or the effective radiant heat at the measured location. Due to the measuring method employed by the dark radiation temperature sensor, an excellent and room-representative measuring result is achieved. In addition there is an independent passive output available to determinate the reference temperature.

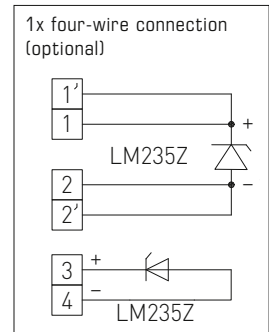
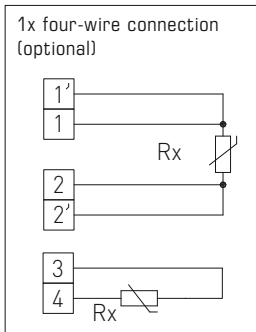
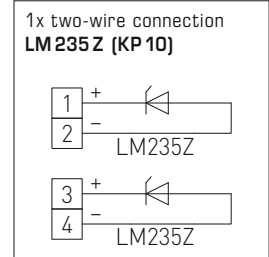
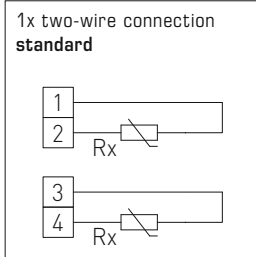
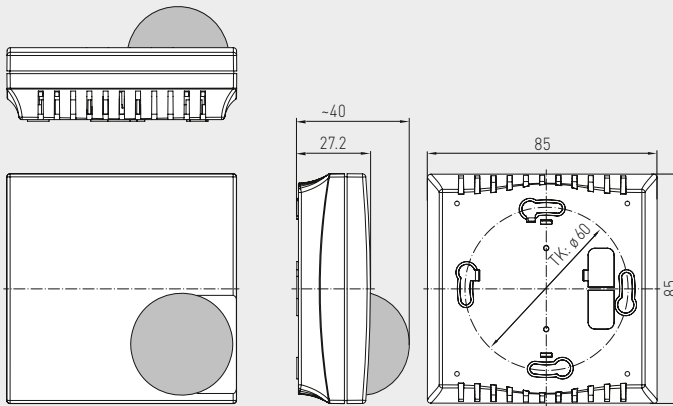


TECHNICAL DATA

Measuring range:	-30...+75 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥100 MΩ, at +20 °C (500 V DC)
Process connection:	by screws
Housing:	plastic, material ABS Housing: pure white (similar to RAL 9010), Semi-globe: black
Dimensions:	85 x 85 x 27 (40) mm (Balduur 1)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Humidity:	< 95% r. H.
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60529)

Dimensional drawing

RSTF



THERMASGARD® RSTF Room radiation temperature sensors

Type / WG03	Sensor / Output	Item No.	Price
RSTF		IP30	
RSTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40C0-1003-000	61,01 €
RSTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40C0-5001-000	61,01 €
RSTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40C0-9001-000	63,25 €
RSTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40C1-0001-000	65,04 €
RSTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40C2-1001-000	61,01 €
RSTF NTC1,8K	NTC 1.8K	1101-40C1-2001-000	64,37 €
RSTF NTC10K	NTC 10K	1101-40C1-5001-000	64,37 €
RSTF NTC20K	NTC 20K	1101-40C1-6001-000	64,37 €
Extra charge:	two or other sensors optional	on request	



Temperature

ACTIVE SENSORS

Our active **THERMASGARD®** temperature sensors are easy to install, versatile and meet all requirements important to you. Adjustable and calibratable temperature transmitters with self-diagnostics provide additional flexibility.

APPLICATION RANGE

- > Hospitals, museums, schools, hotels, public authorities, institutes and banks
- > Sports arenas, holiday centers and movie theaters
- > Car dealers
- > Ships and shipyards
- > Industrial plants and assembly halls
- > Power plants and refineries



THERMASGARD®

228 – 295

Room sensors, room control units

RTM 1	Room temperature measuring transducer	231
FSTM	Room temperature measuring transducer, in-wall	233
FSTM-P	Room control units, in-wall	233
RPTM 1	Pendulum room temperature measuring transducer	291
RPTM 2	Pendulum room temperature measuring transducer	293
HSM	Top hat rail measuring transducer	295

Outdoor sensors, on-wall sensors

ATM 2	Outside temperature measuring transducer	237
ATM 2-VA	Outside temperature measuring transducer (Stainless steel housing Tyr 2E)	NEW 237

Cable sensors, surface-contact sensors

HFTM	Sleeve sensor with cable, temperature measuring transducer	275
HFTM-VA	Sleeve sensor with cable, temperature measuring transducer (Stainless steel housing Tyr 2E)	NEW 275
ALTM 1	Surface-contact temperature measuring transducer	281
ALTM 2	Surface-contact temperature measuring transducer with cable	285
ALTM 2-VA	Surface-contact temperature measuring transducer with cable (Stainless steel housing Tyr 2E)	NEW 285

Duct / immersion / screw-in sensors

TM 43	Duct / immersion / screw-in temperature measuring transducer	245
TM 65	Duct / immersion / screw-in temperature measuring transducer	245
TM 54	Duct / immersion / screw-in temperature measuring transducer	255
RGTM 2	Smoke gas temperature measuring transducer, screw-in sensor	269
RGTM 1	Smoke gas temperature measuring transducer, duct sensor	263
MWTM	Mean-value temperature measuring transducer, rod sensor	251
MWTM-SD	Mean-value temperature measuring transducer, rod sensor	251

Immersion sleeves and accessories

see chapter Accessories	604
-------------------------	------------

Room temperature measuring transducers, calibratable, with multi-range switching and active output

Calibratable room temperature measuring transducer **THERMASGARD® RTM 1** with continuous output, with or without optional display for displaying the actual temperature in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, or in housing made of stainless steel (top and bottom part are of stainless steel, the lid is screwed on), vandal-proof version e.g. for schools, military barracks, and public buildings. This room temperature transmitter / residential room temperature sensor is used to detect / display temperatures in closed dry rooms, in apartments, in offices, supermarkets and business facilities.

RTM 1



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10%) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Sensor:	Pt1000, DIN EN 60751, class B
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) operating range -30...+70 °C with manual zero point correction (± 10K)
Deviation, temperature:	typically ± 0.2K at +25 °C
Output:	0 - 10V or 4...20mA
Ambient temperature:	measuring transducer -30...+70 °C
Connection type:	2- or 3-wire connection
Process connection:	by screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), (optional stainless steel) V2A (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) 75 x 75 x 25 mm (stainless steel)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Installation:	wall mounting or on in-wall flush box Ø55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line display with illumination , cutout 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit) see beginning of this chapter!

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20 °C...+150 °C	ON	ON	ON
-50 °C... +50 °C	OFF	ON	ON
-20 °C... +80 °C	ON	OFF	ON
-30 °C... +60 °C	OFF	OFF	ON
0 °C... +40 °C	ON	ON	OFF
0 °C... +50 °C*	OFF	ON	OFF
0 °C...+100 °C	ON	OFF	OFF
0 °C...+150 °C	OFF	OFF	OFF

* (default / fixed with display)

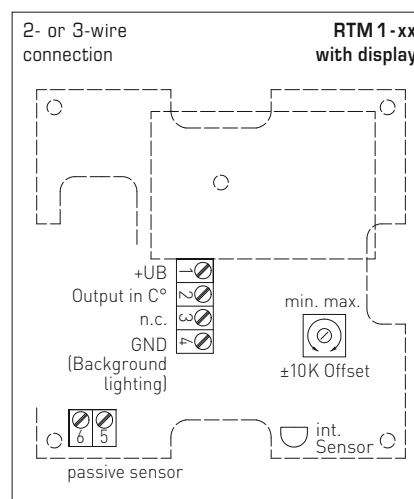
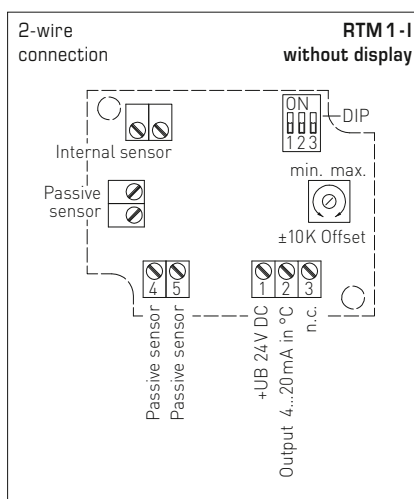
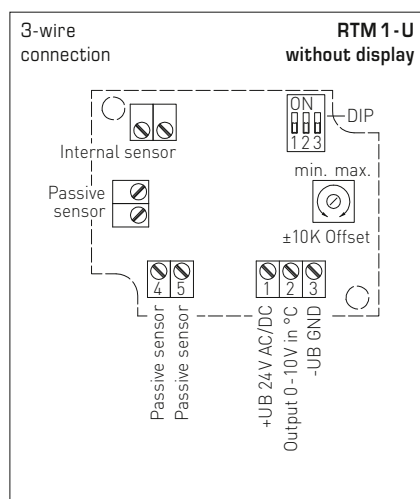
Display and internal diagnostics

RTM 1-U-Display
RTM 1-I-Display

Standard: 22.0 °C

Sensor breakage: 99.99 °C Err 1

Sensor short circuit: -9.99 °C Err 2

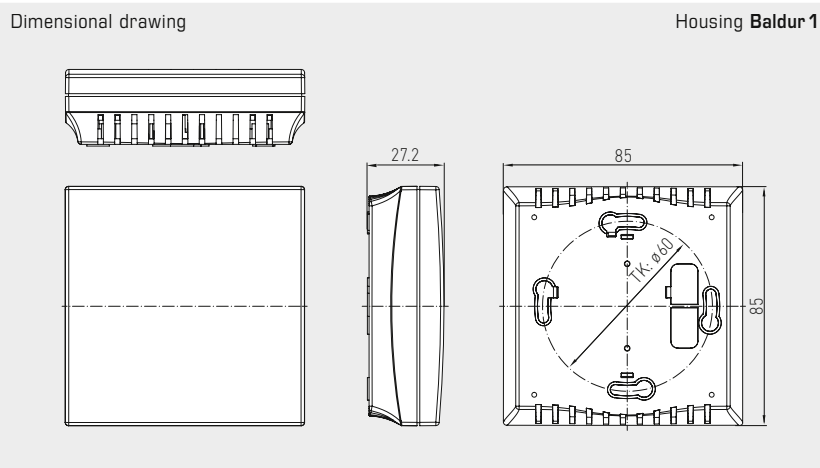




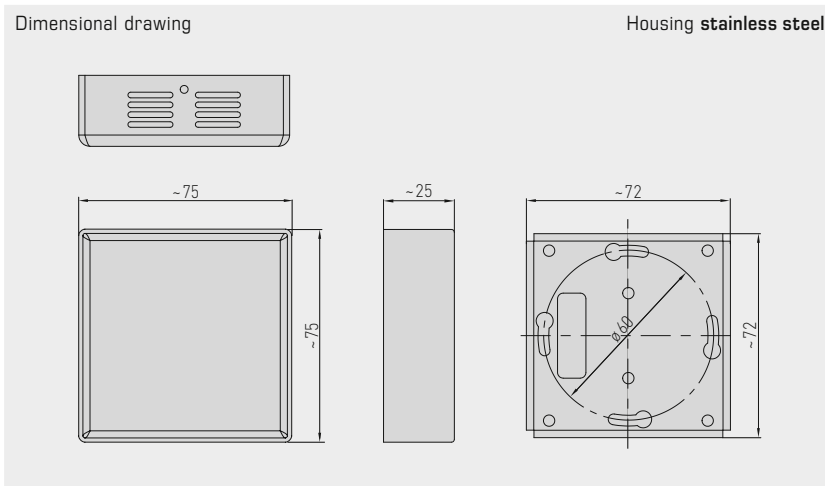
S+S REGELTECHNIK

THERMASGARD® RTM 1

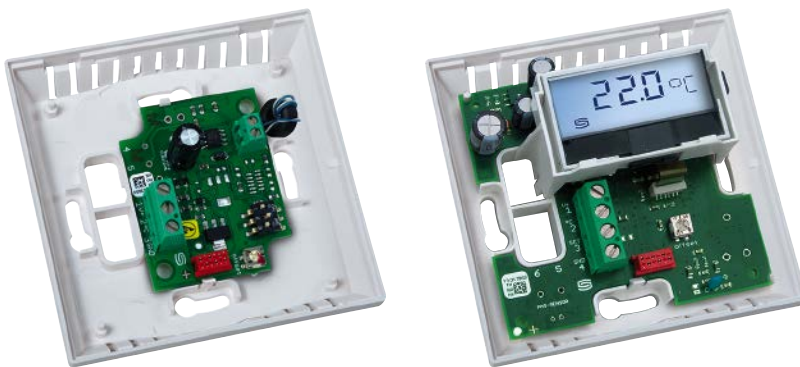
Room temperature measuring transducers, calibratable, with multi-range switching and active output



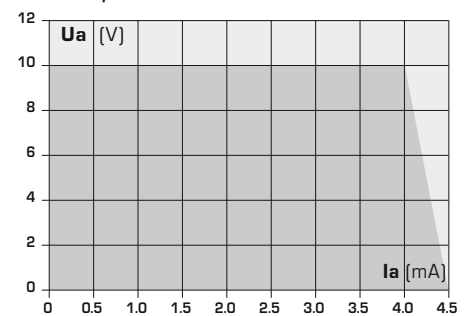
RTM 1 with display



RTM 1 (stainless steel)



Dependency of output voltage on output current



THERMASGARD® RTM 1 Room temperature measuring transducers						
Type / WG01	Sensor	Output	Features	Display	Item No.	Price
RTM1 - U				IP 30, U-variant		
RTM1-U	Pt1000	0 - 10 V	-		1101-41A1-0000-200	67,54 €
RTM1-U LCD	Pt1000	0 - 10 V	Display*	■	1101-41A1-2000-200	106,54 €
RTM1-U VA	Pt1000	0 - 10 V	Stainless steel housing V2A (1.4301)		1101-4151-0000-200	175,70 €
RTM1 - I				IP 30, I-variant		
RTM1-I	Pt1000	4...20 mA	-		1101-41A2-0000-200	67,54 €
RTM1-I LCD	Pt1000	4...20 mA	Display*	■	1101-41A2-2000-200	106,54 €
RTM1-I VA	Pt1000	4...20 mA	Stainless steel housing V2A (1.4301)		1101-4152-0000-200	175,70 €
Extra charge:	Other ranges optional					22,40 €
Note:	* When equipped with display, the measuring range of 0...+50 °C is fixed.					

**Room temperature sensor or measuring transducer,
in-wall in the panel switch programme,
with active output**

The room sensor **THERMASGARD® FSTM / FSTM - P** in the in-wall housing, optionally with potentiometer, is used for measuring the room temperature, and for setpoint adjustment. It converts the measured values into a standard signal of 0-10 V. A digital, long-term stable sensor is used for temperature measurement.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

TECHNICAL DATA

Power supply: 24 V AC / DC (± 10 %)

Power consumption: < 1.1 W / 24 V DC; < 2.2 VA / 24 V AC

TEMPERATURE

Sensor: **digital temperature sensor,**
low hysteresis, high long-term stability

Long-term stability: ± 1 % per year

Measuring range: 0...+50 °C

Deviation, temperature: typically ± 0.8 K at +25 °C

Output, temperature: 0 - 10 V

POTENTIOMETER

Output, potentiometer: 0 - 10 V

Mounting: in-wall flush box Ø 55 mm

Electrical connection: 0.14 - 1.5 mm², using plug terminals

Ambient temperature: Storage -35...+85 °C;
Operation 0...+50 °C

Permitted humidity: max. 90 % r.H., non-precipitating air

Medium: clean air and other non-aggressive, non-combustible gases

Protection class: III (according to EN 60 730)

Protection type: **IP 20** (according to 60 529)

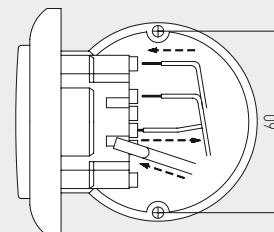
Standards: CE-conformity, electromagnetic compatibility
according to EN 61 326, EMC Directive 2014 / 30 / EU

SWITCH PROGRAMME

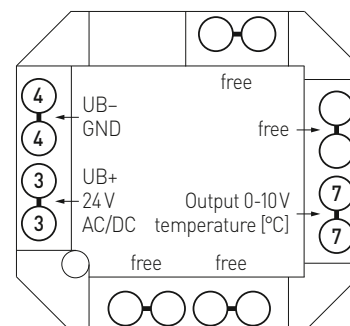
Manufacturer: GIRA System 55
(other switch programmes, manufacturers, colours
as well as prices available upon request)

Housing: plastic,
the standard colour is pure glossy white (similar to RAL 9010)
(other colours are available upon request with colour variants
depending on the respective light switch programme)

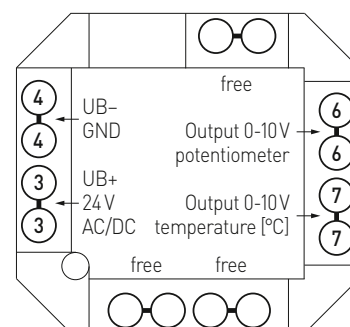
Mounting diagram **in-wall**

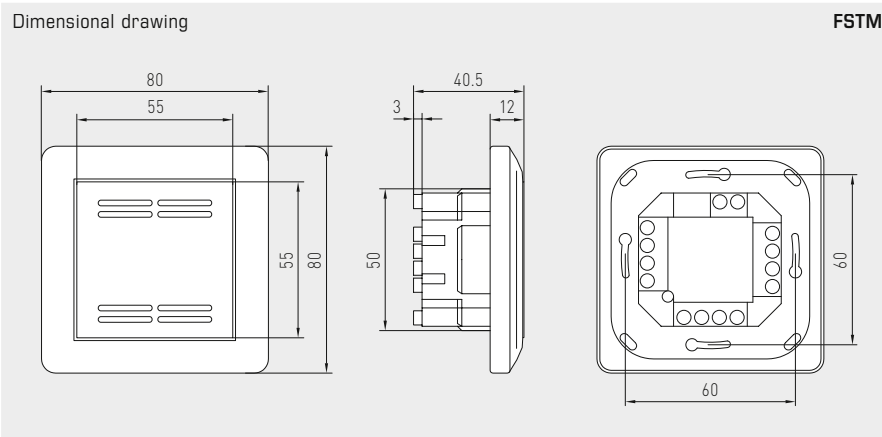


Connection diagram **FSTM**

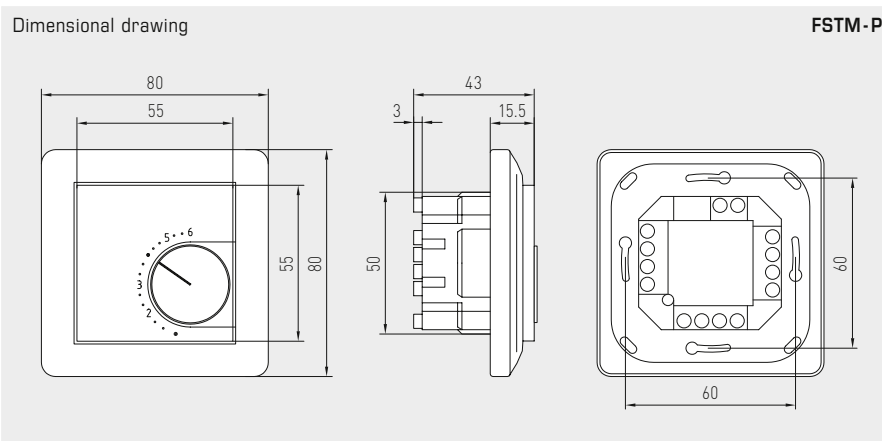


Connection diagram **FSTM - P**





FSTM
Standard



FSTM-P
with potentiometer



Temperature table
MR: 0...+50 °C

°C	U _A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

THERMASGARD® FSTM Room temperature sensor or measuring transducer, in-wall
THERMASGARD® FSTM-P Room temperature sensor or measuring transducer, in-wall with potentiometer

Type / WG02	Measuring Range Temperature	Output Temperature	Potentiometer	Item No.	Price
FSTM					
FSTM-U	0...+50 °C	0-10V	-	1101-9121-0000-162	110,82 €
FSTM-P					
FSTM-U P	0...+50 °C	0-10V	0-10V	1101-9121-0004-282	131,73 €



Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

Calibratable outside temperature measuring transducer **THERMASGARD® ATM 2** with eight switchable measuring ranges, external sensor, continuous output, housing made from impact-resistant plastic with quick-release screws, optionally **with/without display**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It is used to detect outside temperatures, temperatures in wet rooms, e.g. for installation on outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar irradiation, we recommend the use of our sun and ball-impact protection hood **WS01** or **WS04** (accessories) or the device version with the installed sun protection hood **SS02** (on request).

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ATM 2
with cable gland
and SS-02



ATM 2 - Q
with M12 connector



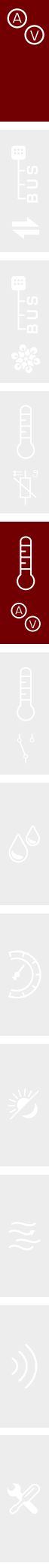
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10%) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = $(U_b - 14 V) / 0.02 A$ for I variant, see load resistance diagram
Load resistance:	$R_L > 5 k\Omega$ for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B, (Perfect Sensor Protection) Sensor external
Measuring ranges:	multi-range switching with 8 switchable measuring ranges see table (other measuring ranges optional) operating range -30...+70 °C with manual zero point correction (± 10K)
Deviation in temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Protective tube:	made from stainless steel V4A (1.4571), Ø 6 mm, NL = 65 mm
Process connection:	by means of screws (on the housing base)
Ambient temperature:	measuring transducer -30...+70 °C
Permissible humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	display with illumination , two-line, cut-out approx. 36 x 15 mm (B x H), to display the actual temperature and internal diagnostics (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)

ACCESSORIES (see table)

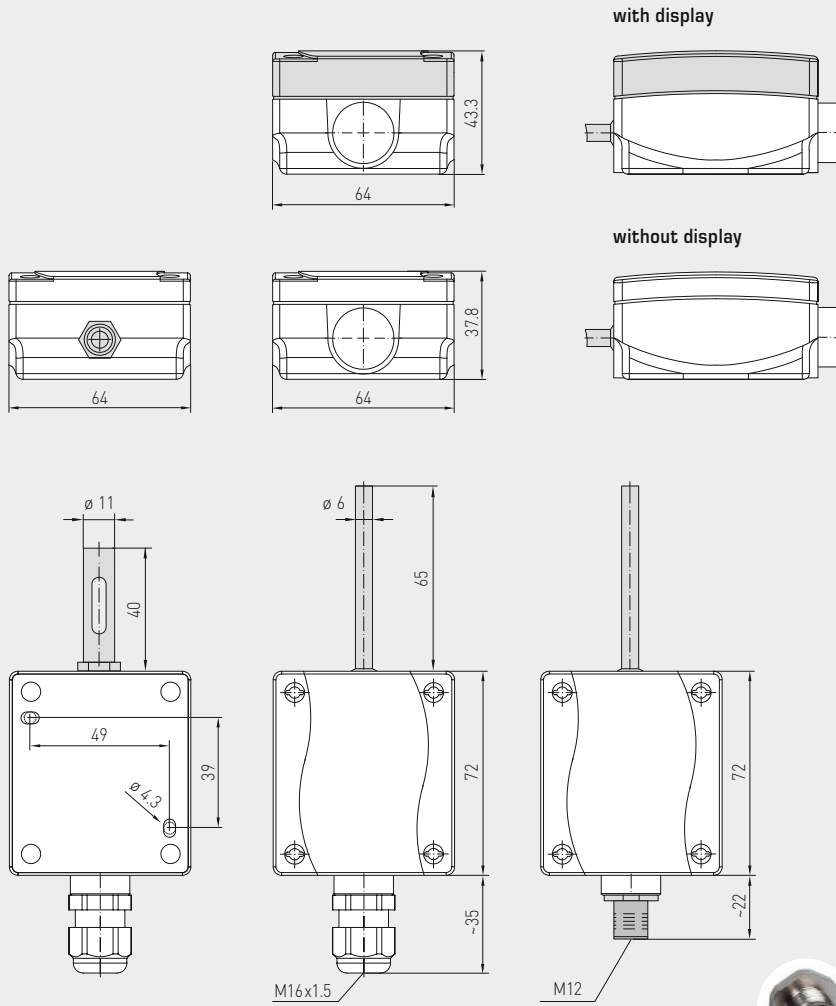


Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output



Dimensional drawing

ATM 2



Housing with SS-02 (on request)

Housing with cable gland

Housing with M12 connector

ATM 2
with cable gland
and display



ATM 2-Q
with M12 connector
and display



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Standard



Measuring range exceeded



Measuring range not reached



Sensor breakage

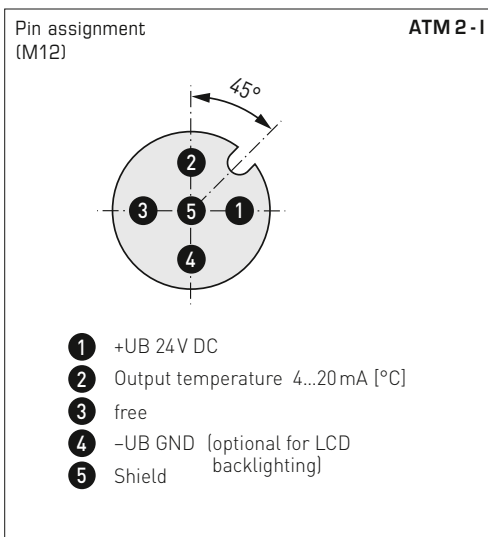
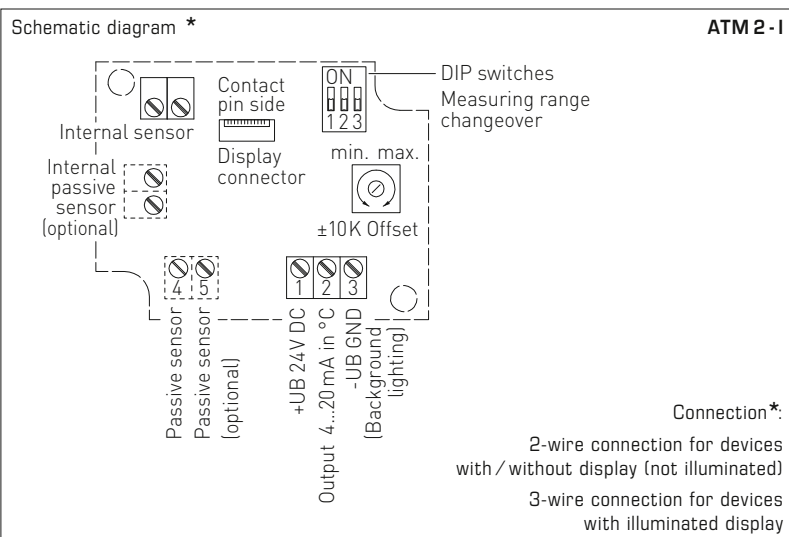
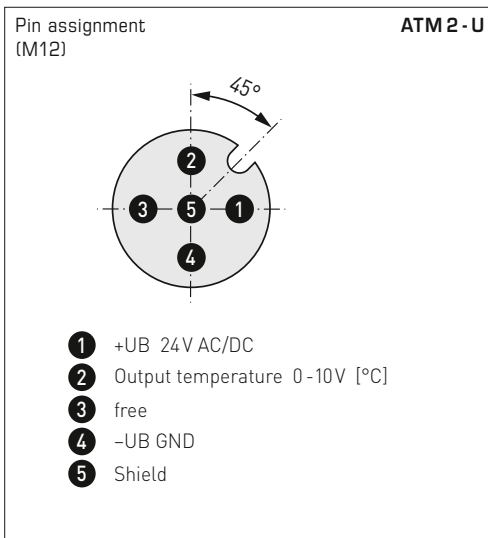
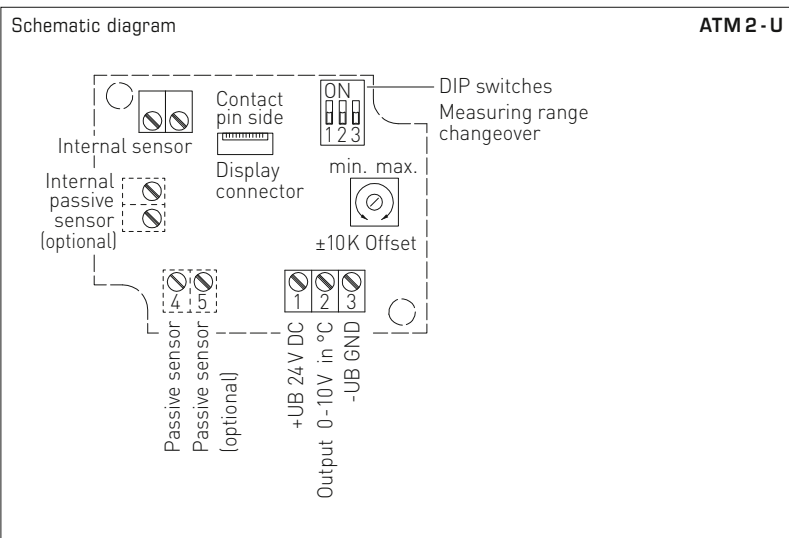


Sensor short circuit

High-performance encapsulation against vibration, mechanical stress and humidity

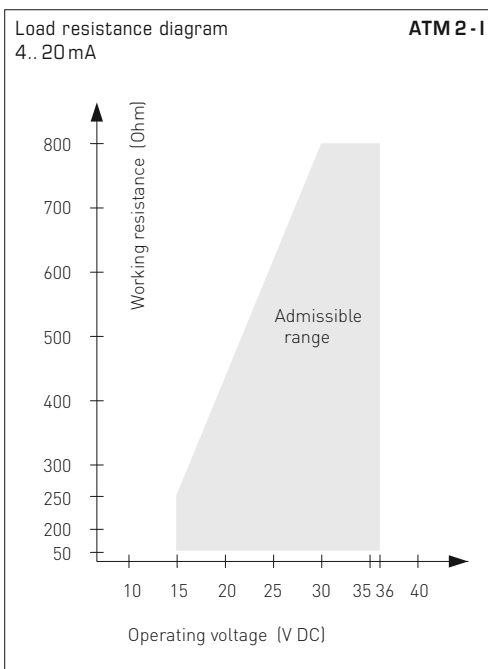
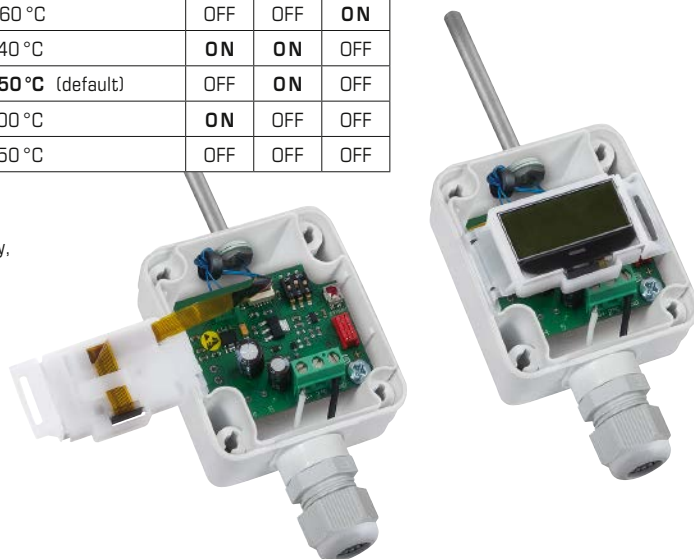


Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

ATM2-xx with display, hinged





S+S REGELTECHNIK

Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output

ATM 2-Q
with M12 connector



ATM 2
with cable gland

THERMASGARD® ATM 2		Outside temperature / wet room temperature measuring transducers (with cable gland)				
Type / WG01	Sensor	Output	Display	Item No.	Price	
ATM 2						
ATM2-I	Pt1000	4...20 mA		1101-1142-0009-900	88,65 €	
ATM2-I LCD	Pt1000	4...20 mA	■	1101-1142-2009-900	133,55 €	
ATM2-U	Pt1000	0-10 V		1101-1141-0009-900	88,65 €	
ATM2-U LCD	Pt1000	0-10 V	■	1101-1141-2009-900	133,55 €	
Housing variant:	Cable connection with cable gland					
Extra charge:	other measuring ranges optional with sun protection hood SS02				22,40 € on request 8,59 €	

THERMASGARD® ATM 2-Q		Outside temperature / wet room temperature measuring transducers (with M12 connector)				
Type / WG01	Sensor	Output	Display ● = Q	Item No.	Price	
ATM 2-Q						
ATM2-I Q	Pt1000	4...20 mA	●	2001-6111-2100-001	125,61 €	
ATM2-I Q LCD	Pt1000	4...20 mA	● ■	2001-6112-2100-001	170,52 €	
ATM2-U Q	Pt1000	0-10 V	●	2001-6111-1100-001	125,61 €	
ATM2-U Q LCD	Pt1000	0-10 V	● ■	2001-6112-1100-001	170,52 €	
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)					
Extra charge:	see table above!					

ACCESSORIES					
WS-01	protection contre le soleil et pare-balle, 184 x 180 x 80 mm, en acier inox V2A (1.4301)			7100-0040-2000-000	28,02 €
WS-04	protection contre le soleil et les intempéries, 130 x 180 x 135 mm, en acier inox V2A (1.4301)			7100-0040-7000-000	33,06 €
Special accessories for M12 connector see chapter Accessories!					

**Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output**

Calibratable outside temperature measuring transducer **THERMASGARD® ATM 2 - VA** with eight switchable measuring ranges, external sensor, continuous output, rugged housing made from **stainless steel V4A**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It is used to detect outside temperatures, temperatures in wet rooms, e.g. for installation on outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar irradiation, we recommend using our sun and ball-impact protection hood **WS01** or **WS03** (accessories).

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC ($\pm 10\%$) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = $(U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see load resistance diagram
Load resistance:	$R_L > 5 \text{ k}\Omega$ for U variant
Power consumption:	$< 1.0 \text{ VA} / 24 \text{ V DC}$; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensor:	Pt1000, DIN EN 60751, class B, (Perfect Sensor Protection) Sensor external
Measuring ranges:	multi-range switching with 8 switchable measuring ranges see table (other measuring ranges optional) operating range $-30 \dots +70 \text{ }^\circ\text{C}$ with manual zero point correction ($\pm 10 \text{ K}$)
Deviation in temperature:	typically $\pm 0.2 \text{ K}$ at $+25 \text{ }^\circ\text{C}$
Output:	0 - 10 V or 4...20 mA
Connection type:	2-wire connection
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Protective tube:	made from stainless steel V4A (1.4571), $\varnothing 6 \text{ mm}$, NL = 65 mm
Process connection:	by screws
Ambient temperature:	measuring transducer $-30 \dots +70 \text{ }^\circ\text{C}$
Permissible humidity:	$< 95\%$ r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)

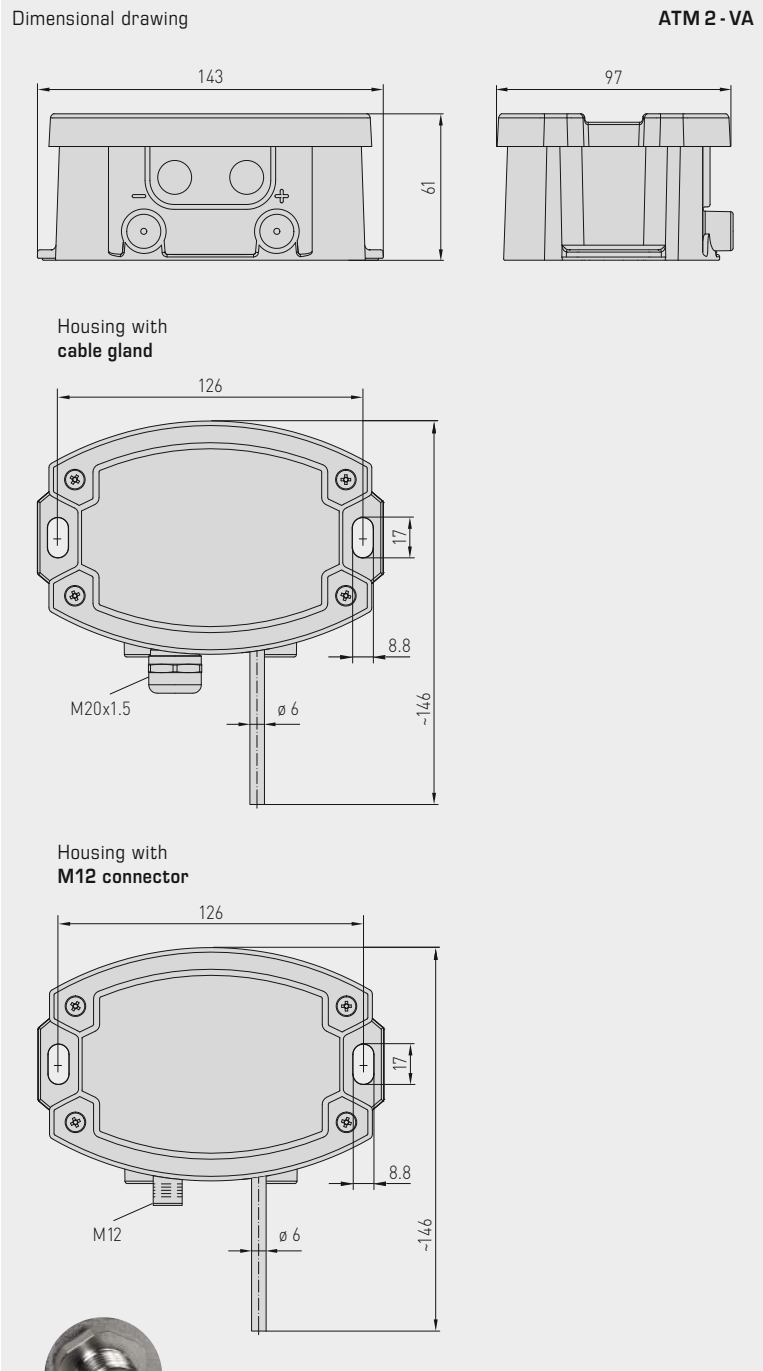
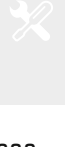


NEW

S+S REGELTECHNIK

thermasgard® ATM 2 - VA

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output



M12 connector (male)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

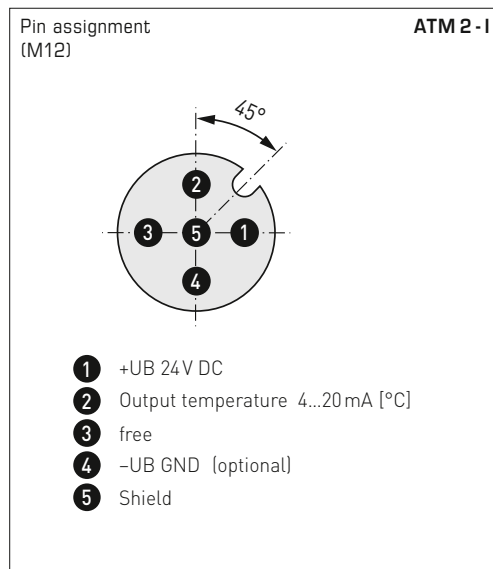
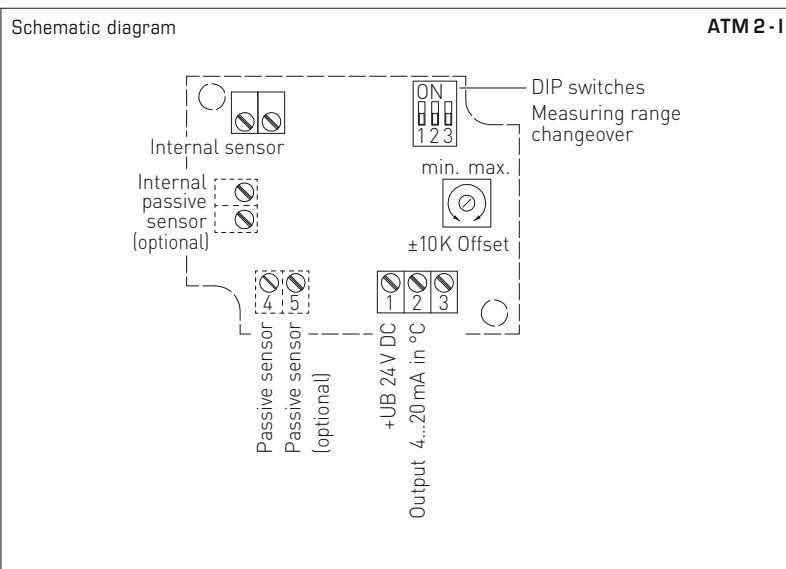
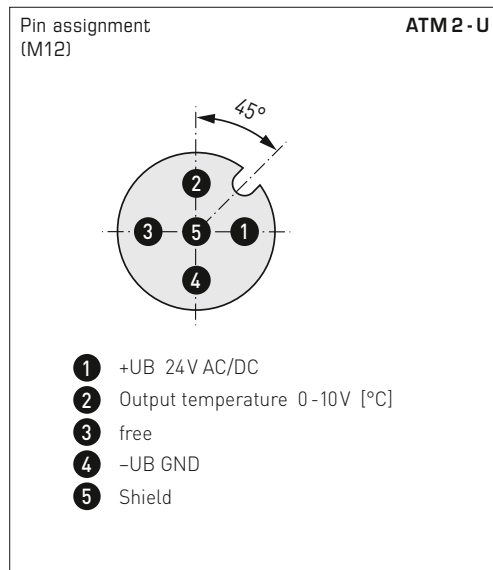
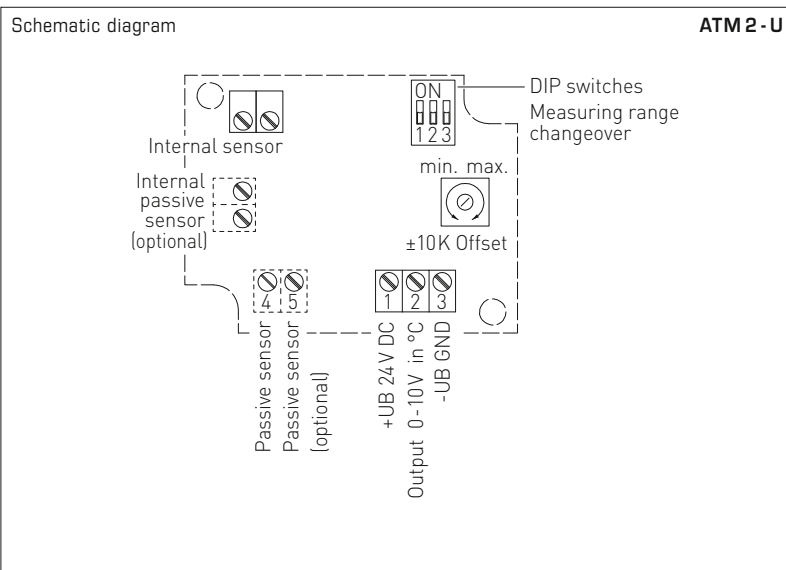
ATM 2 - VA
with cable gland



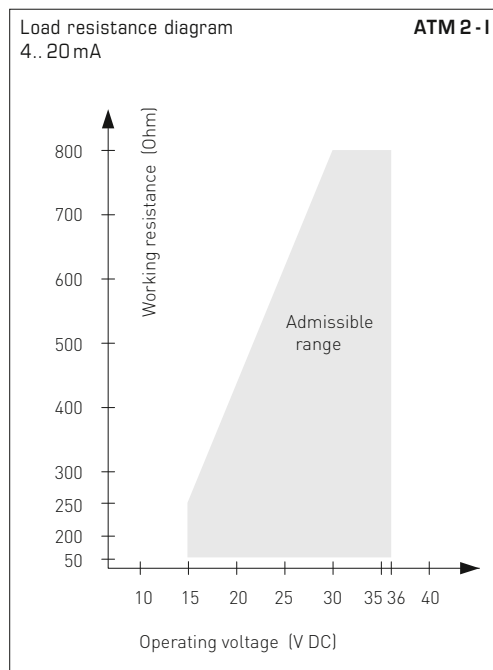
ATM 2 - VAQ
with M12 connector



Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20...+ 150 °C	ON	ON	ON
-50... + 50 °C	OFF	ON	ON
-20... + 80 °C	ON	OFF	ON
-30... + 60 °C	OFF	OFF	ON
0... + 40 °C	ON	ON	OFF
0... + 50 °C (default)	OFF	ON	OFF
0...+ 100 °C	ON	OFF	OFF
0...+ 150 °C	OFF	OFF	OFF





NEW

S+S REGELTECHNIK

THERMASGARD® ATM 2 - VA

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

ATM 2 - VAQ
with M12 connector



ATM 2 - VA
with cable gland



THERMASGARD® ATM 2 - VA		Outside temperature / wet room temperature measuring transducers, <i>ID</i> (Stainless steel housing with cable gland)		
Type / WG02I	Sensor	Output	Item No.	Price
ATM 2 - VA				
ATM2-I VA	Pt1000	4...20 mA	2001-6171-2200-001	332,76 €
ATM2-U VA	Pt1000	0-10 V	2001-6171-1200-001	332,76 €
Housing variant:	Cable connection with cable gland			
Extra charge:	other measuring ranges optional			22,40 €

THERMASGARD® ATM 2 - VAQ		Outside temperature / wet room temperature measuring transducers, <i>ID</i> (Stainless steel housing with M12 connector)		
Type / WG02I	Sensor	Output	● = Q Item No.	Price
ATM 2 - VAQ				
ATM2-I VAQ	Pt1000	4...20 mA	● 2001-6171-2100-001	366,74 €
ATM2-U VAQ	Pt1000	0-10 V	● 2001-6171-1100-001	366,74 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)			
Extra charge:	see table above!			

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output

Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

Calibratable temperature measuring transducer **THERMASGARD® TM 43** with eight switchable measuring ranges, continuous linear output, straight protective tube, housing made from impact-resistant plastic with snap-on lid.

Calibratable temperature measuring transducer **THERMASGARD® TM 65** with eight switchable measuring ranges, continuous linear output, straight protective tube, housing made from impact-resistant plastic with quick-locking screws, **with/without optional display**.

For the detection of temperatures in liquid or gaseous media. For aggressive media, stainless steel immersion sleeves must be used. It is used e.g. in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot-water and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TM 43
with snap-on lid
(IP 54)



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) with manual zero point correction (± 10 K)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Ambient temperature:	measuring transducer -30...+70 °C
Connection type:	2- or 3-wire connection
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016), TM 43 with snap-on lid TM 65 with quick-locking screws (slotted / Phillips head combination), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws on circuit board
Protective tube:	stainless steel, V4A (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	TM 43 IP54 (according to EN 60529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) TM 65 IP67 (according to EN 60529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)

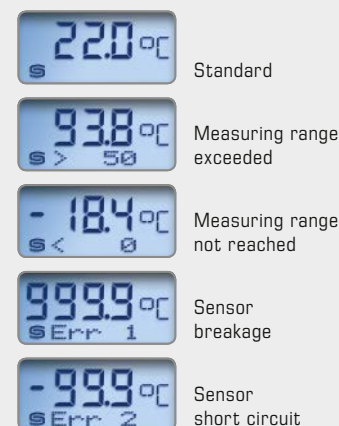
ACCESSORIES

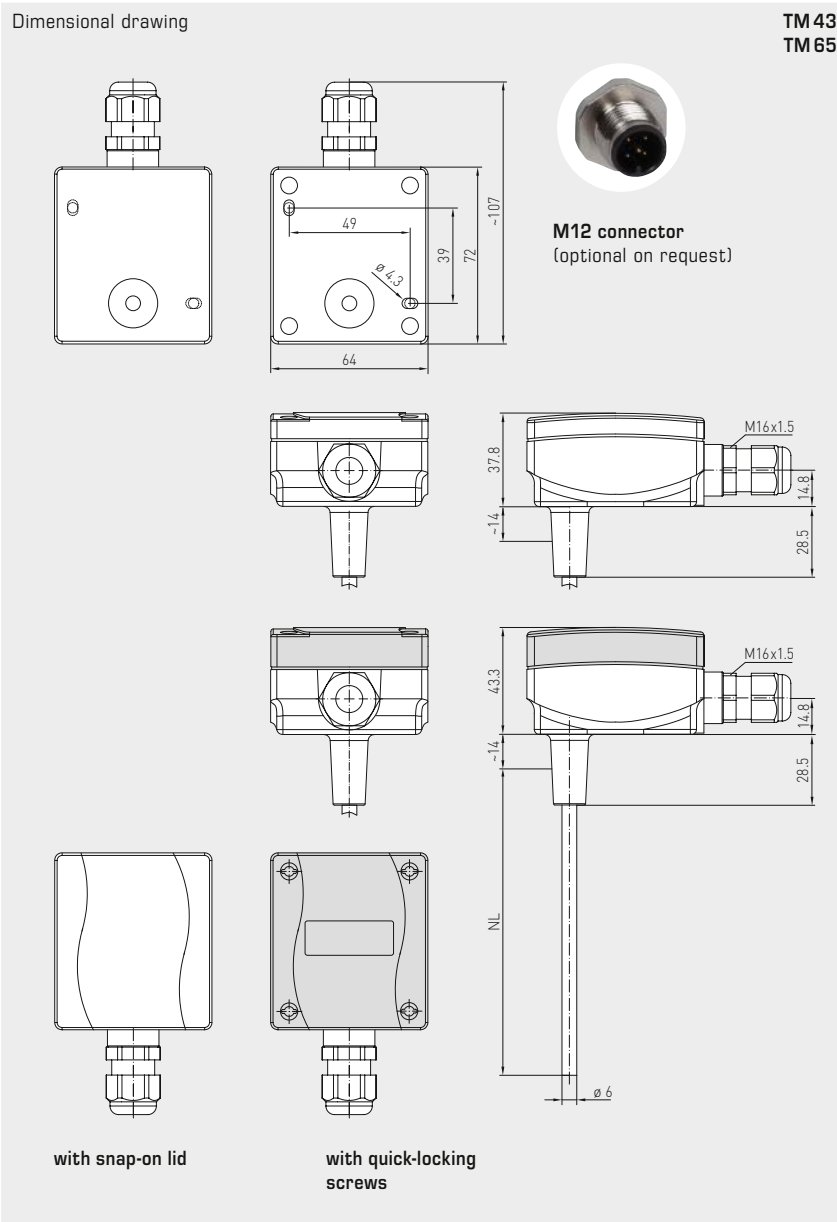
MF-15-K	Mounting flange , plastic, 56.8 x 84.3 mm, Ø = 15.2 mm tube gland, $T_{max} = +100 \text{ °C}$
TH08-ms/xx	Immersion sleeve, brass, nickel-plated , Ø = 8 mm, $T_{max} = +150 \text{ °C}$, $p_{max} = 10 \text{ bar}$
TH08-VA/xx	Immersion sleeve, stainless steel, V4A (1.4571), Ø = 8 mm, $T_{max} = +600 \text{ °C}$, $p_{max} = 40 \text{ bar}$
TH08-VA/xx/90	Immersion sleeve, stainless steel, V4A (1.4571), with neck tube (90 mm), Ø = 8 mm, $T_{max} = +600 \text{ °C}$, $p_{max} = 40 \text{ bar}$

High-performance encapsulation against
vibration, mechanical stress and humidity



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display





TM65
with quick-locking screws
(IP67)



TM65
with display and
quick-locking screws
(IP67)

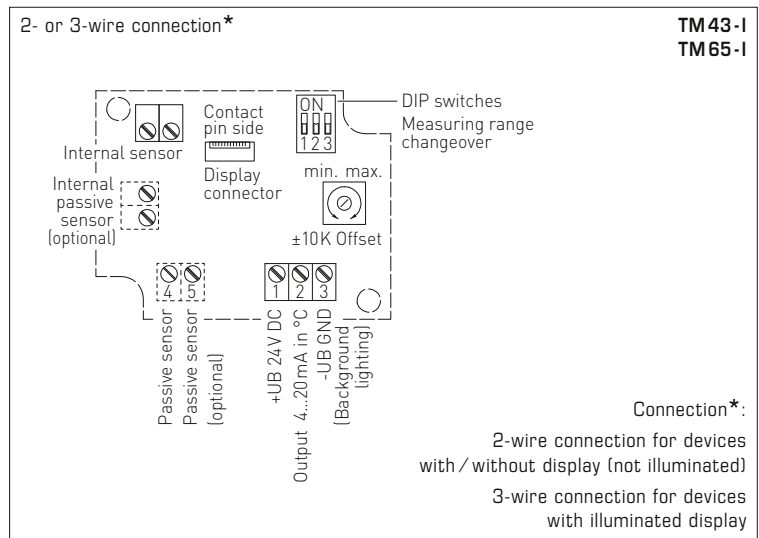
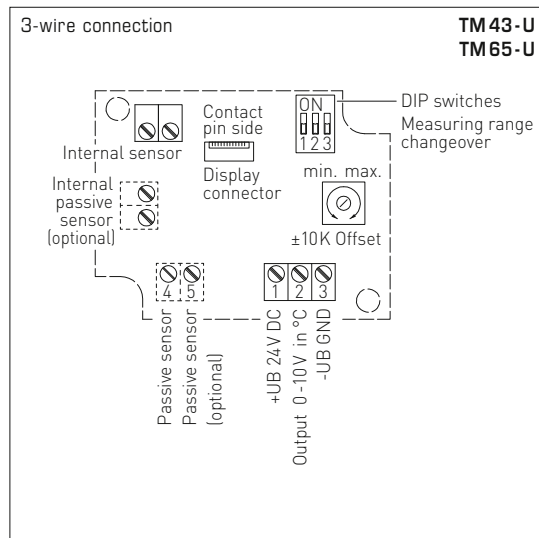


PATENTED



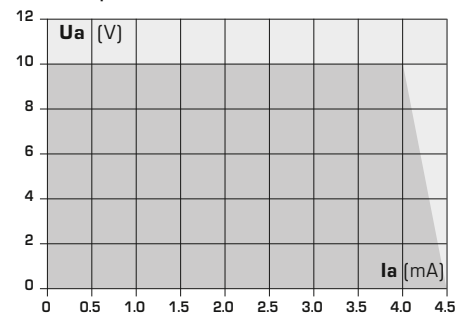
TM65
Basic device
with accessories

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

Dependency of output voltage on output current



TM 65
with display and
quick-locking screws
(IP 67)

TM 65
with quick-locking screws
(IP 67)

TM 43
with snap-on lid
(IP 54)





THERMASGARD® TM 43		Temperature measuring transducer (basic device with snap-on lid), <i>Standard</i>			
Type / WG01B	Output	Inserted Length (EL)	Item No.	Price	
TM 43 - I			IP 54, I-variant		
TM43-I 50mm	4...20 mA	50 mm	1101-7112-0019-900	63,75 €	
TM43-I 100mm	4...20 mA	100 mm	1101-7112-0029-900	64,80 €	
TM43-I 150mm	4...20 mA	150 mm	1101-7112-0039-900	65,74 €	
TM43-I 200mm	4...20 mA	200 mm	1101-7112-0049-900	66,06 €	
TM43-I 250mm	4...20 mA	250 mm	1101-7112-0059-900	81,45 €	
TM43-I 300mm	4...20 mA	300 mm	1101-7112-0069-900	68,25 €	
TM 43 - U			IP 54, U-variant		
TM43-U 50mm	0 - 10 V	50 mm	1101-7111-0019-900	63,75 €	
TM43-U 100mm	0 - 10 V	100 mm	1101-7111-0029-900	64,80 €	
TM43-U 150mm	0 - 10 V	150 mm	1101-7111-0039-900	65,74 €	
TM43-U 200mm	0 - 10 V	200 mm	1101-7111-0049-900	66,06 €	
TM43-U 250mm	0 - 10 V	250 mm	1101-7111-0059-900	81,03 €	
TM43-U 300mm	0 - 10 V	300 mm	1101-7111-0069-900	68,25 €	

THERMASGARD® TM 65		Temperature measuring transducer (basic device with quick-locking screws), <i>Premium</i>			
Type / WG01	Output	Inserted Length (EL)	Display	Item No.	Price
TM 65 - I			IP 67, I-variant		
TM65-I 50mm	4...20 mA	50 mm		1101-7122-0019-900	88,34 €
TM65-I 50mm LCD	4...20 mA	50 mm	■	1101-7122-2019-900	133,25 €
TM65-I 100mm	4...20 mA	100 mm		1101-7122-0029-900	88,59 €
TM65-I 100mm LCD	4...20 mA	100 mm	■	1101-7122-2029-900	133,48 €
TM65-I 150mm	4...20 mA	150 mm		1101-7122-0039-900	88,79 €
TM65-I 150mm LCD	4...20 mA	150 mm	■	1101-7122-2039-900	133,70 €
TM65-I 200mm	4...20 mA	200 mm		1101-7122-0049-900	88,97 €
TM65-I 200mm LCD	4...20 mA	200 mm	■	1101-7122-2049-900	133,88 €
TM65-I 250mm	4...20 mA	250 mm		1101-7122-0059-900	89,25 €
TM65-I 250mm LCD	4...20 mA	250 mm	■	1101-7122-2059-900	134,16 €
TM65-I 300mm	4...20 mA	300 mm		1101-7122-0069-900	89,92 €
TM65-I 300mm LCD	4...20 mA	300 mm	■	1101-7122-2069-900	134,81 €
TM65-I 400mm	4...20 mA	400 mm		1101-7122-0089-900	91,73 €
TM65-I 400mm LCD	4...20 mA	400 mm	■	1101-7122-2089-900	136,64 €
TM 65 - U			IP 67, U-variant		
TM65-U 50mm	0 - 10 V	50 mm		1101-7121-0019-900	88,34 €
TM65-U 50mm LCD	0 - 10 V	50 mm	■	1101-7121-2019-900	133,25 €
TM65-U 100mm	0 - 10 V	100 mm		1101-7121-0029-900	88,59 €
TM65-U 100mm LCD	0 - 10 V	100 mm	■	1101-7121-2029-900	133,48 €
TM65-U 150mm	0 - 10 V	150 mm		1101-7121-0039-900	88,79 €
TM65-U 150mm LCD	0 - 10 V	150 mm	■	1101-7121-2039-900	133,70 €
TM65-U 200mm	0 - 10 V	200 mm		1101-7121-0049-900	88,97 €
TM65-U 200mm LCD	0 - 10 V	200 mm	■	1101-7121-2049-900	133,88 €
TM65-U 250mm	0 - 10 V	250 mm		1101-7121-0059-900	89,25 €
TM65-U 250mm LCD	0 - 10 V	250 mm	■	1101-7121-2059-900	134,16 €
TM65-U 300mm	0 - 10 V	300 mm		1101-7121-0069-900	89,92 €
TM65-U 300mm LCD	0 - 10 V	300 mm	■	1101-7121-2069-900	134,81 €
TM65-U 400mm	0 - 10 V	400 mm		1101-7121-0089-900	91,73 €
TM65-U 400mm LCD	0 - 10 V	400 mm	■	1101-7121-2089-900	136,64 €
Extra charge:	Other ranges optional Cable connection with M12 connector according to DIN EN 61076-2-101			on request	22,40 €

High-performance encapsulation against
vibration, mechanical stress and humidity



Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output

One basic device in four variants...



PATENTED



**TMxx +
TH08-ms/xx**

Immersion / screw-in
temperature sensor
with immersion sleeve,
brass, nickel-plated

**TMxx +
TH08-VA/xx**

Immersion / screw-in
temperature sensor
with immersion sleeve,
stainless steel, V4A

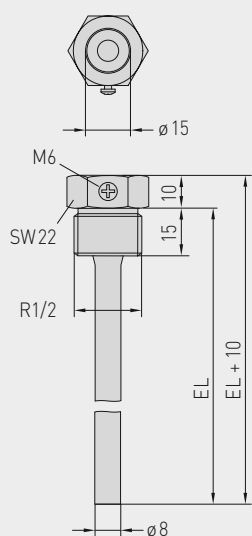
**TMxx +
TH08-VA/xx/90**

Immersion / screw-in
temperature sensor with
immersion sleeve with
neck tube, stainless steel, V4A

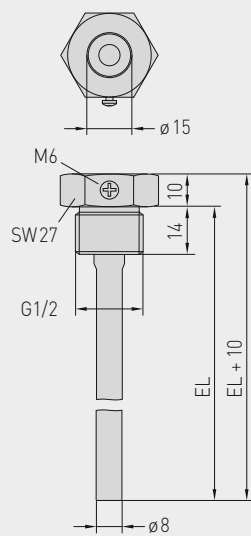
**TMxx +
MF-15-K**

Duct temperature sensor
with mounting flange, plastic

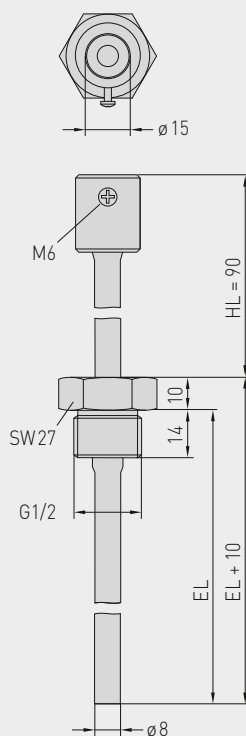
Dimensional drawing
TH08-ms/xx



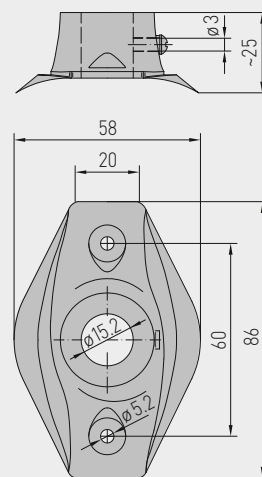
Dimensional drawing
TH08-VA/xx



Dimensional drawing
TH08-VA/xx/90



Dimensional drawing
MF-15-K





... through combination with accessories:



TH08-ms/xx
 Immersion sleeve,
 brass, nickel-plated,
 thread-sealing, conical,
 according to DIN 10226



TH08-VA/xx
 Immersion sleeve,
 stainless steel, V4A,
 flat-sealing, cylindrical,
 according to DIN 228



TH08-VA/xx/90
 Immersion sleeve with neck tube,
 stainless steel, V4A,
 flat-sealing, cylindrical,
 according to DIN 228



MF-15-K
 Mounting flange,
 plastic

THERMASGARD® TH08		Immersion sleeve Ø 8 mm (Accessories)			
Type / WG01B	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.	Price
TH08-ms/xx	Brass nickel-plated			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	8,21 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	9,35 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	9,88 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	10,19 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	11,81 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	12,13 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	12,23 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	12,34 €
TH08-VA/xx	Stainless steel, V4A (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	17,88 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	19,76 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	21,23 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	22,38 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	27,82 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	29,07 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	29,27 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	29,79 €
TH08-VA/xx/90	Stainless steel, V4A (1.4571)			with neck tube (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	25,61 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	26,76 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	28,07 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	29,27 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	30,68 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	33,25 €
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				
Mounting flange (Accessories)					
Type / WG01B		T _{max}	Item No.	Price	
MF					
MF-15-K	Mounting flange, plastic, 56.8x84.3mm, Ø 15.2mm tube gland	+100 °C	7100-0032-0000-000	5,40 €	
Note:	For further information see last chapter!				

Mean value / rod / duct temperature measuring transducer,
including mounting flange, calibratable,
with multi-range switching and active output

Calibratable mean-value temperature measuring transducer **THERMASGARD® MWTM** (rod sensor 0.4...20 m) with eight switchable measuring ranges, continuous output, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, with bendable sensor rod (fully active), protective tube made from copper, plastic-coated, and anti-kink spring, incl. mounting flange.

Calibratable mean-value temperature measuring transducer **THERMASGARD® MWTM-SD** (rod sensor 3 m / 6 m) with eight switchable measuring ranges, continuous output, in an impact-resistant plastic housing with snap-on lid, with bendable sensor rod (fully active), protective tube made from reinforced thermoplastic hose and anti-kink spring, incl. mounting flange.

The sensor is used to detect the mean temperature (mean value) in gaseous media, e.g. in ventilation and air conditioning ducts over the entire cross section or over a defined length. Laid along a meandering route, it uniformly detects the surrounding temperature, as a duct temperature sensor. For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

MWTM

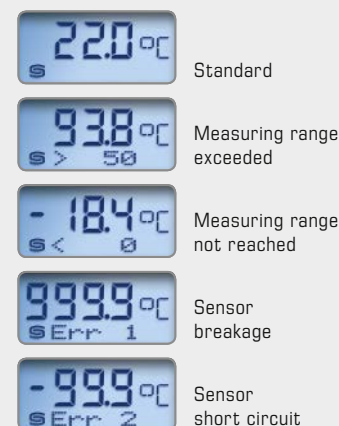
Rod length 0.4 m
(IP 65)



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) $T_{\min} -30 \text{ }^\circ\text{C}$, $T_{\max} +80 \text{ }^\circ\text{C}$ with manual zero point correction (± 10 K)
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Sensors:	active across the entire length (averaging)
Rod material:	protective tube made from copper, plastic-coated (MWTM) (made from reinforced thermoplastic hose for the MWTM-SD), with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	$\varnothing = 5.0 \text{ mm}$, nominal length (NL) = 0.4 m / 3 m / 6 m, see table (nominal length optionally up to max. 20 m)
Rod laying:	Observe the admissible values! Bending radius: > 35 mm Vibration load: ≤ 0.5 g Tensile load: < 480 N for the MWTM < 100 N for the MWTM-SD
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws on circuit board
Process connection:	by mounting flange, plastic (galvanised steel optional, see accessories) and mounting clamps MK-05-M
Ambient temperature:	measuring transducer -30...+70 °C
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 54 (according to EN 60529) for the MWTM-SD IP 65 (according to EN 60529) for the MWTM housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)
ACCESSORIES	see table

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

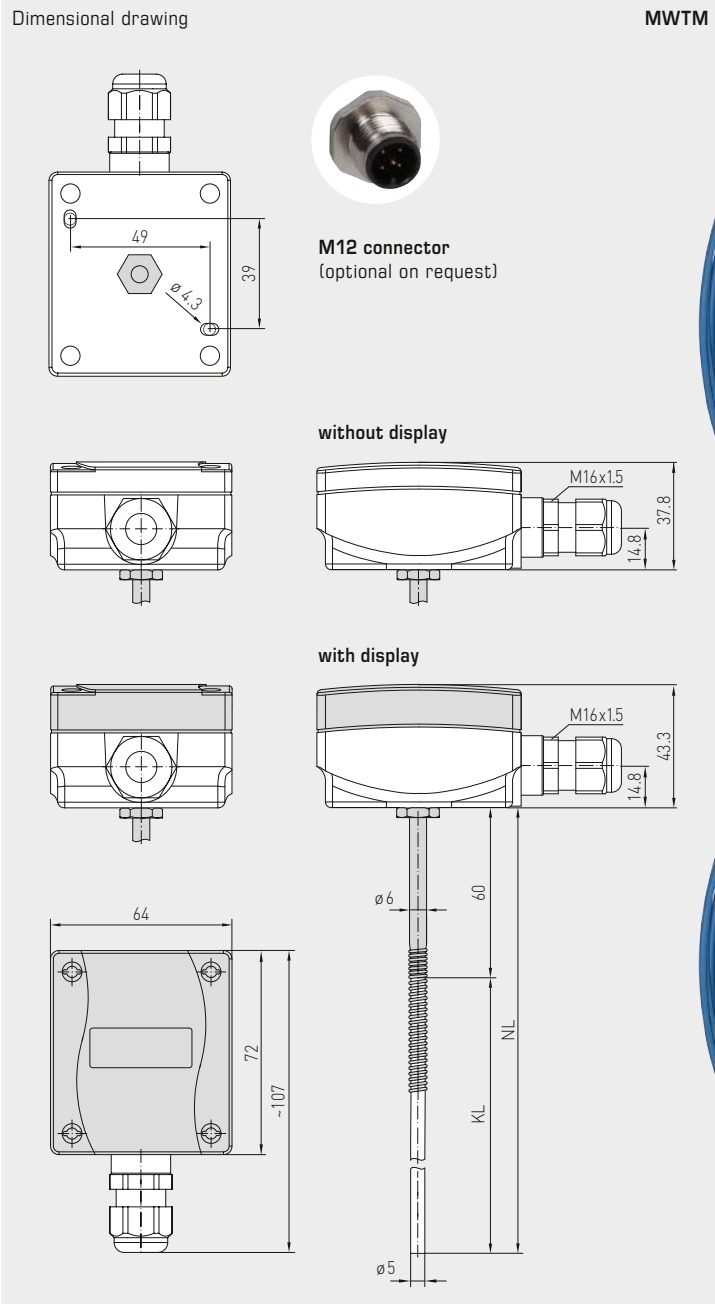




S+S REGELTECHNIK

THERMASGARD® MWTM
THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer,
including mounting flange, calibratable,
with multi-range switching and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

MWTM
Rod length 3 m / 6 m
(IP65)



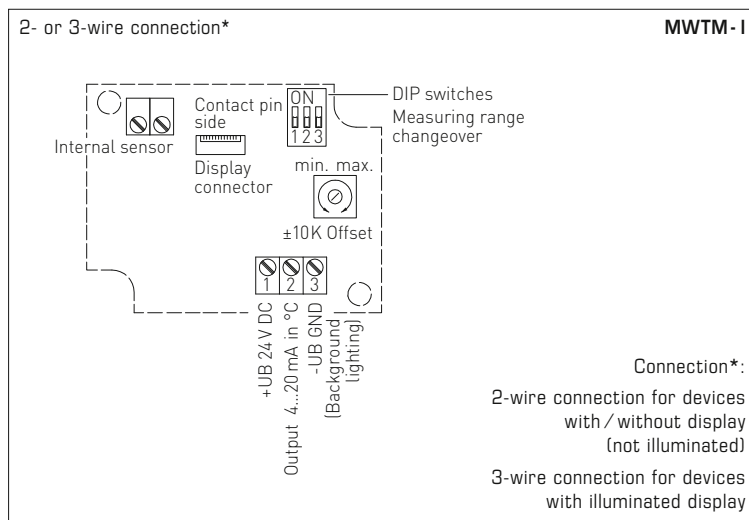
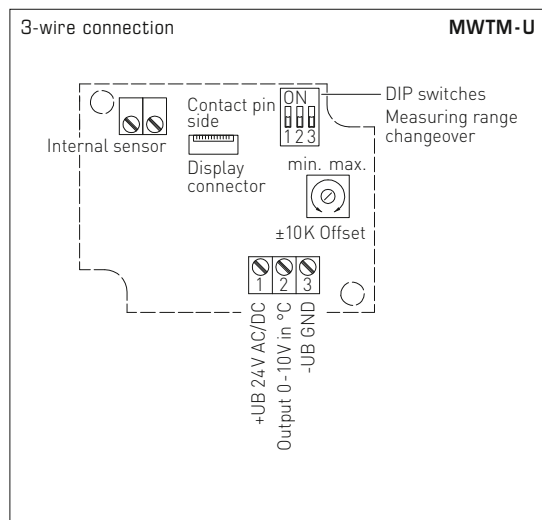
MWTM
with Display
(IP65)



MWTM-SD
Rod length 3 m / 6 m
(IP54)



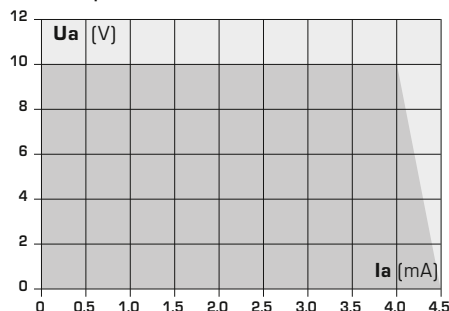
Mean value / rod / duct temperature measuring transducer,
 including mounting flange, calibratable,
 with multi-range switching and active output



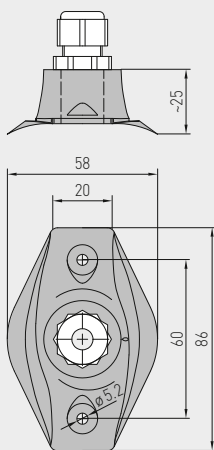
MWTM
 display hinged (optional)



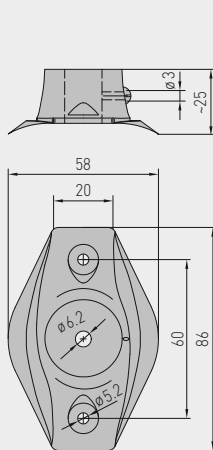
Dependency of output voltage on output current



Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-K**



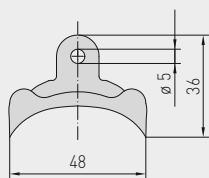
MF-06-K
 Mounting flange, plastic
 (Included in the scope of delivery)



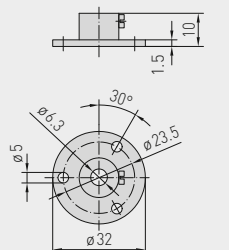
KRD-04
 Capillary tube bushing, plastic (optional)



Dimensional drawing **MK-05-M**



Dimensional drawing **MF-06-M**



MF-06-M
 Mounting flange, metal (optional)



MK-05-M
 Mounting clamps, galvanised steel (from 3 m rod length, included in the scope of delivery)





MWTM
Rod length 3 m / 6 m
with/without Display
(IP65)



MWTM-SD
Rod length 3 m / 6 m
without Display
(IP54)

THERMASGARD® MWTM-SD		Mean-value temperature measuring transducer with rod made from reinforced thermoplastic hose, <i>Standard</i>			
Type / WG01B	Sensor	Output	Rod length	Item No.	Price
MWTM-SD-I					IP54, I variant
MWTM-SD-I 3m	Pt1000	4...20 mA	3.0 m	1101-3132-0239-90K	141,50 €
MWTM-SD-I 6m	Pt1000	4...20 mA	6.0 m	1101-3132-0269-90K	150,26 €
MWTM-SD-U					IP54, U variant
MWTM-SD-U 3m	Pt1000	0 - 10 V	3.0 m	1101-3131-0239-90K	138,53 €
MWTM-SD-U 6m	Pt1000	0 - 10 V	6.0 m	1101-3131-0269-90K	146,89 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request	

THERMASGARD® MWTM		Mean-value temperature measuring transducer with rod made from copper, plastic-coated, <i>Premium</i>			
Type / WG01	Sensor	Output	Rod length	Item No.	Price
MWTM-I					IP65, I variant
MWTM-I 0,4m	Pt1000	4...20 mA	0.4 m	1101-3132-0089-900	151,10 €
MWTM-I 3m	Pt1000	4...20 mA	3.0 m	1101-3132-0239-900	196,46 €
MWTM-I 6m	Pt1000	4...20 mA	6.0 m	1101-3132-0269-900	229,01 €
MWTM-U					IP65, U variant
MWTM-U 0,4m	Pt1000	0 - 10 V	0.4 m	1101-3131-0089-900	151,10 €
MWTM-U 3m	Pt1000	0 - 10 V	3.0 m	1101-3131-0239-900	196,46 €
MWTM-U 6m	Pt1000	0 - 10 V	6.0 m	1101-3131-0269-900	229,01 €
Extra charge:	Other ranges optional			22,40 €	
	Two-line display with illumination			43,94 €	
	Per meter sensor cable (from 6m to max. 20m)			on request	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request	

ACCESSORIES			
MF-06-K	Mounting flange, plastic (included in the scope of delivery)	7100-0030-1000-000	5,40 €
MF-06-M	Mounting flange, metal (Galvanised steel), Ø 35 mm	7100-0030-5000-000	8,43 €
KRD-04	Capillary tube gland bracket, plastic	7100-0030-7000-000	7,86 €
MK-05-M	Mounting clamps, galvanised steel (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000	8,71 €

For further information see last chapter!

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

TM 54
Basic unit

Calibratable temperature measuring transducer **THERMASGARD® TM 54** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, heating engineering, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, mechanical, apparatus and plant engineering and throughout the industrial sector.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

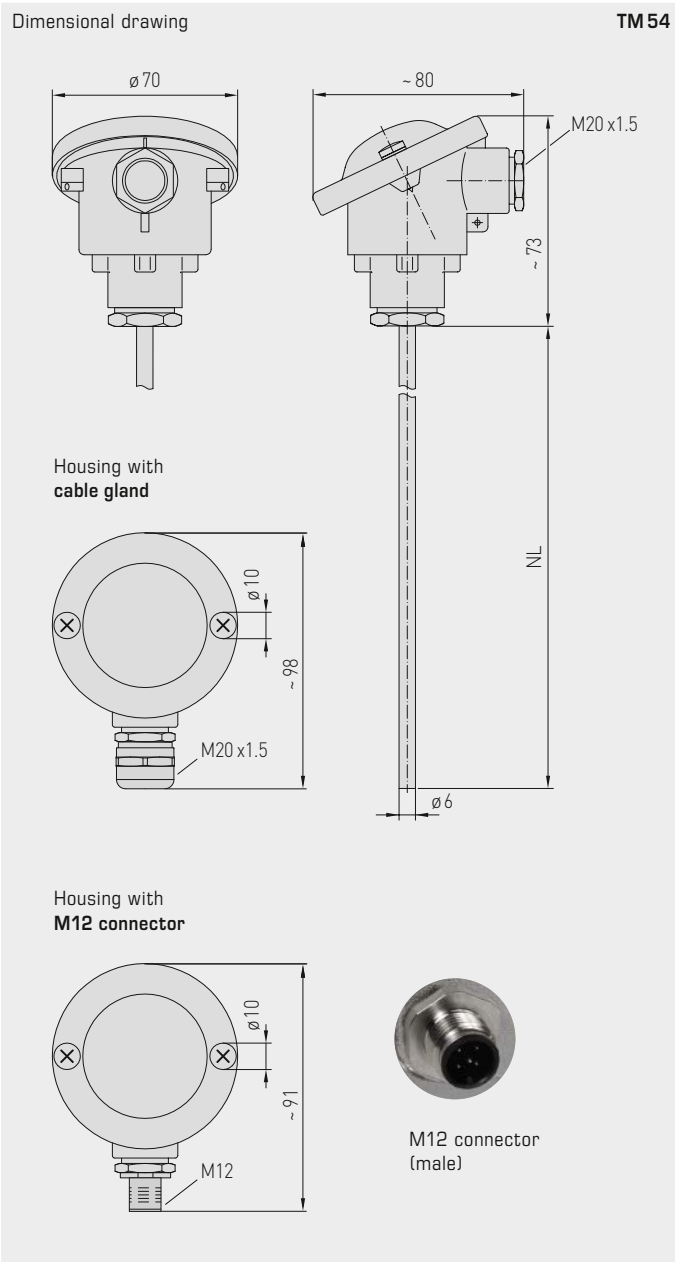


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10%) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_b \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000, DIN EN 60571, class B (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) $T_{max} = +150^\circ\text{C}$ with manual zero point correction (± 10 K)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Cable connection:	TM 54 (standard) adjusting screw made of metal (M 20 x 1.5) TM 54-KV (optional) cable gland, brass, nickel-plated (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) TM 54-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -30...+70 °C
Protective tube:	stainless steel, V4A (1.4571) Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) TM 54 IP 65 (according to EN 60 529) TM 54-KV / TM 54-Q
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)
TH-ms / xx	Immersion sleeve, brass, nickel-plated, Ø = 8 mm, $T_{max} = +150^\circ\text{C}$, $p_{max} = 10 \text{ bar}$
TH-VA / xx	Immersion sleeve, stainless steel, V4A (1.4571), Ø = 8 mm, $T_{max} = +600^\circ\text{C}$, $p_{max} = 40 \text{ bar}$
TH-VA / xx / 90	Immersion sleeve, stainless steel, V4A (1.4571), with neck tube (90 mm), Ø = 8 mm, $T_{max} = +600^\circ\text{C}$, $p_{max} = 40 \text{ bar}$
MF-06-M	Mounting flange, metal, galvanised steel, Ø = 32 mm, Ø = 6.3 mm tube gland, $T_{max} = +700^\circ\text{C}$



Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output



High-performance encapsulation against vibration, mechanical stress and humidity



TM 54
standard
(IP 54)



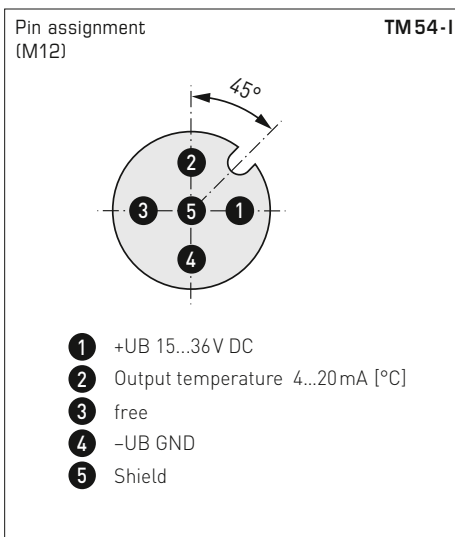
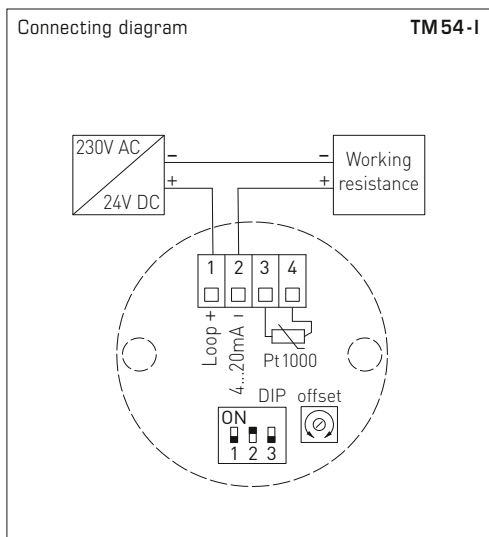
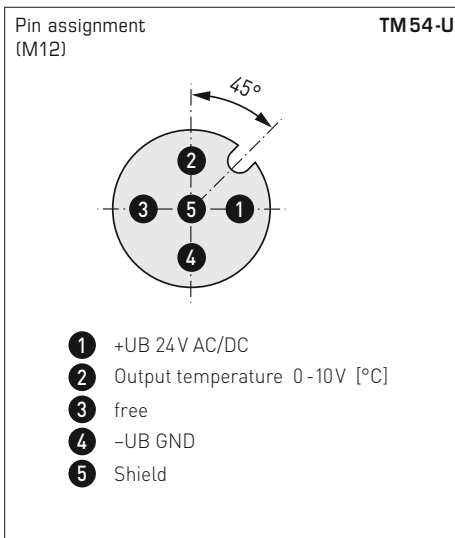
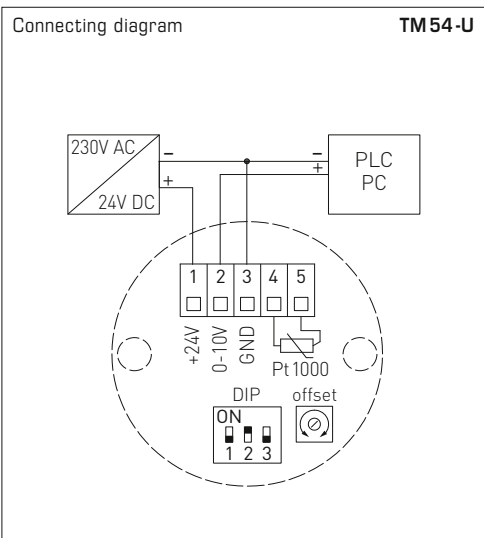
TM 54-KV
with cable gland
(IP 65)



TM 54-Q
with M12 connector
(IP 65)



Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0...+100 °C	ON	OFF	OFF
0...+150 °C	OFF	OFF	OFF



Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output

TM 54
standard
(IP 54)



THERMASGARD® TM 54		Temperature measuring transducer (Basic unit)			
Type / WG01	Sensor	Output	Installation length (EL)	Item No.	Price
TM 54-I				IP 54, I - variant	
TM54-I 50mm	Pt1000	4...20 mA	50 mm	1101-7152-0019-910	133,93 €
TM54-I 100mm	Pt1000	4...20 mA	100 mm	1101-7152-0029-910	137,08 €
TM54-I 150mm	Pt1000	4...20 mA	150 mm	1101-7152-0039-910	143,25 €
TM54-I 200mm	Pt1000	4...20 mA	200 mm	1101-7152-0049-910	145,21 €
TM54-I 250mm	Pt1000	4...20 mA	250 mm	1101-7152-0059-910	147,01 €
TM54-I 300mm	Pt1000	4...20 mA	300 mm	1101-7152-0069-910	148,52 €
TM54-I 350mm	Pt1000	4...20 mA	350 mm	1101-7152-0079-910	151,55 €
TM54-I 400mm	Pt1000	4...20 mA	400 mm	1101-7152-0089-910	159,99 €
TM 54-U				IP 54, U - variant	
TM54-U 50mm	Pt1000	0 - 10 V	50 mm	1101-7151-0019-910	133,93 €
TM54-U 100mm	Pt1000	0 - 10 V	100 mm	1101-7151-0029-910	137,08 €
TM54-U 150mm	Pt1000	0 - 10 V	150 mm	1101-7151-0039-910	143,25 €
TM54-U 200mm	Pt1000	0 - 10 V	200 mm	1101-7151-0049-910	145,21 €
TM54-U 250mm	Pt1000	0 - 10 V	250 mm	1101-7151-0059-910	147,01 €
TM54-U 300mm	Pt1000	0 - 10 V	300 mm	1101-7151-0069-910	148,52 €
TM54-U 350mm	Pt1000	0 - 10 V	350 mm	1101-7151-0079-910	151,56 €
TM54-U 400mm	Pt1000	0 - 10 V	400 mm	1101-7151-0089-910	159,99 €
Housing variant:	equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or M12 connector (IP 65) see the next page!				
Extra charge:	other measuring ranges optional				22,40 €

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output

TM 54 - Q
with M12 connector
(IP 65)



THERMASGARD®		Temperature measuring transducer					
TM 54 - Q		(Basic unit with M12 connector)					
Type / WG01	Sensor	Output	Installation length (EL)	Q	Item No.	Price	
TM 54 - I xx Q				IP 65, I - variant			
TM54-I 50mm Q	Pt1000	4...20 mA	50 mm	●	2001-4111-2100-011	170,90 €	
TM54-I 100mm Q	Pt1000	4...20 mA	100 mm	●	2001-4111-2100-021	174,04 €	
TM54-I 150mm Q	Pt1000	4...20 mA	150 mm	●	2001-4111-2100-031	180,21 €	
TM54-I 200mm Q	Pt1000	4...20 mA	200 mm	●	2001-4111-2100-041	182,18 €	
TM54-I 250mm Q	Pt1000	4...20 mA	250 mm	●	2001-4111-2100-051	183,98 €	
TM54-I 300mm Q	Pt1000	4...20 mA	300 mm	●	2001-4111-2100-061	185,50 €	
TM54-I 350mm Q	Pt1000	4...20 mA	350 mm	●	2001-4111-2100-071	188,53 €	
TM54-I 400mm Q	Pt1000	4...20 mA	400 mm	●	2001-4111-2100-081	196,95 €	
TM 54 - U xx Q				IP 54, U - variant			
TM54-U 50mm Q	Pt1000	0 - 10 V	50 mm	●	2001-4111-1100-011	167,55 €	
TM54-U 100mm Q	Pt1000	0 - 10 V	100 mm	●	2001-4111-1100-021	174,04 €	
TM54-U 150mm Q	Pt1000	0 - 10 V	150 mm	●	2001-4111-1100-031	180,21 €	
TM54-U 200mm Q	Pt1000	0 - 10 V	200 mm	●	2001-4111-1100-041	182,18 €	
TM54-U 250mm Q	Pt1000	0 - 10 V	250 mm	●	2001-4111-1100-051	183,98 €	
TM54-U 300mm Q	Pt1000	0 - 10 V	300 mm	●	2001-4111-1100-061	185,50 €	
TM54-U 350mm Q	Pt1000	0 - 10 V	350 mm	●	2001-4111-1100-071	188,53 €	
TM54-U 400mm Q	Pt1000	0 - 10 V	400 mm	●	2001-4111-1100-081	196,95 €	
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)					
Extra charge:		other measuring ranges optional					
						22,40 €	

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output

TM 54 - KV
with cable gland
(IP 65)



THERMASGARD®		Temperature measuring transducer			
TM 54 - KV		(Basic unit with cable gland)			
Type / WG01	Sensor	Output	Installation length (EL)	Item No.	Price
TM 54 - I xx KV				IP 65, I - variant	
TM54-I 50mm KV	Pt1000	4...20 mA	50 mm	1101-7172-0019-910	142,25 €
TM54-I 100mm KV	Pt1000	4...20 mA	100 mm	1101-7172-0029-910	145,40 €
TM54-I 150mm KV	Pt1000	4...20 mA	150 mm	1101-7172-0039-910	151,56 €
TM54-I 200mm KV	Pt1000	4...20 mA	200 mm	1101-7172-0049-910	153,53 €
TM54-I 250mm KV	Pt1000	4...20 mA	250 mm	1101-7172-0059-910	155,33 €
TM54-I 300mm KV	Pt1000	4...20 mA	300 mm	1101-7172-0069-910	156,85 €
TM54-I 350mm KV	Pt1000	4...20 mA	350 mm	1101-7172-0079-910	159,87 €
TM54-I 400mm KV	Pt1000	4...20 mA	400 mm	1101-7172-0089-910	168,30 €
TM 54 - U xx KV				IP 65, U - variant	
TM54-U 50mm KV	Pt1000	0 - 10 V	50 mm	1101-7171-0019-910	142,25 €
TM54-U 100mm KV	Pt1000	0 - 10 V	100 mm	1101-7171-0029-910	145,40 €
TM54-U 150mm KV	Pt1000	0 - 10 V	150 mm	1101-7171-0039-910	151,56 €
TM54-U 200mm KV	Pt1000	0 - 10 V	200 mm	1101-7171-0049-910	153,53 €
TM54-U 250mm KV	Pt1000	0 - 10 V	250 mm	1101-7171-0059-910	155,33 €
TM54-U 300mm KV	Pt1000	0 - 10 V	300 mm	1101-7171-0069-910	156,85 €
TM54-U 350mm KV	Pt1000	0 - 10 V	350 mm	1101-7171-0079-910	159,87 €
TM54-U 400mm KV	Pt1000	0 - 10 V	400 mm	1101-7171-0089-910	168,30 €
Housing variant "KV":	Cable connection with cable gland				
Extra charge:	other measuring ranges optional				22,40 €

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output

One basic device in four variants ...



**TM54 +
TH -ms/xx**

Immersion / screw-in
temperature sensor
with immersion sleeve,
brass, nickel-plated



**TM54 +
TH -VA/xx**

Immersion / screw-in
temperature sensor
with immersion sleeve,
stainless steel, V4A



**TM54 +
TH -VA/xx/90**

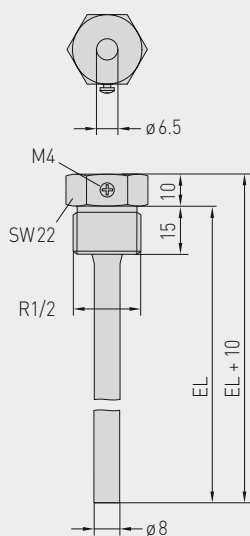
Immersion / screw-in
temperature sensor
with immersion sleeve with
neck tube, stainless steel, V4A



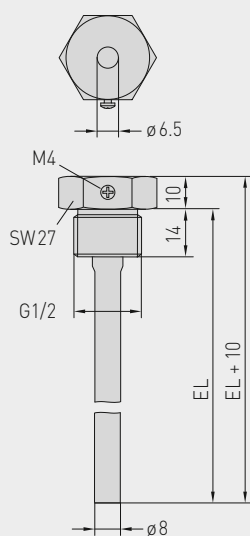
**TM54 +
MF-06-M**

Duct temperature sensor
with mounting flange, metal

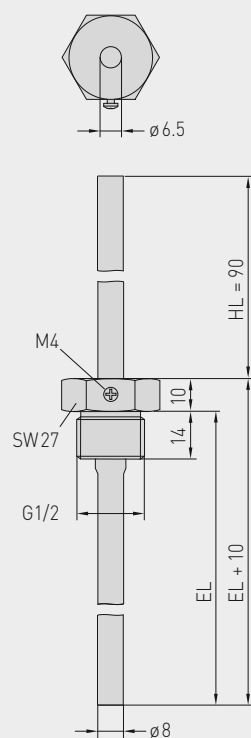
**Dimensional drawing
TH -ms/xx**



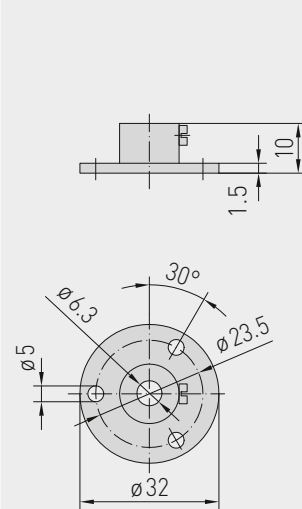
**Dimensional drawing
TH -VA/xx**



**Dimensional drawing
TH -VA/xx/90**



**Dimensional drawing
MF-06-M**





...through combination with accessories:



TH - ms / xx
Immersion sleeve,
brass, nickel-plated,
thread-sealing, conical,
according to DIN 10226



TH - VA / xx
Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH - VA / xx / 90
Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF-06-M
Mounting flange,
metal

THERMASGARD® TH Immersion sleeve Ø 8 mm (accessories)					
Type / WG01	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.	Price
TH - ms / xx Brass nickel-plated					
without neck tube					
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	8,21 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	9,35 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	9,88 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	10,19 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	11,81 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	12,13 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	12,23 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	12,34 €
TH - VA / xx Stainless steel, V4A (1.4571)					
without neck tube					
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	17,88 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	19,76 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	21,23 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	22,38 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	27,82 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	29,07 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	29,27 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	29,79 €
TH - VA / xx / 90 Stainless steel, V4A (1.4571)					
with neck tube (90 mm)					
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	25,61 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	26,76 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	28,07 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	29,27 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	30,68 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	33,25 €
Note:	inner diameter of socket 6.5 mm For further information see last chapter!				
Mounting flange (accessories)					
Type / WG01		T _{max}		Item No.	Price
MF					
MF-06-M	Mounting flange, metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm		+700 °C	7100-0030-5000-000	8,43 €
Note:	For further information see last chapter!				

Duct/smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

Calibratable smoke gas temperature measuring transducer **THERMASGARD® RGTM 1** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101), spring-mounted measuring insert and straight protective tube, incl. mounting flange.

The duct sensor is used to detect high temperatures in gaseous media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RGTM 1
Basic unit

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_b \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	10 kOhm (load max. 1 mA) for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60751, class B) (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) with manual zero point correction (± 10K)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Cable connection:	RGTM 1 (Standard) adjusting screw made of metal (M 20 x 1.5); RGTM 1-KV (optional) cable gland, brass, nickel-plated (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTM 1-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -30...+70 °C
Protective tube:	stainless steel, V4A (1.4571), Ø = 8 mm inserted length (EL) = 200 - 400 mm (see table)
Process connection:	by mounting flange stainless steel V2A (1.4305) (included in the scope of delivery)
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) RGTM 1 IP 65 (according to EN 60 529) RGTM 1-KV / RGTM 1-Q
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU



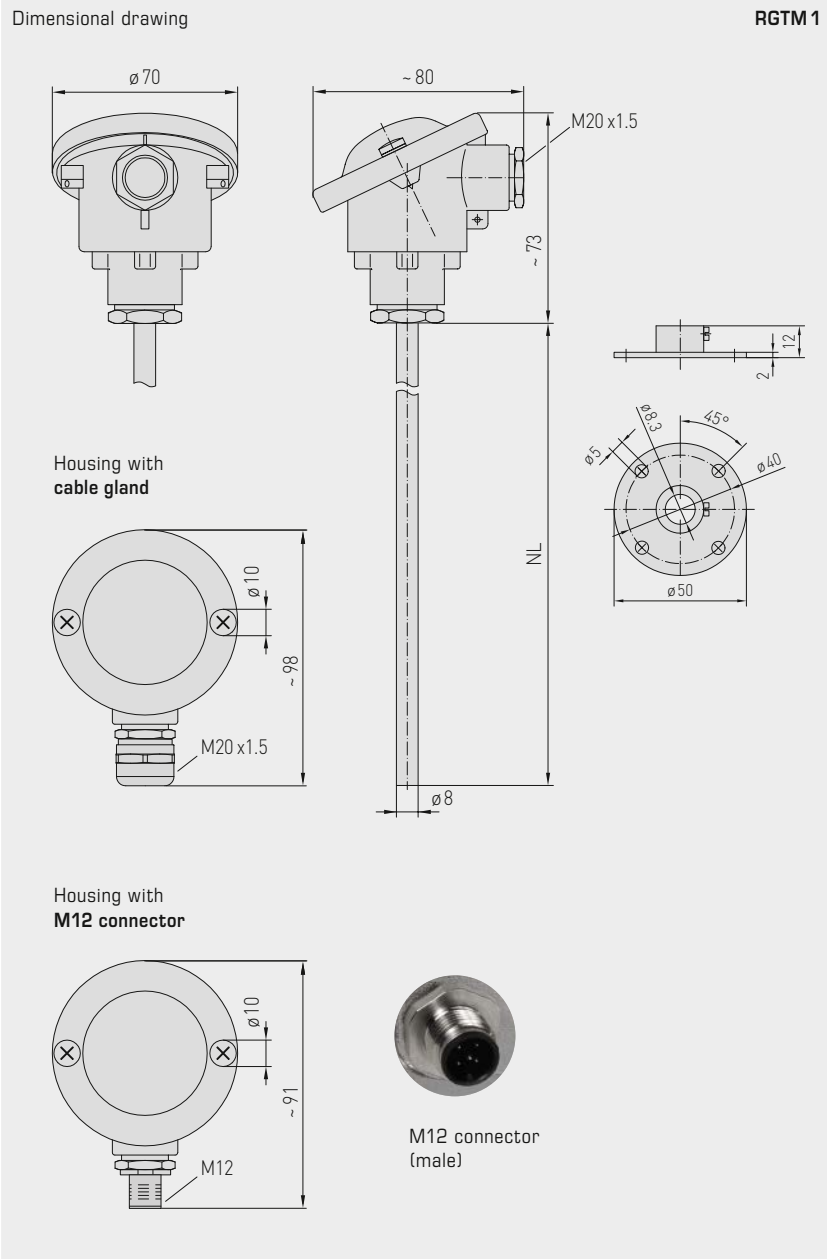
RGTM 1
Measuring insert with ceramic tubelet



S+S REGELTECHNIK

THERMASGARD® RGTM 1

Duct/smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output



RGTM 1 standard (IP54)



RGTM 1-KV with cable gland (IP65)



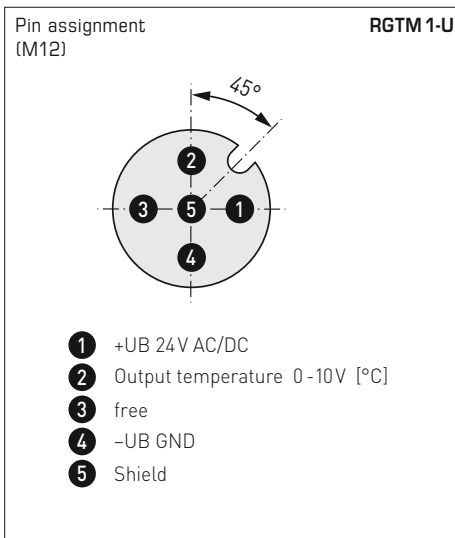
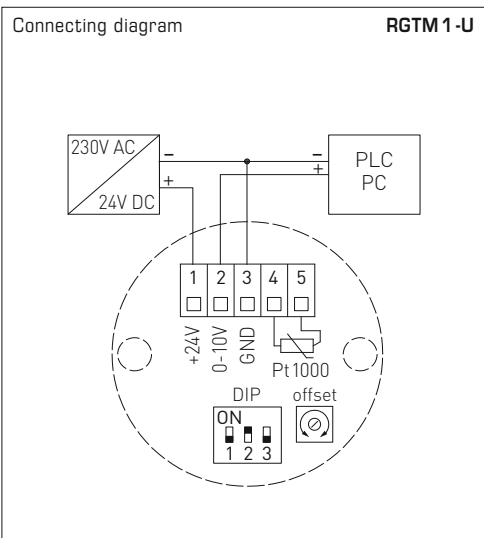
RGTM 1-Q with M12 connector (IP65)



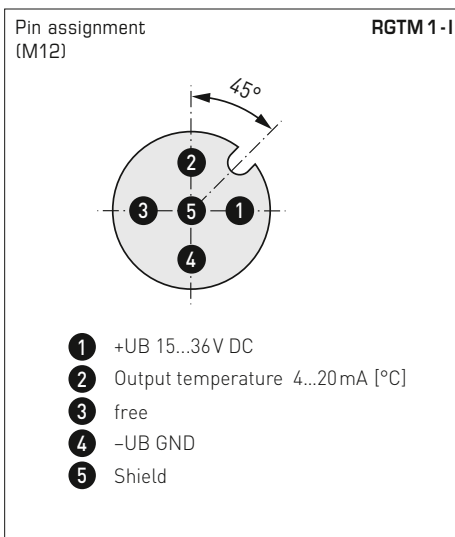
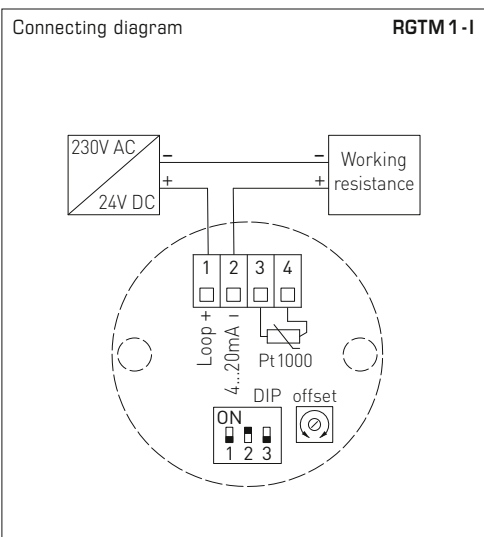
High-performance encapsulation against vibration, mechanical stress and humidity



Duct/smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output



RGTM 1-U
Connecting head



RGTM 1-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
0...+50 °C (default)	OFF	ON	ON
0...+100 °C	ON	OFF	ON
0...+200 °C	OFF	OFF	ON
0...+300 °C	ON	ON	OFF
0...+400 °C	OFF	ON	OFF
0...+500 °C	ON	OFF	OFF
0...+600 °C	OFF	OFF	OFF



Duct/smoke gas temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
and active output

RGTM 1
standard
(IP54)



THERMASGARD® RGTM 1		Duct / smoke gas temperature sensor, incl. mounting flange (standard)			
Type / WG01	Sensor	Output	Installation length (EL)	Item No.	Price
RGTM 1 - I				IP 54, I - variant	
RGTM1-I 200mm	Pt1000	4...20mA	200 mm	1101-3122-0049-810	254,27 €
RGTM1-I 250mm	Pt1000	4...20mA	250 mm	1101-3122-0059-810	264,37 €
RGTM1-I 300mm	Pt1000	4...20mA	300 mm	1101-3122-0069-810	267,18 €
RGTM1-I 400mm	Pt1000	4...20mA	400 mm	1101-3122-0089-810	269,42 €
RGTM 1 - U				IP 54, U - variant	
RGTM1-U 200mm	Pt1000	0 - 10 V	200 mm	1101-3121-0049-810	254,27 €
RGTM1-U 250mm	Pt1000	0 - 10 V	250 mm	1101-3121-0059-810	264,37 €
RGTM1-U 300mm	Pt1000	0 - 10 V	300 mm	1101-3121-0069-810	267,18 €
RGTM1-U 400mm	Pt1000	0 - 10 V	400 mm	1101-3121-0089-810	269,42 €
Housing variant:	equipped as standard with pressure screw (IP54), optional housing variants with cable gland (IP65) or M12 connector (IP65) see the next page!				
Extra charge:	other measuring ranges optional				22,40 €

Duct/smoke gas temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
and active output

RGTM 1 - Q
with M12 connector
(IP 65)



THERMASGARD® RGTM 1 - Q		Duct / smoke gas temperature sensor, incl. mounting flange (with M12 connector)				
Type/WG01	Sensor	Output	Installation length (EL)	Q	Item No.	Price
RGTM 1 - I xx Q				IP 65, I - variant		
RGTM1-I 200mm Q	Pt1000	4...20 mA	200 mm	●	2001-4131-2100-011	291,23 €
RGTM1-I 250mm Q	Pt1000	4...20 mA	250 mm	●	2001-4131-2100-021	301,35 €
RGTM1-I 300mm Q	Pt1000	4...20 mA	300 mm	●	2001-4131-2100-031	304,14 €
RGTM1-I 400mm Q	Pt1000	4...20 mA	400 mm	●	2001-4131-2100-041	306,40 €
RGTM 1 - U xx Q				IP 54, U - variant		
RGTM1-U 200mm Q	Pt1000	0 - 10 V	200 mm	●	2001-4131-1100-011	291,23 €
RGTM1-U 250mm Q	Pt1000	0 - 10 V	250 mm	●	2001-4131-1100-021	301,35 €
RGTM1-U 300mm Q	Pt1000	0 - 10 V	300 mm	●	2001-4131-1100-031	304,14 €
RGTM1-U 400mm Q	Pt1000	0 - 10 V	400 mm	●	2001-4131-1100-041	306,40 €
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)				
Extra charge:	other measuring ranges optional					22,40 €

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



S+S REGELTECHNIK

THERMASGARD® RGTM 1

Duct/smoke gas temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
and active output

RGTM 1 - KV
with cable gland
(IP 65)



THERMASGARD® RGTM 1 - KV		Duct / smoke gas temperature sensor, incl. mounting flange (with cable gland)			
Type / WG01	Sensor	Output	Installation length (EL)	Item No.	Price
RGTM 1 - I xx KV				IP 65, I - variant	
RGTM1-I 200mm KV	Pt1000	4...20mA	200 mm	1101-31D2-0049-810	262,59 €
RGTM1-I 250mm KV	Pt1000	4...20mA	250 mm	1101-31D2-0059-810	272,70 €
RGTM1-I 300mm KV	Pt1000	4...20mA	300 mm	1101-31D2-0069-810	275,50 €
RGTM1-I 400mm KV	Pt1000	4...20mA	400 mm	1101-31D2-0089-810	277,75 €
RGTM 1 - U xx KV				IP 65, U - variant	
RGTM1-U 200mm KV	Pt1000	0 - 10 V	200 mm	1101-31D1-0049-810	262,59 €
RGTM1-U 250mm KV	Pt1000	0 - 10 V	250 mm	1101-31D1-0059-810	272,70 €
RGTM1-U 300mm KV	Pt1000	0 - 10 V	300 mm	1101-31D1-0069-810	275,50 €
RGTM1-U 400mm KV	Pt1000	0 - 10 V	400 mm	1101-31D1-0089-810	277,75 €
Housing variant "KV":		Cable connection with cable gland			
Extra charge:	other measuring ranges optional				22,40 €

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

RGTM 2
Basic unit

Calibratable smoke gas / screw-in temperature measuring transducer with neck tube **THERMASGARD® RGTM 2** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101), spring-mounted measuring insert and straight protective tube.

The duct sensor is used to detect high temperatures in gaseous or liquid media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	10 kOhm (load max. 1 mA) for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60 751, class B) (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) with manual zero point correction (± 10 K)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Cable connection:	RGTM 2 (Standard) adjusting screw made of metal (M 20 x 1.5); RGTM 2-KV (optional) cable gland, brass, nickel-plated (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTM 2-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -30...+70 °C
Protective tube:	stainless steel, V4A (1.4571), G ½" straight pipe thread, wrench size 27 mm, $p_{max} = 40 \text{ bar}$, $\varnothing = 8 \text{ mm}$ length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 400 mm (see table)
Process connection:	screwed socket with G ½"
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) RGTM 2 IP 65 (according to EN 60 529) RGTM 2-KV / RGTM 2-Q
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU



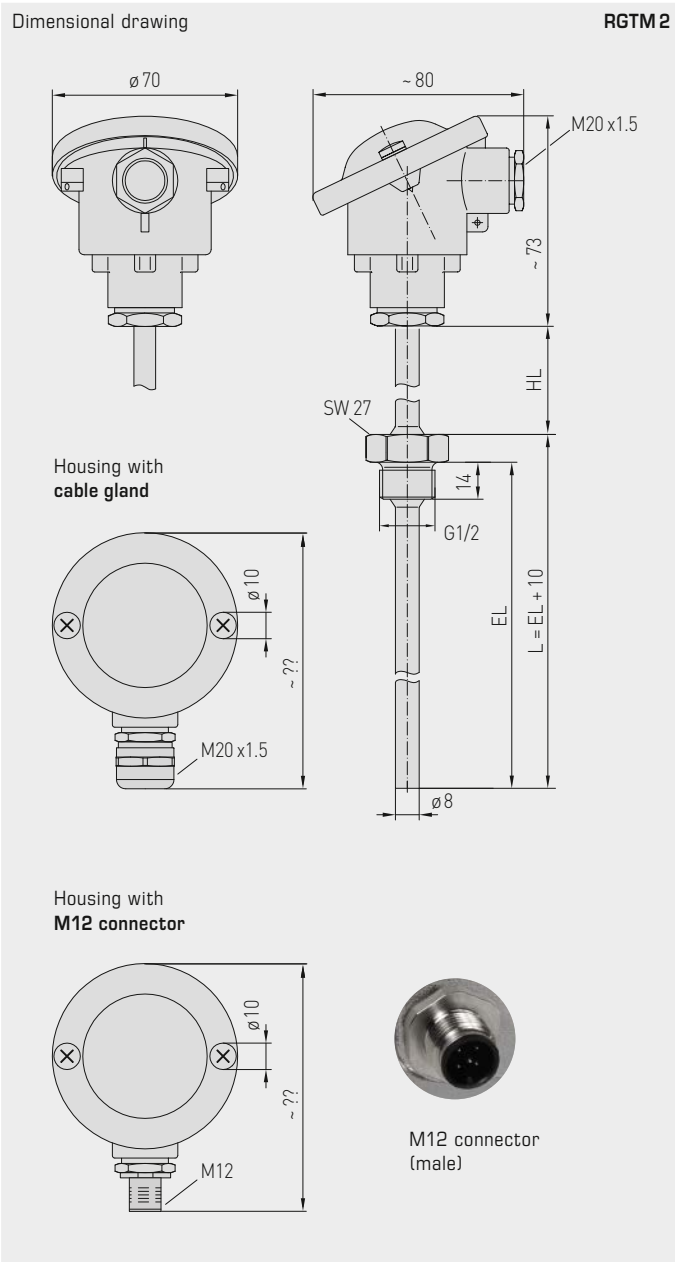
RGTM 2
Measuring insert with ceramic tubelet



S+S REGELTECHNIK

THERMASGARD® RGTM 2

Screw-in/smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION



RGTM 2
standard
(IP 54)



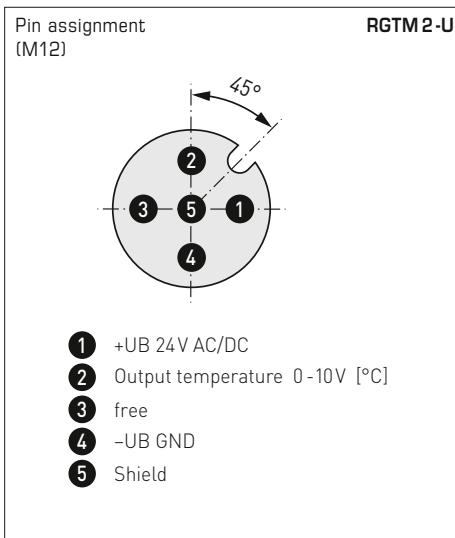
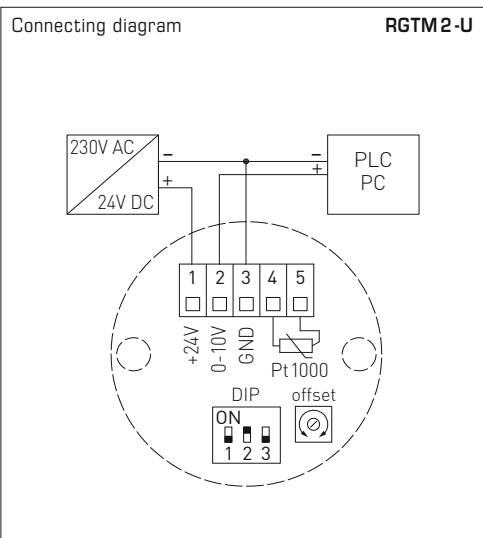
RGTM 2-KV
with cable gland
(IP 65)



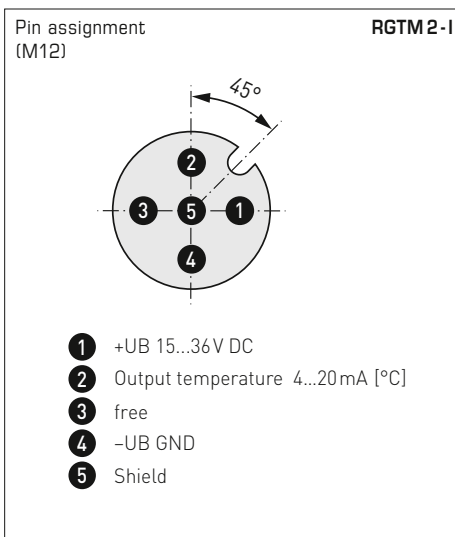
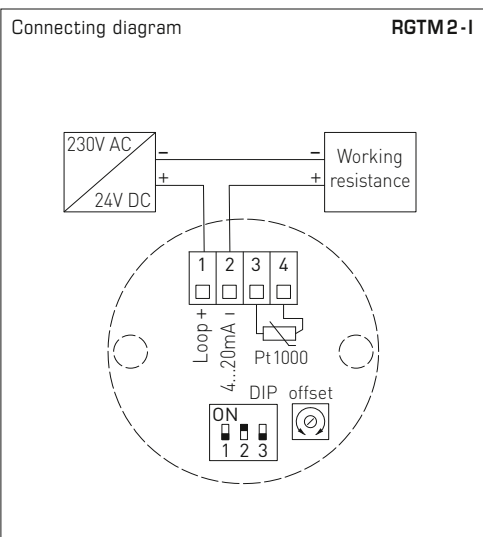
RGTM 2-Q
with M12 connector
(IP 65)



Screw-in / smoke gas temperature measuring transducer,
with neck tube, calibratable, with multi-range switching
and active output



RGTM 2-U
Connecting head



RGTM 2-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
0...+50 °C (default)	OFF	ON	ON
0...+100 °C	ON	OFF	ON
0...+200 °C	OFF	OFF	ON
0...+300 °C	ON	ON	OFF
0...+400 °C	OFF	ON	OFF
0...+500 °C	ON	OFF	OFF
0...+600 °C	OFF	OFF	OFF



Screw-in / smoke gas temperature measuring transducer,
with neck tube, calibratable, with multi-range switching
and active output

RGTM 2
standard
(IP 54)



THERMASGARD® RGTM 2		Screw-in / smoke gas temperature measuring transducer with neck tube (standard)			
Type / WG01	Sensor	Output	Installation length (EL)	Item No.	Price
RGTM 2 - I				IP 54, I - variant	
RGTM2-I 100/80mm	Pt1000	4...20 mA	100 mm	1101-2162-0029-810	246,98 €
RGTM2-I 150/80mm	Pt1000	4...20 mA	150 mm	1101-2162-0039-810	251,46 €
RGTM2-I 200/80mm	Pt1000	4...20 mA	200 mm	1101-2162-0049-810	253,70 €
RGTM2-I 250/80mm	Pt1000	4...20 mA	250 mm	1101-2162-0059-810	263,81 €
RGTM2-I 300/80mm	Pt1000	4...20 mA	300 mm	1101-2162-0069-810	267,18 €
RGTM2-I 400/80mm	Pt1000	4...20 mA	400 mm	1101-2162-0089-810	268,31 €
RGTM 2 - U				IP 54, U - variant	
RGTM2-U 100/80mm	Pt1000	0 - 10 V	100 mm	1101-2161-0029-810	246,98 €
RGTM2-U 150/80mm	Pt1000	0 - 10 V	150 mm	1101-2161-0039-810	251,46 €
RGTM2-U 200/80mm	Pt1000	0 - 10 V	200 mm	1101-2161-0049-810	253,70 €
RGTM2-U 250/80mm	Pt1000	0 - 10 V	250 mm	1101-2161-0059-810	263,81 €
RGTM2-U 300/80mm	Pt1000	0 - 10 V	300 mm	1101-2161-0069-810	267,18 €
RGTM2-U 400/80mm	Pt1000	0 - 10 V	400 mm	1101-2161-0089-810	268,31 €
Housing variant:	equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or M12 connector (IP 65) see the next page!				
Extra charge:	other measuring ranges optional				22,40 €

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

RGTM 2 - Q
with M12 connector (IP 65)



THERMASGARD®		Screw-in / smoke gas temperature measuring transducer with neck tube (with M12 connector)				
Type / WG01	Sensor	Output	Installation length (EL)	Q	Item No.	Price
RGTM 2-I xx Q				IP 65, I - variant		
RGTM2-I 100/80mm Q	Pt1000	4...20 mA	100 mm	●	2001-4141-2100-011	283,95 €
RGTM2-I 150/80mm Q	Pt1000	4...20 mA	150 mm	●	2001-4141-2100-021	288,44 €
RGTM2-I 200/80mm Q	Pt1000	4...20 mA	200 mm	●	2001-4141-2100-031	291,72 €
RGTM2-I 250/80mm Q	Pt1000	4...20 mA	250 mm	●	2001-4141-2100-041	300,78 €
RGTM2-I 300/80mm Q	Pt1000	4...20 mA	300 mm	●	2001-4141-2100-051	304,14 €
RGTM2-I 400/80mm Q	Pt1000	4...20 mA	400 mm	●	2001-4141-2100-061	305,28 €
RGTM 2-U xx Q				IP 65, U - variant		
RGTM2-U 100/80mm Q	Pt1000	0 - 10 V	100 mm	●	2001-4141-1100-011	283,95 €
RGTM2-U 150/80mm Q	Pt1000	0 - 10 V	150 mm	●	2001-4141-1100-021	288,44 €
RGTM2-U 200/80mm Q	Pt1000	0 - 10 V	200 mm	●	2001-4141-1100-031	291,72 €
RGTM2-U 250/80mm Q	Pt1000	0 - 10 V	250 mm	●	2001-4141-1100-041	300,78 €
RGTM2-U 300/80mm Q	Pt1000	0 - 10 V	300 mm	●	2001-4141-1100-051	304,14 €
RGTM2-U 400/80mm Q	Pt1000	0 - 10 V	400 mm	●	2001-4141-1100-061	305,28 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)					
Extra charge:	other measuring ranges optional					22,40 €

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



Screw-in / smoke gas temperature measuring transducer,
with neck tube, calibratable, with multi-range switching
and active output

RGTM 2 - KV
with cable gland
(IP 65)



THERMASGARD®		Screw-in / smoke gas temperature measuring transducer with neck tube (with cable gland)			
Type / WG01	Sensor	Output	Installation length (EL)	Item No.	Price
RGTM 2-I xx KV				IP 65, I-variant	
RGTM2-I 100/80mm KV	Pt1000	4...20mA	100 mm	1101-21D2-0029-810	255,30 €
RGTM2-I 150/80mm KV	Pt1000	4...20mA	150 mm	1101-21D2-0039-810	259,78 €
RGTM2-I 200/80mm KV	Pt1000	4...20mA	200 mm	1101-21D2-0049-810	262,03 €
RGTM2-I 250/80mm KV	Pt1000	4...20mA	250 mm	1101-21D2-0059-810	272,14 €
RGTM2-I 300/80mm KV	Pt1000	4...20mA	300 mm	1101-21D2-0069-810	275,50 €
RGTM2-I 400/80mm KV	Pt1000	4...20mA	400 mm	1101-21D2-0089-810	276,62 €
RGTM 2-U xx KV				IP 65, U-variant	
RGTM2-U 100/80mm KV	Pt1000	0-10 V	100 mm	1101-21D1-0029-810	255,30 €
RGTM2-U 150/80mm KV	Pt1000	0-10 V	150 mm	1101-21D1-0039-810	259,78 €
RGTM2-U 200/80mm KV	Pt1000	0-10 V	200 mm	1101-21D1-0049-810	262,03 €
RGTM2-U 250/80mm KV	Pt1000	0-10 V	250 mm	1101-21D1-0059-810	272,14 €
RGTM2-U 300/80mm KV	Pt1000	0-10 V	300 mm	1101-21D1-0069-810	275,50 €
RGTM2-U 400/80mm KV	Pt1000	0-10 V	400 mm	1101-21D1-0089-810	276,62 €
Housing variant "KV":		Cable connection with cable gland			
Extra charge:	other measuring ranges optional				22,40 €

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

Calibratable temperature measuring transducer with sleeve sensor **THERMASGARD® HFTM** with eight switchable measuring ranges, continuous output, housing made from impact-resistant plastic with quick-release screws, optionally **with/without display**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories).

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see working resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection at IP68) sensor external
Measuring ranges:	multi-range switching with 8 switchable measuring ranges see table (other measuring ranges optional) with manual zero point correction (± 10 K)
Deviation in temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), Ø = 6 mm, nominal length NL = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, 2 x 0.25 mm²; KL = 1.5 m (optionally also other lengths and measuring range limits, e.g., PTFE up to +250 °C or glass fibre with steel mesh up to +350 °C)
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Protection type sensor:	IP 65 (according to EN 60 529) sleeve humidity-tight (standard) IP 68 (according to EN 60 529) sleeve water-tight (optional) IP 54 (according to EN 60 529) with glass fibre cable (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	display with illumination , two-line, cut-out approx. 36x15 mm (B x H), to display the actual temperature and internal diagnostics (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

HFTM
with cable gland



HFTM-Q
with M12 connector





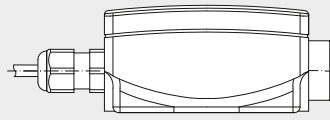
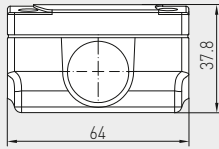
Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output



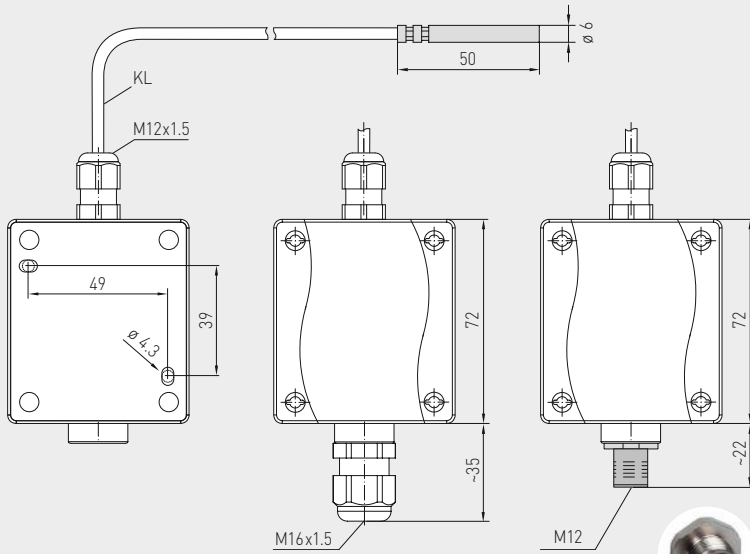
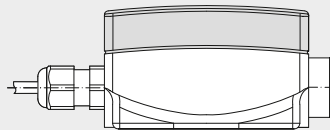
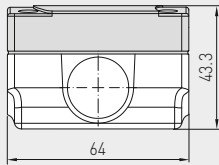
Dimensional drawing

HFTM

without display



with display



Housing with cable gland

Housing with M12 connector

HFTM with cable gland and display



HFTM-Q with M12 connector and display



Display and internal diagnostics THERMASGARD® Measuring transducer with display



Standard



Measuring range exceeded



Measuring range not reached



Sensor breakage



Sensor short circuit



IP65 (standard) humidity-tight



IP68 (optional) water-tight Perfect Sensor Protection

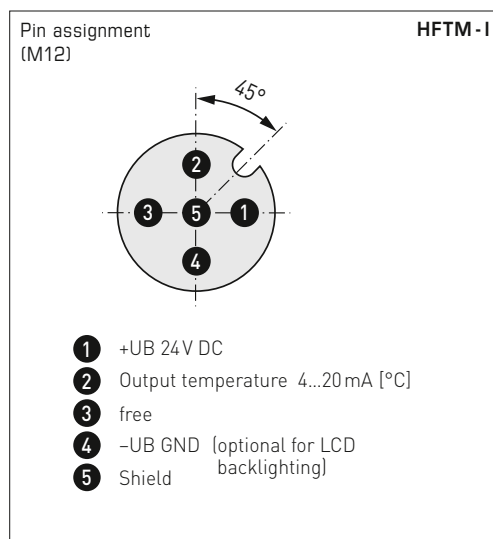
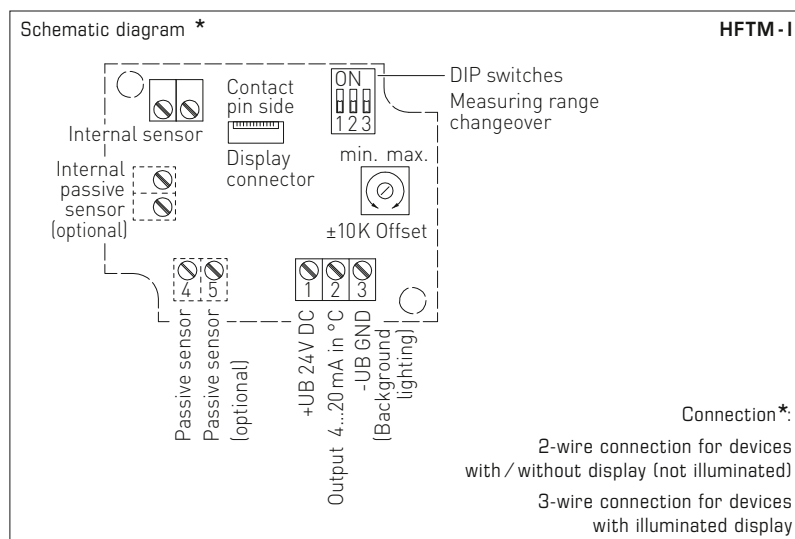
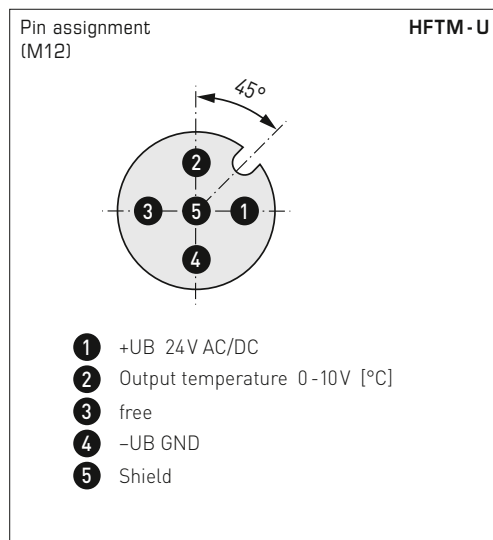
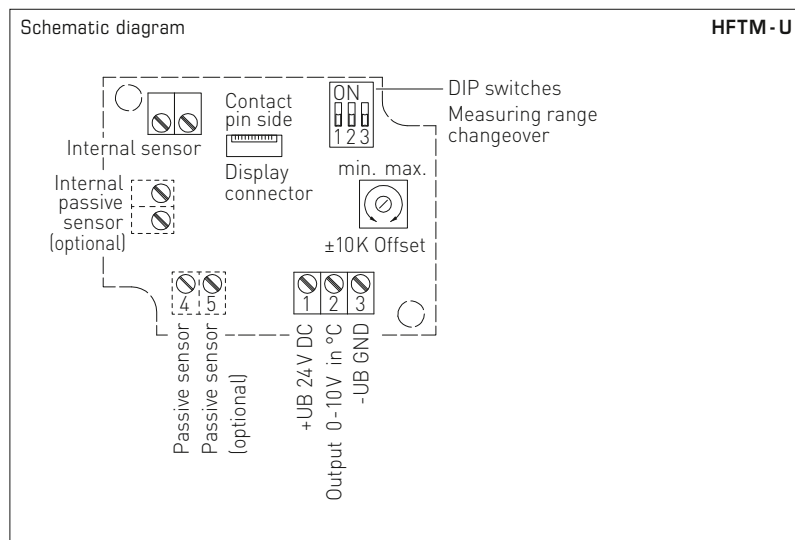


IP54 (optional) with glass fibre cable

High-performance encapsulation against vibration, mechanical stress and humidity

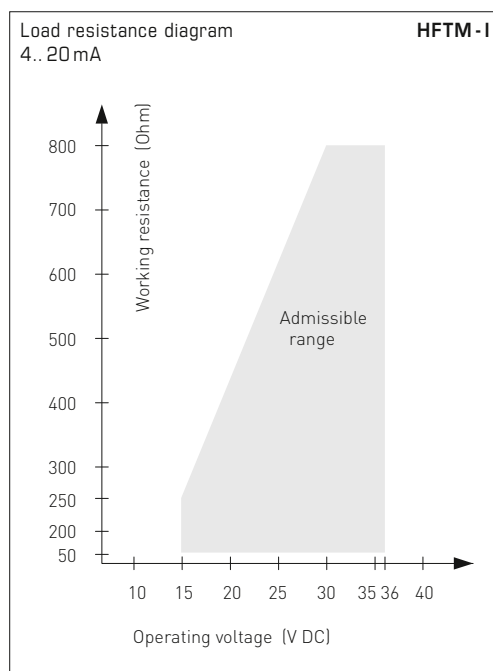


Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

HFTM-xx
with display, hinged



Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

HFTM-Q
with M12 connector

HFTM
with cable gland



THERMASGARD® HFTM		Sleeve sensor with temperature measuring transducer (with cable gland)				
Type / WG01	Sensor	Output	Type	Display	Item No.	Price
HFTM						
HFTM-I	Pt1000	4...20 mA	Remote sensor		1101-1152-0219-920	92,16 €
HFTM-I LCD	Pt1000	4...20 mA	Remote sensor	■	1101-1152-2219-920	137,08 €
HFTM-U	Pt1000	0-10 V	Remote sensor		1101-1151-0219-920	92,16 €
HFTM-U LCD	Pt1000	0-10 V	Remote sensor	■	1101-1151-2219-920	137,08 €
Housing variant:	Cable connection with cable gland					
Extra charge:	other measuring ranges optional					22,40 €
	Protection type IP68 (Sensor sleeve watertight compound-filled)					3,00 €
	2-wire connecting leads, per running meter (silicone/PTFE/glass fibre)					on request
	Other lengths of protection sleeve optional					on request

THERMASGARD® HFTM-Q		Sleeve sensor with temperature measuring transducer (with M12 connector)				
Type / WG01	Sensor	Output	Type	Display ● = Q	Item No.	Price
HFTM-Q						
HFTM-I Q	Pt1000	4...20 mA	Remote sensor	●	2001-2111-2100-001	129,13 €
HFTM-I Q LCD	Pt1000	4...20 mA	Remote sensor	● ■	2001-2112-2100-001	174,04 €
HFTM-U Q	Pt1000	0-10 V	Remote sensor	●	2001-2111-1100-001	154,00 €
HFTM-U Q LCD	Pt1000	0-10 V	Remote sensor	● ■	2001-2112-1100-001	174,04 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)					
Extra charge:	see table above!					

ACCESSORIES	
THE-xx	Immersion sleeve , stainless steel V4A (1.4571) or nickel-plated brass, Ø = 9 mm see chapter Accessories!
	Special accessories for M12 connector see chapter Accessories!

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

Calibratable temperature measuring transducer with sleeve sensor **THERMASGARD® HFTM - VA** with eight switchable measuring ranges, continuous output, rugged housing made from **stainless steel V4A** with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

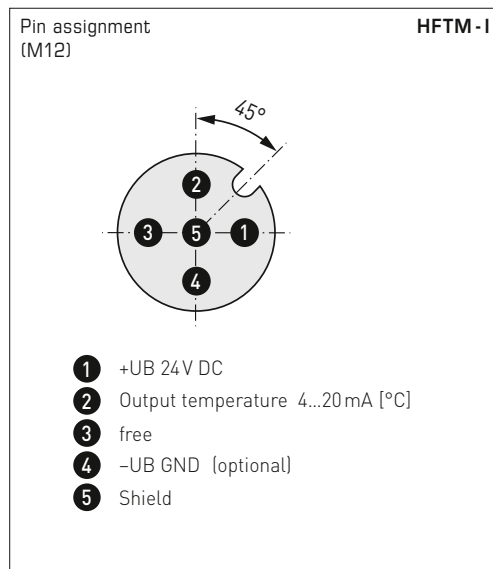
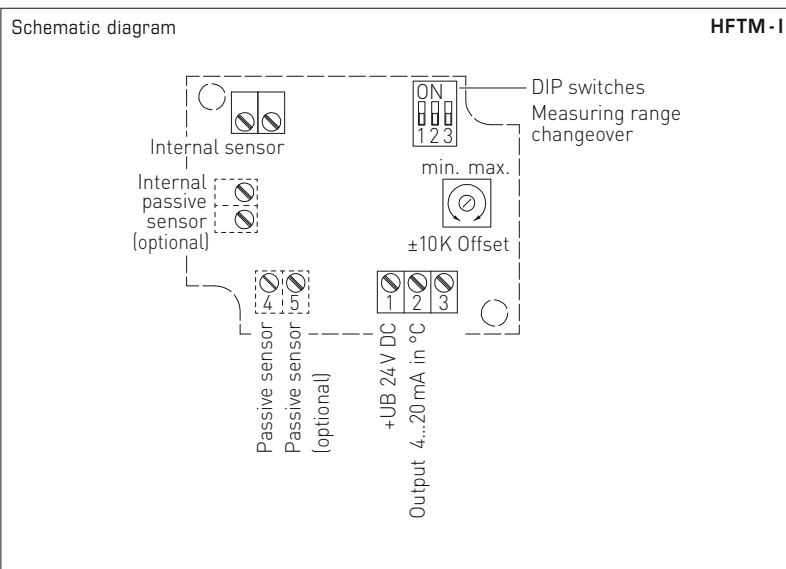
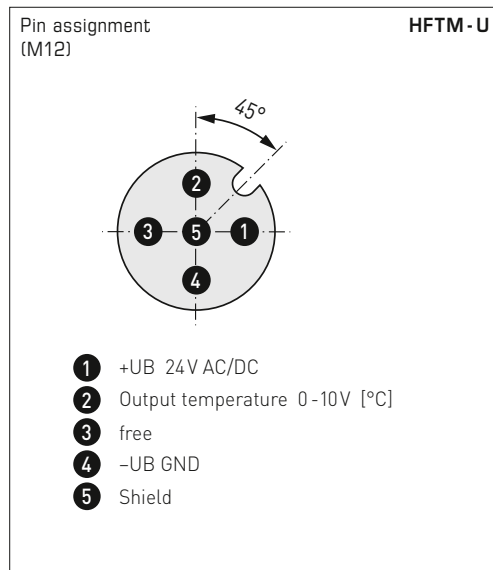
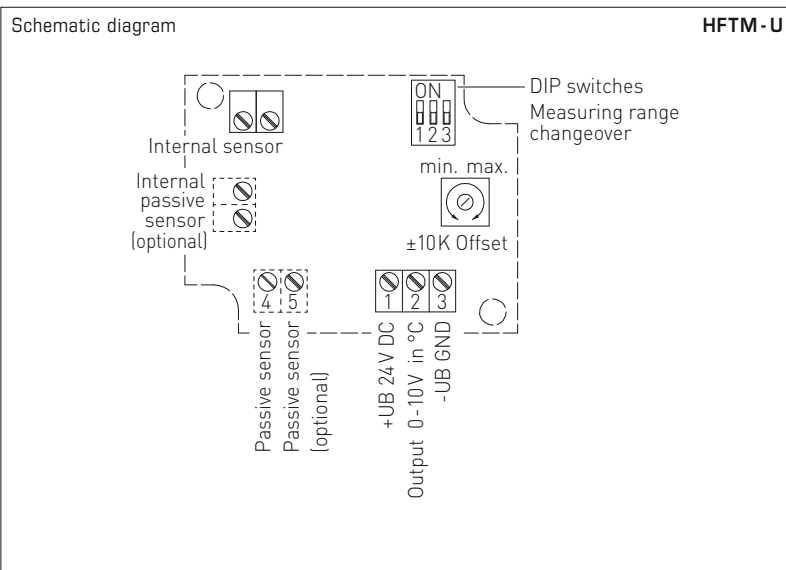
The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. The measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable). A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories).

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

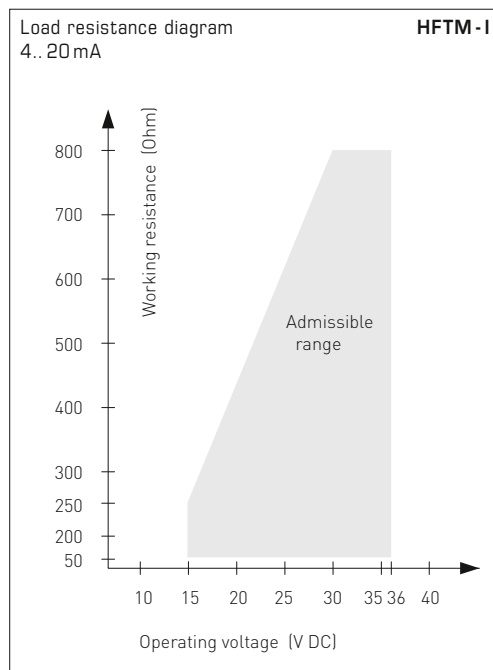
TECHNICAL DATA

Power supply:	24 V AC / DC ($\pm 10\%$) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see working resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.0 \text{ VA} / 24 \text{ V DC}$; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Insulating resistance:	$\geq 100 \text{ M}\Omega$, at $+20^\circ\text{C}$ (500 V DC)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection with IP68) Sensor external
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) with manual zero point correction ($\pm 10 \text{ K}$)
Deviation, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output:	0 - 10 V or 4... 20 mA
Connection type:	2-wire connection
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr2E)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), $\varnothing = 6 \text{ mm}$, nominal length NL = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, $2 \times 0.25 \text{ mm}^2$; KL = 1.5 m (optionally also other lengths and measuring range limits, e.g., PTFE up to $+250^\circ\text{C}$ or glass fibre with steel mesh up to $+350^\circ\text{C}$)
Ambient temperature:	measuring transducer $-30...+70^\circ\text{C}$
Permitted humidity:	$< 95\%$ r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type housing:	IP 65 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	IP 65 (according to EN 60529) sleeve humidity-tight (standard) IP 68 (according to EN 60529) sleeve water-tight (optional) IP 54 (according to EN 60529) with glass fibre cable (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20...+ 150 °C	ON	ON	ON
-50... + 50 °C	OFF	ON	ON
-20... + 80 °C	ON	OFF	ON
-30... + 60 °C	OFF	OFF	ON
0... + 40 °C	ON	ON	OFF
0... + 50 °C (default)	OFF	ON	OFF
0...+ 100 °C	ON	OFF	OFF
0...+ 150 °C	OFF	OFF	OFF





NEW

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output

HFTM - VAQ
with M12 connector

HFTM - VA
with cable gland



THERMASGARD® HFTM - VA		Sleeve sensor with temperature measuring transducer, ID (Stainless steel housing with cable gland)			
Type / WG02I	Sensor	Output	Type	Item No.	Price
HFTM - VA					
HFTM-I VA	Pt1000	4...20 mA	Remote sensor	2001-2141-2200-001	338,03 €
HFTM-U VA	Pt1000	0-10 V	Remote sensor	2001-2141-1200-001	338,03 €
Housing variant:	Cable connection with cable gland				
Extra charge:	other measuring ranges optional				22,40 €
	Protection type IP68 (Sensor sleeve watertight compound-filled)				3,00 €
	2-wire connecting leads, per running meter (silicone / PTFE / glass fibre)				on request
	Other lengths of protection sleeve optional				on request

THERMASGARD® HFTM - VAQ		Sleeve sensor with temperature measuring transducer, ID (Stainless steel housing with M12 connector)			
Type / WG02I	Sensor	Output	Type	● = Q Item No.	Price
HFTM - VAQ					
HFTM-I VAQ	Pt1000	4...20 mA	Remote sensor	● 2001-2141-2100-001	372,02 €
HFTM-U VAQ	Pt1000	0-10 V	Remote sensor	● 2001-2141-1100-001	372,02 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)				
Extra charge:	see table above!				

ACCESSORIES	
THE-xx	Immersion sleeve , stainless steel V4A (1.4571) or nickel-plated brass, Ø = 9 mm see chapter Accessories!
	Special accessories for M12 connector see chapter Accessories!

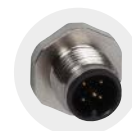


Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output

ALTM 1

Calibratable surface-contact temperature measuring transducer (compact variant) **THERMASGARD® ALTM 1** with eight switchable measuring ranges, continuous output, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, incl. strap.

The surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

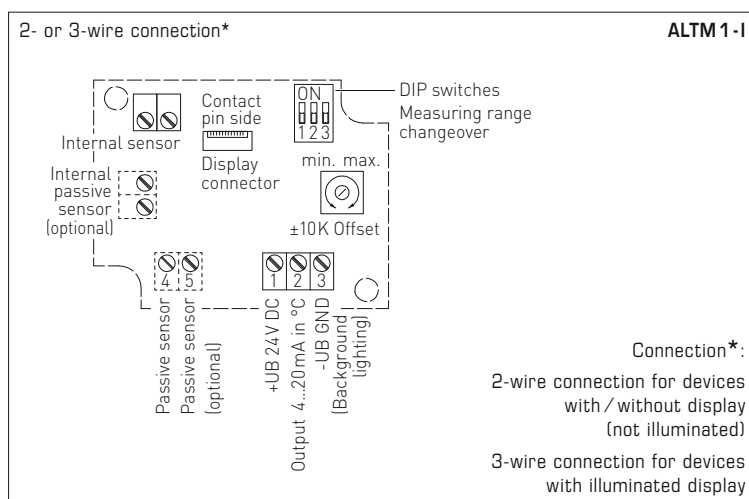
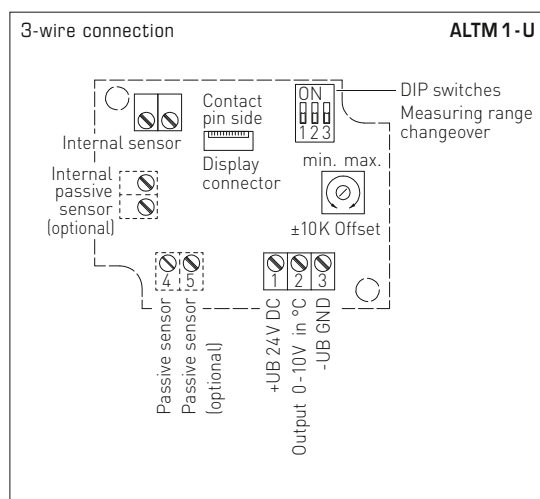
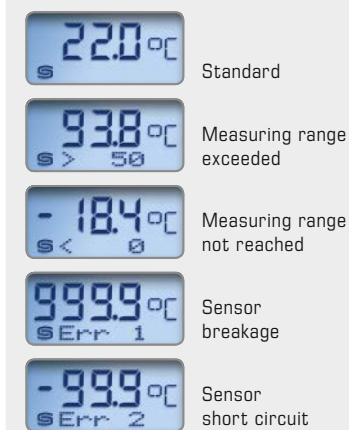


M12 connector
(optional on request)

TECHNICAL DATA

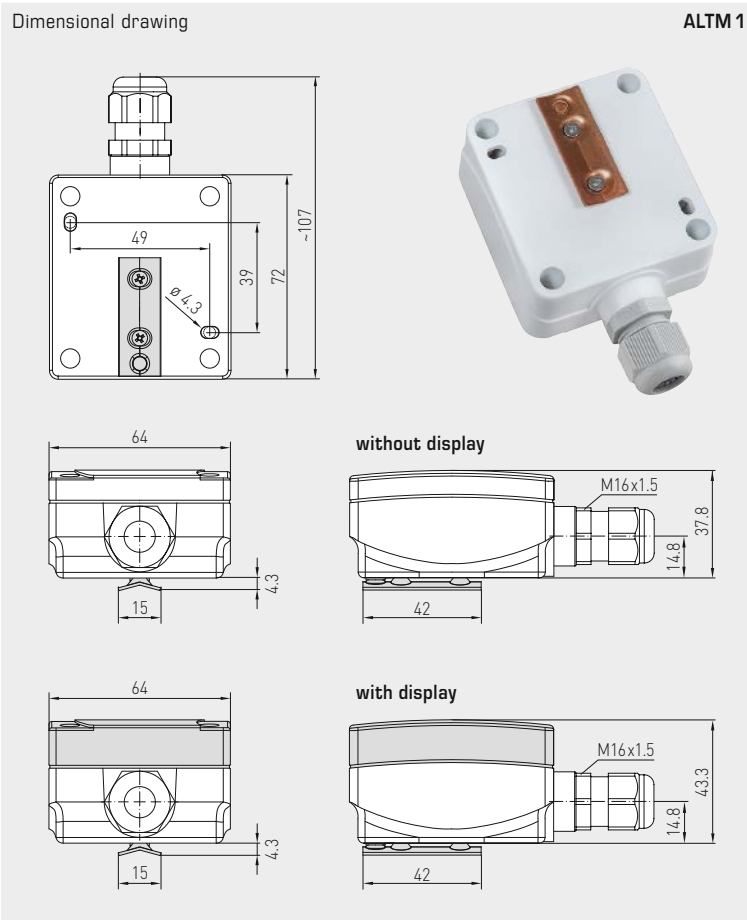
Power supply:	24 V AC / DC (± 10%) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) compact variant: T_{max} up to +100 °C , operating range $-50...+100$ °C with manual zero point correction (± 10 K)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Process connection:	endless strap with metal tightener, (included in the scope of delivery) $\varnothing = 13 - 92 \text{ mm}$ (1/4 - 3"), length L = 300 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Ambient temperature:	measuring transducer $-30...+70$ °C
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display





Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output



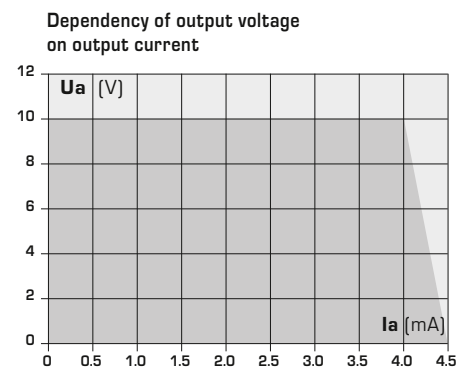
ALTM 1 with display



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF



THERMASGARD® ALTM 1 Surface contact / tube contact temperature measuring transducers (compact)						
Type / WG01	Sensor	Output	Type	Display	Item No.	Price
ALTM 1-I					IP65, I-variant	
ALTM1-I	Pt1000	4...20 mA	Compact		1101-1112-0219-920	92,62 €
ALTM1-I LCD	Pt1000	4...20 mA	Compact	■	1101-1112-2219-920	137,53 €
ALTM 1-U					IP65, U-variant	
ALTM1-U	Pt1000	0-10 V	Compact		1101-1111-0219-920	92,62 €
ALTM1-U LCD	Pt1000	0-10 V	Compact	■	1101-1111-2219-920	137,53 €
Extra charge:	Other ranges optional Cable connection with M12 connector according to DIN EN 61076-2-101					22,40 € on request

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	2,98 €

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output

Calibratable tube contact temperature measuring transducer **THERMASGARD® ALTM 2** with eight switchable, measuring ranges, external sensor, continuous output, housing made from impact-resistant plastic with quick-release screws, optionally **with/without display**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ALTM 2
with cable gland



ALTM 2-Q
with M12 connector

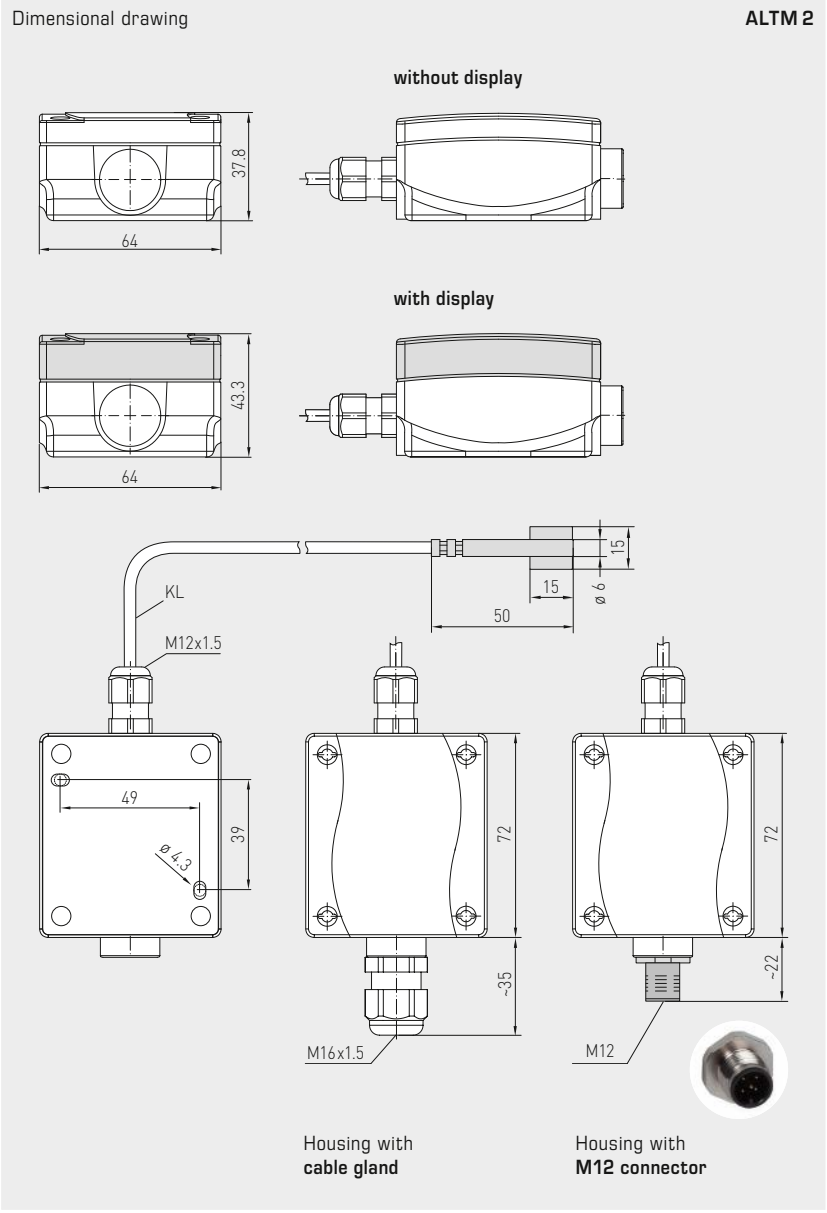


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10%) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see working resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection at IP68) sensor external
Measuring ranges:	multi-range switching with 8 switchable measuring ranges see table (other measuring ranges optional) T_{max} above +100 °C , operating range -50...+150 °C with manual zero point correction (± 10 K)
Deviation in temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Sensor cable:	Silicone, SiHF, 2 x 0.25 mm ² ; KL = 1.5 m (optionally also other lengths and measuring range limits, e.g., PTFE up to +250 °C or glass fibre with steel mesh up to +350 °C)
Sensor protection:	pipe feeder made of stainless steel V4A (1.4571), Ø = 6 mm, L = 50 mm
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Process connection:	endless strap with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (1/4 - 3"), L = 300 mm
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type housing:	IP 65 (according to EN 60529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Protection type sensor:	IP 65 (according to EN 60529) sleeve humidity-tight (standard) IP 68 (according to EN 60529) sleeve water-tight (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	display with illumination , two-line, cut-out approx. 36x15 mm (B x H), to display the actual temperature and internal diagnostics (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)
ACCESSORIES	(see table)



Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output



ALTM 2
with cable gland and display



ALTM 2-Q
with M12 connector and display



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

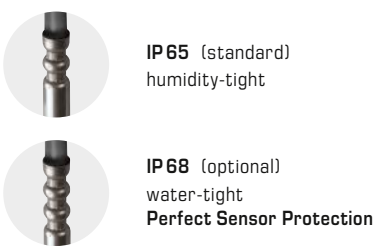
Standard

Measuring range exceeded

Measuring range not reached

Sensor breakage

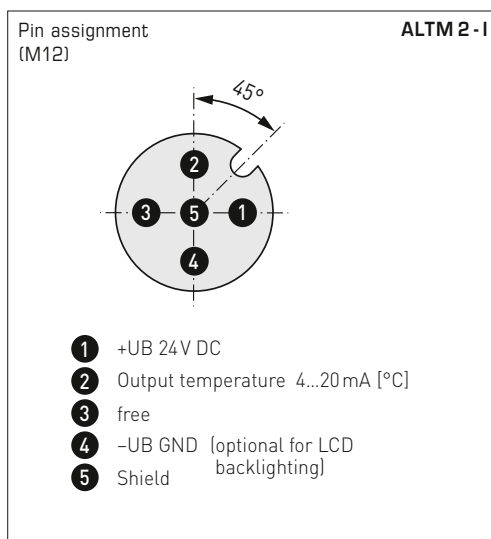
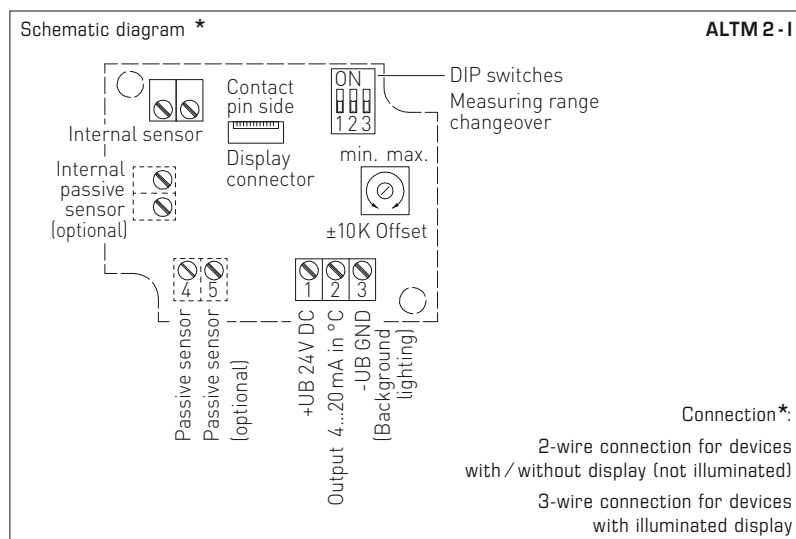
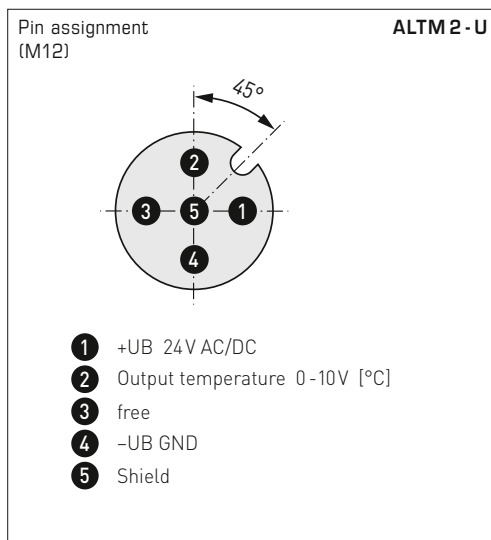
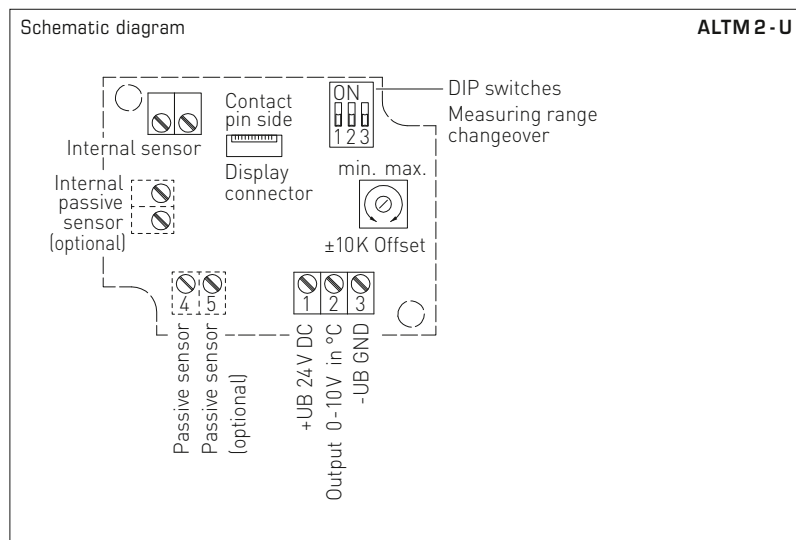
Sensor short circuit



* High-performance encapsulation against vibration, mechanical stress and humidity

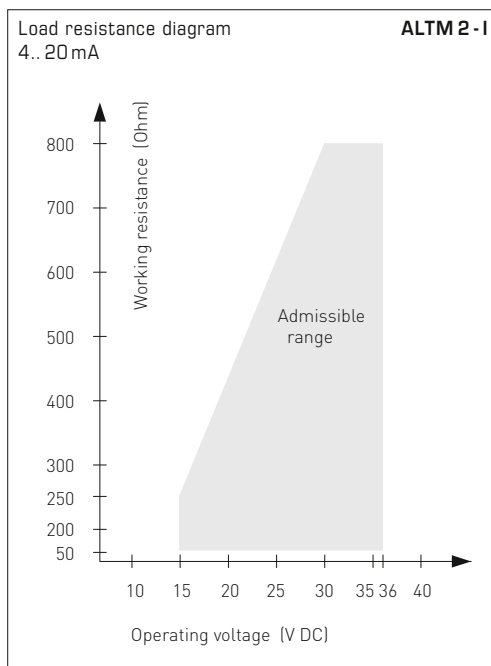


Surface contact / tube contact temperature measuring transducers,
incl. strap, with detached sensor head, calibratable,
with multi-range switching and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

ALTM 2-xx
with display,
hinged





Surface contact / tube contact temperature measuring transducers,
incl. strap, with detached sensor head, calibratable,
with multi-range switching and active output

ALTM 2 - Q
with M12 connector



ALTM 2
with cable gland

THERMASGARD® ALTM 2		Surface contact / tube contact temperature measuring transducers (with cable gland)				
Type / WG01	Sensor	Output	Type	Display	Item No.	Price
ALTM 2						
ALTM2-I	Pt1000	4...20 mA	Remote sensor		1101-1122-0219-920	98,79 €
ALTM2-I LCD	Pt1000	4...20 mA	Remote sensor	■	1101-1122-2219-920	143,70 €
ALTM2-U	Pt1000	0-10 V	Remote sensor		1101-1121-0219-920	98,79 €
ALTM2-U LCD	Pt1000	0-10 V	Remote sensor	■	1101-1121-2219-920	143,70 €
Housing variant:	Cable connection with cable gland					
Extra charge:	other measuring ranges optional					22,40 €
	Protection type IP68 (Sensor sleeve watertight compound-filled)					3,00 €
	2-wire connecting leads, per running meter (silicone / PTFE / glass fibre)					on request

THERMASGARD® ALTM 2 - Q		Surface contact / tube contact temperature measuring transducers (with M12 connector)				
Type / WG01	Sensor	Output	Type	Display	Item No.	Price
				● = Q		
ALTM 2 - Q						
ALTM2-I Q	Pt1000	4...20 mA	Remote sensor	●	2001-2121-2100-001	135,76 €
ALTM2-I Q LCD	Pt1000	4...20 mA	Remote sensor	● ■	2001-2122-2100-001	180,66 €
ALTM2-U Q	Pt1000	0-10 V	Remote sensor	●	2001-2121-1100-001	135,76 €
ALTM2-U Q LCD	Pt1000	0-10 V	Remote sensor	● ■	2001-2122-1100-001	180,66 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)					
Extra charge:	see table above!					

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free		7100-0060-1000-000 2,98 €
Special accessories for M12 connector see chapter Accessories!			

Surface contact / tube contact temperature measuring transducers,
incl. strap, with detached sensor head, calibratable,
with multi-range switching and active output

Calibratable tube contact temperature measuring transducer **THERMASGARD® ALTM 2 - VA** with eight switchable measuring ranges, external sensor, continuous output, rugged housing made from **stainless steel V4A**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10%) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see working resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection with IP68) Sensor external
Measuring ranges:	multi-range switching with 8 switchable measuring ranges see table (other ranges optional) T_{max} above +100 °C , operating range -50...+150 °C with manual zero point correction (± 10 K)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2-wire connection
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Sensor cable:	Silicone, SiHF, 2 x 0.25 mm ² ; KL = 1.5 m (optionally also other lengths and measuring range limits, e.g., PTFE up to +250 °C or glass fibre with steel mesh up to +350 °C)
Sensor protection:	pipe feeder, made of stainless steel V4A (1.4571), Ø = 6 mm, L = 50 mm
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Process connection:	endless strap with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (1/4 - 3"), L = 300 mm
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	IP 65 (according to EN 60 529) sleeve humidity-tight (standard) IP 68 (according to EN 60 529) sleeve water-tight (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)

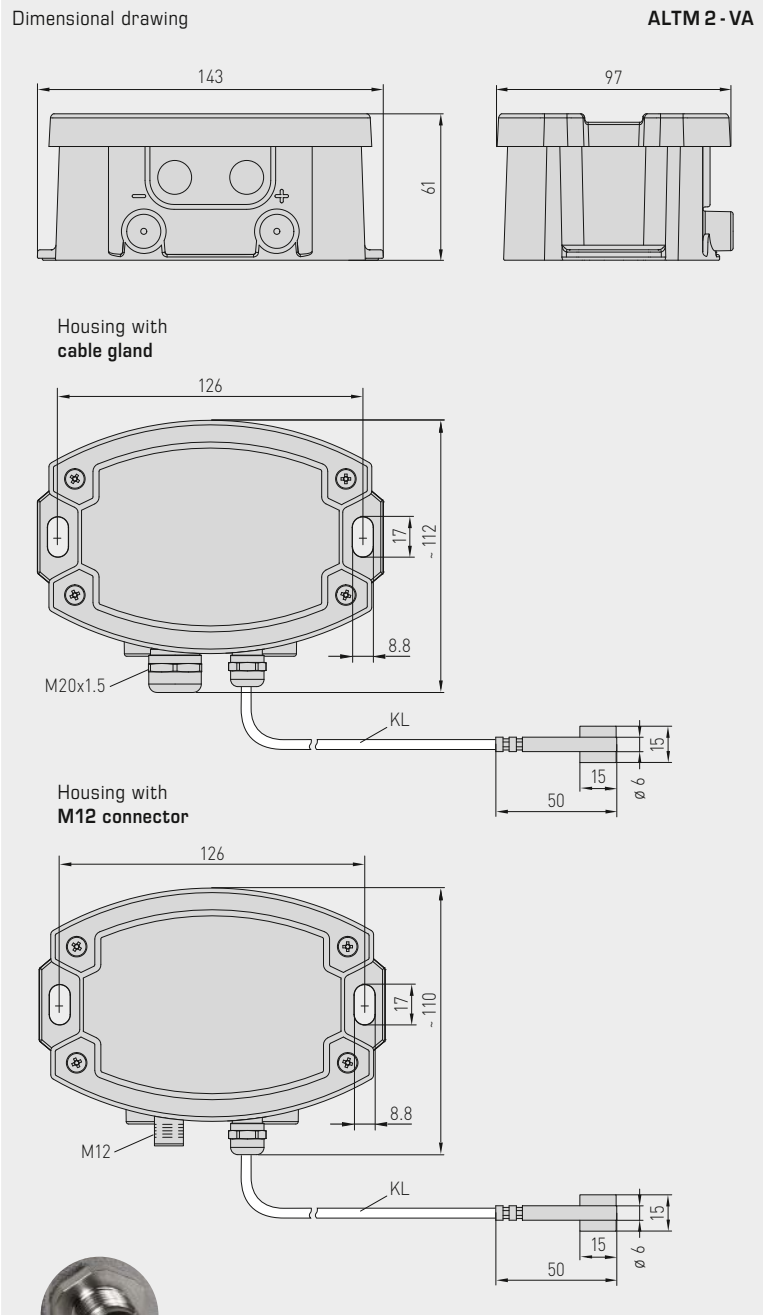


NEW

S+S REGELTECHNIK

Thermasgard® **ALTM 2 - VA**

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output



ALTM 2 - VA
with cable gland



ALTM 2 - VAQ
with M12 connector



M12 connector
(male)



IP65 (standard)
humidity-tight

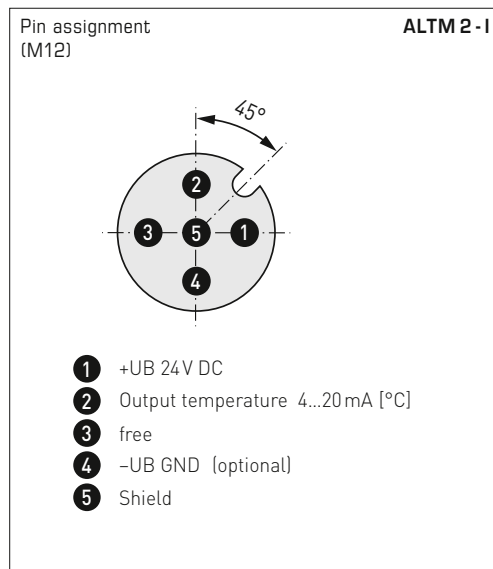
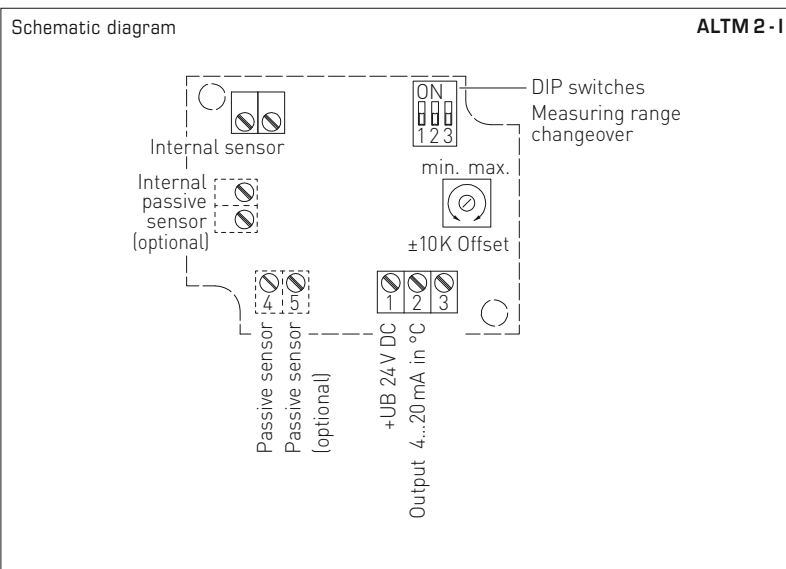
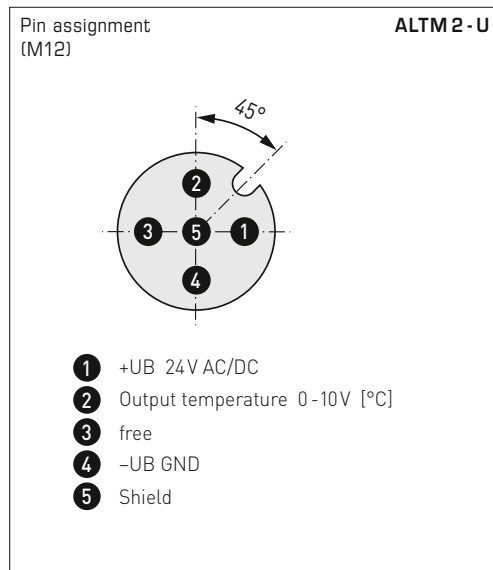
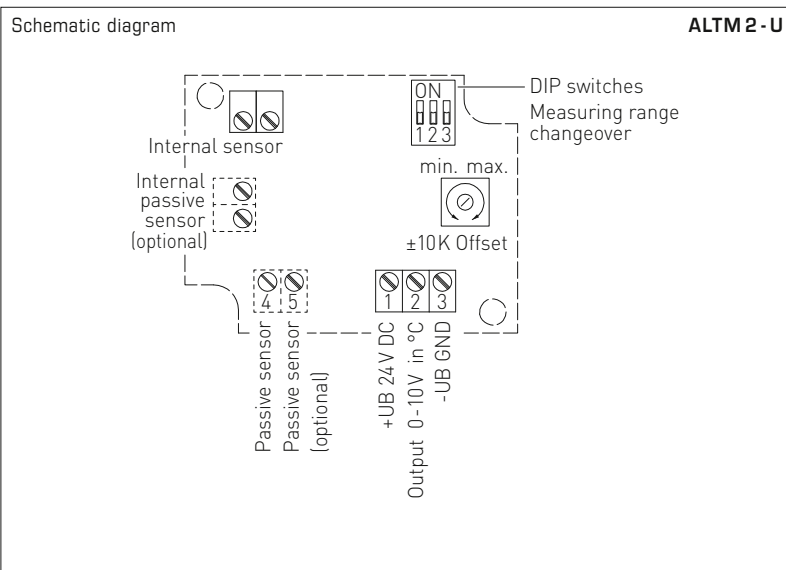


IP68 (optional)
water-tight
Perfect Sensor Protection

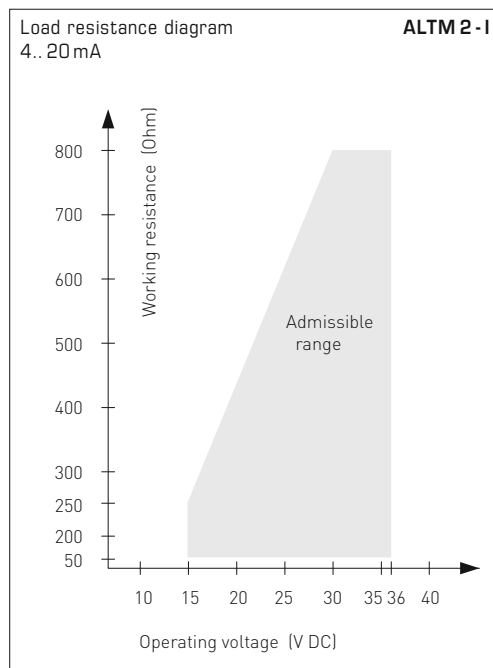
High-performance encapsulation against vibration, mechanical stress and humidity



Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20...+ 150 °C	ON	ON	ON
-50... + 50 °C	OFF	ON	ON
-20... + 80 °C	ON	OFF	ON
-30... + 60 °C	OFF	OFF	ON
0... + 40 °C	ON	ON	OFF
0... + 50 °C (default)	OFF	ON	OFF
0...+ 100 °C	ON	OFF	OFF
0...+ 150 °C	OFF	OFF	OFF





NEW

S+S REGELTECHNIK

THERMASGARD® **ALTM 2 - VA**

Surface contact / tube contact temperature measuring transducers,
incl. strap, with detached sensor head, calibratable,
with multi-range switching and active output



ALTM 2 - VAQ
with M12 connector

ALTM 2 - VA
with cable gland



THERMASGARD® ALTM 2 - VA						
Surface contact / tube contact temperature measuring transducers, <i>ID</i> (Stainless steel housing with cable gland)						
Type / WG02I	Sensor	Output	Type	Item No.	Price	
ALTM 2 - VA						
ALTM2-I VA	Pt1000	4...20 mA	Remote sensor	2001-2151-2200-001	347,98 €	
ALTM2-U VA	Pt1000	0-10 V	Remote sensor	2001-2151-1200-001	347,98 €	
Housing variant:	Cable connection with cable gland					
Extra charge:	other measuring ranges optional Protection type IP68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre)				on request	22,40 € 3,00 €

THERMASGARD® ALTM 2 - VAQ						
Surface contact / tube contact temperature measuring transducers, <i>ID</i> (Stainless steel housing with M12 connector)						
Type / WG02I	Sensor	Output	Type	● = Q	Item No.	Price
ALTM 2 - VAQ						
ALTM2-I VAQ	Pt1000	4...20 mA	Remote sensor	●	2001-2151-2100-001	381,96 €
ALTM2-U VAQ	Pt1000	0-10 V	Remote sensor	●	2001-2151-1100-001	180,66 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)					
Extra charge:	see table above!					

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output

Calibratable room pendulum temperature measuring transducer (with sleeve) **THERMASGARD® RPTM 1** with eight switchable measuring ranges, continuous output, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable).

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

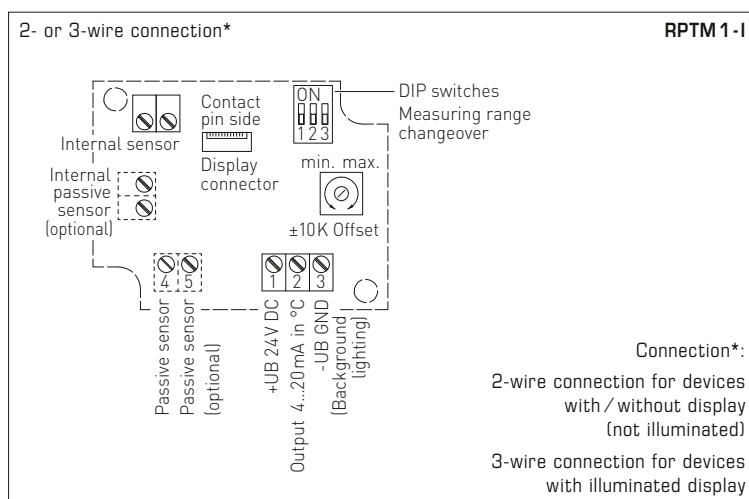
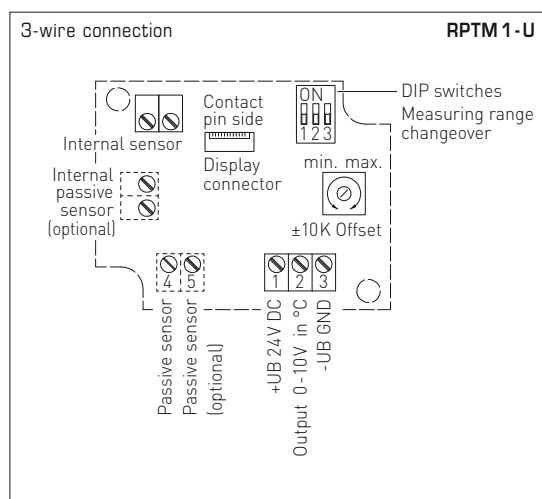
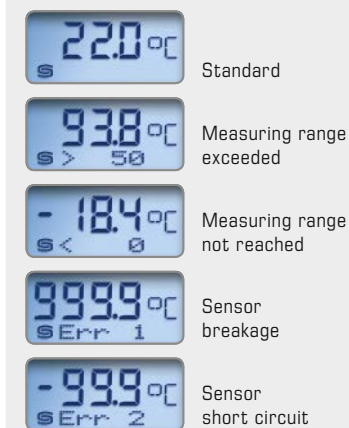
RPTM 1

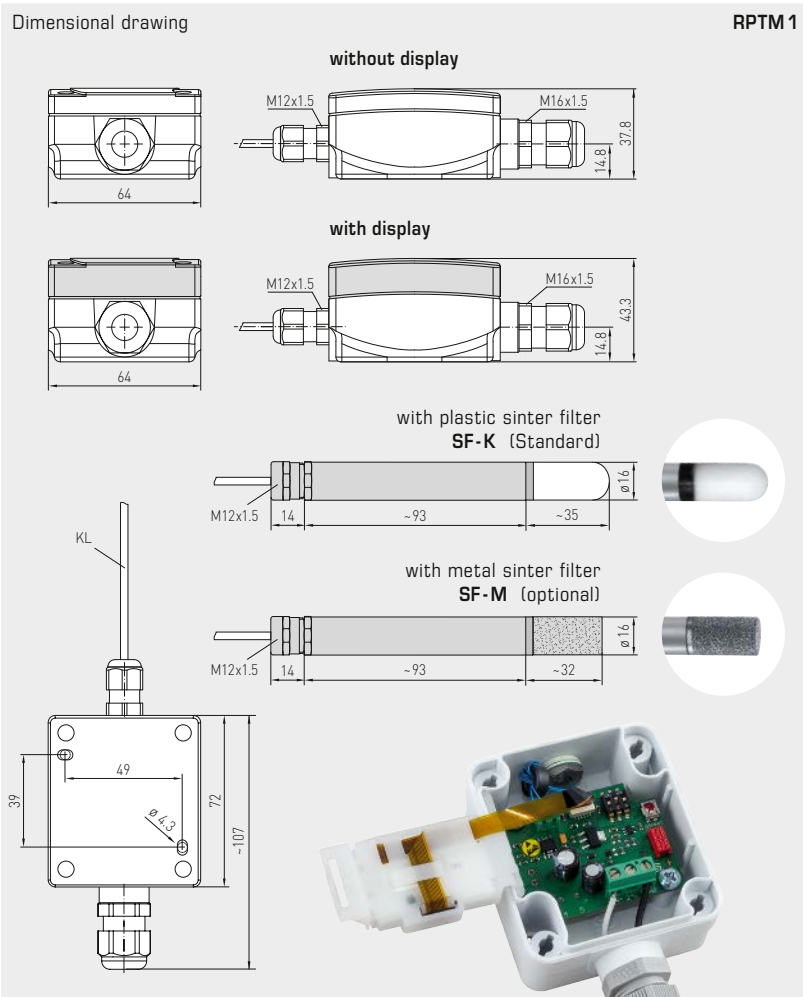
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10%) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges see table (other ranges optional) T_{min} -5 °C, T_{max} +60 °C, with manual zero point correction (± 10 K)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Ambient temperature:	measuring transducer -5...+60 °C
Connection type:	2- or 3-wire connection
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm ² , KL = approx. 1.5 m (other lengths optional)
Protective tube:	stainless steel V2A (1.4301), Ø = 16 mm, NL = 142 mm
Humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 67 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) IP 65 (according to EN 60529) Pendulum with sleeve
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



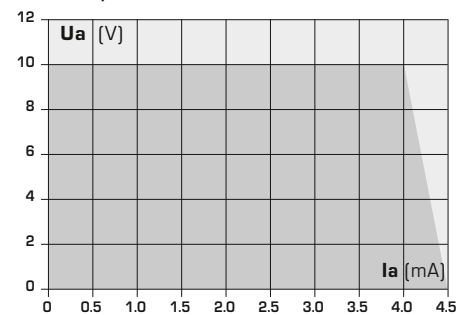


M12 connector (optional on request)

Measuring ranges [adjustable]	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0...+100 °C	ON	OFF	OFF
0...+150 °C	OFF	OFF	OFF

[observe max. permissible temperature ranges!]

Dependency of output voltage on output current



THERMASGARD® RPTM 1 Pendulum room temperature measuring transducer (with stainless steel sleeve)					
Type / WG01	Sensor	Output	Type	Item No.	Price
RPTM 1-I					
RPTM1-I	Pt1000	4...20 mA	Remote sensor	1101-1162-0219-910	133,82 €
RPTM 1-U					
RPTM1-U	Pt1000	0-10 V	Remote sensor	1101-1161-0219-910	133,82 €
Extra charge:	Other ranges optional				22,40 €
	Two-line display with illumination				43,94 €
	2-wire connecting leads, per running meter (PVC)				on request
	Cable connection with M12 connector according to DIN EN 61076-2-101				on request
ACCESSOIRES					
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)			7000-0050-2200-100	37,32 €

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output

RPTM 2

Calibratable room pendulum temperature measuring transducer (with globe) **THERMASGARD® RPTM 2** with eight switchable measuring ranges, continuous output in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, cable sensor with a black plastic globe.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer (globe thermometer) achieves a very good, representative measurement result due to its positioning in the room. The dark radiation sensor determines the effective radiation heat at the measured location. This is relevant for calculating the thermal comfort (operative room temperature) taking into account the co-action of thermal radiation and thermal convection. The ratio of globe temperature / air temperature is approx. 70% / 30%. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

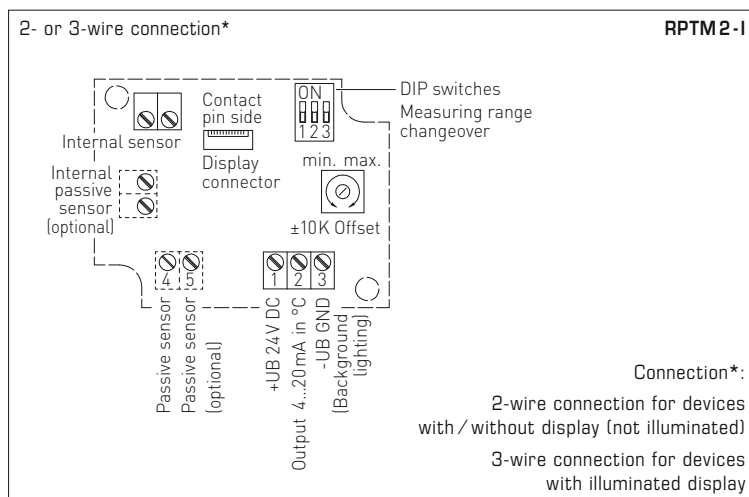
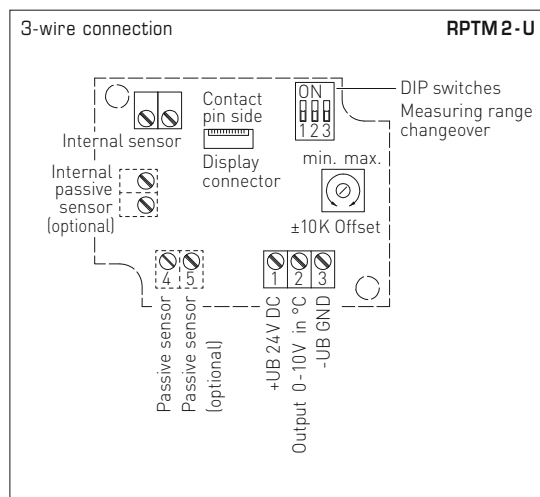
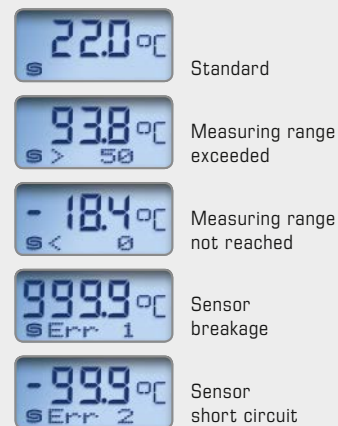


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = $(U_b - 14 V) / 0.02 A$ for I variant
Load resistance:	$R_L > 5 k\Omega$ for U variant
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	Pt1000, DIN EN 60751, class B
Measuring ranges:	multi-range switching with 8 switchable measuring ranges see table (other ranges optional) T_{min} -5 °C, T_{max} +60 °C, with manual zero point correction (± 10 K)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Ambient temperature:	measuring transducer -5...+60 °C
Connection type:	2- or 3-wire connection
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm ² , KL = approx. 1.5 m (other lengths optional)
Globe:	plastic, colour black, Ø = 50 mm
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 67 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) IP 65 (according to EN 60 529) Pendulum with globe
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	Two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (measuring range exceeded, measuring range not reached, sensor breakage, sensor short circuit)

Display and internal diagnostics

THERMASGARD®
Measuring transducer with display

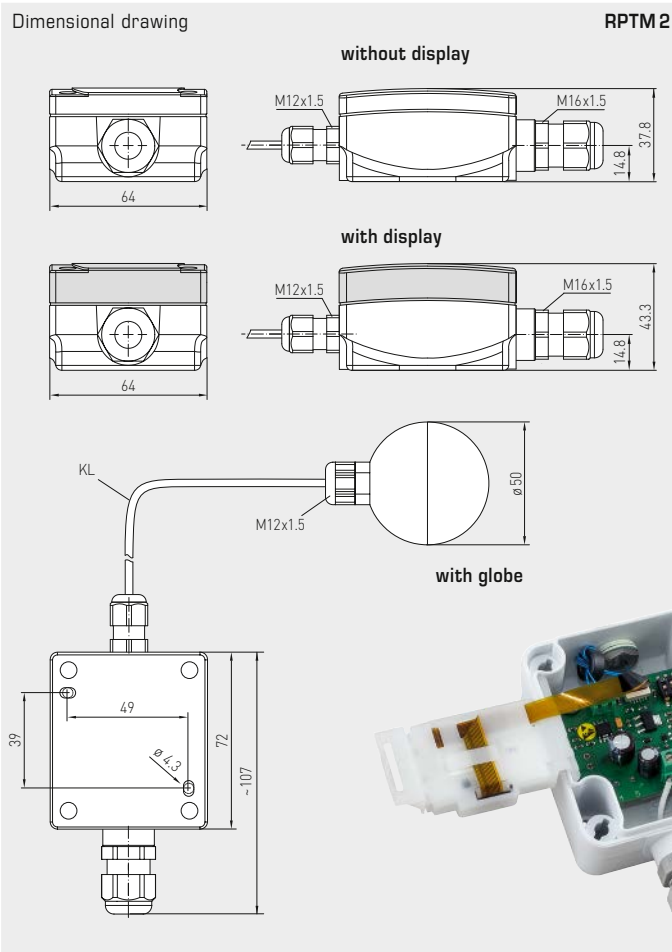




S+S REGELTECHNIK

THERMASGARD® RPTM 2

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output



RPTM 2
with display



M12 connector
(optional on request)

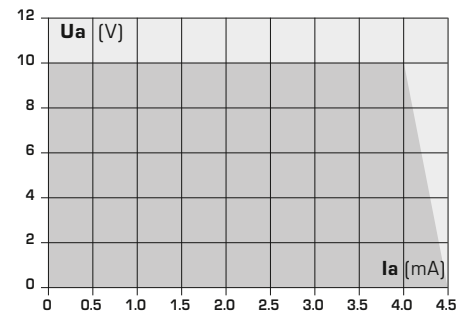


Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

(observe max. permissible temperature ranges!)



Dependency of output voltage on output current



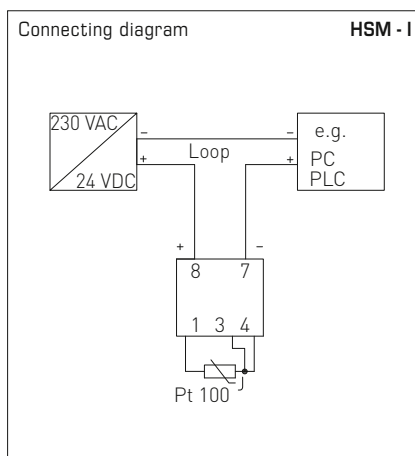
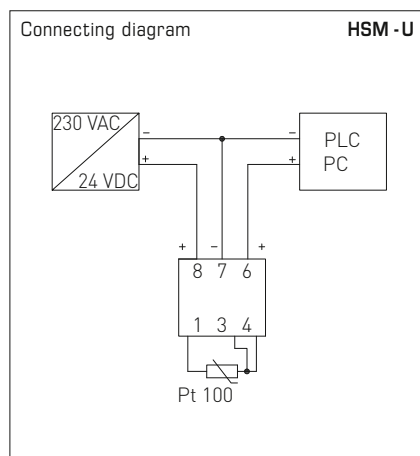
THERMASGARD® RPTM 2 Pendulum room temperature measuring transducers (with globe)					
Type / WG01	Sensor	Output	Type	Item No.	Price
RPTM 2-I					
RPTM2-I	Pt1000	4...20 mA	Remote sensor	1101-1172-0219-910	134,71 €
RPTM 2-U					
RPTM2-U	Pt1000	0-10 V	Remote sensor	1101-1171-0219-910	134,71 €
Extra charge:	Other ranges optional				22,40 €
	Two-line display with illumination				43,94 €
	2-wire connecting leads, per running meter (PVC)				on request
	Cable connection with M12 connector according to DIN EN 61076-2-101				on request

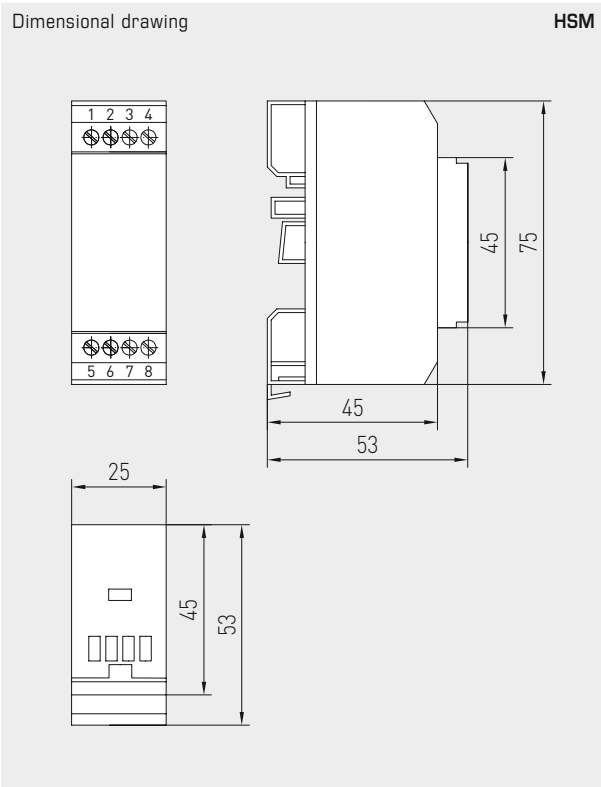
Top hat rail measuring transducers for temperature with multi-range switching and active output

The top hat rail measuring transducer **THERMASGARD® HSM** is an analogue temperature measuring transducer for Pt100 or Pt1000 sensors according to DIN 60751, with 13 switchable measuring ranges (selectable via DIP switches). It is installed inside control cabinets or distribution boxes. The top hat rail transmitter converts the sensor's temperature-dependent resistance signal into a standard signal of 0 - 10 V or 4...20 mA. The output signal is highly accurate temperature linear. The measuring transducer is factory-calibrated.

TECHNICAL DATA

Output:	0 - 10V	4...20 mA
Power supply:	24 V AC / DC ±10 %	24 V DC
Power consumption:	< 0.2 VA / 24 V AC / DC	< 0.55 VA / 24 V DC
Input:	Pt100 / Pt1000	Pt100 / Pt1000
Testing current:	0.25 mA	0.25 mA
Zero point:	-200...+830 °C	-200...+830 °C
Range:	> +20 °C	> +20 °C
Sensor breakage:	> 10 V	> 20 mA
Short circuit:	0 V	< 4 mA
Residual ripple permissible:	< 10 %	< 10 %
Output:	0 - 10V min. load resistance 3 kOhm	4...20 mA max. working resistance $R_a \text{ (Ohm)} = U_B - 12 \text{ V} / 0.02 \text{ A}$
Response time:	< 0.1 s	< 0.1 s
Operating temperature:	-40...+85 °C	-40...+85 °C
Housing:	2TE (75 x 25 x 53 mm) material polycarbonate, colour signal green (similar to RAL 6029)	
Protection class:	III (according to EN 60 730)	
Protection type:	IP 20 (according to EN 60 529)	
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU	





HSM

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3	DIP 4
-20...+150 °C	ON	ON	ON	ON
0... +50 °C (default)	OFF	ON	ON	ON
0...+100 °C	ON	OFF	ON	ON
0...+200 °C	OFF	OFF	ON	ON
0...+300 °C	ON	ON	OFF	ON
0...+400 °C *	OFF	ON	OFF	ON
0...+500 °C *	ON	OFF	OFF	ON
0...+600 °C *	OFF	OFF	OFF	ON
-50... +50 °C	ON	ON	ON	OFF
-100...+100 °C	OFF	ON	ON	OFF
-30... +70 °C	ON	OFF	ON	OFF
-40... +60 °C	OFF	OFF	ON	OFF
0...+250 °C	ON	ON	OFF	OFF

* measuring ranges only for Pt100

THERMASREG® HSM Top hat rail measuring transducers for temperature				
Type / WG01	Sensor	Output	Item No.	Price
HSM-I			IP20, I-variant	
HSM-I	Pt100 / Pt1000	4...20 mA	1101-6112-0009-700	123,97 €
HSM-U			IP20, U-variant	
HSM-U	Pt100 / Pt1000	0 - 10 V	1101-6111-0009-700	123,97 €
Extra charge:	Other ranges optional			22,40 €
For special orders please specify:	Type and measuring range (MR) e.g. HSM-U, Pt100, (MR: 0...+450 °C); HSM-I, Pt100, (MR: 0...+550 °C)			



Temperature CONTROL DEVICES

Our **THERMASREG®** temperature controllers and thermostats are known for their rugged, long-life and reliable measuring technology, widely field-proven in everyday use. Well engineered and manufactured in customized versions, these devices have a perfect fit in high-end installations.

APPLICATION RANGE

- > Office and administration buildings
- > Schools, hotels and public authorities
- > Power plants and district heating facilities
- > Industrial buildings and production plants
- > Food industry
- > Heating and ventilation systems



THERMASREG®

296 – 337

Room temperature controllers

RTR-B	Room temperature controller	299
RTR-S	Room temperature controller, fan coil controller	301
RTR-E-UP	Room temperature controller, clock thermostat	305
TET	Top hat rail thermostat	337

Surface contact thermostats

ALTR 060	Surface-contact thermostat	322
ALTR 090	Surface-contact thermostat	322
ALTR 1	Surface-contact thermostat	323
ALTR 3	Surface-contact thermostat	323
ALTR 5	Surface-contact thermostat	323
ALTR 7	Surface-contact thermostat	323

Built-in controllers, duct controllers

ETR	Built-in temperature controller, one-step / two-step	313
KTR	Duct temperature controller, one-step / two-step	319
TRxx-F	Temperature controller with remote sensor	309
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	331

Wet room temperature controllers

TR040	Temperature controller	306
TR060	Temperature controller	306
TR 22	Temperature controller	307
TR04040	Temperature controller, two-step	308

Frost protection thermostats

FST	Frost protection thermostat, mechanical, one-step, switching	327
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	331
FS-20	2-phase frost protection thermostat, with control and cascading input, two-step, switching	335

Immersion sleeves and accessories

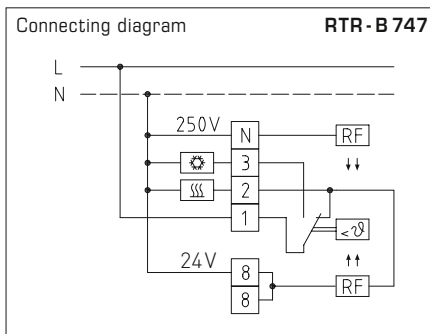
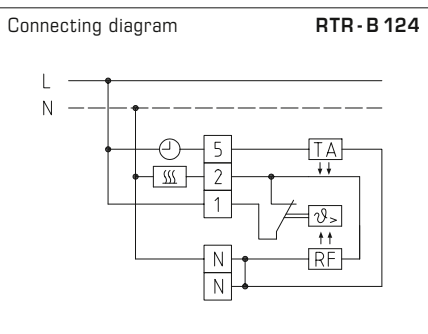
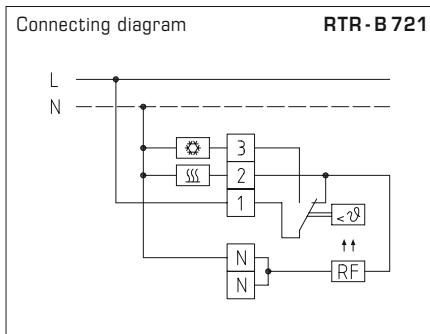
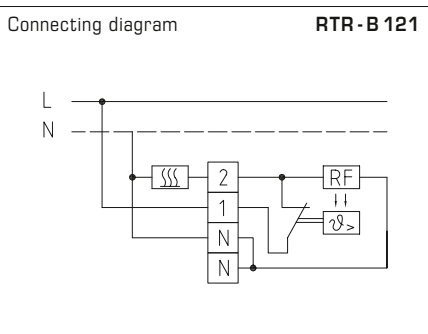
see chapter Accessories	604
-------------------------	------------

Room temperature controllers, mechanical, on-wall

One-step mechanical single room controller **THERMASREG® RTR-B** in bi-metal technology with thermal feedback for monitoring or controlling temperatures in dry rooms, or for activating any kind of heating system as room thermostat. For currentless open radiator valves, the cooling output from the changeover contact (normally open contact) must be connected. At breaker contacts, a maximum of 10 valve actuators can be connected and at normally open contacts a maximum of 5 valve actuators.

TECHNICAL DATA

Switching capacity: (Contact load)	230 V AC, 50-60 Hz heating: 10 mA...10 (4) A, DC 30 W cooling: 10 mA...5 (2) A
Sensor element:	bi-metal
Control range:	+5...+30 °C
Output:	breaker or changeover contact
Operating difference:	approx. 0.5 K
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	75 x 75 x 25 mm (E1)
Electrical connection:	0.14-2.5 mm ² via terminal screws
Installation:	wall mounting or on in-wall flush box Ø55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Protection class:	II (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

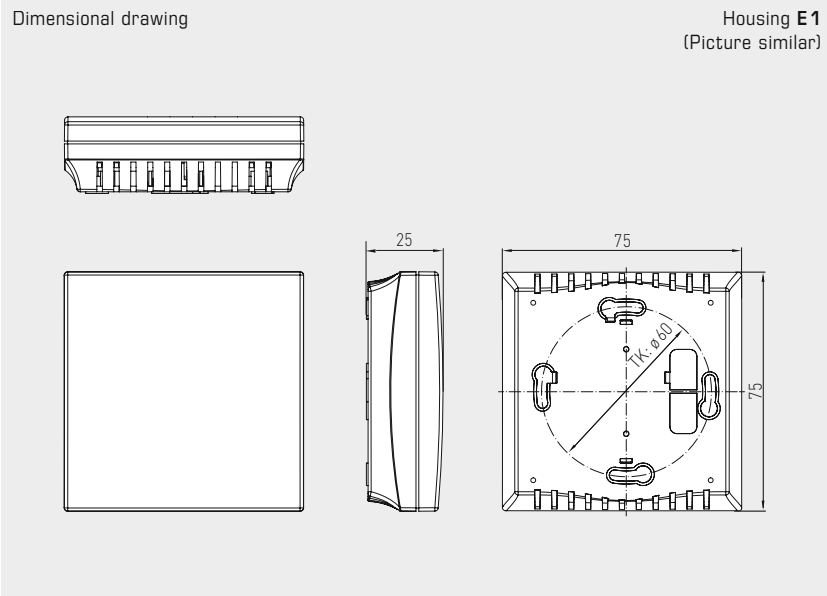




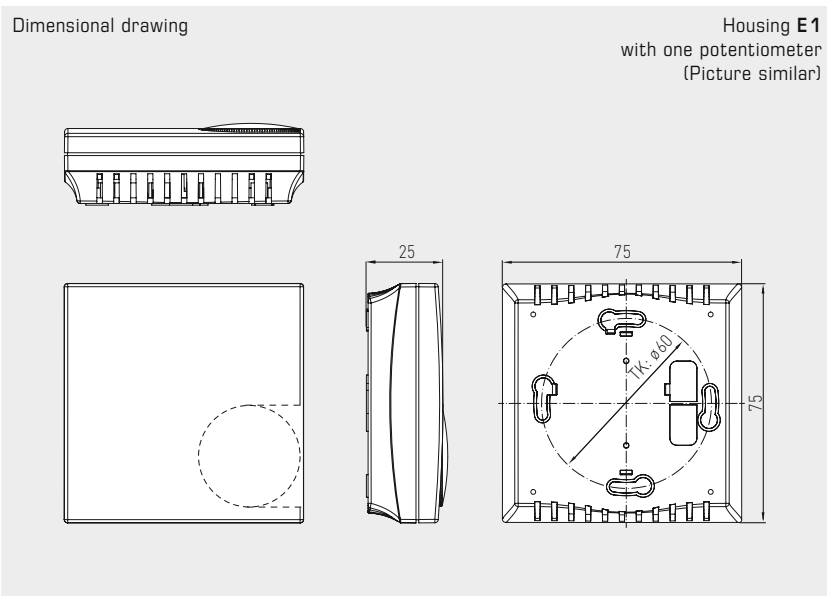
S+S REGELTECHNIK

THERMASREG® RTR-B

Room temperature controllers, mechanical, on-wall



RTR-B 747
with internal setting



RTR-B 121
RTR-B 124
RTR-B 721
with external setting



THERMASREG® RTR-B Room temperature controllers

Type / WG01	Temperature Range	Function	Output	Item No.	Price
RTR-B 121 / B 124 / B 721				External setting	
RTR-B 121	+5...+30 °C	Heating	Breaker	1102-4011-2100-000	30,30 €
RTR-B 124	+5...+30 °C	Heating, temperature reduction -5 K	Breaker	1102-4011-2400-000	32,02 €
RTR-B 721	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-2100-000	33,34 €
RTR-B 747				Internal setting	
RTR-B 747	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-4700-000	36,37 €

Room temperature controllers, continuous, on-wall, general

Electronic room temperature controllers, climate controllers **THERMASREG® RTR-S** for monitoring or controlling temperatures with output 0 - 10V for heating and cooling, optional as continuous climate controller with manual ventilator speed regulation, setpoint adjustment, and LED status indicators. Application in dry individual rooms heated or cooled by radiators, cooling ceilings, or ventilation, or air conditioning systems, or as remote control unit for air conditioners, e.g. in hotels, offices, or hospitals or as room thermostat.

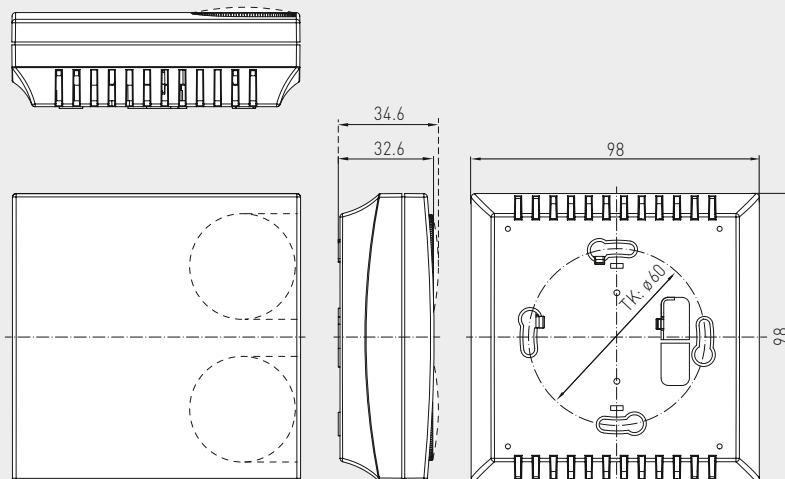
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10%)
Temperature sensor:	internal or external (selectable via jumper) Pt 1000 according to DIN EN 60751, class B
Control range:	+5...+30 °C, adjustable via setpoint potentiometer with numerical scale or +21 °C (± 8 K), adjustable via setpoint potentiometer with swelling arrow (central position / + / -)
Output:	1 x heating, 1 x cooling, 0 - 10 V or 10 - 0 V repluggable, max. 5 mA
Proportional band:	internally adjustable via potentiometer heating +0.5...+3 K (1 K factory setting) cooling +0.5...+3 K (2 K factory setting)
Neutral zone:	internally adjustable via potentiometer, +1...+5 K (1K factory setting)
Control mode:	PI
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Humidity:	max. 90% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Dimensional drawing

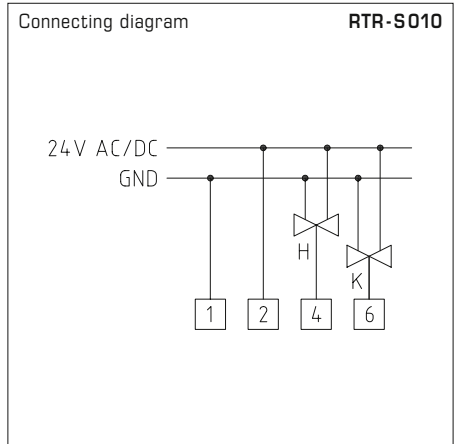
Housing **Baldur 2**

(one or two potentiometers possible)





RTR-S010
(BalduR2)
Continuous room temperature controller for 2-channel single room control

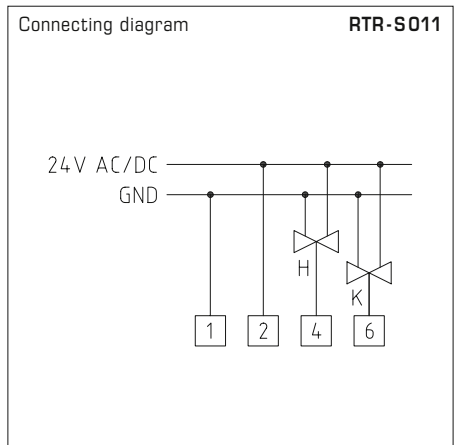


THERMASREG® RTR-S010 Room temperature controller

Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S010				External setting	
RTR-S 010	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1000-000	159,70 €
Features:	+5...+30 °C, via setpoint device, numerical scale				



RTR-S011
(BalduR2)
Continuous room temperature controller for 2-channel single room control



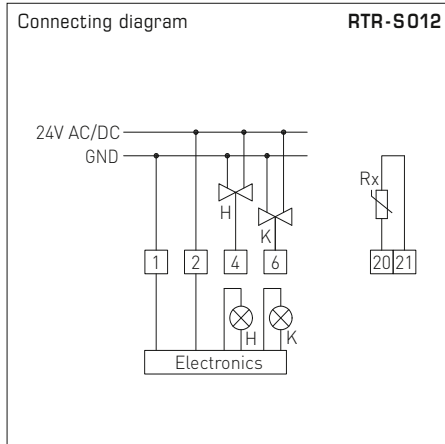
THERMASREG® RTR-S011 Room temperature controller

Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S011				External setting	
RTR-S 011	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1100-000	159,70 €
Features:	+21 °C (± 8 K), via setpoint device, swelling arrow (central position / + / -)				

Room temperature controllers, continuous, on-wall, different versions



RTR-S 012
(Baldur 2)
Continuous room temperature controller for 2-channel single room control, with LED operating mode indicator

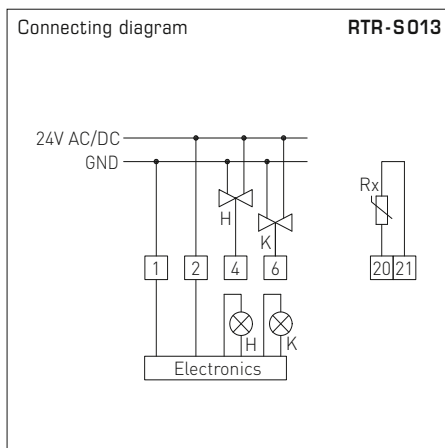


THERMASREG® RTR-S 012 Room temperature controller

Type/WG01	Sensor internal/external	Output Heating	Output Cooling	Item No.	Price
RTR-S 012				External setting	
RTR-S 012	Pt1000	0 - 10V	0 - 10V	1102-4080-1200-000	166,49 €
Features:	+5...+30 °C, via setpoint device, numerical scale, LED red: operating mode heating, LED blue: operating mode cooling				



RTR-S 013
(Baldur 2)
Continuous room temperature controller for 2-channel single room control, with LED operating mode indicator



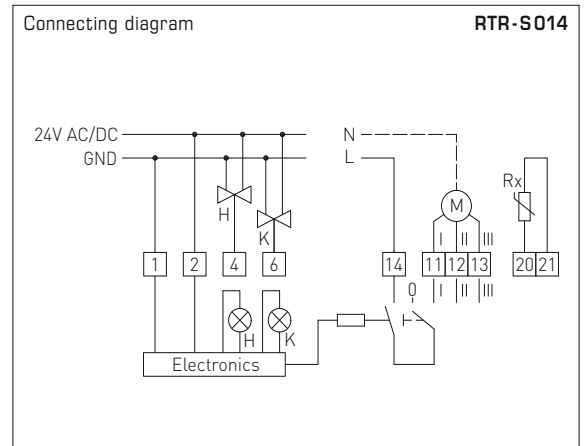
THERMASREG® RTR-S 013 Room temperature controller

Type/WG01	Sensor internal/external	Output Heating	Output Cooling	Item No.	Price
RTR-S 013				External setting	
RTR-S 013	Pt1000	0 - 10V	0 - 10V	1102-4080-1300-000	166,49 €
Features:	+21 °C (±8K) via setpoint device, swelling arrow (central position / + / -), LED red: operating mode heating, LED blue: operating mode cooling				



RTR-S014
(BalduR2)

Continuous room temperature controller for 2-channel single room control with LED operating mode indicator and 3-speed selector switch for ventilators



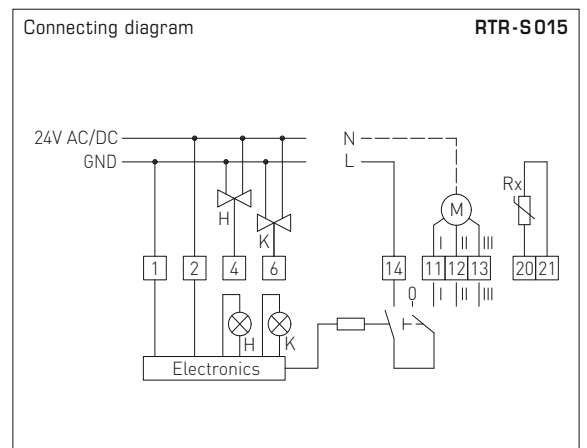
THERMASREG® RTR-S014 Room temperature controller

Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S014				External setting	
RTR-S 014	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1400-000	173,29 €
Features:	+5...+30 °C, via setpoint device, numerical scale, internal / external sensor selectable LED red: operating mode heating, LED blue: operating mode cooling, 4-step turn switch for ventilator speed (0 / I / II / III)				



RTR-S015
(BalduR2)

Continuous room temperature controller for 2-channel single room control with LED operating mode indicator and 3-speed selector switch for ventilators



THERMASREG® RTR-S015 Room temperature controller

Type / WG01	Sensor internal / external	Output Heating	Output Cooling	Item No.	Price
RTR-S015				External setting	
RTR-S 015	Pt1000	0 - 10 V	0 - 10 V	1102-40B0-1500-000	173,29 €
Features:	+21 °C (±8 K) via setpoint device, swelling arrow (central position / + / -), LED red: operating mode heating, LED blue: operating mode cooling, 4-step turn switch for ventilator speed (0 / I / II / III)				

**Room temperature controllers,
in-wall, general**

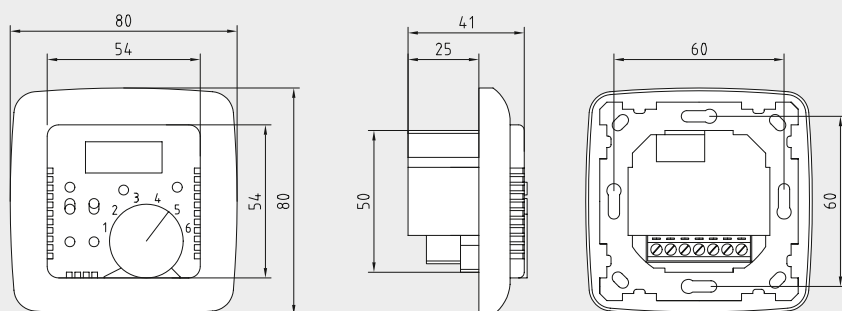
Electronic single-room controllers / clock thermostats with week program **THERMASREG® RTR-E-UP** with internal sensor or 4-meter remote sensor for in-wall installation suitable for temperature monitoring and control, for activating any kind of heating system and valves (closed when currentless), as room temperature controller, room thermostat, floor temperature controller, or clock controller, e. g. for electric floor direct heating systems, for bathrooms, for night storage, wall, ceiling and gas heating systems.

TECHNICAL DATA

Power supply:	230 V AC, 50 Hz
Temperature sensor:	NTC according to DIN 44574, sensor extension up to max. 50 m, with double insulation according to EN 60730-2-1
Control range:	see table +15...+30 °C for room temperature controllers +10...+60 °C for floor temperature controllers +15...+30 °C and +20...+60 °C for combined controllers
Accuracy:	typically ± 5 %
Output:	1x normally open contact (single ended)
Switching capacity:	3.6 kW
Switching current: (Contact load)	16 A (ohmic load)
Safety:	with sensor breakage and sensor short circuit protection (in case of sensor breakage or sensor short circuit heating is switched of)
Operating difference:	approx. 0.6 K
Housing:	plastic, colour pure white (similar RAL 9010)
Dimensions:	80 x 80 x 16 mm
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Temperature range limitation:	in the turning knob
Installation:	in in-wall flush box Ø = 55 mm
Protection class:	II (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

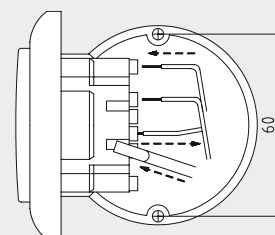
Dimensional drawing

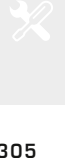
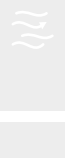
RTR-E-UP



Installation scheme

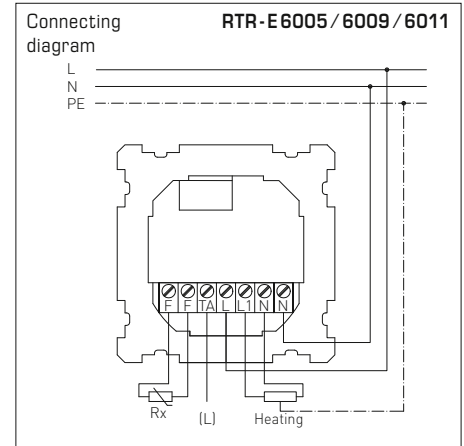
RTR-E-UP





RTR-E 6005
RTR-E 6009
RTR-E 6011

Room temperature controller
for single room control
with LED operating mode indicator



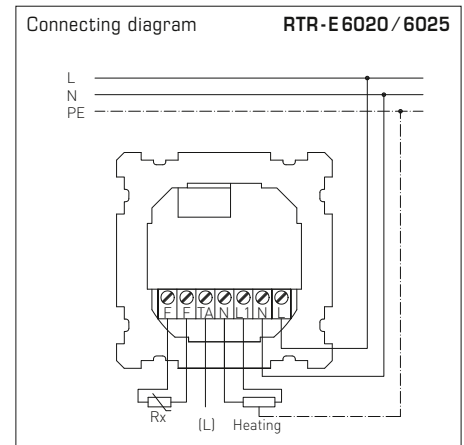
THERMASREG® RTR - E 6005 / 6009 / 6011 Room temperature controllers

Type / WG01	Temperature Range	Sensor	Function Heating	Item No.	Price
				IP30	
RTR-E 6005	+5...+30 °C	Room sensor, Sensor Internal	Room temperature controller	1102-5010-0050-000	112,83 €
RTR-E 6009	+10...+60 °C	with remote sensor (L = 4 m)	Floor temperature controller	1102-5010-0090-000	113,94 €
RTR-E 6011	+5...+30 °C / +20...+60 °C	Room sensor, Sensor Internal, with remote sensor (L = 4 m)	Room temperature controller and floor temperature monitor (combined controller)	1102-5010-0110-000	134,16 €
Features:	with night temperature setback, main switch, and LED operating mode indicator				



RTR-E 6020
RTR-E 6025

Room temperature controller
for single room control
with LED operating mode indicator,
LC display, and clock



THERMASREG® RTR - E 6020 / 6025 Room temperature controllers

Type / WG01	Temperature Range	Sensor	Function Heating	Item No.	Price
				IP30	
RTR-E 6020	+5...+30 °C	Room sensor, Sensor Internal	Room temperature controller with clock	1102-5010-0200-000	161,10 €
RTR-E 6025	+10...+60 °C	with remote sensor (L = 4 m)	Floor temperature controller with clock	1102-5010-0250-000	171,87 €
Features:	with week programme, main switch, party switch, LC display, and LED operating mode indicator				

**Temperature controllers, one-step,
with switching output**

Mechanical temperature controllers/wet room temperature controllers **THERMASREG® TR 040 / TR 060** with switching output (one-step) and stainless steel capillary (spiral coil sensor), working without external voltage. They are used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

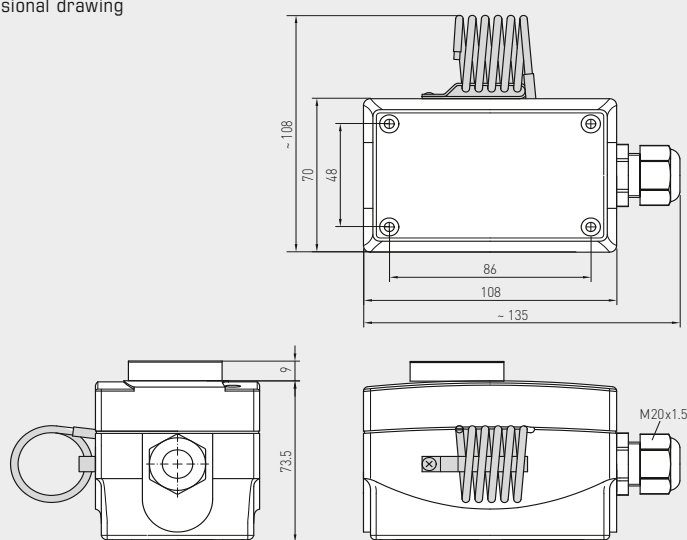
TECHNICAL DATA

Switching capacity: (Contact load)	24...250V AC +10%, 16A, cos φ = 1.0 24...250V AC +10%, 1.5A, cos φ = 0.6 at 24V AC min. 150mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-35...+65 °C
Capillary:	stainless steel V2A (1.4303)
Tolerance:	T _{min} ± 3K; T _{max} ± 3K; at +20°C ± 1K
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Routing:	admissible vibration load ≤ ½g
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

- Heating:** The preset setpoint (scale value) is equivalent to the switch-off value of the heating. The switch-on value is lower by the amount of operating difference. Contact 2-3 breaks when temperature rises to the preset value.
- Cooling:** The preset setpoint (scale value) is equivalent to the switch-on value of the cooling. The switch-off value is lower by the amount of operating difference. Contact 1-2 closes when temperature rises to the preset value.

Dimensional drawing



**TR 040
TR 060**

**TR 040
TR 060**
(one-step)
TR

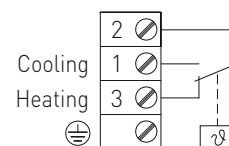


**TR 040 U
TR 060 U**
(one-step)
TW



Connecting diagram

**TR 040
TR 060**



THERMASREG® TR 040 / TR 060 Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
TR 040 / 060				TR (External setting)	
TR-040	0...+40 °C	2K	+65 °C	1102-1050-1100-200	69,44 €
TR-060	0...+60 °C	2K	+75 °C	1102-1050-1100-300	69,44 €
TR 040 U / 060 U				TW (Internal setting)	
TR-040 U	0...+40 °C	2K	+65 °C	1102-1050-2100-200	68,32 €
TR-060 U	0...+60 °C	2K	+75 °C	1102-1050-2100-300	68,32 €

Mechanical temperature controller / wet room temperature controller **THERMASREG® TR 22** with switching output (one-step) and copper capillary, working without external voltage. It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TR 22
(one-step)
TR

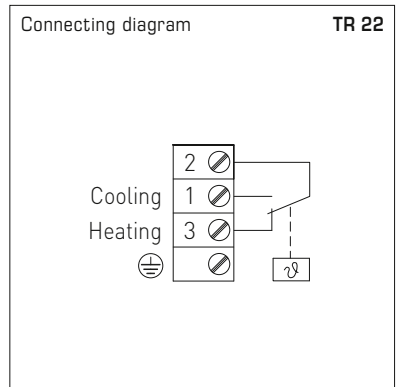
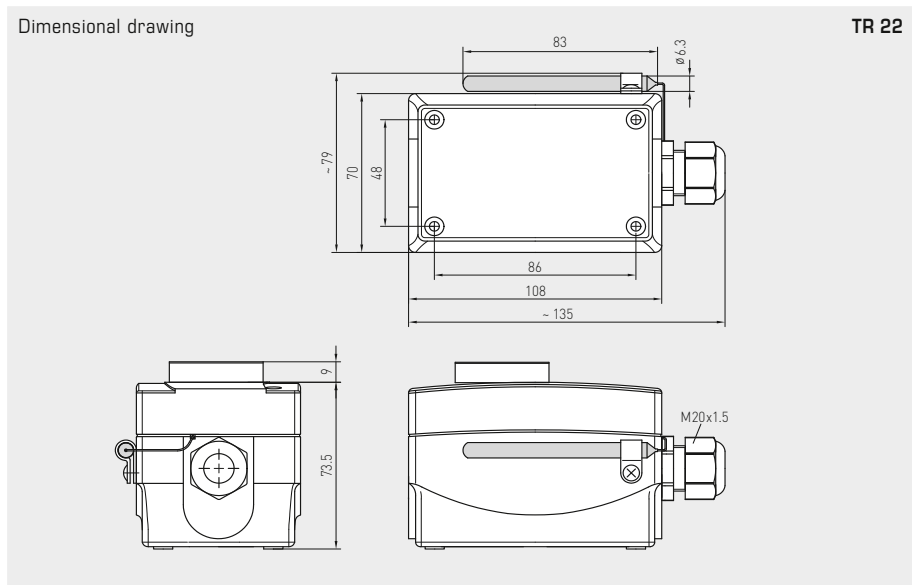
TECHNICAL DATA	
Switching capacity: (Contact load)	24...250V AC +10%, 16A, cos φ = 1.0 24...250V AC +10%, 1.5A, cos φ = 0.6 at 24V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-35...+65 °C
Design principle:	torsion meter with liquid filling
Capillary:	copper
Tolerance:	T _{min} ± 3K; T _{max} ± 3K
Routing:	admissible vibration load ≤ ½g
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

- Heating:** The preset setpoint (scale value) is equivalent to the switch-off value of the heating. The switch-on value is lower by the amount of operating difference. Contact 2 - 3 breaks when temperature rises to the preset value.
- Cooling:** The preset setpoint (scale value) is equivalent to the switch-on value of the cooling. The switch-off value is lower by the amount of operating difference. Contact 1 - 2 closes when temperature rises to the preset value.



TR 22 U
(one-step)
TW



THERMASREG® TR 22 Temperature controllers, one-step					
Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
TR 22				TR (External setting)	
TR-22	-35...+35 °C	3K (± 1K)	+60 °C	1102-1050-1100-100	69,44 €
TR 22 U				TW (Internal setting)	
TR-22 U	-35...+35 °C	3K (± 1K)	+60 °C	1102-1050-2100-100	68,32 €

**Temperature controllers, two-step,
with switching output**

Mechanical temperature controller/wet room temperature controller **THERMASREG® TR 04040** with two independently switching outputs, which are separately adjustable (e.g. for switching between day and night time) and stainless steel capillary (spiral coil sensor), working without external voltage. It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

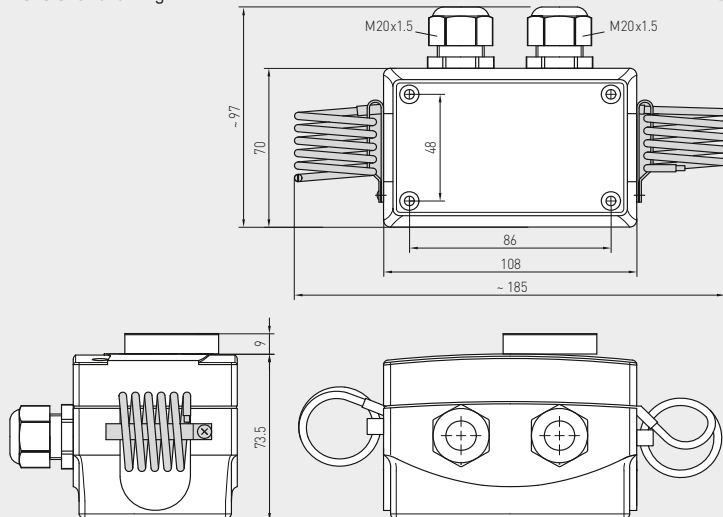
TECHNICAL DATA

Switching capacity:	24...250V AC +10%, 16A, cos φ = 1.0 24...250V AC +10%, 1.5A, cos φ = 0.6 at 24V AC min. 150mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact (two changeover contacts, separately adjustable)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	2x M20 x 1.5; including strain relief
Housing temperature:	-10...+65 °C
Capillary:	stainless steel V2A (1.4303)
Tolerance:	T _{min} ± 3K; T _{max} ± 3K; at +20 °C ± 1K
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Routing:	admissible vibration load ≤ ½g
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

Heating: Contacts 2-3 and 5-6 break when temperature rises to the preset value.
Cooling: Contacts 2-1 and 5-4 break when temperature drops to the preset value.

Dimensional drawing **TR 04040**



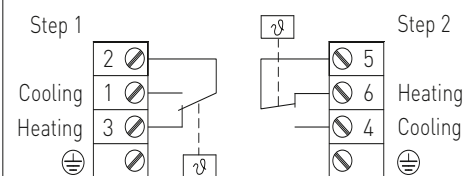
TR 04040



TR 04040 U



Connecting diagram **TR 04040**



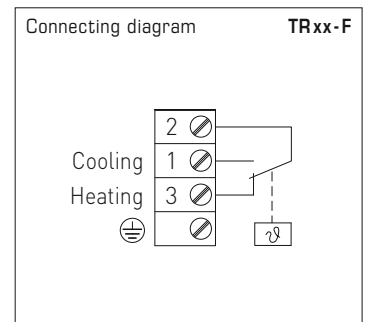
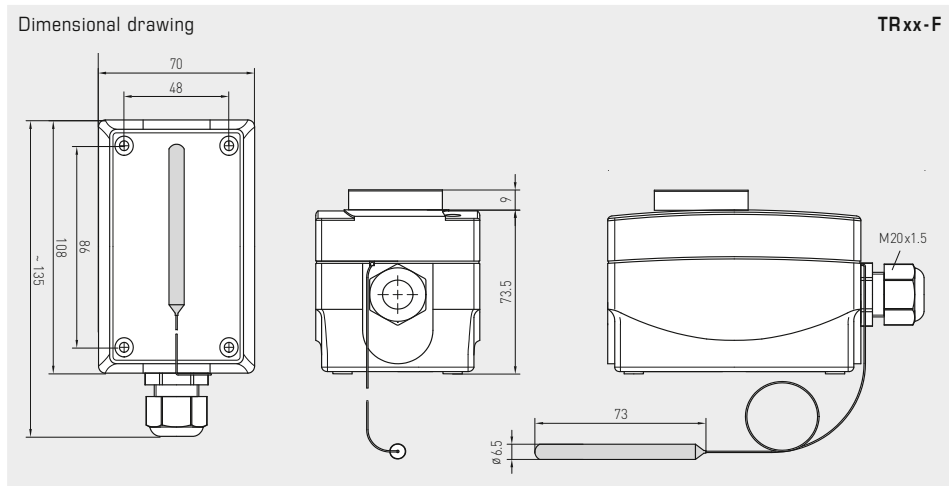
THERMASREG® TR 04040 Temperature controllers, two-step

Type / WG01	Temperature Range (adjustable)		Thermal Operating Difference (fixed) approx.		Max. Capillary Temperature	Item No.	Price
	1.	2.	1.	2.			
TR 04040						TR + TW (External/Internal setting)	
TR-04040	0...+40 °C	0...+40 °C	2K	2K	+65 °C	1102-1050-1200-200	102,15 €
TR 04040 U						TW + TW (Internal setting)	
TR-04040 U	0...+40 °C	0...+40 °C	2K	2K	+65 °C	1102-1050-2200-200	102,15 €

Mechanical temperature controller THERMASREG® TR xx-F with remote sensor and switching output (one-step), working as capillary thermostat / capillary controller without external voltage. This capillary controller is used for monitoring and to control temperatures of non-aggressive liquid or gaseous media in heating, ventilation and air conditioning technology as well as in mechanical and apparatus engineering, for installation in immersion sleeves or air conditioning ducts.

TECHNICAL DATA	
Switching capacity: (Contact load)	24...250 V AC +10%, 16 A, cos φ = 1.0 24...250 V AC +10%, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-10...+65 °C
Design principle:	torsion meter with liquid filling
Sensor:	copper tube, length of capillary = 1 m with PVC protective hose, Ø 6.8 mm
Tolerance:	T _{min} ± 3 K; T _{max} ± 3 K
Inserted length:	immersion sleeves EL = 150 mm (accessories see table)
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION
Heating: wire contacts 2 - 3
Cooling: wire contacts 2 - 1



THERMASREG® TR xx - F Temperature controllers, one-step					
Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
				TR (External setting)	
TRxx-F					
TR-1-F	-35... +35 °C	3 K (± 1 K)	+60 °C	1102-1056-1110-100	70,38 €
TR-060-F	0... +60 °C	3 K (± 1 K)	+75 °C	1102-1050-1110-300	70,38 €
TR-090-F	0... +90 °C	3 K (± 1 K)	+120 °C	1102-1050-1110-400	70,38 €
TR-0120-F	0...+120 °C	5 K (± 1 K)	+135 °C	1102-1050-1110-500	70,38 €
TR-50140-F	+50...+140 °C	5 K (± 1 K)	+150 °C	1102-1050-1110-600	70,38 €
Extra charge:	U = Internal setting (TW), e.g. TR-090-F-U				8,78 €
ACCESSORIES					
THR-MS-08/150	Brass immersion sleeve, EL = 150 mm, Ø 8 x 0.5 mm			7100-0011-3404-000	13,71 €
THR-VA-09/150	Stainless steel immersion sleeve V2A (1.4301), EL = 150 mm, Ø 9 x 1.0 mm			7100-0012-3032-000	36,15 €

For further information, see the last chapter!

Equipment sensor/controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test (module B) according to directive 2014/68/EU.

Mechanical temperature control device/rod thermostat THERMASREG® ETR with switching output, used for monitoring, controlling or limiting the temperatures of liquid or gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller TR, temperature monitor TW, or as safety temperature limiter STB.



TECHNICAL DATA

Switching capacity: (Contact load)	24 ... 250 V AC + 10 %, 10 A, cos φ = 1.0 24 ... 250 V AC + 10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor2)
Cable gland:	M20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	-10...+65 °C at the switch block housing
Tolerance:	T _{min} ± 5 K; T _{max} ± 3 K
Immersion sleeves:	THR-ms-08/xx , Single sleeve brass, nickel-plated, Ø = 8 mm, R ½" straight pipe thread, wrench size 22, p _{max} = 10 bar, T _{max} = +150 °C THR-VA-09/xx , Single sleeve stainless steel V4A (1.4571), Ø = 9 mm, G ½" straight pipe thread, wrench size 22, p _{max} = 25 bar, T _{max} = +150 °C THR-VA-17/xx , Double sleeve stainless steel V4A (1.4571), Ø = 17 mm, G ½" straight pipe thread, wrench size 22, p _{max} = 25 bar, T _{max} = +150 °C (Depending on the type, the relevant immersion sleeve is included in the scope of delivery, see table)
Operating medium:	Water, oil, air and exhaust gas
Inserted length:	100 mm / 150 mm / 200 mm (see table)
Process connection:	screwed socket
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014/30/EU, low-voltage directive 2014/35/EU
Tests:	EC type test (module B) according to directive 2014/68/EU , certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: STB 1201, TR/STB 1202
FUNCTION	TW, TR: Contact 2-3 breaks when temperature rises to the preset value. STB: Contact 2-1 or 5-4 (two-step) breaks when temperature rises to the preset value. Restart is possible only after cooling off by approx. 15 K - 20 K by pressing the reset button.





Configuration variants:

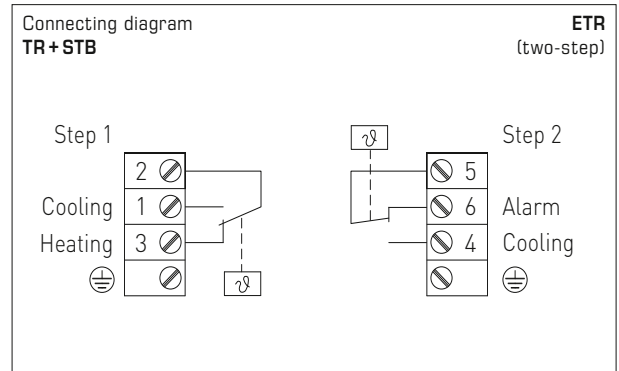
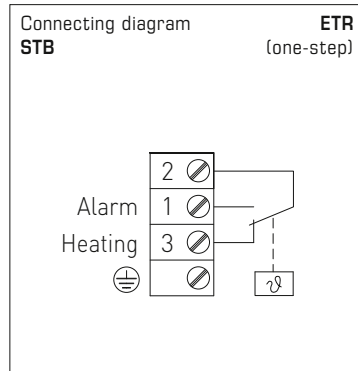
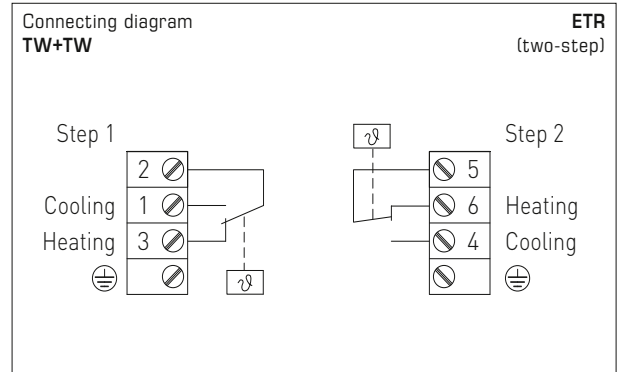
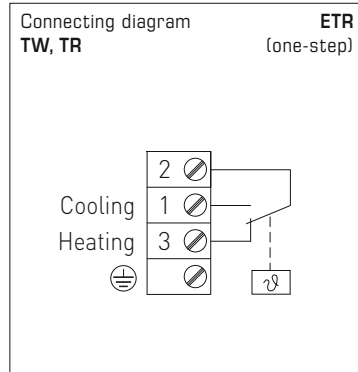
- TW**
Temperature monitor
(internal setting)

- TR**
Temperature controller
(external setting)

- STB**
Safety temperature limiter
(internal setting)

- TW+TW**
Double temperature monitor
(internal setting)

- TR + STB**
Temperature controller
(external setting) +
Safety temperature limiter
(internal setting)



CERTIFICATE

valid until: 25.02.2028
ZERTIFIKAT
gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU
EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.: **Z-IS-TAF-MUC-18-03-2652130-002**
Zertifikat-Nr.:

Name and address of manufacturer: **S+S Regeltechnik GmbH**
Name und Anschrift des Herstellers: Pirmasr Str. 20, 90411 Nürnberg

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.
Hiemit wird bescheinigt, dass das unten genannte Baumuster die Anforderungen der Richtlinie 2014/68/EU erfüllt

Evaluation report No.: **C-T 1382-01/18 dated 2018-02-26**
Prüfbericht Nr.:

Scope of examination: **Safety temperature limiter as safety accessory**
Geltungsbereich: type: ETR and KTR (see page 3) basis of examination and details see page 3

Manufacturing plant: **S+S Regeltechnik GmbH**
Fertigungsstätte: Pirmasr Str. 20, 90411 Nürnberg

München, 26.02.2018
(Place, date)
(Ort, Datum)

TÜV SÜD Industrie Service GmbH
Certification Body for pressure equipment

Johannes Steigelmeyer
Johannes Steigelmeyer

089 5190-1027
fscert@tuev-sud.de

Notified Body, No. 0038
Notifizierte Stelle, Kennnummer 0038
TÜV SÜD Industrie Service GmbH
Wiederstraße 199
80686 München
GERMANY

Page 1 of the certificate No. / Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002

Replaces certificate dated:
IS-TAF-MUC 08 02 100248356 001
Basis of examination:
Vd TÜV-Merkblatt Temperatur 100:2017-03
DIN EN 14597 :2015-01
Essential safety requirements of Directive 2014/68/EU

Type code

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the following difference: The tube is not closed to the medium.
KTR-R90110	STB	Same function as ETR R90110, with the following difference: The tube is not closed to the medium.

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to + 85°
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to + 110°
KTR-060R85	TR/STB	Same function as ETR-060R85, with the following difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the following difference: The tube is not closed to the medium

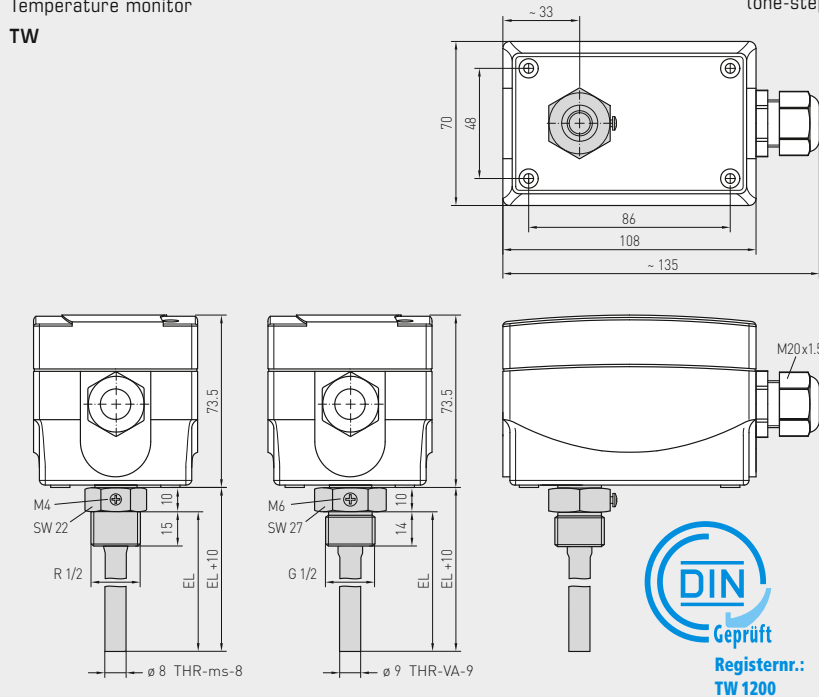
The conditions listed below have to be considered:

- To keep the specified response time the types ETR... shall be used with the provided tube and thermal conducting paste
- Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment

Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

Dimensional drawing
 Temperature monitor
TW

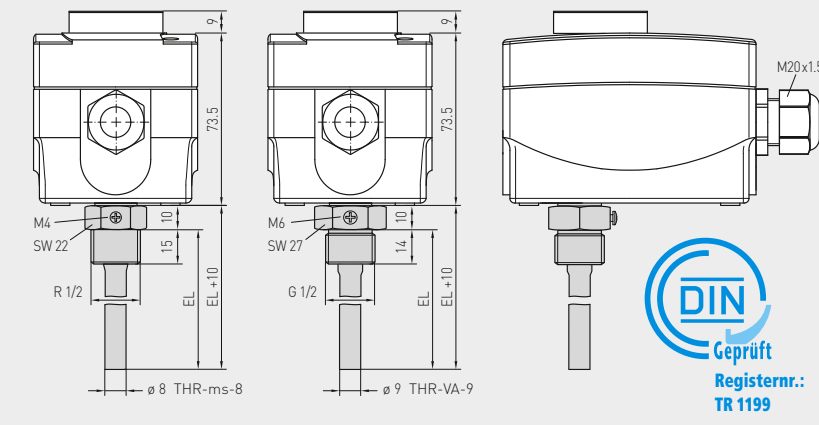
ETR-xx U
 (one-step)



ETR-060 U
ETR-090 U
 (one-step)
TW

Dimensional drawing
 Temperature controller
TR

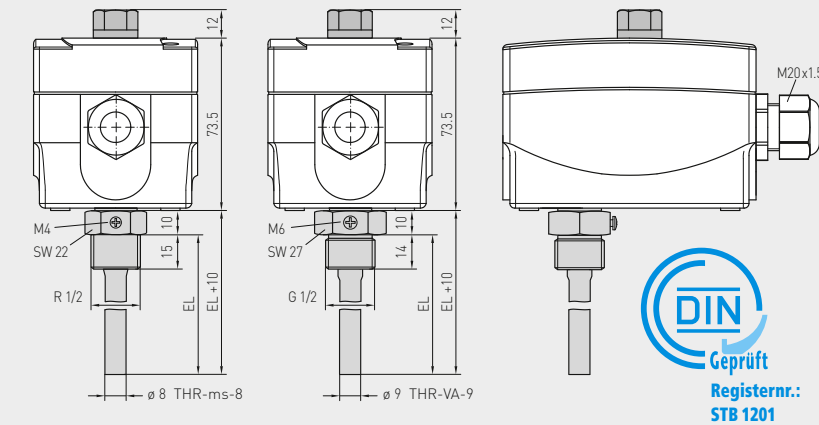
ETR-xx
 (one-step)



ETR-1
ETR-060
ETR-090
ETR-0120
ETR-50140
 (one-step)
TR

Dimensional drawing
 Safety temperature limiter
STB

ETR-Rxx
 (one-step)



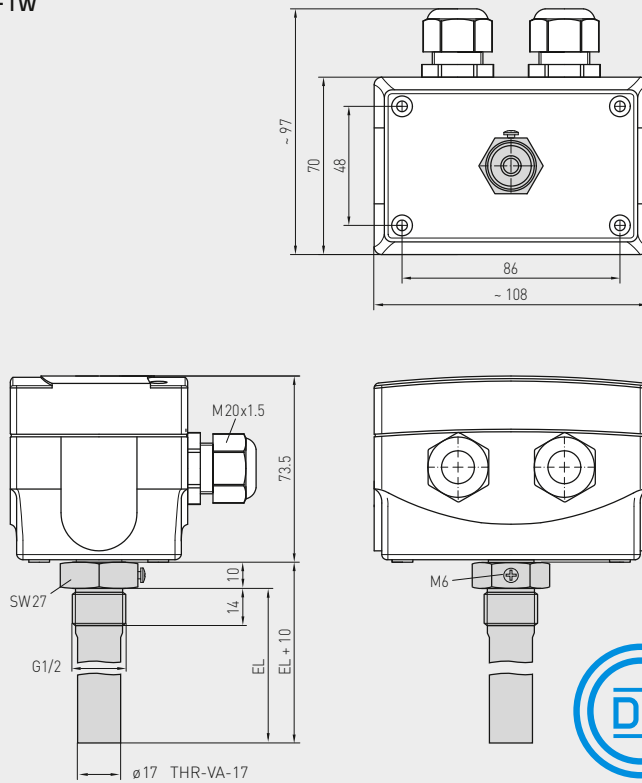
ETR-R6585
ETR-R90110
 (one-step)
STB
 selectable



THERMASREG® ETR Equipment sensor / controller, one-step, including immersion sleeve						
Type / WG02	Inserted Length (EL)	Temperature Ranges (adjustable)	Thermal Operating Difference (fixed) approx.	Maximum Capillary Temp.	Item No.	Price
ETR-060 U					TW	
ETR-060 U MS/100	100 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-380	62,46 €
ETR-060 U MS/150	150 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-310	64,56 €
ETR-060 U MS/200	200 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-320	68,25 €
ETR-060 U VA/100	100 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-390	86,82 €
ETR-060 U VA/150	150 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-330	88,91 €
ETR-060 U VA/200	200 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-340	92,62 €
ETR-090 U					TW	
ETR-090 U MS/100	100 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-480	62,46 €
ETR-090 U MS/150	150 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-410	64,56 €
ETR-090 U MS/200	200 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-420	68,25 €
ETR-090 U VA/100	100 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-490	86,82 €
ETR-090 U VA/150	150 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-430	88,91 €
ETR-090 U VA/200	200 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-440	92,62 €
ETR-1					TR	
ETR-1 MS/100	100 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-180	62,46 €
ETR-1 MS/150	150 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-110	64,56 €
ETR-1 MS/200	200 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-120	68,25 €
ETR-1 VA/100	100 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-190	86,82 €
ETR-1 VA/150	150 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-130	88,91 €
ETR-1 VA/200	200 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-140	92,62 €
ETR-060					TR	
ETR-060 MS/100	100 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-380	62,46 €
ETR-060 MS/150	150 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-310	64,56 €
ETR-060 MS/200	200 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-320	68,25 €
ETR-060 VA/100	100 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-390	86,82 €
ETR-060 VA/150	150 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-330	88,91 €
ETR-060 VA/200	200 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-340	92,62 €
ETR-090					TR	
ETR-090 MS/100	100 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-480	62,46 €
ETR-090 MS/150	150 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-410	64,56 €
ETR-090 MS/200	200 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-420	68,25 €
ETR-090 VA/100	100 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-490	86,82 €
ETR-090 VA/150	150 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-430	88,91 €
ETR-090 VA/200	200 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-440	92,62 €
ETR-0120					TR	
ETR-0120 MS/100	100 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-580	62,46 €
ETR-0120 MS/150	150 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-510	64,56 €
ETR-0120 MS/200	200 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-520	68,25 €
ETR-0120 VA/100	100 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-590	86,82 €
ETR-0120 VA/150	150 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-530	88,91 €
ETR-0120 VA/200	200 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-540	92,62 €
ETR-50140					TR	
ETR-50140 MS/100	100 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-680	62,46 €
ETR-50140 MS/150	150 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-610	64,56 €
ETR-50140 MS/200	200 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-620	68,25 €
ETR-50140 VA/100	100 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-690	86,82 €
ETR-50140 VA/150	150 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-630	88,91 €
ETR-50140 VA/200	200 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-640	92,62 €
ETR-R6585					STB	
ETR-R6585 MS/100	100 mm	+65...+85 °C	+0 / -15...20K	+120 °C	1102-2010-6100-780	75,27 €
ETR-R6585 MS/150	150 mm	+65...+85 °C	+0 / -15...20K	+120 °C	1102-2010-6100-710	77,36 €
ETR-R6585 MS/200	200 mm	+65...+85 °C	+0 / -15...20K	+120 °C	1102-2010-6100-720	84,43 €
ETR-R6585 VA/100	100 mm	+65...+85 °C	+0 / -15...20K	+120 °C	1102-2010-6100-790	91,19 €
ETR-R6585 VA/150	150 mm	+65...+85 °C	+0 / -15...20K	+120 °C	1102-2010-6100-730	93,28 €
ETR-R6585 VA/200	200 mm	+65...+85 °C	+0 / -15...20K	+120 °C	1102-2010-6100-740	97,11 €
ETR-R90110					STB	
ETR-R90110 MS/100	100 mm	+90...+110 °C	+0 / -15...20K	+120 °C	1102-2010-6100-880	75,27 €
ETR-R90110 MS/150	150 mm	+90...+110 °C	+0 / -15...20K	+120 °C	1102-2010-6100-810	77,36 €
ETR-R90110 MS/200	200 mm	+90...+110 °C	+0 / -15...20K	+120 °C	1102-2010-6100-820	84,43 €
ETR-R90110 VA/100	100 mm	+90...+110 °C	+0 / -15...20K	+120 °C	1102-2010-6100-890	91,19 €
ETR-R90110 VA/150	150 mm	+90...+110 °C	+0 / -15...20K	+120 °C	1102-2010-6100-830	93,28 €
ETR-R90110 VA/200	200 mm	+90...+110 °C	+0 / -15...20K	+120 °C	1102-2010-6100-840	97,11 €
Type designation:	ETR-xx_immersion sleeve material / inserted length (mm) MS = Brass nickel-plated, VA = Stainless steel V4A (1.4571) For further information and accessories see next page...					

Dimensional drawing
Double temperature monitor
TW + TW

ETR-xx U
(two-step)



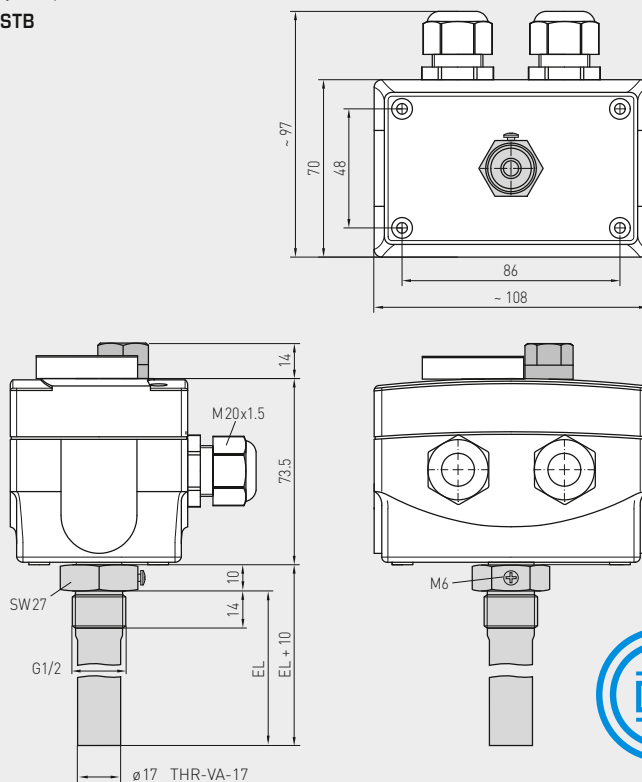
Geprüft
Registernr.:
TW / TW 1241



ETR-090090 U
(two-step)
TW + TW

Dimensional drawing
Temperature controller +
safety temperature limiter
TR + STB

ETR-xx Rxx
(two-step)



Geprüft
Registernr.:
TR / STB 1202



ETR-060 R 85
ETR-090 R 110
(two-step)
TR + STB
selectable



THERMASREG® ETR Equipment sensor / controller, two-step, including immersion sleeve

Type / WG02	Inserted Length (EL)	Temperature Ranges (adjustable)		Thermal Operating Difference (fixed) approx.		Maximum Capillary Temp.	Item No.	Price
		1.	2.	1.	2.			
ETR-090090 U							TW + TW	
ETR-090090 U VA/150	150 mm	0...+90 °C	0...+90 °C	3K	3K	+120 °C	1102-2010-2205-130	129,11 €
ETR-090090 U VA/200	200 mm	0...+90 °C	0...+90 °C	3K	3K	+120 °C	1102-2010-2205-140	140,33 €
ETR-060R85							TR + STB	
ETR-060R85 VA/150	150 mm	0...+60 °C	+65...+85 °C	3K	+0 / -15...20K	+120 °C	1102-2010-7205-230	129,11 €
ETR-060R85 VA/200	200 mm	0...+60 °C	+65...+85 °C	3K	+0 / -15...20K	+120 °C	1102-2010-7205-240	140,33 €
ETR-090R110							TR + STB	
ETR-090R110 VA/150	150 mm	0...+90 °C	+90...+110 °C	3K	+0 / -15...20K	+135 °C	1102-2010-7205-330	129,11 €
ETR-090R110 VA/200	200 mm	0...+90 °C	+90...+110 °C	3K	+0 / -15...20K	+135 °C	1102-2010-7205-340	140,33 €

Type designation:	ETR-xx_immersion sleeve material / inserted length (mm) MS = Brass nickel-plated, VA = Stainless steel V4A (1.4571)		
Extra charge:	U = Internal setting, unless included in a certain type /2 = 2 steps, unless included in a certain type	on request	8,78 €
Features:	TR = Temperature controller (external setting) TW = Temperature monitor (internal setting) STB = Safety temperature limiter (internal setting), selectable , with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20K below switching temperature (+0K / - 15...20K); with EC type test (module B) according to directive 2014 / 68 / EU		
Note:	To ensure accurate responsiveness series ETR devices must only be used in connection with the immersion sleeves included in the scope of delivery while applying heat-conductive paste		

ACCESSORIES

WLP-1	Heat-conductive paste , silicone-free	7100-0060-1000-000	2,98 €
--------------	--	--------------------	---------------

For further information see last chapter!

THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm

Type / WG01	p _{max} (static)	T _{max}	Time Constant for Medium:			Inserted Length (EL)	Item No. Ø	Price
			Air	Water	Oil			
THR-ms-08 / xx							Brass nickel-plated	
							Ø 8 x 0.5 mm	
THR-MS-08/100	10 bar	+150 °C	106 s	18 s	53 s	100 mm	7100-0011-3022-000	13,60 €
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	150 mm	7100-0011-3404-000	13,71 €
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	200 mm	7100-0011-3403-000	16,29 €
THR-VA-09 / xx							Stainless steel V4A (1.4571)	
							Ø 9 x 1.0 mm	
THR-VA-09/100	25 bar	+150 °C	92 s	17 s	41 s	100 mm	7100-0012-3022-000	35,03 €
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	150 mm	7100-0012-3032-000	36,15 €
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	200 mm	7100-0012-3042-000	38,73 €
THR-VA-17 / xx							Stainless steel V4A (1.4571)	
							Ø 17 x 1.0 mm	
THR-VA-17/150	25 bar	+150 °C	-	45 s	55 s	150 mm	7100-0012-3033-000	36,15 €
THR-VA-17/200	25 bar	+150 °C	-	45 s	55 s	200 mm	7100-0012-3404-000	38,73 €

Ordering example:	THR - ms - 08 / 100	(Brass immersion sleeve, Ø = 8 mm, EL = 100 mm)
	THR - VA - 09 / 150	(Stainless steel immersion sleeve, Ø = 9 mm, EL = 150 mm)
	THR - VA - 17 / 200	(Stainless steel immersion sleeve, Ø = 17 mm, EL = 200 mm)

Note: inner diameter of socket 15.0 mm

Duct temperature controllers, including mounting flange,
EC type-tested, TÜV tested,
with switching output

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test (module B) according to directive 2014 / 68 / EU.

Mechanical temperature control device / rod thermostat THERMASREG® KTR with switching output, used for monitoring, controlling or limiting the temperatures of gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller TR, temperature monitor TW, or as safety temperature limiter STB.



TECHNICAL DATA

Switching capacity: (Contact load)	24...250V AC +10%, 10A, cos φ = 1.0 24...250V AC +10%, 1.5A, cos φ = 0.6 at 24V AC min. 150mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	-10...+65 °C at the switch block housing
Tolerance:	T _{min} ± 5 K; T _{max} ± 3 K
Operating medium:	Air
Protective tube:	metal , material CuZn37 (2.0321), Ø 14 mm, NL = 205 mm
Inserted length:	approx. 205 mm (with flange); approx. 184 mm (without flange)
Process connection:	by mounting flange (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
Tests:	EC type test (module B) according to directive 2014 / 68 / EU , certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: STB 1201, TR / STB 1202

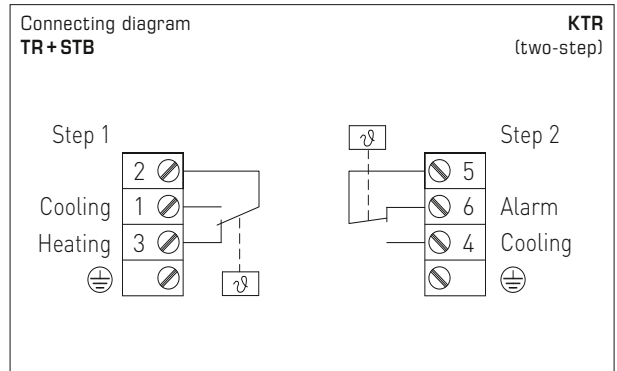
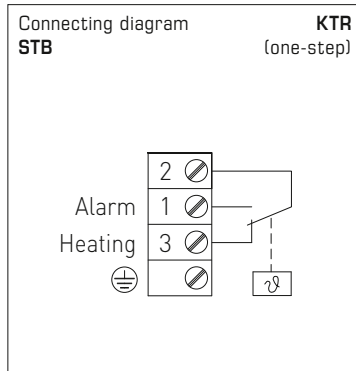
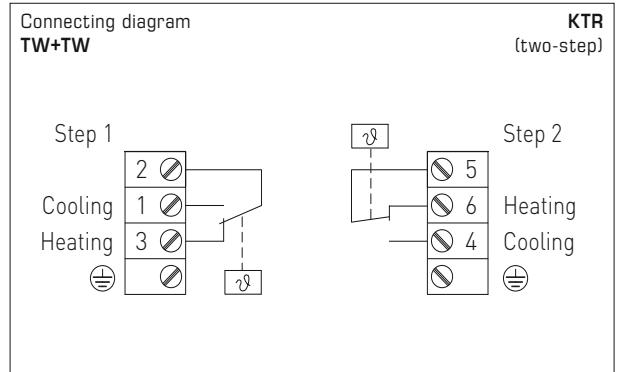
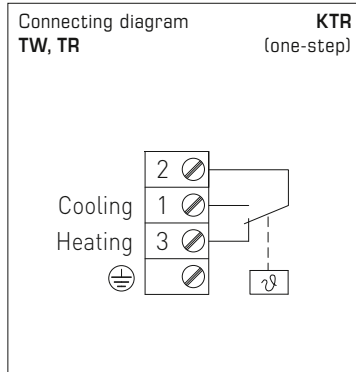
FUNCTION	TW, TR: Contact 2 - 3 breaks when temperature rises to the preset value.
	STB: Contact 2 - 1 or 5 - 4 (two-step) breaks when temperature rises to the preset value. Restart is possible only after cooling off by approx. 15 K - 20 K by pressing the reset button.





Configuration variants:

- TW**
Temperature monitor
(internal setting)
- TR**
Temperature controller
(external setting)
- STB**
Safety temperature limiter
(internal setting)
- TW+TW**
Double temperature monitor
(internal setting)
- TR+STB**
Temperature controller
(external setting) +
Safety temperature limiter
(internal setting)



CERTIFICATE
valid until: 25.02.2028
ZERTIFIKAT
gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU

EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.: **Z-IS-TAF-MUC-18-03-2652130-002**
 Name and address of manufacturer: **S+S Regeltechnik GmbH**
Name und Anschrift des Herstellers: Pirmasr Str. 20, 90411 Nürnberg

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.

Nimmt wird bescheinigt, dass das unten genannte Baumuster die Anforderungen der Richtlinie 2014/68/EU erfüllt

Evaluation report No.: **C-T 1382-01/18 dated 2018-02-26**
Prüfbericht Nr.:

Scope of examination: **Safety temperature limiter as safety accessory**
Geltungsbereich: type: ETR and KTR (see page 3) basis of examination and details see page 3

Manufacturing plant: **S+S Regeltechnik GmbH**
Fertigungsstätte: Pirmasr Str. 20, 90411 Nürnberg

TÜV SÜD Industrie Service GmbH
 Certification Body for pressure equipment

Johannes Steigelmeyer

089 5190-1027
fsuetzung@tuev-sued.de

München, 26.02.2018
(Place, date)
(Ort, Datum)

Verification of Certificate by TÜV SÜD App Verify
Erstbesprüfung durch App TÜV SÜD Verify

Notified Body, No. 0038
Notifizierte Stelle, Kennnummer 0038
TÜV SÜD Industrie Service GmbH
Wiederstraße 199
80686 München
GERMANY

Page 1 of the certificate No. / Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002

Replaces certificate dated
IS-TAF-MUC 08 02 100248356 001
Basis of examination:
VdTUV-Merkblatt Temperatur 100:2017-03
DIN EN 14597 :2015-01
Essential safety requirements of Directive 2014/68/EU

Type code

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the following difference: The tube is not closed to the medium.
KTR-R90110	STB	Same function as ETR R90110, with the following difference: The tube is not closed to the medium.

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to + 85°
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to + 110°
KTR-060R85	TR/STB	Same function as ETR-060R85, with the following difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the following difference: The tube is not closed to the medium

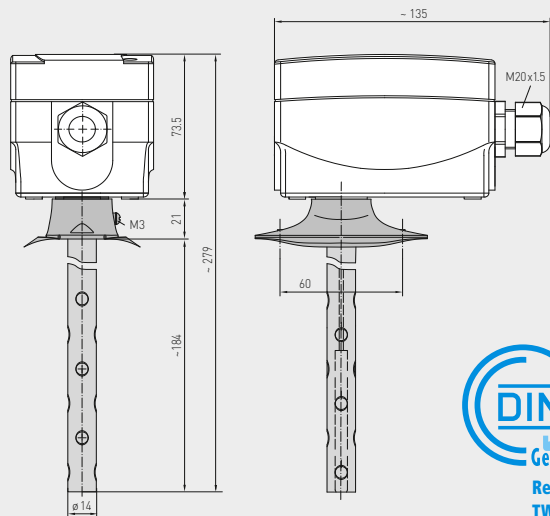
The conditions listed below have to be considered:

- To keep the specified response time the types ETR... shall be used with the provided tube and thermal conducting paste
- Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment

Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

Dimensional drawing
Temperature monitor
TW

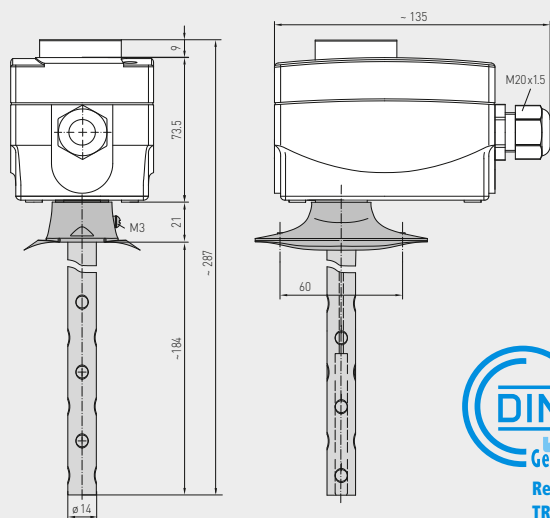
KTR-xxU
(one-step)



KTR-060U
KTR-090U
(one-step)
TW

Dimensional drawing
Temperature controller
TR

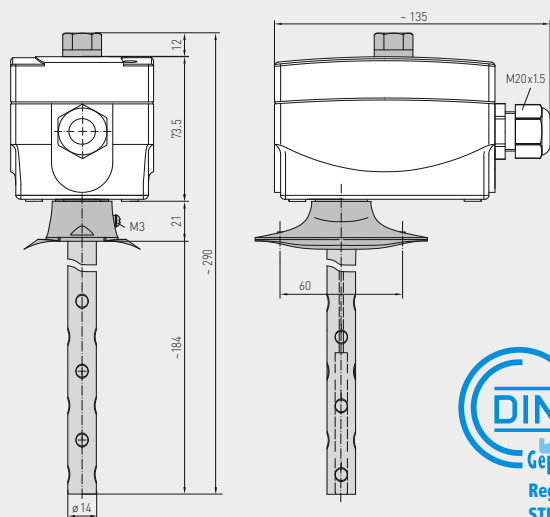
KTR-xx
(one-step)



KTR-1
KTR-060
KTR-090
KTR-0120
KTR-50140
(one-step)
TR

Dimensional drawing
Safety temperature limiter
STB

KTR-Rxx
(one-step)

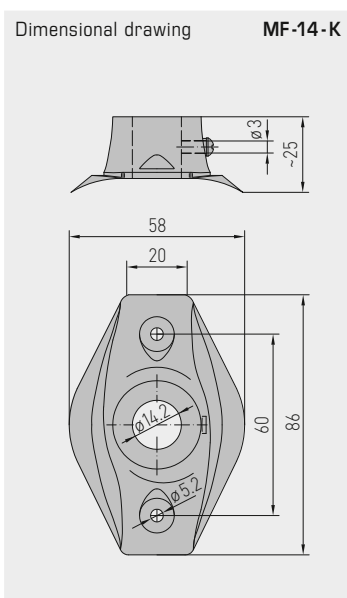


KTR-R6585
KTR-R90110
(one-step)
STB
adjustable



THERMASREG® KTR Duct temperature controllers, one-step						
Type / WG02	Ø mm	Temperature Ranges (adjustable)	Thermal Operating Difference (fixed) approx.	Maximum Capillary Temp.	Item No.	Price
KTR-060 U / 090 U					TW	
KTR-060 U	14	0...+60 °C	3K	+75 °C	1102-3010-2100-350	67,46 €
KTR-090 U	14	0...+90 °C	3K	+120 °C	1102-3010-2100-450	67,46 €
KTR-xx					TR	
KTR-1	14	-35...+35 °C	3K	+75 °C	1102-3010-1100-150	67,46 €
KTR-060	14	0...+60 °C	3K	+75 °C	1102-3010-1100-350	67,46 €
KTR-090	14	0...+90 °C	3K	+120 °C	1102-3010-1100-450	67,46 €
KTR-0120	14	0...+120 °C	5K	+135 °C	1102-3010-1100-550	67,46 €
KTR-50140	14	+50...+140 °C	5K	+150 °C	1102-3010-1100-650	67,46 €
KTR-R6585 / R90110					STB	
KTR-R6585	14	+65...+85 °C	+0 / -15...20K	+120 °C	1102-3010-6100-750	79,98 €
KTR-R90110	14	+90...+110 °C	+0 / -15...20K	+120 °C	1102-3010-6100-850	79,98 €
Extra charge:	U	= Internal setting, unless included in a certain type				8,78 €
	/2	= 2 steps, unless included in a certain type				on request
Equipment:	FT	= Manual reset when temperature drops				
	ST	= Manual reset when temperature rises				
	TR	= Temperature controller (external setting)				
	TB	= Temperature limiter (internal setting)				
	TW	= Temperature monitor (internal setting)				
	STB	= Safety temperature limiter (internal setting), selectable , with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) with EC type test (module B) according to directive 2014 / 68 / EU				

ACCESSORIES			
MF-14-K	Mounting flange, plastic	7100-0030-2000-000	8,43 €
For further information see last chapter!			

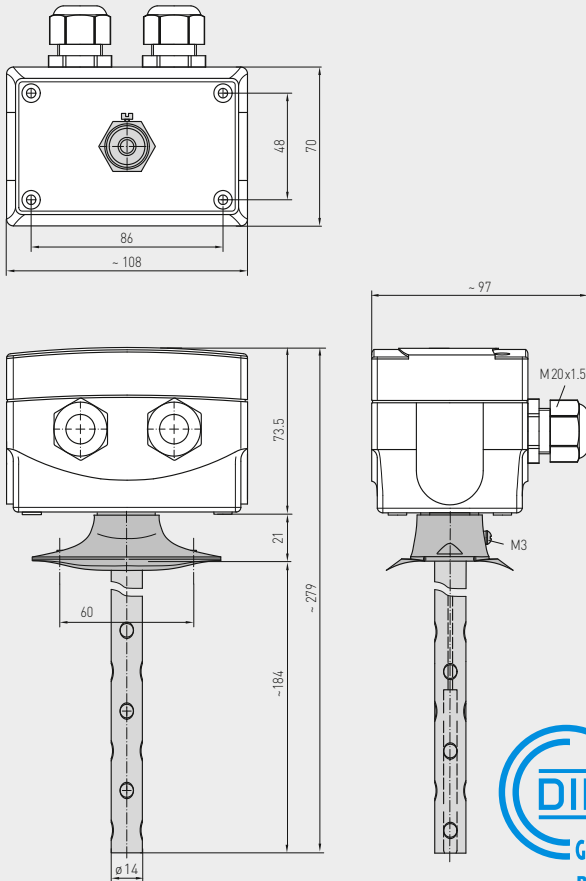


MF-14-K
Mounting flange,
plastic



Dimensional drawing
Double temperature monitor
TW + TW

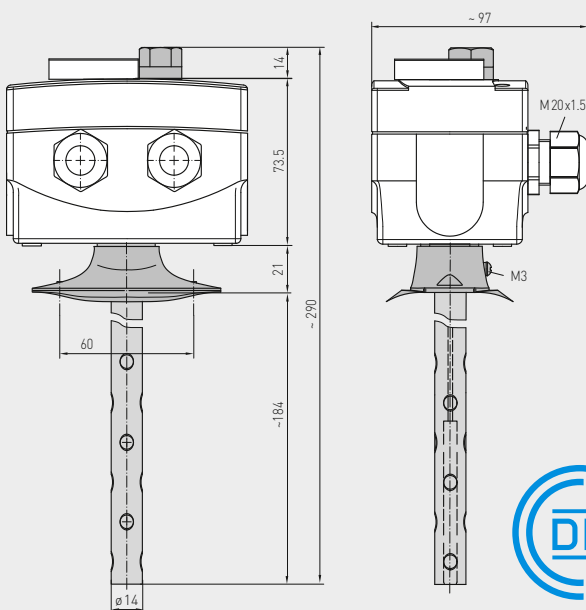
KTR-xxU
(two-step)



KTR-090090U
(two-step)
TW + TW

Dimensional drawing
Temperature controller +
safety temperature limiter
TR + STB

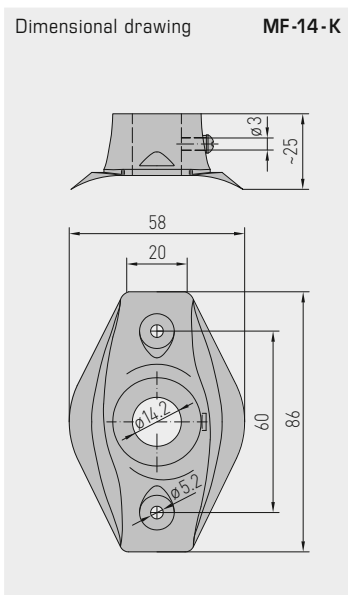
KTR-xxRxx
(two-step)



KTR-060R85
KTR-090R110
(two-step)
TR + STB
adjustable



THERMASREG® KTR Duct temperature controllers, two-step								
Type / WG02	Ø mm	Temperature Ranges (adjustable)		Thermal Operating Difference (fixed) approx.		Maximum Capillary Temp.	Item No.	Price
		1.	2.	1.	2.			
KTR-090090 U							TW+TW	
KTR-090090 U	14	0...+90°C	0...+90°C	3K	3K	+120°C	1102-3010-2205-150	100,31 €
KTR-060R85							TR+STB	
KTR-060R85	14	0...+60°C	+65...+85°C	3K	+0/-15...20K	+120°C	1102-3010-7205-250	100,31 €
KTR-090R110							TR+STB	
KTR-090R110	14	0...+90°C	+90...+110°C	3K	+0/-15...20K	+135°C	1102-3010-7205-350	100,31 €
Extra charge:	U = Internal setting, unless included in a certain type /2 = 2 steps, unless included in a certain type						on request	8,78 €
Features:	TR = Temperature controller (external setting) TW = Temperature monitor (internal setting) STB = Safety temperature limiter (internal setting), selectable, with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) with EC type test (module B) according to directive 2014/68/EU							
ACCESSORIES								
MF-14-K	Mounting flange, plastic						7100-0030-2000-000	8,43 €
For further information see last chapter!								



MF-14-K
Mounting flange,
plastic



Surface contact temperature controllers, including tension spring

Mechanical temperature controllers / contact thermostats **THERMASREG® ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

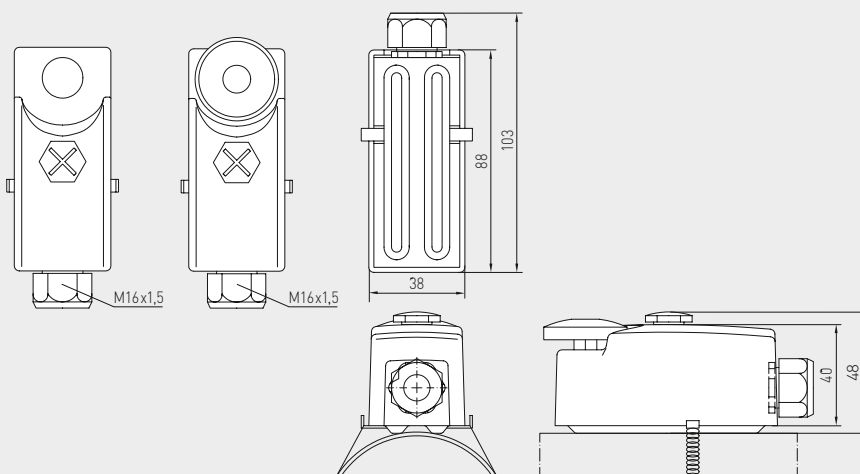
TECHNICAL DATA

Switching capacity: (Contact load)	16 (4) A; 24...250 V AC at 24 V AC min. 150 mA
Max. sensor temperature:	+110 °C
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	ABS (acrylonitrile butadiene styrene), fibre-glass reinforced, base: steel, galvanised, top: grey, M 16 x 1.5
Housing temperature:	-35...+65 °C
Tolerance:	T _{min} ± 5 K; T _{max} ± 5 K
Sensor element:	bi-metal
Housing dimensions:	38 x 48 x 103 mm
Process connection:	by metal tension spring, 220 mm long (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 40 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION **Heating:** wire contacts C - 1
Cooling: wire contacts C - 2

Dimensional drawing

ALTR 060 / 090



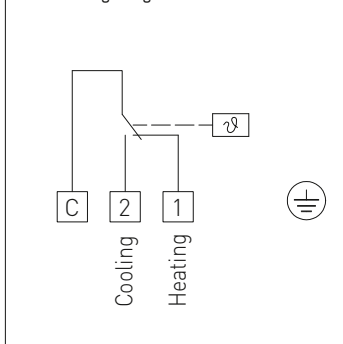
ALTR 060 / 090



ALTR 060 / 090 U



Connecting diagram ALTR 060 / 090



THERMASREG® ALTR 060 / 090 Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
ALTR 060 / 090					
ALTR-060	0...+60 °C	8 K (± 1 K)	+110 °C	TR (External setting) 1102-1040-1100-300	28,07 €
ALTR-090	0...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-400	28,07 €
ALTR 060 / 090 U					
ALTR-060 U	0...+60 °C	8 K (± 1 K)	+110 °C	TW (Internal setting) 1102-1040-2100-300	28,07 €
ALTR-090 U	0...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-400	28,07 €



Mechanical temperature controllers / contact thermostats **THERMASREG® ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

TECHNICAL DATA

Switching capacity:	24 ... 250 V AC + 10%, 16 A, cos φ = 1.0 (Contact load) 24 ... 250 V AC + 10%, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-35...+65 °C
Tolerance:	T _{min} ± 5 K; T _{max} ± 5 K
Design principle:	torsion meter with liquid filling
Process connection:	endless strap with metal tightener (included in the scope of delivery), Ø = 13 - 92 mm (1/4 - 3"), L = 300 mm
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

Heating: The preset setpoint (scale value) is equivalent to the switch-off value of the heating. The switch-on value is lower by the amount of operating difference. Contact 2-3 breaks when temperature rises to the preset value.

Cooling: The preset setpoint (scale value) is equivalent to the switch-on value of the cooling. The switch-off value is lower by the amount of operating difference. Contact 1-2 closes when temperature rises to the preset value.

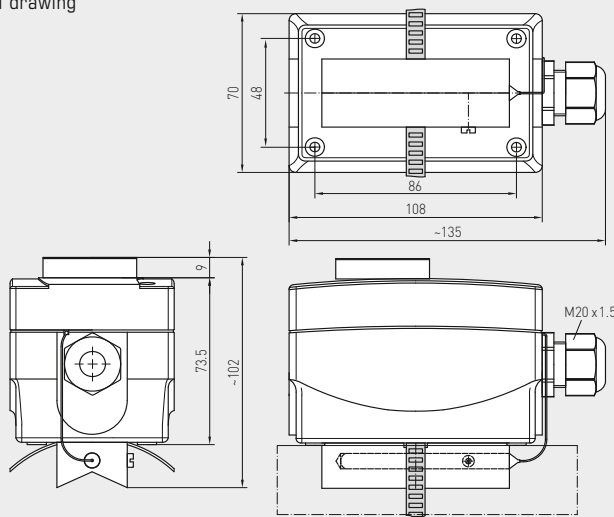


ALTR 1/3/5/7

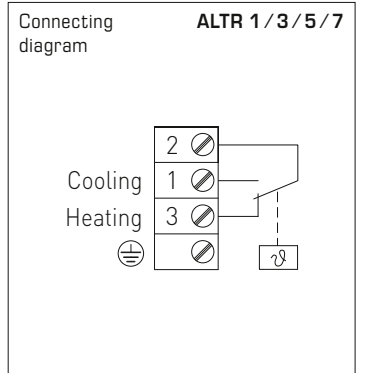


ALTR 1/3/5/7U

Dimensional drawing



ALTR 1/3/5/7



THERMASREG® ALTR 1 / 3 / 5 / 7 Surface contact temperature controllers

Type/WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
ALTR 1/3/5/7					
ALTR-1	-35... +35 °C	5K (± 1 K)	+60 °C	TR (External setting) 1102-1030-1100-100	88,79 €
ALTR-3	0... +60 °C	5K (± 1 K)	+75 °C	1102-1030-1100-300	88,79 €
ALTR-5	0... +90 °C	5K (± 1 K)	+120 °C	1102-1030-1100-400	88,79 €
ALTR-7	0... +120 °C	5K (± 1 K)	+130 °C	1102-1030-1100-500	88,79 €
Extra charge:	U = Internal setting (TW), e.g. ALTR-1 U				8,78 €

Frost protection thermostats, mechanical, one-step, with switching output

The mechanical frost protection thermostat / frost monitor **THERMASREG® FST** with switching output, fully-active sensor rod, with automatic reset, or with mechanical locking and manual reset, is available with capillaries in lengths of 0.6 m, 1.8 m, 3 m, 6 m, or 12 m. This frost protection monitor is used for air- and water-side temperature monitoring at heat exchangers, water circulation systems, and heating registers to prevent freezing up and to avoid frost damages, e. g. in ventilation and air conditioning ducts. All devices are self-secure with sensor breakage detection. In case of damage to the capillary tube – membrane system, the relay automatically switches to heating function. **FST-3** can also be used for monitoring liquids. The sensor tube can be installed inside an immersion sleeve. Mounting clamps **MK-05-K** are included in the delivery.

FST - 1D / 5D / 7D / 8D

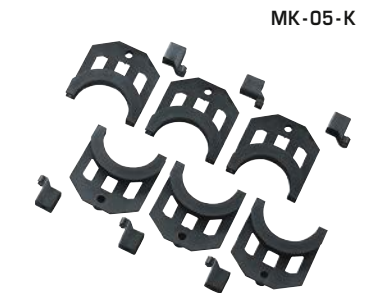
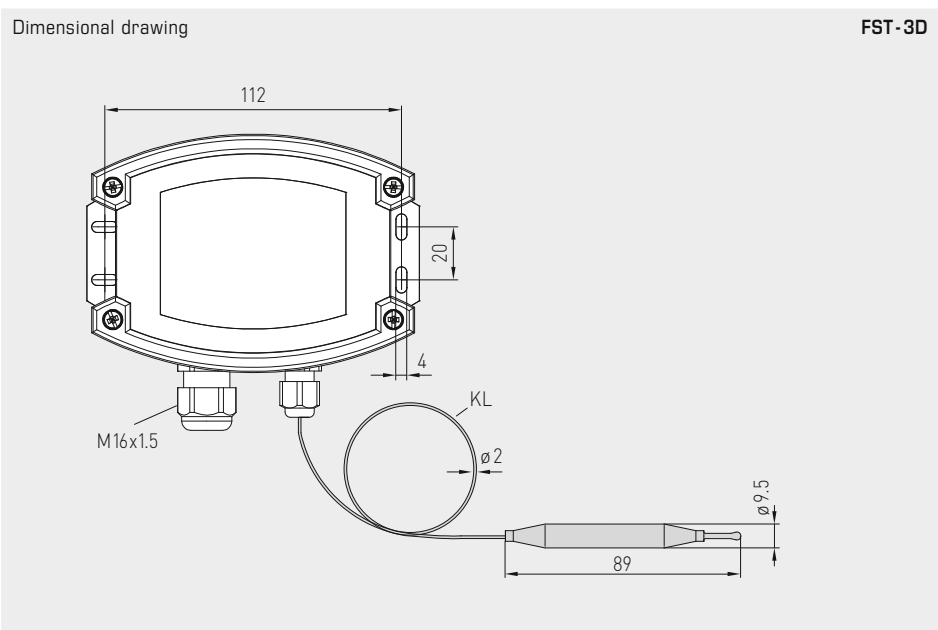
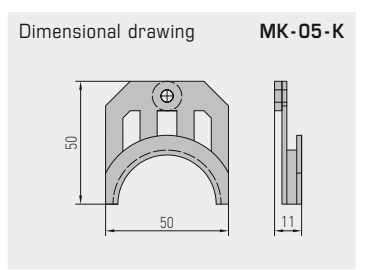
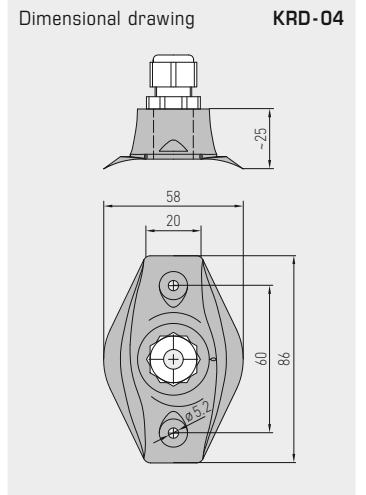
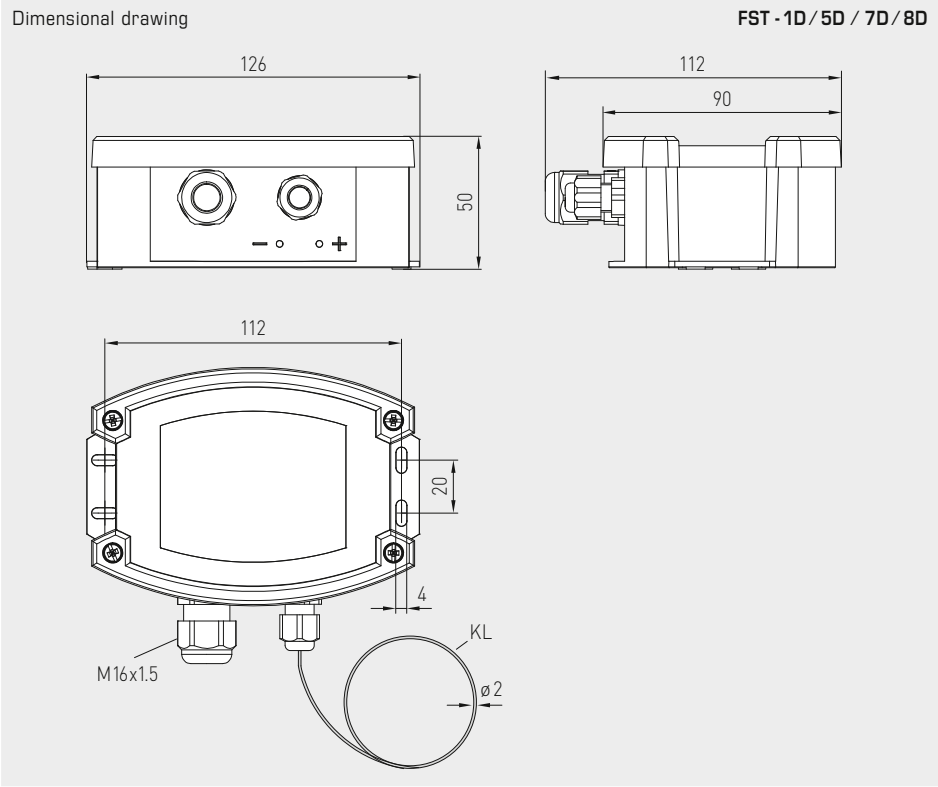


TECHNICAL DATA

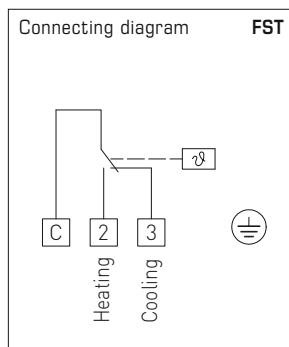
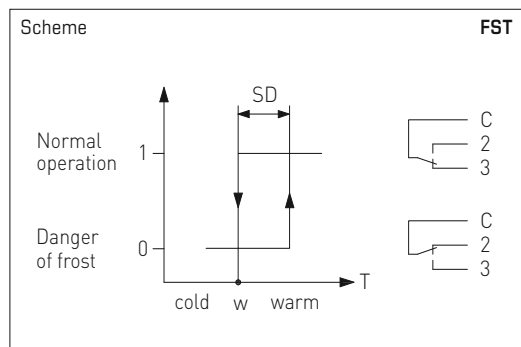
Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	-10...+15 °C / +14 °F...+59 °F, factory setting to w = +5 °C (+41 °F)
Operating difference:	2 ± 1 K (3.6 ± 1.8 °F)
Reproducibility:	± 0.5 K (± 0.9 °F)
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Sensor responding length:	approx. 40 cm
Length of capillary tube:	see table of types (0.6...12 m)
Resetting:	FST-xD automatic FST-xD-HR manual
Permissible medium:	FST-1D/5D/7D/8D air FST-3D water
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: w + min. +2 °C (min. +3.6 °F) storage / transport: -30...+70 °C (-22...+158 °F) capillary: max. +150 °C (+302 °F)
Process connection:	by mounting clamps MK-05-K (included in the scope of delivery)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Cable gland:	M16 x 1.5; including strain relief
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Installation length:	arbitrary
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Electrical connection:	0.14 - 2.5 mm²
Protection class:	I (according to EN 60 730-1)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	Contact C-2: danger of frost / sensor breakage Contact C-3: normal operation
For further information and accessories see next page...	

FST-3D





Frost protection thermostats, mechanical, one-step, with switching output



FST - 1D / 5D / 7D / 8D - HR
(manual rest)



FUNCTION

The switch inside frost protection thermostat **FST** responds (closes contact C-2) when temperature falls below the preset temperature setpoint over a capillary tube length of at least 40cm. Simultaneously contact C-3 breaks and can be used as a signal contact. Resetting (closing contact C-3) happens automatically when temperature rises above the preset setpoint value again (on type **FST-xR** resetting must be done manually by pressing the reset button).

The **FST** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C-2 closes and therefore can be used as operating contact. The air temperature is detected over the entire sensor length (capillary tube). The gas-filled (R507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.

Capillary tube: The capillary tube is laid uniformly at the hot side of the air heater to be protected (in case of air coolers in front of the air cooler) at a distance of approx. 5cm crosswise to the heat exchanger tubes over the entire area. For test purposes, it is recommended to make a loop of approx. 20cm directly underneath the housing and before entering the air duct. To avoid damaging the capillary tube, a minimum bending radius of 20mm must be observed. Installation is facilitated by using the mounting clamps available under accessories.

Frost simulation: The frost situation can be simulated and functioning of the device can be tested by dipping the capillary tube testing loop into a pot filled with ice water.

FST-3D-HR
(manual rest)



WS-03

Weather and sun protection hood (optional)



FST-xD
TW = temperature monitor
(automatically switching)



FST-xD-HR
TB = temperature limiter
(manual reset)



THERMASREG® FST Frost protection thermostats, mechanical

Type / WG03	Temperature Range	Thermal Operating Difference (fixed) approx.	Length of Capillary	Permissible Medium	Item No.	Price
FST-xx D						TW
FST-1D *	-10...+15°C	2K (± 1 K)	6.0 m	air	1102-1021-0102-000	76,85 €
FST-3D *	-10...+15°C	2K (± 1 K)	1.8 m	air / water	1102-1023-0102-000	78,42 €
FST-5D *	-10...+15°C	2K (± 1 K)	3.0 m	air	1102-1022-0102-000	74,76 €
FST-7D *	-10...+15°C	2K (± 1 K)	12.0 m	air	1102-1025-0102-000	132,47 €
FST-8D	-10...+15°C	2K (± 1 K)	0.6 m	air	1102-1024-0102-000	72,75 €
FST-xx D- HR						TB
FST-1D-HR *	-10...+15°C	2K (± 1 K)	6.0 m	air	1102-1021-1102-000	92,32 €
FST-3D-HR *	-10...+15°C	2K (± 1 K)	1.8 m	air / water	1102-1023-1102-000	94,62 €
FST-5D-HR *	-10...+15°C	2K (± 1 K)	3.0 m	air	1102-1022-1102-000	92,00 €
FST-7D-HR *	-10...+15°C	2K (± 1 K)	12.0 m	air	1102-1025-1102-000	145,94 €
FST-8D-HR	-10...+15°C	2K (± 1 K)	0.6 m	air	1102-1024-1102-000	86,21 €
Features:	FST-xD	TW = temperature monitor (automatically switching)				
	FST-xD-HR	TB = temperature limiter (manual reset)				

ACCESSORIES

KRD-04	Capillary tube gland bracket	7100-0030-7000-000	7,86 €
MK-05-K	Mounting clamps (6 pieces) plastic (*= included in the scope of delivery)	7100-0034-1000-000	8,71 €
TH-MS-01	Immersion sleeves, brass, for FST-3	7100-0011-5402-000	13,71 €
TH-VA-02	Immersion sleeves, stainless steel V2A (1.4301), for FST-3	7100-0012-5402-000	35,93 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €

For further information see last chapter!

**Duct frost protection thermostat,
incl. mounting flange, mechanical, one-step,
with switching output**

Mechanical frost protection thermostat / frost monitor **THERMASREG® FST-K** with switching output, duct tube monitored across the entire length, with automatic reset or with mechanical locking, with/without optional manual reset.

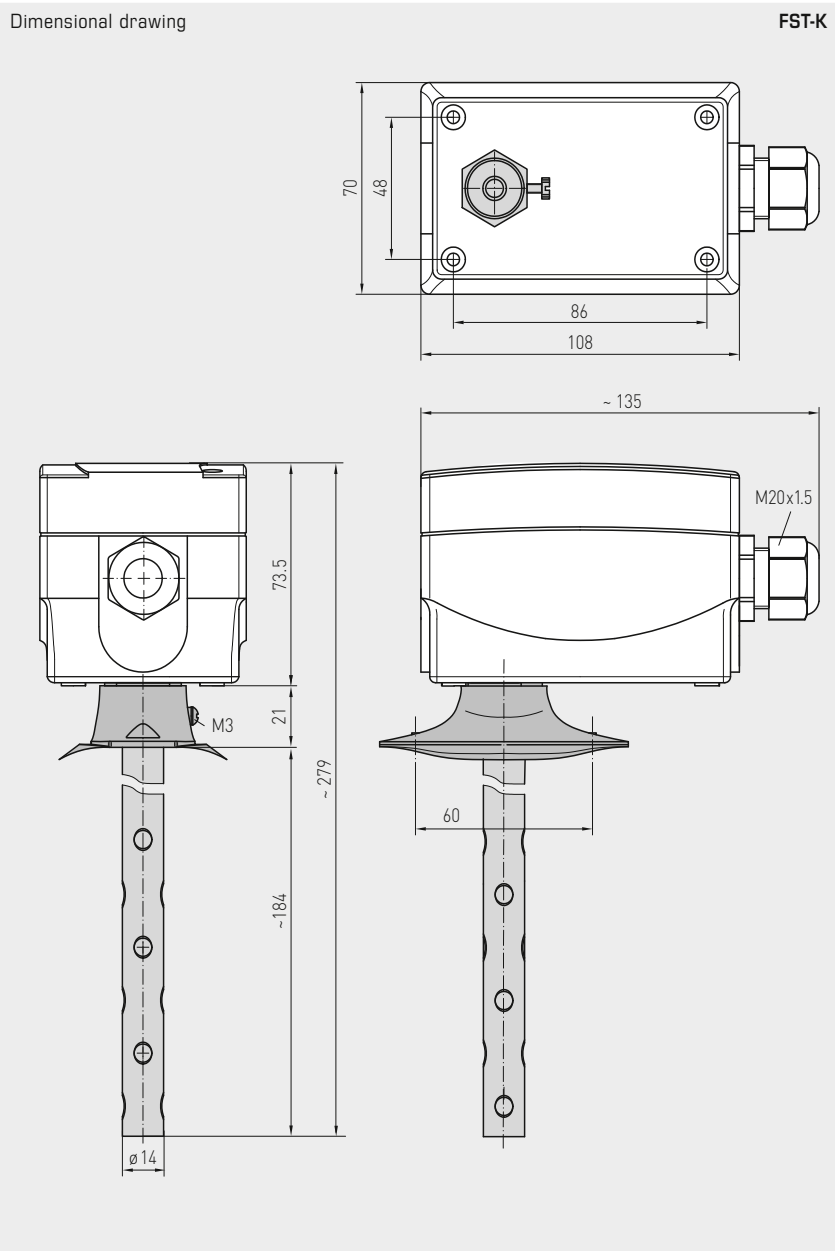
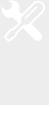
The frost protector is suitable for air side temperature monitoring at heat exchangers and heating registers to prevent freezing up and to avoid frost damage, e.g. in ventilation and air conditioning ducts. The FST-K is intrinsically safe and is equipped with sensor breakage detection. In the event of damage to the capillary membrane system, the frost sensor automatically switches to the heating function. The scope of delivery includes the mounting flange **MF-14-K**.

TECHNICAL DATA

Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	-10...+15 °C / +14 °F...+59 °F, factory setting to $w = +5 °C (+41 °F)$
Operating difference:	$2 \pm 1 K (3.6 \pm 1.8 °F)$
Reproducibility:	$\pm 0.5 K (\pm 0.9 °F)$
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Resetting:	FST-K automatic FST-K-HR manual (by hand)
Permissible medium:	Air
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: $w + \text{min. } +2 °C (\text{min. } +3.6 °F)$ storage / transport: -30...+70 °C (-22...+158 °F)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; with strain relief
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm ² , via screw terminals
Protective tube:	metal , material CuZn37 (2.0321), Ø 14 mm, NL = 205 mm
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Protection class:	I (according to EN 60 730-1)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
FUNCTION	Contact C-2: danger of frost / sensor breakage Contact C-3: normal operation
For further information and accessories see next page...	



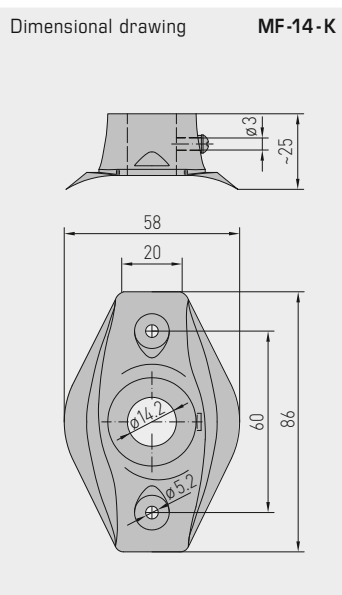
Duct frost protection thermostat, incl. mounting flange, mechanical, one-step, with switching output



FST-K



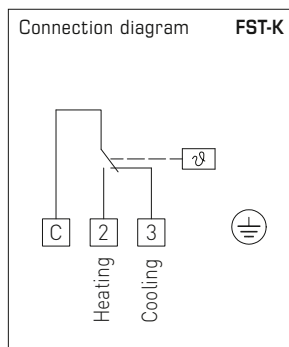
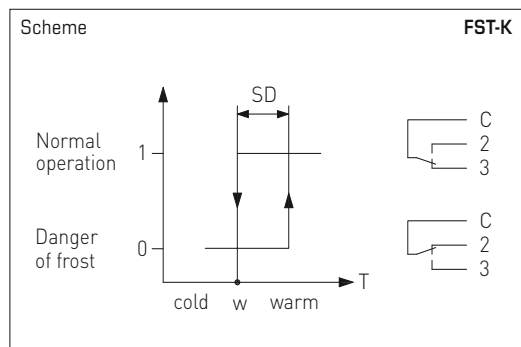
FST-K-HR
with manual reset



MF-14-K
Mounting flange,
plastic



Duct frost protection thermostat,
incl. mounting flange, mechanical, one-step,
with switching output



FUNCTION

The switch in the **FST-K** duct frost protection thermostat responds if the temperature across the entire length of the duct tube falls below the preset temperature setpoint (closes contact C-2). Contact C-3 opens at the same time and can be used as a signal contact. Resetting occurs automatically (contact closes C-3) if the temperature rises above the preset setpoint again (on type **FST-K-HR**, resetting must be performed manually using the reset button).

The **FST-K** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C-2 closes and can therefore be used as an operating contact. The air temperature is detected over the entire length of the sensor (capillary tube). The gas-filled (R507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.

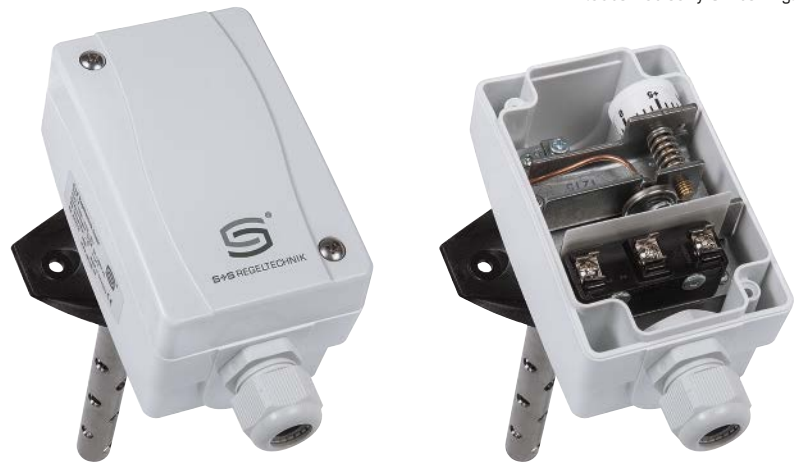


S+S REGELTECHNIK

Duct frost protection thermostat, incl. mounting flange, mechanical, one-step, with switching output

FST-K

TW = temperature monitor (automatically switching)



FST-K-HR

TB = temperature limiter (manual reset)



THERMASREG® FST-K Duct frost protection thermostat, mechanical

Type / WG02	Temperature Range	Thermal Operating Difference (fixed) approx.	Function	Permissible Medium	Item No.	Price
FST-K					TW	
FST-K	-10...+15°C	2K (± 1 K)	TW	air	1102-1064-0100-001	105,92 €
FST-K-HR					TB	
FST-K HR	-10...+15°C	2K (± 1 K)	TB	air	1102-1064-1100-000	119,40 €
Equipment:	FST-K FST-K-HR	TW = temperature monitor (automatically switching) TB = temperature limiter (manual reset)				

ACCESSORIES

MF-14-K	Mounting flange, plastic	7100-0030-2000-000	8,43 €
----------------	---------------------------------	--------------------	---------------

For further information see last chapter!

**2-phase frost protection thermostat,
with control and cascading input,
with active and switching output**

FS-20

Electronic frost protection thermostat / frost monitor **THERMASREG® FS-20** with switching relay output, continuous temperature and valve output (summation output 0–10V) and control and cascading output (0–10V), optionally with connection for heating element, in an impact-resistant plastic housing with quick-locking screws, with display by default, with fully active sensorrod made from copper.

The frost monitor is used to monitor air conditioning systems, heat exchangers, heating registers and similar systems, and protects against frost damage and freezing. Falling below the limit value is detected at the coldest measuring point of the capillary tube, the sensor rod is active along its entire length. Uses internal diagnostics to detect capillary breakage, power failure or electric damage to the sensor as an error and the relay automatically switches to frost.

The innovative 2-phase frost protection thermostat enables simple combination of several devices (cascading) for demand-oriented, comprehensive frost monitoring. The delivery scope includes the mounting clamps **MK-05-K** for expert attachment of the sensor rod.

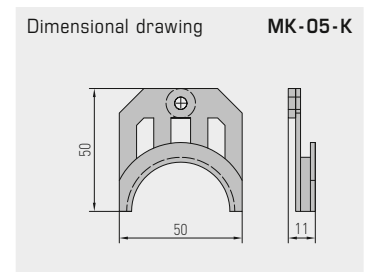
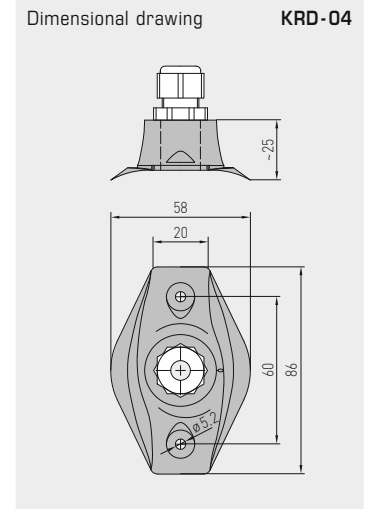
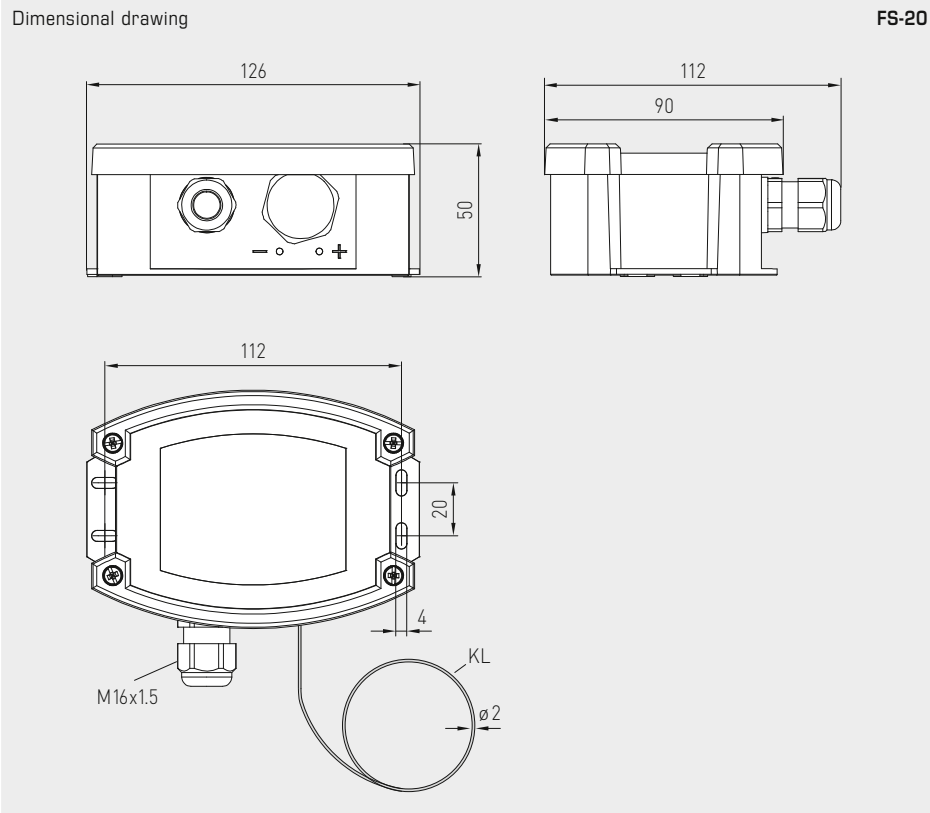


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L > 50 \text{ k}\Omega$
Measuring range:	0...+15 °C
Input:	1 x 0-10V control input DDC 1 x 0-10V ascading input
Output:	1 x 0-10V output temperature (corresponding to 0...+15 °C) 1 x 0-10V output valve (frost signal with control voltage and cascading) 1 x potential-free changeover contact (24 V), range of adjustment 0...+15 °C
Current consumption:	max. 100 mA at 24 V DC (FS-20 without heating element) max. 200 mA at 24 V DC (FS-20 xx HE with heating element)
Accuracy:	typically ± 1 K (at +10 °C)
Hysteresis of the switch step:	2K
Turn-on/run-in time:	< 1 min
Response time:	$t_{90} < 5 \text{ s}$
Sensor and capillary tube:	Copper sensor rod, length of 3 m or 6 m, active along the entire sensor length, min. response length of 25 cm
Ambient temperatures:	Sensor and capillary tube: -20...+60 °C (capillary tube at a distance of > 20 cm from the housing) Housing: -15...+50 °C Storage/transport: -30...+70 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Cable gland:	M 16 x 1.5; including strain relief, exchangeable, max. inner diameter 10.4 mm
Process connection:	by mounting clamps MMK-05-K (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Permitted humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying the actual temperature, measuring range overrange/underrange of the set switch point (frost protection temperature), and alarm indicator for "frost" or "error" (capillary breakage, overvoltage/undervoltage)
Internal diagnostics:	Error 1 in case of cable / capillary breakage Error 2 in case of undervoltage / overvoltage (relay automatically switches to frost)



2-phase frost protection thermostat, with control and cascading input, with active and switching output



WS-03
Weather and sun protection hood (optional)



MK-05-K



KRD-04



**2-phase frost protection thermostat,
with control and cascading input,
with active and switching output**

FUNCTION

The filling used in the copper capillary tube in the frost protection monitor generates a pressure signal that is proportional to the lowest temperature on the entire capillary tube (but min. 200mm). This is converted into an electrical signal by a sensor and electronically amplified. The standard signal 0-10V generated as a result corresponding to 0...+15°C is issued. This voltage is available at the "Temp." terminal.

The internal potentiometer can be used to specify a **frost switchpoint "FS"** for the potential-free changeover contact in the range from 0°C (left limit stop) to +15°C (right limit stop). If this switchpoint "FS" is undershot, the relay output switches to the "frost protection" position (contact "W" connected to contact "Ö"). If the temperature rises by more than 2K above the set switchpoint "FS", the device switches back to normal operating mode if **"Reset Auto"** is selected. The relay drops out to the initial position (contact "W" connected to contact "S"). If the **"Reset Hand"** operating mode is selected, the relay output does not automatically switch even if the set switchpoint "FS" +2K is exceeded, but must be manually reset from the **reset button**.

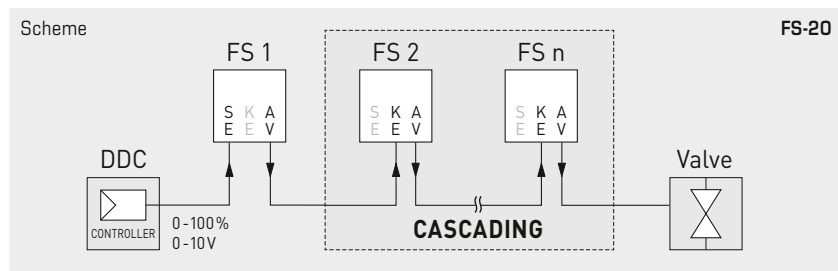
In addition, a second voltage output "AV", mapped by 0-10V, is available. At a voltage of 0V at the control input "SE", the output voltage "AV" is always 0V if the measured temperature is at least 6K above the set switchpoint "FS". If the measured temperature falls below the set switchpoint "FS"+6K, the voltage output "AV" increases in a linear fashion from 0V to 10V. The increase here amounts to 1.67 V for every degree Kelvin by which the temperature approaches the preset switchpoint "FS". The output voltage 10V is therefore issued at "FS" = measured temperature. If you increase "SE", the output voltage "AV" is increased by this amount. The "AV" output therefore represents a summation output for the input variables "SE" and "Frost signal". In this case, the "Frost signal" variable describes the output behaviour of "AV" at "SE" = 0V. The maximum output voltage is restricted to 10V.

Several frost protection devices can be connected to each other via the **cascading input "KE"** to cover a larger channel cross-section for frost monitoring. The AV output of the first device is connected to the KE input of the second device. The internal device logic decides on the priority frost signal of both devices for controlling the heating register valve.

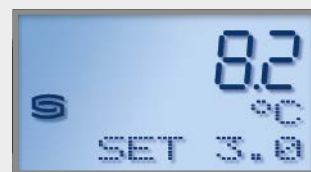
In the event of capillary breakage, electrical sensor damage (cable breakage), voltage failure, falling short of the permissible voltage level or exceeding it, the relay output is automatically switched to "Frost protection" (contact "W" connected to contact "Ö").

NOTE

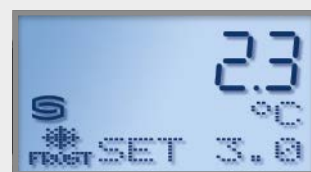
The capillary tube must be securely seated in the socket and must not twist.
A redundant setup to protect critical systems is **absolutely necessary**.



Display readout FS-20



Normal operation
Actual temperature and set switchpoint temperature



Frost protection alarm
Actual temperature is below switchpoint temperature

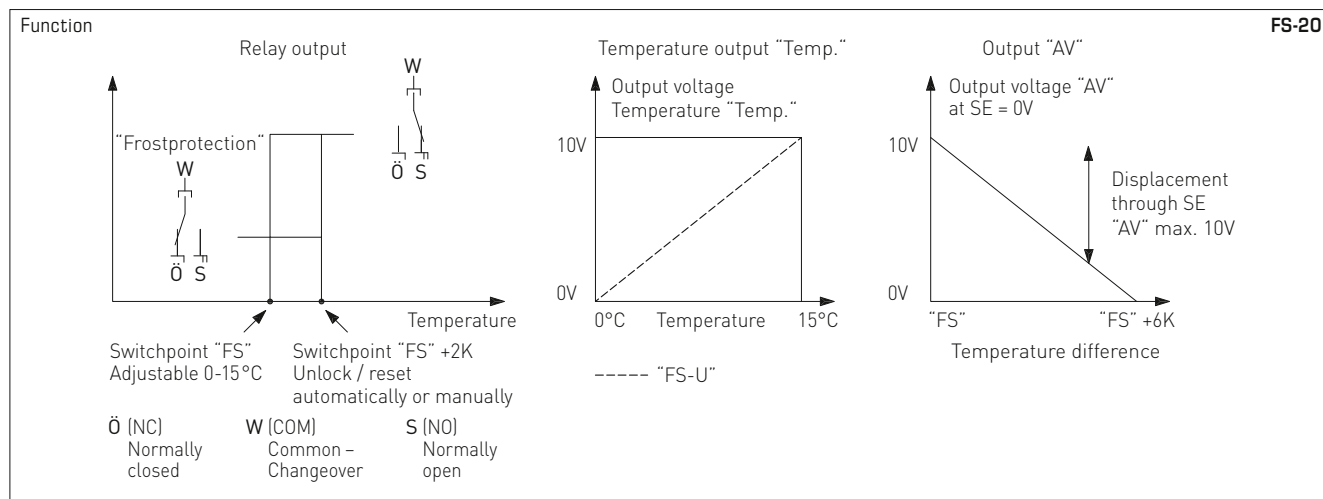


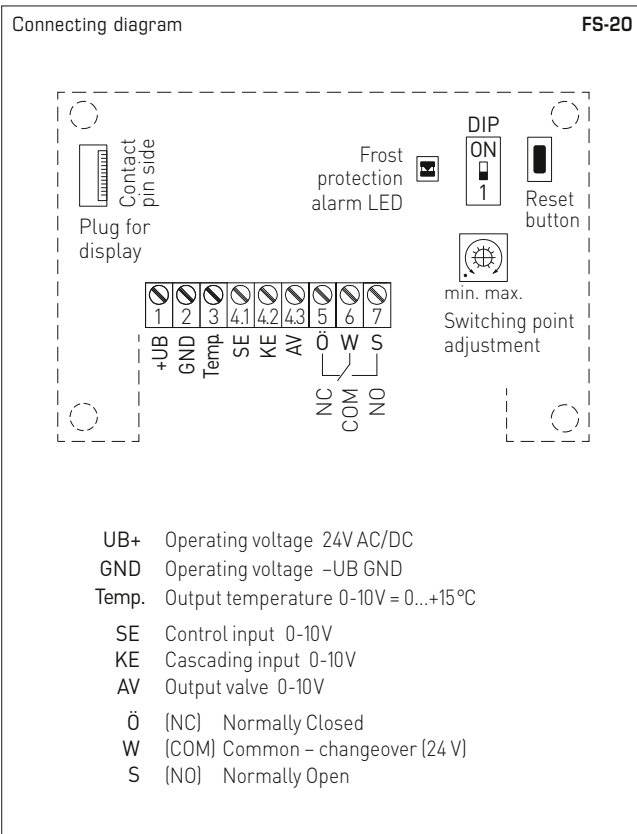
Measuring range exceeded
Actual temperature rises above +15°C



Measuring range underranged
Actual temperature falls below 0°C

- 1 ERROR** Error message 1 in case of cable/capillary breakage
- 2 ERROR** Error message 2 in case of undervoltage/overvoltage





DIP switch	FS-20
Resetting after frost protection (Mode adjustable)	DIP 1
Reset Hand (manually) Alarm remains saved	ON
Reset Auto (automatically) Alarm is reset automatically (default)	OFF

THERMASREG® FS-20 Two-phase frost protection thermostats

Type/WG02	Measuring Range	Output	Sensor length	Display	Item No.	Price
FS-20						
FS20-UW 3m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	3,0m	■	1102-1012-2102-030	225,77 €
FS20-UW 6m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	6,0m	■	1102-1011-2102-030	265,22 €
FS-20 xx HE with heating element						
FS20-UW-HE 3m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	3,0m	■	1102-1012-2112-030	245,70 €
FS20-UW-HE 6m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	6,0m	■	1102-1011-2112-030	286,13 €

ACCESSORIES			
KRD-04	Capillary tube gland bracket		7100-0030-7000-000 7,86 €
MK-05-K	Mounting clamps (6 pieces) plastic (included in the scope of delivery)		7100-0034-1000-000 8,71 €
WS-03	Weather and sun protection hood, 200x180x150 mm, stainless steel V2A (1.4301)		7100-0040-6000-000 39,45 €

For further information see last chapter!

Temperature controller for top hat rail installation for remote sensor, with multi-range switching and switching output

Electronic top hat rail thermostat / top hat rail temperature controller **THERMASREG® TET** for installation in distributor boxes or control cabinets, with switching output, multi-range switching, and adjustable hysteresis. It is used for electronic control and monitoring of temperatures by remote sensors in the residential sector (e.g. in connection with floor heating systems), in halls and greenhouses and in the industrial sector.

This controller is provided with sensor breakage detection and a switch-off function.

TECHNICAL DATA

Power supply:	24 V DC, +10% / -15%; 24 V AC or 230 V AC, +10% / -15%, 50 - 60 Hz
Power consumption:	2.5 VA
Control range:	-10...+30 °C; +20...+80 °C; +60...+120 °C, selectable
Input:	Pt1000
Output:	relay as single-pole, potential-free changeover contact (1x)
Switching capacity: (Contact load)	max. 6 A 250 V AC U _e / I _e AC-15, 120 V / 3.5 A, 240 V / 3 A U _e / I _e DC-13, 24 V / 2.5 A EN 60947-5-1, VDE 0435
Operating Difference:	adjustable
Lifetime:	changeover contact mechanical: 5 x 10 ⁶ changeover contact electrical: 1 x 10 ⁵
Ambient conditions:	-20...+60 °C, non-precipitating air
Operating mode indicator:	LED
Housing:	plastic, colour black-grey (similar to RAL 7021) and light grey (similar to RAL 7035), width: 45 mm, 3TE
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Mounting:	on DIN top hat rail
Humidity:	< 90 % r. H., non-precipitating air
Protection class:	II (according to EN 60730)
Protection type:	IP 20 at front side (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

The range of interpretation is selected at the lower potentiometer.

Three measuring ranges can be chosen: -10...+30 °C; +20...+80 °C; +60...+120 °C.

The temperature to be monitored is determined by the potentiometer »Setpoint« and the switchpoints (hysteresis) are defined at the potentiometer »Hyst.«

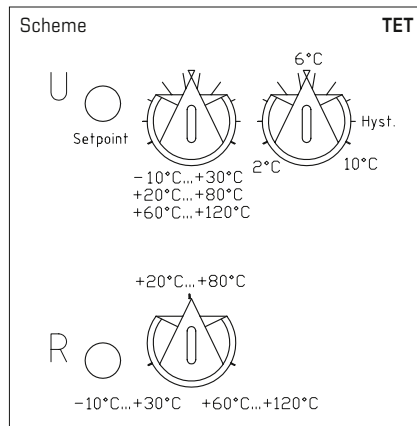
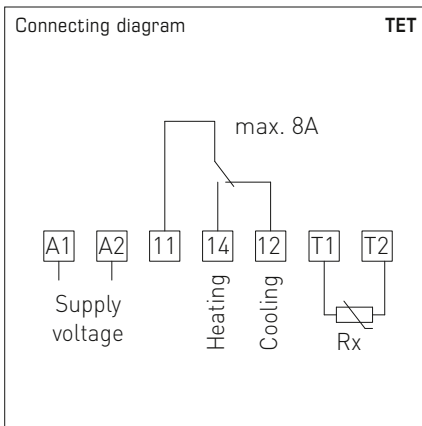
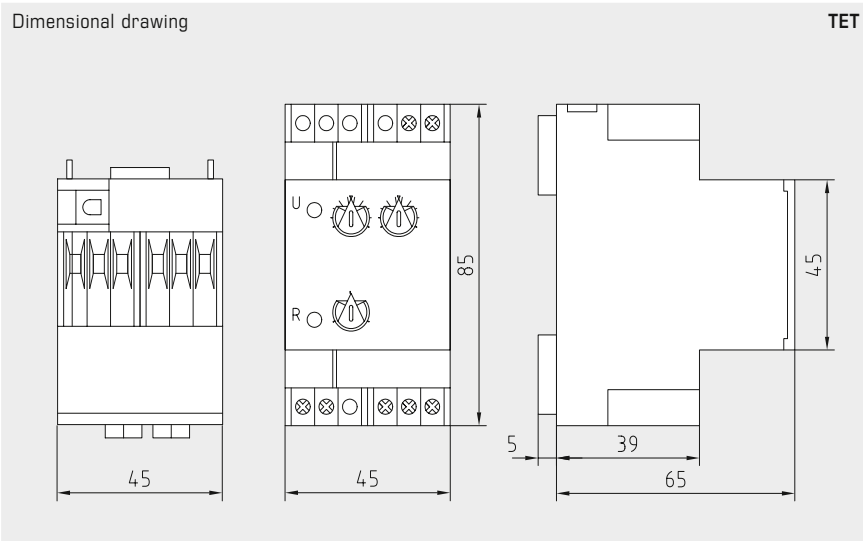
When temperature at the Pt1000 exceeds the value of »Setpoint + Hyst.«, the output relay switches to rest position (switched off).

When temperature falls below »Setpoint - Hyst.«, the output relay is reactivated.

The following conditions result in a drop of the relay to rest position:

Excess temperature, short circuit, or wire breakage at the Pt 1000 sensor, failure of power supply.

Measuring input and power supply have no electric connection i.e. are galvanically isolated.



THERMASREG® TET Temperature controller for top hat rail installation						
Type / WG01	Supply Voltage	Input Sensor	Output	Item No.	Price	
TET						
TET-230VAC	230 V AC, 2,5 VA	Pt1000	1 x changeover contact (potential-free)	1 102-6021-0000-000	177,98 €	
TET-24VAC	24 V AC, 2,5 VA	Pt1000	1 x changeover contact (potential-free)	1 102-6022-0000-000	177,98 €	
TET-24VDC	24 V DC, 2,5 VA	Pt1000	1 x changeover contact (potential-free)	1 102-6023-0000-000	177,98 €	



Humidity

HYGRASGARD® humidity sensors and **HYGRASREG®** humidity controllers will never let you down when mold and rust formation must be prevented. With an accuracy of 2% RH, they will always keep you on the safe side. Their application range spans from standard uses in facility automation to highly demanding cleanroom installations.

APPLICATION RANGE

- > Refrigeration, air conditioning, ventilation and cleanroom technology
- > Food and pharmaceutical industry
- > Hospitals, museums, office buildings and greenhouses
- > Production facilities, laboratories, computer rooms and control cabinets
- > Meteorology



HYGRASGARD® & HYGRASREG®

338 – 435

Room sensors

RFF/RFTF	Room humidity sensor, on-wall	345
FSFM/FSFTM	Room humidity sensor, in-wall	347
DFF/DFTF	In-ceiling humidity sensor	351
RPFF-SD	Pendulum room humidity sensor	393
RPFF/RPFTF	Pendulum room humidity sensor	397
RPFF/RPFTF-25	Pendulum room humidity sensor, pluggable	401
VFF/VFTF	Showcase humidity sensor	405

Duct sensors

KFF/KTF-SD	Duct humidity sensor	378
KFF/KTF	Duct humidity sensor	379
KFF/KTF-20	Duct humidity sensor	381
KTF-20-VA	Duct humidity sensor (Stainless steel housing Tyr2E)	NEW 387
KAVTF	Duct humidity sensor	391

On-wall sensors

AFF/AFTF-SD	On-wall humidity sensor	355
AFF/AFTF	On-wall humidity sensor	360
AFF/AFTF-20	On-wall humidity sensor	363
AFTF-20-VA	On-wall humidity sensor (Stainless steel housing Tyr2E)	NEW 369
AFF/AFTF-25	On-wall humidity sensor, pluggable	361
AAVTF	Outdoor humidity sensor	373

Hygrostats

RH-2	Room hygrostat, one-step	407
AH-40	On-wall hygrostat, one-step	413
KH-10	Duct hygrostat, one-step	419
KH-40	Duct hygrostat, one-step	421

Hygrothermostats

RHT	Room hygrothermostat, one-step	406
RHT-30	Room hygrothermostat, two-step	411
AHT-30	On-wall hygrothermostat, two-step	417
KHT-30	Duct hygrothermostat, two-step	425

Condensation control switch, dew point control switch, leakage sensor

KW-SD	Condensation control switch	428
KW	Condensation control switch	429
TW	Dew point control switch	433
LS	Leakage sensor	435

Immersion sleeves and accessories

see chapter Accessories	604
-------------------------	------------



Humidity



HYGRASGARD® & HYGRASREG®

Multifunctional sensor technology for humidity and temperature

Broad Spectrum

All our humidity measuring transducers are designed to be multifunctional. This reduces the diversity of types while expanding their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

Optimum Precision

These devices are developed and manufactured according to the latest criteria; latest generation digital sensors are installed. All devices are produced at our factory and are calibrated and 100% checked in our climatic exposure test cabinets. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Approved Safety

The **HYGRASGARD® 3112** with current output (Test No. D8 0910 69871 003) and the **HYGRASGARD® 3111** with voltage output (Test No. D8 0910 69871004) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.



DIN tested/certified devices



RoHS conforming materials



ESD compliant manufacturing



CE compliance tested by external laboratories

Certified Quality



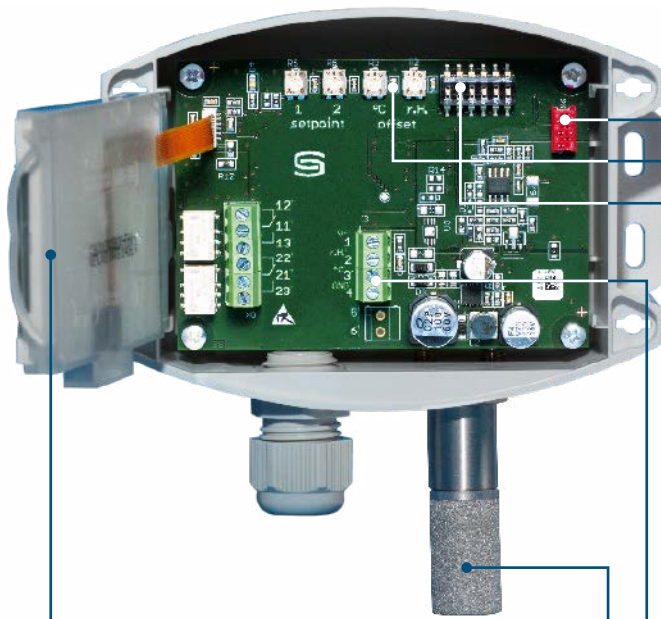
Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.



GOST certificates



EAC certified



1



Extra-Large Display (70 x 40 mm)

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units

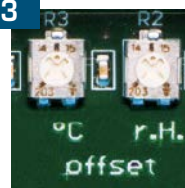
2



Quality Assurance

Calibration and balancing are done by means of the bus system in climate cabinets

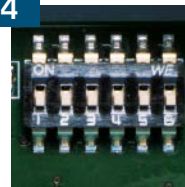
3



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

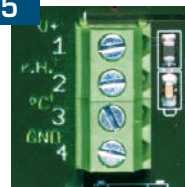
4



DIP Switches

For multi-range toggling as well as setting of measuring ranges, response times, damping times, units and configuration levels

5



Screw Terminals

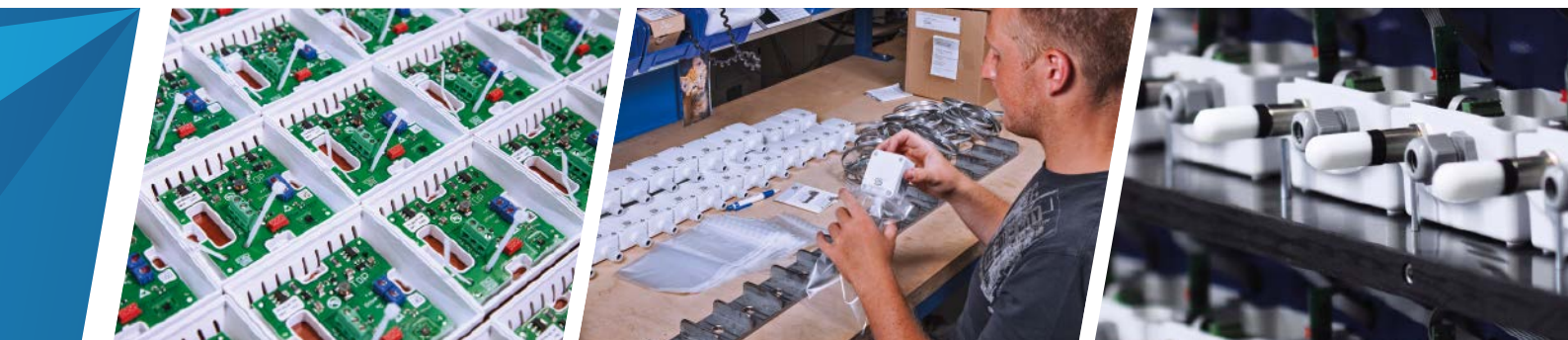
Active output signals 0-10V, 4...20mA or switched output

6



Digital Humidity & Temperature Probe

Highly precise, longterm stable and temperature compensated



Room humidity and temperature sensors ($\pm 2.0\%$),
on-wall, calibratable,
with active/passive output

The calibratable room humidity and temperature sensor **HYGRASGARD® RFF/RFTF** measures the relative humidity and/or temperature of air. It converts the measurands humidity and temperature into standard signals of 0-10V or 4...20mA and is available with or without an optional display (for displaying actual humidity and actual temperature) in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. The relative humidity (in % r.H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

It is used in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, in interior rooms such as residential rooms, offices, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of air temperature and humidity. A digital long-term stable sensor is used as a measuring element for humidity and temperature measurement. Fine adjustment by the user is possible.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36V DC for U variant 15...36V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3V$
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14V) / 0.02A$ for I variant
Load resistance:	$R_L > 5k\Omega$ for U variant
Power consumption:	< 1.1 VA / 24 V DC ; < 2.2 VA / 24 V AC
Sensors:	digital humidity sensor with integrated temperature sensor, small hysteresis, high long-term stability

HUMIDITY

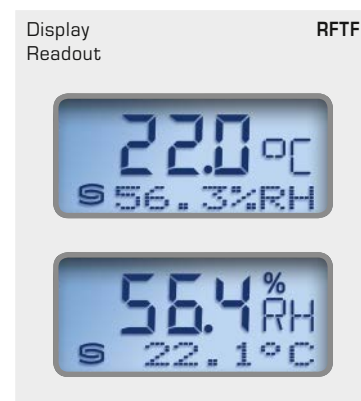
Measuring range, humidity:	0...100% r. H. (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0 ... 95% r. H. (non-precipitating air)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r. H.) at +25 °C, otherwise $\pm 3.0\%$
Output, humidity:	0-10 V for U variant 4...20mA for I variant, working resistance < 800 Ω , see load resistance diagram

TEMPERATURE

Measuring range, temperature:	0...+50 °C (output corresponding to 0 -10V or 4... 20mA or Ohm value) others upon request!
Operating range, temperature:	0...+50 °C
Deviation, temperature:	typically $\pm 0.2K$ at +25 °C
Output, temperature:	0 -10V or 4 ... 20 mA or Ohm value
Ambient temperature:	storage -25...+50 °C, operation -5...+55 °C
Electrical connection:	2-, 3- or 4-wire connection (see connecting diagram) 0.14 -1.5 mm ² via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimensions:	85 x 85 x 27 mm (Balduur 1)
Installation:	wall mounting or on in-wall flush box, $\varnothing 55$ mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60 730)
Protection type:	IP30 (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line display with illumination, 36x15 mm (W x H), for displaying ACTUAL temperature and/or ACTUAL humidity

The two-line display readout switches between the ACTUAL humidity reading in % r. H. and the ACTUAL temperature reading in °C.

Backlighting is installed for better instrument readability.





S+S REGELTECHNIK

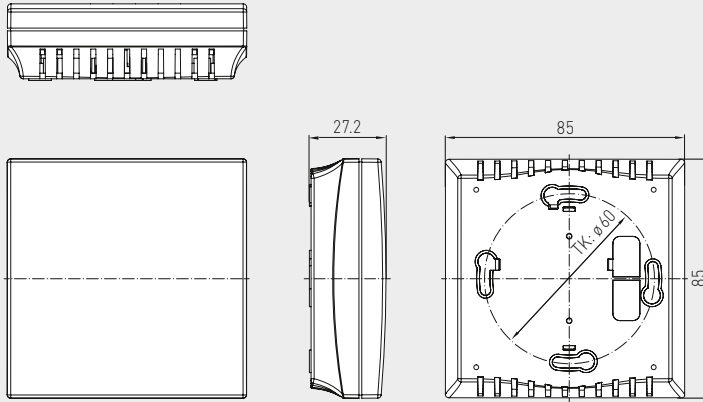
HYGRASGARD® RFF
HYGRASGARD® RFTF

Room humidity and temperature sensors ($\pm 2.0\%$),
on-wall, calibratable,
with active/passive output



Dimensional drawing
(Balduur 1)

RFF
RFTF



RFF
RFTF



RFF
RFTF
without display

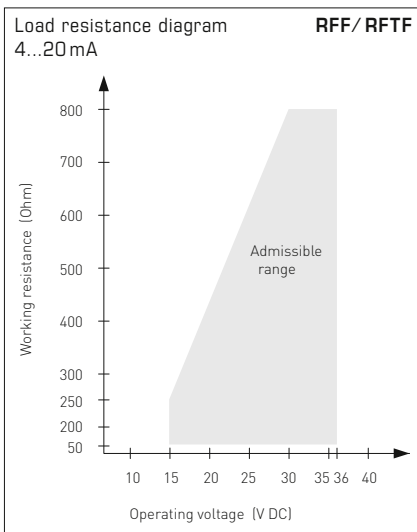
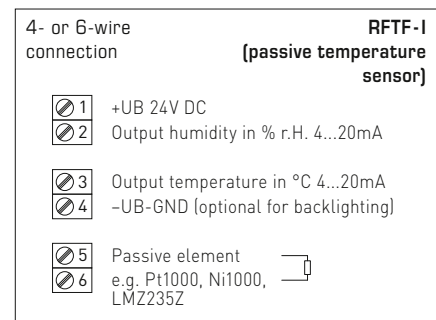
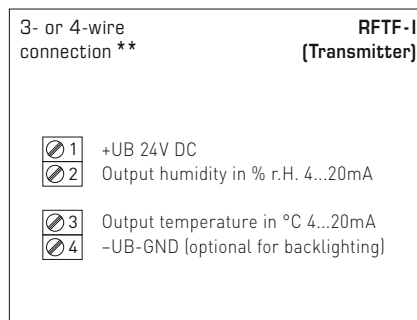
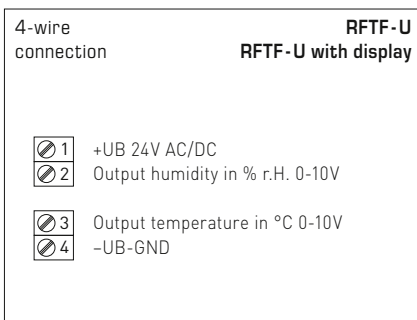
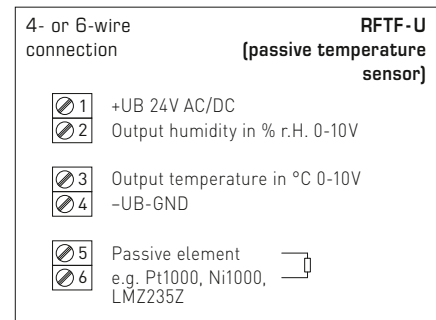
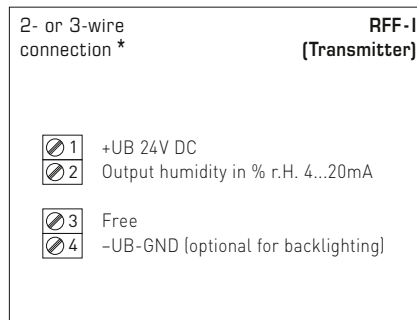
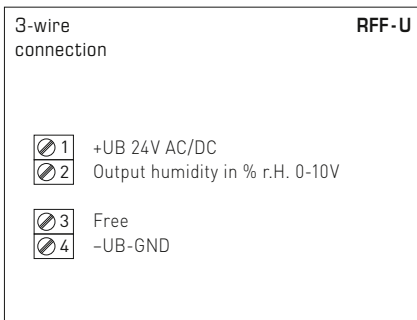
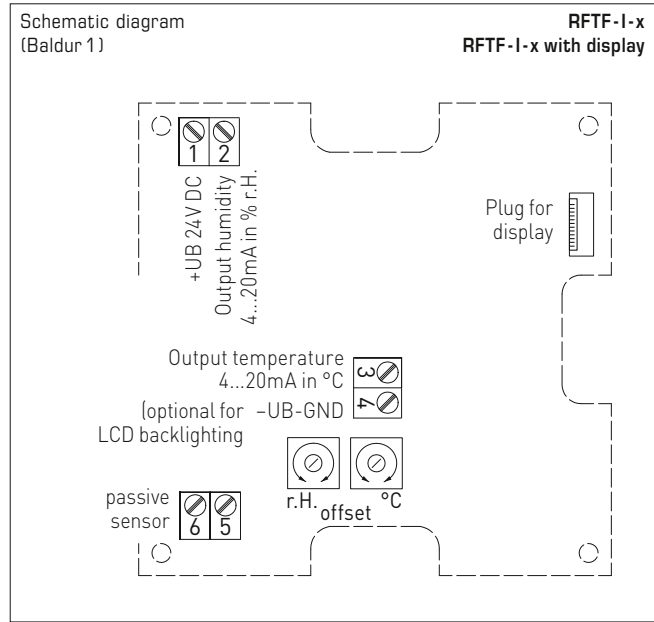
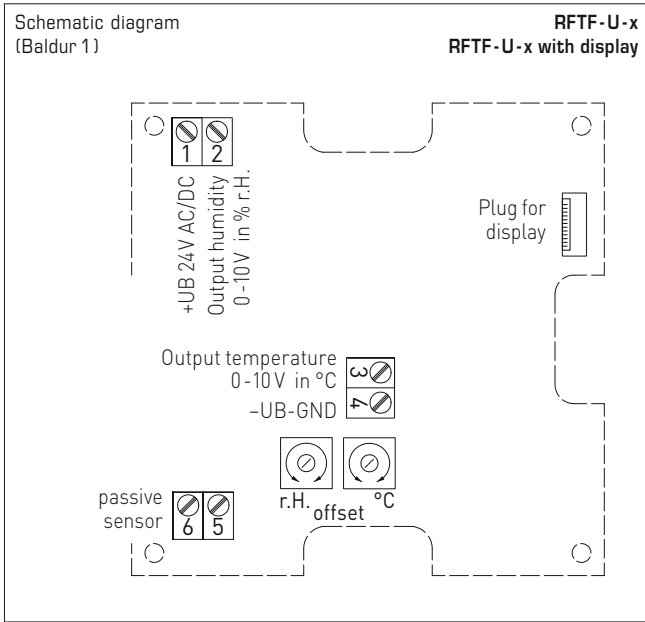
RFF
RFTF
with display



RFF
RFTF
with display



Room humidity and temperature sensors ($\pm 2.0\%$),
on-wall, calibratable,
with active/passive output



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection:**
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

At the I variant the humidity path must be connected!



Humidity table

MR: 0...100% r.H.

% r.H.	U _A in V	I _A in mA
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
Continued at the right...		

% r.H.	U _A in V	I _A in mA
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Temperature table

MR: 0...+50°C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

HYGRASGARD® RFF		Room humidity sensors					
HYGRASGARD® RFTF		Room humidity and temperature sensors					
Type/WG01	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature		(Baldur 1)	
RFF							(active)
RFF-I	0...100% r.H.	–	4...20mA	–		1201-41A2-0000-000	104,86 €
RFF-I LCD	0...100% r.H.	–	4...20mA	–	■	1201-41A2-0200-000	153,80 €
RFF-U	0...100% r.H.	–	0-10V	–		1201-41A1-0000-000	104,86 €
RFF-U LCD	0...100% r.H.	–	0-10V	–	■	1201-41A1-0200-000	153,80 €
RFTF							(active)
RFTF-I	0...100% r.H.	0...+50°C	4...20mA	4...20mA		1201-41A2-1000-000	108,12 €
RFTF-I LCD	0...100% r.H.	0...+50°C	4...20mA	4...20mA	■	1201-41A2-1200-000	157,16 €
RFTF-U	0...100% r.H.	0...+50°C	0-10V	0-10V		1201-41A1-1000-000	108,12 €
RFTF-U LCD	0...100% r.H.	0...+50°C	0-10V	0-10V	■	1201-41A1-1200-000	157,16 €

HYGRASGARD® RFTF - U xx		Room humidity and temperature sensors					
Type/WG01	Measuring Range / Readout		Output			Item No.	Price
	Humidity	Temperature	Humidity	Temperature		(Baldur 1)	
RFTF - U xx							(active / passive)
Pt, Ni, LM235Z							
RFTF-U Pt100	0...100% r.H.	0...+50°C	0-10V	0-10V + Pt100		1201-41A1-2001-000	143,98 €
RFTF-U Pt1000	0...100% r.H.	0...+50°C	0-10V	0-10V + Pt1000		1201-41A1-2005-000	146,95 €
RFTF-U Ni1000	0...100% r.H.	0...+50°C	0-10V	0-10V + Ni1000		1201-41A1-2009-000	147,96 €
RFTF-U NiTK	0...100% r.H.	0...+50°C	0-10V	0-10V + Ni1000TK5000		1201-41A1-2010-000	148,18 €
RFTF-U LM235Z	0...100% r.H.	0...+50°C	0-10V	0-10V + LM235Z, 10mV / K		1201-41A1-2021-000	147,62 €
RFTF - U xx							(active / passive)
NTC							
RFTF-U NTC1,8K	0...100% r.H.	0...+50°C	0-10V	0-10V + NTC 1,8kOhm		1201-41A1-2012-000	148,07 €
RFTF-U NTC10K	0...100% r.H.	0...+50°C	0-10V	0-10V + NTC 10kOhm		1201-41A1-2015-000	144,86 €
RFTF-U NTC20K	0...100% r.H.	0...+50°C	0-10V	0-10V + NTC 20kOhm		1201-41A1-2016-000	144,86 €
Extra charge:	Two-line display with illumination						43,94 €

**Room humidity and temperature sensor or measuring transducer,
in-wall in the panel switch programme,
with active output**

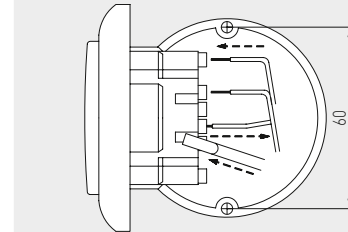
The room sensor **HYGRASGARD® FSFM / FSFTM** in the in-wall housing is used for measuring the relative humidity and temperature of the air. It converts the measured values into a standard signal of 0-10 V.

A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% r.H.] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc

Mounting diagram in-wall



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC ; < 2.2 VA / 24 V AC

HUMIDITY

Sensor:	digital humidity sensor, with integrated temperature sensor, low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity:	0...100 % r. H.
Operating range, humidity:	0...95 % r. H. (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20...80 % r. H.) at +25 °C, otherwise ± 5.0 %
Output, humidity:	0-10 V

TEMPERATURE

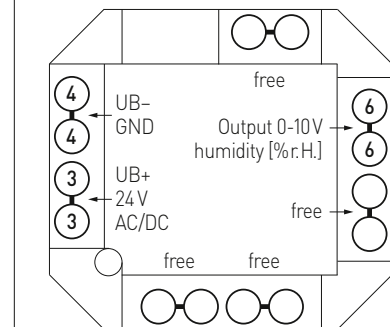
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0-10 V

Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	0.14 - 1.5 mm ² , using plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % r.H., non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

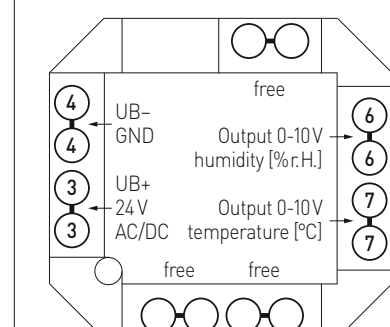
SWITCH PROGRAMME

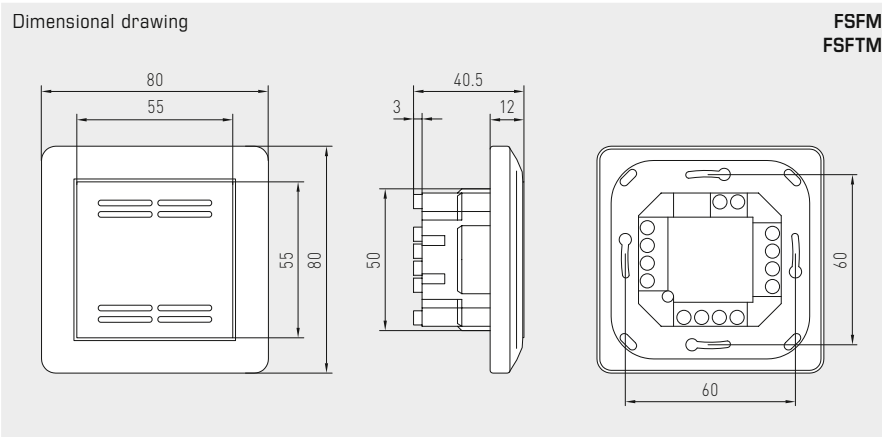
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram FSFM



Connection diagram FSFTM





Humidity table

MR: 0...100% r. H.

% r.H.	U _A [V]	% r.H.	U _A [V]
0	0	50	5.0
5	0.5	55	5.5
10	1.0	60	6.0
15	1.5	65	6.5
20	2.0	70	7.0
25	2.5	75	7.5
30	3.0	80	8.0
35	3.5	85	8.5
40	4.0	90	9.0
45	4.5	95	9.5
Continued to the right ...		100	10.0

Temperature table

MR: 0...+50 °C

°C	U _A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

HYGRASGARD® FSFM Room humidity sensor or measuring transducer, in-wall
HYGRASGARD® FSFTM Room humidity and temperature sensor or measuring transducer, in-wall

Type / WG02	Measuring Range		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
FSFM						
FSFM-U	0...100% r. H.	-	0-10 V	-	1201-9121-0000-162	211,19 €
FSFTM						
FSFTM-U	0...100% r. H.	0...+50 °C	0-10 V	0-10 V	1201-9121-1000-162	217,46 €

**In-ceiling humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output**

The calibratable humidity and temperature sensor **HYGRASGARD® DFF / DFTF** measures the relative humidity and temperature of air. It converts the measurands into a standard signal of 0-10V or 4...20mA, and is available with / without an optional display.

It is equipped with four switchable temperature ranges. Relative humidity (in % r.H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. The measuring transducers are designed for exact detection of temperature and humidity. A digital, long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

The ceiling-installed sensor is used in non-aggressive, dust-free environments and is used for installation in suspended ceilings in corridors, offices, as well as in residential and commercial buildings. The connecting head is pluggable for quick, easy mounting. The measuring transducer is accommodated in a separate housing.

**DFF
DFTF**



TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_B (Ohm) = $(U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability

HUMIDITY

Measuring range, humidity:	0...100% r.H. (output corresponding to 0-10V or 4...20mA)
Operating range, humidity:	0...95% r.H. (without formation of dew)
Deviation in humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$
Output, humidity:	0-10V for U variant 4...20 mA for I variant, see load resistance diagram

TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (see table) $-35...+35^\circ\text{C}$; $-35...+75^\circ\text{C}$; $0...+50^\circ\text{C}$; $0...+80^\circ\text{C}$ (output corresponding to 0-10V or 4...20mA)
Deviation temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10V or 4...20mA
Ambient temperature:	storage $-5...+60^\circ\text{C}$; operation $-5...+60^\circ\text{C}$
Long-term stability:	$\pm 1\%$ per year

Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	2-, 3- or 4-wire (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, pluggable , \varnothing = approx. 35 mm, H = approx. 29 mm, with metal sinter filter made of stainless steel V4A (1.4404)

Mounting (sensor):	in the suspended ceiling, ceiling cut-out $\varnothing = 30 \text{ mm}$, cover $\varnothing < 35 \text{ mm}$
Protection class:	III (according to EN 60 730)
Protection type:	IP 67 (according to EN 60 529) Housing tested TÜV SÜD, Report No. 713139052 IP 30 (according to EN 60 529) Sensor in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), to display the ACTUAL temperature and / or ACTUAL humidity

**DFF
DFTF**
Connecting head,
pluggable

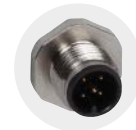
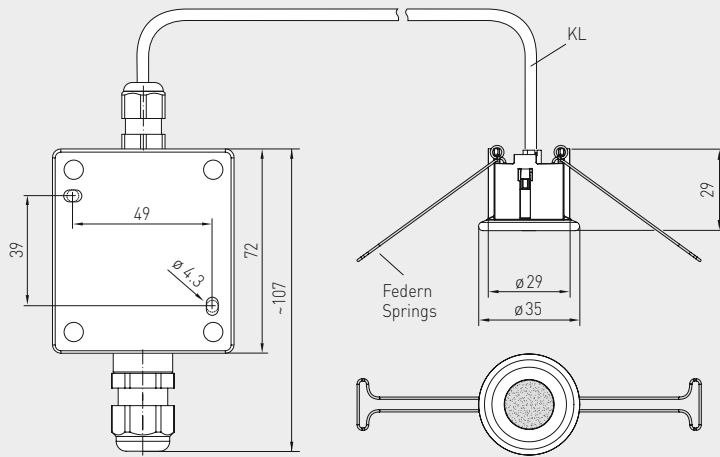
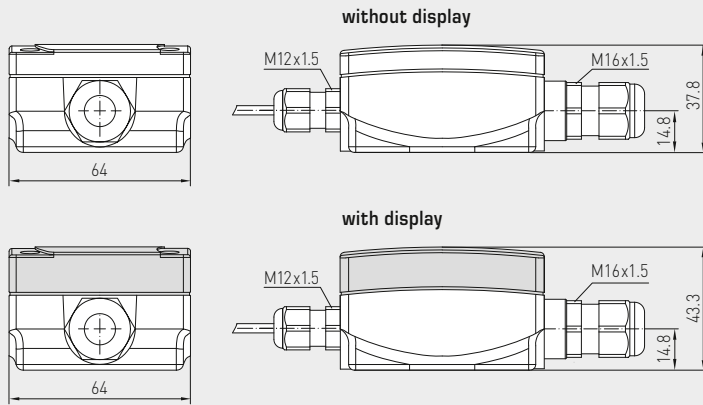




Dimensional drawing

DFF
DFTF

DFF
DFTF
with display



M12 connector
(optional on request)

Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

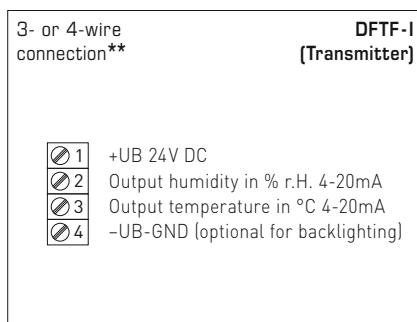
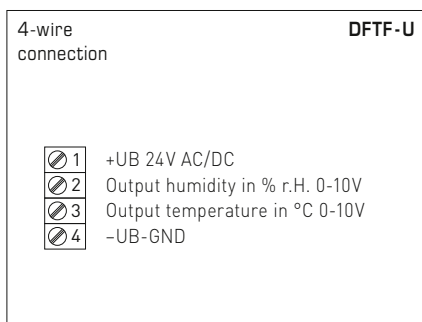
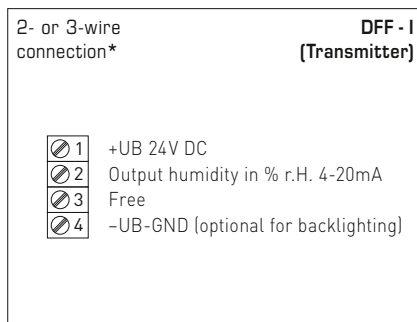
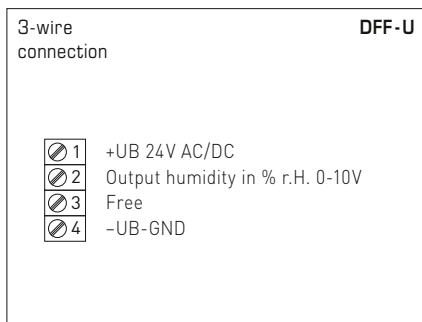
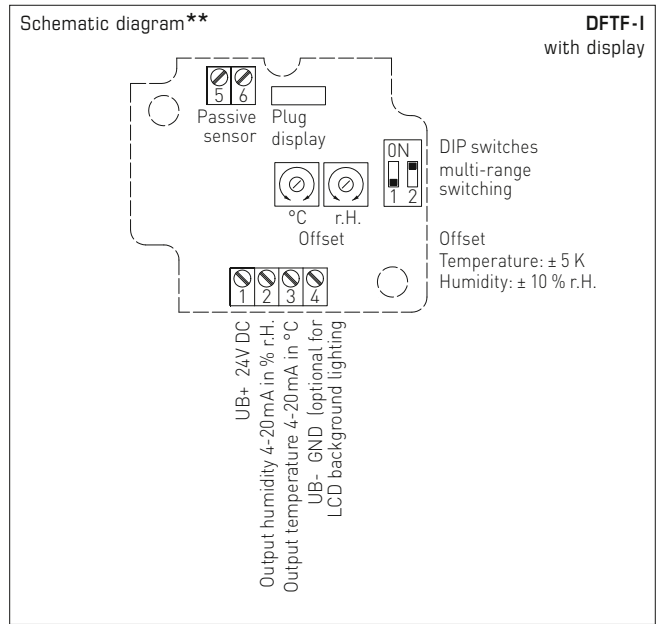
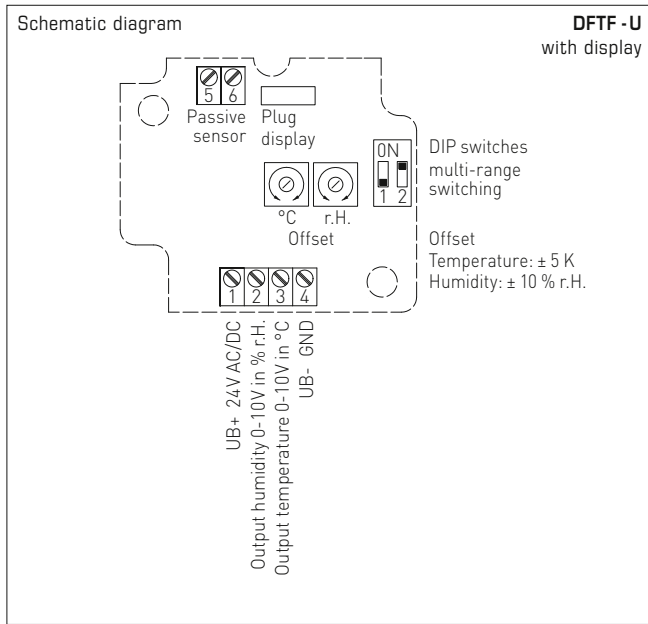
Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

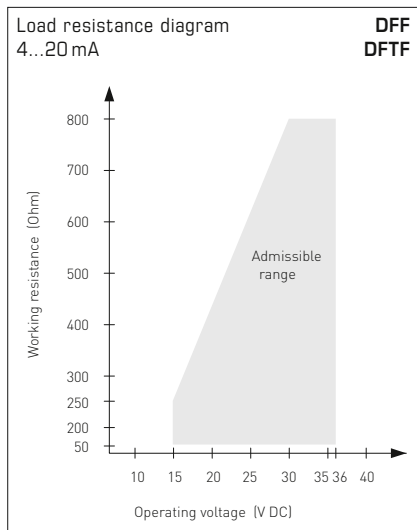
Humidity table
MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

In-ceiling humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!



S+S REGELTECHNIK

HYGRASGARD® DFF
HYGRASGARD® DFTF

In-ceiling humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output



DFF
DFTF
with display



HYGRASGARD® DFF		In-ceiling humidity sensors ($\pm 2.0\%$), <i>Premium</i>				
HYGRASGARD® DFTF		In-ceiling humidity and temperature sensors ($\pm 2.0\%$), <i>Premium</i>				
Type / WG01	Measuring Range / Readout	Output	Display	Item No.	Price	
	Humidity	Humidity	Humidity			
	Temperature	Temperature	Temperature			
DFF-I						
I-variant						
DFF-I	0...100% r. H.	–	4...20mA	–	1201-6132-0000-100 302,15 €	
DFF-I LCD	0...100% r. H.	–	4...20mA	–	■ 1201-6132-0200-100 353,38 €	
DFF-U						
U-variant						
DFF-U	0...100% r. H.	–	0-10V	–	1201-6131-0000-100 302,15 €	
DFF-U LCD	0...100% r. H.	–	0-10V	–	■ 1201-6131-0200-100 353,38 €	
DFTF-I						
I-variant						
DFTF-I	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20mA	4...20mA	1201-6132-1000-100 309,47 €	
DFTF-I LCD	0...100% r. H.	(4x as above)	4...20mA	4...20mA	■ 1201-6132-1200-100 360,70 €	
DFTF-U						
U-variant						
DFTF-U	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V	1201-6131-1000-100 309,47 €	
DFTF-U LCD	0...100% r. H.	(4x as above)	0-10V	0-10V	■ 1201-6131-1200-100 360,70 €	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	

**On-wall humidity and temperature sensors ($\pm 2.0\%$),
compact form, calibratable, with multi-range switching
and active output**

The calibratable outdoor humidity/temperature sensors **HYGRASGARD® AFF-SD/AFTF-SD** measure the relative humidity and/or temperature of air. They convert the measurands into standard signals of 0-10 V or 4...20 mA and are available with or without an optional display. Terminal box housing made of impact-resistant plastic with housing cover with quick-locking screws. They have four switchable temperature ranges and are applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % r.H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. These measuring transducers are designed for precise detection of humidity. A digital long-term stable sensor is used as a measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFF-SD
AFTF-SD
compact form



SF-M
Metal sinter filter
(optional)



TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = $(U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ k}\Omega$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal sinter filter, $\varnothing 16 \text{ mm}$, $L = 32 \text{ mm}$)

HUMIDITY

Measuring range, humidity:	0...100% r.H. (output corresponding to 0-10 V or 4...20 mA)
Operating range, humidity:	0...95% r.H. (without dew formation)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$
Output, humidity:	0-10 V for U variant 4...20 mA for I variant, see load resistance diagram

TEMPERATURE

Measuring range, temperature:	multi-range switching (see table) $-35...+35^\circ\text{C}$; $-35...+75^\circ\text{C}$; $0...+50^\circ\text{C}$; $0...+80^\circ\text{C}$ (output corresponding to 0-10 V or 4...20 mA)
Deviation, temperature:	typically $\pm 0.6 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10 V or 4...20 mA or Ohm value
Ambient temperature:	storage $-35...+85^\circ\text{C}$, operation $-30...+70^\circ\text{C}$, non-precipitating
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 16 \text{ mm}$, $NL = 55 \text{ mm}$
Process connection:	by screws
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, according to EMC directive 2014/30/EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and/or ACTUAL humidity

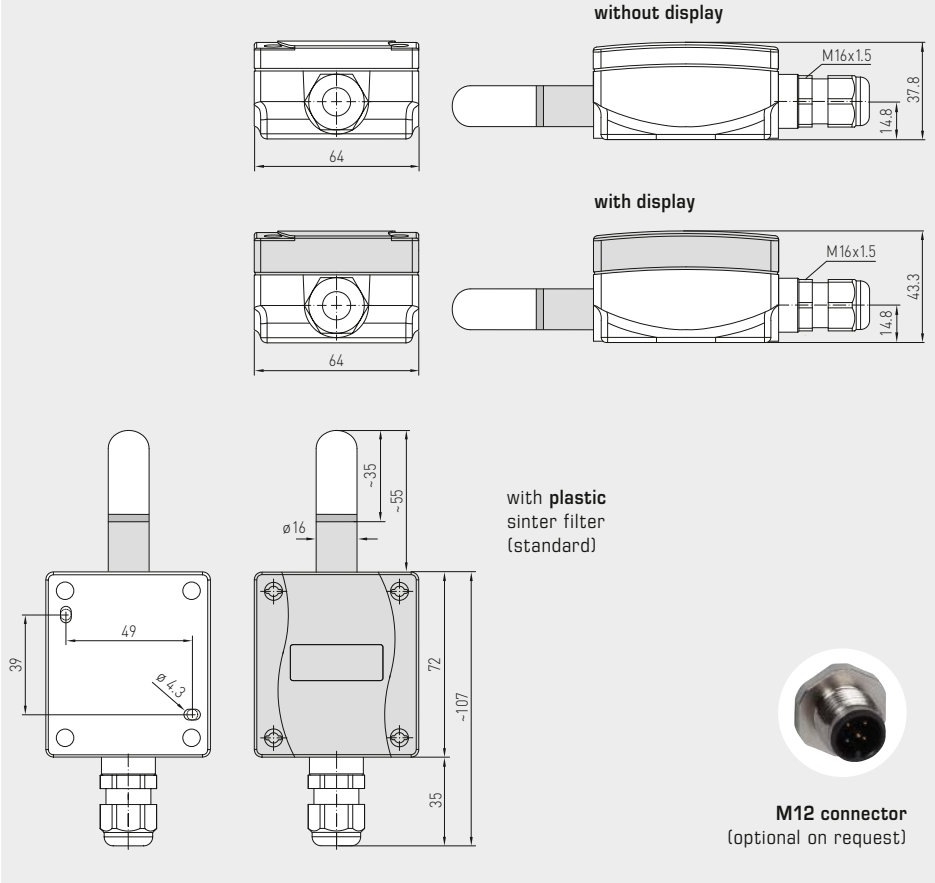
ACCESSORIES see last chapter



Dimensional drawing

AFF-SD
AFTF-SD

AFF-SD
AFTF-SD
compact form
with display



SF-M
Metal sinter filter
(optional)



Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

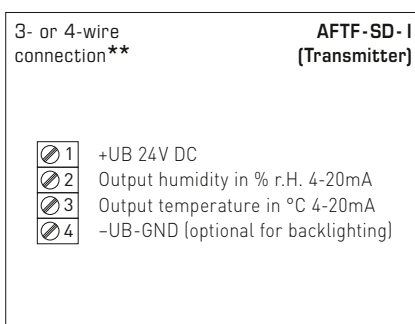
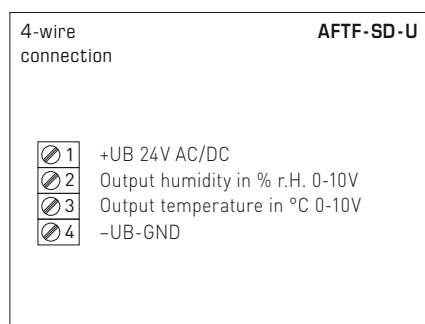
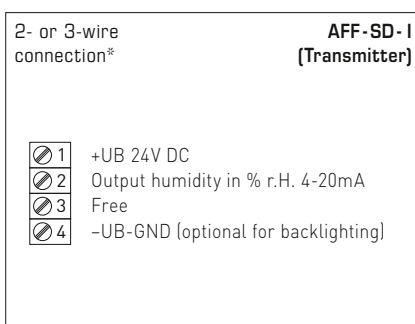
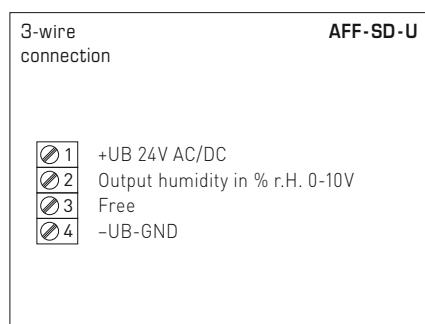
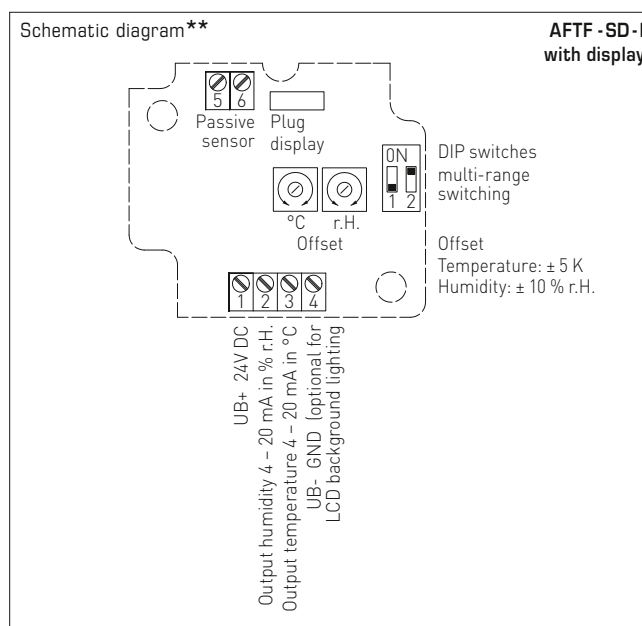
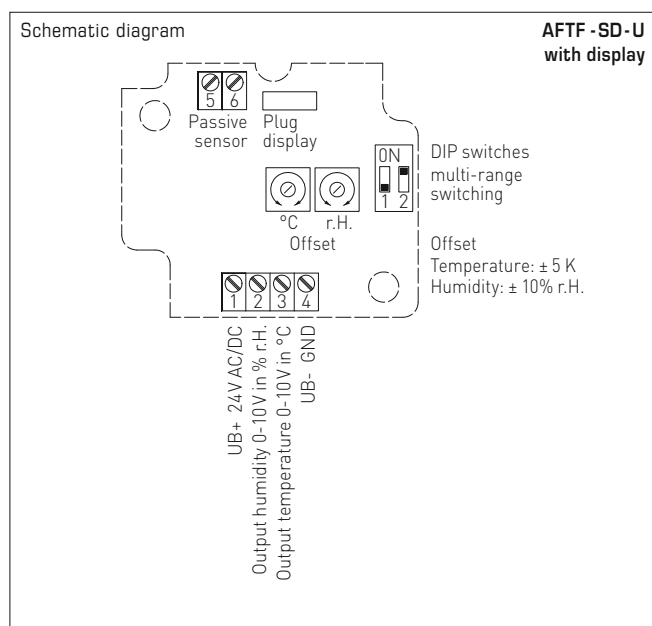
Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

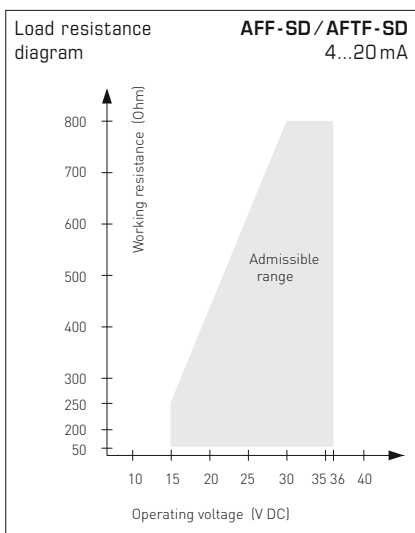
Humidity table
MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

On-wall humidity and temperature sensors ($\pm 2.0\%$), compact form, calibratable, with multi-range switching and active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection:**
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!



WS-04

Weather and sun protection hood (optional)

AFF-SD
AFTF-SD
compact form with display



HYGRASGARD® AFF-SD On-wall humidity sensors, compact form ($\pm 2.0\%$), *Standard*
HYGRASGARD® AFTF-SD On-wall humidity and temperature sensors, compact form ($\pm 2.0\%$), *Standard*

Type/ WG01B	Measuring Range/ Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
AFF-SD-I							I-variant
AFF-SD-I	0...100% r. H.	–	4...20 mA	–		1201-1122-0000-100	159,41 €
AFF-SD-I LCD	0...100% r. H.	–	4...20 mA	–	■	1201-1122-0200-000	204,32 €
AFF-SD-U							U-variant
AFF-SD-U	0...100% r. H.	–	0-10 V	–		1201-1121-0000-100	159,41 €
AFF-SD-U LCD	0...100% r. H.	–	0-10 V	–	■	1201-1121-0200-000	204,32 €
AFTF-SD-I							I-variant
AFTF-SD-I	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-1122-1000-100	162,78 €
AFTF-SD-I LCD	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	■	1201-1122-1200-100	207,68 €
AFTF-SD-U							U-variant
AFTF-SD-U	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-1121-1000-100	162,78 €
AFTF-SD-U LCD	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	■	1201-1121-1200-100	207,68 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101						on request

ACCESSORIES								
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)						7000-0050-2200-100	37,32 €
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)						7100-0040-2000-000	28,02 €
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)						7100-0040-7000-000	33,06 €
For further information, see last chapter Accessories!								

**On-wall humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
calibratable, with multi-range switching
and active/passive output**

Calibratable outdoor humidity/temperature sensor **HYGRASGARD® AFF/AFTF** ($\pm 2.0\%$) and **AFF-20/AFTF-20** ($\pm 1.8\%$) with plastic sinter filter (optional metal sinter filter) or **AFF-25/AFTF-25** ($\pm 1.8\%$) with pluggable measuring head with metal sinter filter; housing made of impact-resistant plastic with quick-locking screws, optionally with /without display, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

It measures the relative humidity and/or temperature of the air and converts the measurand into a standard signal of 0 - 10V or 4...20 mA. They have four switchable temperature ranges and are applied in non-aggressive, dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % r. H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFF / AFTF ($\pm 2.0\%$)
with plastic sinter filter
(standard)



AFF-20 / AFTF-20 ($\pm 1.8\%$)
with plastic sinter filter
(standard)



AFF-25 / AFTF-25 ($\pm 1.8\%$)
pluggable measuring head
with metal sinter filter



TECHNICAL DATA

Power supply: 24 V AC ($\pm 20\%$); 15...36 V DC for U variant
15...36 V DC for I variant,
depending on working resistance, residual ripple stabilised ± 0.3 V

Working resistance: R_b (ohm) = $(U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see load resistance diagram

Load resistance: $R_L > 5 \text{ k}\Omega$ for U variant

Power consumption: $< 1.1 \text{ VA} / 24 \text{ V DC}$; $< 2.2 \text{ VA} / 24 \text{ V AC}$

Sensors: **digital humidity sensor with integrated temperature sensor**,
low hysteresis, high long-term stability

HUMIDITY

Measuring range, humidity: 0...100% r. H.

Permitted humidity: $< 95\%$ r. H., non-precipitating air

Deviation in humidity: **AFF / AFTF:**
typically $\pm 2.0\%$ (20...80% r. H.) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$
AFF-20 / AFTF-20, AFF-25 / AFTF-25:
typically $\pm 1.8\%$ (10...90% r. H.) at $+25^\circ\text{C}$, otherwise $\pm 2.0\%$

Output humidity: 0-10 V for U variant; 4...20 mA for I variant

TEMPERATURE

Measuring range, temperature: **multi-range switching** (see table)
 $-35...+35^\circ\text{C}$; $-35...+75^\circ\text{C}$; $0...+50^\circ\text{C}$; $0...+80^\circ\text{C}$

Ambient temperature: storage $-35...+85^\circ\text{C}$; operation $-30...+80^\circ\text{C}$, non-precipitating

Deviation, temperature: **AFF / AFTF:**
typically $\pm 0.4 \text{ K}$ at $+25^\circ\text{C}$

AFF-20 / AFTF-20, AFF-25 / AFTF-25:
typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$

Output, temperature: 0-10 V for U variant; 4...20 mA for I variant;
AFTF-Uxx (passive temperature sensor) see table

Electrical connection: 2-, 3-, or 4-wire connection (see connecting diagram),
0.14 - 1.5 mm², via terminal screws

Cable connection: **cable gland**, plastic (M 16 x 1.5; with strain relief,
exchangeable, max. inner diameter 10.4 mm) or
M12 connector according to DIN EN 61076-2-101 (optional)

Housing: plastic, UV-resistant, material polyamide, 30% glass-globe reinforced,
with quick-locking screws (slotted / Phillips head combination),
colour traffic white (similar to RAL 9016),
housing cover for display is transparent!

Housing dimensions: 126 x 90 x 50 mm (Tyr2)

Protective tube: **stainless steel V2A** (1.4301), \varnothing 16 mm
AFF / AFTF: NL = 55 mm
AFF-20 / AFTF-20: NL = 137 mm
AFF-25 / AFTF-25: NL = 88.5 mm

Sensor protection: **AFF / AFTF, AFF-20 / AFTF-20:**
plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable
(optional metal sinter filter, \varnothing 16 mm, L = 32 mm)

AFF-25 / AFTF-25:
pluggable measuring head (probe), stainless steel V2A (1.4301),
with metal sinter filter, \varnothing 16 mm, L = 88.5 mm, exchangeable

Process connection: by screws

Long-term stability: $\pm 1\%$ per year

Protection class: III (according to EN 60 730)

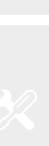
Protection type: **IP 65** (according to EN 60 529)

Standards: CE conformity, according to EMC directive 2014 / 30 / EU,
according to EN 61326-1, according to EN 61326-2-3

Optional: three-line **display with illumination**, cutout 70 x 40 mm (W x H),
for displaying ACTUAL temperature and / or ACTUAL humidity

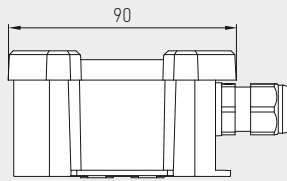
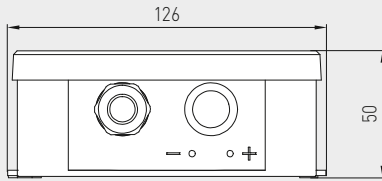
ACCESSORIES

see last chapter

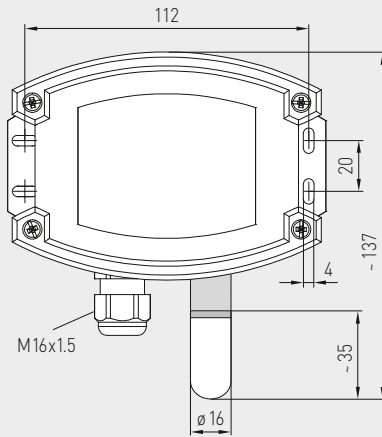


Dimensional drawing

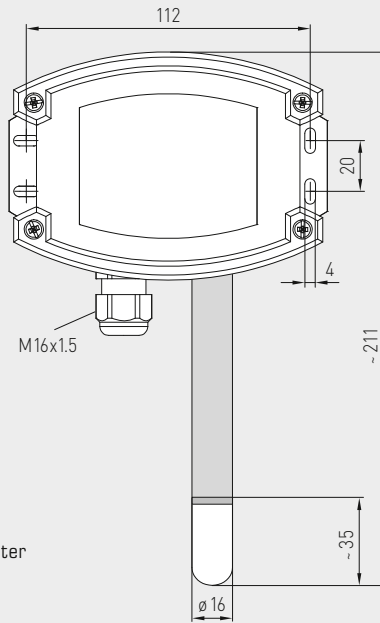
AFF / AFTF
AFF-20 / AFTF-20



AFF / AFTF



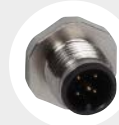
AFF-20 / AFTF-20



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



M12 connector
(optional)

AFF / AFTF ($\pm 2.0\%$)
with display and
plastic sinter filter
(standard)

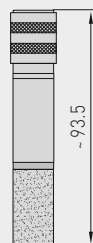
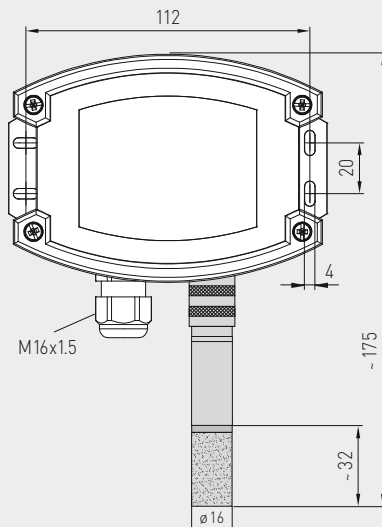


AFF-20 / AFTF-20 ($\pm 1.8\%$)
with display and
plastic sinter filter
(standard)



Dimensional drawing

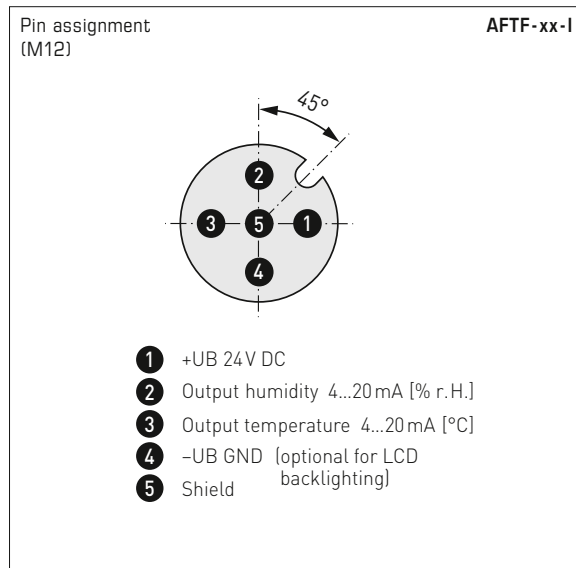
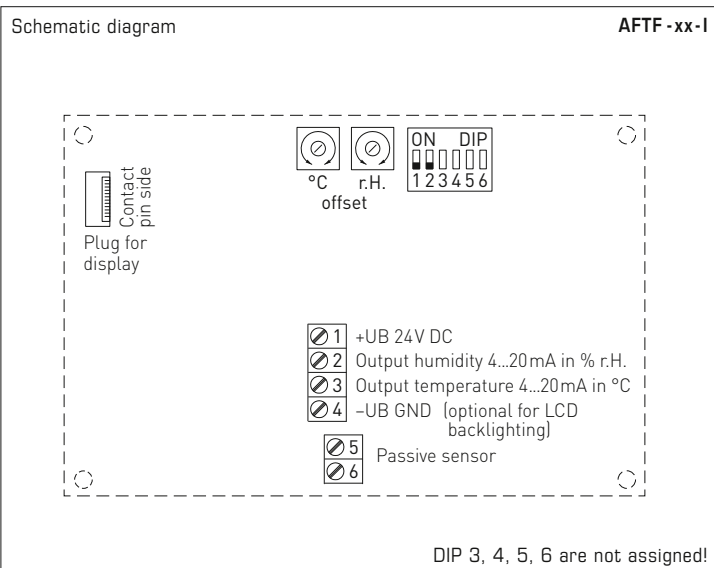
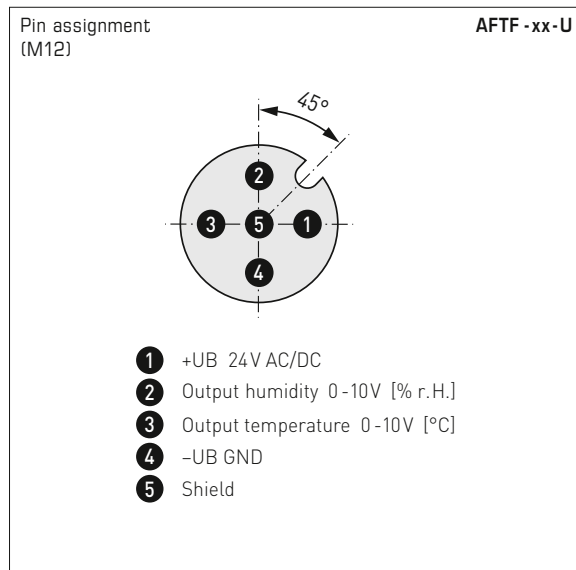
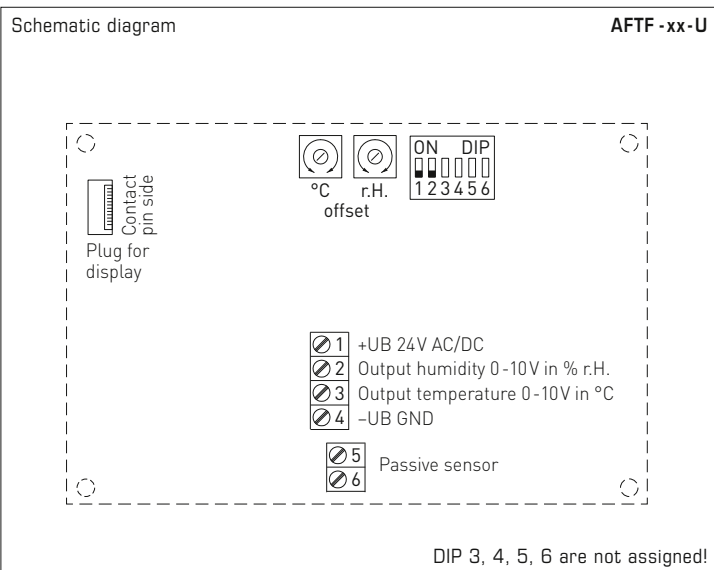
AFF-25 / AFTF-25



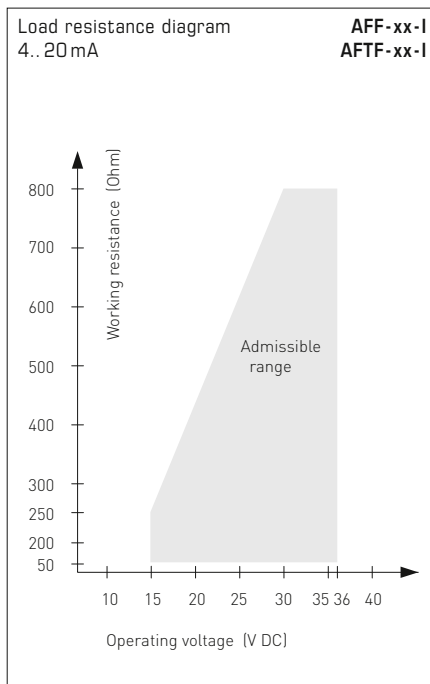
pluggable
measuring head
with metal
sinter filter

AFF-25 / AFTF-25 ($\pm 1.8\%$)
pluggable measuring head
with metal sinter filter
and display





AFF-xx / AFTF-xx
 with display,
 hinged





3-wire connection **AFF-xx-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Free
4	-UB-GND

2- or 3-wire connection * **AFF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Free
4	-UB-GND (optional for backlighting)

4- or 6-wire connection **AFTF-U (passive temperature sensor)**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	-UB-GND
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

4-wire connection **AFTF-xx-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	-UB-GND

3- or 4-wire connection ** **AFTF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Output temperature in °C 4...20mA
4	-UB-GND (optional for backlighting)

4- or 6-wire connection **AFTF-I (passive temperature sensor)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Output temperature in °C 4...20mA
4	-UB-GND (optional for backlighting)
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF

Connection*:
2-wire connection for devices with/without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the I variant the humidity path must be connected!

Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

On-wall humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active/passive output

AFF / AFTF ($\pm 2,0\%$)
with cable gland



HYGRASGARD® AFF On-wall humidity sensors ($\pm 2.0\%$), *Standard*
HYGRASGARD® AFTF On-wall humidity and temperature sensors ($\pm 2.0\%$), *Standard*

Type / WG02	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
AFF							
AFF-I	0...100% r. H.	–	4...20 mA	–		1201-7112-0000-000	167,83 €
AFF-I LCD	0...100% r. H.	–	4...20 mA	–	■	1201-7112-0400-000	212,73 €
AFF-U	0...100% r. H.	–	0-10V	–		1201-7111-0000-000	167,83 €
AFF-U LCD	0...100% r. H.	–	0-10V	–	■	1201-7111-0400-000	212,73 €
AFTF							
AFTF-I	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7112-1000-000	184,11 €
AFTF-I LCD	0...100% r. H.	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-000	229,01 €
AFTF-U	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V		1201-7111-1000-000	184,11 €
AFTF-U LCD	0...100% r. H.	(4x as above)	0-10V	0-10V	■	1201-7111-1400-000	229,01 €
Housing variant:	Cable connection with cable gland (M12 connector on request)						

HYGRASGARD® AFTF-U xx On-wall humidity and temperature sensors ($\pm 2.0\%$), *Standard*
(passive temperature sensor)

Type / WG02	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
AFTF-U xx	Pt, Ni, LM235Z, NTC		(active / passive)			
AFTF-U Pt100	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V + Pt100	1201-7111-2001-000	185,23 €
AFTF-U Pt1000	0...100% r. H.	(4x as above)	0-10V	0-10V + Pt1000	1201-7111-2005-000	186,35 €
AFTF-U Ni1000	0...100% r. H.	(4x as above)	0-10V	0-10V + Ni1000	1201-7111-2009-000	186,92 €
AFTF-U NiTK	0...100% r. H.	(4x as above)	0-10V	0-10V + Ni1000TK5000	1201-7111-2010-000	187,47 €
AFTF-U LM235Z	0...100% r. H.	(4x as above)	0-10V	0-10V + LM235Z , 10mV / K	1201-7111-2021-000	186,46 €
AFTF-U NTC1,8K	0...100% r. H.	(4x as above)	0-10V	0-10V + NTC 1,8 kOhm	1201-7111-2012-000	187,25 €
AFTF-U NTC10K	0...100% r. H.	(4x as above)	0-10V	0-10V + NTC 10 kOhm	1201-7111-2015-000	184,68 €
AFTF-U NTC20K	0...100% r. H.	(4x as above)	0-10V	0-10V + NTC 20 kOhm	1201-7111-2016-000	184,68 €
Housing variant:	Cable connection with cable gland (M12 connector on request)					



S+S REGELTECHNIK

HYGRASGARD® AFF-25
HYGRASGARD® AFTF-25

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



AFF-25 / AFTF-25 ($\pm 1.8\%$)
with cable gland

HYGRASGARD® AFF-25		On-wall humidity sensors, pluggable ($\pm 1.8\%$), <i>Deluxe</i>				
HYGRASGARD® AFTF-25		On-wall humidity and temperature sensors, pluggable ($\pm 1.8\%$), <i>Deluxe</i>				
Type / WG02	Measuring Range / Readout	Output	Display	Item No.	Price	
	Humidity	Temperature	Humidity	Temperature		
AFF-25						
AFF-25-I	0...100 % r. H.	–	4... 20 mA	–	1201-7132-0000-101 314,32 €	
AFF-25-I LCD	0...100 % r. H.	–	4... 20 mA	–	■ 1201-7132-0400-101 358,25 €	
AFF-25-U	0...100 % r. H.	–	0-10 V	–	1201-7131-0000-101 314,32 €	
AFF-25-U LCD	0...100 % r. H.	–	0-10 V	–	■ 1201-7131-0400-101 358,25 €	
AFTF-25						
AFTF-25-I	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA	1201-7132-1000-101 333,41 €	
AFTF-25-I LCD	0...100 % r. H.	(4x as above)	4... 20 mA	4... 20 mA	■ 1201-7132-1400-101 377,34 €	
AFTF-25-U	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	1201-7131-1000-101 333,41 €	
AFTF-25-U LCD	0...100 % r. H.	(4x as above)	0-10 V	0-10 V	■ 1201-7131-1400-101 377,34 €	
Housing variant:	Cable connection with cable gland (M12 connector on request)					

ACCESSORIES					
SF-M	Metal sinter filter, \varnothing 16 mm, L=32 mm, exchangeable stainless steel V4A (1.4404)			7000-0050-2200-100	37,32 €
MSK-25	Pluggable measuring head (probe) stainless steel V2A (1.4301), Metal sinter filter, \varnothing 16 mm, L=88.5 mm, exchangeable replacement element for AFF-25/AFTF-25			7201-1131-0000-000	189,72 €
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)			7100-0040-2000-000	28,02 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)			7100-0040-6000-000	39,45 €

For further information see last chapter!

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

AFTF-20-Q ($\pm 1.8\%$)
with M12 connector



HYGRASGARD® AFTF-20-Q		On-wall humidity sensors and temperature sensors ($\pm 1.8\%$), <i>Premium</i> (with M12 connector)					
Type / WG02	Measuring Range/Readout Humidity	Readout Temperature	Output Humidity	Output Temperature	Display ● = Q	Item No.	Price
AFTF-20-Q							
AFTF-20-I Q	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-6121-2100-001	270,51 €
AFTF-20-I Q LCD	0...100% r. H.	(4x as above)	4...20 mA	4...20 mA	● ■	2003-6122-2100-001	313,17 €
AFTF-20-U Q	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V	●	2003-6121-1100-001	270,51 €
AFTF-20-U Q LCD	0...100% r. H.	(4x as above)	0-10V	0-10V	● ■	2003-6122-1100-001	313,17 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)						

ACCESSORIES			
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000	28,02 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €

For further information see last chapter!



S+S REGELTECHNIK

HYGRASGARD® AFF-20
HYGRASGARD® AFTF-20

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



AFF-20 / AFTF-20 ($\pm 1.8\%$)
with cable gland

HYGRASGARD® AFF-20		On-wall humidity sensors ($\pm 1.8\%$), <i>Premium</i> (with cable gland)					
Type / WG02	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
AFF-20							
AFF-20-I	0...100% r. H.	–	4...20 mA	–		1201-7112-0000-201	212,73 €
AFF-20-I LCD	0...100% r. H.	–	4...20 mA	–	■	1201-7112-0400-201	257,64 €
AFF-20-U	0...100% r. H.	–	0-10 V	–		1201-7111-0000-201	212,73 €
AFF-20-U LCD	0...100% r. H.	–	0-10 V	–	■	1201-7111-0400-201	257,64 €
Housing variant:	Cable connection with cable gland (M12 connector on request)						

HYGRASGARD® AFTF-20		On-wall humidity and temperature sensors ($\pm 1.8\%$), <i>Premium</i> (with cable gland)					
Type / WG02	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
AFTF-20							
AFTF-20-I	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7112-1000-201	233,54 €
AFTF-20-I LCD	0...100% r. H.	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-201	276,20 €
AFTF-20-U	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-201	233,54 €
AFTF-20-U LCD	0...100% r. H.	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-201	276,20 €
Housing variant:	Cable connection with cable gland (M12 connector see AFTF-20-Q)						

ACCESSORIES							
SF-M	Metal sinter filter , \varnothing 16 mm, L=32 mm, exchangeable stainless steel V4A (1.4404)					7000-0050-2200-100	37,32 €
WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)					7100-0040-2000-000	28,02 €
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)					7100-0040-6000-000	39,45 €
For further information see last chapter!							

**On-wall humidity sensors and temperature sensors (± 1.8%),
calibratable, with multi-range switching
and active output**

Calibratable outdoor humidity and temperature sensor **HYGRASGARD® AFTF-20-VA** (± 1.8%) with metal sinter filter, rugged housing, **stainless steel V4A**, optionally with /without display, with cable gland or M12 connector according to DIN EN 61076-2-101.

It measures the relative humidity and the temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFTF-20-VA
with cable gland



AFTF-20-VAQ
with M12 connector



TECHNICAL DATA

Power supply:	24 V AC (± 20%); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_B \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see load resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability

HUMIDITY

Measuring range, humidity:	0...100% r. H.
Permitted humidity:	< 95% r. H., non-precipitating air
Deviation in humidity:	typically ± 1.8% (10...90% r. H.) at +25 °C, otherwise ± 2.0%
Output humidity:	0 - 10 V for U variant 4...20 mA for I variant

TEMPERATURE

Measuring range, temperature:	multi-range switching (see table) -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C
Ambient temperature:	storage -35...+85 °C; operation -30...+80 °C, non-precipitating
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V for U variant 4...20 mA for I variant
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Protective tube:	made from stainless steel V2A (1.4301), Ø 16 mm, NL = 137 mm
Sensor protection:	metal sinter filter , Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Process connection:	by screws via the mounting fixture on the housing
Long-term stability:	± 1% per year
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL temperature and ACTUAL humidity

ACCESSORIES (see table)



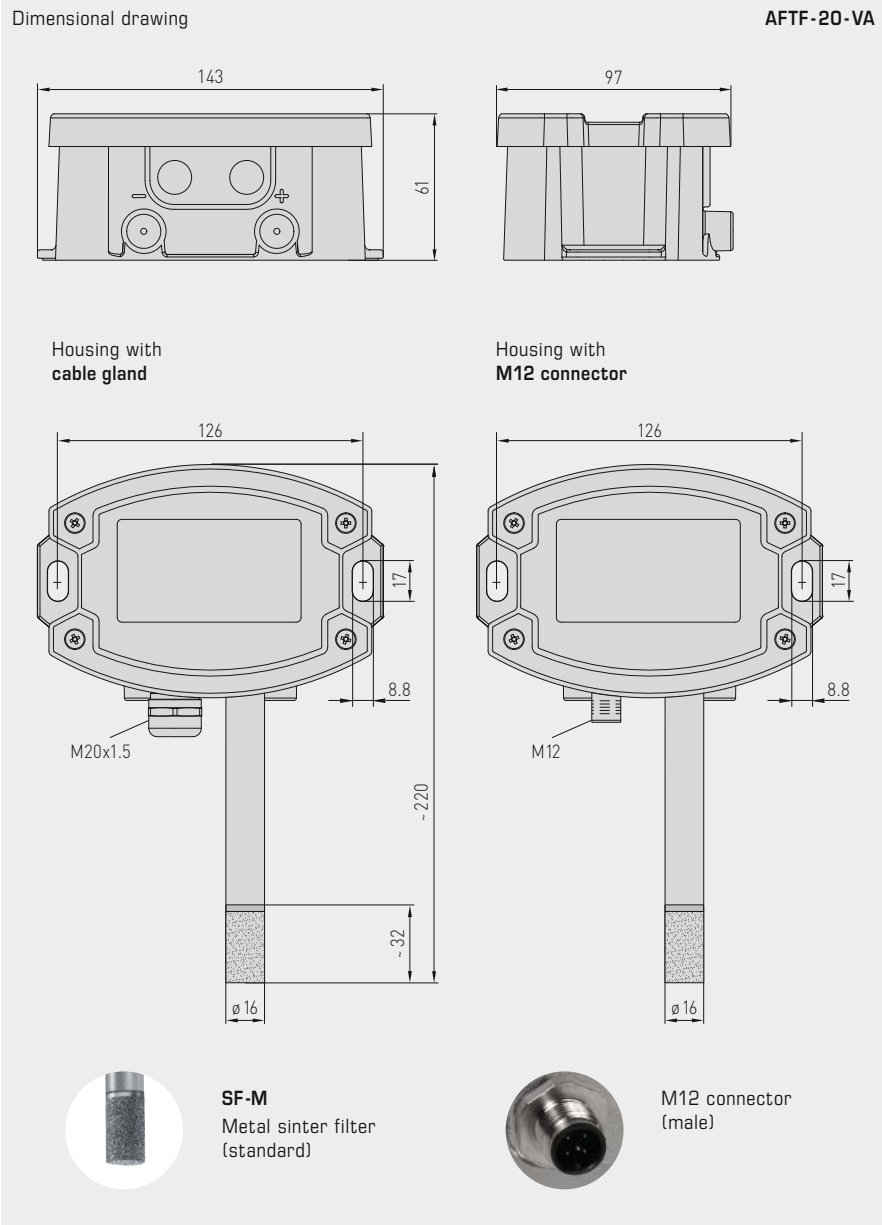
NEW

S+S REGELTECHNIK

HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

A
V



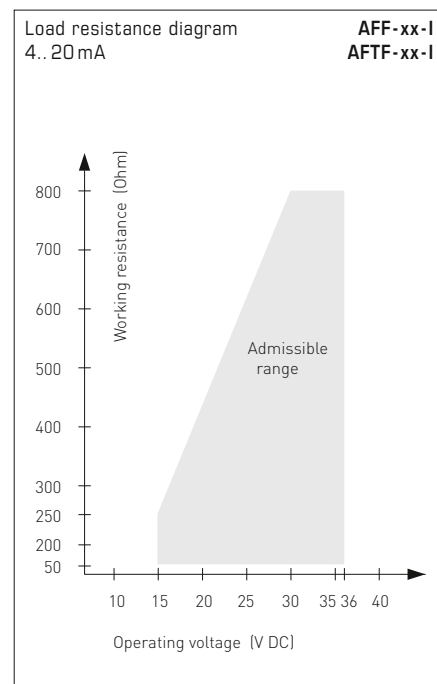
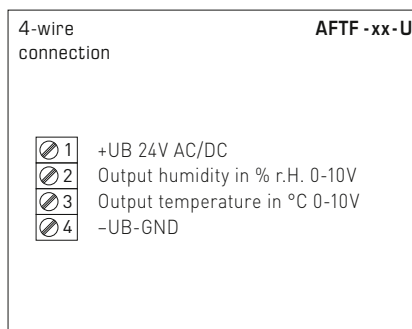
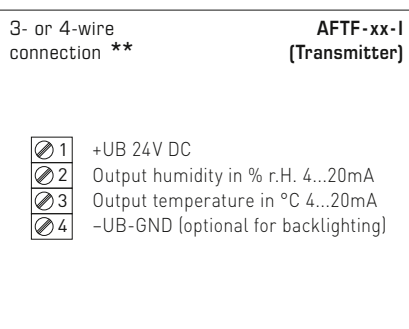
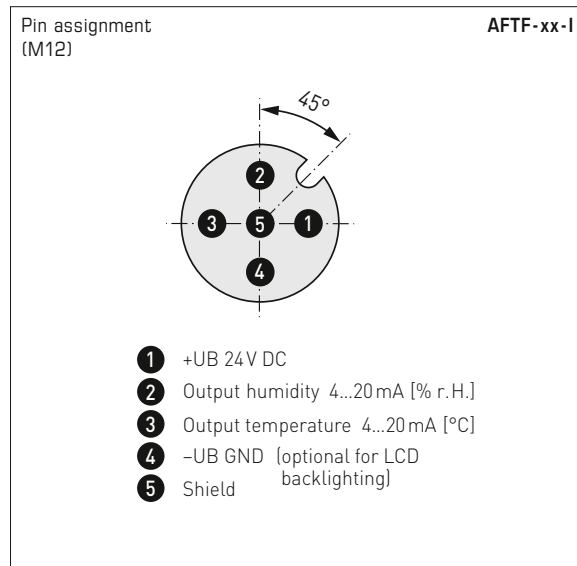
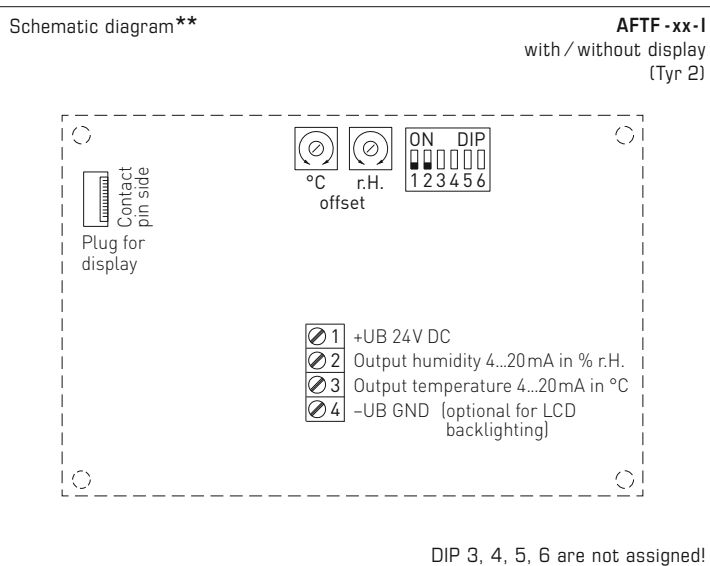
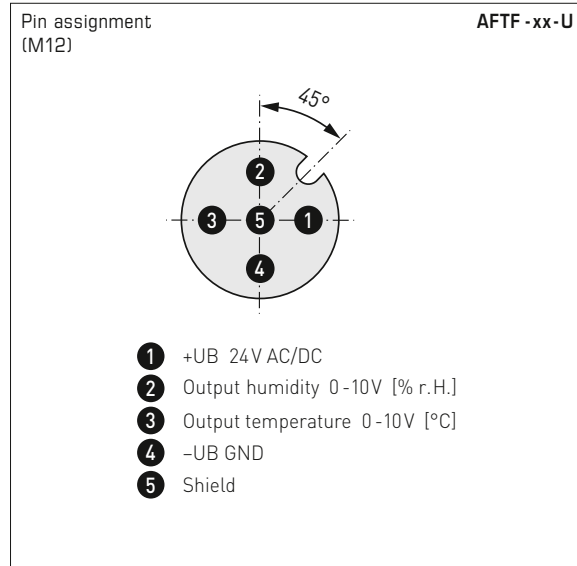
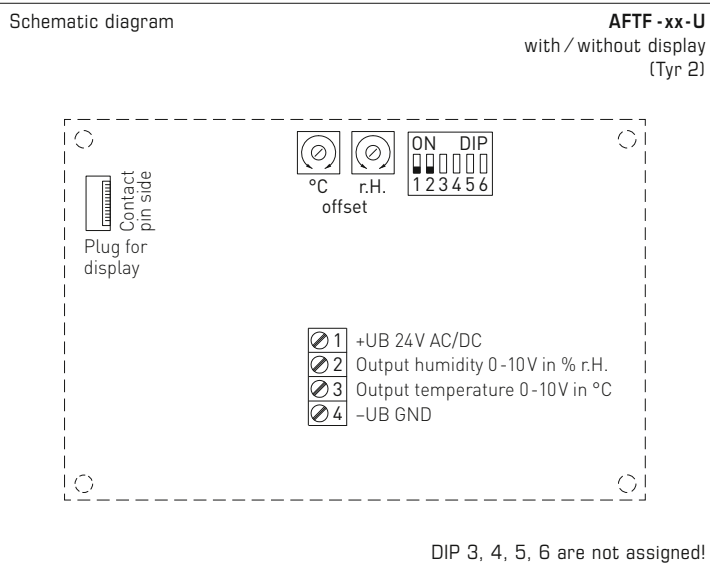
AFTF-20-VA
with cable gland
and display



AFTF-20-VAQ
with M12 connector
and display



On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I** variant the humidity path must be connected!

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



S+S REGELTECHNIK

NEW

HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors (± 1.8%), calibratable, with multi-range switching and active output

AFTF-20-VAQ with display, hinged



Temperature table MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

AFTF-20-VAQ
with M12 connector



HYGRASGARD® AFTF-20-VAQ		On-wall humidity sensors and temperature sensors ($\pm 1,8\%$), ID (with M12 connector)					
Type / WG02I	Measuring Range/Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature	● = Q		
AFTF-20-VAQ						(active)	
AFTF-20-I VAQ	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-6181-2100-001	584,09 €
AFTF-20-I VAQ LCD	0...100% r. H.	(4x as above)	4...20 mA	4...20 mA	● ■	2003-6182-2100-001	721,13 €
AFTF-20-U VAQ	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V	●	2003-6181-1100-001	584,09 €
AFTF-20-U VAQ LCD	0...100% r. H.	(4x as above)	0-10V	0-10V	● ■	2003-6182-1100-001	721,13 €
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)					

ACCESSORIES			
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000	28,02 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €

For further information see last chapter!



NEW

S+S REGELTECHNIK

HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



AFTF-20-VA
with cable gland

HYGRASGARD® AFTF-20-VA		On-wall humidity sensors and temperature sensors ($\pm 1.8\%$), ID (with cable gland)					
Type / WG02I	Measuring Range/Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
AFTF-20-VA							
AFTF-20-I VA	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		2003-6181-2200-001	550,11 €
AFTF-20-I VA LCD	0...100% r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	2003-6182-2200-001	687,15 €
AFTF-20-U VA	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		2003-6181-1200-001	550,11 €
AFTF-20-U VA LCD	0...100% r. H.	(4x as above)	0-10 V	0-10 V	■	2003-6182-1200-001	687,15 €
Housing variant:	Cable connection with cable gland						

ACCESSORIES			
SF-M	Metal sinter filter, \varnothing 16 mm, L=32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000	28,02 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €

For further information see last chapter!



**On-wall outdoor humidity sensors (± 2.0 %),
for mixture ratio, relative/absolute humidity,
dew point, enthalpy (switchable) and temperature,
with multi-range switching, with active output**

The universal humidity sensors **HYGRASGARD® AAVTF** are used to determine diverse characteristic variables in humidity measurement. The relative humidity and temperature of the ambient air are measured. From these measurands, the different characteristic variables are internally calculated.

For device version x-U, two outputs of 0 - 10V are available, for Version x-I two outputs of 4...20 mA. Here, the output variables for these outputs can be defined using DIP switches. Selectable for output 1 are relative humidity [% r. H.], absolute humidity [g / m³], mixture ratio [g / kg], dew point temperature [°C], or enthalpy [kJ / kg] (while neglecting the atmospheric air pressure). At output 2, four different measuring ranges for ambient temperature [°C] are selectable. Ex-factory condition (default) for output 1 is relative humidity 0...100% r. H., for output 2 temperature measuring range 0...+50 °C. Due to the different configuration alternatives provided, numerous measurement and control tasks can be solved by just one device. These devices must be operated in pollutant-free, non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors. Application examples include medical technology, refrigeration, air conditioning, and clean room technology. These sensors are suitable for wall mounting.

AAVTF
with plastic sinter filter
(standard)



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensors:	digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)

HUMIDITY

Measuring range, humidity:	multi-range switching with 8 switchable measuring ranges (see table) 0...100% r. H. (default)
Operating range, humidity:	10...95% r. H., without formation of dew
Deviation, humidity:	typically ± 2.0% (20...80% r. H.) at +25 °C, otherwise ± 3.0% Deviations of other outputs result from deviations of humidity and temperature.
Output 1, humidity:	0 - 10V for U variant (see table) 4...20 mA for I variant (see table)

TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (see table) 0...+50 °C (default); -20...+80 °C; -35...+75 °C; -35...+35 °C
Operating range, temperature:	-35...+85 °C sensors
Deviation, temperature:	typically ± 0.6 K at +25 °C
Output 2, temperature:	0 - 10V for U variant (see table) 4...20 mA for I variant (see table)
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Electrical connection:	4-wire connection for U variant 3-wire connection for I variant (Transmitter) 0.14 - 1.5 mm ² , via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (1.4301), Ø = 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36x15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables

ACCESSORIES

see last chapter

SF-M
Metal sinter filter
(optional)

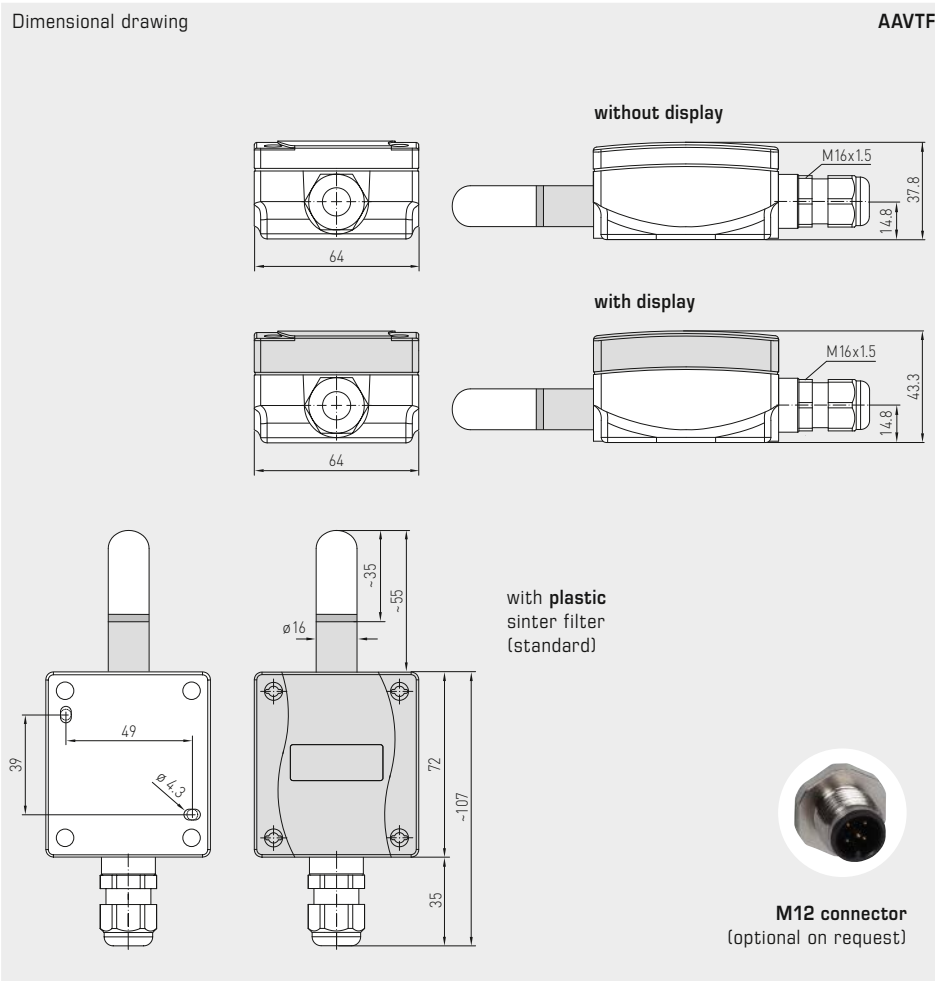
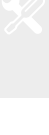
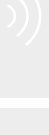
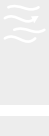




S+S REGELTECHNIK

HYGRASGARD® AAVTF

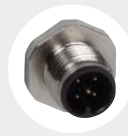
On-wall outdoor humidity sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity,
dew point, enthalpy (switchable) and temperature,
with multi-range switching, with active output



AAVTF
with display and
plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



M12 connector
(optional on request)



Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

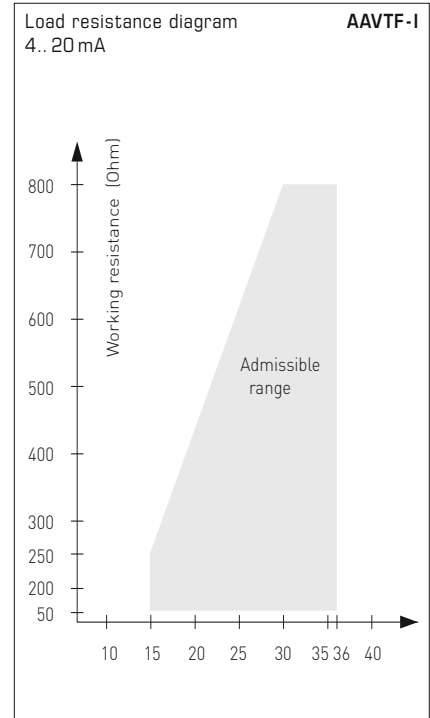
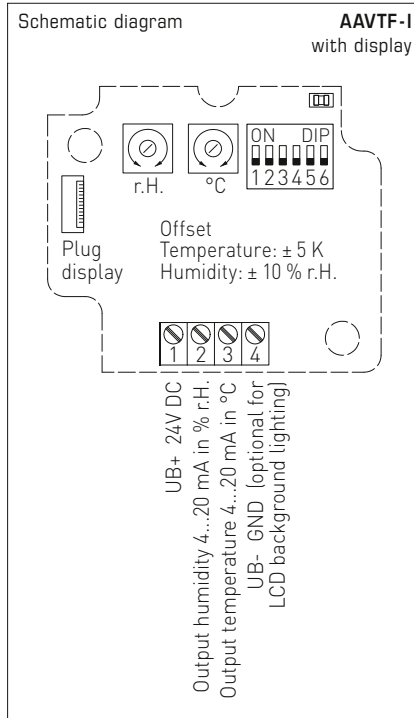
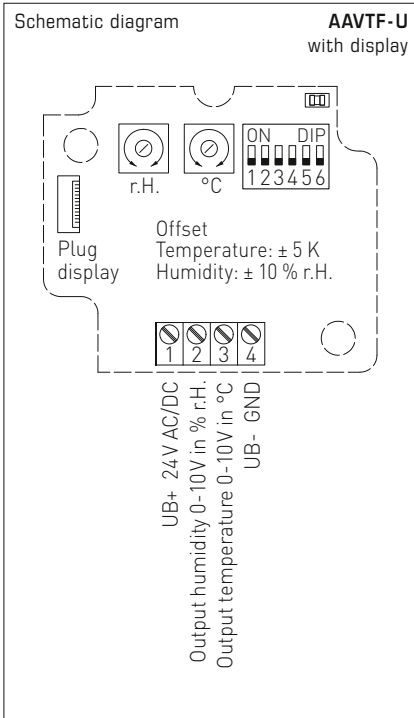
Temperature table
MR: -20...+80 °C

°C	U _A in V	I _A in mA
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Humidity table
MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

On-wall outdoor humidity sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity,
dew point, enthalpy (switchable) and temperature,
with multi-range switching, with active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 $^{\circ}\text{C}$ (default)	OFF	OFF
-20...+80 $^{\circ}\text{C}$	ON	OFF
-35...+75 $^{\circ}\text{C}$	OFF	ON
-35...+35 $^{\circ}\text{C}$	ON	ON

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
r.H.: 0...100% (default)	OFF	OFF	OFF
MR: 0...50 g/kg	ON	OFF	OFF
MR: 0...80 g/kg	OFF	ON	OFF
A.H.: 0...50 g/m ³	OFF	OFF	ON
A.H.: 0...80 g/m ³	ON	ON	OFF
DP: 0...+50 $^{\circ}\text{C}$	ON	OFF	ON
DP: -20...+80 $^{\circ}\text{C}$	OFF	ON	ON
ENT.: 0...85 kJ/kg	ON	ON	ON

Possible parameters:

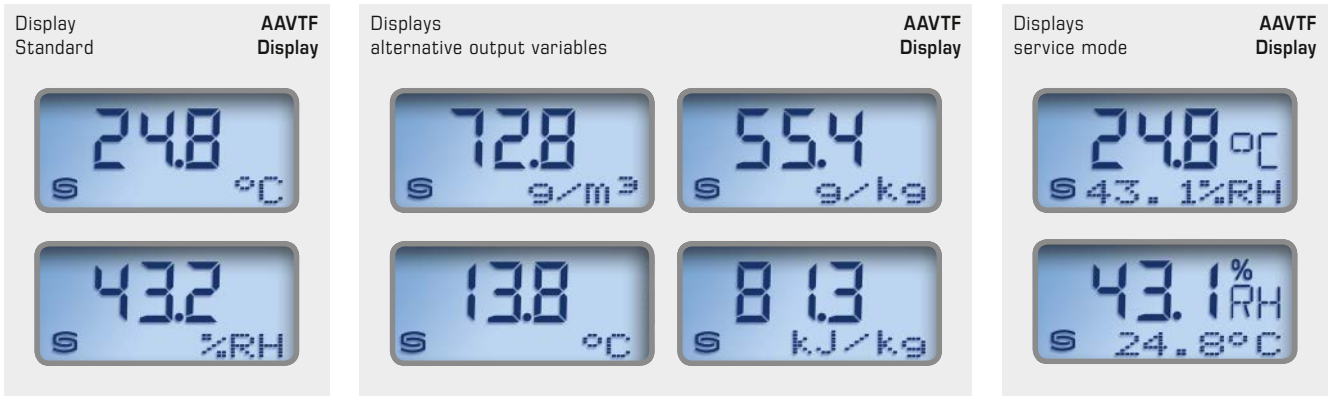
[r.H.] = relative humidity in %
 [MR] = mixture ratio in g/kg
 [A.H.] = absolute humidity in g/m³
 [DP] = dew point in $^{\circ}\text{C}$
 [ENT.] = enthalpy in kJ/kg

Service display/output (adjustable)	DIP 6
Display $^{\circ}\text{C}$ and % r.H., output of set measurements via DIP 1-5 (service mode for setting $^{\circ}\text{C}$ and % r.H.)	ON
Display and output of set measurements via DIP 1-5	OFF





On-wall outdoor humidity sensors ($\pm 2.0\%$), for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). In this case, the first line displays the value while the second line displays the corresponding unit:

Temperature in °C
Relative humidity in % r.H.

For improved legibility, backlighting is provided.

DIP switches can be used to display an **alternative output variable** instead of the standard display:

Absolute humidity in g/m³
Dew point in °C
Mixture ratio in g/kg
Enthalpy in kJ/kg

The **service mode** simultaneously displays (alternately in the first and second lines) the **actual temperature** and the **actual humidity** (relative humidity).

HYGRASGARD® AAVTF On-wall outdoor humidity sensors ($\pm 2.0\%$)

Type / WG01	Measuring Range Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
AAVTF-I	(switchable)	(switchable)				I-variant	
AAVTF-I	0...100% r. H. (default) 0...50 g/kg (MR) 0...80 g/kg (MR) 0...50 g/m³ (A.H.) 0...80 g/m³ (A.H.) 0...+50 °C (DP) -20...+80 °C (DP) 0...85 kJ/kg (ENT.)	0...+50 °C (default) -20...+80 °C -35...+75 °C -35...+35 °C	4...20 mA	4...20 mA		1201-1162-6000-028	181,29 €
AAVTF-I LCD	(8x as above)	(4x as above)	4...20 mA	4...20 mA	■	1201-1162-6200-028	225,24 €
AAVTF-U						U-variant	
AAVTF-U	(8x as above)	(4x as above)	0-10V	0-10V		1201-1161-6000-028	181,29 €
AAVTF-U LCD	(8x as above)	(4x as above)	0-10V	0-10V	■	1201-1161-6200-028	225,24 €
Extra charge:	Other non-standard ranges optional						131,81 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101						on request

ACCESSORIES

SF-M	Metal sinter filter , \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000	28,02 €
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000	33,06 €

For further information, see last chapter Accessories!

Duct humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$), including mounting flange, calibratable, with multi-range switching and active/passive output

Calibratable duct humidity-/temperature sensor **HYGRASGARD® KFF-SD/KFTF-SD** ($\pm 2,0\%$), with plastic sinter filter (optional metal sinter filter), housing made from impact-resistant plastic with snap-on lid, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

Calibratable duct humidity-/temperature sensor **HYGRASGARD® KFF/KFTF** ($\pm 2,0\%$) or **KFF-20/KFTF-20** ($\pm 1,8\%$), with plastic sinter filter (optional metal sinter filter), housing made of impact-resistant plastic with quick-locking screws, optionally with/without display, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0-10V or 4...20mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3V$
Working resistance:	$R_a(\text{ohm}) = (U_b - 14V) / 0.02A$ for I variant, see load resistance diagram
Load resistance:	$R_L > 5k\Omega$ for U variant
Power consumption:	$< 1.1VA / 24V DC$; $< 2.2VA / 24V AC$
Sensors:	digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability

HUMIDITY

Measuring range, humidity:	0...100% r. H.
Permissible air humidity:	$< 95\%$ r. H., non-precipitating air
Deviation, humidity:	KFF / KFTF / KFF-SD / KFTF-SD: typically $\pm 2.0\%$ (20...80% r. H.) at $+25^\circ C$, otherwise $\pm 3.0\%$ KFF-20 / KFTF-20: typically $\pm 1.8\%$ (10...90% r. H.) at $+25^\circ C$, otherwise $\pm 2.0\%$
Output, humidity:	0-10 V for U variant; 4...20 mA for I variant

TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (see table) $-35...+35^\circ C$; $-35...+75^\circ C$; $0...+50^\circ C$; $0...+80^\circ C$
Ambient temperature:	storage $-35...+85^\circ C$; operation $-30...+75^\circ C$, non-precipitating
Deviation, temperature:	typically $\pm 0.2K$ at $+25^\circ C$
Output, temperature:	0-10 V for U variant; 4...20 mA for I variant; KFTF-Uxx (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	KFF-xx / KFTF-xx (without display): 72 x 64 x 37.8 mm (Tyr 1/01) KFF / KFTF (with display): 72 x 64 x 43.3 mm (Tyr 1) KFF-20 / KFTF-20 (with display): 26 x 90 x 50 mm (Tyr 2)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection $\varnothing 20$ mm, NL = 235 mm, $v_{max} = 30$ m/s (air) (on request, optional stainless steel V2A (1.4301), $\varnothing 16$ mm)
Sensor protection:	plastic sinter filter , $\varnothing 16$ mm, L = 35 mm, exchangeable (optional metal sinter filter , $\varnothing 16$ mm, L = 32 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60 730)
Protection type:	KFF-SD / KFTF-SD IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) KFF-xx / KFTF-xx IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	display with illumination , for displaying ACTUAL temperature and / or ACTUAL humidity KFF / KFTF (Tyr 1): two-line, cutout approx. 36x15 mm (W x H) KFF-20 / KFTF-20 (Tyr 2): three-line, cutout approx. 70x40 mm (W x H)

ACCESSORIES

see last chapter

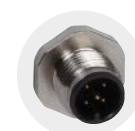
SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)



Protective tube stainless steel (optional on request)

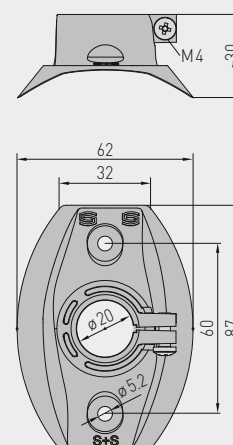


M12 connector (optional)

MFT-20-K
Mounting flange, plastic



Dimensional drawing **MFT-20-K**



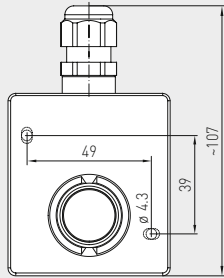
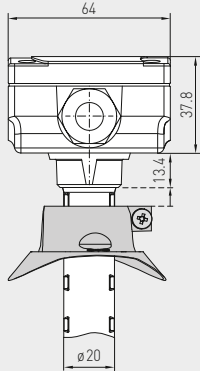


Duct humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$), including mounting flange, calibratable, with multi-range switching and active/passive output

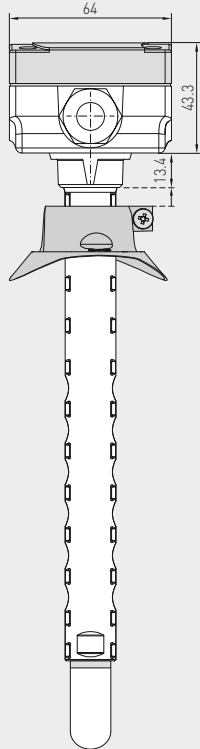


Dimensional drawing

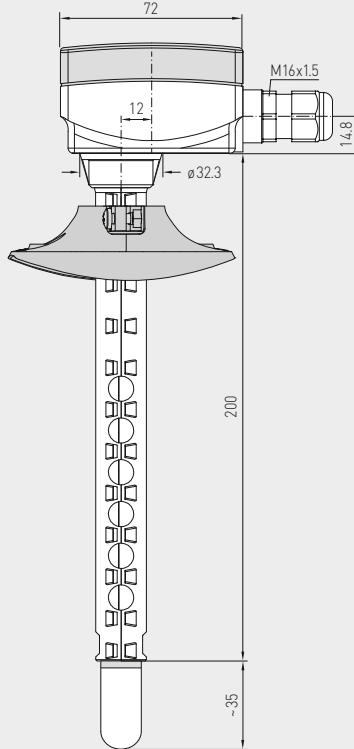
without display



with display



KFF/KFTF with/without display
KFF-SD/KFTF-SD without display
KFF-20/KFTF-20 without display



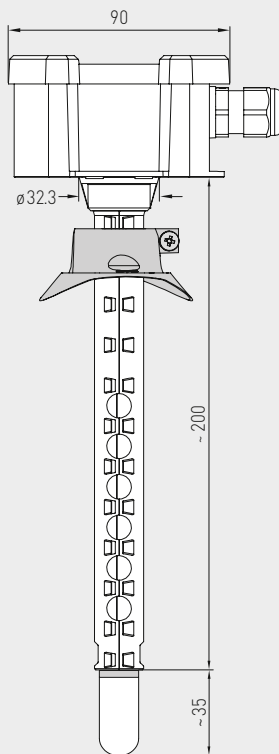
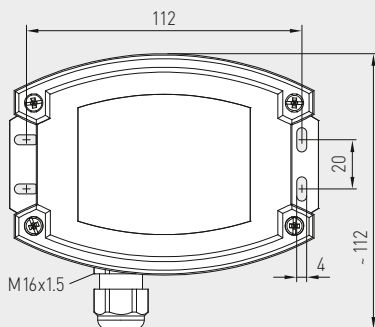
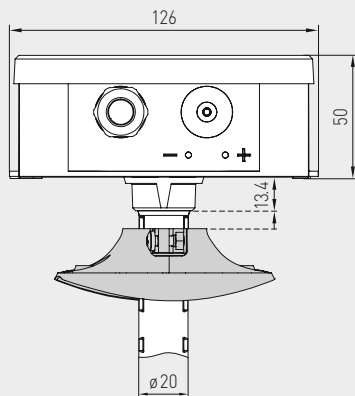
KFF-SD/KFTF-SD ($\pm 2,0\%$)
with snap-on lid
(IP54)



KFF/KFTF ($\pm 2,0\%$)
KFF-20/KFTF-20 ($\pm 1,8\%$)
without display
(IP65)

Dimensional drawing

KFF-20/KFTF-20 with display



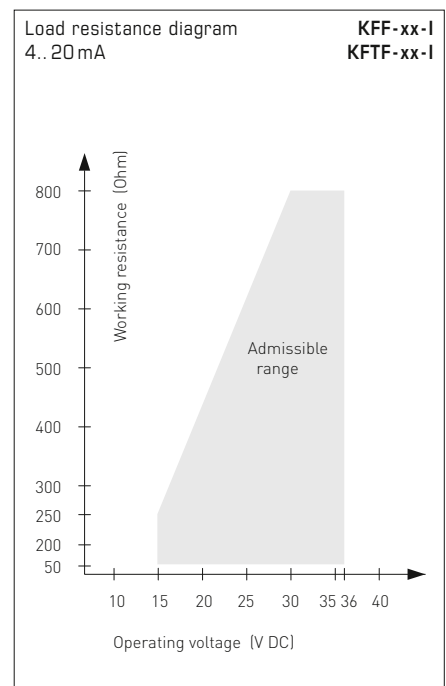
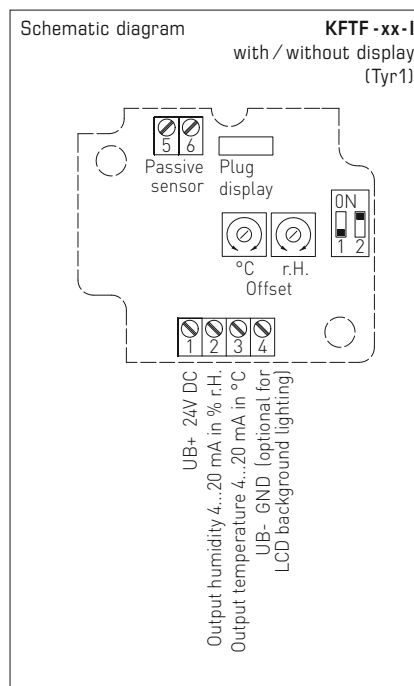
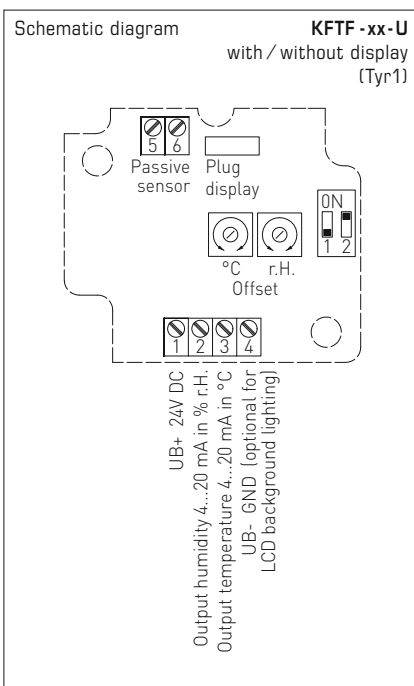
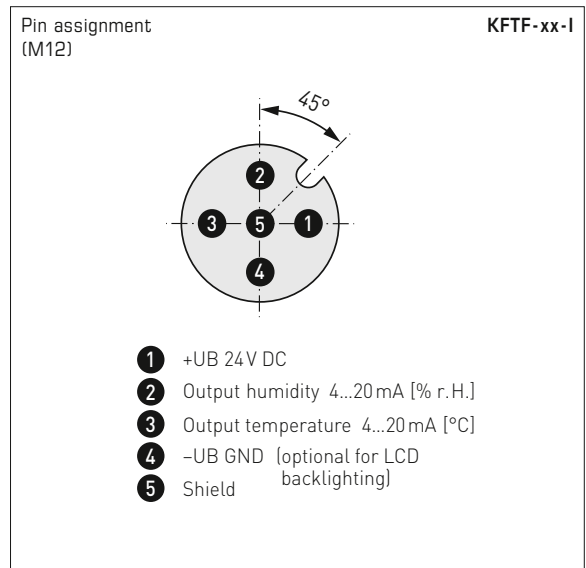
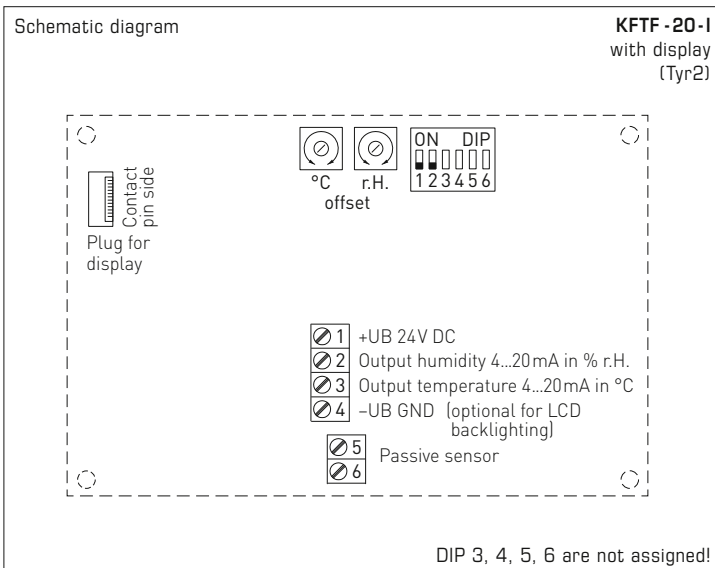
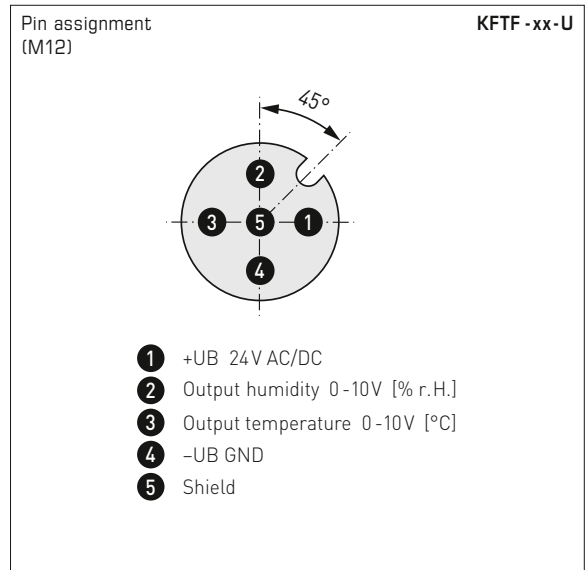
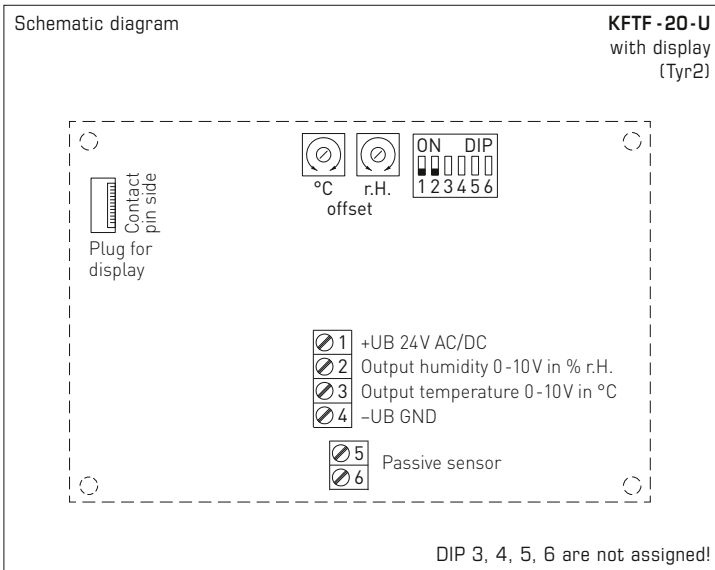
KFF/KFTF ($\pm 2,0\%$)
with display
(IP65)



KFF-20/KFTF-20 ($\pm 1,8\%$)
with display
(IP65)



Duct humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$), including mounting flange, calibratable, with multi-range switching and active/passive output





Duct humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$), including mounting flange, calibratable, with multi-range switching and active/passive output

3-wire connection **KFF-xx-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Free
4	-UB-GND

2- or 3-wire connection * **KFF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Free
4	-UB-GND (optional for backlighting)

4- or 6-wire connection **KFTF-U (passive temperature sensor)**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	-UB-GND
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

4-wire connection **KFTF-xx-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	-UB-GND

3- or 4-wire connection ** **KFTF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Output temperature in °C 4...20mA
4	-UB-GND (optional for backlighting)

4- or 6-wire connection **KFTF-I (passive temperature sensor)**

1	+UB 24V DC
2	Output humidity in % r.H. 4...20mA
3	Output temperature in °C 4...20mA
4	-UB-GND (optional for backlighting)
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF

Connection*:
2-wire connection for devices with/without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the I variant the humidity path must be connected!

Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Duct humidity and temperature sensors ($\pm 2.0\%$), including mounting flange, calibratable, with multi-range switching and active output

KFF-SD / KFTF-SD
with snap-on lid
(IP 54)



HYGRASGARD® KFF-SD Duct humidity sensors ($\pm 2.0\%$), *Standard*
HYGRASGARD® KFTF-SD Duct humidity and temperature sensors ($\pm 2.0\%$), *Standard*

Type / WG01B	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
KFF-SD					IP 54	
KFF-SD-I	0...100% r. H.	–	4...20 mA	–	1201-3182-0000-029	143,13 €
KFF-SD-U	0...100% r. H.	–	0-10 V	–	1201-3181-0000-029	143,13 €
KFTF-SD					IP 54	
KFTF-SD-I	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-3182-1000-029	147,06 €
KFTF-SD-U	0...100% r. H.	(4x as above)	0-10 V	0-10 V	1201-3181-1000-029	147,06 €
Housing variant:	Cable connection with cable gland (M12 connector on request)					

ACCESSORIES

SF-M	Metal sinter filter , \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
-------------	---	--------------------	----------------

For further information, see chapter Accessories!



KFF / KFTF
with quick-locking screws
(IP65)



HYGRASGARD® KFF		Duct humidity sensors ($\pm 2.0\%$), <i>Standard</i>				
HYGRASGARD® KFTF		Duct humidity and temperature sensors ($\pm 2.0\%$), <i>Standard</i>				
Type / WG01	Measuring Range / Readout	Output	Display	Item No.	Price	
	Humidity	Humidity				
	Temperature	Temperature				
KFF						IP65
KFF-I	0...100 % r. H.	–	4...20 mA	–	1201-3112-0000-029	153,80 €
KFF-I LCD	0...100 % r. H.	–	4...20 mA	–	■ 1201-3112-0200-029	198,70 €
KFF-U	0...100 % r. H.	–	0-10 V	–	1201-3111-0000-029	153,80 €
KFF-U LCD	0...100 % r. H.	–	0-10 V	–	■ 1201-3111-0200-029	198,70 €
KFTF						IP65
KFTF-I	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-3112-1000-029	157,72 €
KFTF-I LCD	0...100 % r. H.	(4x as above)	4...20 mA	4...20 mA	■ 1201-3112-1200-029	202,64 €
KFTF-U	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	1201-3111-1000-029	157,72 €
KFTF-U LCD	0...100 % r. H.	(4x as above)	0-10 V	0-10 V	■ 1201-3111-1200-029	202,64 €
Housing variant:	Cable connection with cable gland (M12 connector on request)					

HYGRASGARD® KFTF - U xx		Duct humidity and temperature sensors ($\pm 2.0\%$), <i>Standard</i> (passive temperature sensor)				
Type / WG01	Measuring Range / Readout	Output	Item No.	Price		
	Humidity	Humidity				
	Temperature	Temperature				
KFTF - U xx		Pt, Ni, LM235Z, NTC		IP65		
			(active / passive)			
KFTF-U Pt100	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V 0-10 V + Pt100	1201-3111-2001-029	163,90 €	
KFTF-U Pt1000	0...100 % r. H.	(4x as above)	0-10 V 0-10 V + Pt1000	1201-3111-2005-029	164,46 €	
KFTF-U Ni1000	0...100 % r. H.	(4x as above)	0-10 V 0-10 V + Ni1000	1201-3111-2009-029	165,03 €	
KFTF-U NiTK	0...100 % r. H.	(4x as above)	0-10 V 0-10 V + Ni1000TK5000	1201-3111-2010-029	165,92 €	
KFTF-U LM235Z	0...100 % r. H.	(4x as above)	0-10 V 0-10 V + LM235Z , 10mV / K	1201-3111-2021-029	164,80 €	
KFTF-U NTC1,8K	0...100 % r. H.	(4x as above)	0-10 V 0-10 V + NTC 1,8 kOhm	1201-3111-2012-029	165,03 €	
KFTF-U NTC10K	0...100 % r. H.	(4x as above)	0-10 V 0-10 V + NTC 10 kOhm	1201-3111-2015-029	164,01 €	
KFTF-U NTC20K	0...100 % r. H.	(4x as above)	0-10 V 0-10 V + NTC 20 kOhm	1201-3111-2016-029	164,01 €	
Housing variant:	Cable connection with cable gland (M12 connector on request)					

Duct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching
and active output

KFTF-20-Q

with M12 connector,
with display (Tyr2)

KFTF-20-Q

with M12 connector,
without display (Tyr1)



HYGRASGARD® KFTF-20-Q		Duct humidity and temperature sensors ($\pm 1.8\%$), <i>Premium</i> (with M12 connector)					
Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display ● = Q	Item No.	Price
KFTF-20-Q						IP 65	
KFTF-20-I Q	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA	●	2003-4151-2100-001	270,51 €
KFTF-20-I Q LCD	0...100% r. H.	(4x as above)	4... 20 mA	4... 20 mA	● ■	2003-4172-2100-001	313,17 €
KFTF-20-U Q	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V	●	2003-4151-1100-001	270,51 €
KFTF-20-U Q LCD	0...100% r. H.	(4x as above)	0-10V	0-10V	● ■	2003-4172-1100-001	313,17 €
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)					

ACCESSORIES			
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
For further information, see chapter Accessories!			



KFF-20 / KFTF-20
with cable gland,
with display (Tyr2)



KFF-20 / KFTF-20
with cable gland,
without display (Tyr1)



HYGRASGARD® KFF-20		Duct humidity sensors ($\pm 1.8\%$), <i>Premium</i> (with cable gland)					
Type / WG02	Measuring Range/ Humidity	Readout Temperature	Output Humidity	Temperature	Display	Item No.	Price
KFF-20						IP65	
KFF-20-I	0...100% r. H.	-	4... 20 mA	-		1201-3112-0000-030	212,73 €
KFF-20-I LCD	0...100% r. H.	-	4... 20 mA	-	■	1201-8112-0400-030	257,64 €
KFF-20-U	0...100% r. H.	-	0-10 V	-		1201-3111-0000-030	212,73 €
KFF-20-U LCD	0...100% r. H.	-	0-10 V	-	■	1201-8111-0400-030	257,64 €
Housing variant:	Cable connection with cable gland (M12 connector on request)						

HYGRASGARD® KFTF-20		Duct humidity and temperature sensors ($\pm 1.8\%$), <i>Premium</i> (with cable gland)					
Type / WG02	Measuring Range/ Humidity	Readout Temperature	Output Humidity	Temperature	Display	Item No.	Price
KFTF-20						IP65	
KFTF-20-I	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-3112-1000-030	233,54 €
KFTF-20-I LCD	0...100% r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	1201-8112-1400-030	276,20 €
KFTF-20-U	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-030	233,54 €
KFTF-20-U LCD	0...100% r. H.	(4x as above)	0-10 V	0-10 V	■	1201-8111-1400-030	276,20 €
Housing variant:	Cable connection with cable gland (M12 connector see KFTF-20-Q)						

ACCESSORIES								
SF-M	Metal sinter filter, \varnothing 16 mm, L=32 mm, exchangeable stainless steel V4A (1.4404)						7000-0050-2200-100	37,32 €
For further information, see chapter Accessories!								

Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

Calibratable humidity and temperature sensor **HYGRASGARD® KFTF-20-VA** ($\pm 1.8\%$) with metal sinter filter, rugged housing, **stainless steel V4A**, optionally with /without display, with cable gland or M12 connector according to DIN EN 61076-2-101.

It measures the relative humidity and the temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply: 24 V AC ($\pm 20\%$); 15...36 V DC for U variant
15...36 V DC for I variant,
depending on working resistance, residual ripple stabilised $\pm 0.3V$

Working resistance: $R_b(\text{ohm}) = (U_b - 14V) / 0.02A$ for I variant,
see load resistance diagram

Load resistance: $R_L > 5k\Omega$ for U variant

Sensors: **digital humidity sensor with integrated temperature sensor**,
low hysteresis, high long-term stability

HUMIDITY

Measuring range, humidity: 0...100% r. H.

Permitted humidity: < 95% r. H., non-precipitating air

Deviation in humidity: typically $\pm 1.8\%$ (10...90% r. H.) at +25°C, otherwise $\pm 2.0\%$

Output humidity: 0 - 10 V for U variant
4...20 mA for I variant

TEMPERATURE

Measuring range, temperature: **multi-range switching** (see table)
-35...+35°C; -35...+75°C; 0...+50°C; 0...+80°C

Ambient temperature: storage -35...+85°C; operation -30...+80°C,
non-precipitating

Deviation, temperature: typically $\pm 0.2K$ at +25°C

Output, temperature: 0 - 10 V for U variant
4...20 mA for I variant

Electrical connection: 2-, 3-, or 4-wire connection (see connection diagram),
0.14 - 1.5 mm², via terminal screws

Cable connection: **cable gland, stainless steel V2A** (1.4305)
(M20 x 1.5; with strain relief, exchangeable,
inner diameter 6 - 12 mm) or
M12 connector (male, 5-pin, A-code)
according to DIN EN 61076-2-101

Housing: **stainless steel V4A** (1.4571),
with non-distortion cover bolting,
impact resistant, high EMI shielding,
corrosion, temperature, weather- and UV-resistant

Housing dimensions: 143 x 97 x 61 mm (Tyr 2E)

Protective tube: **made from stainless steel V2A** (1.4301), \varnothing 16 mm, NL = 197 mm

Sensor protection: **metal sinter filter**, \varnothing 16 mm, L = 32 mm, exchangeable,
stainless steel V4A (1.4404)

Process connection: by screws
via the mounting fixture on the housing

Long-term stability: $\pm 1\%$ per year

Protection class: III (according to EN 60730)

Protection type: **IP 65** (according to EN 60529)
Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)

Standards: CE conformity according to EMC Directive 2014/30/EU,
according to EN 61326-1, according to EN 61326-2-3

Optional: **display with illumination**, three-line, cutout approx. 70 x 40 mm (W x H),
to display the ACTUAL temperature and ACTUAL humidity

ACCESSORIES (see table)

KFTF-20-VA
with cable gland



KFTF-20-VAQ
with M12 connector





NEW

S+S REGELTECHNIK

HYGRASGARD® **KFTF-20-VA**

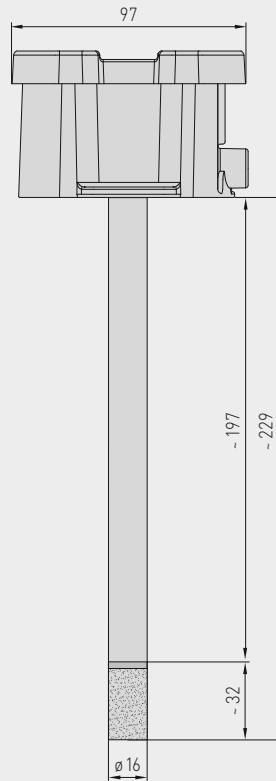
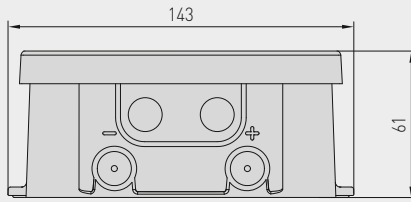
Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



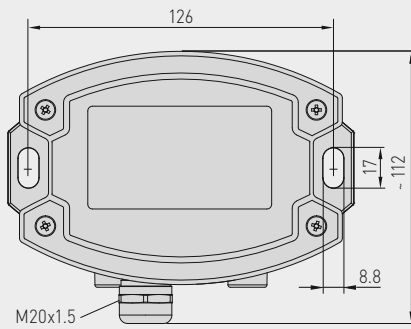
Dimensional drawing

KFTF-20-VA

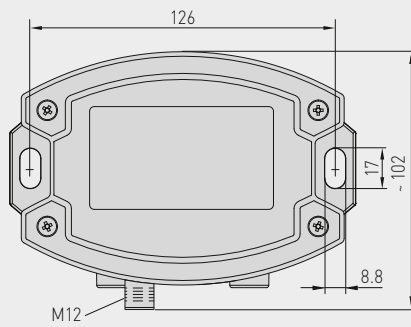
KFTF-20-VA
with cable gland
and display



Housing with
cable gland



Housing with
M12 connector



SF-M
Metal sinter filter
(standard)

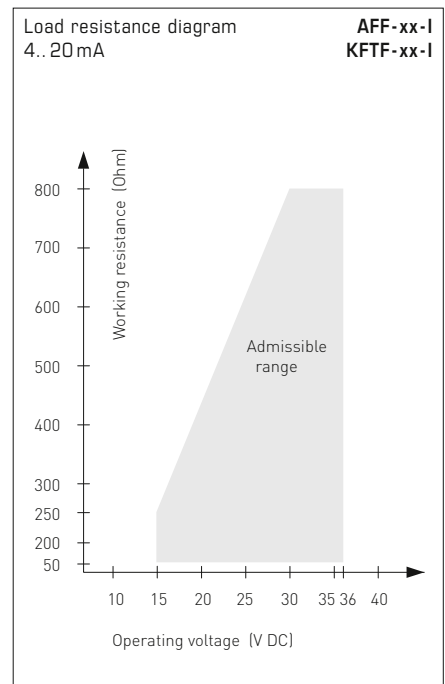
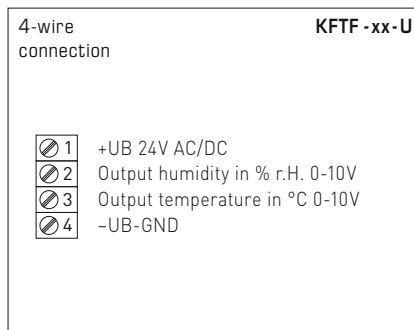
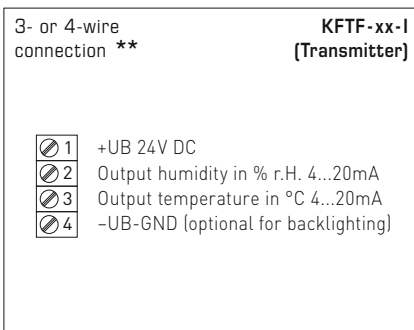
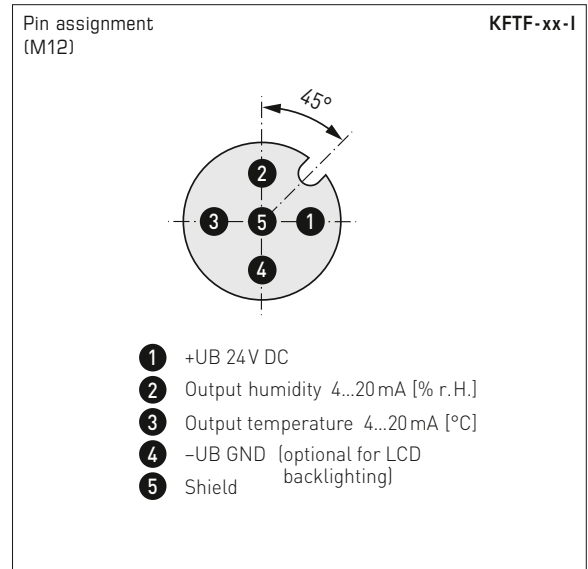
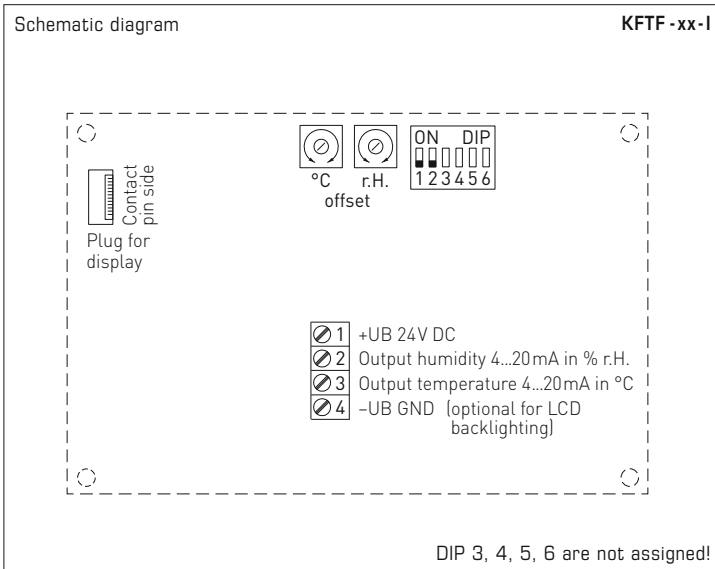
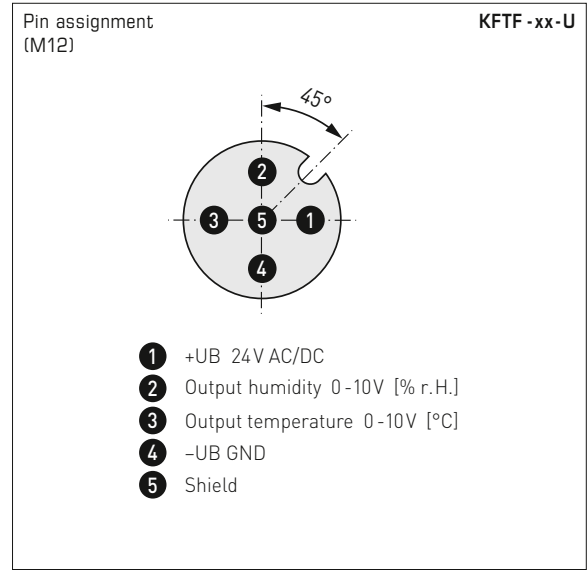
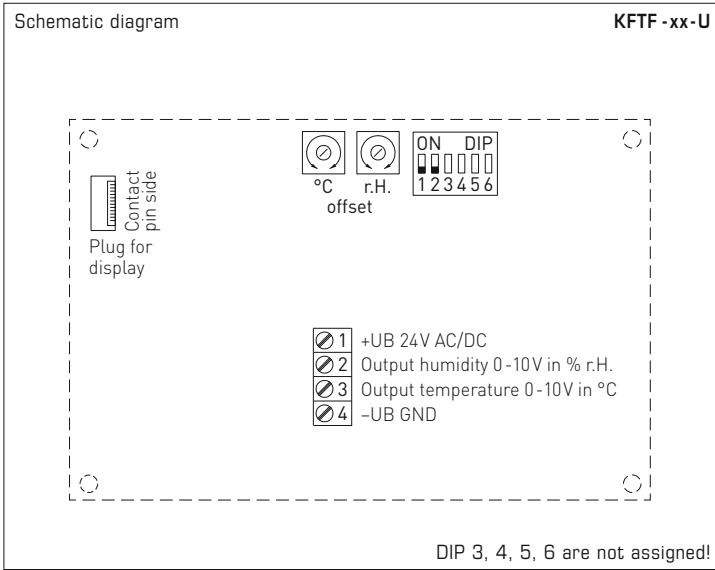


M12 connector
(male)

KFTF-20-VAQ
with M12 connector
and display



Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I** variant the humidity path must be connected!

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



NEW

S+S REGELTECHNIK

HYGRASGARD® KFTF-20-VA

Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

KFTF-20-VAQ
with display,
hinged



Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Duct humidity and temperature sensors ($\pm 1.8\%$), calibratable, with multi-range switching and active output

KFTF-20-VAQ
with M12 connector



HYGRASGARD® KFTF-20-VAQ		Duct humidity and temperature sensors ($\pm 1.8\%$), ID (with M12 connector)					
Type / WG02I	Measuring Range/Readout Humidity	Readout Temperature	Output Humidity	Output Temperature	Display ● = Q	Item No.	Price
KFTF-20-VAQ							
KFTF-20-I VAQ	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-6181-2100-001	584,09 €
KFTF-20-I VAQ LCD	0...100% r. H.	(4x as above)	4...20 mA	4...20 mA	● ■	2003-6182-2100-001	721,13 €
KFTF-20-U VAQ	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V	●	2003-4161-1100-001	584,09 €
KFTF-20-U VAQ LCD	0...100% r. H.	(4x as above)	0-10V	0-10V	● ■	2003-4162-1100-001	721,13 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)						

ACCESSORIES			
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
For further information, see chapter Accessories!			



NEW

S+S REGELTECHNIK

HYGRASGARD® **KFTF-20-VA**

Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



KFTF-20-VA
with cable gland

HYGRASGARD® KFTF-20-VA		Duct humidity and temperature sensors ($\pm 1.8\%$), <i>ID</i> (with cable gland)					
Type / WG02I	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
KFTF-20-VA							
KFTF-20-I VA	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		2003-4161-2200-001	550,11 €
KFTF-20-I VA LCD	0...100% r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	2003-4162-2200-001	687,15 €
KFTF-20-U VA	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		2003-4161-1200-001	550,11 €
KFTF-20-U VA LCD	0...100% r. H.	(4x as above)	0-10 V	0-10 V	■	2003-4162-1200-001	687,15 €
Housing variant:	Cable connection with cable gland						

ACCESSORIES			
SF-M	Metal sinter filter, \varnothing 16 mm, L=32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
For further information, see chapter Accessories!			



Duct outdoor humidity sensors ($\pm 2.0\%$), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

The universal humidity sensors **HYGRASGARD® KAVTF** with 6 output sizes are used to determine diverse characteristic variables in humidity measurement. The relative humidity and temperature of the ambient air are measured. From these measurands, the different characteristic variables are internally calculated.

For device version x-U, two outputs of 0 - 10 V are available, for Version x-I two outputs of 4...20 mA. Here, the output variables for these outputs can be defined using DIP switches. Selectable for output 1 are relative humidity [% r.H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], or enthalpy [kJ/kg] (while neglecting the atmospheric air pressure). At output 2, four different measuring ranges for ambient temperature [°C] are selectable. Ex-factory condition (default) for output 1 is relative humidity 0...100% r.H., for output 2 temperature measuring range 0...+50 °C.

Due to the different configuration alternatives provided, numerous measurement and control tasks can be solved by just one device. These devices are to be operated in pollutant-free non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors. Application examples include medical technology, refrigeration, air conditioning, and clean room technology. These sensors are appropriate for duct installation.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3V$
Working resistance:	$R_b(\text{ohm}) = (U_b - 14 V) / 0.02 A$ for I variant
Load resistance:	$R_L > 5 k\Omega$ for U variant
Power consumption:	$< 1 W$ at 24 V DC; $< 2 VA$ at 24 V AC
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter , $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal sinter filter , $\varnothing 16 \text{ mm}$, $L = 32 \text{ mm}$)

HUMIDITY

Measuring range, humidity:	multi-range switching with 8 switchable measuring ranges (see table) 0...100% r.H. (default)
Operating range, humidity:	10...95% r.H., without formation of dew
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at +25 °C, otherwise $\pm 3.0\%$ Deviations of other outputs result from deviations of humidity and temperature.
Output 1, humidity:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)

TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (see table) 0...+50 °C (default); -20...+80 °C; -35...+75 °C; -35...+35 °C
Operating range, temperature:	-35...+85 °C sensors
Deviation, temperature:	typically $\pm 0.2K$ at +25 °C
Output 2, temperature:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Electrical connection:	4-wire connection for U variant 3-wire connection for I variant (Transmitter) 0.14 - 1.5 mm ² , via terminal screws

Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection $\varnothing 20 \text{ mm}$, $NL = 235 \text{ mm}$, $v_{\text{max}} = 30 \text{ m/s}$ (air) (on request, optional stainless steel V2A (1.4301), $\varnothing 16 \text{ mm}$)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) in the built-in state, Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables

ACCESSORIES

see last chapter

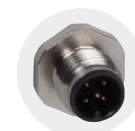
SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)

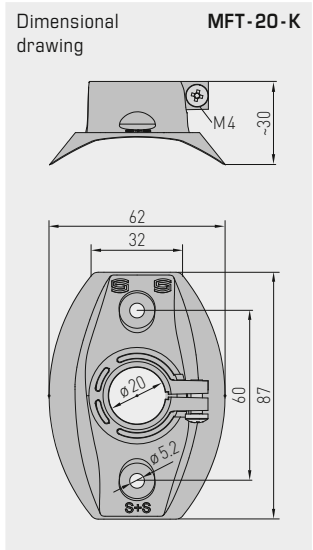


Protective tube stainless steel
(optional on request)



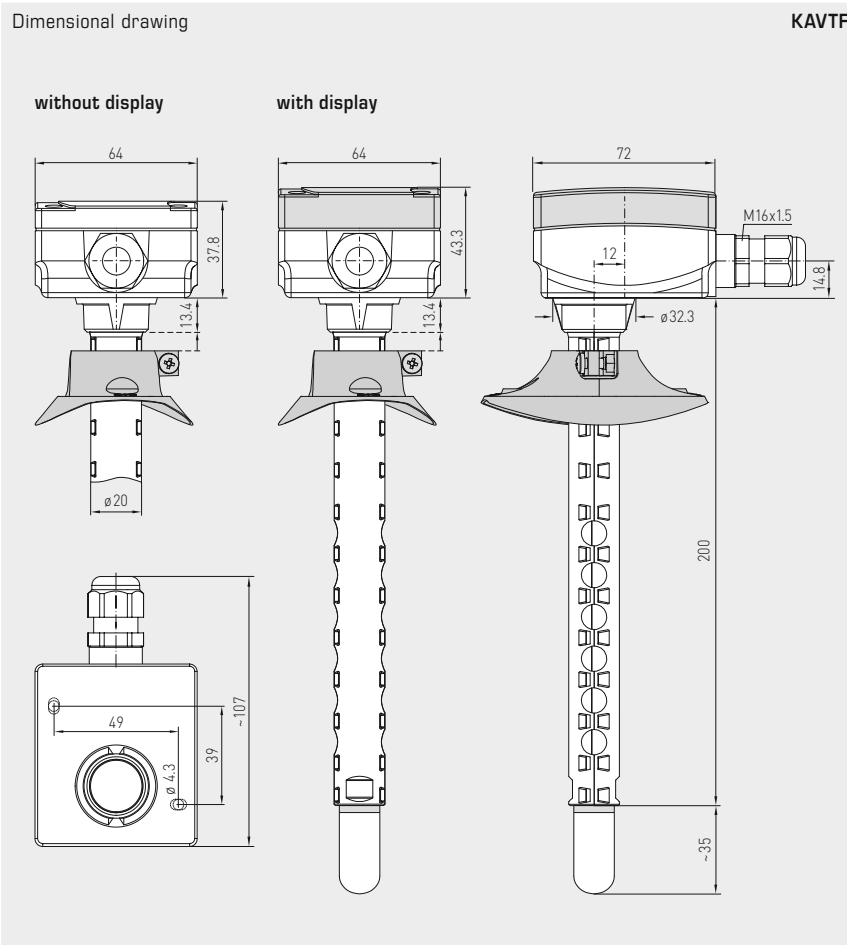
M12 connector
(optional on request)

MFT-20-K
Mounting flange,
plastic





Duct outdoor humidity sensors ($\pm 2.0\%$), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

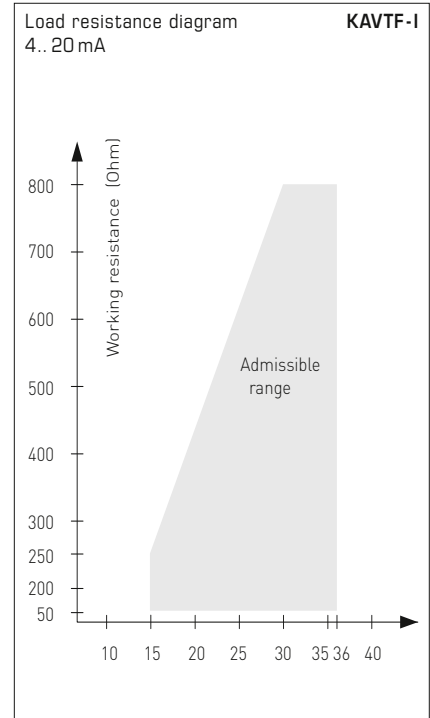
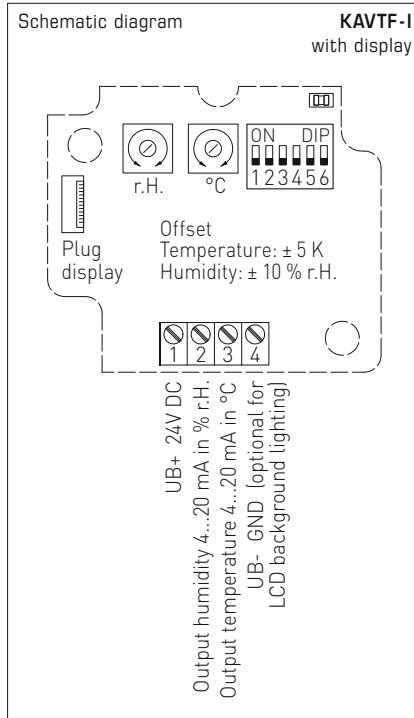
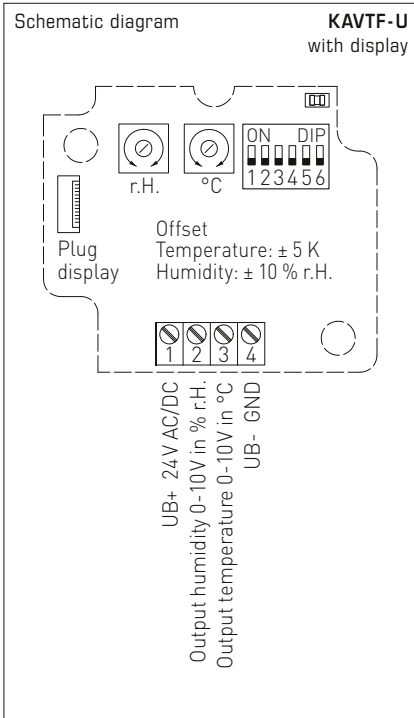
Temperature table
MR: -20...+80 °C

°C	U _A in V	I _A in mA
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Humidity table
MR: 0...100 % r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Duct outdoor humidity sensors ($\pm 2.0\%$), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+80 °C	ON	OFF
-35...+75 °C	OFF	ON
-35...+35 °C	ON	ON

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
r.H.: 0...100 % (default)	OFF	OFF	OFF
MR: 0...50 g/kg	ON	OFF	OFF
MR: 0...80 g/kg	OFF	ON	OFF
A.H.: 0...50 g/m ³	OFF	OFF	ON
A.H.: 0...80 g/m ³	ON	ON	OFF
DP: 0...+50 °C	ON	OFF	ON
DP: -20...+80 °C	OFF	ON	ON
ENT.: 0...85 kJ/kg	ON	ON	ON

Possible parameters:

(r.H.) = relative humidity in %
 (MR) = mixture ratio in g/kg
 (A.H.) = absolute humidity in g/m³
 (DP) = dew point in °C
 (ENT.) = enthalpy in kJ/kg

Service display/output (adjustable)	DIP 6
Display °C and % r.H., output of set measurements via DIP 1-5 (service mode for setting °C and % r.H.)	ON
Display and output of set measurements via DIP 1-5	OFF

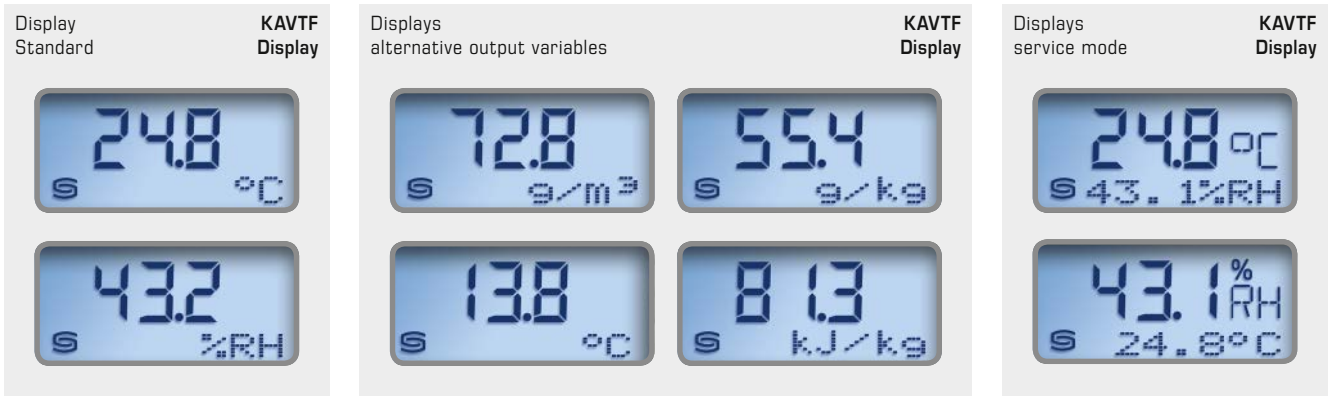
KAVTF
with plastic sinter filter
SF-K (standard)

KAVTF
with metal sinter filter
SF-M (optional)





Duct outdoor humidity sensors ($\pm 2.0\%$), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). In this case, the first line displays the value while the second line displays the corresponding unit:

- Temperature in °C
- Relative humidity in % r.H.

For improved legibility, backlighting is provided.

DIP switches can be used to display an **alternative output variable** instead of the standard display:

- Absolute humidity in g/m³
- Dew point in °C
- Mixture ratio in g/kg
- Enthalpy in kJ/kg

The **service mode** simultaneously displays (alternately in the first and second lines) the **actual temperature** and the **actual humidity** (relative humidity).



KAVTF with display

HYGRASGARD® KAVTF Duct outdoor humidity sensors ($\pm 2.0\%$)						
Type/ WG01	Measuring Range	Temperature	Output	Display	Item No.	Price
	Humidity		Humidity	Temperature		
KAVTF-I	(switchable)	(switchable)			I-variant	
KAVTF-I	0...100% r.H. (default)	0...+50°C (default)	4...20 mA	4...20 mA	1201-3162-6000-029	165,29 €
	0...50 g/kg (MR)	-20...+80°C				
	0...80 g/kg (MR)	-35...+75°C				
	0...50 g/m ³ (A.H.)	-35...+35°C				
	0...80 g/m ³ (A.H.)					
	0...+50°C (DP)					
	-20...+80°C (DP)					
	0...85 kJ/kg (ENT.)					
KAVTF-I LCD	(8x as above)	(4x as above)	4...20 mA	4...20 mA	■ 1201-3162-6200-029	218,62 €
KAVTF-U					U-variant	
KAVTF-U	(8x as above)	(4x as above)	0-10V	0-10V	1201-3161-6000-029	165,29 €
KAVTF-U LCD	(8x as above)	(4x as above)	0-10V	0-10V	■ 1201-3161-6200-029	218,62 €
Extra charge:	Other non-standard ranges optional					131,81 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €

**Pendulum room humidity sensors (± 2.0%),
calibratable, with active output**

The calibratable pendulum room humidity sensor **HYGRASGARD® RPF - SD** with plastic sinter filter measures the relative humidity of air. It converts the measured humidity into a standard signal of 4...20 mA. Relative humidity (in % r. H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The sensor applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for precise detection of humidity. A digital long-term stable sensor is used as a measuring element for humidity measurement. This sensor is suitable for duct installation, as a pendulum sensor, or for integration in equipment.

TECHNICAL DATA

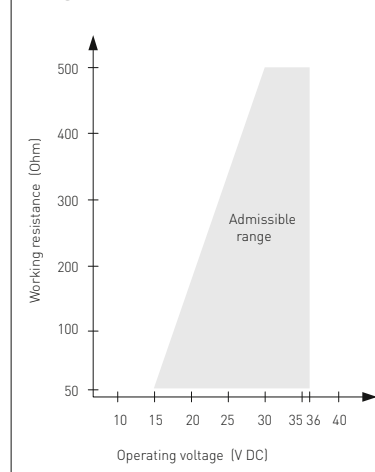
Power supply:	15...36 V DC depending on working resistance, residual ripple stabilised ± 0.3V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.03 \text{ A}$ $R_a < 500 \text{ Ohm}$
Power consumption:	< 1.1 VA / 24 V DC
Sensors:	digital humidity sensor small hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% r. H. (output corresponding to 4...20 mA)
Operating range, humidity:	0...95% r. H. (without formation of dew)
Deviation, humidity:	typically ± 2.0% (20...80% r. H.) at +25 °C, otherwise ± 3.0%
Output, humidity:	4...20 mA, see load resistance diagram
Ambient temperature:	storage -25...+50 °C operation -5...+55 °C
Long-term stability:	± 1 % per year
Electrical connection:	2-wire connection (see connecting diagram), 0.14 - 1.5 mm ²
Connection cable:	PVC, LiYY, 2 x 0.25 mm ² , KL = approx. 1.5 m (other lengths optional)
Protective tube:	stainless steel V2A (1.4301), Ø = 16 mm, NL = 142 mm
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
ACCESSORIES	see last chapter

Humidity table

MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Load resistance diagram **RPF - SD**
4...20 mA



Circuit board

RPF - SD

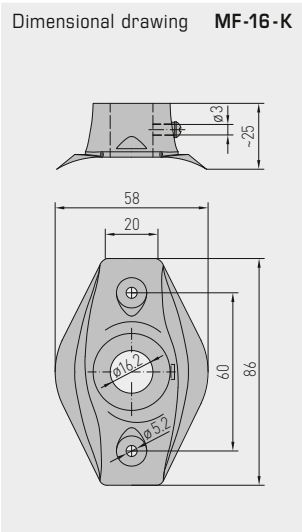


2-wire connection

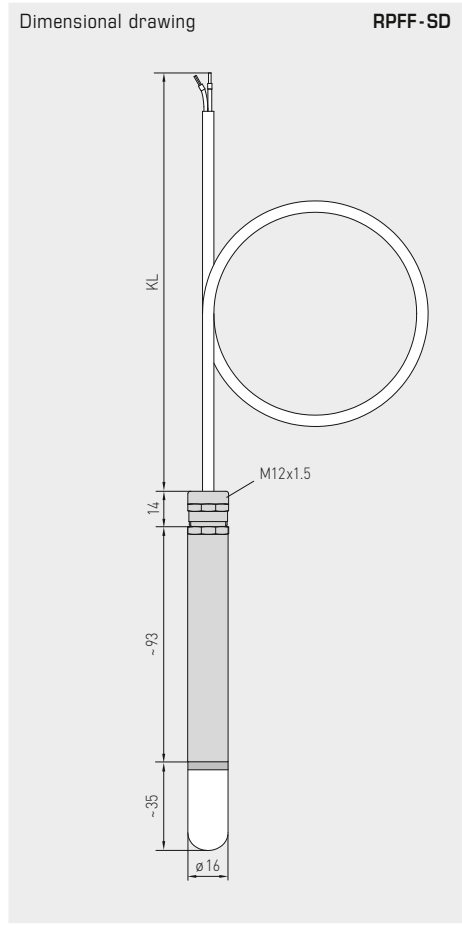
RPF - SD - I
(Transmitter)



+UB 24V DC
Output humidity
in % r.H. 4-20mA



MF-16-K
Mounting flange,
plastic
(optional)



RPFF-SD
with plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



HYGRASGARD® RPFF-SD Pendulum room humidity sensors ($\pm 2.0\%$), *Standard*

Type / WG01	Measuring Range Humidity (relative)	Output Humidity (relative)	Item No.	Price
RPFF-SD-I			I-variant	
RPFF-SD-I	0...100% r. H.	4...20 mA	1201-1172-0000-150	137,68 €
Extra charge:	Cable length (KL) 1.5 m, other lengths optional		on request	
For special orders please specify:	Type, cable length e.g. RPFF-SD-I, 3 m; RPFF-SD-I, 4 m			

ACCESSORIES

SF-M	Metal sinter filter , \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €
MF-16-K	Mounting flange, plastic For further information see last chapter!	7100-0030-0000-000	8,43 €



**Pendulum room humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output**

The calibratable pendulum room humidity and temperature sensor **HYGRASGARD® RPFF / RPFTF** with plastic sinter filter measures the relative humidity and temperature of air. It converts the measurands into standard signals of 0-10 V or 4...20 mA and is available with or without an optional display. It has four switchable temperature ranges. The sensor is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of temperature and humidity. A digital long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**RPFF
RPFTF**
with plastic sinter filter
(standard)

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal sinter filter, $\varnothing 16 \text{ mm}$, $L = 32 \text{ mm}$)

HUMIDITY

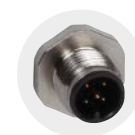
Measuring range, humidity:	0...100% r. H. (output corresponding to 0-10 V or 4...20 mA)
Operating range, humidity:	0...95% r. H. (without formation of dew)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r. H.) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$
Output, humidity:	0 - 10 V for U variant 4...20 mA for I variant, see load resistance diagram

TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (see table) $-35...+35^\circ\text{C}$; $-35...+75^\circ\text{C}$; $0...+50^\circ\text{C}$; $0...+80^\circ\text{C}$ (output corresponding to 0-10 V or 4...20 mA)
Operating range, temperature:	$-35...+80^\circ\text{C}$
Deviation, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10 V or 4...20 mA or Ohm value
Ambient temperature:	storage $-5...+60^\circ\text{C}$ operation $-5...+60^\circ\text{C}$
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm ² via terminal screws
Connection cable:	PVC, LiYY, 6 x 0.14 mm ² , KL = approx. 2 m (other lengths optional)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 16 \text{ mm}$, NL = 142 mm
Protection class:	III (according to EN 60 730)
Protection type:	IP 67 (according to EN 60 529) Housing tested TÜV SÜD, Report No. 713139052 (Tyr 1) IP 65 (according to EN 60 529) Pendulum with sleeve
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

ACCESSORIES

see last chapter



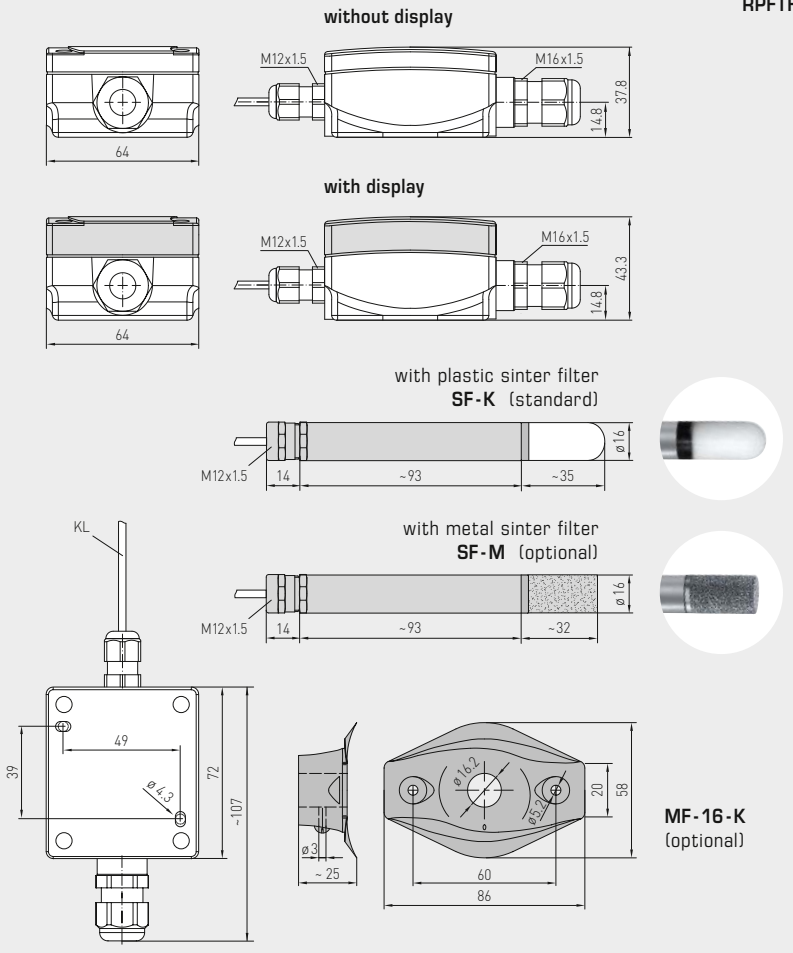
M12 connector
(optional on request)

MF-16-K
Mounting flange,
plastic
(optional)





Dimensional drawing



RPFF
RPFTF

RPFF
RPFTF
with display and
plastic sinter filter
(standard)



Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

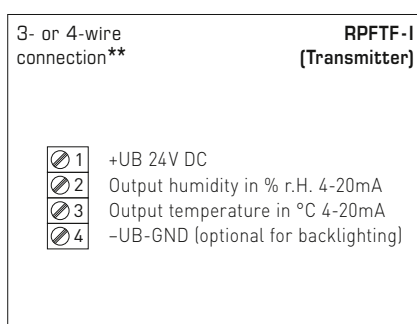
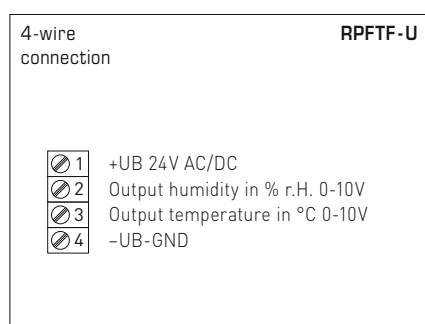
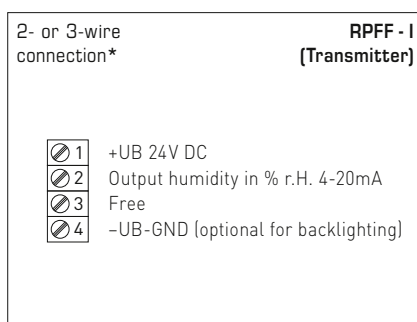
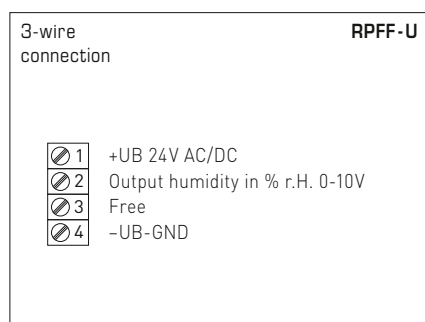
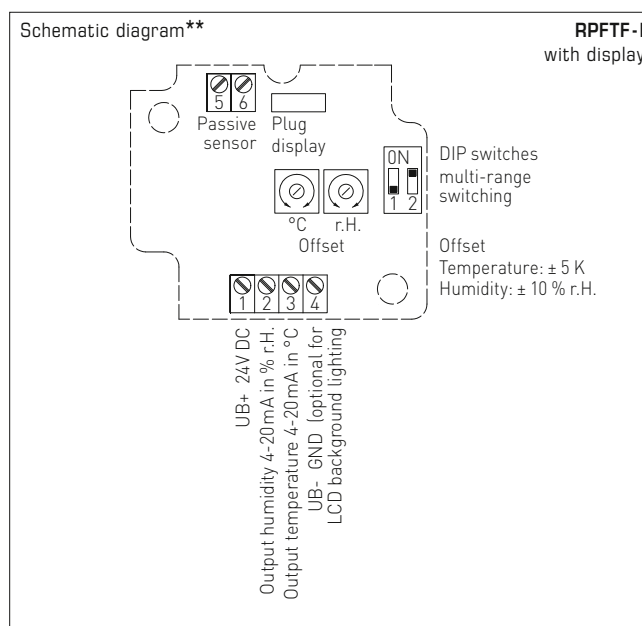
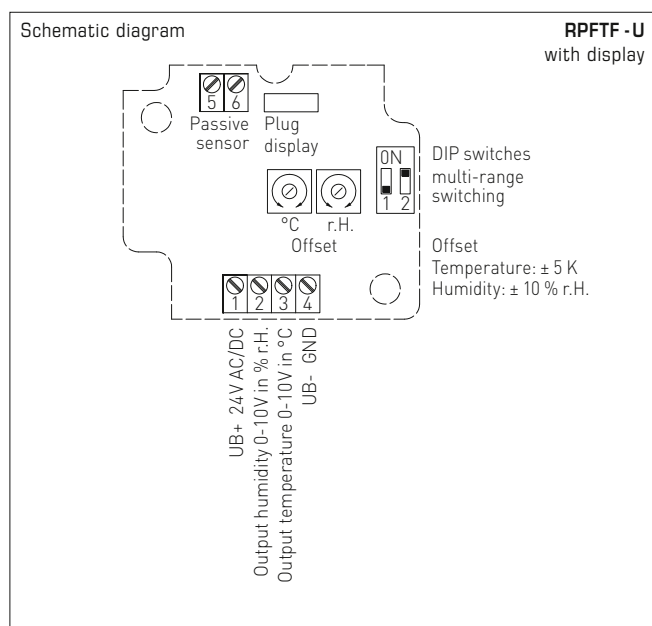
Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

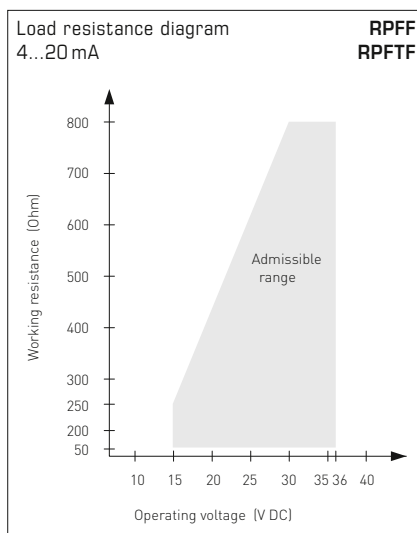
Humidity table
MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Pendulum room humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!



S+S REGELTECHNIK

HYGRASGARD® RPFF
HYGRASGARD® RPFTF

Pendulum room humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output

RPFF
RPFTF
with display



HYGRASGARD® RPFF Pendulum room humidity sensors ($\pm 2.0\%$), *Premium*
HYGRASGARD® RPFTF Pendulum room humidity and temperature sensors ($\pm 2.0\%$), *Premium*

Type / WG01	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
RPFF						
RPFF-I	0...100% r. H.	-	4...20 mA	-	1201-1172-0000-100	175,12 €
RPFF-U	0...100% r. H.	-	0-10 V	-	1201-1171-0000-100	175,12 €
RPFTF						
RPFTF-I	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-1172-1000-100	179,05 €
RPFTF-U	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	1201-1171-1000-100	179,05 €
Extra charge:	Two-line display with illumination Cable length (KL = 2 m), other lengths optional up to max. 5 m					43,94 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request

ACCESSORIES						
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)				7000-0050-2200-100	37,32 €
MF-16-K	Mounting flange, plastic				7100-0030-0000-000	8,43 €
For further information see last chapter!						

**Pendulum room humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output**

The calibratable pendulum room humidity and temperature sensor **HYGRASGARD® RPFF-25/RPFTF-25** with pluggable metal sinter filter, housing made of impact-resistant plastic, with/without optional display.

It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0-10 V or 4...20 mA. It is equipped with four switchable temperature ranges. The sensor is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of temperature and humidity. A digital long-term stable sensor is used as measuring element for humidity and temperature measurement. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPFF-25/RPFTF-25 ($\pm 1.8\%$)
pluggable measuring head
with metal sinter filter



TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = $(U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ k}\Omega$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	digital humidity sensor with integrated temperature sensor , small hysteresis, high long-term stability, sensor head pluggable
Sensor protection:	pluggable measuring head (probe) with metal sinter filter , $\varnothing 16 \text{ mm}$, $L = 88.5 \text{ mm}$, exchangeable

HUMIDITY

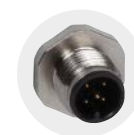
Measuring range, humidity:	0...100% r. H. (output corresponding to 0-10 V or 4...20 mA)
Operating range, humidity:	0...95% r. H. (without formation of dew)
Deviation, humidity:	typically $\pm 1.8\%$ (10...90% r. H.) at $+25^\circ\text{C}$, otherwise $\pm 2.0\%$
Output, humidity:	0-10 V for U variant 4...20 mA for I variant, see load resistance diagram

TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (see table) $-35...+35^\circ\text{C}$; $-35...+75^\circ\text{C}$; $0...+50^\circ\text{C}$; $0...+80^\circ\text{C}$ (output corresponding to 0-10 V or 4...20 mA)
Deviation, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10 V or 4...20 mA or Ohm value
Ambient temperature:	storage $-35...+85^\circ\text{C}$ operation $-30...+70^\circ\text{C}$
Long-term stability:	$\pm 1\%$ per year
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm ² via terminal screws
Connection cable:	KL = 2 m
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 18 \text{ mm}$ (16 mm), $L = 120 \text{ mm}$
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	three-line display with illumination , cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

ACCESSORIES

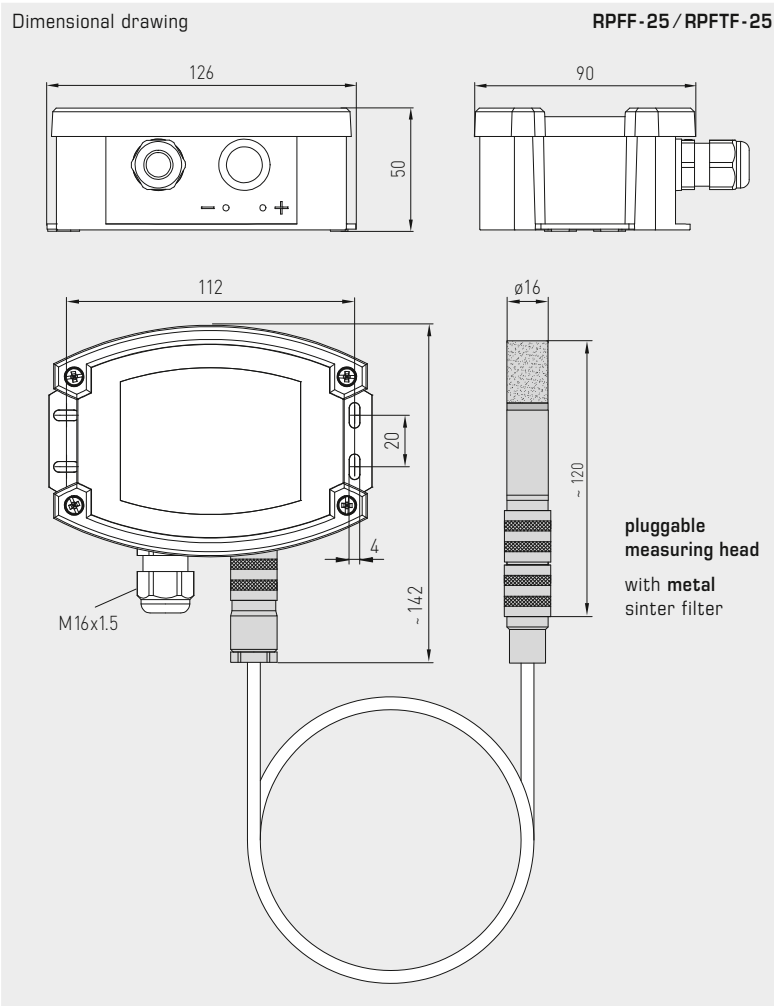
see last chapter



M12 connector
(optional on request)

MF-16-K
Mounting flange,
plastic
(optional)





RPFF-25 / RPFTF-25 ($\pm 1.8\%$)
pluggable measuring head
with metal sinter filter
and display



Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

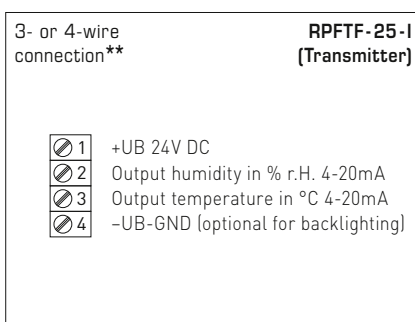
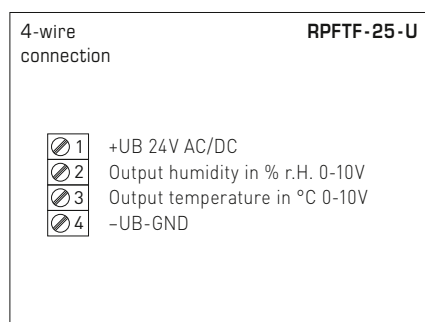
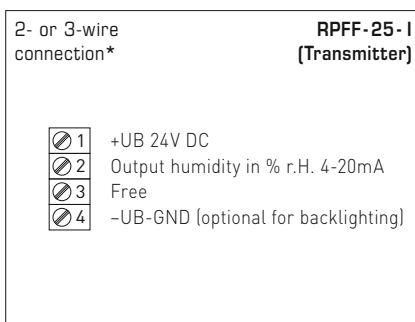
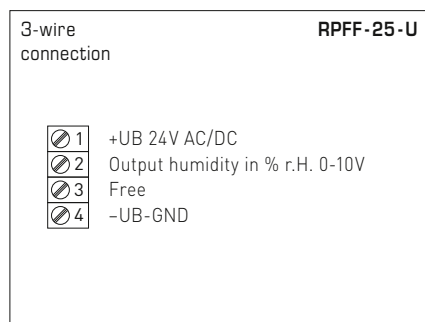
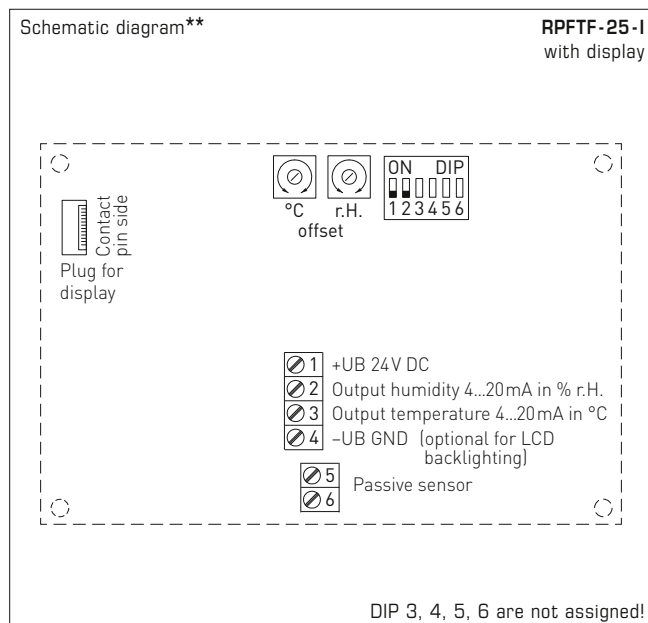
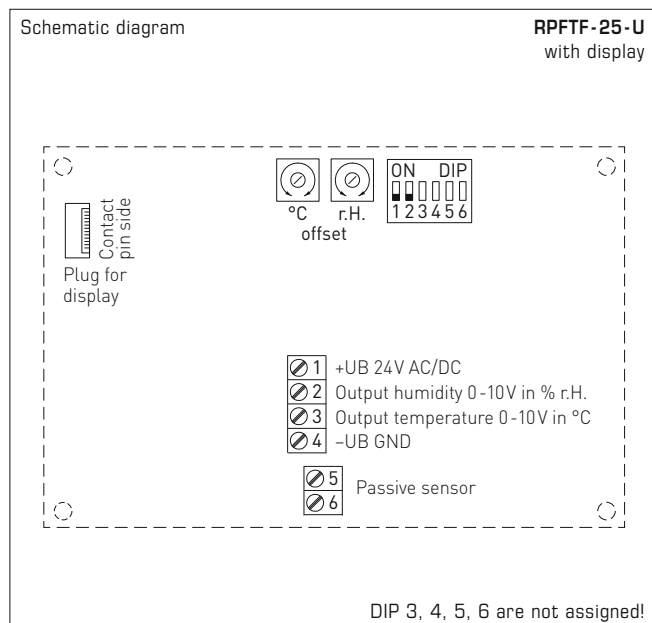
Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

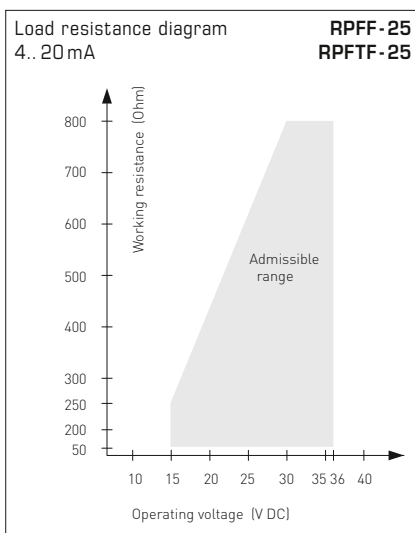
Humidity table
MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Pendulum room humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



Connection*:

- 2-wire connection for devices with / without display (not illuminated)
- 3-wire connection for devices with illuminated display

Connection**:

- 3-wire connection for devices with / without display (not illuminated)
- 4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!



RPFF-25 / RPFTF-25 ($\pm 1.8\%$)
with display



HYGRASGARD® RPFF - 25 Pendulum room humidity sensors, pluggable ($\pm 1.8\%$), *Deluxe*
HYGRASGARD® RPFTF - 25 Pendulum room humidity and temperature sensors, pluggable ($\pm 1.8\%$), *Deluxe*

Type / WG02	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
RPFF-25-I							I-variant
RPFF-25-I	0...100% r. H.	–	4... 20 mA	–		1201-7122-0000-100	364,83 €
RPFF-25-I LCD	0...100% r. H.	–	4... 20 mA	–	■	1201-7122-0400-100	408,77 €
RPFF-25-U							U-variant
RPFF-25-U	0...100% r. H.	–	0-10 V	–		1201-7121-0000-100	364,83 €
RPFF-25-U LCD	0...100% r. H.	–	0-10 V	–	■	1201-7121-0400-100	408,77 €
RPFTF-25-I							I-variant
RPFTF-25-I	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-7122-1000-100	383,93 €
RPFTF-25-I LCD	0...100% r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	1201-7122-1400-100	427,86 €
RPFTF-25-U							U-variant
RPFTF-25-U	0...100% r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7121-1000-100	383,93 €
RPFTF-25-U LCD	0...100% r. H.	(4x as above)	0-10 V	0-10 V	■	1201-7121-1400-100	427,86 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101						on request

ACCESSORIES			
MSK-25	Pluggable measuring head (sensor), stainless steel V2A (1.4301), metal sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable, as replacement element for RPFF-25/RPFTF-25	7201-1131-0000-000	189,72 €
MF-16-K	Mounting flange, plastic	7100-0030-0000-000	8,43 €

For further information see last chapter!

Showcase humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output

The calibratable humidity and temperature sensor **HYGRASGARD® VFF / VFTF** measures the relative humidity and temperature of air. It converts the measurands humidity and temperature into a standard signal of 0-10V or 4...20mA, and is available with / without an optional display. It is equipped with four switchable temperature ranges. Relative humidity (in % r.H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. The measuring transducers are designed for exact detection of temperature and humidity. A digital, long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

The showcase sensor is used in non-aggressive, dust-free environments and is specifically designed for installation in ceilings, walls, inside showcases or display cabinets in museums, galleries, cinemas or lecture halls or laboratories. The measuring element is contained inside a stainless steel probe and its low height (approx. 2.5 mm) makes it barely noticeable.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = $(U_b - 14 V) / 0.02 A$ for I variant
Load resistance:	$R_L > 5 k\Omega$ for U variant
Power consumption:	$< 1.1 VA / 24 V DC$; $< 2.2 VA / 24 V AC$
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability

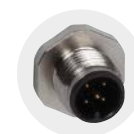
HUMIDITY

Measuring range, humidity:	0...100% r.H. (output corresponding to 0-10V or 4...20mA)
Operating range, humidity:	0...95% r.H. (without formation of dew)
Deviation in humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at $+25^\circ C$, otherwise $\pm 3.0\%$
Output, humidity:	0-10V for U variant 4...20 mA for I variant, see load resistance diagram

TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (see table) $-35...+35^\circ C$; $-35...+75^\circ C$; $0...+50^\circ C$; $0...+80^\circ C$ (output corresponding to 0-10V or 4...20mA)
Deviation, temperature:	typically $\pm 0.2 K$ at $+25^\circ C$
Output, temperature:	0-10V or 4...20mA
Ambient temperature:	storage $-5...+60^\circ C$; operation $-5...+60^\circ C$
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = 2 m
Sensor protection:	probe made of stainless steel, V4A (1.4571), pluggable ; sensor head $\varnothing = 17$ mm, H = approx. 2.5 mm; protective sleeve $\varnothing = 10$ mm, NL = approx. 25 mm, M10 x 1.0; with plastic plug connector $\varnothing =$ approx. 11 mm, NL = approx. 25 mm,
Mounting (sensor):	cut-out $\varnothing = 11 - 15$ mm, inserted length (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Protection class:	III (according to EN 60 730)
Protection type:	IP 67 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) IP 65 (according to EN 60 529) Probe
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line display with illumination , cut-out approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

VFF
VFTF



M12 connector
(optional on request)

VFF
VFTF

Probe made of stainless steel,
pluggable

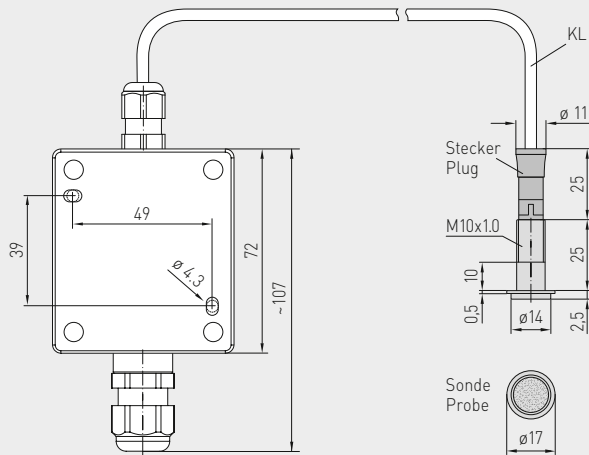
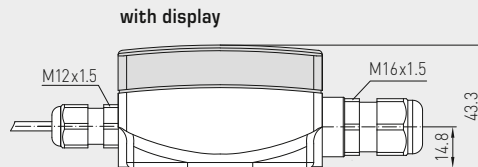
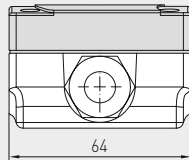
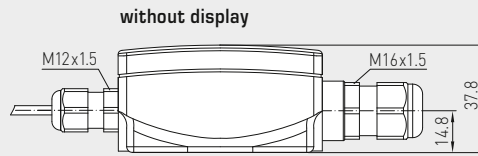
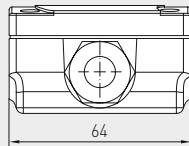




Dimensional drawing

VFF
VFTF

VFF
VFTF
with display



Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

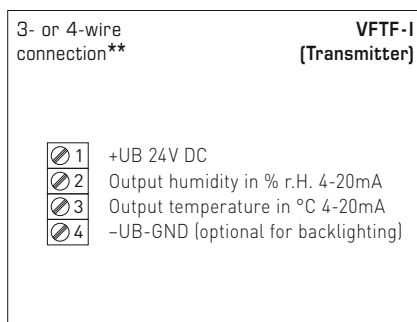
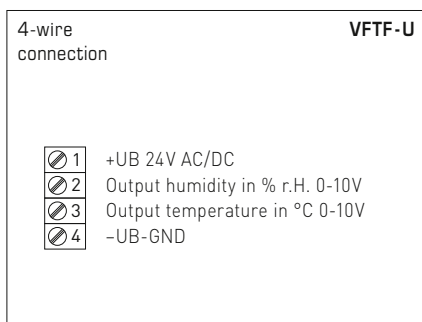
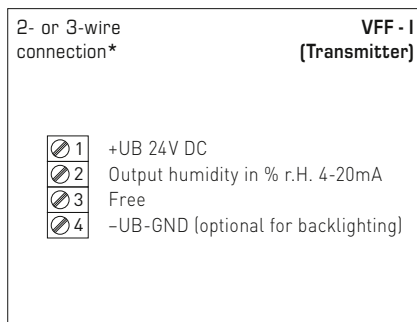
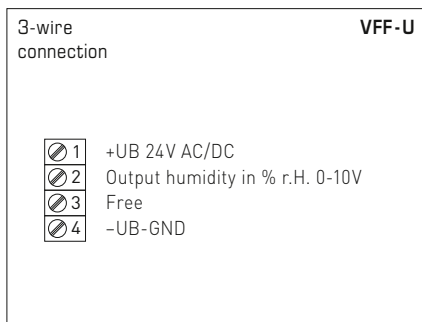
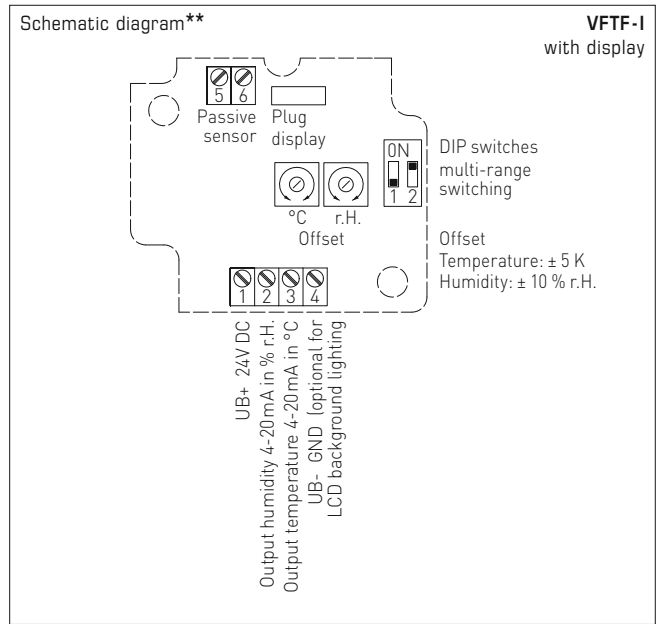
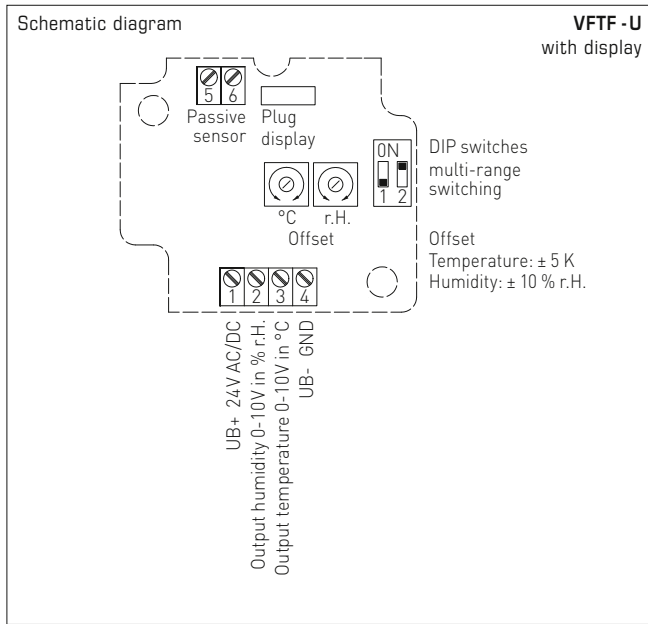
Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

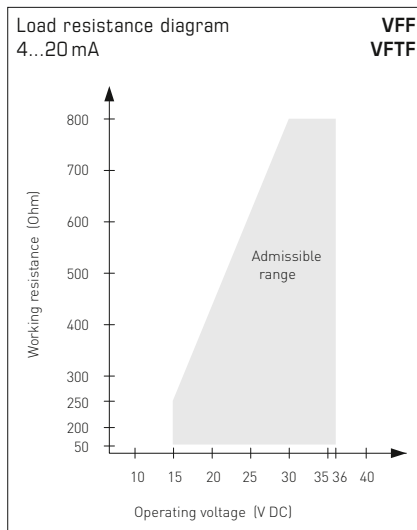
Humidity table
MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Showcase humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!



S+S REGELTECHNIK

HYGRASGARD® VFF
HYGRASGARD® VFTF

Showcase humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output

VFF
VFTF
with display



HYGRASGARD® VFF		Showcase humiditysensor ($\pm 2.0\%$), <i>Premium</i>				
HYGRASGARD® VFTF		Showcase humidity- and temperature sensor ($\pm 2.0\%$), <i>Premium</i>				
Type / WG02	Measuring Range / Readout	Output	Display	Item No.	Price	
	Humidity	Humidity	Temperature			
VFF-I						
VFF-I	0...100% r. H.	4...20mA	-	I-variant	1201-6122-0000-100 407,75 €	
VFF-I LCD	0...100% r. H.	4...20mA	-	■	1201-6122-0200-100 452,71 €	
VFF-U						
VFF-U	0...100% r. H.	0-10V	-	U-variant	1201-6121-0000-100 407,75 €	
VFF-U LCD	0...100% r. H.	0-10V	-	■	1201-6121-0200-100 452,71 €	
VFTF-I						
VFTF-I	0...100% r. H.	4...20mA	4...20mA	I-variant	1201-6122-1000-100 411,41 €	
					-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	
VFTF-I LCD	0...100% r. H.	4...20mA	4...20mA	■	1201-6122-1200-100 456,67 €	
VFTF-U						
VFTF-U	0...100% r. H.	0-10V	0-10V	U-variant	1201-6121-1000-100 411,41 €	
					-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	
VFTF-U LCD	0...100% r. H.	0-10V	0-10V	■	1201-6121-1200-100 456,67 €	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	

Room hygro-thermostat, mechanical, one-step

The mechanical room hygro-thermostat **HYGRASREG® RHT**, a room hygrostat with (bimetal) temperature controller, is used for controlling and monitoring the relative humidity (humidifying and dehumidifying) and the temperature in office and residential rooms, baths, winter gardens, labs, computer rooms, etc. RHT is applied in dust-free, pollutant-free, non-aggressive air.

RHT



TECHNICAL DATA

HYGROSTAT

Switching capacity: (Contact load)	24...230 V AC > 24 V in dry rooms only according to VDE 0110 Dehumidifying: 5 (0.2) A, min. 100 mA Humidifying: 3 (0.2) A, min. 100 mA
Setting range:	35...100% r. H.
Contact:	2 changeover contact
Sensor element:	plastic fibres
Tolerance:	max. 3% r. H.
Operating difference:	approx. 4% r. H.
Housing temperature:	0...+60°C

FUNCTION	Humidifying: wire terminals 5 and 6 Dehumidifying: wire terminals 5 and 7
-----------------	--

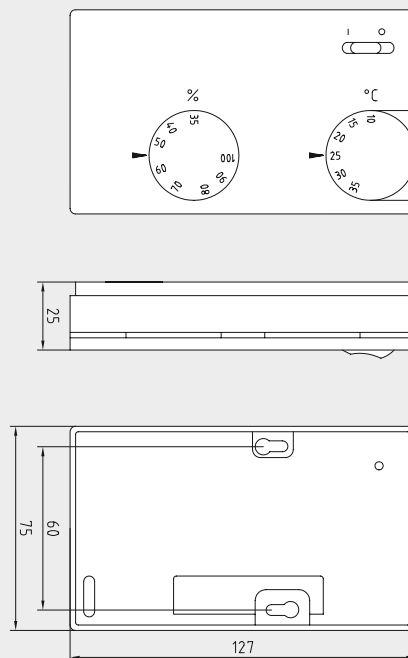
THERMOSTAT

Switching capacity:	10 (4) A, 24 / 230V AC
Control range:	+10...+35°C
Contact:	1 changeover contact (potential-free)
Sensor element:	bimetal, with thermal feedback
FUNCTION	Heating: wire terminals 2 and 5 Cooling: wire terminals 3 and 5

Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	127.5 x 75 x 28.6 mm
Installation:	wall mounting or on in-wall flush box, Ø 55 mm
Electrical connection:	0.14 - 2.5 mm ² , via terminal screws
Protection class:	II (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
ACCESSORIES	When mounting indoor room enclosures on in-wall flush boxes with horizontal fixing holes, adapter frame ARA 1.7 E must be included in the order.

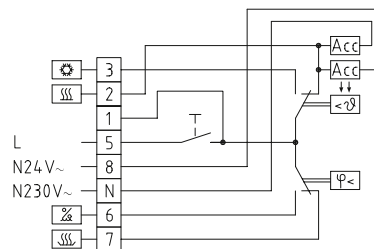
Dimensional drawing

RHT



Connecting diagram

RHT



HYGRASREG® RHT Room hygro-thermostat

Type/WG02	Setting Range	Steps	Features	Item No.	Price
RHT	Humidity	Temperature		External setting	
RHT-1	35...100% r. H.	+10...+35°C	one-step	main switch	1202-4010-0000-000 146,50 €
ACCESSORIES					
ARA 1,7 E	Adapter frame for in-wall flush boxes			7100-0060-4000-000	6,22 €

Mechanical room hygrostat **HYGRASREG® RH-2** with switching output (with single-pole microswitch as two-position controller with humidity sensor) working without external voltage, with humidity measuring element made of stabilized synthetic gauze, optional with setpoint setter for switchpoint adjustment (external or internal setting) in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. RH-2 is used for controlling and monitoring the relative humidity in office and residential rooms, baths, labs, control cabinets, computer rooms, etc., as minimum or maximum hygrostat. It is used in dust-free, pollutant-free, non-aggressive air.

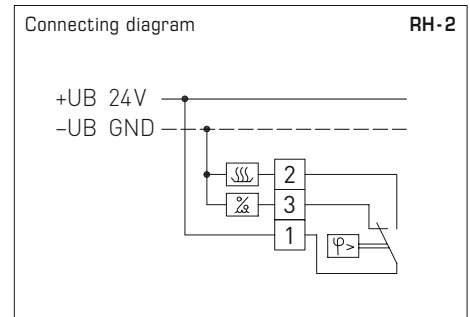
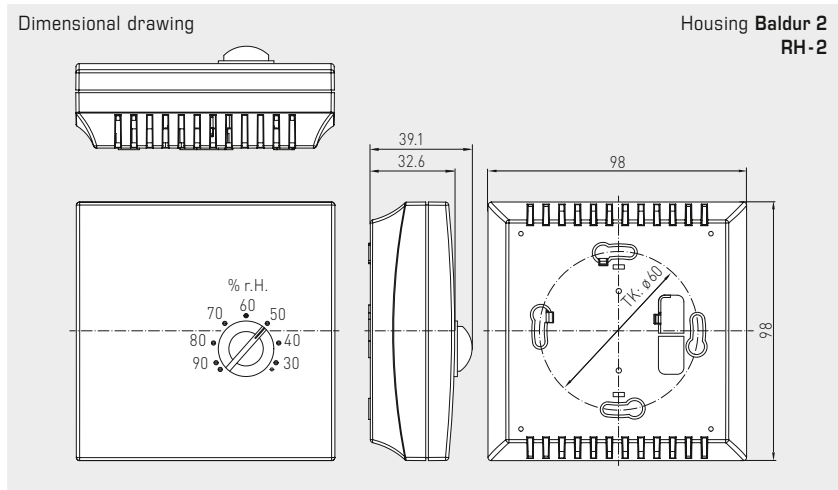
RH-2
(with external setting)



RH-2U
(with internal setting)



TECHNICAL DATA	
Switching capacity: (Contact load)	24 V AC/DC dehumidifying: 5 (0.2) A, min. 100 mA humidifying: 3 (0.2) A, min. 100 mA
Setting range:	25 ... 95 % r. H.
Contact:	1 changeover contact
Sensor element:	plastic fibres
Operating difference:	approx. 4 % r. H.
Tolerance:	max. 3 % r. H.
Housing temperature:	0...+40 °C
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 39 mm (Baldur 2, with Potentiometer)
Electrical connection:	0.14 - 2.5 mm ² , via terminal screws
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	humidifying: wire terminals 1 and 3 dehumidifying: wire terminals 1 and 2



HYGRASREG® RH-2 Room hygrostat, <i>Standard</i>						
Type/WG01	Setting Range Humidity	Hysteresis	Output	Steps	Item No.	Price
RH-2						External setting
RH-2	25...95 % r. H.	approx. 4 % r. H.	1x Changeover contact	one-step	1202-40C0-0010-000	73,19 €
RH-2 U						Internal setting
RH-2 U	25...95 % r. H.	approx. 4 % r. H.	1x Changeover contact	one-step	1202-40C0-0020-000	75,43 €

Room hygrostats and humidity and temperature sensors ($\pm 2.0\%$), electronic, two-step, with continuous / switching outputs

Electronic room hygrostat and/or room thermostat **HYGRASREG® RHT-30** with one continuous and two switching outputs, adjustable switching thresholds, with / without optional display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class $\pm 2.0\%$ r.H.). The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The RHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$), 15...36 V DC
Load resistance:	$R_L > 5 \text{ k}\Omega$
Power consumption:	$< 1,5 \text{ VA} / 24 \text{ V DC}$, $< 3,5 \text{ VA} / 24 \text{ V AC}$
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Setting range:	5...95% r.H. (Humidity) +5...+45°C (Temperature) (switch steps 1 and 2 are separately adjustable)
Operating difference:	Mode 1: both switch steps are freely adjustable (rel. humidity) Mode 2: 5% between both switch steps (rel. humidity) Mode 3: both switch steps freely adjustable (temperature) Mode 4: switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DIP switches)
Output:	potential-free changeover contacts (2x changeover contact 24 V, 1A ohmic load, separately adjustable, 1x 0 - 10V)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at +25°C, otherwise $\pm 3.0\%$
Deviation, temperature:	typically $\pm 0.2 \text{ K}$ at +25°C
Ambient temperature:	storage -35...+85°C; operation -30...+70°C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimensions:	98 x 98 x 35 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, $\varnothing 55 \text{ mm}$, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Standards:	CE conformity, EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36x15 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature respectively for setpoint adjustment

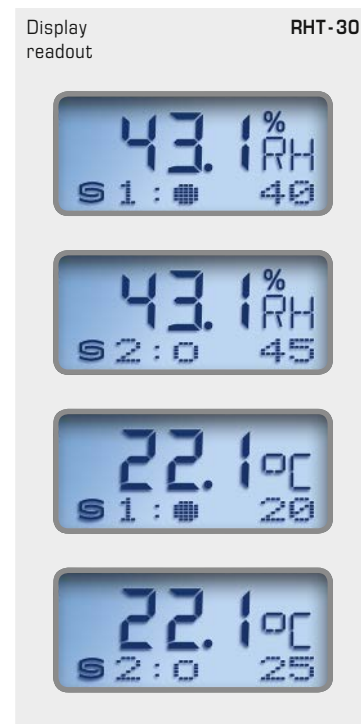
FUNCTION

Humidifying/heating:	1st step: wire contacts 11 - 12. If actual humidity falls more than 3% r.H. / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. 2. step: wire contacts 21 - 22. If actual humidity falls more than 3% r.H. / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / temperature
Dehumidifying/cooling:	1st step: wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. 2. step: wire contacts 21 - 23. When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / temperature

The **1st line** of the display shows the **ACTUAL humidity** in % r.H. and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. Resolution: 1/10 % r.H. or 1/10 °C.

The **2nd line** shows information about the **switching status of the relay** (as a circuit), and indicates the **switching value** in % r.H. or °C (adjustable via the corresponding set potentiometer). The readouts of the switching thresholds for the first and second relay are displayed alternately at an interval of twenty seconds.

For improved legibility, backlighting is provided.

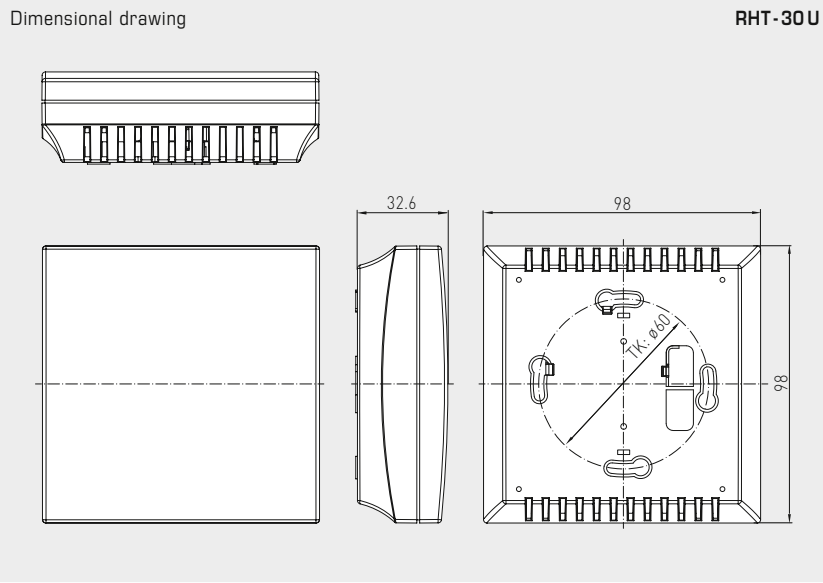




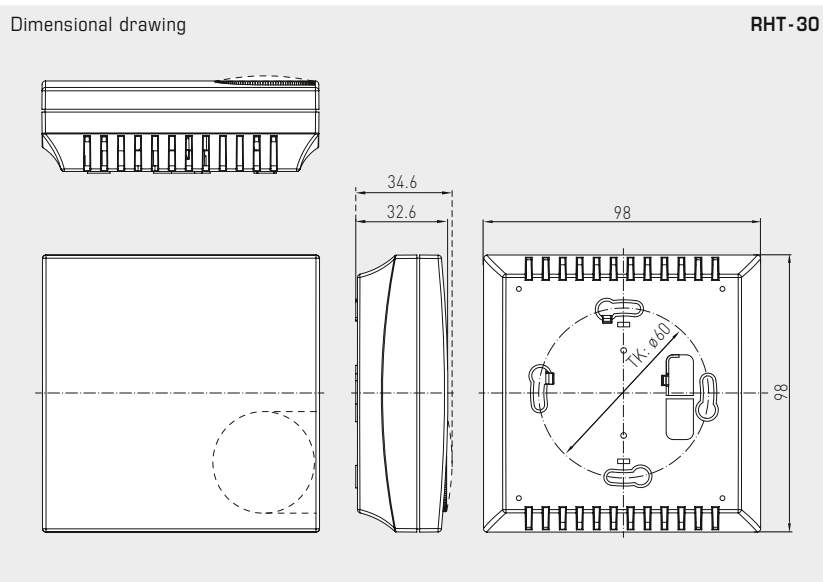
S+S REGELTECHNIK

HYGRASREG® RHT - 30

Room hygrostats and humidity and temperature sensors ($\pm 2.0\%$), electronic, two-step, with continuous / switching outputs



RHT-30U
with internal setting



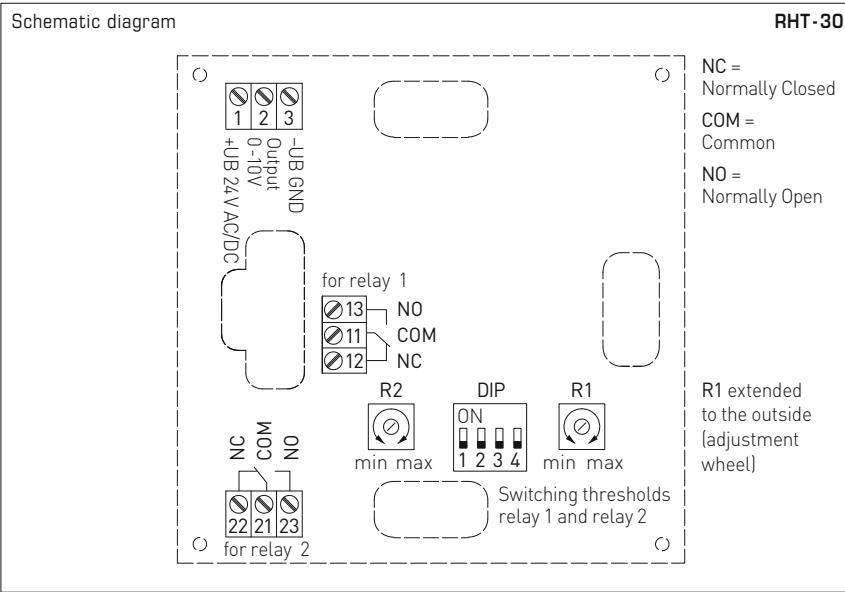
RHT-30



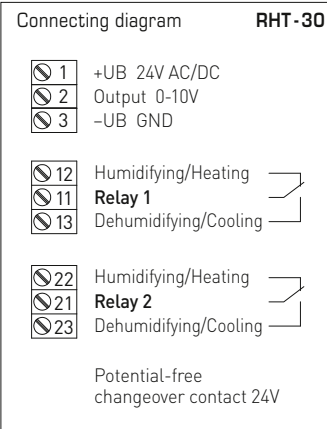
RHT-30
with display



Room hygrostats and humidity and temperature sensors ($\pm 2.0\%$), electronic, two-step, with continuous / switching outputs

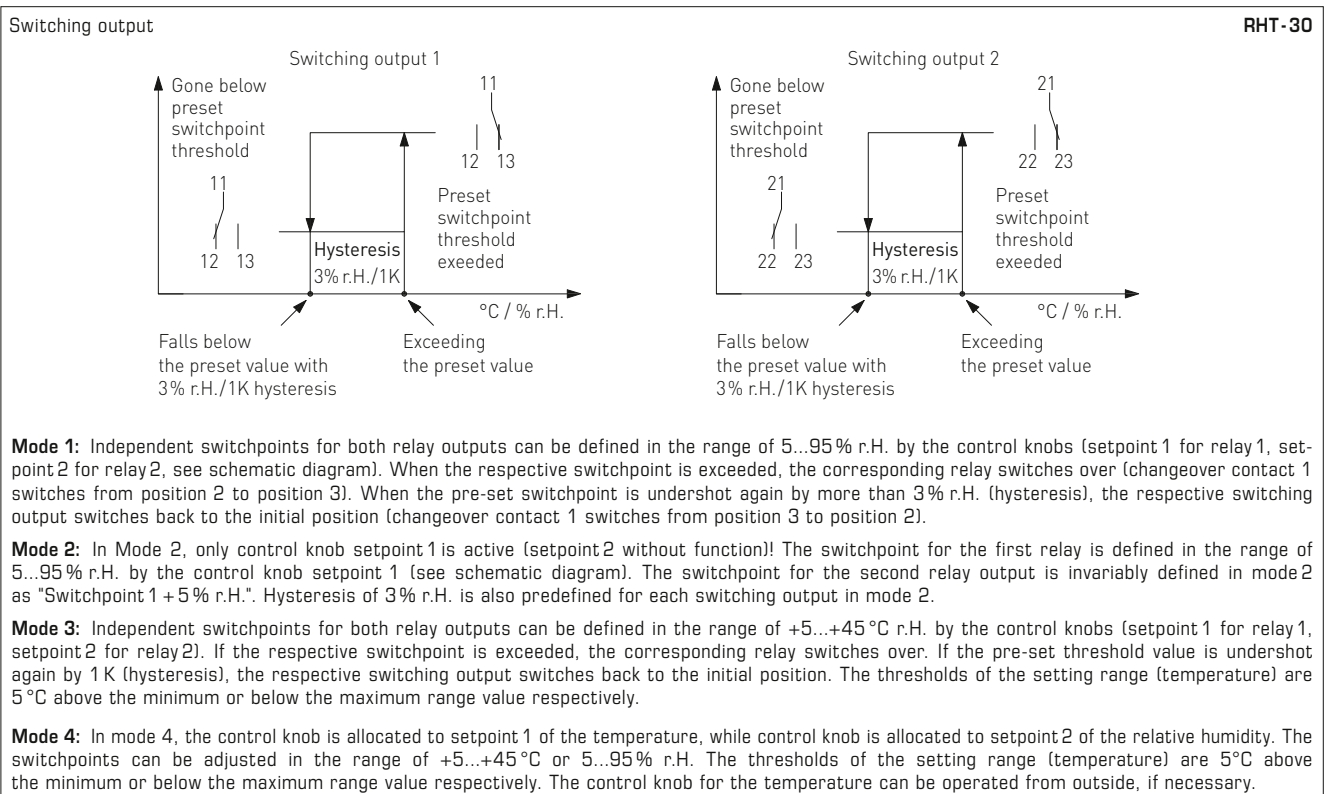


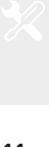
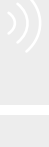
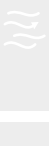
DIP switches	RHT-30	
Function mode	DIP 1	DIP 2
Mode 1 (2x 5...95% r.H.) (default)	OFF	OFF
Mode 2 (5...95% r.H. + 5% r.H.)	ON	OFF
Mode 3 (2x +5...+45°C)	OFF	ON
Mode 4 (5...95% r.H./+5...+45°C)	ON	ON
Output	DIP 3	
Temperature	ON	
Relative humidity (default)	OFF	
Backlighting	DIP 4	
activated	ON	
deactivated (default)	OFF	



Supply	AC	DC
→ 1	24 V~	24 V DC
→ 3	0 V	GND

12 (A1) →	Relay 1 Breaker contact
11 (W1) →	Relay 1 Changeover contact
13 (B1) →	Relay 1 Normally open contact
22 (A2) →	Relay 2 Breaker contact
21 (W2) →	Relay 2 Changeover contact
23 (B2) →	Relay 2 Normally open contact





RHT-30 with display



Humidity table

MR: 0 ...100% r. H.

% r.H.	U _A in V	% r.H.	U _A in V
0	0.0	50	5.0
5	0.5	55	5.5
10	1.0	60	6.0
15	1.5	65	6.5
20	2.0	70	7.0
25	2.5	75	7.5
30	3.0	80	8.0
35	3.5	85	8.5
40	4.0	90	9.0
45	4.5	95	9.5
Continued at the right...		100	10.0

Temperature table

MR: 0 ...+50 °C

°C	U _A in V
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

HYGRASREG® RHT - 30 Room hygrostats and humidity and temperature sensors ($\pm 2.0\%$)							
Type / WG02	Setting Range		Output	Steps	Display	Item No.	Price
	Humidity	Temperature					
RHT-30							External setting
RHT-30W	5...95% r. H.	+5...+45 °C	2x Changeover contact, 1x 0-10V	two-step		1202-4077-1011-200	162,89 €
RHT-30W LCD	5...95% r. H.	+5...+45 °C	2x Changeover contact, 1x 0-10V	two-step	■	1202-4077-1211-200	174,60 €
RHT-30-U							Internal setting
RHT-30W U	5...95% r. H.	+5...+45 °C	2x Changeover contact, 1x 0-10V	two-step		1202-4077-1021-200	160,54 €

**On-wall hygrostats and humidity sensors ($\pm 2.0\%$),
electronic, one-step,
with switching outputs**

AH-40
with display and
metal sinter filter
(optional)

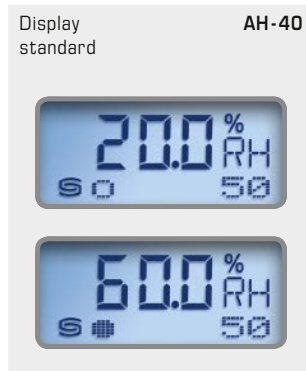
Electronic hygrostat and humidity sensor **HYGRASREG® AH-40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class $\pm 2.0\%$ r.H.) and for setting the target humidity.

It is suitable for controlling and monitoring the relative air humidity, e.g. in laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The AH-40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.



TECHNICAL DATA

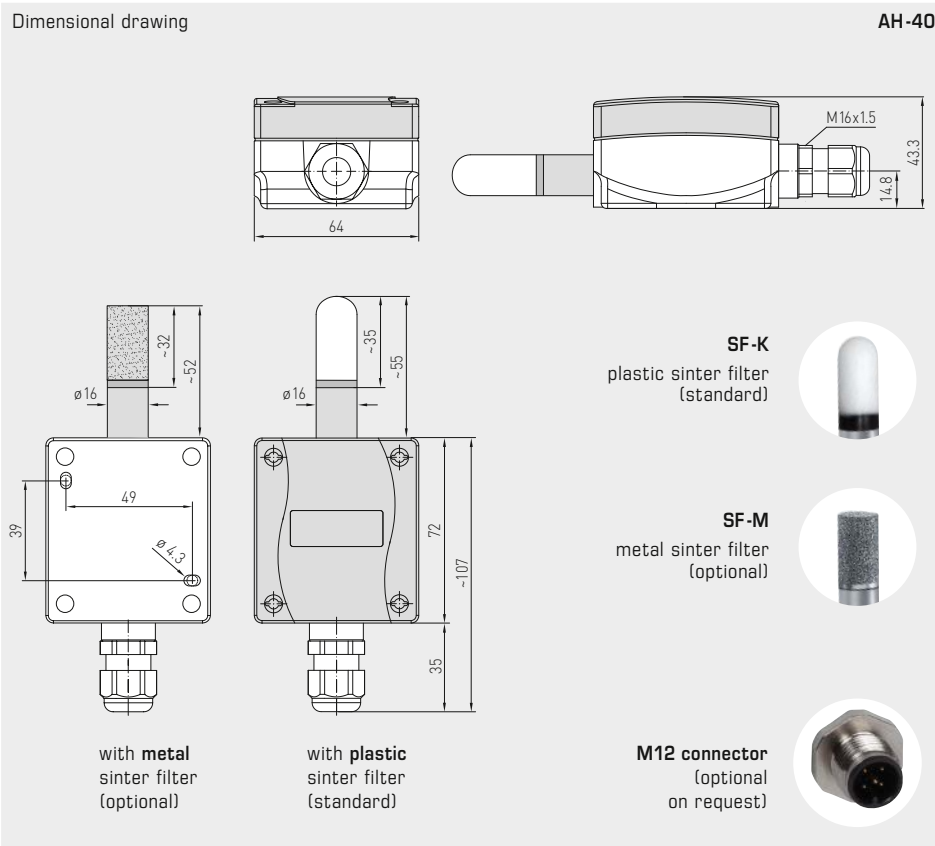
Power supply:	24 V AC ($\pm 20\%$) 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC < 2.2 VA / 24 V AC
Sensors:	digital humidity sensor , small hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, \varnothing 16 mm, L = 32 mm)
Setting range:	5...95% r.H.
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at +25 °C, otherwise $\pm 3.0\%$
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 with display)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (1.4301), \varnothing 16 mm, NL = 55 mm
Prozessanschluss:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014/30/EU
Display:	two-line display with illumination , cutout approx. 36x15 mm (W x H), for displaying actual humidity and for setting the target humidity
Displaying:	The 1 st line of the display shows the relative humidity . The 2 nd line shows on the left side the information regarding the switching status of the relay (as a circuit), as well as the switching value readout in % r.H. on the right side (adjustable using the set potentiometer). ○ Circuit, empty = relay in idle state ● Circuit, full = relay energised
FUNCTION	actual humidity < switching value contact 11-12 closed (LED OFF) actual humidity > switching value contact 11-13 closed (LED ON)



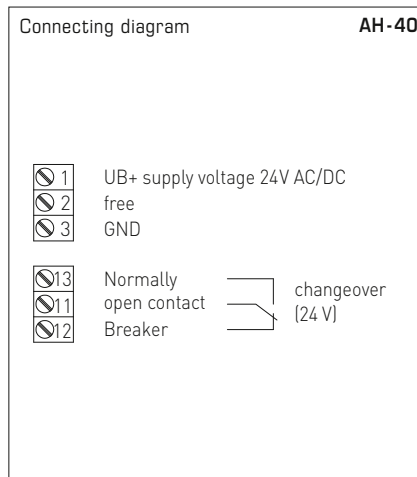
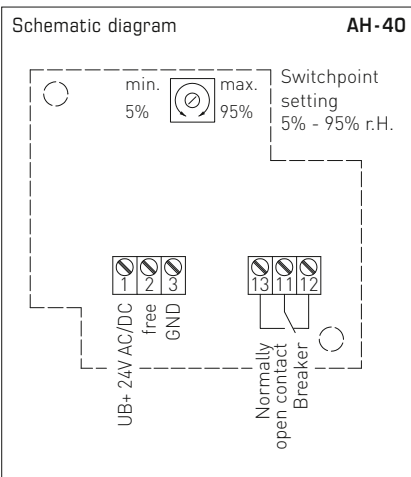


S+S REGELTECHNIK

On-wall hygrometers and humidity sensors ($\pm 2.0\%$),
electronic, one-step,
with switching outputs



AH-40
with display and
plastic sinter filter
(standard)



HYGRASREG® AH-40 On-wall hygrometers and humidity sensors ($\pm 2.0\%$), Premium						
Type / WG01	Setting Range Humidity	Output	Steps	Display	Item No.	Price
AH-40-U						
AH-40W LCD	5...95% r.H.	1 x Changeover contact	one-step	■	1202-1065-0221-000	159,97 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request
ACCESSORIES						
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)				7000-0050-2200-100	37,32 €

**On-wall hygrometers and
humidity and temperature sensors ($\pm 2.0\%$),
electronic, two-step, with multi-range switching
and continuous/switching output**

Electronic on-wall thermostat and/or on-wall thermostat **HYGRASREG® AHT-30** with a continuous and two switching outputs, adjustable switching thresholds and display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class $\pm 2.0\%$ r.H.). The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The AHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC / DC ($\pm 20\%$)
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, \varnothing 16 mm, L = 32 mm)
Setting range:	5...95% r.H. (humidity) Multi-range switching with 4 switchable measuring ranges (see table) -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C (temperature) (Switch steps 1 and 2 are separately adjustable)
Operating difference:	Mode 1: both switch steps are freely adjustable (rel. humidity) Mode 2: 5% between both switch steps (rel. humidity) Mode 3: both switch steps freely adjustable (temperature) Mode 4: switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DiP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1 A ohmic load, separately adjustable, 2x 0 - 10 V for U variant or 4...20 mA for I variant)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80% r. H.) at +25 °C, otherwise $\pm 3.0\%$
Deviation, temperature:	typically ± 0.4 K at +25 °C
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (1.4301), \varnothing 16 mm, NL = 55 mm (see dimensional drawing)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Standards:	CE conformity, EMC directive 2014 / 30 / EU
Display:	three-line display with illumination , cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment

FUNCTION

Humidifying/heating:	1st step: wire contacts 11 - 12. If actual humidity falls more than 3% r.H. / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. 2nd step: wire contacts 21 - 22. If actual humidity falls more than 3% r.H. / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / terminal 3: output temperature
Dehumidifying/cooling:	1st step: wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. 2nd step: wire contacts 21 - 23. When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / terminal 3: output temperature



On-wall hygrometers and humidity and temperature sensors ($\pm 2.0\%$), electronic, two-step, with multi-range switching and continuous/switching output



Dimensional drawing **AHT-30**

SF-K
plastic sinter filter
(standard)

SF-M
metal sinter filter
(optional)

M12 connector
(optional on request)

AHT-30
with display and plastic sinter filter (standard)



AHT-30
with display and metal sinter filter (optional)



WS-03

Weather and sun protection hood (optional)



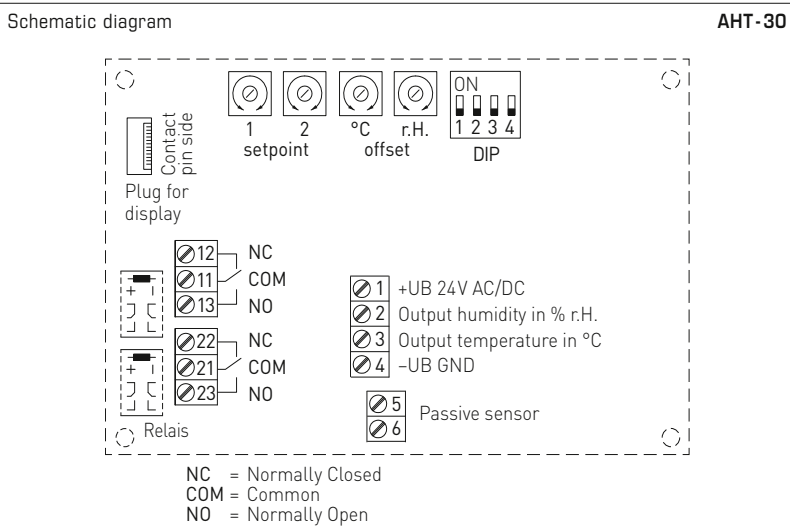
Display readout

The **1st line** of the display shows the **ACTUAL humidity** in % r.H. and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. The resolution is 1/10 % r.H. or 1/10 °C.

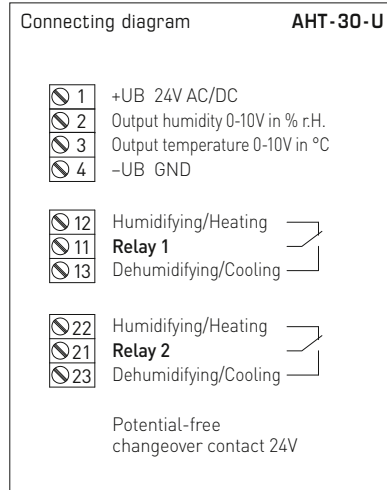
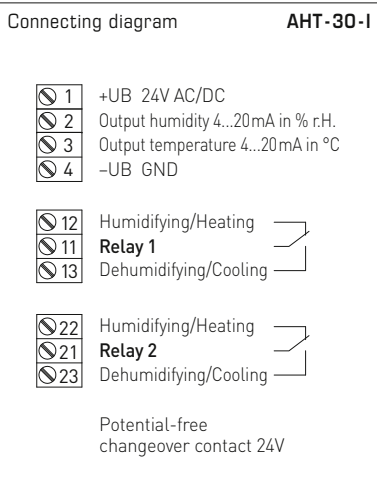
The **3rd line** shows information about the **switching status of relay 1 and 2** (as circuits) on the left, and on the right for the **switching values of relay 1 and 2** in % r.H. or °C (adjustable via the corresponding set potentiometer). The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

For improved legibility, backlighting is provided.

On-wall hygromats and humidity and temperature sensors ($\pm 2.0\%$), electronic, two-step, with multi-range switching and continuous/switching output



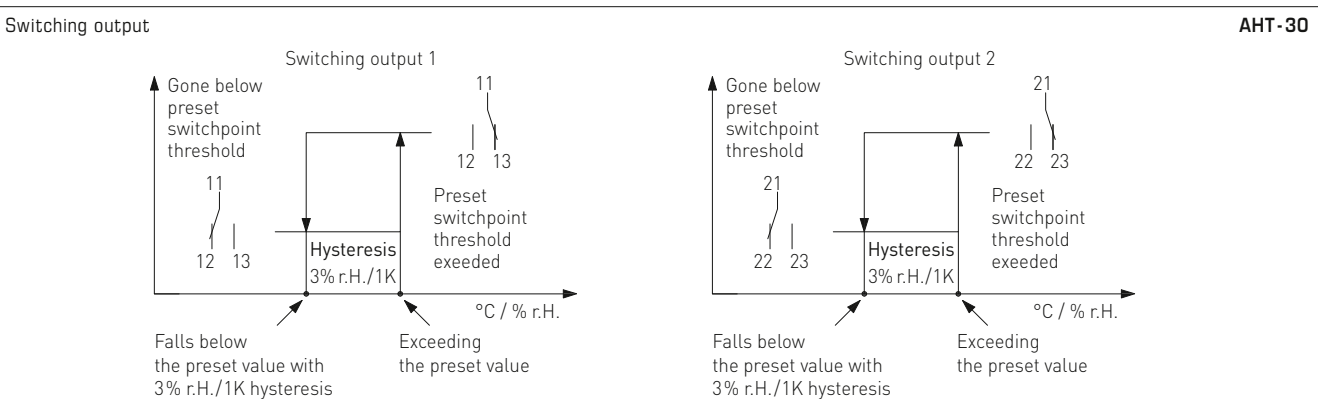
DIP switches	AHT-30	
Function mode	DIP 1	DIP 2
Mode 1 (2x 5...95% r.H.) (default)	OFF	OFF
Mode 2 (5...95% r.H. + 5% r.H.)	ON	OFF
Mode 3 (2x -35...+80 °C)	OFF	ON
Mode 4 (5...95% r.H. / -35...+80 °C)	ON	ON
Temperature range	DIP 3	DIP 4
-35...+35 °C	OFF	OFF
0...+80 °C	ON	OFF
0...+50 °C (default)	OFF	ON
-35...+75 °C	ON	ON



Supply	AC	DC
→ 1	24 V~	24 V DC
→ 4	0V	GND

12 (A1) →	Relay 1 Breaker contact
11 (W1) →	Relay 1 Changeover contact
13 (B1) →	Relay 1 Normally open contact

22 (A2) →	Relay 2 Breaker contact
21 (W2) →	Relay 2 Changeover contact
23 (B2) →	Relay 2 Normally open contact



Mode 1: Independent switchpoints for both relay outputs can be defined in the range of 5...95% r.H. by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3% r.H. (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

Mode 2: In Mode 2, only control knob setpoint 1 is active (setpoint 2 without function)! The switchpoint for the first relay is defined in the range of 5...95% r.H. by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5% r.H.". Hysteresis of 3% r.H. is also predefined for each switching output in mode 2.

Mode 3: Independent switchpoints within the temperature range (selectable via DIP switches) for both relay outputs can be defined by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

Mode 4: In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be set within the temperature range (selectable via DIP switches) or from 5...95% r.H. (humidity). The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.



AHT-30 with display



Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASREG® AHT-30 On-wall hygrometer and humidity and temperature sensor ($\pm 2.0\%$), *Deluxe*

Type / WG02	Setting Range Humidity Temperature	Output	Steps	Display	Item No.	Price
AHT-30-I I-variant						
AHT-30W-I LCD	5...95 % r. H. -35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 4...20 mA	two-step	■	1202-7127-2421-000	207,95 €
AHT-30-U U-variant						
AHT-30W-U LCD	5...95 % r. H. -35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 0-10 V	two-step	■	1202-7127-1421-000	207,95 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	
ACCESSORIES						
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)				7000-0050-2200-100	37,32 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)				7100-0040-6000-000	39,45 €

Duct hygrostats including mounting flange, mechanical, one-step, with switching output

Mechanical duct hygrostat **HYGRASREG® KH-10** with switching output as one-step hygrostat. It works without external voltage and is used for controlling and monitoring the relative humidity in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc. to control humidifying and dehumidifying equipment, as minimum guard, or maximum hygrostat. KH-10 is applied in dust-free, pollutant-free, non-aggressive air.

KH-10-U
(with internal setting)

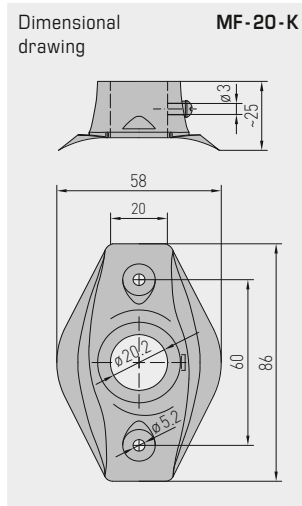
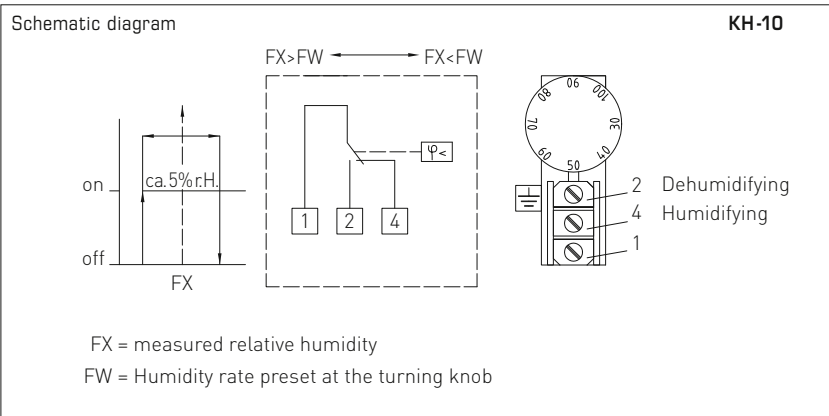


TECHNICAL DATA

Switching capacity: (Contact load)	15 (2) A; 24...250V AC, min. 100 mA > 24 V in dry rooms only according to VDE 0110
Setting range:	35...100 % r. H.
Contact:	dust-proof microswitch as single-pole, potential-free changeover contact (gold-plated optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Ambient temperature:	0...+60 °C
Operating difference:	approx. 3...6 % r. H.
Measuring accuracy:	typically ± 4 % r. H.
Controlled medium:	air, unpressurised, non-aggressive
Average temperature coefficient:	0.2 % / K; at +20 °C and 50 % r. H.
Flow rate:	max. 8 m / s
Sensor sleeve:	made of brass nickel-plated, Ø 20 mm, NL = 223 mm
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

Humidifying:	Wire contacts 1 - 4. Switch points ON/OFF are approx. 2.5 % r. H. above or below the selected value.
Dehumidifying:	Wire contacts 1 - 2. Switch points ON/OFF are approx. 2.5 % r. H. above or below the selected value.





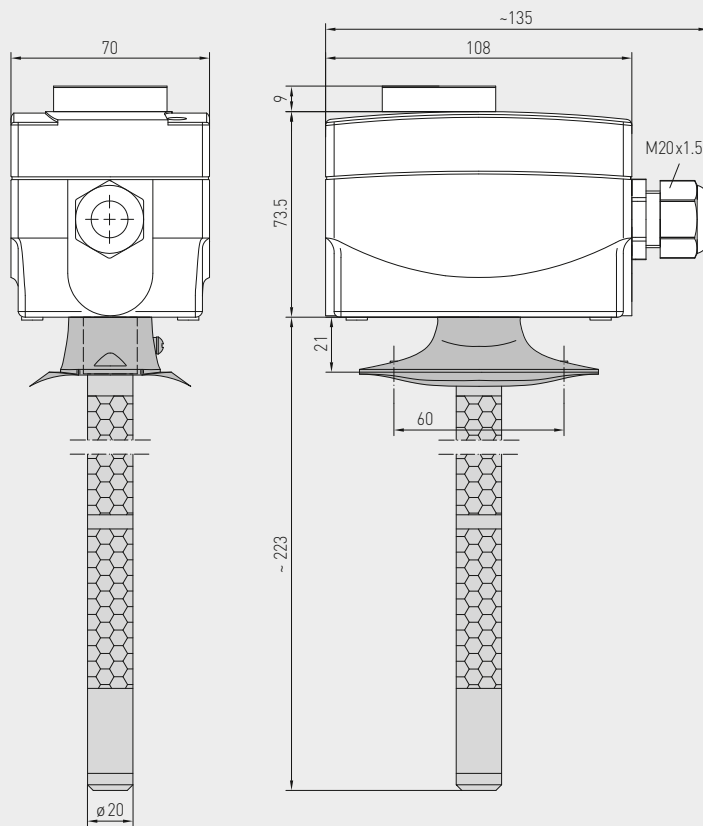
S+S REGELTECHNIK

HYGRASREG® KH-10

Duct hygrostats including mounting flange, mechanical, one-step, with switching output



Dimensional drawing



KH-10

KH-10
(with external setting)



MF-20-K

Mounting flange, plastic



HYGRASREG® KH-10 Duct hygrostats, mechanical, <i>Standard</i>					
Type / WG01	Setting Range Humidity	Steps	Features	Item No.	Price
KH-10				External setting	
KH-10	35...100% r.H.	one-step	–	1202-3012-0010-000	202,26 €
KH-10-U				Internal setting	
KH-10 U	35...100% r.H.	one-step	Setpoint setter concealed	1202-3012-0020-000	200,11 €
ACCESSORIES					
MF-20-K	Mounting flange for KH, plastic, for duct installation (included in the scope of delivery)			7100-0030-4000-000	8,43 €
WH-20	Wall bracket for KH for on-wall mounting			1200-0010-4000-000	11,00 €
For further information see last chapter!					

Duct hygrostats and humidity sensors ($\pm 2.0\%$), including mounting flange, electronic, one-step, with switching outputs

Electronic hygrostat and humidity sensor **HYGRASREG® KH-40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class $\pm 2.0\%$ r.H.) and for setting the target humidity. It is suitable for controlling and monitoring the relative air humidity, e.g. in ventilation and air conditioning ducts, laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The KH-40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	digital humidity sensor , small hysteresis, high long-term stability
Sensor protection:	plastic sinter filter , \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter , \varnothing 16 mm, L = 32 mm)
Setting range:	5...95 % r. H.
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Deviation, humidity:	typically $\pm 2.0\%$ (20...80 % r. H.) at +25 °C, otherwise $\pm 3.0\%$
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, \varnothing 20 mm, NL = 235 mm, $v_{max} = 30$ m/s (air) (on request, optional stainless steel V2A (1.4301), \varnothing 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Display:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1st line of the display shows the relative humidity . The 2nd line shows on the left side the information regarding the switching status of the relay (as a circuit), as well as the switching value readout in % r.H. on the right side (adjustable using the set potentiometer). ○ Circuit, empty = relay in idle state ● Circuit, full = relay energised
FUNCTION	actual humidity < switching value contact 11-12 closed (LED OFF) actual humidity > switching value contact 11-13 closed (LED ON)

SF-K
Plastic sinter filter
(standard)



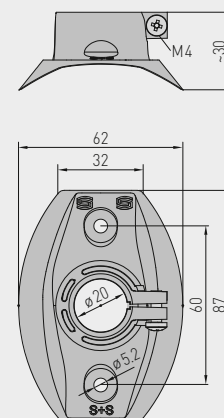
SF-M
Metal sinter filter
(optional)



MFT-20-K
Mounting flange,
plastic



Dimensional drawing **MFT-20-K**



Display standard **KH-40**

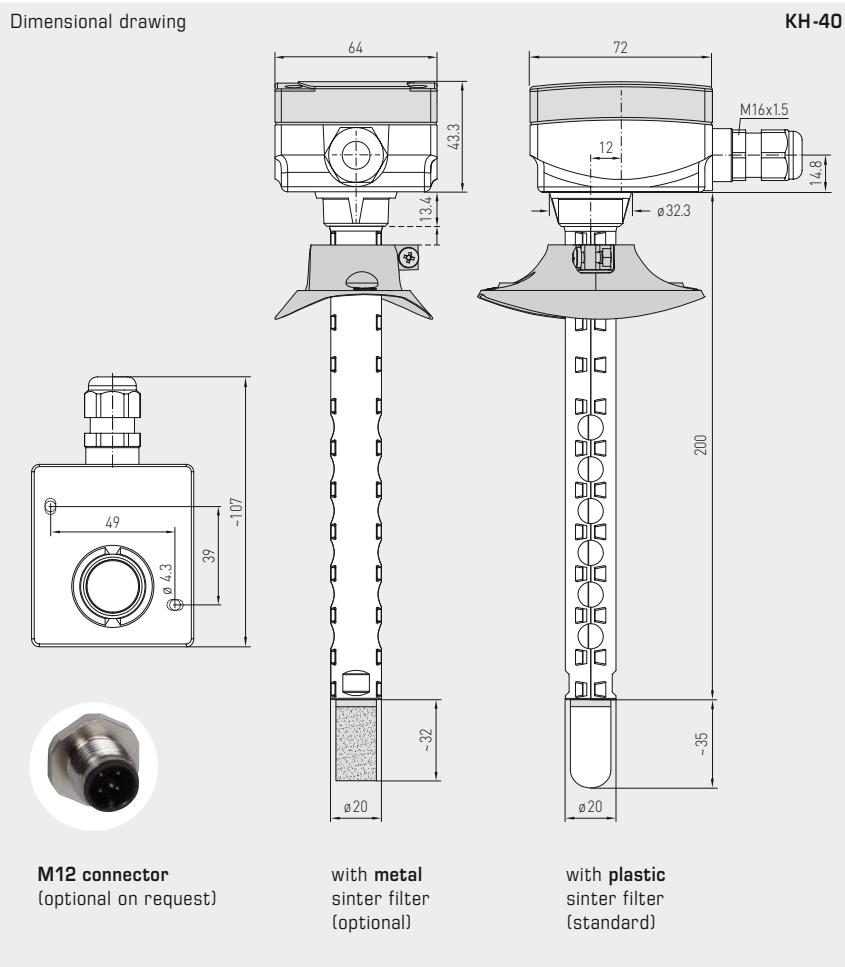




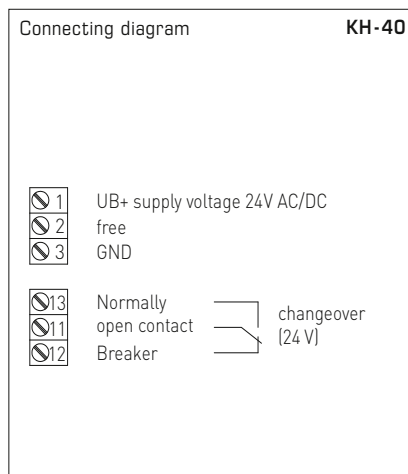
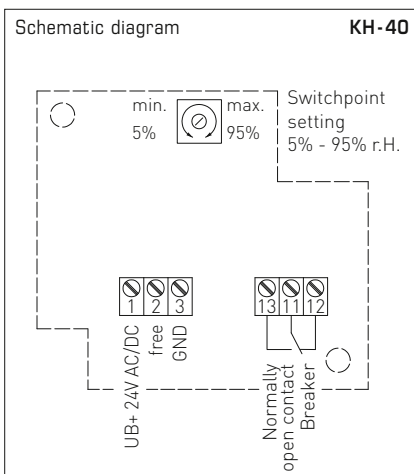
S+S REGELTECHNIK

HYGRASREG® KH-40

Duct hygrostats and humidity sensors ($\pm 2.0\%$), including mounting flange, electronic, one-step, with switching outputs



KH-40 with display and plastic sinter filter (standard)



HYGRASREG® KH-40 Duct hygrostats and humidity sensors ($\pm 2.0\%$), Premium						
Type/WG01	Setting Range Humidity	Output	Steps	Display	Item No.	Price
KH-40						
KH-40W LCD	5...95% r.H.	1 x Changeover contact	one-step	■	1202-3065-0221-000	161,03 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	
ACCESSORIES						
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)				7000-0050-2200-100	37,32 €

Duct hygrostats and humidity and temperature sensors ($\pm 2.0\%$), incl. mounting flange, electronic, two-step, with multi-range switching and continuous/switching output

Electronic duct hygrostat and/or duct thermostat **HYGRASREG® KHT-30** with a continuous and two switching outputs, adjustable switching thresholds and display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class $\pm 2.0\%$ r.H.). The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The KHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

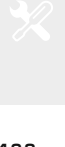
Power supply:	24 V AC/DC ($\pm 20\%$)
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, \varnothing 16 mm, L = 32 mm)
Setting range:	5...95 % r.H. (humidity) Multi-range switching with 4 switchable measuring ranges (see table) -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C (temperature) (Switch steps 1 and 2 are separately adjustable)
Operating difference:	Mode 1: both switch steps are freely adjustable (rel. humidity) Mode 2: 5 % between both switch steps (rel. humidity) Mode 3: both switch steps freely adjustable (temperature) Mode 4: switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DIP switches)
Output:	potential-free changeover contacts (2x changeover contact 24 V, 1A ohmic load, separately adjustable, 2x 0-10V for U variant or 4...20mA for I variant)
Deviation, humidity:	typically $\pm 2.0\%$ (20...80 % r.H.) at +25 °C, otherwise $\pm 3.0\%$
Deviation, temperature:	typically $\pm 0.2\text{K}$ at +25 °C
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Ty2)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, \varnothing 20 mm, NL = 235 mm, $v_{\text{max}} = 30$ m/s (air) (optional available on request stainless steel V2A (1.4301), \varnothing 16 mm)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Standards:	CE conformity, EMC directive 2014/30/EU
Display:	three-line display with illumination , cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment

FUNCTION

Humidifying/heating:	1st step: wire contacts 11 - 12. If actual humidity falls more than 3 % r.H. / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. 2nd step: wire contacts 21 - 22. If actual humidity falls more than 3 % r.H. / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / terminal 3: output temperature
Dehumidifying/cooling:	1st step: wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. 2nd step: wire contacts 21 - 23. When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / terminal 3: output temperature



Duct hygrostats and humidity and temperature sensors ($\pm 2.0\%$), incl. mounting flange, electronic, two-step, with multi-range switching and continuous/switching output



Dimensional drawing KHT-30

SF-K
plastic sinter filter
(standard)

SF-M
metal sinter filter
(optional)

M12 connector
(optional on request)



KHT-30
with display and plastic sinter filter (standard)



KHT-30
with display and metal sinter filter (optional)

Dimensional drawing MFT-20-K



MFT-20-K
Mounting flange, plastic

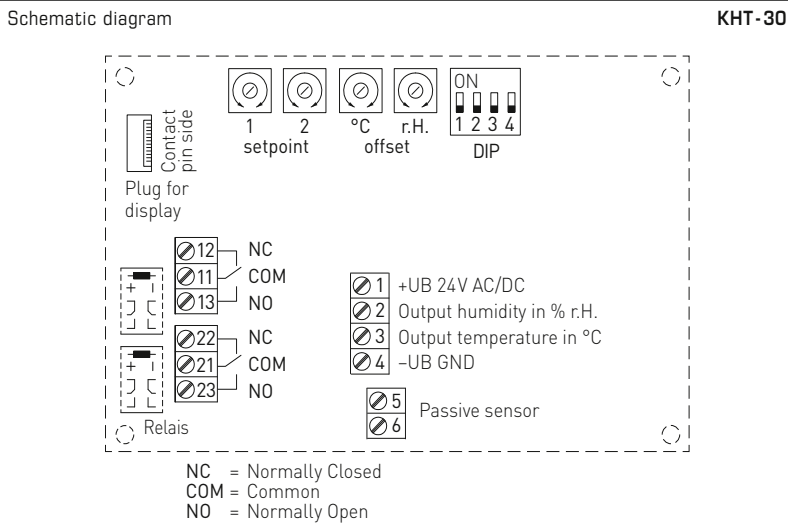
Display readout

The **1st line** of the display shows the **ACTUAL humidity** in % r.H. and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. The resolution is 1/10 % r.H. or 1/10 °C.

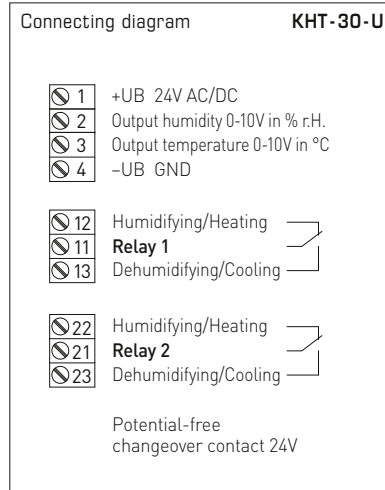
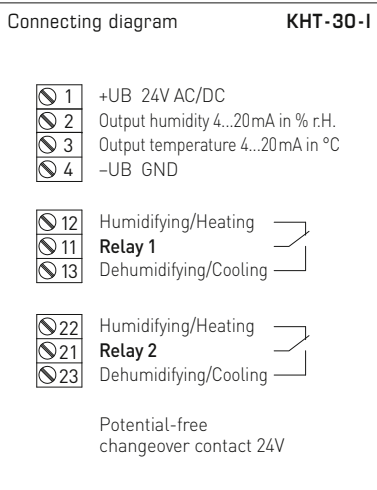
The **3rd line** shows information about the **switching status of relay 1 and 2** (as circuits) on the left, and on the right for the **switching values of relay 1 and 2** in % r.H. or °C (adjustable via the corresponding set potentiometer). The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

For improved legibility, backlighting is provided.

Duct hygromats and humidity and temperature sensors ($\pm 2.0\%$), incl. mounting flange, electronic, two-step, with multi-range switching and continuous/switching output



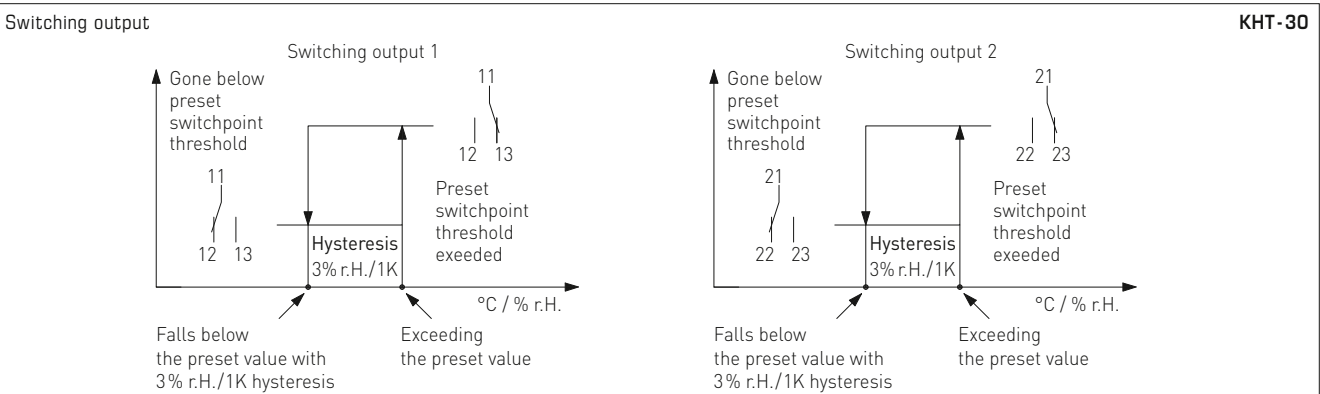
DIP switches	KHT-30	
Function mode	DIP 1	DIP 2
Mode 1 (2x 5...95% r.H.) (default)	OFF	OFF
Mode 2 (5...95% r.H. + 5% r.H.)	ON	OFF
Mode 3 (2x -35...+80 °C)	OFF	ON
Mode 4 (5...95% r.H. / -35...+80 °C)	ON	ON
Temperature range	DIP 3	DIP 4
-35...+35 °C	OFF	OFF
0...+80 °C	ON	OFF
0...+50 °C (default)	OFF	ON
-35...+75 °C	ON	ON



Supply	AC	DC
→ 1	24 V~	24 V DC
→ 4	0V	GND

12 (A1) →	Relay 1 Breaker contact
11 (W1) →	Relay 1 Changeover contact
13 (B1) →	Relay 1 Normally open contact

22 (A2) →	Relay 2 Breaker contact
21 (W2) →	Relay 2 Changeover contact
23 (B2) →	Relay 2 Normally open contact



Mode 1: Independent switchpoints for both relay outputs can be defined in the range of 5...95% r.H. by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3% r.H. (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

Mode 2: In Mode 2, only control knob setpoint 1 is active (setpoint 2 without function)! The switchpoint for the first relay is defined in the range of 5...95% r.H. by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5% r.H.". Hysteresis of 3% r.H. is also predefined for each switching output in mode 2.

Mode 3: Independent switchpoints within the temperature range (selectable via DIP switches) for both relay outputs can be defined by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

Mode 4: In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be set within the temperature range (selectable via DIP switches) or from 5...95% r.H. (humidity). The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.



Duct hygromats and humidity and temperature sensors ($\pm 2.0\%$), incl. mounting flange, electronic, two-step, with multi-range switching and continuous/switching output



KHT-30 with display

Temperature table
MR: -35...+75 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U _A in V	I _A in mA
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % r. H.

% r.H.	U _A in V	I _A in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASREG® KHT - 30 Duct hygromat and humidity and temperature sensor ($\pm 2.0\%$), <i>Deluxe</i>						
Type / WG02	Setting Range	Output	Steps	Display	Item No.	Price
	Humidity	Temperature				
KHT-30-I I-variant						
KHT-30W-I LCD	5...95% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 4...20mA	two-step	■ 1202-8127-2421-000	207,95 €
KHT-30-U U-variant						
KHT-30W-U LCD	5...95% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 0-10V	two-step	■ 1202-8127-1421-000	207,95 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	
ACCESSORIES						
SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)				7000-0050-2200-100	37,32 €

Condensation control switches
including strap / with detached sensor head,
with switching output

Patented quality product
(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

The condensation control switch **HYGRASREG® KW** with housing made from impact-resistant plastic with quick-locking screws or the cost-effective **HYGRASREG® KW-SD** with snap-on lid is installed on cooling ceilings, on cooling/cold-water piping or on cooled surfaces and is designed to prevent the formation of condensation.

It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status indicator).

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. The KW condensation control switch can be operated as a monitor on cooling ceilings or pipes so that the switching output is activated when dew builds up on the cooling ceilings of the property to be monitored and e.g. a heating system is started, or other actuators are initiated.

TECHNICAL DATA

Power supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Switchpoint:	approx. 93% r.H. (permanently set)
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover is transparent! KW-xx with quick-locking screws (slotted / Phillips head combination), KW-xx-SD with snap-on lid,
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 / Tyr 01)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Process connection:	endless strap with metal tightener, 300 mm, for pipes up to 3" diameter (included in the scope of delivery)
Mounting:	The mounting position should be selected so that no condensate can enter the sensor system in the event that condensation forms! KW / KW-SD with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) KW-external / KW-SD-external with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	KW-xx IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) KW-SD-xx IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

FUNCTION

The relay output is triggered (contact 13-11 closed) if the **switchpoint (93% r.H.)** is not reached and opens (contact 12-11 closed) in the event of a fault (power failure, condensation).



LED short pulses =
relay active → switchpoint not reached
ACTUAL humidity < 93% r.H. (no condensation)



LED long pulses =
relay inactive → switchpoint exceeded
ACTUAL humidity > 93% r.H. (condensation)

KW-SD
with snap-on lid
(IP 54)



KW-SD-extern
with snap-on lid
(IP 54)





Dimensional drawing **KW
KW-SD**

M12 connector
(optional on request)

KW
with quick-locking screws
(IP 65)



Dimensional drawing **KW-external
KW-SD-external**

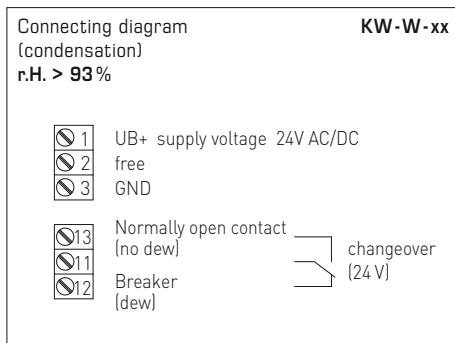
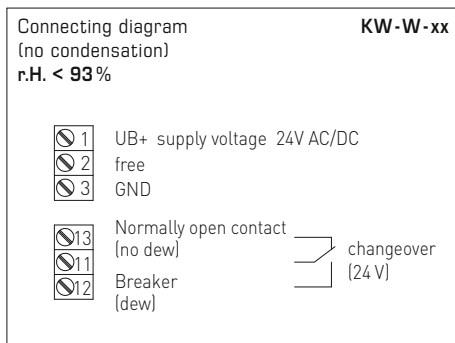
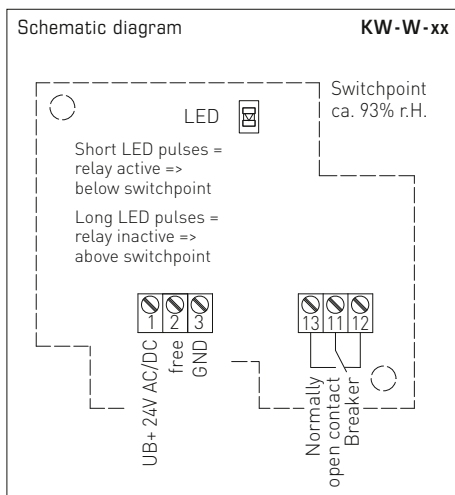
M12 connector
(optional on request)

KW-extern
with quick-locking screws
(IP 65)



Condensation control switches
including strap / with detached sensor head,
with switching output

KW
pro-dynamic
cross convection



HYGRASREG® KW-SD

Condensation control switches including strap,, *Standard*

HYGRASREG® KW-SD-external

Condensation control switches with detached sensor head, *Standard*

Type / WG01B	Switchpoint Humidity	Output Humidity	Mounting	Item No.	Price
KW-SD			Sensor internal	IP 54	
KW-W-SD	ca. 93% r. H.	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1075-0001-020	93,13 €
KW-SD-external			Sensor external	IP 54	
KW-W-SD extern	ca. 93% r. H.	Changeover contact	for mounting on pipes	1202-1075-0001-040	101,96 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request	



S+S REGELTECHNIK

HYGRASREG® KW
HYGRASREG® KW-SD

Condensation control switches
including strap/with detached sensor head,
with switching output



KW
KW-external
with quick-locking screws
(IP 65)



KW-SD
KW-SD-external
with snap-on lid
(IP54)

HYGRASREG® KW		Condensation control switches including strap, <i>Premium</i>			
HYGRASREG® KW-external		Condensation control switches with detached sensor head, <i>Premium</i>			
Type/WG01	Switchpoint Humidity	Output Humidity	Mounting	Item No.	Price
KW			Sensor internal	IP 65	
KW-W	ca. 93% r. H.	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1025-0001-020	99,57 €
KW-external			Sensor external	IP 65	
KW-W-extern	ca. 93% r. H.	Changeover contact	for mounting on pipes	1202-1025-0001-040	120,94 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request	

Dew point control switches
including strap / with detached sensor head,
with active / switching outputs

Patented quality product
(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

The dew point control switch **HYGRASREG® TW** is installed on cooling / cold-water piping or on cooled surfaces. It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its patented measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status display), **with / without display**.

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. Facilitated by the continuous measuring range from 0...100% r.H. of the **TW-U** and the adjustable switchpoint for the **TW-W** of 75...100% r.H., it is possible to operate cooling ceilings, for example, so that the switching output of the dew point control switch, the DDC, is activated and then triggers a heater or other control elements, thereby preventing the formation of dew on pipes or cooling ceilings or on the property to be monitored.

TW
with quick-locking screws



TW-extern
with quick-locking screws



TECHNICAL DATA

Power supply:	24 V AC (± 20%) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Measuring Range:	formation of dew is detected at 0...100% r.H. on the TW-U , continuous 75...100% r.H. on the TW-W , switching (switchpoint adjustable by potentiometer, factory setting 75% r.H.)
Output:	0-10 V or potential-free changeover contact (24 V), 1 A ohmic load
Sensors:	digital humidity sensor with integrated temperature sensor , small hysteresis, high long-term stability
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	endless strap with metal tightener, 300 mm, for pipes up to 3" diameter (included in the scope of delivery)
Mounting:	TW with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) TW-external with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36x15 mm (W x H), for displaying actual humidity and the switching status of the relay

FUNCTION The relay output is triggered (contact 13-11 closed) if the **pre-set switchpoint** (factory setting 75% r.H.) is not reached and opens (contact 12-11 closed) in the event of an error (power failure, condensation).



LED short pulses =
relay active → switchpoint not reached
ACTUAL humidity < pre-set switchpoint (no condensation)



LED long pulses =
relay inactive → switchpoint exceeded
ACTUAL humidity > pre-set switchpoint (condensation)



Dimensional drawing **TW**

M12 connector
(optional on request)

TW
with display
and quick-locking screws



Dimensional drawing **TW-external**

M12 connector
(optional on request)

TW-external
with display
and quick-locking screws



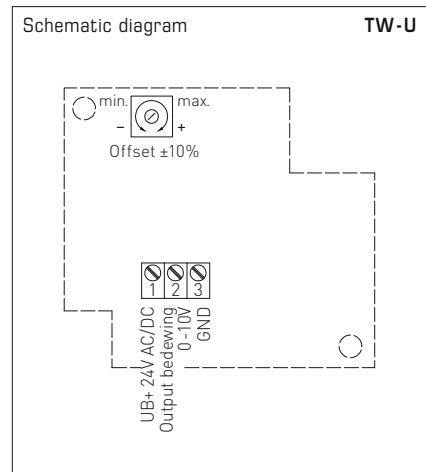
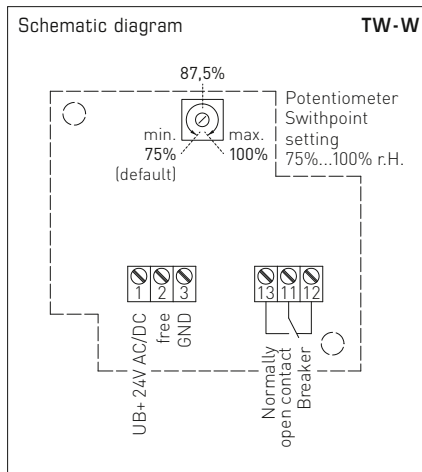
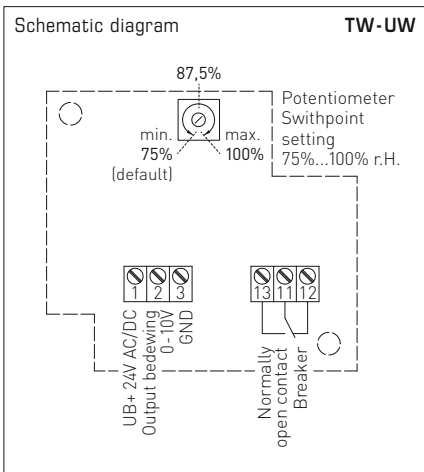
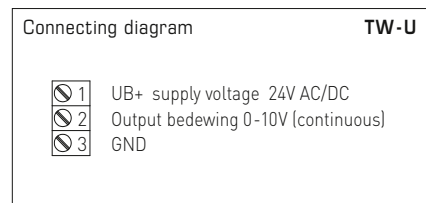
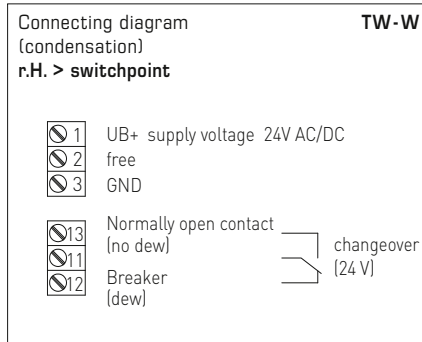
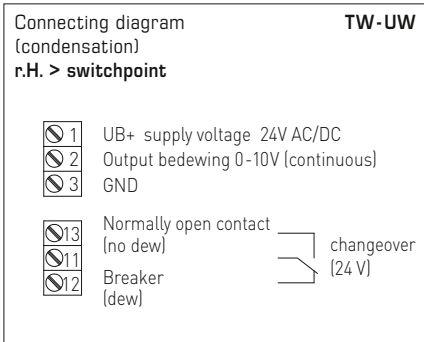
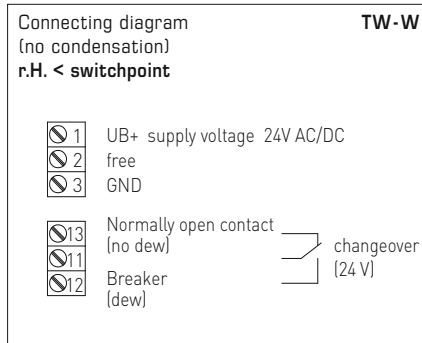
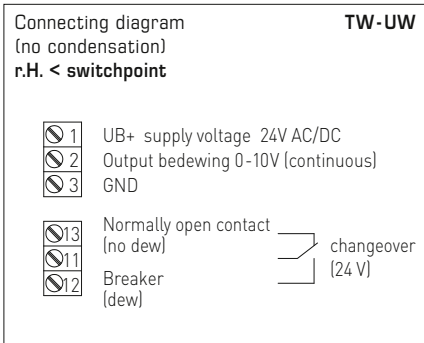
Dew point control switches including strap / with detached sensor head, with active / switching outputs

TW pro-dynamic cross convection



By default, the first line of the display shows the **relative humidity**.
The second line shows the information about the **switching status of the relay** (as a circuit) on the left, and the respective **switching value** in % r.H. on the right (switchpoint adjustable by potentiometer, factory setting 75% r.H.).

- **Circuit, empty** = relay in idle state
- **Circuit, full** = relay energised





Dew point control switches including strap/with detached sensor head, with active/switching outputs

TW
with display



TW-external
with display



HYGRASREG® TW Dew point control switches including strap (± 3%), *Deluxe*
HYGRASREG® TW-external Dew point control switches with detached sensor head (± 3%), *Deluxe*

Type/ WG01	Measuring Range Humidity	Output Humidity	Mounting	Display	Item No.	Price
			Sensor internal		IP 65	
TW						
TW-W	75...100% r. H.	Changeover contact	for mounting directly on pipes		1202-1015-0001-000	111,98 €
TW-W LCD	75...100% r. H.	Changeover contact	for mounting directly on pipes	■	1202-1015-1201-020	155,92 €
TW-U	0...100% r. H.	0-10 V	for mounting directly on pipes		1201-1011-1001-020	116,24 €
TW-U/W	0...100% r. H.	0-10 V + Changeover contact	for mounting directly on pipes		1202-1012-1001-020	133,30 €
TW-U/W LCD	0...100% r. H.	0-10 V + Changeover contact	for mounting directly on pipes	■	1202-1012-1201-020	177,25 €
			Sensor external		IP 65	
TW-external						
TW-W-extern	75...100% r. H.	Changeover contact	for mounting on pipes		1202-1015-0021-030	143,96 €
TW-W-extern LCD	75...100% r. H.	Changeover contact	for mounting on pipes	■	1202-1015-0221-030	187,89 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request	

Leakage sensor / water ingress detector with switching output

The leakage sensor / water ingress detector **HYGRASREG® LS** with leakage location is used to detect water ingresses and ingresses of conductive liquids. It is designed for the early detection of water leakages to protect sensitive electrical and electronic equipment in buildings against moisture. The water ingress detector consists of an electronic monitoring system with LED status indicator, and a matching electrode, which can be extended by the user.

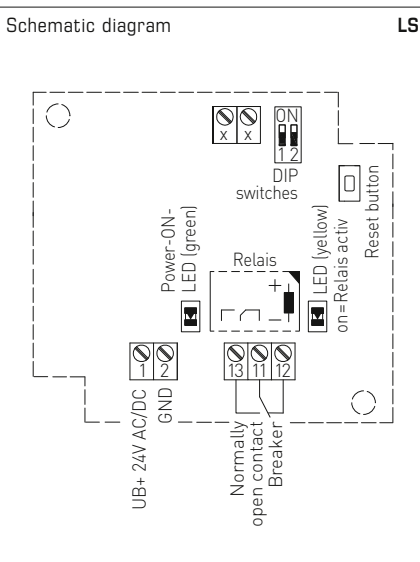
LS-2



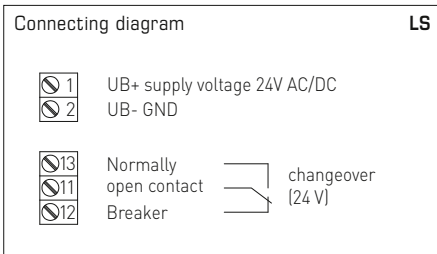
TECHNICAL DATA

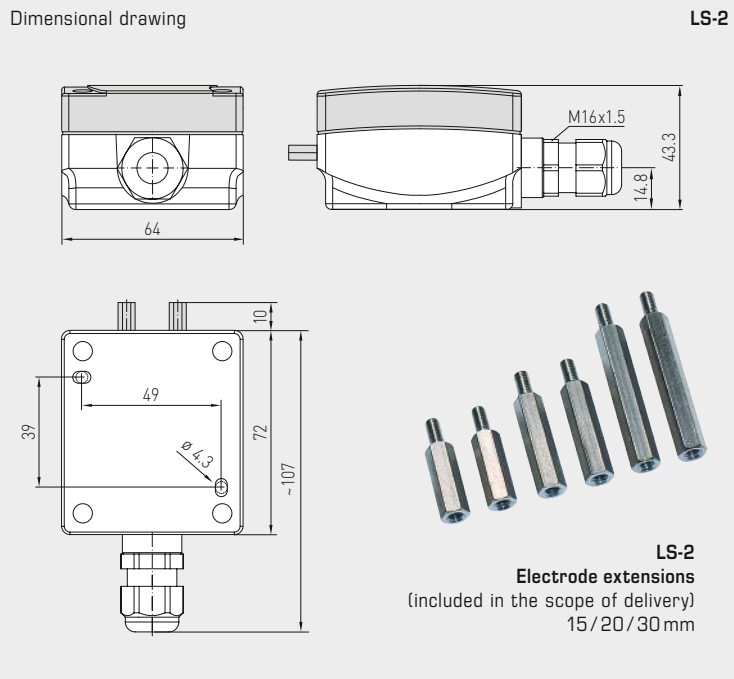
Power supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Operating range electronics module:	10...95% r. H.; 0...+50 °C
Monitoring range:	conductive liquids between the probes
Switching threshold:	conductance between electrodes > threshold
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Process connection:	two external probes, laid according to measuring task (on the LS-2) or upright on electrodes with insulating plastic caps, which are mounted on the housing underside (on the LS-4)
Mounting accessories:	for device type LS-2 (2 electrodes 10 mm, already permanently mounted) Electrode extension 15 mm, 20 mm and 30 mm, 2 pieces each, stainless steel V2A (1.4301) (enclosed) Cable sensor , L = 1 m (optional)
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
FUNCTION	The leak sensor can be set using DIP switches so that the relay is energised during normal operation. This means that relay opens in the event of a fault (water damage, cable breakage, power failure). This also enables a break in the cable to the sensor to be detected.

LS-4

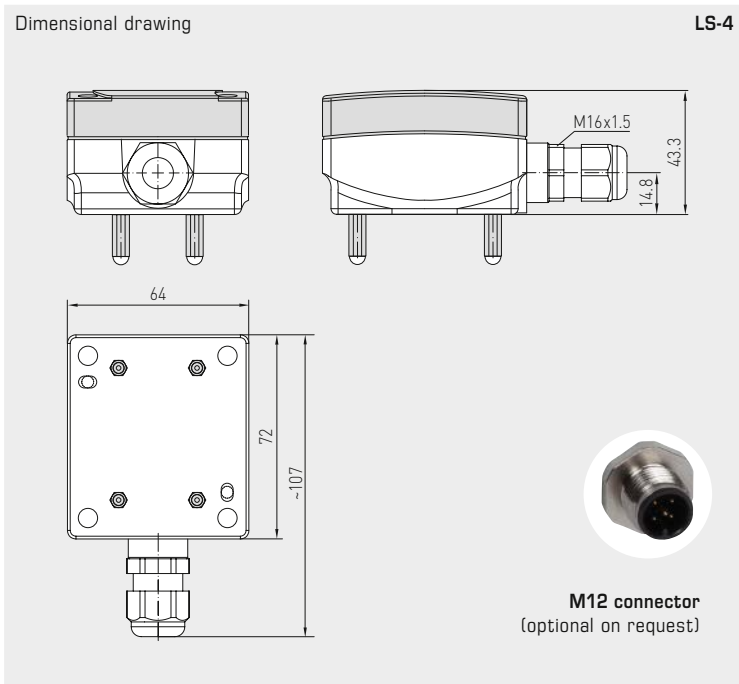


Self-locking (selectable)	DIP 1
Self-locking ON	ON
Self-locking OFF	OFF
Relay status (selectable)	DIP 2
Normally open contact OPEN	ON
Normally open contact CLOSED	OFF





LS-2



LS-4

HYGRASREG® LS Leakage sensor / water ingress detector				
Type / WG01	Detection of leakage of conductive liquids	Output Humidity (relative)	Item No.	Price
LS				
LS-2	Conductance > switching threshold	Changeover contact	1202-1042-0000-000	91,90 €
LS-4	Conductance > switching threshold	Changeover contact	1202-1042-0000-100	104,03 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request	

ACCESSORIES				
LS-Kabelsonde	Cable sensor , L = 1 m, for device type LS-2		1202-1042-0000-001	22,46 €
For further information, see last chapter Accessories!				



Pressure

Whether absolute or relative, atmospheric, differential or below-atmospheric – our **PREMASGARD®** and **PREMASREG®** devices can handle any kind of pressure and provide the right solution for any pressurized environment. High-precision piezo-resistive sensors ensure reliable performance from 25 Pa to 300 bar.

APPLICATION RANGE

- > Process and mechanical engineering
- > Medical and cleanroom engineering
- > Large catering facilities
- > Heating, ventilation and air conditioning
- > Pump control and pressure lines
- > Filter monitoring and air pressure deficiency protection
- > Rotational speed and limit value control



PREMASGARD® & PREMASREG®

436 – 499

for gaseous media [mbar / Pa]

PREMASGARD® 111x	Pressure measuring transducer	451
PREMASGARD® 112x	Pressure measuring transducer	451
PREMASGARD® 112x-SD	Pressure measuring transducer	450
PREMASGARD® 211x	Pressure measuring transducer	445
PREMASGARD® 212x	Pressure measuring transducer	445
PREMASGARD® 212x-SD	Pressure measuring transducer	444
PREMASGARD® 711x	Pressure measuring transducer	457
PREMASGARD® 711x-VA	Pressure measuring transducer (Stainless steel housing Tyr2E)	NEW 463
PREMASREG® 711x	Pressure measuring transducer, pressure controller/pressure switch	469
PREMASREG® 711x-VA	Pressure measuring transducer, pressure controller/pressure switch (Stainless steel housing Tyr2E)	NEW 475
ALD	Measuring transducer [mbar] atmospheric pressure	489
DS 1 / DS 2	Differential pressure switch	493

for volume flow [mbar / Pa]

PREMASREG® 716x	Volume flow measuring transducer, pressure controller/pressure switch	481
PREMASREG® 716x-VA	Volume flow measuring transducer, pressure controller/pressure switch (Stainless steel housing Tyr2E)	NEW 487

for liquid media [bar]

SHD	Pressure measuring transducer	495
SHD-SD	Pressure measuring transducer	495
SHD 400	Pressure measuring transducer	497
SHD 692	Pressure measuring transducer	499

Special accessories

see chapter Accessories	615
-------------------------	------------



Pressure



PREMASGARD® & PREMASREG®

Multifunctional sensor technology for the correct pressure

Broad Spectrum

Our pressure measuring transducers are designed to be multifunctional. This reduces the diversity of types while expanding their possible applications. Take advantage of our experience, our development, manufacturing and product know-how and order these products direct from the manufacturer S+S Regeltechnik. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching, reaction times, units, automatic mode, and manual calibration are selectable via DIP switches.

Optimum Precision

The pressure sensors are developed and manufactured according to the latest criteria. They are fitted with the newest generation sensors that are linearised, temperature-compensated, and offer long-term and zero-point stability. The devices are produced at our factory and are calibrated and 100% tested at our test benches and pressure chambers. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing, and product know-how, and order these products directly from the manufacturer.

Approved Safety

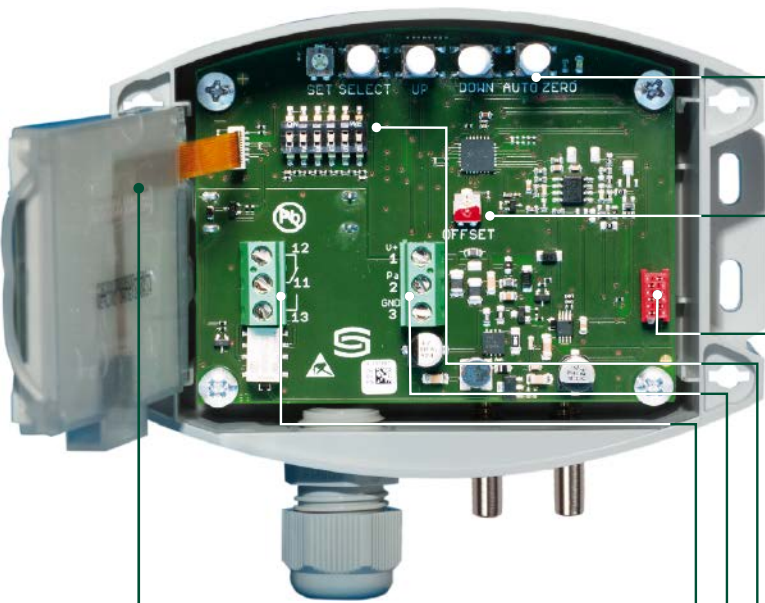
-  RoHS conforming materials
-  ESD compliant manufacturing
-  CE compliance tested by external laboratories

Certified Quality



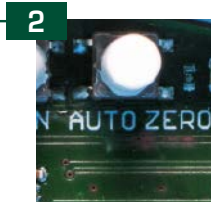
Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.

-  GOST certificates
-  EAC certified



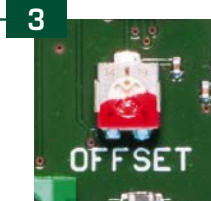
Extra-Large Display (70 x 40 mm)

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units



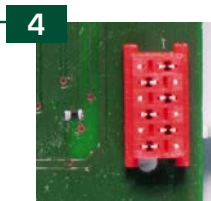
Auto-Zero

For zero point correction



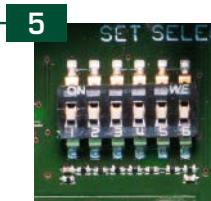
Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration



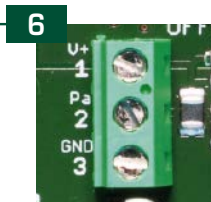
Quality Assurance

Calibration and balancing are done by means of the bus system at their pressure test bench



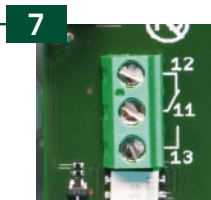
DIP Switches

For multi-range toggling as well as setting of 4 or 8 different measuring ranges, response times, damping times, units and configuration levels



Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched output



Relais

With optional automatic zero point calibration and valve for zero point correction



Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

The calibrateable compact pressure sensors of the **PREMASGARD® 211x/212x/212x-SD** series are equipped with 8 switchable measuring ranges, 2 switchable output signals (16 devices in one) and with or without optional display and are used for measuring above-atmospheric, below-atmospheric, or differential pressures and Volume flow in air. The piezo-resistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. These pressure transmitters have a pushbutton for manual zero point calibration and an adjustable offset. Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for monitoring filters, for level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous non-aggressive, non-combustible media. The differential pressure sensor is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws). You can find further device types under **PREMASGARD® 111x/112x/112x-SD** (I variant with 2-wire connection).

TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %)
Working resistance:	R _a (Ohm) = 25 ... 450 Ohm for I variant
Load resistance:	R _L > 25 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Current consumption:	< 45 mA
Measuring function:	Differential pressure, volume flow (square root output signal)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Output:	switchable 0-10V / 4...20 mA (via DIP switches)
Electrical connection:	3-wire connection
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Type of pressure:	differential pressure
Medium:	clean air and other non-aggressive, non-combustible gases
Accuracy:	Type 2110/2120/2120-SD (100 Pa): typically ± 3 Pa at +25 °C Type 2111/2121/2121-SD (1000 Pa): typically ± 10 Pa at +25 °C Type 2115/2125/2125-SD (5000 Pa): typically ± 35 Pa at +25 °C compared to the calibrated reference device
Zero point offset:	± 10 % of final value
Above- / below-atmospheric pressure:	± 50 kPa
Long-term stability:	± 1 % per year
Signal filtering:	switchable 1 s / 10 s (via DIP switches)
Hysteresis:	0.3 % of final value
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Temperature drift values:	± 0.1 % of final value / °C
Linearity:	< ± 1 % of final value
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! Type 211x/212x: with quick-locking screws (slotted/Phillips head combination) Type 212x-SD: with snap-on lid
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 / Tyr 01 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	Type 211x/212x: IP 67 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) Type 212x-SD: IP 54 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) * Housing in the built-in state
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Features:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), to display ACTUAL pressure
ACCESSORIES	see table

PREMASGARD® 211x
Pressure connectors **on the top side**, with quick-locking screws (IP 67)



PREMASGARD® 212x
Pressure connectors **on the bottom side**, with quick-locking screws (IP 67)



PREMASGARD® 212x-SD
Pressure connectors **on the bottom side**, with snap-on lid (IP 54)



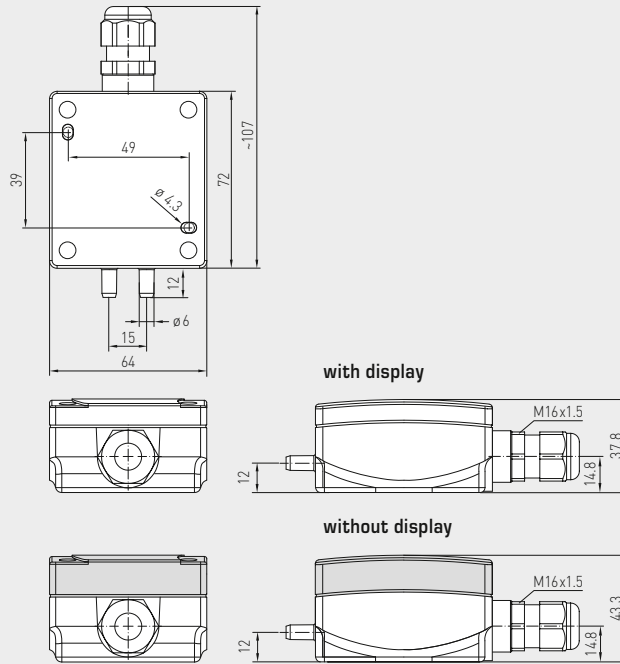


Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output



Dimensional drawing

PREMASGARD® 211x

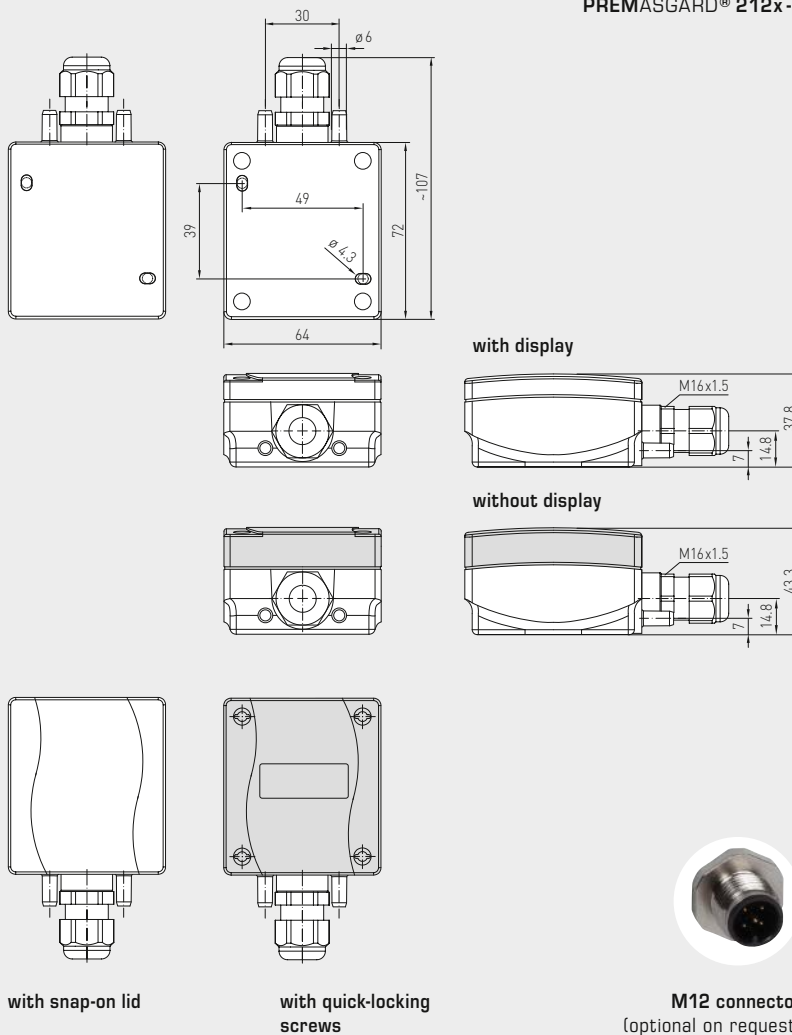


PREMASGARD® 211x
Pressure connectors
on the top side,
with display,
with quick-locking screws
(IP67)



Dimensional drawing

PREMASGARD® 212x
PREMASGARD® 212x-SD



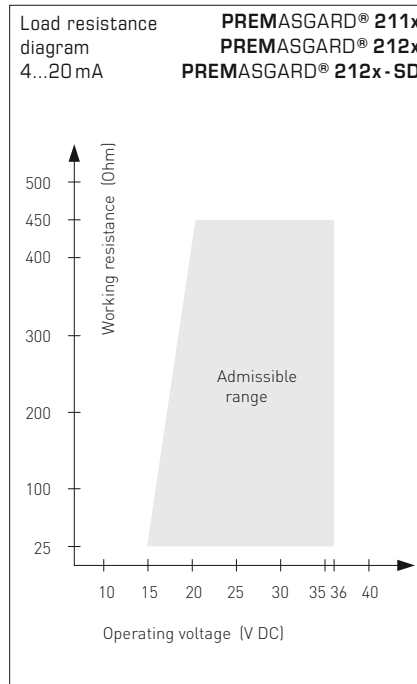
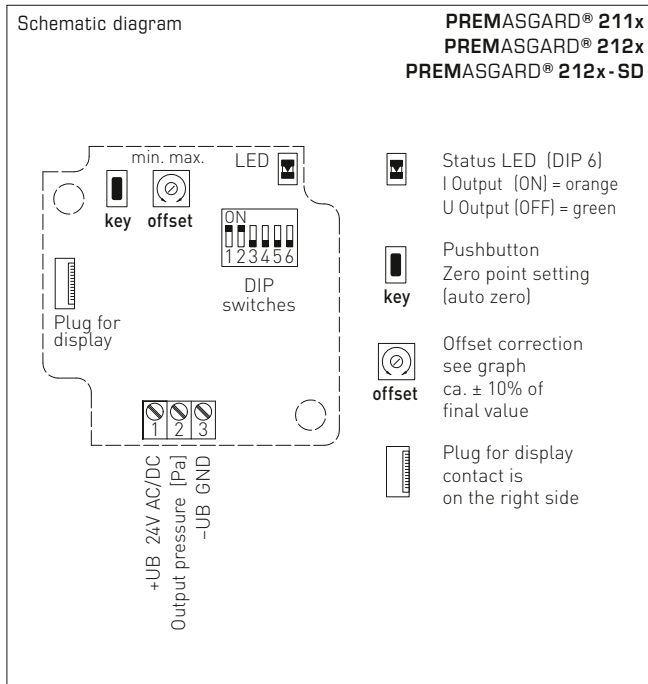
PREMASGARD® 212x
Pressure connectors
on the bottom side,
with display,
with quick-locking screws
(IP67)



PREMASGARD® 212x-SD
Pressure connectors
on the bottom side,
with display,
with snap-on lid
(IP54)



Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output



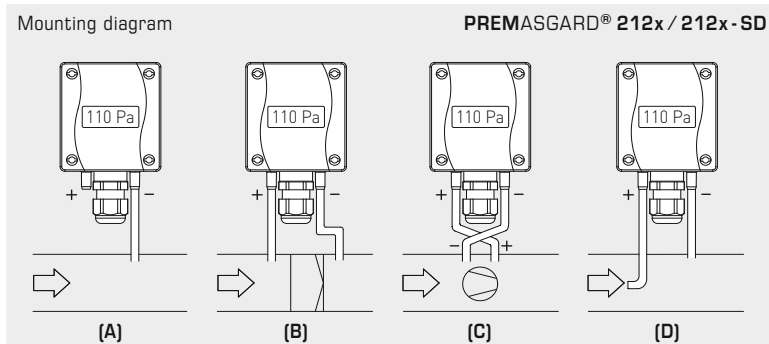
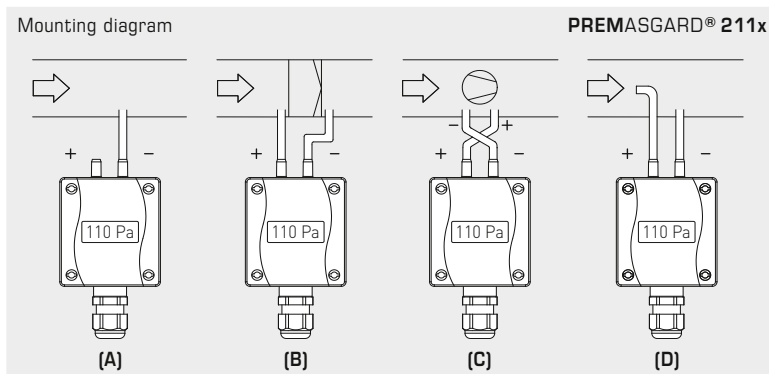
Pressure range (selectable) – max. measuring range (default) is depending to the type of device						DIP 1	DIP 2
0...50 Pa	0...100 Pa	0...1000 Pa	-50...+50 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
-	0...300 Pa	0...2000 Pa	-	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
-	0...500 Pa	0...3000 Pa	-	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...100 Pa	0...1000 Pa	0...5000 Pa	-100...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Output characteristic line (Mode selectable)	DIP 4
Linear (default) (for pressure detection)	OFF
Square root extracting (to determine the volume flow)	ON

Measuring range mode (Mode selectable)	DIP 3
Unidirectional (0...+MR) (default)	OFF
Bidirectional (-MR...+MR)	ON

Measurement signal filtering (Time interval selectable)	DIP 5
10 s (default)	OFF
1 s	ON

Output (selectable)	DIP 6
Voltage 0-10 V (default)	OFF
Current 4...20 mA	ON



TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

(A) Below-atmospheric pressure

P1 (+) is not connected, but open to the atmosphere
P2 (-) connected to inside of duct

(B) Filter

P1 (+) connected upstream of filter
P2 (-) connected downstream of filter

(C) Ventilator

P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator

(D) Volume flow

P1 (+) dynamic pressure, connected in flow direction
P2 (-) static pressure, connected free of dynamic pressure components

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow

k = K factor

Δp = Differential pressure [Pa]



S+S REGELTECHNIK

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® 211x
Pressure connectors
on the top side,
with display



PREMASGARD® 212x
Pressure connectors
on the bottom side,
with display



WS-04
Weather and sun protection hood
(optional)

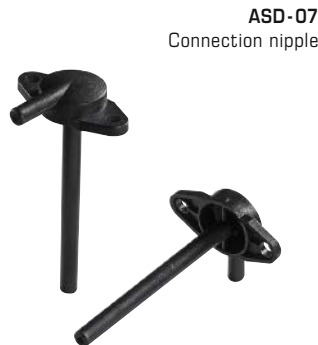
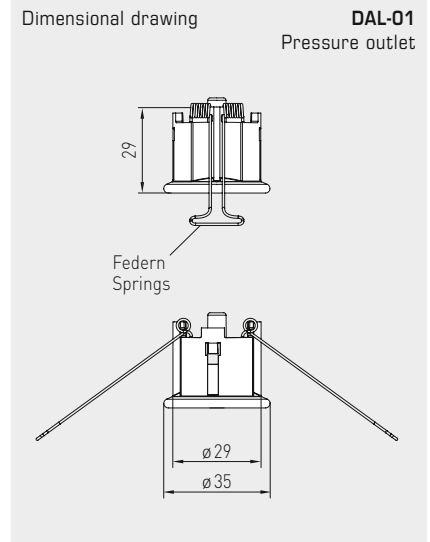
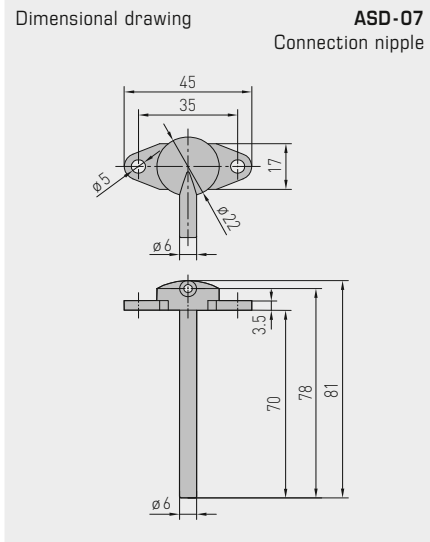
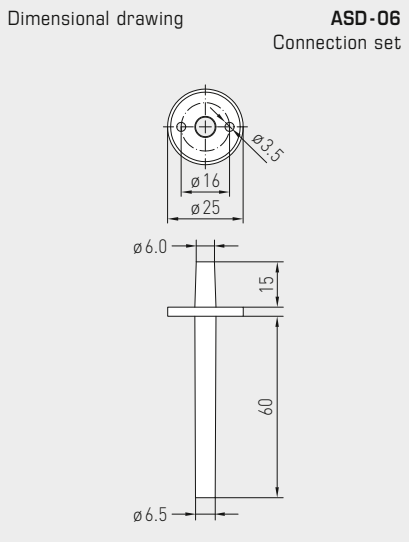


Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH ₂ O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH ₂ O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH ₂ O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH ₂ O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH ₂ O
1 mH ₂ O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH ₂ O



Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output



ACCESSORIES		Item No.	Price
ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	6,74 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	6,74 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	31,55 €
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000	33,06 €

For further information, see last chapter Accessories!

PREMASGARD® 212x-SD Pressure, differential pressure and volume flow measuring transducers, <i>Standard</i> (Pressure connectors on the bottom side)					
Pressure range (Ranges adjustable)	Type / WGD1B (3-wire connection)	Output (switchable)	Display	Item No. (with snap-on lid)	Price
max. - 1000...+ 1000 Pa	PREMASGARD® 2121-SD		IP 54		
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2121-SD	0-10V / 4...20mA		1301-11B7-0010-000	120,36 €
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 2121-SD LCD	0-10V / 4...20mA	■	1301-11B7-2010-000	163,20 €
0... 500 Pa / - 500...+ 500 Pa					
0... 1000 Pa / -1000...+ 1000 Pa					
max. - 5000...+ 5000 Pa	PREMASGARD® 2125-SD		IP 54		
0...1000 Pa / -1000...+1000 Pa	PREMASGARD 2125-SD	0-10V / 4...20mA		1301-11B7-0050-000	120,36 €
0...2000 Pa / -2000...+2000 Pa	PREMASGARD 2125-SD LCD	0-10V / 4...20mA	■	1301-11B7-2050-000	163,20 €
0...3000 Pa / -3000...+3000 Pa					
0...5000 Pa / -5000...+5000 Pa					
max. - 100...+ 100 Pa	PREMASGARD® 2120-SD		IP 54		
0... 50 Pa / - 50...+ 50 Pa	PREMASGARD 2120-SD	0-10V / 4...20mA		1301-11B7-0110-000	120,36 €
0... 100 Pa / -100...+ 100 Pa	PREMASGARD 2120-SD LCD	0-10V / 4...20mA	■	1301-11B7-2110-000	163,20 €
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Output:	0-10V or 4...20mA (selectable via DIP switches)				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)				



Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® 211x

Pressure connectors **on the top side**, with/without display, with quick-locking screws (IP 67)

PREMASGARD® 212x

Pressure connectors **on the bottom side**, with/without display, with quick-locking screws (IP 67)

PREMASGARD® 212x-SD

Pressure connectors **on the bottom side**, with/without display, with snap-on lid (IP 54)



PREMASGARD® 211x		Pressure, differential pressure and volume flow measuring transducers, <i>Premium</i> (Pressure connectors on the top side)			
Pressure range (Ranges adjustable)	Type /WG01 (3-wire connection)	Output (switchable)	Display	Item No. (with quick-locking screws)	Price
max. - 1000...+ 1000 Pa	PREMASGARD® 2111			IP 67	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2111	0-10V / 4...20mA		1301-1197-0010-000	134,14 €
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 2111 LCD	0-10V / 4...20mA	■	1301-1197-2010-000	178,79 €
0... 500 Pa / - 500...+ 500 Pa					
0... 1000 Pa / - 1000...+ 1000 Pa					
max. - 5000...+ 5000 Pa	PREMASGARD® 2115			IP 67	
0...1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 2115	0-10V / 4...20mA		1301-1197-0050-000	134,14 €
0...2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 2115 LCD	0-10V / 4...20mA	■	1301-1197-2050-000	178,79 €
0...3000 Pa / - 3000...+ 3000 Pa					
0...5000 Pa / - 5000...+ 5000 Pa					
max. - 100...+ 100 Pa	PREMASGARD® 2110			IP 67	
0... 50 Pa / - 50...+ 50 Pa	PREMASGARD 2110	0-10V / 4...20mA		1301-1197-0110-000	134,14 €
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2110 LCD	0-10V / 4...20mA	■	1301-1197-2110-000	178,79 €
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Output:	0-10V or 4...20mA (selectable via DIP switches)				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)				

PREMASGARD® 212x		Pressure, differential pressure and volume flow measuring transducers, <i>Premium</i> (Pressure connectors on the bottom side)			
Pressure range (Ranges adjustable)	Type /WG01 (3-wire connection)	Output (switchable)	Display	Item No. (with quick-locking screws)	Price
max. - 1000...+ 1000 Pa	PREMASGARD® 2121			IP 67	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2121	0-10V / 4...20mA		1301-11A7-0010-000	134,14 €
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 2121 LCD	0-10V / 4...20mA	■	1301-11A7-2010-000	178,79 €
0... 500 Pa / - 500...+ 500 Pa					
0... 1000 Pa / - 1000...+ 1000 Pa					
max. - 5000...+ 5000 Pa	PREMASGARD® 2125			IP 67	
0...1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 2125	0-10V / 4...20mA		1301-11A7-0050-000	134,14 €
0...2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 2125 LCD	0-10V / 4...20mA	■	1301-11A7-2050-000	178,79 €
0...3000 Pa / - 3000...+ 3000 Pa					
0...5000 Pa / - 5000...+ 5000 Pa					
max. - 100...+ 100 Pa	PREMASGARD® 2120			IP 67	
0... 50 Pa / - 50...+ 50 Pa	PREMASGARD 2120	0-10V / 4...20mA		1301-11A7-0110-000	134,14 €
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2120 LCD	0-10V / 4...20mA	■	1301-11A7-2110-000	178,79 €
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Output:	0-10V or 4...20mA (selectable via DIP switches)				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)				

I variant
with 2-wire
connection



S+S REGELTECHNIK

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

The calibrateable compact pressure sensors of the **PREMASGARD® 111x / 112x / 112x-SD** series are equipped with eight switchable measuring ranges and with or without optional display (eight devices in one) and are used for measuring above-atmospheric, below-atmospheric, or differential pressures and Volume flow in air. The piezo-resistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. These pressure transmitters have a pushbutton for manual zero point calibration and an adjustable offset. Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for monitoring filters, for level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous non-aggressive, non-combustible media. The differential pressure sensor is supplied including connection set **ASD-06** (2m connection hose, two pressure connection nipples, screws). You can find further device types under **PREMASGARD® 211x / 212x / 212x-SD** (3-conductor connection) with switchable output (0-10V / 4...20 mA).

PREMASGARD® 111x
Pressure connectors
on the top side
with quick-locking screws
(IP 67)



PREMASGARD® 112x
Pressure connectors
on the bottom side
with quick-locking screws
(IP 67)



PREMASGARD® 112x-SD
Pressure connectors
on the bottom side
with snap-on lid
(IP 54)



TECHNICAL DATA

Power supply:	24 V AC (±20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Measuring function:	Differential pressure, volume flow (square root output signal)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Output:	0 -10V or 4...20 mA
Electrical connection:	2- or 3-wire connection
Media temperature:	-20...+50 °C
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Type of pressure:	differential pressure
Medium:	clean air and other non-aggressive, non-combustible gases
Accuracy:	Type 1111 / 1121 / 1121-SD (1000 Pa): typically ± 10 Pa Type 1115 / 1125 / 1125-SD (5000 Pa): typically ± 50 Pa Type 1116 / 1126 (10000 Pa): typically ± 50 Pa compared to the calibrated reference device
Zero point offset:	± 10 % of final value
Above- / below-atmospheric pressure:	max. 5 x measuring range
Long-term stability:	± 1 % per year
Signal filtering:	switchable 1 s / 10 s
Hysteresis:	0.3 % of final value
Media contacting parts:	ms, Ni, Nylon, PU, Si, PVC with plasticisers
Temperature drift values:	± 0.1 % of final value / °C
Current consumption:	< 20 mA
Linearity:	< ± 1 % of final value
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! Type 111x / 112x: with quick-locking screws (slotted/Phillips head combination) Type 112x-SD: with snap-on lid
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 / Tyr 01 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	Type 111x / 112x: IP 67 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) Type 112x-SD: IP 54 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) * Housing in the built-in state
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Features:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), to display ACTUAL pressure
ACCESSORIES	see table



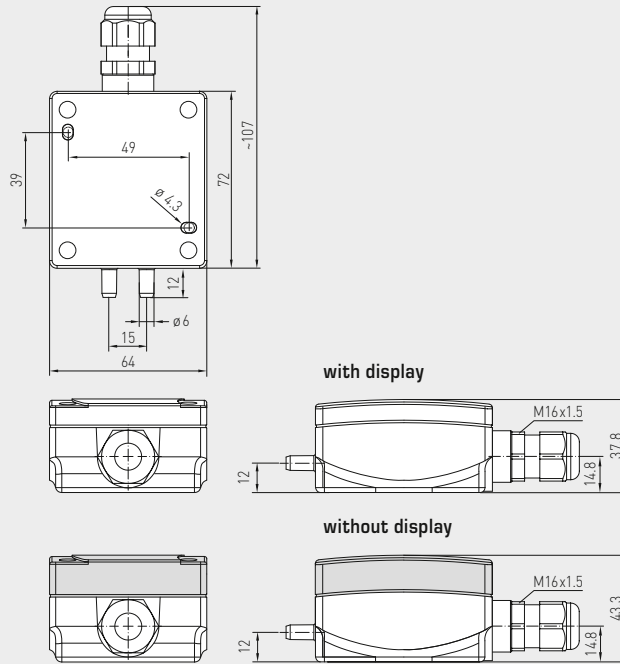
S+S REGELTECHNIK

1 variant with 2-wire connection

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

Dimensional drawing

PREMASGARD® 111x

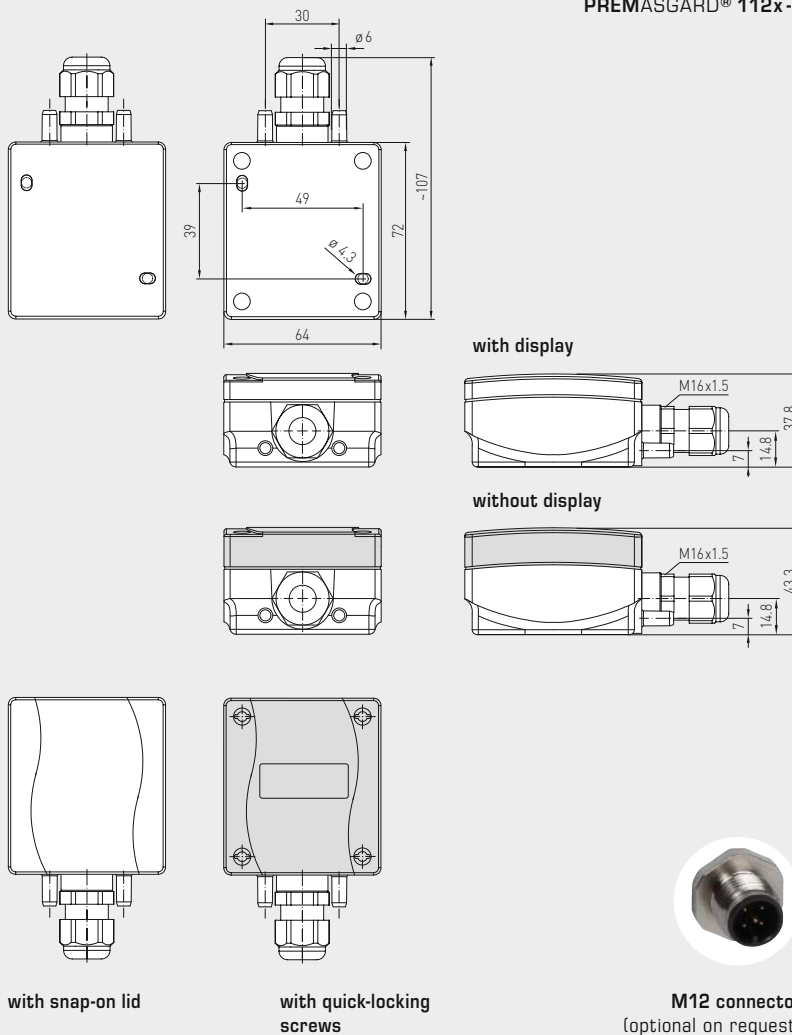


PREMASGARD® 111x
Pressure connectors on the top side, with display, with quick-locking screws (IP67)



Dimensional drawing

PREMASGARD® 112x
PREMASGARD® 112x-SD



PREMASGARD® 112x
Pressure connectors on the bottom side, with display, with quick-locking screws (IP67)



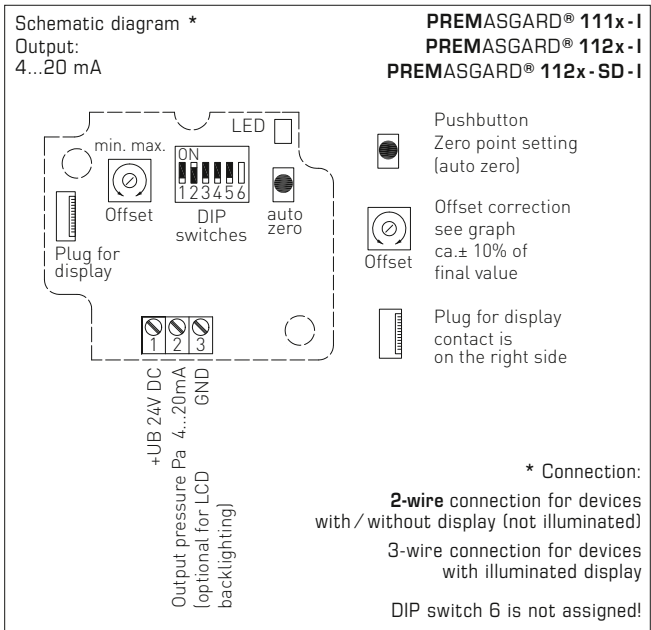
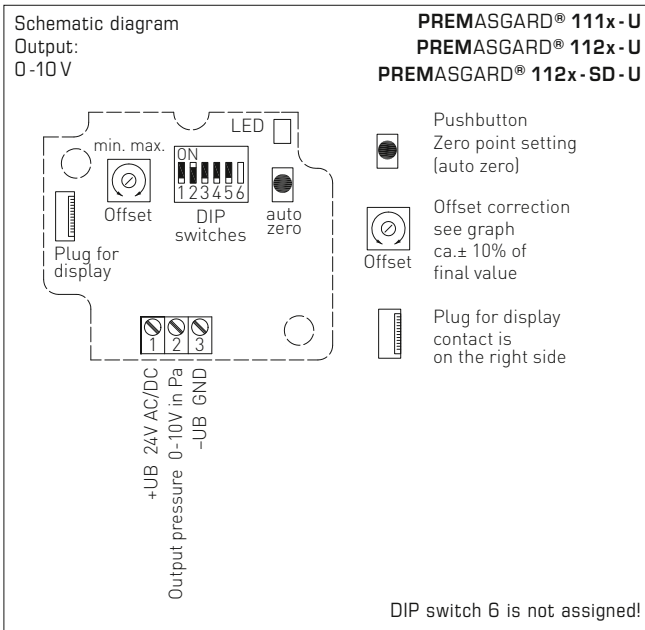
PREMASGARD® 112x-SD
Pressure connectors on the bottom side, with display, with snap-on lid (IP54)



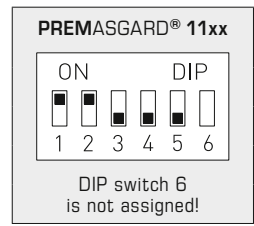
1 variant with 2-wire connection



Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output



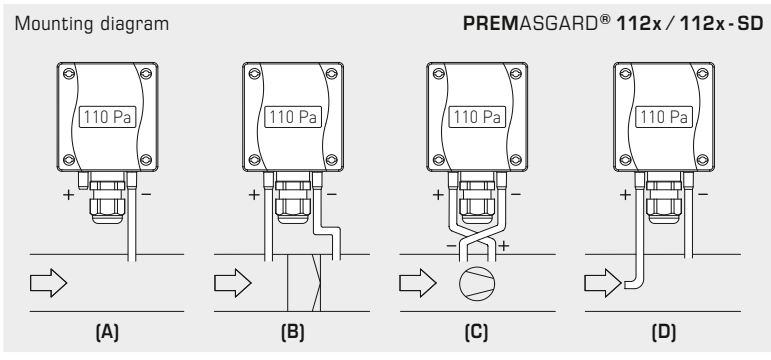
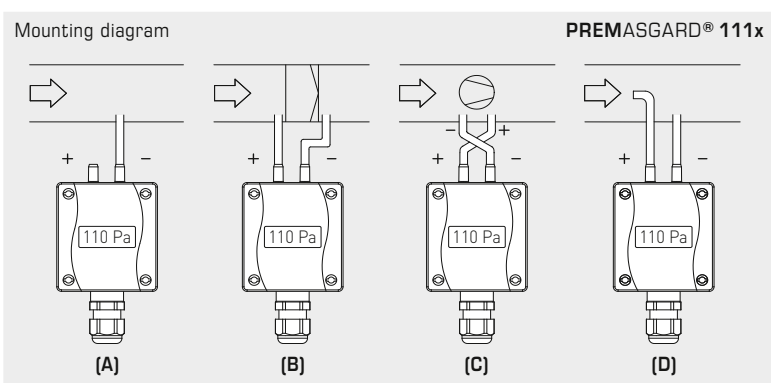
Pressure range (selectable) – max. measuring range (default) is depending to the type of device						DIP 1	DIP 2
0...100 Pa	0...1000 Pa	0...4000 Pa	-100...+100 Pa	-1000...+1000 Pa	-4000...+4000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	0...6000 Pa	-300...+300 Pa	-2000...+2000 Pa	-6000...+6000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	0...8000 Pa	-500...+500 Pa	-3000...+3000 Pa	-8000...+8000 Pa	OFF	ON
0...1000 Pa	0...5000 Pa	0...10000 Pa	-1000...+1000 Pa	-5000...+5000 Pa	-10000...+10000 Pa	ON	ON



Measuring range mode (Mode selectable)	DIP 3
Unidirectional (0...+MR) (default)	OFF
Bidirectional (-MR...+MR)	ON

Output characteristic line (Mode selectable)	DIP 4
Linear (default) (for pressure detection)	OFF
Square root extracting (to determine the volume flow)	ON

Measurement signal filtering (Time interval selectable)	DIP 5
10 s (default)	OFF
1 s	ON



TYPES OF MONITORING:

- Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.
- (A) **Below-atmospheric pressure**
P1 (+) is not connected, but open to the atmosphere
P2 (-) connected to inside of duct
 - (B) **Filter**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
 - (C) **Ventilator**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator
 - (D) **Volume flow**
P1 (+) dynamic pressure, connected in flow direction
P2 (-) static pressure, connected free of dynamic pressure components

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow
k = K factor
 Δp = Differential pressure [Pa]

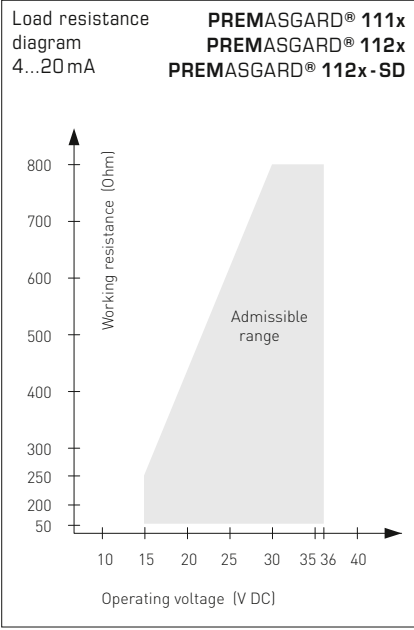


S+S REGELTECHNIK

1 variant with 2-wire connection

PREMASGARD® 111x/112x/112x-SD

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output



PREMASGARD® 111x
Pressure connectors on the top side, with display



PREMASGARD® 112x
Pressure connectors on the bottom side, with display

WS-04

Weather and sun protection hood (optional)



Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH ₂ O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH ₂ O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH ₂ O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH ₂ O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH ₂ O
1 mH ₂ O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH ₂ O

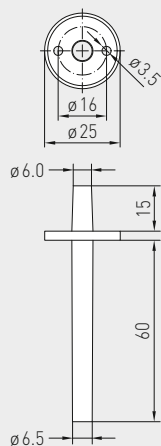
Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

1 variant with 2-wire connection

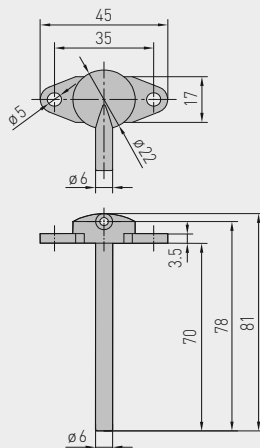


S+S REGELTECHNIK

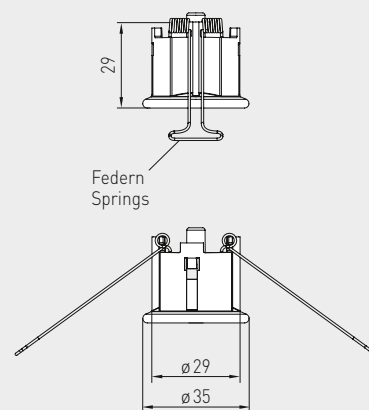
Dimensional drawing ASD-06 Connection set



Dimensional drawing ASD-07 Connection nipple



Dimensional drawing DAL-01 Pressure outlet



ASD-06 Connection set



ASD-07 Connection nipple



DAL-01 Pressure outlet



ACCESSORIES		Item No.	Price
ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	6,74 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	6,74 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	31,55 €
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000	33,06 €

For further information, see last chapter Accessories!

PREMASGARD® 112x-SD Pressure, differential pressure and volume flow measuring transducers, *Standard* (Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with snap-on lid)	Price
max. - 1000...+ 1000 Pa	PREMASGARD® 1121-SD				IP 54	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 1121-SD-I	2	4...20 mA		1301-1182-0010-000	132,25 €
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 1121-SD-I LCD	2/3	4...20 mA	■	1301-1182-2010-000	170,34 €
0... 500 Pa / - 500...+ 500 Pa	-	3	0-10 V		see PREMASGARD® 212x-SD	
0... 1000 Pa / - 1000...+ 1000 Pa	-					
max. - 5000...+ 5000 Pa	PREMASGARD® 1125-SD				IP 54	
0... 1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 1125-SD-I	2	4...20 mA		1301-1182-0050-000	132,25 €
0... 2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 1125-SD-I LCD	2/3	4...20 mA	■	1301-1182-2050-000	170,34 €
0... 3000 Pa / - 3000...+ 3000 Pa	-	3	0-10 V		see PREMASGARD® 212x-SD	
0... 5000 Pa / - 5000...+ 5000 Pa	-					
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.					
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)					



S+S REGELTECHNIK

1 variant with 2-wire connection

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® 111x

Pressure connectors on the top side, with/without display, with quick-locking screws (IP 67)

PREMASGARD® 112x

Pressure connectors on the bottom side, with/without display, with quick-locking screws (IP 67)

PREMASGARD® 112x-SD

Pressure connectors on the bottom side, with/without display, with snap-on lid (IP 54)



PREMASGARD® 111x		Pressure, differential pressure and volume flow measuring transducers, <i>Premium</i> (Pressure connectors on the top side)				
Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with quick-locking screws)	Price
max. - 1000...+ 1000 Pa	PREMASGARD® 1111				IP 67	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 1111-I	2	4...20 mA		1301-1112-0010-000	134,14 €
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 1111-I LCD	2/3	4...20 mA	■	1301-1112-2010-000	178,79 €
0... 500 Pa / - 500...+ 500 Pa	-	3	0-10 V		see PREMASGARD® 211x	
0... 1000 Pa / - 1000...+ 1000 Pa	-					
max. - 5000...+ 5000 Pa	PREMASGARD® 1115				IP 67	
0...1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 1115-I	2	4...20 mA		1301-1112-0050-000	134,14 €
0...2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 1115-I LCD	2/3	4...20 mA	■	1301-1112-2050-000	178,79 €
0...3000 Pa / - 3000...+ 3000 Pa	-	3	0-10 V		see PREMASGARD® 211x	
0...5000 Pa / - 5000...+ 5000 Pa	-					
max. - 10000...+ 10000 Pa	PREMASGARD® 1116				IP 67	
0... 4000 Pa / - 4000...+ 4000 Pa	PREMASGARD 1116-I	2	4...20 mA		1301-1112-0060-000	155,69 €
0... 6000 Pa / - 6000...+ 6000 Pa	PREMASGARD 1116-I LCD	2/3	4...20 mA	■	1301-1112-2060-000	196,46 €
0... 8000 Pa / - 8000...+ 8000 Pa	PREMASGARD 1116-U	3	0-10 V		1301-1111-0060-000	155,69 €
0...10000 Pa / - 10000...+ 10000 Pa	PREMASGARD 1116-U LCD	3	0-10 V	■	1301-1111-2060-000	196,46 €
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.					
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)					

PREMASGARD® 112x		Pressure, differential pressure and volume flow measuring transducers, <i>Premium</i> (Pressure connectors on the bottom side)				
Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with quick-locking screws)	Price
max. - 1000...+ 1000 Pa	PREMASGARD® 1121				IP 67	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 1121-I	2	4...20 mA		1301-1172-0010-000	134,14 €
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 1121-I LCD	2/3	4...20 mA	■	1301-1172-2010-000	178,79 €
0... 500 Pa / - 500...+ 500 Pa	-	3	0-10 V		see PREMASGARD® 212x	
0... 1000 Pa / - 1000...+ 1000 Pa	-					
max. - 5000...+ 5000 Pa	PREMASGARD® 1125				IP 67	
0...1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 1125-I	2	4...20 mA		1301-1172-0050-000	134,14 €
0...2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 1125-I LCD	2/3	4...20 mA	■	1301-1172-2050-000	178,79 €
0...3000 Pa / - 3000...+ 3000 Pa	-	3	0-10 V		see PREMASGARD® 212x	
0...5000 Pa / - 5000...+ 5000 Pa	-					
max. - 10000...+ 10000 Pa	PREMASGARD® 1126				IP 67	
0... 4000 Pa / - 4000...+ 4000 Pa	PREMASGARD 1126-I	2	4...20 mA		1301-1172-0060-000	155,69 €
0... 6000 Pa / - 6000...+ 6000 Pa	PREMASGARD 1126-I LCD	2/3	4...20 mA	■	1301-1172-2060-000	196,46 €
0... 8000 Pa / - 8000...+ 8000 Pa	PREMASGARD 1126-U	3	0-10 V		1301-1171-0060-000	155,69 €
0...10000 Pa / - 10000...+ 10000 Pa	PREMASGARD 1126-U LCD	3	0-10 V	■	1301-1171-2060-000	196,46 €
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.					
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)					

Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

The calibratable pressure sensors **PREMASGARD® 711x** (series) with eight switchable measuring ranges (eight devices in one), housing made from impact-resistant plastic, optionally with /without display, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101 and with metal pressure port nozzles (quick connect optional) are used to measure positive, negative or differential pressures in air. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional/standard for 25 Pa) and an offset potentiometer for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes the connection set **ASD-06** (2 m connection hose, two pressure port nipples, screws).

PREMASGARD® 711x
with cable gland



PREMASGARD® 711x-Q
with M12 connector



Pressure port
Metal nozzles
(standard)



TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	$R_B \text{ (Ohm)} = (U_B - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see working resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 2 VA / 24 V DC, < 3.5 VA / 24 V AC
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Type of pressure:	differential pressure
Pressure connection:	equipped as standard with metal connection nozzles for pressure hose Ø 6 mm, optionally with quick connect made from stainless steel for PVC fabric pressure hose Ø 6 mm (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °C
Accuracy:	Type 7112 (25 Pa): typically ±1 Pa Type 7110 (100 Pa): typically ±2 Pa Type 7111 (1000 Pa): typically ±5 Pa Type 7115 (5000 Pa): typically ±25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ±1% of final value ±2% of final value for pressure ranges < ±250 Pa
Temp. drift values:	±0.1% / °C ±0.3% / °C for pressure ranges < 250 Pa
Zero point offset:	< ±0.7% of final value ±1.4% of final value for pressure ranges < 250 Pa
Positive/negative pressure:	max. ±100 hPa
Signal filtering:	switchable 1 s / 10 s (via DIP switches)
Output:	0 -10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14-1.5 mm², via plug-in screw terminal
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic , UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Air humidity:	<95% r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL pressure as well as the automatic zero point calibration
ACCESSORIES	see table





Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output



Dimensional drawing **PREMASGARD® 711x**

Housing with **cable gland**
equipped as standard with pressure port **nozzles**

Housing with **M12 connector**
equipped as standard with pressure port **nozzles**

Pressure port **nozzles, metal**

M12 connector (male)

PREMASGARD® 711x
with cable gland and display



PREMASGARD® 711x-Q
with M12 connector and display



Dimensional drawing **PREMASGARD® 711x**

Housing with **cable gland**
optional on request with **quick connect**

Housing with **M12 connector**
optional on request with **quick connect**

Stainless steel quick connect

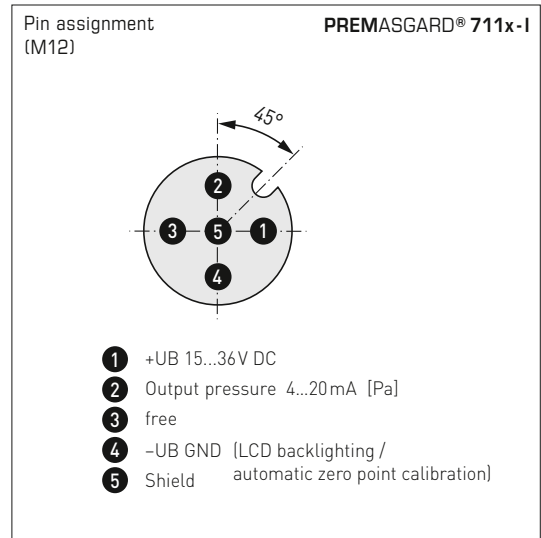
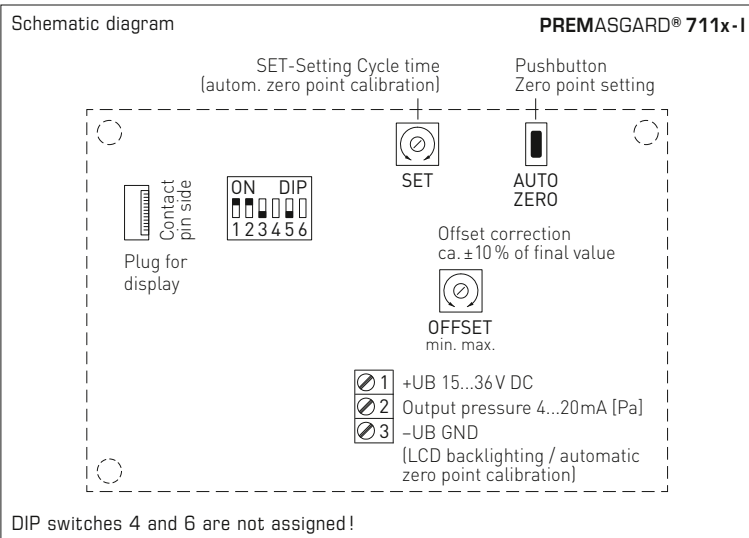
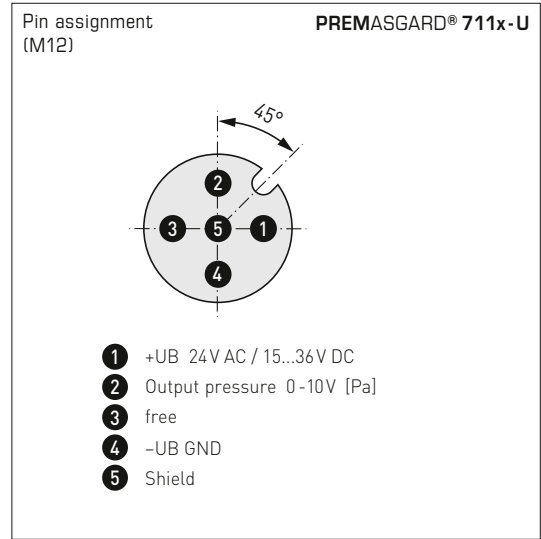
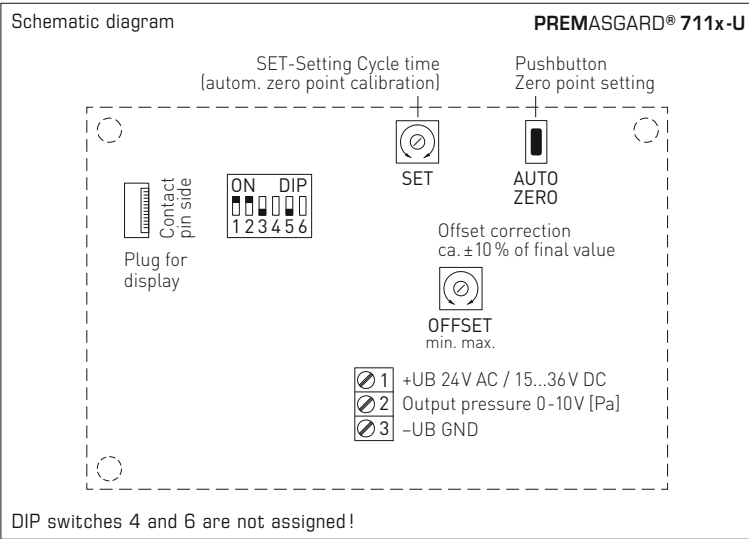
M12 connector (male)



Pressure port
Stainless steel quick connect (optional)



Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

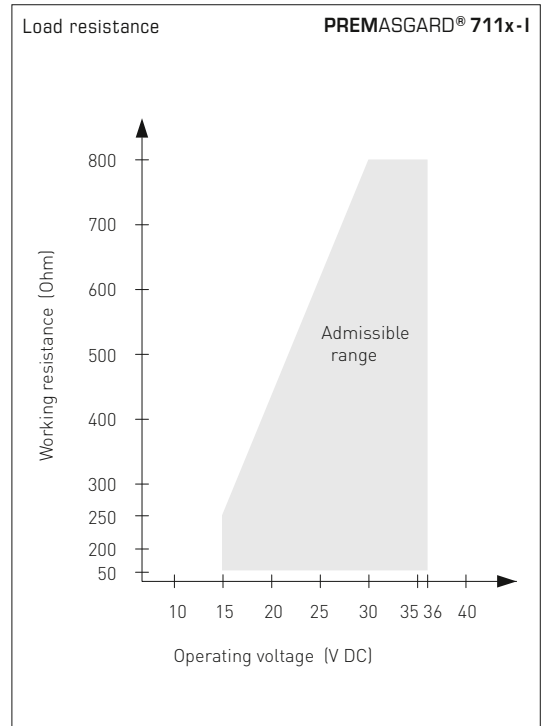


Display with option automatic zero point calibration

Standard
Actual pressure (in Pa)
Calibration interval (arrows)

Zero point calibration active
Remaining calibration time (in seconds)

Adjustment of zero point calibration
Cycle time (15 min to 24 hours) adjustable by potentiometer.





Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

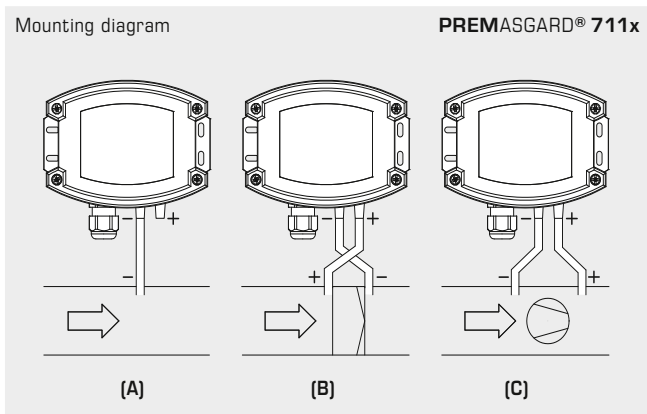
PREMASGARD® 711x-Q
with display,
hinged



Pressure range (selectable) – max. measuring range (default) is depending to the type of device								DIP 1	DIP 2
0...25 Pa	0...50 Pa	0...100 Pa	0...1000 Pa	-25...+25 Pa	-50...+50 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
-	-	0...300 Pa	0...2000 Pa	-	-	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
-	-	0...500 Pa	0...3000 Pa	-	-	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...25 Pa	0...100 Pa	0...1000 Pa	0...5000 Pa	-25...+25 Pa	-100...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Measuring range mode (Mode selectable)	DIP 3
Unidirectional (0...+MR) (default)	OFF
Bidirectional (-MR...+MR)	ON

Measurement signal filtering (Time interval selectable)	DIP 5
10 s (default)	OFF
1 s	ON



TYPES OF MONITORING:

- (A) Below-atmospheric pressure:**
P1 (+) is not connected
but open against atmosphere
P2 (-) connected to inside of duct
- (B) Filter:**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
- (C) Ventilator:**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator

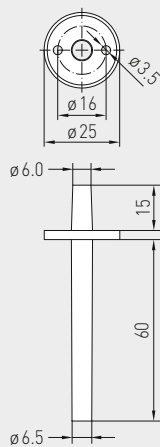
Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWs
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWs
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWs
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWs
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWs
1 mWs	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWs

Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

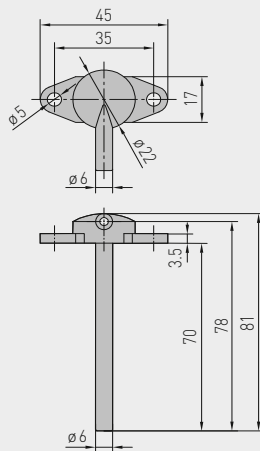
Dimensional drawing **ASD-06**
Connection set



ASD-06
Connection set



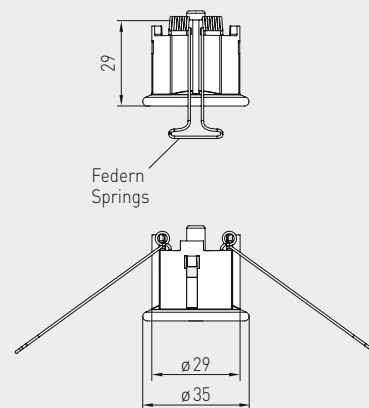
Dimensional drawing **ASD-07**
Connection nipple



ASD-07
Connection nipple



Dimensional drawing **DAL-01**
Pressure outlet



DAL-01
Pressure outlet



WS-03
Weather and sun protection hood (optional)

Pressure port
equipped as standard with pressure port metal **nozzles**



optional on request with stainless steel **quick connect**



ACCESSORIES

ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	6,74 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	6,74 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	31,55 €
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €

For further information, see chapter Accessories!



S+S REGELTECHNIK

PREMASGARD® 711x

Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® 711x-Q
with M12 connector



PREMASGARD® 711x
with cable gland



PREMASGARD® 711x		Pressure and differential pressure measuring transducers, <i>Deluxe</i>			
Pressure range (adjustable)	Type / WG02	Output	Display ● = Q	Item No.	Price
max. - 1000...+ 1000 Pa		Type 7111			
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-U	0-10V		1301-7111-0010-200	148,23 €
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-U LCD	0-10V	■	1301-7111-4010-200	207,95 €
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7111-I	4...20mA		1301-7112-0010-100	148,23 €
0... 1000 Pa / -1000... + 1000 Pa	PREMASGARD 7111-I LCD	4...20mA	■	1301-7112-4010-100	207,95 €
	PREMASGARD 7111-U Q	0-10V	●	2004-6131-1100-001	185,20 €
	PREMASGARD 7111-U Q LCD	0-10V	● ■	2004-6132-1100-001	244,92 €
	PREMASGARD 7111-I Q	4...20mA	●	2004-6131-2100-001	185,20 €
	PREMASGARD 7111-I Q LCD	4...20mA	● ■	2004-6132-2100-001	244,92 €
max. - 5000...+ 5000 Pa		Type 7115			
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7115-U	0-10V		1301-7111-0050-200	148,23 €
0... 2000 Pa / - 2000... + 2000 Pa	PREMASGARD 7115-U LCD	0-10V	■	1301-7111-4050-200	207,95 €
0... 3000 Pa / - 3000... + 3000 Pa	PREMASGARD 7115-I	4...20mA		1301-7112-0050-100	148,23 €
0... 5000 Pa / - 5000... + 5000 Pa	PREMASGARD 7115-I LCD	4...20mA	■	1301-7112-4050-100	207,95 €
	PREMASGARD 7115-U Q	0-10V	●	2004-6131-1100-011	185,20 €
	PREMASGARD 7115-U Q LCD	0-10V	● ■	2004-6132-1100-021	244,92 €
	PREMASGARD 7115-I Q	4...20mA	●	2004-6131-2100-011	185,20 €
	PREMASGARD 7115-I Q LCD	4...20mA	● ■	2004-6132-2100-011	244,92 €
max. - 100...+ 100 Pa		Type 7110			
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-U	0-10V		1301-7111-0110-200	186,62 €
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-U LCD	0-10V	■	1301-7111-4110-200	239,94 €
	PREMASGARD 7110-I	4...20mA		1301-7112-0110-100	186,62 €
	PREMASGARD 7110-I LCD	4...20mA	■	1301-7112-4110-100	239,94 €
	PREMASGARD 7110-U Q	0-10V	●	2004-6131-1100-021	223,59 €
	PREMASGARD 7110-U Q LCD	0-10V	● ■	2004-6132-1100-031	276,91 €
	PREMASGARD 7110-I Q	4...20mA	●	2004-6131-2100-021	223,59 €
	PREMASGARD 7110-I Q LCD	4...20mA	● ■	2004-6132-2100-021	276,91 €
max. - 25...+ 25 Pa		Type 7112			
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-U	0-10V		1301-7111-0370-200	238,87 €
	PREMASGARD 7112-U LCD	0-10V	■	1301-7111-4370-200	282,82 €
	PREMASGARD 7112-I	4...20mA		1301-7112-0370-200	238,87 €
	PREMASGARD 7112-I LCD	4...20mA	■	1301-7112-4370-200	282,82 €
	PREMASGARD 7112-U Q	0-10V	●	2004-6131-1100-031	275,85 €
	PREMASGARD 7112-U Q LCD	0-10V	● ■	2004-6132-1100-011	319,79 €
	PREMASGARD 7112-I Q	4...20mA	●	2004-6131-3100-001	275,85 €
	PREMASGARD 7112-I Q LCD	4...20mA	● ■	2004-6132-3100-011	319,79 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin , A-code)				
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration with optional quick connect for PVC fabric pressure hose Ø 6 mm				43,94 € 63,98 € 36,98 €

Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output

The calibratable pressure sensors **PREMASGARD® 711x-VA** (series) with eight switchable measuring ranges (eight devices in one), **stainless steel V4A** housing, optionally with /without display, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101 and pressure port by stainless steel quick connection (pipe fitting optional) are used to measure positive, negative or differential pressures in air. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional/standard for 25 Pa) and an offset potentiometer for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® 711x-VA
with cable gland



PREMASGARD® 711x-VAQ
with M12 connector



Pressure port
Stainless steel
quick connect
(standard)



TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3V
Working resistance:	$R_a(\text{Ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see working resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 2 VA / 24 V DC, < 3.5 VA / 24 V AC
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Type of pressure:	differential pressure
Pressure port:	equipped as standard with quick connect made from stainless steel for PVC-fabric pressure hose Ø 6 mm (external diameter) optionally with pipe fitting , stainless steel V2A (1.4305) for pressure lines Ø 6 mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °C
Accuracy:	Type 7112 (25 Pa): typically ± 1 Pa Type 7110 (100 Pa): typically ± 2 Pa Type 7111 (1000 Pa): typically ± 5 Pa Type 7115 (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value ± 2 % of final value for pressure ranges < ± 250 Pa
Temp. drift values:	± 0.1 % / °C ± 0.3 % / °C for pressure ranges < 250 Pa
Zero point offset:	< ± 0.7 % of final value ± 1.4 % of final value for pressure ranges < 250 Pa
Positive /negative pressure:	max. ± 100 hPa
Signal filtering:	switchable 1 s / 10 s (via DIP switches)
Output:	0 -10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 -1.5 mm², via plug-in screw terminal
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Air humidity:	<95 % r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL pressure as well as the automatic zero point calibration
ACCESSORIES	(see table)

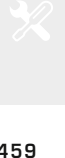
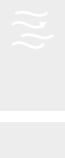


NEW

S+S REGELTECHNIK

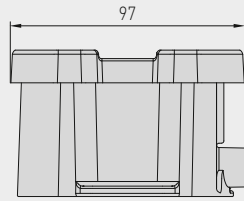
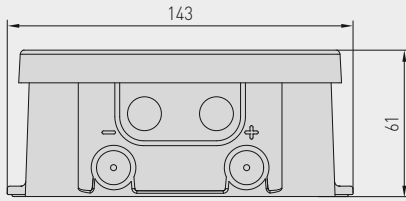
PREMASGARD® 711x-VA

Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output



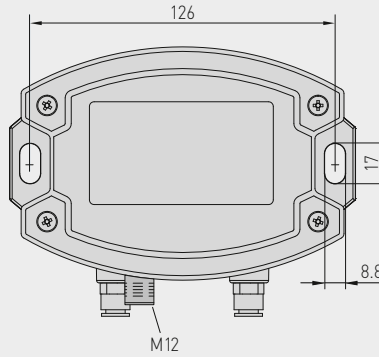
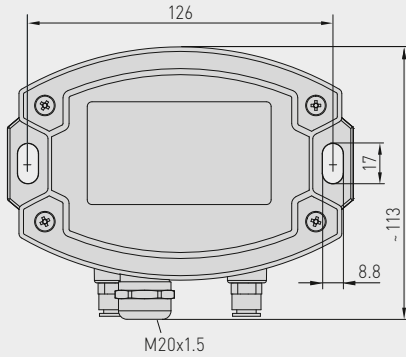
Dimensional drawing

PREMASGARD® 711x-VA

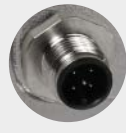


Housing with **cable gland**
equipped as standard with **quick connect**
for pressure hoses

Housing with **M12 connector**
equipped as standard with **quick connect**
for pressure hoses



Stainless steel
quick connect



M12 connector
(male)

PREMASGARD® 711x-VA
with cable gland
and display



PREMASGARD® 711x-VAQ
with M12 connector
and display

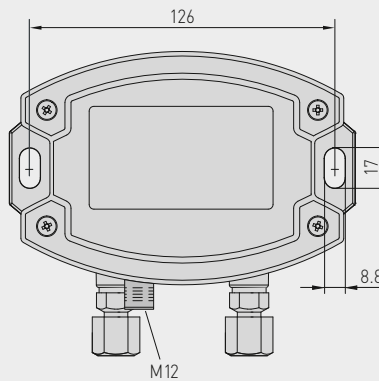
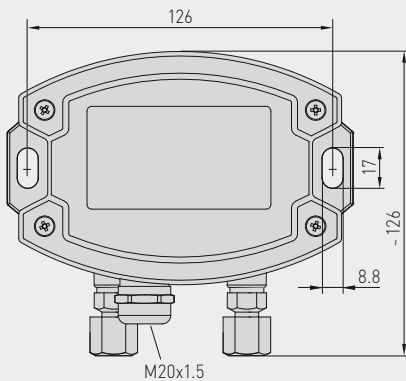


Dimensional drawing

PREMASGARD® 711x-VA

Housing with **cable gland**
optional on request
with **pipe fitting**
for pressure lines

Housing with **M12 connector**
optional on request
with **pipe fitting**
for pressure lines



Stainless steel V2A
pipe fitting

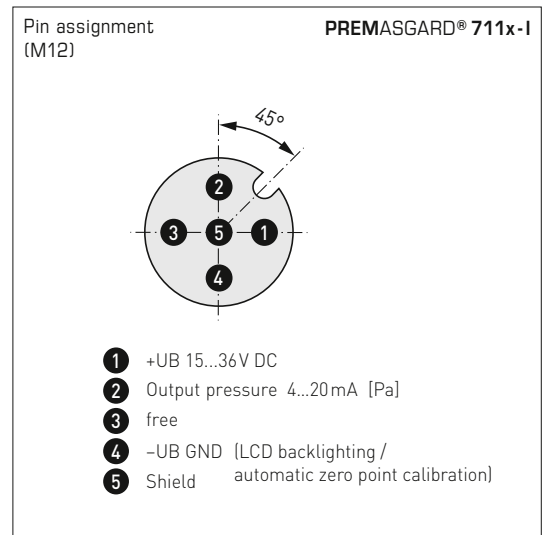
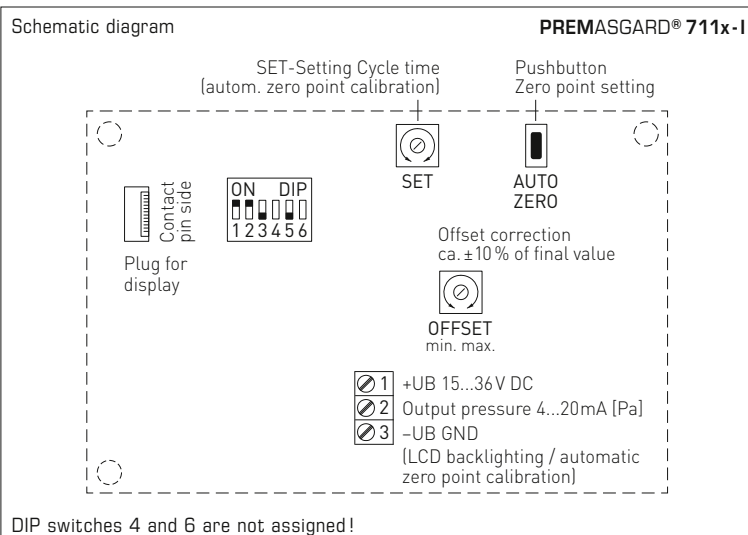
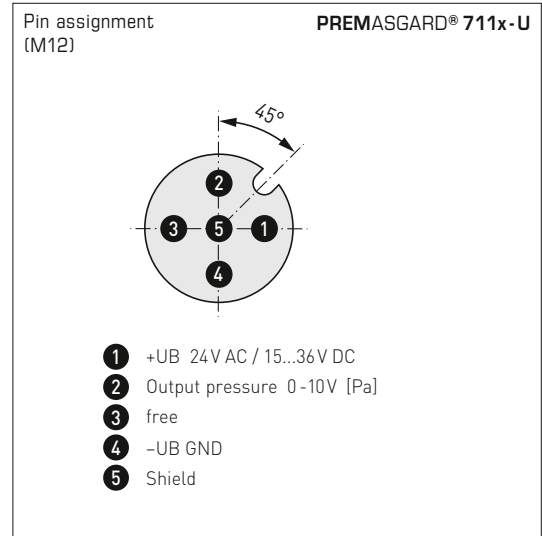
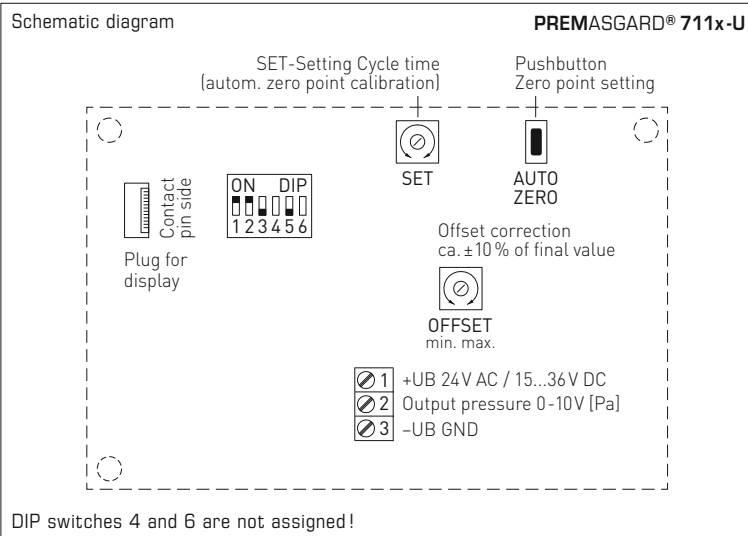


M12 connector
(male)

Pressure port
Stainless steel V2A
pipe fitting
(optional)



Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output

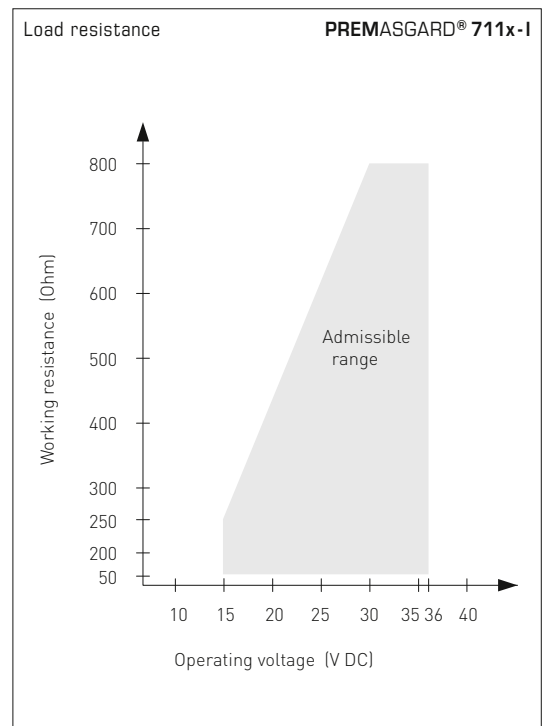


Display with option automatic zero point calibration

Standard
Actual pressure (in Pa)
Calibration interval (arrows)

Zero point calibration active
Remaining calibration time (in seconds)

Adjustment of zero point calibration
Cycle time (15 min to 24 hours) adjustable by potentiometer.





NEW

S+S REGELTECHNIK

PREMASGARD® 711x-VA

Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output

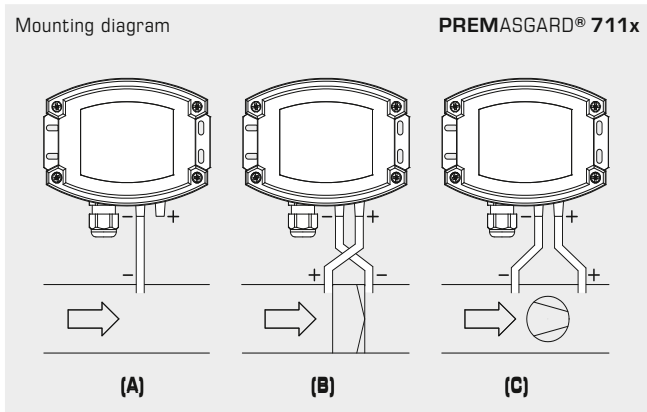
PREMASGARD® 711x-VAQ
with display,
hinged



Pressure range (selectable) – max. measuring range (default) is depending to the type of device								DIP 1	DIP 2
0...25 Pa	0...50 Pa	0...100 Pa	0...1000 Pa	-25...+25 Pa	-50...+50 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
-	-	0...300 Pa	0...2000 Pa	-	-	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
-	-	0...500 Pa	0...3000 Pa	-	-	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...25 Pa	0...100 Pa	0...1000 Pa	0...5000 Pa	-25...+25 Pa	-100...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Measuring range mode (Mode selectable)	DIP 3
Unidirectional (0...+MR) (default)	OFF
Bidirectional (-MR...+MR)	ON

Measurement signal filtering (Time interval selectable)	DIP 5
10 s (default)	OFF
1 s	ON



TYPES OF MONITORING:

- (A) Below-atmospheric pressure:**
P1 (+) is not connected
but open against atmosphere
P2 (-) connected to inside of duct
- (B) Filter:**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
- (C) Ventilator:**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWs
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWs
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWs
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWs
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWs
1 mWs	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWs

Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output

PREMASGARD® 711x-VAQ
with M12 connector



PREMASGARD® 711x-VAQ		Pressure and differential pressure measuring transducer, ID Stainless steel housing with M12 connector			
Pressure range (adjustable)	Type / WG02I	Output	Display ● = Q	Item No.	Price
max. - 1000...+ 1000 Pa		Type 7111			
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-U VAQ	0-10 V	●	2004-6191-1100-001	492,71 €
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-U VAQ LCD	0-10 V	● ■	2004-6192-1100-001	652,74 €
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7111-I VAQ	4...20mA	●	2004-6191-2100-001	492,71 €
0... 1000 Pa / -1000... + 1000 Pa	PREMASGARD 7111-I VAQ LCD	4...20mA	● ■	2004-6192-2100-001	652,74 €
max. - 5000...+ 5000 Pa		Type 7115			
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7115-U VAQ	0-10 V	●	2004-6191-1100-011	492,71 €
0...2000 Pa / -2000... + 2000 Pa	PREMASGARD 7115-U VAQ LCD	0-10 V	● ■	2004-6192-1100-011	652,74 €
0...3000 Pa / -3000... + 3000 Pa	PREMASGARD 7115-I VAQ	4...20mA	●	2004-6191-2100-011	492,71 €
0...5000 Pa / -5000... + 5000 Pa	PREMASGARD 7115-I VAQ LCD	4...20mA	● ■	2004-6192-2100-011	652,74 €
max. - 100...+ 100 Pa		Type 7110			
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-U VAQ	0-10 V	●	2004-6191-1100-021	547,69 €
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-U VAQ LCD	0-10 V	● ■	2004-6192-1100-021	700,73 €
	PREMASGARD 7110-I VAQ	4...20mA	●	2004-6191-2100-021	547,69 €
	PREMASGARD 7110-I VAQ LCD	4...20mA	● ■	2004-6192-2100-021	700,73 €
max. - 25...+ 25 Pa		Type 7112			
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-U VAQ	0-10 V	●	2004-6191-1100-031	626,07 €
<i>equipped as standard with automatic zero point calibration (3-wire connection)</i>	PREMASGARD 7112-U VAQ LCD	0-10 V	● ■	2004-6192-1100-031	765,04 €
	PREMASGARD 7112-I VAQ	4...20mA	●	2004-6191-3100-001	626,07 €
	PREMASGARD 7112-I VAQ LCD	4...20mA	● ■	2004-6192-3100-001	765,04 €
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)			
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm				43,94 € 63,98 € 36,98 €

ACCESSORIES

xx-M12 Special accessories for M12 connector

For further information, see chapter Accessories!



NEW

S+S REGELTECHNIK

PREMASGARD® 711x-VA

Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output

PREMASGARD® 711x-VA
with cable gland



PREMASGARD® 711x-VA		Pressure and differential pressure measuring transducer, ID Stainless steel housing with cable gland			
Pressure range (adjustable)	Type / WG02I	Output	Display	Item No.	Price
max. - 1000...+ 1000 Pa		Type 7111			
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-U VA	0-10V		2004-6191-1200-001	461,35 €
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-U VA LCD	0-10V	■	2004-6192-1200-001	618,76 €
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7111-I VA	4...20mA		2004-6191-2200-001	461,35 €
0... 1000 Pa / -1000... + 1000 Pa	PREMASGARD 7111-I VA LCD	4...20mA	■	2004-6192-2200-001	618,76 €
max. - 5000...+ 5000 Pa		Type 7115			
0...1000 Pa / - 1000 ... + 1000 Pa	PREMASGARD 7115-U VA	0-10V		2004-6191-1200-011	461,35 €
0...2000 Pa / -2000 ... +2000 Pa	PREMASGARD 7115-U VA LCD	0-10V	■	2004-6192-1200-011	618,76 €
0...3000 Pa / -3000 ... +3000 Pa	PREMASGARD 7115-I VA	4...20mA		2004-6191-2200-011	461,35 €
0...5000 Pa / -5000 ... + 5000 Pa	PREMASGARD 7115-I VA LCD	4...20mA	■	2004-6192-2200-011	618,76 €
max. - 100...+ 100 Pa		Type 7110			
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-U VA	0-10V		2004-6191-1200-021	513,70 €
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-U VA LCD	0-10V	■	2004-6192-1200-021	666,74 €
	PREMASGARD 7110-I VA	4...20mA		2004-6191-2200-021	513,70 €
	PREMASGARD 7110-I VA LCD	4...20mA	■	2004-6192-2200-021	666,74 €
max. - 25...+ 25 Pa		Type 7112			
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-U VA	0-10V		2004-6191-1200-031	592,09 €
<i>equipped as standard with automatic zero point calibration (3-wire connection)</i>	PREMASGARD 7112-U VA LCD	0-10V	■	2004-6192-1200-031	731,06 €
	PREMASGARD 7112-I VA	4...20mA		2004-6191-3200-001	592,09 €
	PREMASGARD 7112-I VA LCD	4...20mA	■	2004-6192-3200-001	731,06 €
Housing variant:	Cable connection with cable gland made from stainless steel V2A (1.4305)				
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm				43,94 € 63,98 € 36,98 €



Pressure port
equipped as standard with
quick connect
for pressure hoses



optional on request
with **pipe fitting**
for pressure lines



**Pressure and differential pressure measuring transducers/switches,
incl. connection set, with multi-range switching
and adjustable, switching and active output**

The electronic **PREMASREG® 711x** pressure sensors and switches are equipped with eight switchable measuring ranges, one switching output, one continuous output, and a display for setting the switch-point and to display the ACTUAL pressure (eight devices in one, plus differential pressure switch / differential pressure monitor, continuous pressure sensor in a single device).

The pressure sensor with a housing made from impact-resistant plastic, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101 and with metal pressure port nozzles (quick connect optional) is used to measure positive, negative or differential pressures in clean air, with limit value switching. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional) and one offset potentiometer for setting the switching point and one for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes the connection set **ASD-06** (2m connection hose, two pressure port nipples, screws).

TECHNICAL DATA

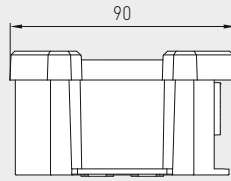
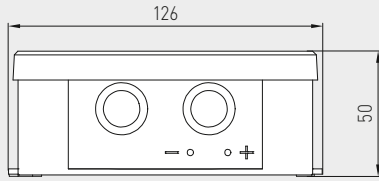
Power supply:	24 V AC / DC (± 20%)
Load resistance:	$R_L > 5 \text{ k}\Omega$
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Type of pressure:	differential pressure
Pressure connection:	equipped as standard with metal connection nozzles for pressure hose $\varnothing 6 \text{ mm}$, optionally with quick connect made from stainless steel for PVC fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °C
Accuracy:	Type 7111 (1000 Pa): typically ± 5 Pa Type 7115 (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value
Temp. drift values:	± 0.1 % / °C
Zero point offset:	< ± 0.7% of final value
Setting increment Δp :	1 % of pressure range (100 Pa => 1 Pa; 5000 Pa => 50 Pa)
Switching hysteresis:	± 1 % of pressure range (100 Pa => ± 1 Pa; 5000 Pa => ± 50 Pa)
Positive /negative pressure:	max. ± 100 hPa
Signal filtering:	switchable 1 s / 10 s (via DIP switches)
Output:	0 -10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14 -1.5 mm ² , via plug-in screw terminal
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 12-pin , A-code) according to DIN EN 61076-2-101
Housing:	plastic , UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and/or SETPOINT pressure as well as automatic zero point calibration
ACCESSORIES	see table

Pressure port
Metal nozzles
(standard)



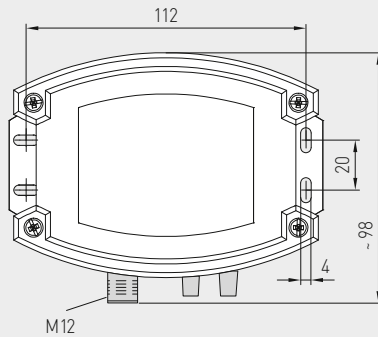
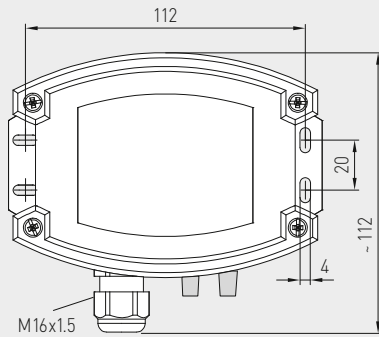
Dimensional drawing

PREMASREG® 711x



Housing with **cable gland**
equipped as standard with
pressure port **nozzles**

Housing with **M12 connector**
equipped as standard with
pressure port **nozzles**



Pressure port **nozzles, metal**



M12 connector (male)

PREMASREG® 711x-Q
with cable gland
and display



PREMASREG® 711x-Q
with M12 connector
and display



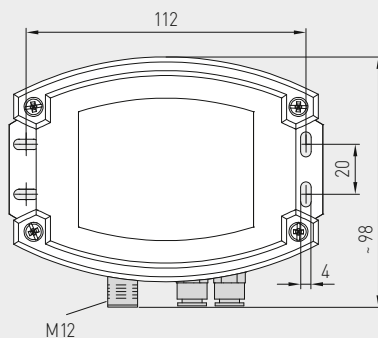
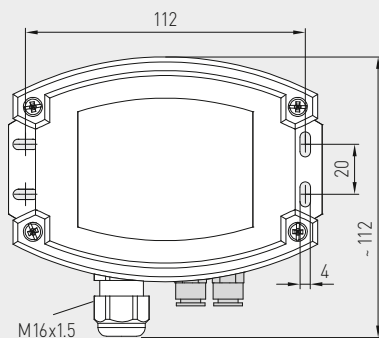
Pressure port
Stainless steel
quick connect
(optional)

Dimensional drawing

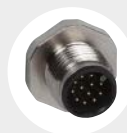
PREMASREG® 711x

Housing with **cable gland**
optional on request
with **quick connect**

Housing with **M12 connector**
optional on request
with **quick connect**



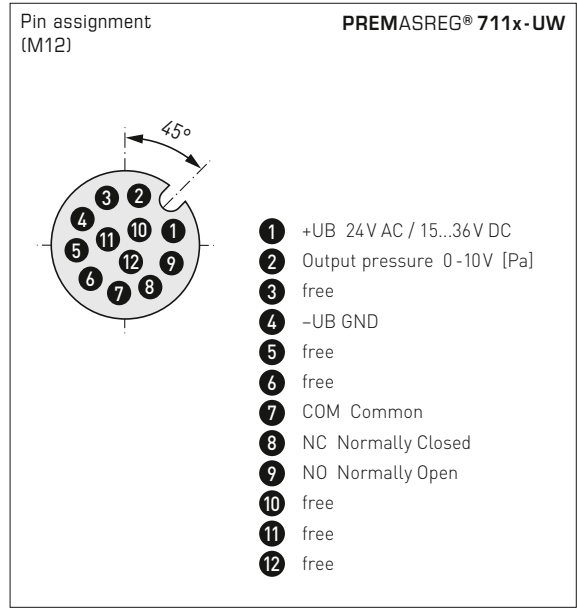
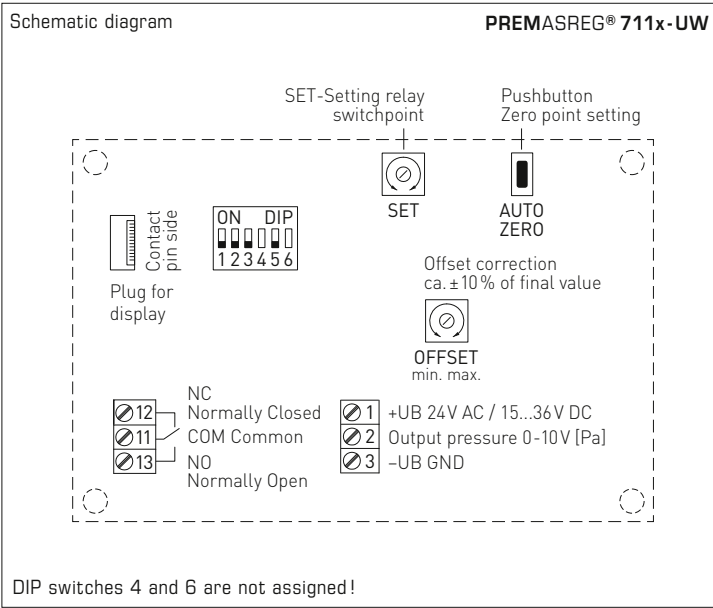
Stainless steel
quick connect



M12 connector (male)



Pressure and differential pressure measuring transducers/switches,
incl. connection set, with multi-range switching
and adjustable, switching and active output



Pressure range (selectable) – max. measuring range (default) is depending to the type of device				DIP 1	DIP 2
0...100 Pa	0...1000 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...1000 Pa	0...5000 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Measuring range mode (Mode selectable)	DIP 3
Unidirectional (0...+MR) (default)	OFF
Bidirectional (-MR...+MR)	ON

Measurement signal filtering (Time interval selectable)	DIP 5
10 s (default)	OFF
1 s	ON

Display with option automatic zero point calibration



Zero point calibration active

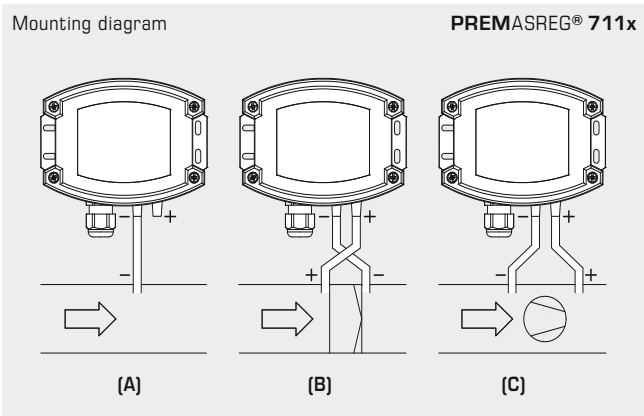
Remaining calibration time (in seconds)

Cycle time (approx. 90 minutes) is fixed in the factory.



Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

PREMASREG® 711x-Q with display, hinged



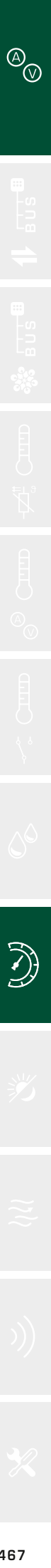
TYPES OF MONITORING:

- (A) Below-atmospheric pressure:**
P1 (+) is not connected but open against atmosphere
P2 (-) connected to inside of duct
- (B) Filter:**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
- (C) Ventilator:**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator

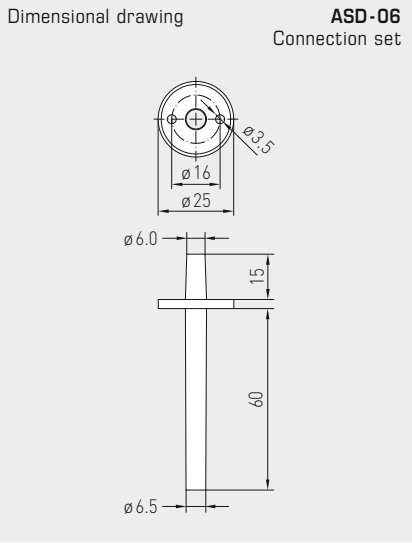
Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

Conversion table for pressure values:

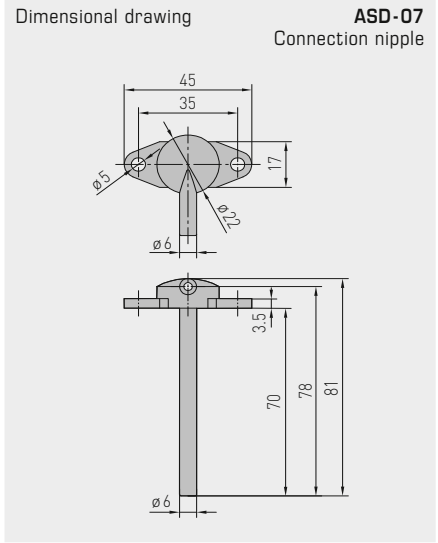
Unit =	bar	mbar	Pa	kPa	mWs
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWs
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWs
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWs
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWs
1 mWs	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWs



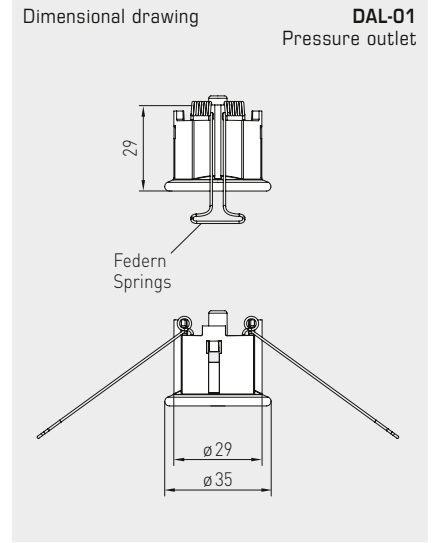
Pressure and differential pressure measuring transducers/switches,
incl. connection set, with multi-range switching
and adjustable, switching and active output



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet



WS-03
Weather and sun protection hood
(optional)

Pressure port
equipped as standard with
pressure port metal **nozzles**



optional on request
with stainless steel
quick connect



ACCESSORIES

ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	6,74 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	6,74 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	31,55 €
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €

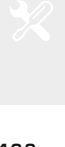
For further information, see chapter Accessories!



PREMASREG® 711x-Q
with M12 connector



PREMASREG® 711x
with cable gland



PREMASREG® 711x		Pressure and differential pressure measuring transducers/switches, <i>Deluxe</i>			
Pressure range (adjustable)	Type/WG02	Output	Display ● = Q	Item No.	Price
max. - 1000...+ 1000 Pa		Type 7111			
0... 100 Pa / - 100... + 100 Pa	PREMASREG 7111-UW LCD	0-10V 1x Changeover contact	■	1302-7111-4011-200	212,21 €
0... 300 Pa / - 300... + 300 Pa	PREMASREG 7111-UW Q LCD	0-10V 1x Changeover contact	● ■	2004-6132-4100-001	249,19 €
0... 500 Pa / - 500... + 500 Pa					
0... 1000 Pa / -1000... + 1000 Pa					
max. - 5000...+ 5000 Pa		Type 7115			
0...1000 Pa / - 1000 ... + 1000 Pa	PREMASREG 7115-UW LCD	0-10V 1x Changeover contact	■	1302-7111-4051-200	212,21 €
0...2000 Pa / -2000 ... + 2000 Pa	PREMASREG 7115-UW Q LCD	0-10V 1x Changeover contact	● ■	2004-6132-4100-011	249,19 €
0...3000 Pa / -3000 ... + 3000 Pa					
0...5000 Pa / -5000 ... + 5000 Pa					
Housing variant "Q":	Cable connection with M12 connector (male, 12-pin , A-code)				
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration with optional quick connect for PVC fabric pressure hose Ø 6 mm				43,94 € 63,98 € 36,98 €

**Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output**

The electronic **PREMASREG® 711x-VA** pressure sensors and switches are equipped with eight switchable measuring ranges, one switching output, one continuous output, and a display for setting the switchpoint and to display the ACTUAL pressure (eight devices in one, plus differential pressure switch/differential pressure monitor, continuous pressure sensor in a single device).

The pressure sensor with a housing made from **stainless steel V4A**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101 and with pressure port by stainless steel quick connect (pipe fitting optional) is used to measure positive, negative or differential pressures in clean air, with limit value switching. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional) as well as one offset potentiometer for setting the switching point and one for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (±20%)
Load resistance:	$R_L > 5 \text{ k}\Omega$
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Type of pressure:	differential pressure
Pressure port:	equipped as standard with quick connect made from stainless steel for PVC-fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter) optionally with pipe fitting , stainless steel V2A (1.4305) for pressure lines $\varnothing 6 \text{ mm}$
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °C
Accuracy:	Type 7111 (1000 Pa): typically $\pm 5 \text{ Pa}$ Type 7115 (5000 Pa): typically $\pm 25 \text{ Pa}$ compared to the calibrated reference device
Sum of linearity+hysteresis:	< $\pm 1\%$ of final value
Temp. drift values:	$\pm 0.1\%$ / °C
Zero point offset:	< $\pm 0.7\%$ of final value
Setting increment Δp :	1% of pressure range (100 Pa => 1 Pa; 5000 Pa => 50 Pa)
Switching hysteresis:	$\pm 1\%$ of pressure range (100 Pa => $\pm 1 \text{ Pa}$; 5000 Pa => $\pm 50 \text{ Pa}$)
Positive/negative pressure:	max. $\pm 100 \text{ hPa}$
Signal filtering:	switchable 1 s / 10 s (via DIP switches)
Output:	0 -10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14 -1.5 mm ² , via plug-in screw terminal
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 12-pin , A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr2E)
Air humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014/30/EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and/or SETPOINT pressure as well as automatic zero point calibration
ACCESSORIES	(see table)

Pressure port
Stainless steel
quick connect
(standard)



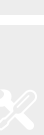


NEW

S+S REGELTECHNIK

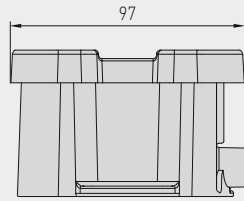
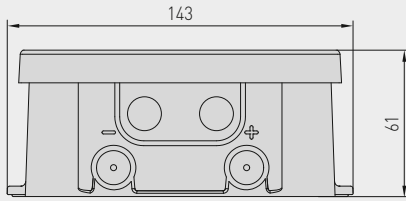
PREMASREG® 711x-VA

Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output



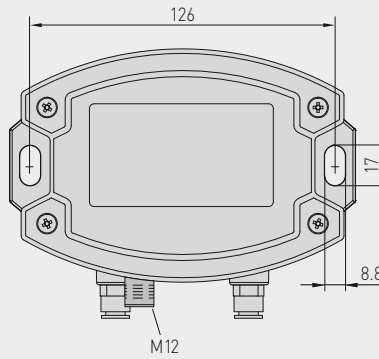
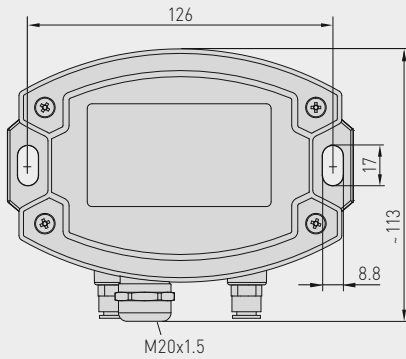
Dimensional drawing

PREMASREG® 711x-VA

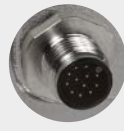


Housing with **cable gland**
equipped as standard with **quick connect**
for pressure hoses

Housing with **M12 connector**
equipped as standard with **quick connect**
for pressure hoses



Stainless steel
quick connect



M12 connector
(male)

PREMASREG® 711x-VA
with cable gland
and display



PREMASREG® 711x-VAQ
with M12 connector
and display

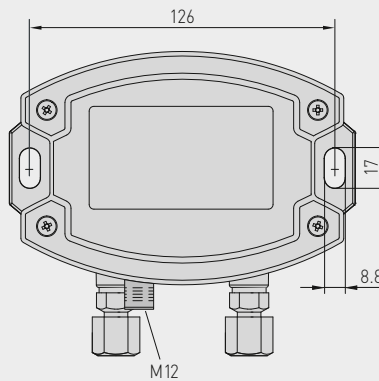
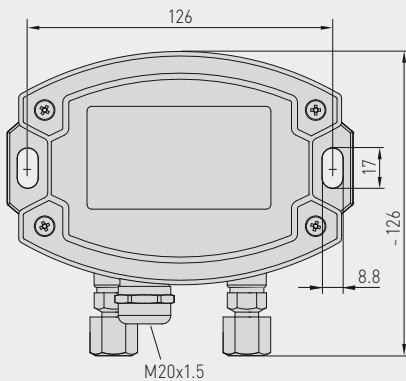


Dimensional drawing

PREMASREG® 711x-VA

Housing with **cable gland**
optional on request
with **pipe fitting**
for pressure lines

Housing with **M12 connector**
optional on request
with **pipe fitting**
for pressure lines



Stainless steel V2A
pipe fitting

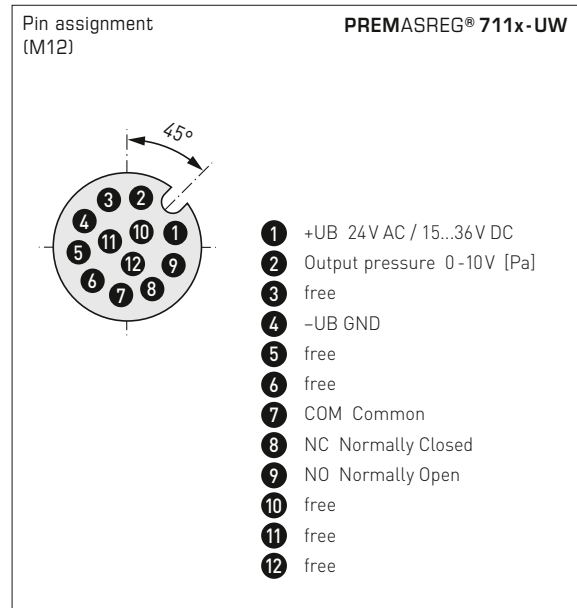
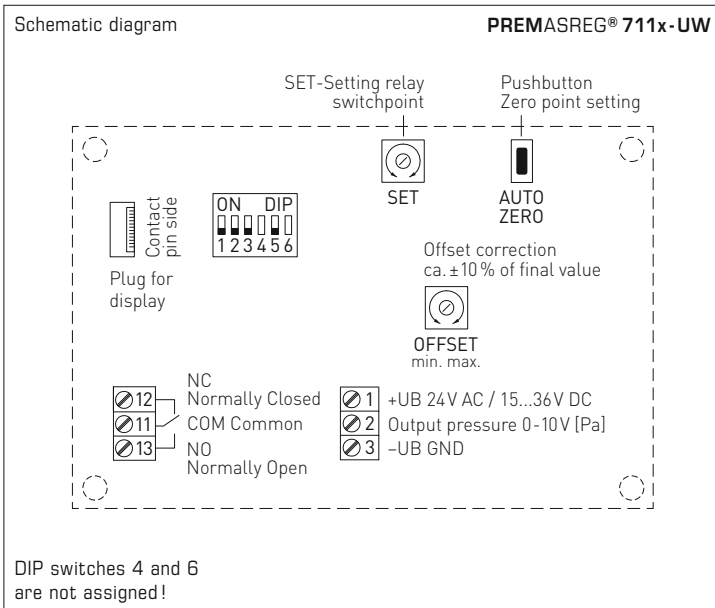


M12 connector
(male)

Pressure port
Stainless steel V2A
pipe fitting
(optional)



Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output



Pressure range (selectable) – max. measuring range (default) is depending to the type of device				DIP 1	DIP 2
0...100 Pa	0...1000 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...1000 Pa	0...5000 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Measuring range mode (Mode selectable)	DIP 3
Unidirectional (0...+MR) (default)	OFF
Bidirectional (-MR...+MR)	ON

Measurement signal filtering (Time interval selectable)	DIP 5
10 s (default)	OFF
1 s	ON

Display with option automatic zero point calibration



Zero point calibration active

Remaining calibration time (in seconds)

Cycle time (approx. 90 minutes) is fixed in the factory.



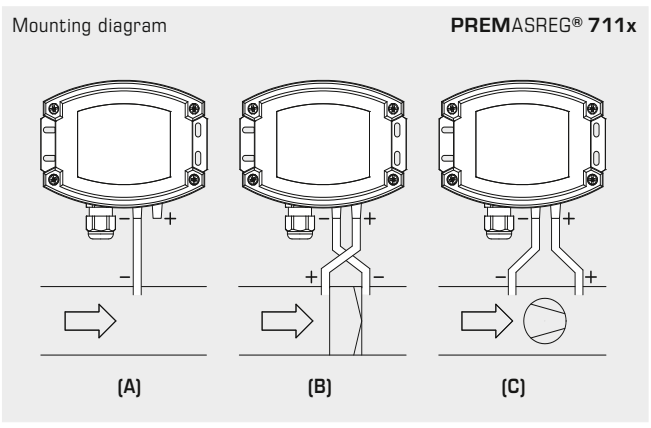
NEW

S+S REGELTECHNIK

PREMASREG® 711x-VA

Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output

PREMASREG® 711x-VAQ
with display,
hinged



TYPES OF MONITORING:

- (A) Below-atmospheric pressure:**
P1 (+) is not connected
but open against atmosphere
P2 (-) connected to inside of duct
- (B) Filter:**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
- (C) Ventilator:**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWs
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWs
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWs
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWs
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWs
1 mWs	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWs

Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output

PREMASREG® 711x-VAQ
with M12 connector



PREMASREG® 711x-VAQ		Pressure and differential pressure measuring transducers/switches, <i>ID</i> (Stainless steel housing with M12 connector)			
Pressure range (adjustable)	Type / WG02I	Output	Display ● = Q	Item No.	Price
max. - 1000...+ 1000 Pa		Type 7111			
0... 100 Pa / - 100... + 100 Pa	PREMASREG 7111-UW VAQ LCD	0-10V 1x Changeover contact	● ■	2004-6192-4100-001	659,13 €
0... 300 Pa / - 300... + 300 Pa					
0... 500 Pa / - 500... + 500 Pa					
0... 1000 Pa / -1000... + 1000 Pa					
max. - 5000...+ 5000 Pa		Type 7115			
0... 1000 Pa / - 1000 ... + 1000 Pa	PREMASREG 7115-UW VAQ LCD	0-10V 1x Changeover contact	● ■	2004-6192-4100-011	659,13 €
0... 2000 Pa / -2000 ... + 2000 Pa					
0... 3000 Pa / -3000 ... + 3000 Pa					
0... 5000 Pa / -5000 ... + 5000 Pa					
Housing variant "Q":		Cable connection with M12 connector (male, 12-pin , A-code)			
Multi-range switching:		The pressure ranges depend on the device type and can be set via DIP switches.			
Extra charge:		Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm			43,94 € 63,98 € 36,98 €

ACCESSORIES

xx-M12 Special accessories for M12 connector

For further information, see chapter Accessories!



S+S REGELTECHNIK

NEW

PREMASREG® 711x-VA

Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output

PREMASREG® 711x-VA
with cable gland



PREMASREG® 711x-VA		Pressure and differential pressure measuring transducers/switches, ID (Stainless steel housing with cable gland)			
Pressure range (adjustable)	Type/WG02I	Output	Display	Item No.	Price
max. - 1000...+ 1000 Pa		Type 7111			
0... 100 Pa / - 100... + 100 Pa	PREMASREG 7111-UW VA LCD	0-10V 1x Changeover contact	■	2004-6192-4200-001	625,16 €
0... 300 Pa / - 300... + 300 Pa					
0... 500 Pa / - 500... + 500 Pa					
0... 1000 Pa / -1000... + 1000 Pa					
max. - 5000...+ 5000 Pa		Type 7115			
0...1000 Pa / - 1000 ... + 1000 Pa	PREMASREG 7115-UW VA LCD	0-10V 1x Changeover contact	■	2004-6192-4200-011	625,16 €
0...2000 Pa / -2000 ... + 2000 Pa					
0...3000 Pa / -3000 ... + 3000 Pa					
0...5000 Pa / -5000 ... + 5000 Pa					
Housing variant:	Cable connection with cable gland made from stainless steel V2A (1.4305)				
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration with optional pipe fitting made from stainless steel V2A for pressure lines \varnothing 6 mm				43,94 € 63,98 € 36,98 €



Pressure port

equipped as standard with **quick connect** for pressure hoses



optional on request with **pipe fitting** for pressure lines



Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

The electronic **PREMASREG® 716x** pressure sensor and switch is equipped with measuring functions for volume flow, differential pressure, filter monitoring and liquid level detection based on pressure measurement in clean air. The devices with a housing made from impact-resistant plastic, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101 and with metal pressure port nozzles (quick connect optional) are fitted with one switching output, one continuous output and one backlit display for setting the switching point and displaying the **ACTUAL** values. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

This pressure sensor is used in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The medium measured is air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

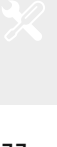
It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. A connection set **ASD-06** (2 m connection hose, two pressure nipples, screws) is included in the scope of supply.

TECHNICAL DATA

Power supply:	24 V AC / DC ($\pm 10\%$) and 15...36 V DC
Load resistance:	$R_L > 5\text{ k}\Omega$
Power consumption:	$< 1.5\text{ VA} / 24\text{ V DC}$, $< 2.8\text{ VA} / 24\text{ V AC}$
Measuring function:	Volume flow, differential pressure, filter monitoring, fill level (adjustable)
Measuring ranges:	10...100% (adjustable)
Type of pressure:	differential pressure
Pressure connection:	equipped as standard with metal connection nozzles for pressure hose $\varnothing 6\text{ mm}$, optionally with quick connect made from stainless steel for PVC fabric pressure hose $\varnothing 6\text{ mm}$ (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	$-20...+50\text{ }^\circ\text{C}$
Accuracy:	Type 7161 (1000 Pa): typically $\pm 5\text{ Pa}$ Type 7165 (5000 Pa): typically $\pm 25\text{ Pa}$ compared to the calibrated reference device
Sum of linearity+hysteresis:	$< \pm 1\%$ of final value (pressure)
Temp. drift values:	$\pm 0.1\%$ / $^\circ\text{C}$
Positive / negative pressure:	max. $\pm 10000\text{ Pa}$
Signal hysteresis:	$\pm 1\%$ of final value (pressure) 10 Pa / 50 Pa
Signal filtering:	switchable 1 s / 10 s (via DIP switches) and small value suppression $< 1\%$
Output:	0-10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14-1.5 mm ² , via plug-in screw terminal
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 12-pin , A-code) according to DIN EN 61076-2-101
Housing:	plastic , UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Air humidity:	$< 95\%$ r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying the volume flow, differential pressure, contamination degree or level and for setting the switchpoint, K factor, measuring range limits and other settings
K factor:	1 to 3000 (adjustable)
Units:	m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm (adjustable)
Max. value displayed:	999999
ACCESSORIES	see table

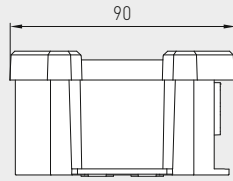
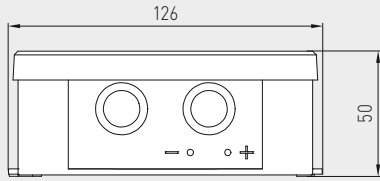
Pressure port
Metal nozzles
(standard)





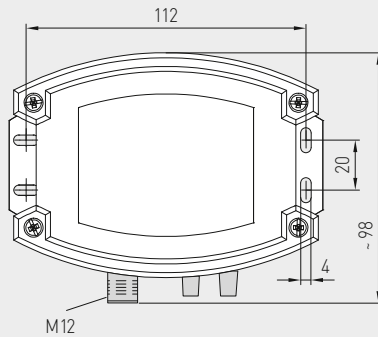
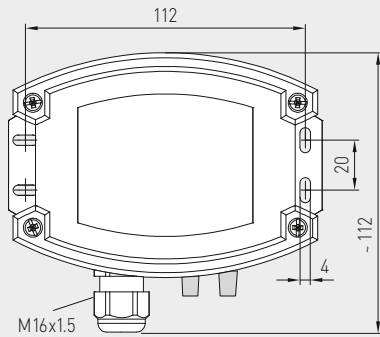
Dimensional drawing

PREMASREG® 716x



Housing with cable gland equipped as standard with pressure port nozzles

Housing with M12 connector equipped as standard with pressure port nozzles



Pressure port nozzles, metal



M12 connector (male)

PREMASREG® 716x with cable gland and display



PREMASREG® 716x-Q with M12 connector and display

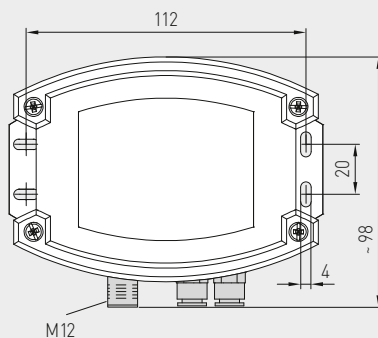
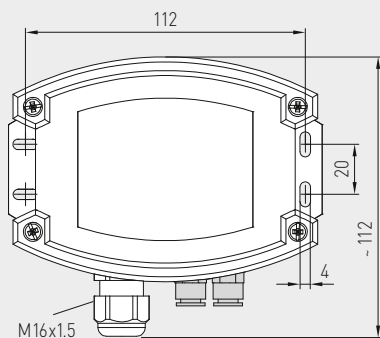


Dimensional drawing

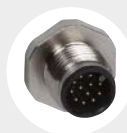
PREMASREG® 716x

Housing with cable gland optional on request with quick connect

Housing with M12 connector optional on request with quick connect



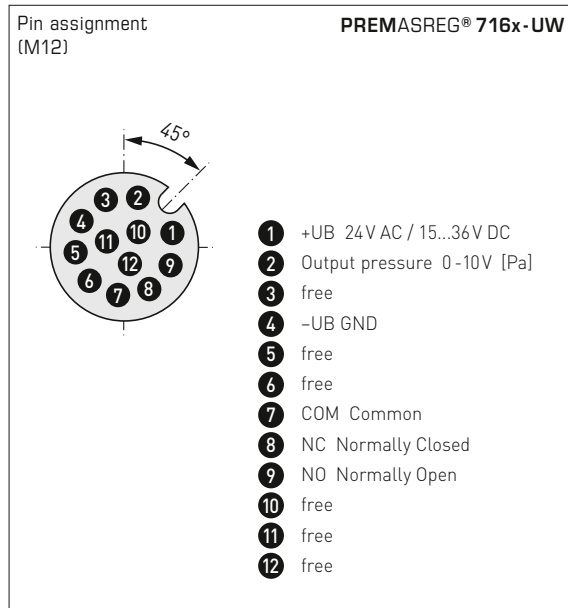
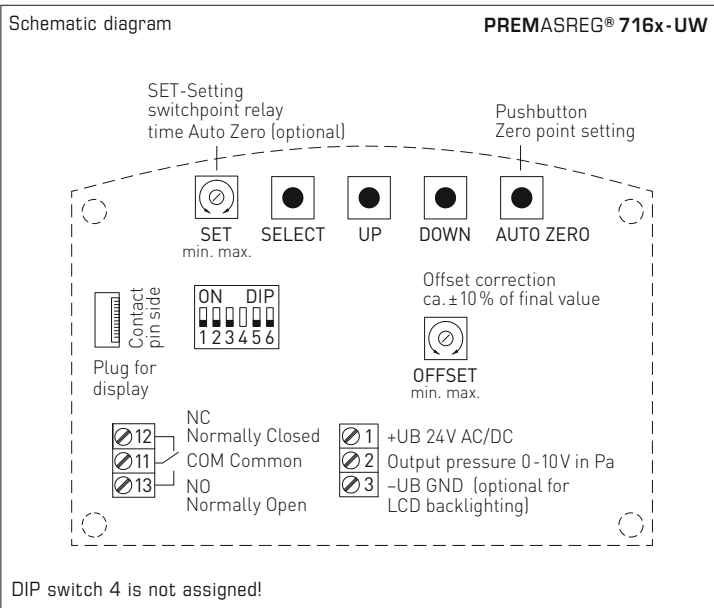
Stainless steel quick connect



M12 connector (male)

Pressure port Stainless steel quick connect (optional)





Measuring range mode (Mode selectable)	DIP 1
Unidirectional (0...+MR) (default)	OFF
Bidirectional (-MR...+MR)	ON

Small value suppression (measured values < 1% of end value (pressure) = 0)	DIP 2
Deactivated (default)	OFF
Active	ON

Relay (Function adjustable)	DIP 3
Deactivated (default)	OFF
Active (display shows switching point)	ON

Measurement signal filtering (Time interval selectable)	DIP 5
10s (default)	OFF
1s	ON

Service mode (display adjustable)	DIP 6
Standard (according to configuration) (default)	OFF
Service (differential pressure in Pa)	ON

PREMASREG® 716x
Function types



Volumolum flow rate

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow in m³/h
k = K factor 1...3000
Δp = Differential pressure in Pa



Differential pressure

$$\Delta p = p_+ - p_-$$

Δp = Differential pressure in Pa
p₊ = higher pressure
p₋ = lower pressure



Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %
Δp = Differential pressure in Pa
p_{Filter} = differential pressure filter replacement in Pa



Level display

$$h = \Delta p \div (\rho \cdot g)$$

h = Fill level height in cm
Δp = Differential pressure in Pa
ρ = Density 700...1300 in kg/m³
g = 9.81 m/s²

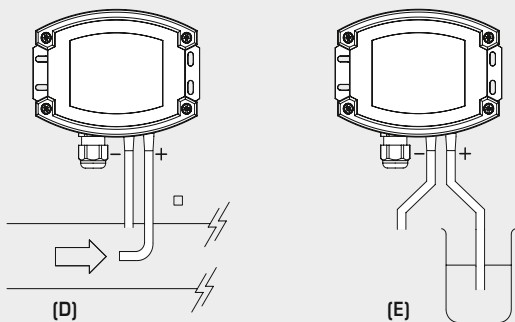
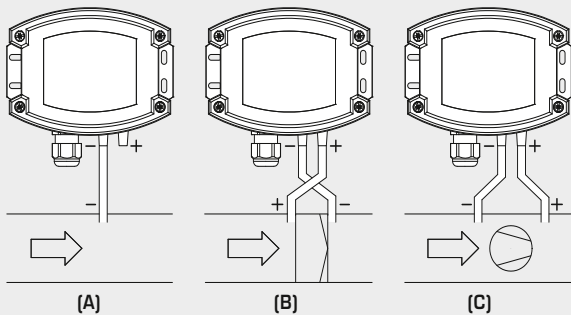


PREMASREG® 716x-Q
with display,
hinged



Mounting diagram

PREMASREG® 716x



TYPES OF MONITORING:

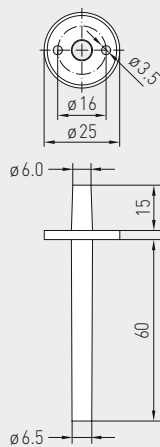
- (A) **Below-atmospheric pressure:**
P1 (+) is not connected, but open to the atmosphere
P2 (-) connected to inside of duct
 - (B) **Filter:**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
 - (C) **Ventilator:**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator
 - (D) **Volume flow:**
P1 (+) dynamic pressure, Connected in flow direction
P2 (-) static pressure, Connected free of dynamic pressure components
 - (E) **Level:**
P1 (+) Connection submerged in medium
P2 (-) Connection is open to the atmosphere
- Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWs
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWs
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWs
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWs
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWs
1 mWs	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWs

Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

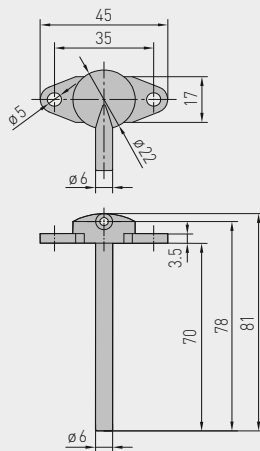
Dimensional drawing **ASD-06**
Connection set



ASD-06
Connection set



Dimensional drawing **ASD-07**
Connection nipple



ASD-07
Connection nipple



WS-03
Weather and sun protection hood (optional)

Pressure port
equipped as standard with pressure port metal nozzles



optional on request with stainless steel quick connect



ACCESSORIES

ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	6,74 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	6,74 €
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €

For further information, see chapter Accessories!



PREMASREG® 716x-Q
with M12 connector



PREMASREG® 716x
with cable gland



Measuring Range Pressure / Volume Flow		Type / WG02	Output	Display ● = Q	Item No.	Price
0...1000 Pa		Type 7161				
k = 3000 94800 m³/h	PREMASREG 7161-UW	LCD	0-10V 1x Changeover contact	■	1302-7161-4161-200	245,28 €
	PREMASREG 7161-UW Q	LCD	0-10V 1x Changeover contact	● ■	2004-6132-4100-021	282,24 €
0...5000 Pa		Type 7165				
k = 3000 212100 m³/h	PREMASREG 7165-UW	LCD	0-10V 1x Changeover contact	■	1302-7161-4171-200	245,28 €
	PREMASREG 7165-UW Q	LCD	0-10V 1x Changeover contact	● ■	2004-6132-4100-031	282,24 €
Housing variant "Q":		Cable connection with M12 connector (male, 12-pin , A-code)				
Multi-range switching:		The pressure ranges depend on the device type and can be set via DIP switches.				
Extra charge:		with optional quick connect for PVC fabric pressure hose Ø 6 mm				36,98 €

Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection

The electronic **PREMASREG® 761x-VA** pressure sensor and switch is equipped with measuring functions for volume flow, differential pressure, filter monitoring and liquid level detection based on pressure measurement in clean air. The devices with a housing made from **stainless steel V4A**, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101 and pressure port by stainless steel quick connect (pipe fitting optional) are fitted with one switching output, one continuous output and a backlit display for setting the switching point and displaying the ACTUAL values. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

This pressure sensor is used in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The medium measured is air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC ($\pm 10\%$) and 15...36 V DC
Load resistance:	$R_L > 5 \text{ k}\Omega$
Power consumption:	$< 1.5 \text{ VA} / 24 \text{ V DC}$, $< 2.8 \text{ VA} / 24 \text{ V AC}$
Measuring function:	Volume flow, differential pressure, filter monitoring, fill level (adjustable)
Measuring ranges:	10...100% (adjustable)
Type of pressure:	differential pressure
Pressure port:	equipped as standard with quick connect made from stainless steel for PVC-fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter) optionally with pipe fitting , stainless steel V2A (1.4305) for pressure lines $\varnothing 6 \text{ mm}$
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	$-20...+50 \text{ }^\circ\text{C}$
Accuracy:	Type 7161 (1000 Pa): typically $\pm 5 \text{ Pa}$ Type 7165 (5000 Pa): typically $\pm 25 \text{ Pa}$ compared to the calibrated reference device
Sum of linearity+hysteresis:	$< \pm 1\%$ of final value (pressure)
Temp. drift values:	$\pm 0.1\% / ^\circ\text{C}$
Positive / negative pressure:	max. $\pm 10000 \text{ Pa}$
Signal hysteresis:	$\pm 1\%$ of final value (pressure) 10 Pa / 50 Pa
Signal filtering:	switchable 1 s / 10 s (via DIP switches) and small value suppression $< 1\%$
Output:	0-10 V 1 changeover contact (24V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14-1.5 mm ² , via plug-in screw terminal
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6-12 mm) or M12 connector (male, 12-pin, A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr2E)
Air humidity:	$< 95\%$ r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying the volume flow, differential pressure, contamination degree or level and for setting the switchpoint, K factor, measuring range limits and other settings
K factor:	1 to 3000 (adjustable)
Units:	m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm (adjustable)
Max. value displayed:	999999
ACCESSORIES	(see table)

Pressure port
Stainless steel
quick connect
(standard)



Dimensional drawing **PREMASREG® 716x-VA**

143
61

97

Housing with cable gland
equipped as standard with **quick connect** for pressure hoses

126
17
~113
8.8
M20x1.5

Stainless steel quick connect

Housing with M12 connector
equipped as standard with **quick connect** for pressure hoses

126
17
8.8
M12

M12 connector (male)

PREMASREG® 716x-VA
with cable gland and display



PREMASREG® 716x-VAQ
with M12 connector and display



Dimensional drawing **PREMASREG® 716x-VA**

Housing with cable gland
optional on request with **pipe fitting** for pressure lines

126
17
~126
8.8
M20x1.5

Stainless steel V2A pipe fitting

Housing with M12 connector
optional on request with **pipe fitting** for pressure lines

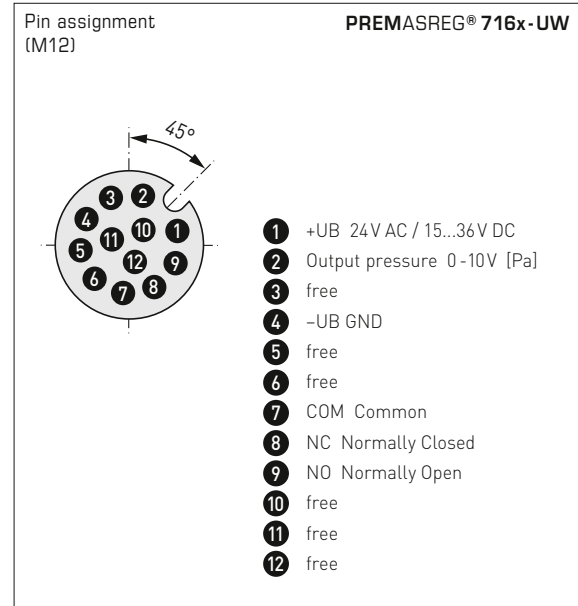
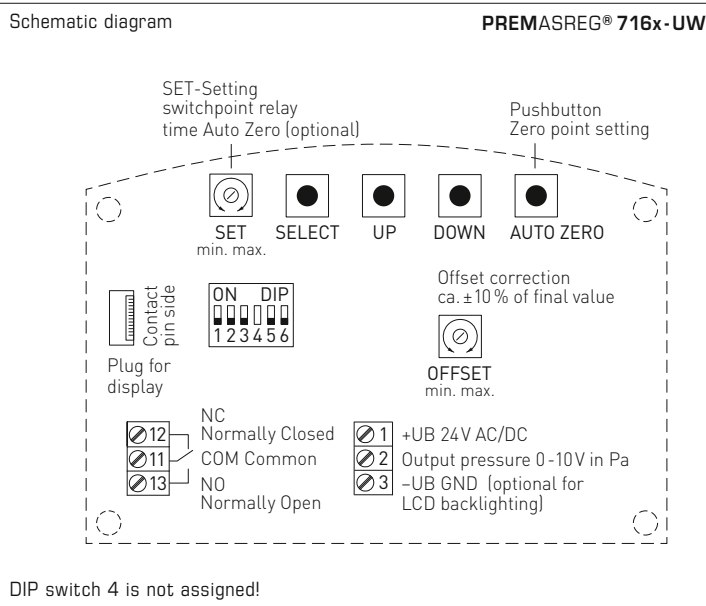
126
17
8.8
M12

M12 connector (male)



Pressure port
Stainless steel V2A pipe fitting (optional)





Measuring range mode (Mode selectable)	DIP 1
Unidirectional (0...+MR) (default)	OFF
Bidirectional (-MR...+MR)	ON

Small value suppression (measured values < 1% of end value (pressure) = 0)	DIP 2
Deactivated (default)	OFF
Active	ON

Relay (Function adjustable)	DIP 3
Deactivated (default)	OFF
Active (display shows switching point)	ON

Measurement signal filtering (Time interval selectable)	DIP 5
10 s (default)	OFF
1 s	ON

Service mode (display adjustable)	DIP 6
Standard (according to configuration) (default)	OFF
Service (differential pressure in Pa)	ON



Volumolum flow rate

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow in m³/h
 k = K factor 1...3000
 Δp = Differential pressure in Pa



Differential pressure

$$\Delta p = p_+ - p_-$$

Δp = Differential pressure in Pa
 p₊ = higher pressure
 p₋ = lower pressure



Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %
 Δp = Differential pressure in Pa
 p_{Filter} = differential pressure filter replacement in Pa



Level display

$$h = \Delta p \div (\rho \cdot g)$$

h = Fill level height in cm
 Δp = Differential pressure in Pa
 ρ = Density 700...1300 in kg/m³
 g = 9.81 m/s²

PREMASREG® 716x
Function types



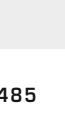
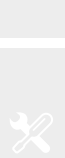
NEW

S+S REGELTECHNIK

PREMASREG® 716x-VA

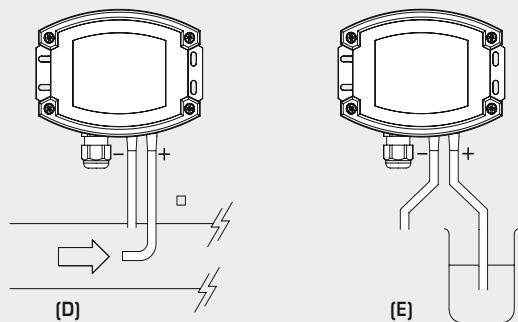
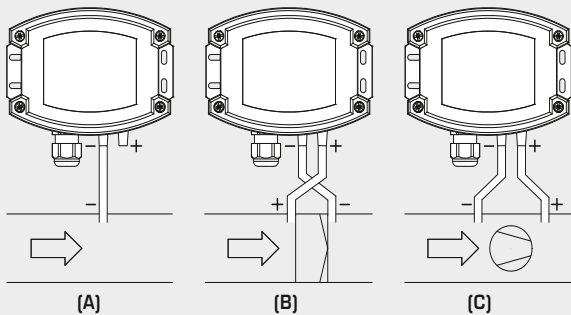
Pressure measuring transducers/switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection

PREMASREG® 716x-VAQ
with display,
hinged



Mounting diagram

PREMASREG® 716x



TYPES OF MONITORING:

(A) Below-atmospheric pressure:

P1 (+) is not connected,
but open to the atmosphere
P2 (-) connected to inside of duct

(B) Filter:

P1 (+) connected upstream of filter
P2 (-) connected downstream of filter

(C) Ventilator:

P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator

(D) Volume flow:

P1 (+) dynamic pressure,
Connected in flow direction
P2 (-) static pressure,
Connected free of dynamic pressure components

(E) Level:

P1 (+) Connection submerged in medium
P2 (-) Connection is open to the atmosphere

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (-) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWs
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWs
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWs
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWs
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWs
1 mWs	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWs

Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection

S+S REGELTECHNIK

PREMASREG® 716x-VAQ
with M12 connector



PREMASREG® 716x-VAQ Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection, *ID* Stainless steel housing with M12 connector

Measuring Range	Type / WG02I	Output	Display	Item No.	Price
Pressure / Volume Flow			● = Q		

0...1000 Pa		Type 7161			
k = 3000	94800 m³/h	PREMASREG 7116-UW VAQ LCD	0-10V 1x Changeover contact	● ■ 2004-6192-4100-021	708,73 €

0...5000 Pa		Type 7165			
k = 3000	212100 m³/h	PREMASREG 7165-UW VAQ LCD	0-10V 1x Changeover contact	● ■ 2004-6192-4100-031	708,73 €

Housing variant "Q":	Cable connection with M12 connector (male, 12-pin , A-code)
-----------------------------	---

Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.
------------------------	---

Extra charge:	with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm	36,98 €
---------------	---	---------

ACCESSORIES

xx-M12 Special accessories for M12 connector

For further information, see chapter Accessories!



S+S REGELTECHNIK

NEW

PREMASREG® 716x-VA

Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection

PREMASREG® 716x-VA
with cable gland



PREMASREG® 716x-VA		Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection, <i>ID</i> Stainless steel housing with cable gland			
Measuring Range Pressure / Volume Flow	Type / WG02I	Output	Display	Item No.	Price
0...1000 Pa		Type 7161			
k = 3000 94800 m³/h	PREMASREG 7161-UW VA LCD	0-10V 1x Changeover contact	■	2004-6192-4200-021	674,74 €
0...5000 Pa		Type 7165			
k = 3000 212100 m³/h	PREMASREG 7165-UW VA LCD	0-10V 1x Changeover contact	■	2004-6192-4200-031	674,74 €
Housing variant:	Cable connection with cable gland made from stainless steel V2A (1.4305)				
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Extra charge:	with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm				36,98 €



Pressure port
equipped as standard with **quick connect** for pressure hoses



optional on request with **pipe fitting** for pressure lines



Barometers /

Measuring transducers for atmospheric pressure, calibratable, with active output

S+S REGELTECHNIK

ALD

Calibratable barometer **PREMASGARD® ALD** with active output (U/I switchable) and 4 measuring ranges (max. 600...1100 hPa, switchable), in a compact plastic housing with quick-locking screws, optionally with/without display.

The pressure sensor is used for measuring atmospheric air pressure in clean air (non-precipitating) or other non-aggressive, non-combustible gases. It is used in various applications such as ventilation and air conditioning technology, in meteorological measurement stations and air-pressure-dependent control systems.

The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC/DC (± 10%)
Working resistance:	R_a (Ohm) = 25 ... 450 Ohm for I-output
Load resistance:	$R_L > 25$ kOhm for U-output
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Current consumption:	< 45 mA
Measuring ranges:	multi-range switching with 4 switchable measuring ranges (see table)
Output:	switchable 0-10V / 4...20 mA (via DIP switches)
Connection type:	3-wire connection
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Type of pressure:	atmospheric air pressure/absolute pressure
Medium:	clean air and non-aggressive, non-combustible gases
Accuracy:	typically ± 0.4 kPa compared to calibrated reference device
Zero point offset:	± 50 hPa
Positive pressure:	200 kPa
Signal filtering:	switchable 1 s / 10 s (via DIP switches)
Temperature drift:	± 0.1 % of final value per °C
Housing:	plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 plug-in connector (flush-type connector, 5-pin, A-coding) according to DIN EN 61076-2-101 (optional, available upon request)
Electrical connection:	0.14 - 1.5mm ² , via screw terminals
Air humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP67 (according to EN 60529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, EMC Directive 2014/30/EU
Equipment:	display , one-line, cutout approx. 36 x 15 mm (W x H), for displaying the atmospheric air pressure/absolute pressure
ACCESSOIRES	see chapter Accessories
WS-04	weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)



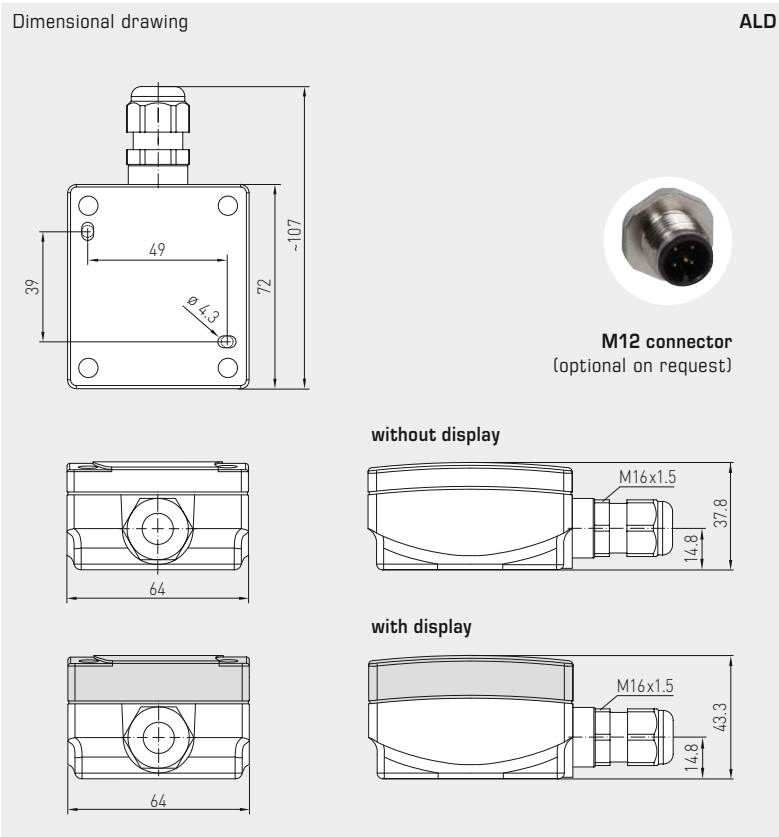
Pressure range (adjustable)	DIP 1	DIP 2
600...1100 hPa	OFF	OFF
700...1100 hPa	ON	OFF
800...1100 hPa	OFF	ON
900...1100 hPa (default)	ON	ON

Measurement signal filtering (selectable time interval)	DIP 5
10 s (default)	OFF
1 s	ON

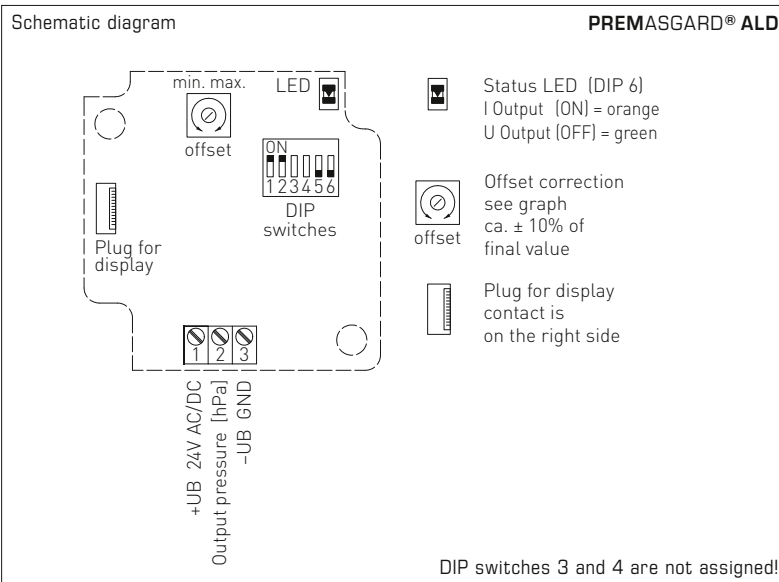
Output (selectable)	DIP 6
Voltage 0-10V (default)	OFF
Current 4...20 mA	ON

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWs
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWs
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWs
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWs
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWs
1 mWs	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWs



ALD
with display



WS-04
Weather and sun protection hood
(optional)



PREMASGARD® ALD Measuring transducer for atmospheric pressure

Pressure range (adjustable)	Type / WG01	Output (switchable)	Display	Item no.	Price
max. 600...1100 hPa	ALD				
600...1100 hPa	ALD	0-10V / 4...20mA		1301-1157-0130-200	147,90 €
700...1100 hPa					
800...1100 hPa	ALD LCD	0-10V / 4...20mA		1301-1157-2130-200	174,42 €
900...1100 hPa					
Multi-range switching:	The pressure ranges can be set via DIP switches.				
Output:	0-10V or 4...20 mA (selectable via DIP switches)				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)				

**Differential pressure switches for air,
with mounting angle, incl. connection set**

The mechanical differential pressure switch / differential pressure monitor **PREMASREG® DS 1** with metal angle is used for monitoring above-atmospheric, differential, and below-atmospheric pressures of air and gaseous, non-aggressive media in air ducts, ventilation intake or exhaust devices, as a flow monitor, as a pressure difference detector or pressure monitor for flow detection at electric heating registers, for monitoring V-belts and filters, as air pressure deficiency protection, for monitoring fans and air dampers, or as a limit value controller. The switchpoint is adjusted using the internal precision scale.

These instruments are factory-calibrated. The differential pressure switch DS 1 is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws) and mounting angle **DS-MW-Z**.

DS 1
with mounting angle



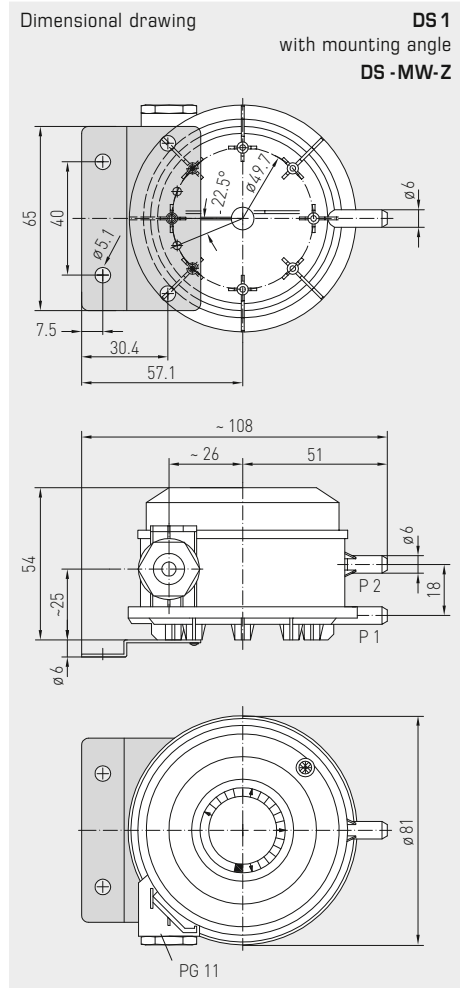
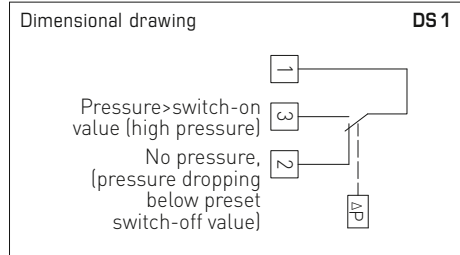
TECHNICAL DATA

Switching capacity: (Contact load)	5 (0.8) A, 250 V AC 4 (0.7) A, 30 V DC
Contact:	single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
Pressure range:	see table, high adjustment accuracy due to individual laser-etched scale for each switch
Housing:	base: material PC (10% GF), colour light grey (similar to RAL 7035), snap-on lid: material PC, transparent, cable gland PG 11 with strain relief
Temperature of medium:	-30...+85 °C
Membrane:	silicone, LSR (Liquid Silicon Rubber, tempered at +200 °C, non-outgassing, LABS-free, no emission of varnish-adhesion inhibiting substances), long-term stability of switching points due to trapezoidal bead membranes
Humidity:	< 90% r. H., non-precipitating air
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws with torsion protection
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Mounting:	with metal angle DS-MW-Z (included in the scope of delivery) (for other optional shapes, see table) Recommended mounting position: vertical (pressure connections downward) – factory setting; horizontal (cap up / down)
Protection class:	II (according to EN 60 730)
Protection type:	IP 54 (according to EN 60529) with top cover
Standards:	CE conformity, low-voltage directive 2014 / 35 / EU
Tests:	DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 2009 / 142 / EU, CE 0085 A P 0918

FUNCTION
Contact 1 - 2 breaks when pressure / differential pressure rises to the preset value.
Contact 1 - 3 closes when pressure / differential pressure drops and can be used as signal contact.

ACCESSORIES

ASD-06	Connection set (nipple straight) – (included in the scope of delivery)
DS-MW-Z	Mounting angle (included in the scope of delivery)
DS-MW-L	Mounting angle (optional)
DS1-MW-U	Mounting angle (optional), combination bracket for vertical or horizontal mounting
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, aus stainless steel V2A (1.4301)



The mechanical differential pressure switch / differential pressure monitor **PREMASREG® DS-2** with 4-hole plastic base ring is used for monitoring above-atmospheric, differential and below-atmospheric pressures of clean air and other gaseous, non-aggressive non-combustible media in air ducts, air intake or exhaust devices, as a pressure difference detector or pressure monitor for flow detection at electric heating registers, for monitoring V-belts and filters, as air pressure deficiency protection, for monitoring fans and air dampers, or as a limit value controller. The switchpoint is adjusted using the internal precision scale.

These instruments are factory-calibrated. The differential pressure switch DS 2 is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws) and mounting ring **DS-MR-K**.

TECHNICAL DATA

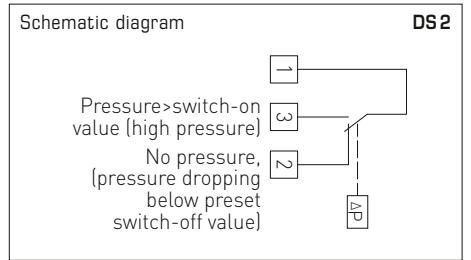
Switching capacity: (Contact load)	5 (0.8) A, 250 V AC 4 (0.7) A, 30 V DC
Contact:	single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
Pressure range:	see table, high adjustment accuracy due to individual laser-etched scale for each switch
Housing:	base: material PC (10 % GF), colour light grey (similar to RAL 7035), snap-on lid: material PC, transparent, cable gland PG 11 with strain relief
Temperature of medium:	-30...+85 °C
Membrane:	silicone, LSR (Liquid Silicon Rubber, tempered at +200 °C, non-outgassing, LABS-free, no emission of varnish-adhesion inhibiting substances), long-term stability of switching points due to trapezoidal bead membranes
Humidity:	< 90 % r. H., non-precipitating air
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws with torsion protection
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Mounting:	by 4-hole base ring, plastic (included in the scope of delivery), recommended mounting position: vertical (pressure connections downward) – factory setting, horizontal (cap up / down)
Protection class:	II (according to EN 60730)
Protection type:	IP 54 (according to EN 60529) with top cover
Standards:	CE conformity, low-voltage directive 2014 / 35 / EU
Tests:	DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 2009 / 142 / EU, CE 0085 A P 0918

FUNCTION
Contact 1-2 breaks when pressure / differential pressure rises to the preset value.
Contact 1-3 closes when pressure / differential pressure drops and can be used as signal contact.

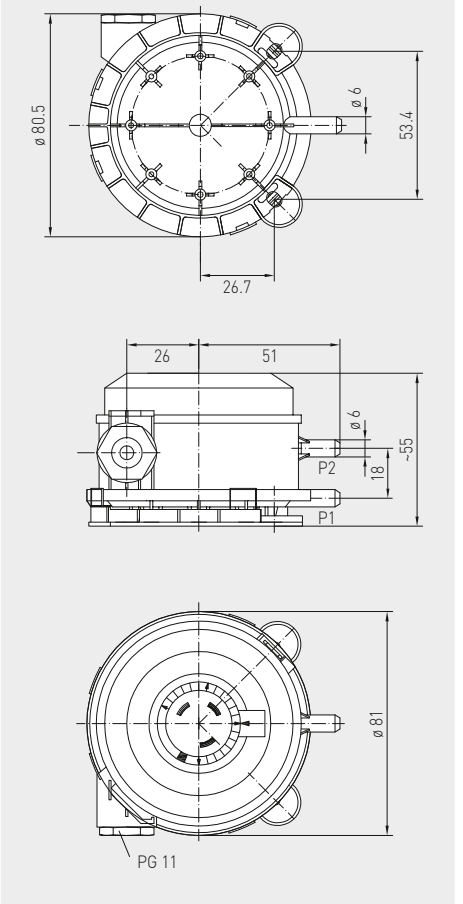
ACCESSORIES

ASD-06	Connection set (nipple straight) – (included in the scope of delivery)
DS-MR-K	Mounting ring (included in the scope of delivery)
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, aus stainless steel V2A (1.4301)

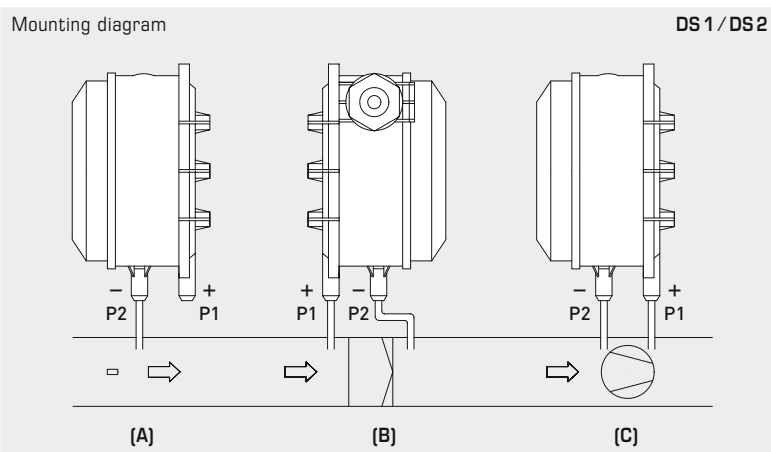
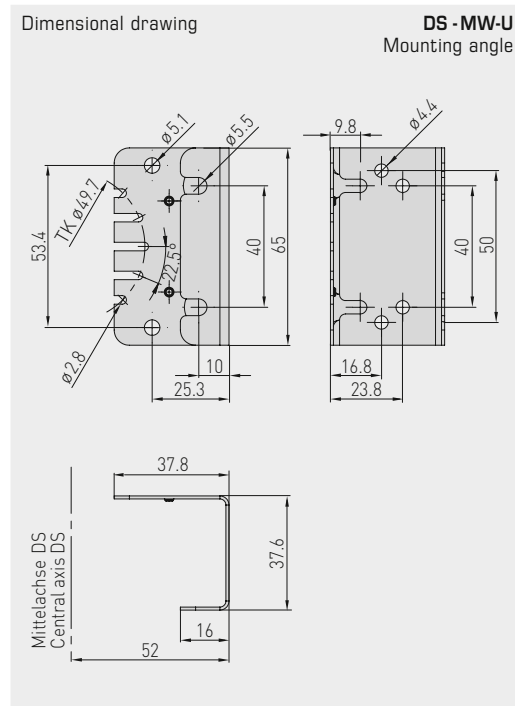
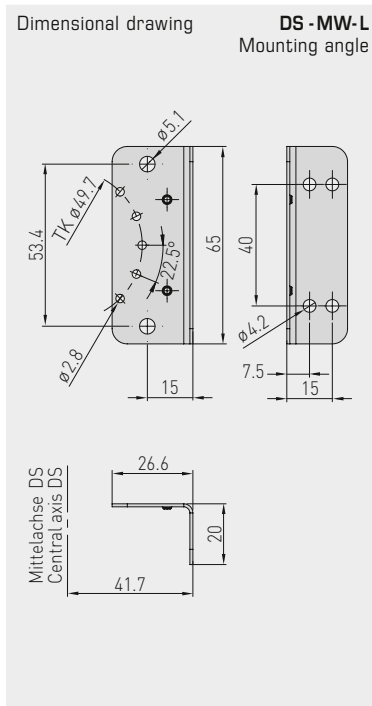
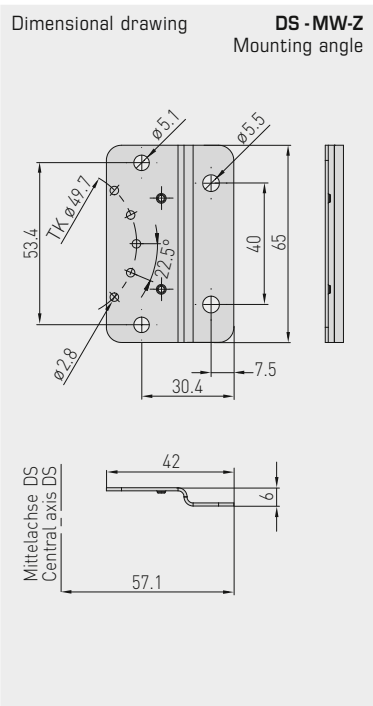
DS2
with mounting ring



Dimensional drawing DS2
with mounting ring
DS-MR-K



Differential pressure switches for air,
including connection set



DS 1 / DS 2
Connection



Setting potentiometer
(internal setting)

Connecting terminals
secured against turning

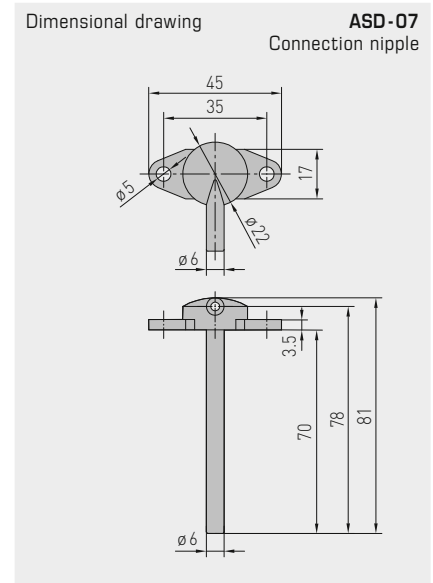
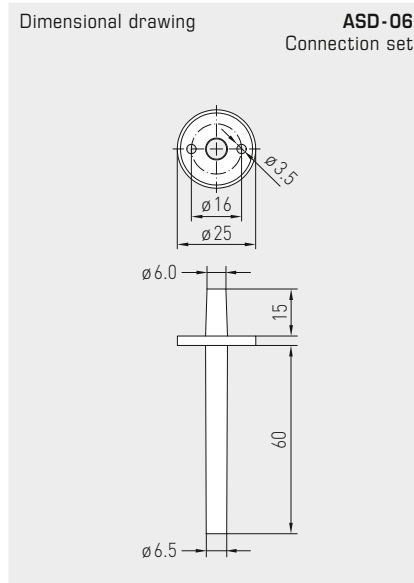
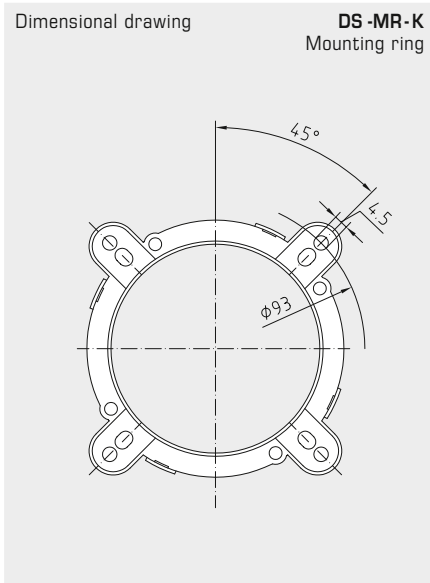
TYPES OF MONITORING:

- (A) Below-atmospheric pressure:**
P1 (+) is not connected but open against atmosphere
P2 (-) connected to inside of duct
- (B) Filter:**
P1 (+) connected upstream of filter
P2 (-) connected downstream of filter
- (C) Ventilator:**
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and P2 (-) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH ₂ O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH ₂ O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH ₂ O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH ₂ O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH ₂ O
1 mH ₂ O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH ₂ O



PREMASREG® DS 1 Differential pressure switches with mounting angle, *Premium*
PREMASREG® DS 2 Differential pressure switches with mounting ring, *Standard*

Type	Pressure range (adjustable)	Operating Difference approx.	Max. Pressure	Item No.	Price
DS 1 / WG02	<i>Premium</i>			with mounting angle DS-MW-Z	
DS-106	20... 300 Pa (0.2...3.0 mbar)	0.1 mbar ± 15%	5000 Pa (50 mbar)	1302-4011-0000-000	46,92 €
DS-106 A	50... 500 Pa (0.5...5.0 mbar)	0.2 mbar ± 15%	5000 Pa (50 mbar)	1302-4012-0000-000	46,92 €
DS-106 B	100... 1000 Pa (1.0...10.0 mbar)	0.4 mbar ± 15%	5000 Pa (50 mbar)	1302-4013-0000-000	46,92 €
DS-106 C	500...2000 Pa (5.0...20.0 mbar)	1.0 mbar ± 15%	5000 Pa (50 mbar)	1302-4014-0000-000	46,92 €
DS-106 D	1000...5000 Pa (10.0...50.0 mbar)	2.5 mbar ± 15%	7500 Pa (75 mbar)	1302-4015-0000-000	46,92 €
DS 2 / WG03B	<i>Standard</i>			with mounting ring DS-MR-K	
DS-205 F	20... 300 Pa (0.2...3.0 mbar)	0.1 mbar ± 15%	5000 Pa (50 mbar)	1302-4026-0000-000	30,96 €
DS-205 B	50... 500 Pa (0.5...5.0 mbar)	0.2 mbar ± 15%	5000 Pa (50 mbar)	1302-4022-0000-000	30,96 €
DS-205 D	100... 1000 Pa (1.0...10.0 mbar)	0.4 mbar ± 15%	5000 Pa (50 mbar)	1302-4027-0000-000	30,96 €
DS-205 E	500...2000 Pa (5.0...20.0 mbar)	1.0 mbar ± 15%	5000 Pa (50 mbar)	1302-4028-0000-000	30,96 €
ACCESSORIES					
DS-MW-Z	Sheet steel mounting angle in Z-form (DS 1: included in the scope of delivery)			7100-0063-0000-000	11,78 €
DS-MW-L	Sheet steel mounting angle in L-form			7100-0063-1000-000	12,06 €
DS-MW-U	Sheet steel mounting angle in U-form			7100-0060-9000-000	14,82 €
ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws			7100-0060-3000-000	6,74 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	6,74 €
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)			7100-0040-7000-000	33,06 €

For further information, see last chapter Accessories!

Pressure measuring transducers, incl. DIN plug-in connectors, with active output

The pressure sensor **PREMASGARD® SHD-SD** is used for measuring relative pressures (min. 0...6 bar / max. 0...16 bar) in gaseous and liquid media. **Not suitable for ammonia and freon!**

The pressure sensor **PREMASGARD® SHD** is used for measuring relative pressures (min. 0...1 bar / max. 0...40 bar) in gaseous and liquid media. The pressure measuring cell is welded to the pressure sensors without a gasket.

The pressure measuring transducer converts the measurand into a standard signal of 0-10 V or 4...20 mA. Process connection is G 1/2". This pressure transmitter is used in hydraulics, pneumatics, process technology, in mechanical and plant engineering.

SHD xx
with display
(optional)



TECHNICAL DATA

Power supply:	24 V AC / DC for output 0-10 V 7 - 33 V DC for output 4...20 mA
Measuring ranges:	see table (other ranges upon request)
Output:	0-10 V, 3-wire, (working resistance > 10 kOhm) or 4...20 mA, 2-wire, (working resistance < (UB (V)-7 V) / 0,02 A; R _L depending on working resistance
Electrical connection:	0.25 - 1.5 mm ² , via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	G 1/2" sealing at the back, and manometer (combined) with profile gasket FPM, special WW G 1/4" DIN 3852
Type of pressure:	relative
Medium:	liquid and gaseous
Response time:	2 ms (1 ms typical)
Characteristic line:	± 0.3%
Mounting:	directly on pressure line
Housing:	stainless steel V2A (1.4305)
Connecting head:	plastic, approx. 98 x 50 x 34 mm

SHD-SD

Measuring principle:	ceramic measuring cell
Temperature of medium:	-15...+125 °C
Medium contacting parts:	stainless steel V2A (1.4305); measuring element ceramic Al ₂ O ₃ (96%); sealing material FPM (Viton)
Load changes:	< 100 Hz
Overload range / Bursting pressure:	< 4 bar: 3 x FS > 4 bar: 2.5 x FS

SHD

Measuring principle:	steel measuring cell
Temperature of medium:	-40...+135 °C
Medium contacting parts:	stainless steel V2A (1.4305)
Overload range:	< 6 bar: 5 x of final valu > 6 bar: 3 x of final valu (max. 1500 bar)
Bursting pressure:	< 6 bar: 10 x of final valu > 6 bar: 6 x of final valu (max. 2500 bar)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Tests:	Drinking water approval according to NSF/ANSI 61/372, UL-certified according to ANSI/UL 61010-1

ACCESSORIES

Display module, made of plastic, polyamide material, black colour, extra height: approx. 73 mm, pluggable, **factory-calibrated and configured**, for displaying the differential pressure (in bar, other units available upon request)

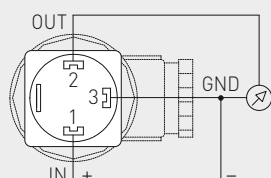
Display module
(Accessories)



Connecting diagram

SHD xx-U

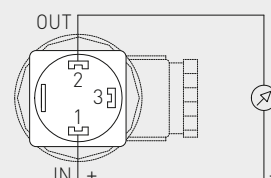
- 2 Output pressure 0-10V
- 3 GND
- 1 Supply voltage UB+ 24V AC/DC

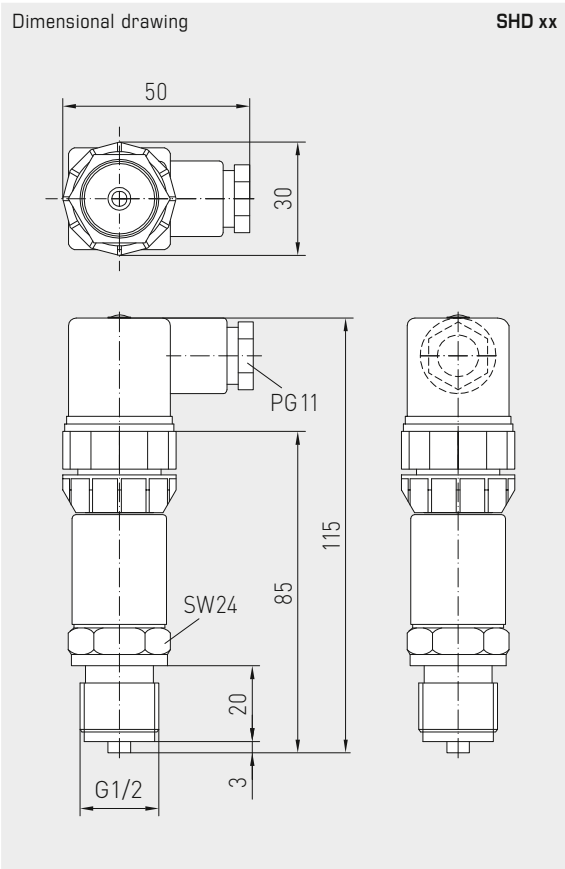


Connecting diagram

SHD xx-I

- 2 Output pressure 4...20mA
- 3 Free
- 1 Supply voltage UB+ 24V DC





SHD xx
without display
(standard)



PREMASGARD® SHD - SD		Pressure measuring transducer, <i>Standard</i> or gaseous and liquid media			
Measuring Range	Type/WG01	Item No.	Type/WG01	Item No.	Price
	SHD-SD-U	U - variant	SHD-SD-I	I - variant	
0... 6 bar	SHD-SD-U 6	1301-2121-0550-120	SHD-SD-I 6	1301-2122-0550-000	114,51 €
0...10 bar	SHD-SD-U 10	1301-2121-0560-120	SHD-SD-I 10	1301-2122-0560-000	114,51 €
0...16 bar	SHD-SD-U 16	1301-2121-0570-120	SHD-SD-I 16	1301-2122-0570-000	114,51 €
Note:	Not suitable for ammonia and freon!				

PREMASGARD® SHD		Pressure measuring transducer, <i>Premium</i> for gaseous and liquid media			
Measuring Range	Type/WG01	Item No.	Type/WG01	Item No.	Price
	SHD-U	U - variant	SHD-I	I - variant	
0... 1 bar	SHD-U 1	1301-2111-0520-220	SHD-I 1	1301-2112-0520-120	189,16 €
0...2,5 bar	SHD-U 2,5	1301-2111-0530-220	SHD-I 2,5	1301-2112-0530-120	189,16 €
0... 6 bar	SHD-U 6	1301-2111-0550-220	SHD-I 6	1301-2112-0550-120	136,95 €
0... 10 bar	SHD-U 10	1301-2111-0560-220	SHD-I 10	1301-2112-0560-120	136,95 €
0... 16 bar	SHD-U 16	1301-2111-0570-220	SHD-I 16	1301-2112-0570-120	136,95 €
0... 25 bar	SHD-U 25	1301-2111-0580-220	SHD-I 25	1301-2112-0580-120	189,16 €
0... 40 bar	SHD-U 40	1301-2111-0590-220	SHD-I 40	1301-2112-0590-120	189,16 €

ACCESSORIES	
LCD-SHD	Display module, factory-calibrated and configured, pluggable, LCD display rotatable and tiltable (in bar, other units available upon request) Extra charge 242,61 €

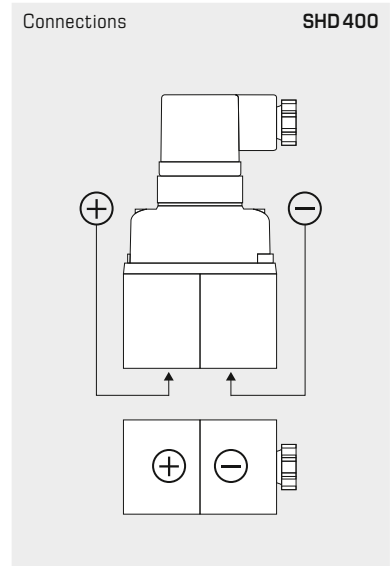


**Pressure measuring transducers,
incl. DIN plug-in connectors,
with active output**

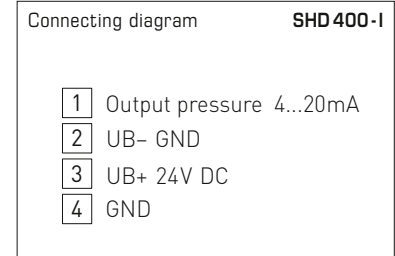
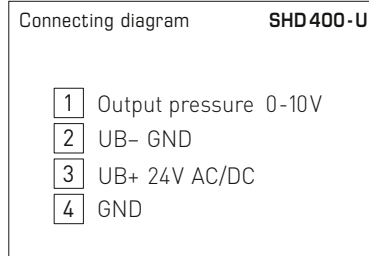
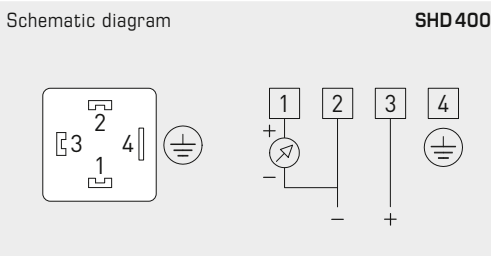
The pressure sensor / differential pressure sensor **PREMASGARD® SHD 400** is used to measure above-atmospheric, below-atmospheric, and differential pressures in virtually neutral gaseous and liquid media. A rugged and non-sensitive ceramic pressure measuring cell is used. The measuring pressure acts on the ceramic membrane, causing it to deform. This membrane is fitted with a DMS bridge whose resistance value changes in proportion to the degree of deformation. The electronics integrated in the transmitter housing converts this change in resistance into a standard signal of 0-10 V or 4...20 mA. The process connection is implemented via two internal threads G 1/8". It is used in all areas of industrial and sanitary measurement technology, such as differential pressure measurement between the supply and return lines in heating systems or for monitoring filters, fans, and compressors.

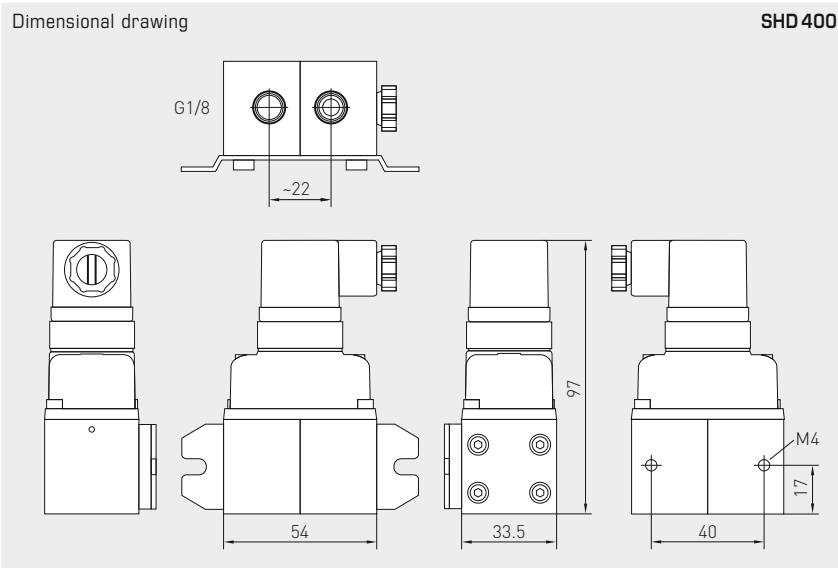
TECHNICAL DATA

Power supply:	24 V AC / DC (± 20 %)
Measuring ranges:	see table
Output:	0-10 V or 4...20 mA
Permissible working resistance: (at nominal voltage)	R _L = 2 kΩ for U-variant R _L = 700 Ω for I-variant
Electrical connection:	0.25 - 1.5 mm ² , via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	G 1/8" internal thread (optional connection types upon request)
Type of pressure:	differential pressure, above- or below atmospheric pressure
Medium:	liquid or gaseous
Temperature of medium:	-20...+80 °C (non-freezing media)
Mounting:	by 2x M4 screw or fixing plate for wall mounting (installation arbitrary)
Housing:	stainless steel V2A (1.4305)
Medium contacting parts:	ceramic, stainless steel V2A (1.4305), brass, fluorinated rubber
Response time:	< 5 ms
Characteristic line:	< 1 % of final value (at +25 °C)
Overload range:	see table (one-sided max. pressure)
Bursting pressure:	64 bar
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
ACCESSORIES	
VSD-xx-VA / ms	Fitting set, made of stainless steel VA or brass (see table)
WH-400	Fixing plate for wall mounting (wall holder)



A plus and minus symbol etched on the housing identifies the side on which the respective pressure connection is to be connected below:
(+) for higher pressure
(-) for lower pressure





SHD 400

VSD-06-VA
Fitting set
(optional)



WH-400
Wall holder
(optional)



PREMASGARD® SHD 400 Pressure measuring transducers, *Standard* for gaseous and liquid media

Type / WG01	Measuring Range	One-sided max. pressure (+)	One-sided max. pressure (-)	System pressure	Output	Item No.	Price
SHD400-U						U-variant	
SHD 400 U VA 2	0... 2 bar	10 bar	5 bar	16 bar	0-10 V	1301-4131-0850-139	325,26 €
SHD 400 U VA 4	0... 4 bar	21 bar	15 bar	16 bar	0-10 V	1301-4131-0540-139	325,26 €
SHD 400 U VA 6	0... 6 bar	21 bar	15 bar	16 bar	0-10 V	1301-4131-0550-139	325,26 €
SHD 400 U VA 10	0...10 bar	25 bar	25 bar	45 bar	0-10 V	1301-4131-0560-139	325,26 €
SHD400-I						I-variant	
SHD 400 I VA 2	0... 2 bar	10 bar	5 bar	16 bar	4...20 mA	1301-4132-0850-139	325,26 €
SHD 400 I VA 4	0... 4 bar	21 bar	15 bar	16 bar	4...20 mA	1301-4132-0540-139	325,26 €
SHD 400 I VA 6	0... 6 bar	21 bar	15 bar	16 bar	4...20 mA	1301-4132-0550-139	325,26 €
SHD 400 I VA 10	0...10 bar	25 bar	25 bar	45 bar	4...20 mA	1301-4132-0560-139	325,26 €

ACCESSORIES

VSD-06-MS	Fitting set made of brass, 6 mm	7100-0064-1100-000	14,09 €
VSD-08-MS	Fitting set made of brass, 8 mm	7100-0064-1300-000	14,19 €
VSD-06-VA	Fitting set made of stainless steel VA, 6 mm	7100-0064-1200-000	60,15 €
VSD-08-VA	Fitting set made of stainless steel VA, 8 mm	7100-0064-1400-000	69,11 €
WH-400	Fixing plate for wall mounting (wall holder)	7100-0066-0100-000	13,33 €

Pressure measuring transducers, incl. DIN plug-in connectors and mounting angle, with active output

The pressure sensor / differential pressure sensor **PREMASGARD® SHD-692** is used for pressure measurement in gaseous and liquid media. It converts the measurand into standard signals of 0-10 V or 4...20 mA. Process connection is 2 x G 1/8" - 27 NPT internal thread. SHD-692 differential pressure transmitters are used in piping and hydraulic systems, in mechanical and plant engineering as well as in building automation.

Not applicable for ammonia and Freon!

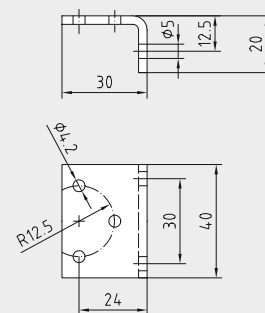
SHD 692
with display
(optional)



TECHNICAL DATA

Power supply:	24 V AC (+15% / -10%), 18 - 33 V DC for U-variant 24 V DC (±20%) for I-variant
Measuring ranges:	see table
Output:	0-10 V (3-wire connection) or 4...20 mA (2-wire connection)
Permissible working resistance: (at nominal voltage)	$R_L > 10 \text{ k}\Omega$ for U-variant $R_L < 600 \Omega$ for I-variant
Electrical connection:	0.25 - 1.5 mm ² , via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	screw pipe connection for 6 mm pipe (G 1/8" - 27 NPT internal thread)
Type of pressure:	differential pressure
Measuring principle:	ceramic measuring cell
Medium:	liquid or gaseous
Temperature of medium:	-15...+80 °C
Mounting:	by mounting angle (included in the scope of delivery), installation arbitrary
Housing:	stainless steel V2A (1.4305)
Medium contacting parts:	INOX (1.4305), ceramics, sealing material EPDM
Response time:	< 5 ms
Class:	0.5%
Total error:	< 1.3%
Overload range:	see table (one-sided max. pressure)
System pressure:	max. 25 bar (P1 + P2)
Bursting pressure:	1.5 x system pressure
Insulating resistance:	≥ 100 MOhm, at +20 °C (500 V DC)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
ACCESSORIES:	Display-Modul , made of plastic, polyamide material, black colour, extra height: approx. 73 mm, pluggable, factory-calibrated and configured , for displaying the differential pressure (in bar, other units available upon request)

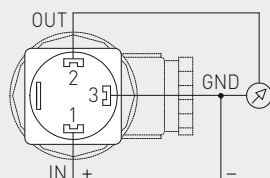
Dimensional drawing **SHD 692**
Mounting angle



Connecting diagram

SHD 692-U

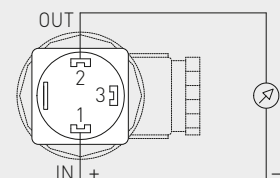
- 2 Output pressure 0-10V
- 3 GND
- 1 Supply voltage UB+ 24V AC / 18-33V DC

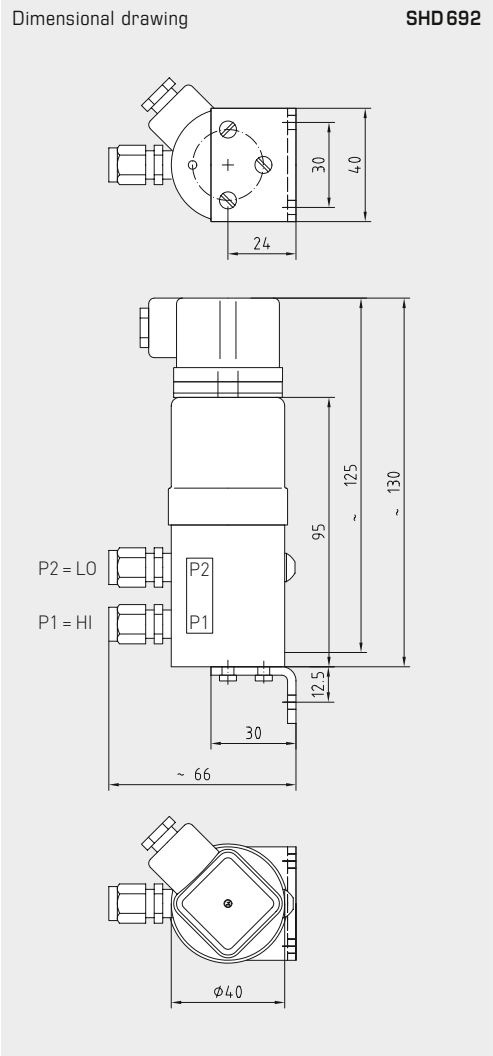


Connecting diagram

SHD 692-I

- 2 Output pressure 4...20mA
- 3 Free
- 1 Supply voltage UB+ 24V DC





SHD 692 without display (standard)



Display module (Accessories)



PREMASGARD® SHD 692 Pressure measuring transducers, *Deluxe* or gaseous and liquid media

Type / WG02	Measuring Range	One-Sided max. pressure	Output	Item No.	Price
SHD 692-U				U - variant	
SHD 692-U-900	0...0,1 bar	0,6 bar	0-10 V	1301-4121-0500-000	512,30 €
SHD 692-U-907	0...0,5 bar	3 bar	0-10 V	1301-4121-0510-000	512,30 €
SHD 692-U-912	0... 1 bar	5 bar	0-10 V	1301-4121-0520-000	512,30 €
SHD 692-U-916	0...2,5 bar	12 bar	0-10 V	1301-4121-0530-000	512,30 €
SHD 692-U-918	0... 4 bar	12 bar	0-10 V	1301-4121-0540-000	512,30 €
SHD 692-I				I - variant	
SHD 692-I-900	0...0,1 bar	0,6 bar	4...20 mA	1301-4122-0500-000	512,30 €
SHD 692-I-907	0...0,5 bar	3 bar	4...20 mA	1301-4122-0510-000	512,30 €
SHD 692-I-912	0... 1 bar	5 bar	4...20 mA	1301-4122-0520-000	512,30 €
SHD 692-I-916	0...2,5 bar	12 bar	4...20 mA	1301-4122-0530-000	512,30 €
SHD 692-I-918	0... 4 bar	12 bar	4...20 mA	1301-4122-0540-000	512,30 €
Note:	Not applicable for ammonia and freon!				

ACCESSORIES						
LCD-SHD	Display-Modul , factory-calibrated and configured, pluggable, LCD display rotatable and tiltable (in bar, other units available upon request)				Extra charge	242,61 €





Light Intensity & Motion

PHOTASGARD® light intensity sensors and **KINASGARD®** motion or presence detectors are your perfect choice when it comes to saving energy in climatized and security installations.

These S+S solutions keep your costs of lighting, shading, heating and cooling in the “green” range. Incidentally, they also have a perfect fit in presence detection and security zones.

APPLICATION RANGE

- > Heating, ventilation, air conditioning and lighting systems
- > Greenhouses, shading and solar protection
- > Production facilities and offices in line with occupational health and safety regulations
- > Access control, protected areas and security zones
- > Parking lots, courtyards and corridors



PHOTASGARD® & KINASGARD®

500 – 519

Light intensity sensors

AHKF	Outdoor light intensity sensor	507
RHKF	Room light intensity sensor	506
DHKF	In-ceiling light intensity sensor	509

Motion sensors

ABWF	Outdoor motion sensor	511
RBWF	Room motion sensor	510
DBWF	In-ceiling motion sensor	513
DBWF-C	In-ceiling motion sensor	513

Light intensity and motion sensors

ABWF/LF	Outdoor motion and light sensor	517
RBWF/LF	Room motion and light sensor	515
DBWF/LF/FTF	In-ceiling motion and light sensor with humidity and temperature sensor	519



Light Intensity & Motion



PHOTASGARD® & KINASGARD®

Multifunctional sensor technology for light and movement

Broad Spectrum

Our active motion and light intensity sensors are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

Optimum Precision

The devices are tested according to the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Approved Safety



RoHS conforming materials



ESD compliant manufacturing



CE compliance tested by external laboratories

Certified Quality



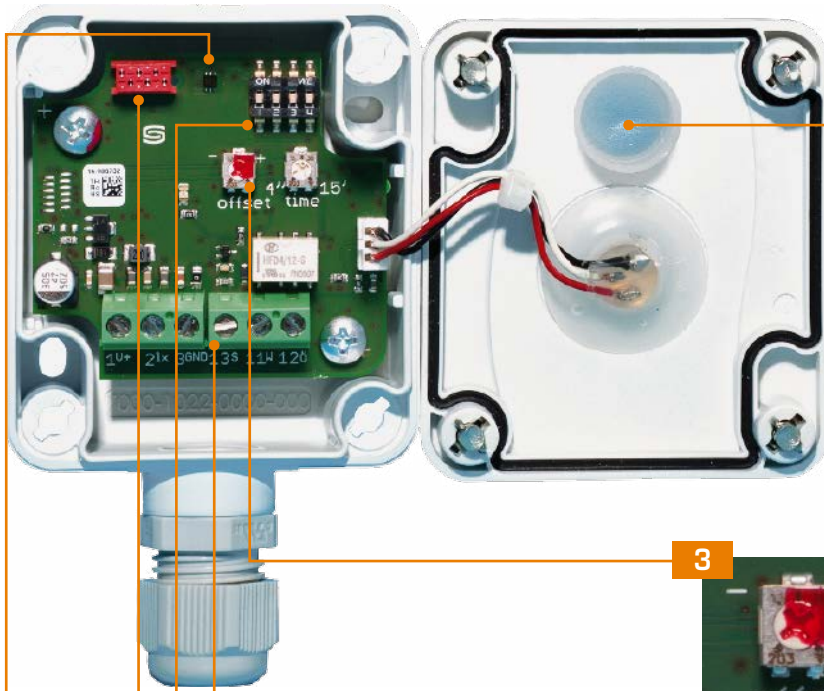
Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.



GOST certificates



EAC certified



2

Diffusor

With diffusion and absorption rates specially matched to the light intensity sensor, extends the receiving characteristics over a wider angular range

Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

3



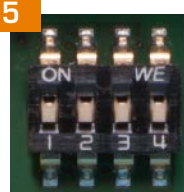
4



Screw Terminals

Active output signals 0-10V or 4...20mA

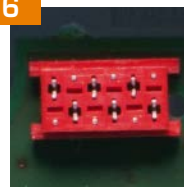
5



DIP Switches

For multi-range toggling and setting of 4 measuring ranges:
 RHKF 0.5 / 1 / 2 / 20 kLux
 AHKF 0.5 / 1 / 20 / 60 kLux

6



Quality Assurance

Calibration and balancing are done by means of the bus system



Digital Photo Sensor

With high resolution and resistance to ageing, for a wide linear brightness range of 0-120 kLux

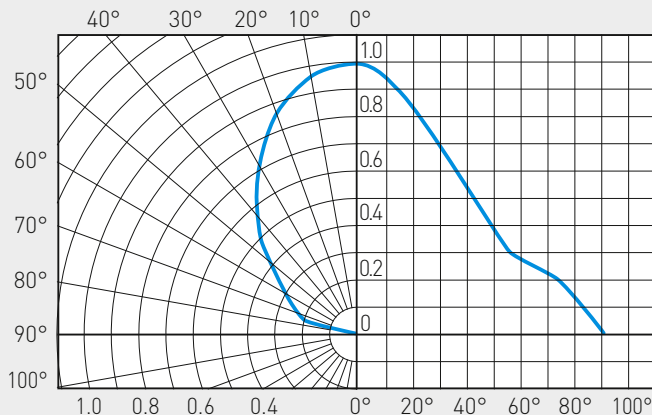
- > Special measuring ranges possible, e.g. for twilight
- > High measuring accuracy with max. < 5 % deviation



General information

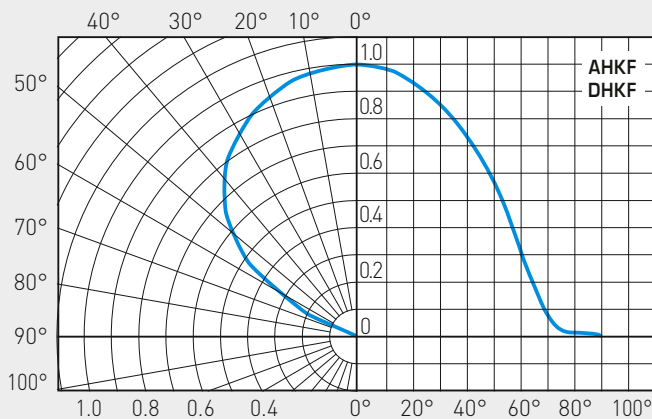
Light sensor

Light sensor (indoor areas) PHOTASGARD®



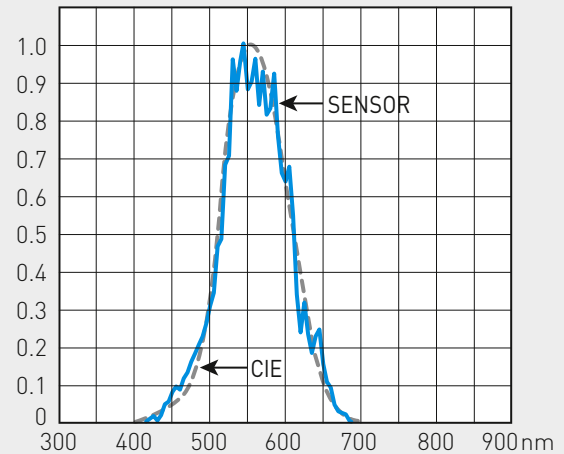
Characteristic curve showing the sensitivity of light sensor (indoor areas) relative to the angle of incidence of light.

Light sensor (outdoor areas) PHOTASGARD®



Characteristic curve showing the sensitivity of light sensor (outdoor areas) relative to the angle of incidence of light.

Light sensor (indoor and outdoor areas) PHOTASGARD®

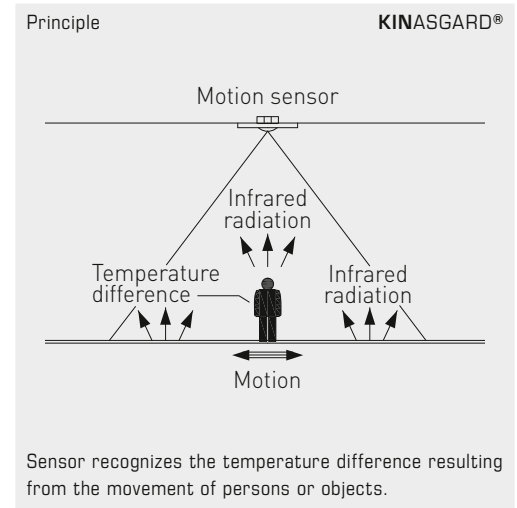
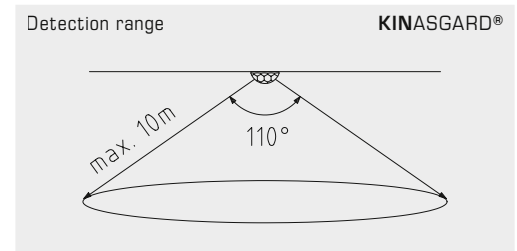
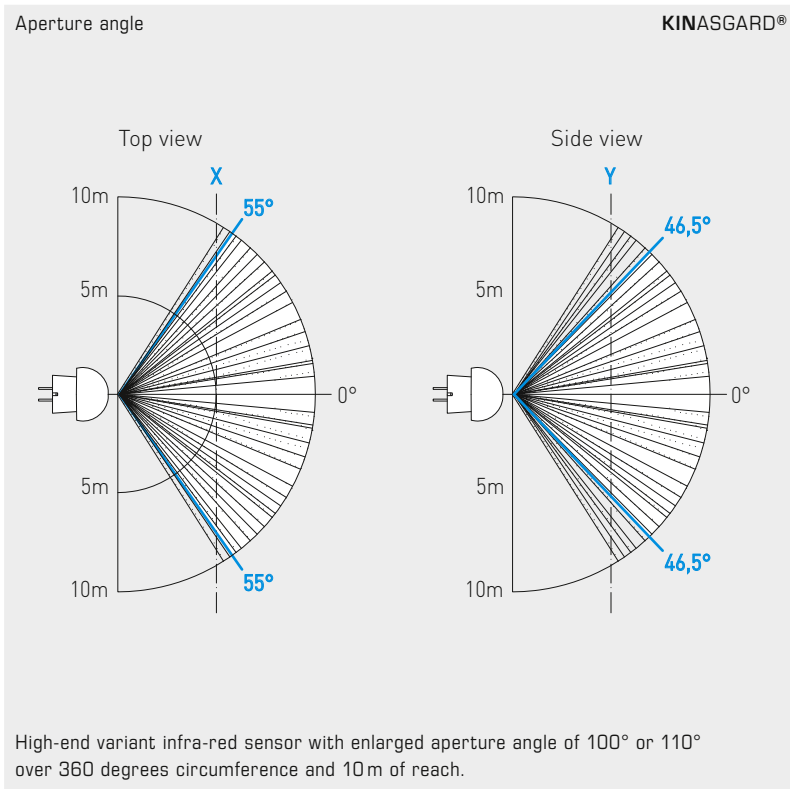


Characteristic curve showing the sensitivity of light sensor on the circuit board in respect of the wavelength of light.

The broken line represents the light perception of the human eye.

The light sensor used in PHOTASGARD® light intensity sensors was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400nm to 700nm.

With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).



In all **KINASGARD®** motion sensors and presence detectors, a high-end variant infra-red sensor with enlarged angle of aperture is exclusively used.

The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

The sensor recognizes changes in the infra-red radiation spectrum, meaning heat radiation, resulting from the movement of persons or objects.

Such movements generate a temporary change of the temperature gradient in the field.

Due to the constant presence of body (heat) radiation, this sensor is ideally suitable for detecting persons. The temperature difference between sensor and object must be >5 K.

**Room light intensity sensors
with multi-range switching
and active output**

The room light intensity sensor **PHOTASGARD® RHKF** with four switchable measuring ranges (four devices in one) measures the luminous intensity with a diffuser and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at workplaces, in storage halls, workshops and corridors, in indoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and to control sunshade equipment avoiding unnecessary heating-up of rooms. Therefore it minimizes your variety of types and stock keeping while covering a greater range of universal applications. The sensor used in PHOTASGARD® light intensity sensors was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400nm to 700nm. With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

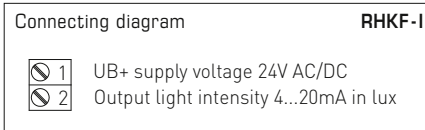
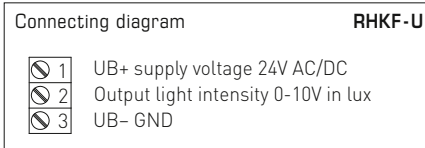
RHKF



TECHNICAL DATA

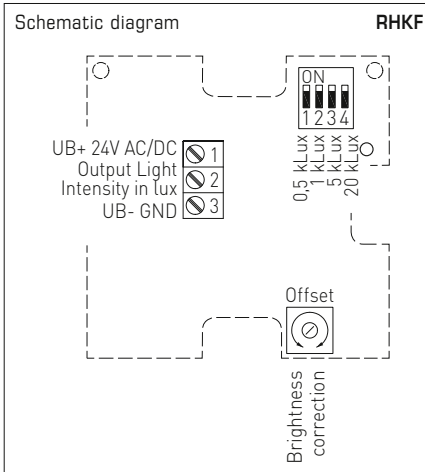
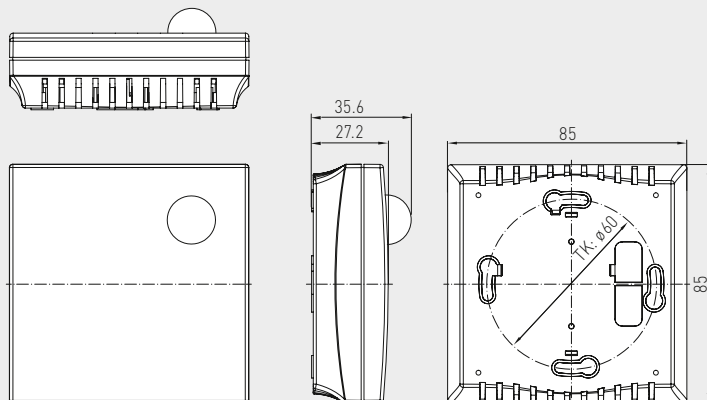
Power supply:	24 V AC (±20%); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor with diffuser (see beginning of this chapter)
Measuring ranges:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 5 kLux / 20 kLux (other individual ranges optional, e. g. 100 kLux)
Output:	4...20mA or 0-10V (2- or 3-wire connection)
Deviation:	typically < 5% of final value
Ambient temperature:	0...+50°C
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø55mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges [selectable]	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	ON	OFF	OFF	OFF
0... 1 kLux (default)	OFF	ON	OFF	OFF
0... 5 kLux	OFF	OFF	ON	OFF
0... 20 kLux	OFF	OFF	OFF	ON



Dimensional drawing

Housing **Baldur 1**
RHKF



PHOTASGARD® RHKF Room light intensity sensors

Type/WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
RHKF				
RHKF-I	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4 ... 20mA	1601-41A2-2000-000	88,87 €
RHKF-U	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	0-10V	1601-41A1-2000-000	88,87 €
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	



The light intensity sensor / twilight sensor **PHOTASGARD® AHKF** with six switchable measuring ranges (six devices in one) measures the luminous intensity and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at workplaces, in greenhouses, storage halls, workshops, corridors, in outdoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and as sun protection control to avoid unnecessary room heating. Therefore it minimizes your variety of types and stock keeping while covering a greater range of universal applications. The sensor used was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm. With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and / or for measuring artificial light of high colour temperature (similar to sunlight).

TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36V DC for U variant 15...36V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_0 - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor (see beginning of this chapter)
Measuring ranges:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux (other individual ranges optional, e. g. 100 kLux)
Output:	4...20 mA or 0-10 V (2- or 3-wire connection)
Deviation:	typically < 5% of final value
Ambient temperature:	-30...+70 °C
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL9016), Housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	IP 67 (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU



AHKF

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	-
0... 1 kLux	ON	OFF	OFF	-
0... 2 kLux	OFF	ON	OFF	-
0... 5 kLux	ON	ON	OFF	-
0... 20 kLux (default)	OFF	OFF	ON	-
0... 60 kLux	ON	OFF	ON	-

Connecting diagram **AHKF-U**

- 1 UB+ supply voltage 24V AC/DC
- 2 Output light intensity 0-10V in lux
- 3 UB- GND

Connecting diagram **AHKF-I**

- 1 UB+ supply voltage 24V AC/DC
- 2 Output light intensity 4...20mA in lux

Dimensional drawing **AHKF**

M12 connector (optional on request)

Schematic diagram **AHKF**

PHOTASGARD® AHKF Outdoor light intensity sensors / twilight sensors

Type/WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
AHKF				
AHKF-I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4 ... 20 mA	1601-1112-1000-000	88,87 €
AHKF-U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10V	1601-1111-1000-000	88,87 €
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	

**In-ceiling light intensity sensors,
with multi-range switching
and active output**

DHKF
Connecting head,
pluggable

The light-intensity sensor **PHOTASGARD® DHKF** with six switchable measuring ranges (six devices in one) for installation in suspended ceilings. The connecting head is pluggable for quick and easy mounting. The measuring transducer is accommodated in a separate housing.

The sensor used was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400nm to 700nm. With its special filter, the sensor is therefore ideally suited to exposure measurement of daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

It is used for daylight-dependent constant light control, to control luminaires, lighting systems, Venetian blinds and canvas blinds, and to control light intensity and sun protection hoods to avoid unnecessary heating-up of rooms. It is used in greenhouses, storage halls, industrial halls, workshops, corridors, residential and commercial buildings.



TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor (see beginning of this chapter)
Measuring ranges:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux (optional other individual measuring ranges, e. g. 100 kLux)
Output:	4...20 mA or 0-10 V
Deviation:	typically < 5 % of final value
Ambient temperature:	-30...+70 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37,8 mm (Tyr 1)
Electrical connection:	2- or 3-wire (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Connecting cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, pluggable , Ø = approx. 35 mm, H = approx. 29 mm
Mounting (sensor):	in the suspended ceiling, ceiling cut-out Ø = 30 mm, cover Ø = < 35 mm
Protection type:	IP67 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) IP30 (according to EN 60 529) Sensor in the built-in state
Protection class:	III (according to EN 60 730)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
0...500 Lux	OFF	OFF	OFF
0... 1 kLux	ON	OFF	OFF
0... 2 kLux	OFF	ON	OFF
0... 5 kLux	ON	ON	OFF
0... 20 kLux (default)	OFF	OFF	ON
0... 60 kLux	ON	OFF	ON

Note: **DIP 4, 5, 6** are not assigned!

Connecting diagram DHKF-U

Connecting diagram DHKF-I

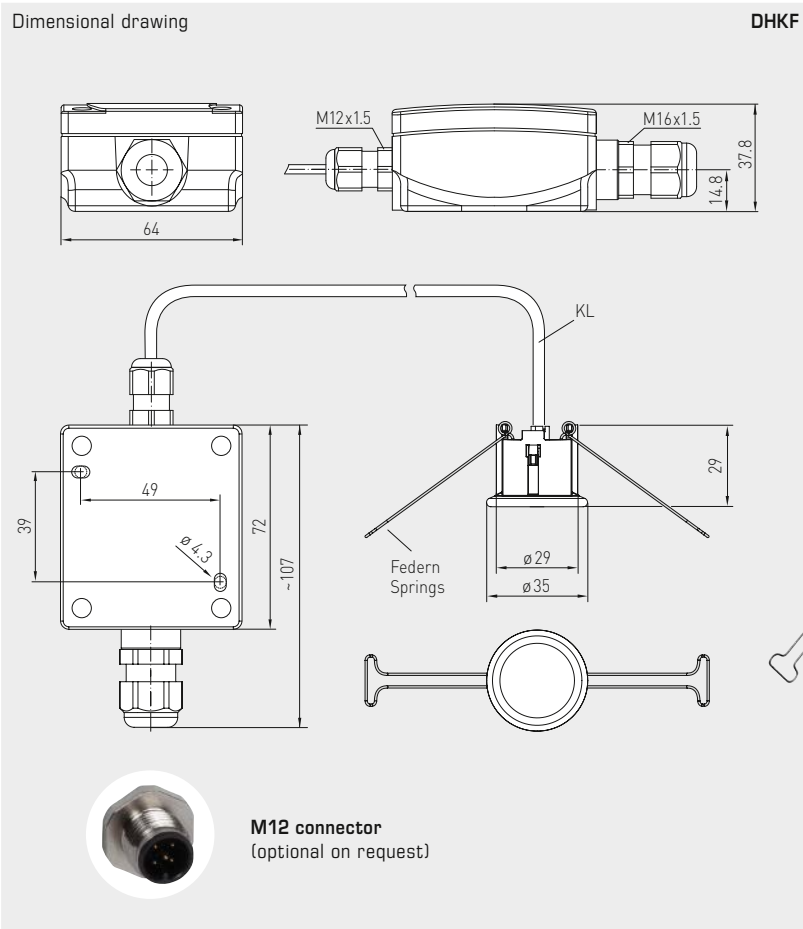
Schematic diagram DHKF



S+S REGELTECHNIK

PHOTASGARD® DHKF

In-ceiling light intensity sensors,
with multi-range switching
and active output



DHKF

PHOTASGARD® DHKF In-ceiling light intensity sensors

Type / WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
DHKF				
DHKF I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4 ... 20mA	1601-6122-1000-000	130,69 €
DHKF U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10V	1601-6121-1000-000	130,69 €
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request	



**Room motion sensor
with switching output**

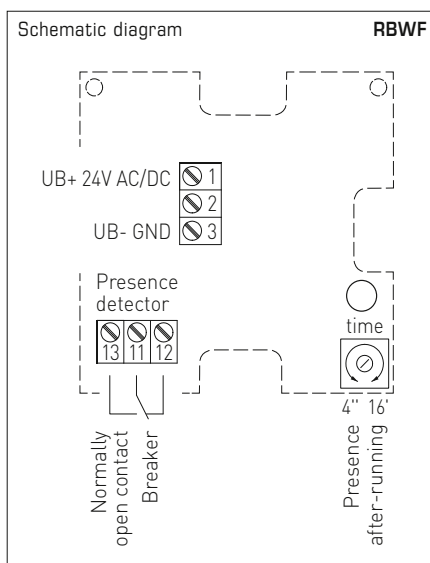
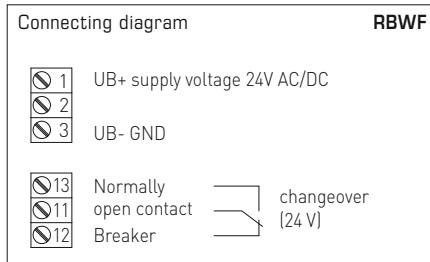
The motion sensor and presence detector **KINASGARD® RBWF** detects the presence of persons and motions and has a switching output (changeover contact). The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. Elegant housing made of plastic with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry in case of on-wall installation. The room motion sensor is used to monitor and recognise conditions and for the motion-dependent control of room functions, e.g. for lowering temperatures in unused rooms as a motion detector. This residential room motion detector is installed in corridors, in outdoor areas, in industrial halls, in offices, in residential rooms and business facilities.

RBWF



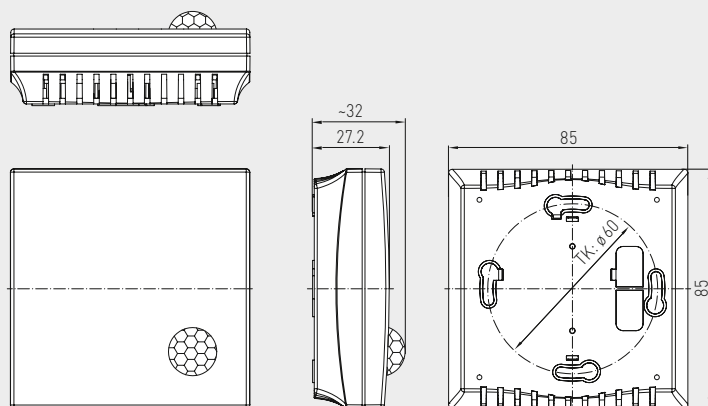
TECHNICAL DATA

Power supply:	24 V AC (± 20%); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU



Dimensional drawing

Housing **Baldur 1 RBWF**



KINASGARD® RBWF Room motion sensor

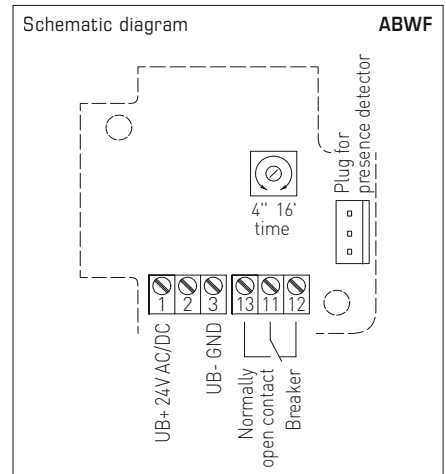
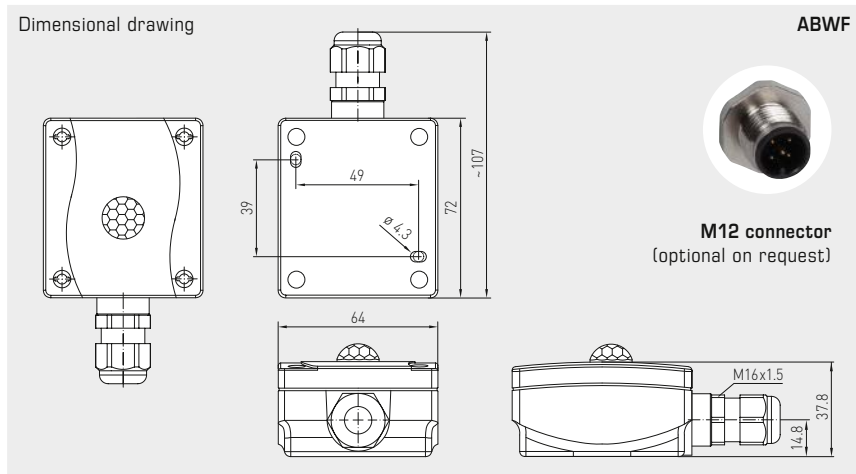
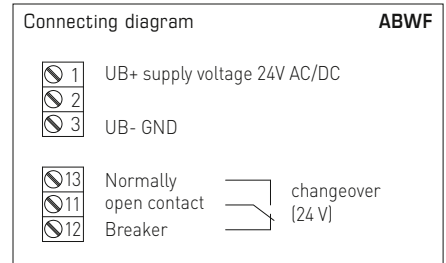
Type / WG01	Detection	Output	Item No.	Price
RBWF	Presence + Motion	Presence + Motion		
RBWF-W	Yes / No (relay on / off)	Changeover contact	1401-41A0-4000-000	95,98 €

The motion sensor and presence detector **KINASGARD® ABWF** detects the presence of persons and motions. It is used to observe and recognise conditions and for motion-dependent control of room functions, e.g. as a motion detector to lower temperatures in unused rooms. The motion sensor is used in corridors, in outdoor areas, in industrial halls, in offices, residential rooms and business facilities. The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. The sensor recognizes changes in the infra-red radiation spectrum, so in heat radiation, resulting from the movement of persons or objects. Such movements generate a temporary change of the temperature gradient in the field. Due to the constant presence of body (heat) radiation, this sensor is ideally suitable for detecting persons. The temperature difference between sensor and object must be > 5K.

ABWF



TECHNICAL DATA	
Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular
Motion detection:	of persons and objects, required temperature difference between subject and surroundings ≥ 5 K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Ambient temperature:	-10...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU



KINASGARD® ABWF Outdoor motion sensor				
Type / WG01	Detection	Output	Item No.	Price
ABWF	Presence + Motion	Presence + Motion		
ABWF-W	Yes / No (relay on / off)	Changeover contact	1401-1110-4000-000	114,48 €

**In-ceiling motion sensor
with switching output**

The in-ceiling motion sensor and presence detector **KINASGARD® DBWF / DBWF-C** detects the presence of persons and movements and has a switching contact as an output. It has been designed for monitoring and detecting statuses and for motion-dependent control of room functions, e.g. for lowering the temperature of unused rooms.

The in-ceiling motion sensor is used for installation in suspended ceilings in corridors, offices, as well as in residential and business facilities. The connecting head is pluggable for quick, easy mounting. The measuring transducer is accommodated in a separate housing. The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

**DBWF
DBWF-C**
connecting head,
pluggable



TECHNICAL DATA

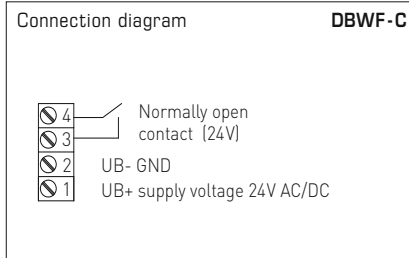
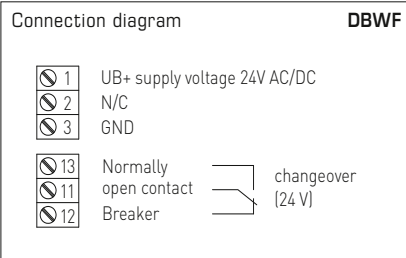
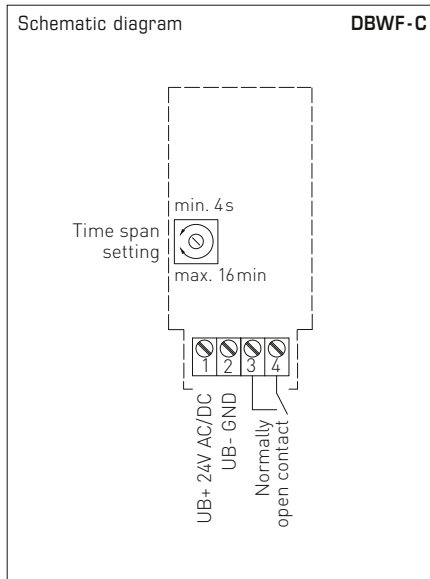
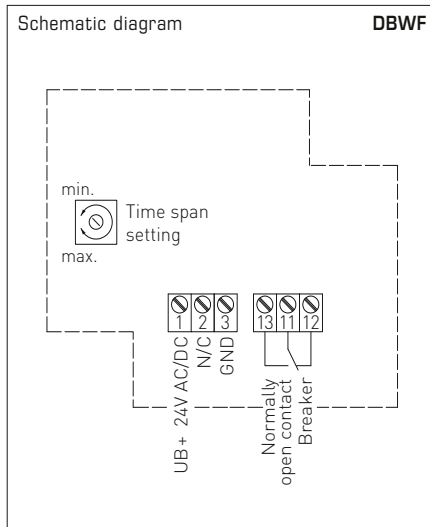
Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular, at an installation height of approx. 3 m the sensor covers a detection radius (r) of approx. 3.4 m
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
After-running time:	adjustable from 4 seconds to 16 minutes
Ambient temperature:	-10...+50 °C
Connecting head:	plastic, material polycarbonate (PC), colour white, pluggable
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = approx. 2 m
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Mounting (sensor):	in the suspended ceiling, ceiling cutout Ø = 30 mm, cover Ø = < 35 mm
Protection type (sensor):	IP 30 (according to EN 60 529) in the built-in state
Protection class (sensor):	III (according to EN 60 730)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

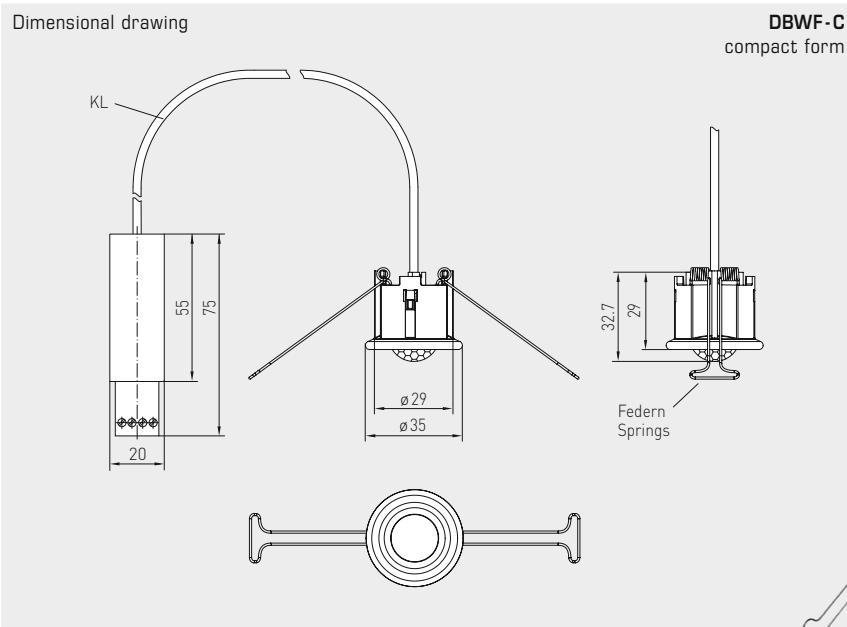
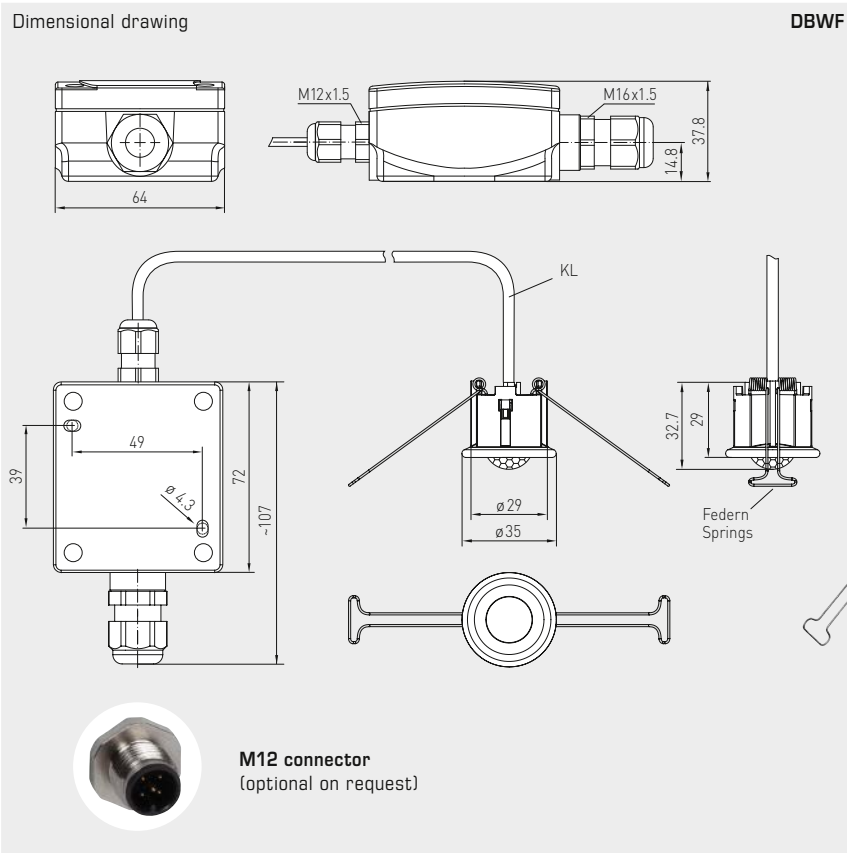
DBWF measuring transducer

Output:	potential-free changeover contact (24 V), 1 A ohmic load
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protection type (housing):	IP 67 (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)

DBWF-C measuring transducer

Output:	potential-free normally open contact , signal relay, max. 24 V / 0.5 A
Housing:	plastic, material PVC, colour black
Housing dimensions:	55 x 20 x 15 mm (compact form)
Protection type (housing):	IP 20 (according to EN 60 529) (compact form)





Type / WG01	Detection	Output	Item no.	Price
KINASGARD® DBWF	In-ceiling motion sensor			
KINASGARD® DBWF-C	In-ceiling motion sensor, compact form			
	Presence + Movement	Presence + Movement		
DBWF				
DBWF-W	Yes / No (relay on / off)	Changeover contact	1401-6120-3000-000	122,63 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request	
DBWF-C				
DBWF-C	Yes / No (relay on / off)	Normally open contact	1401-6130-1000-006	91,69 €

Room motion sensor and light sensor, multisensors with active and switching output

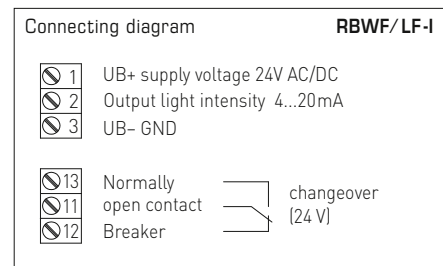
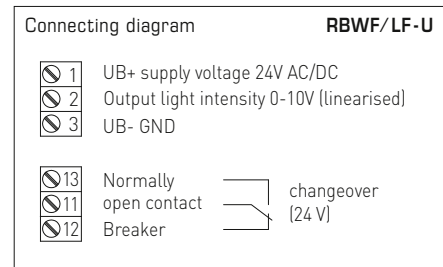
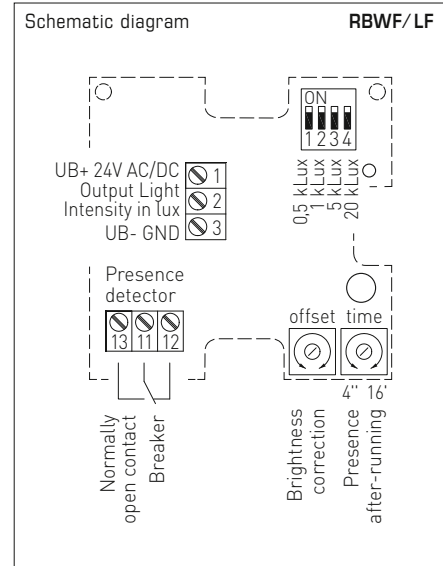
The room motion and light sensor and presence detector **KINASGARD® RBWF-LF** is a combined instrument that detects motion and light intensity using a diffuser as well as the presence of persons and is used to recognize conditions. RBWF-LF issues a standard signal of 0-10V or 4...20mA for light intensity and has a switching (normally open contact) output for detecting motion.

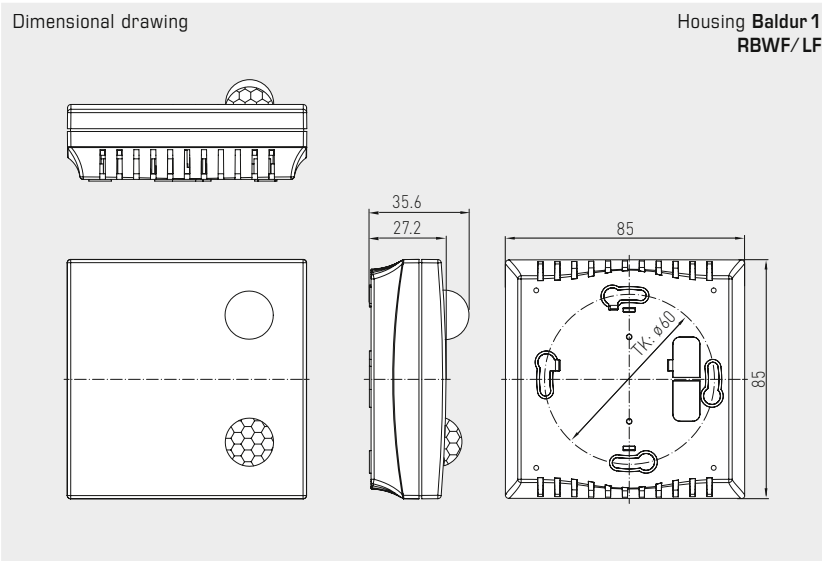
This multi-sensor is used in building automation, in corridors, at workplaces, in industrial halls, in offices and business facilities for the control of lighting as needed, e.g. to control sunshade equipment, for daylight-dependant constant light control, for activating Venetian blinds or luminaries, for automatic energy conservation, and to avoid unnecessary heating-up or cooling of unoccupied rooms.

TECHNICAL DATA

Power supply:	24V AC (±20%); 15...36V DC for U variant 15...36V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3V
Working resistance:	$R_B(\text{ohm}) = (U_b - 14\text{V}) / 0.02\text{A}$ for I variant
Load resistance:	$R_L > 5\text{kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor and light sensor with diffuser (see beginning of this chapter)
Output, motion sensor:	without / with motion + presence, potential-free normally open contact (24V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Measuring ranges:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 5 kLux / 20 kLux (other individual ranges optional, e. g. 100 kLux)
Output, light sensor:	0-10V (linearised, active, 3-wire connection) or 4...20mA
Deviation, light sensor:	typically < 5% of final value
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	ON	OFF	OFF	OFF
0... 1 kLux (default)	OFF	ON	OFF	OFF
0... 5 kLux	OFF	OFF	ON	OFF
0... 20 kLux	OFF	OFF	OFF	ON





RBWF/LF



KINASGARD® RBWF/LF Room motion sensor and light sensor

Type / WG01	Detection, Measuring Range	Output	Item No.	Price
RBWF-LF-U				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-41A1-1100-000	145,53 €
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	0 -10V (linearised)		
RBWF-LF-I				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-41A1-3200-000	145,53 €
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4...20 mA		
Extra charge:	Other individual measuring ranges optional, e.g. 100 kLux		on request	



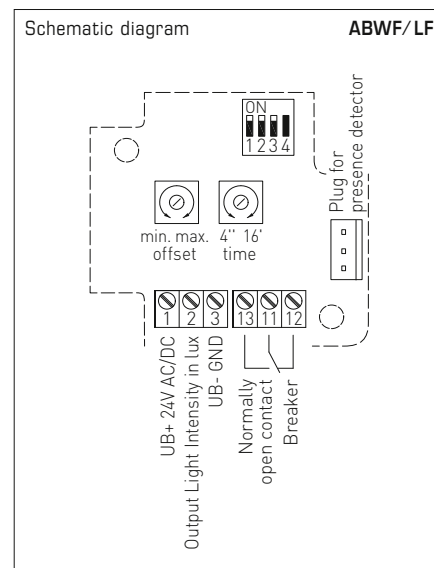
Outdoor motion sensor and light sensor, multisensors with active and switching output

The room motion and light sensor and presence detector **KINASGARD® ABWF / LF** is a combined instrument that detects motions and light intensity as well as the presence of persons and is used to recognize conditions. ABWF / LF issues a standard signal of 0-10V or 4...20mA for light intensity and has a switching (changeover contact) output for the detection of motions.

The motion sensor / presence detector detects the presence of persons and motions. It is used to monitor and recognise conditions and for motion-dependent control of room functions, e.g. as a motion detector to lower temperatures in unused rooms. The motion sensor is used in corridors, in outdoor areas, in industrial halls, in offices, residential rooms and business facilities.

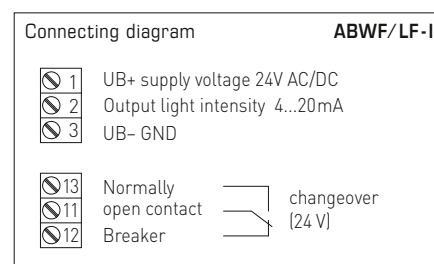
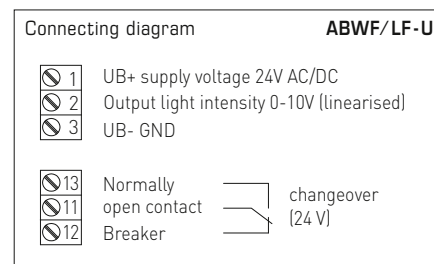
The light intensity sensor / twilight sensor with six switchable measuring ranges (six devices in one) measures the luminous intensity and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at workplaces, in greenhouses, storage halls, workshops, corridors, in outdoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and to control sunshade equipment avoiding unnecessary heating-up of rooms.

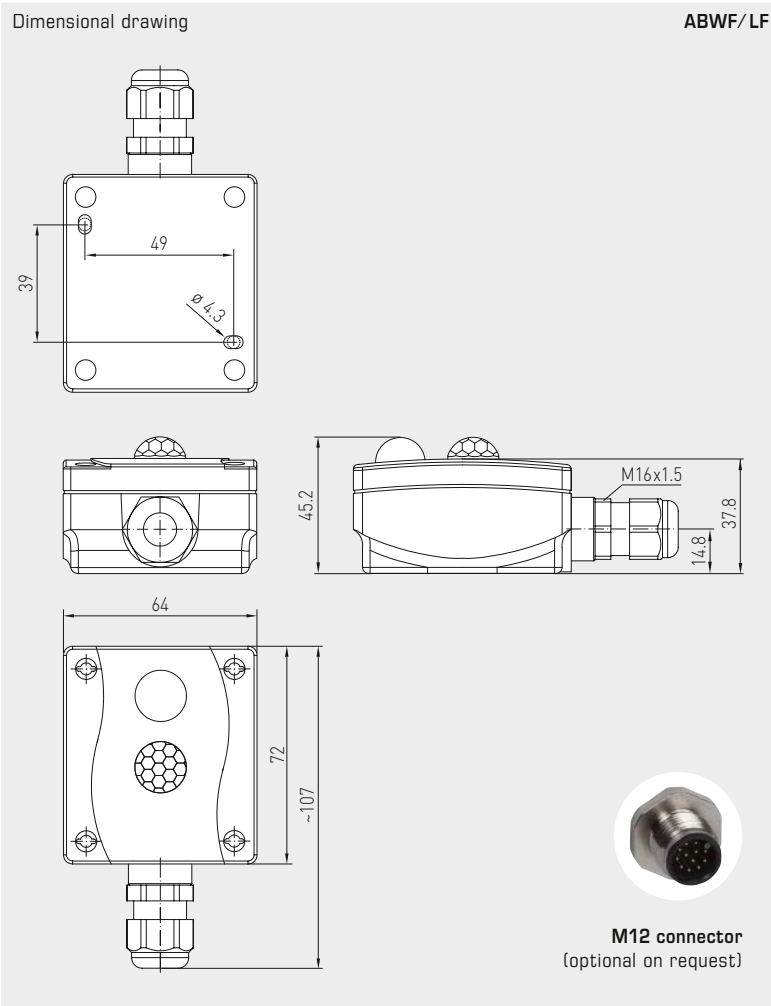
Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	-
0... 1 kLux	ON	OFF	OFF	-
0... 2 kLux	OFF	ON	OFF	-
0... 5 kLux	ON	ON	OFF	-
0... 20 kLux (default)	OFF	OFF	ON	-
0... 60 kLux	ON	OFF	ON	-



TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36V DC for U variant 15...36V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor and light sensor (see beginning of this chapter)
Output, motion sensor:	without / with motion + presence, potential-free normally open contact (24V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Measuring ranges:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux (other individual ranges optional, e. g. 100 kLux)
Output:	0-10 V (linearised, active, 3-wire connection) or 4...20 mA
Deviation, light sensor:	typically < 5 % of final value
Ambient temperature:	-10...+50 °C
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU





ABWF/LF



KINASGARD® ABWF/LF Outdoor motion sensor and light sensor				
Type / WG01	Detection, Measuring Range	Output	Item No.	Price
ABWF-LF-U				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-1111-2100-000	154,63 €
2. Light Intensity	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0 - 10V (linearised)		
ABWF-LF-I				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-1111-3200-000	154,63 €
2. Light Intensity	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4...20mA (linearised)		
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request	

In-ceiling motion detector, light, humidity and temperature sensor, multisensors with switching output

The in-ceiling sensor **KINASGARD® DBWF/LF/FTF** is used to detect persons within a distance of up to 10 meters and to measure luminous intensity or brightness, relative humidity and temperature. It has been designed for installation in suspended ceilings.

The sensor detects **motion** over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. If motion is detected, the potential-free relay output is switched. The hold time of the output, measured from the moment of the last detected movement, can be preset internally in the device via potentiometer within a range of 4 seconds to approx. 17 minutes.

For the **temperature and humidity**, an analogue output 0-10 V corresponding to 0...+50 °C or 0...100 % r. H. is available. Deviations due to the mounting position and location can be compensated internally using one offset regulator respectively.

For **luminous intensity or brightness** of 0...1000 lux or 0...5000 lux (selectable via DIP switches), an analogue output 0-10 V is also available. It is also possible to activate the motion output depending on brightness with the help of a jumper.

Fields of application for the DBWF/LF/FTF include residential room monitoring, automatic switching of lights, control technology, alarm technology, and motion-dependent control of room functions, e. g. for lowering the temperature in unused rooms.

TECHNICAL DATA

Power supply:	24 V AC / DC (half-wave rectification, read the instructions!)
Power consumption:	< 3.6 VA at 24 V DC
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Outputs:	0-10 V or inverted 10-0V (selectable via DIP switches)

MOTION

Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular, at an installation height of approx. 3 m the sensor covers a detection radius (r) of approx. 3.4 m
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
Output, motion sensor:	potential-free changeover contact, for switching safety extra-low voltage only, up to 1 A
After-running time:	adjustable from 4 s to 17 min

LIGHT INTENSITY

Sensor:	light sensor with diffusor (see beginning of this chapter)
Measuring range, light sensor:	0...1000 lux / 0...5000 lux (selectable via DIP switches)
Output, light sensor:	0-10 V
Deviation, light sensor:	typically < ± 10 % of final value (referred to calibration reference source, approx. 5700K)
Temperature drift:	< ± 5 % of final value / 10K at +20 °C

HUMIDITY

Measuring range, humidity:	0...100 % r.H. (output corresponding to 0-10 V)
Operating range, humidity:	10...95 % r.H. (non-precipitating air)
Deviation, humidity:	typically ± 3 % r.H. (20...80 %); at +20 °C, otherwise ± 5 % r.H.
Output, humidity:	0-10 V

TEMPERATURE

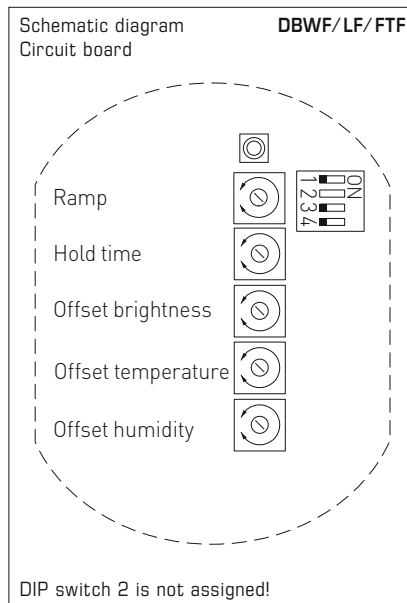
Measuring range, temperature:	0...+50 °C (output corresponding to 0-10 V) other measuring ranges on request!
Operating range, temperature:	0...+50 °C
Deviation, temperature:	typically ± 0.8K at +20 °C, under standard conditions
Output, temperature:	0-10 V
Ambient temperature:	0...+50 °C
Storage temperature:	-20...+50 °C
Housing:	steel, white painted
Housing dimensions:	cover: Ø 96 mm, height of housing: 30 mm
Installation dimensions:	ceiling cutout: Ø 80 mm installation depth: < 45 mm (incl. connector system) on-wall protrusion: > 13 mm (motion sensor) > 20 mm (humidity sensor)

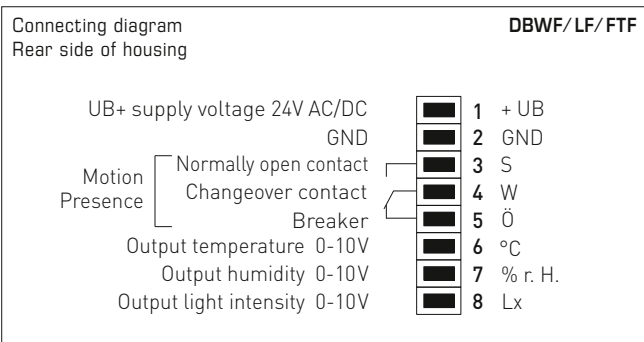
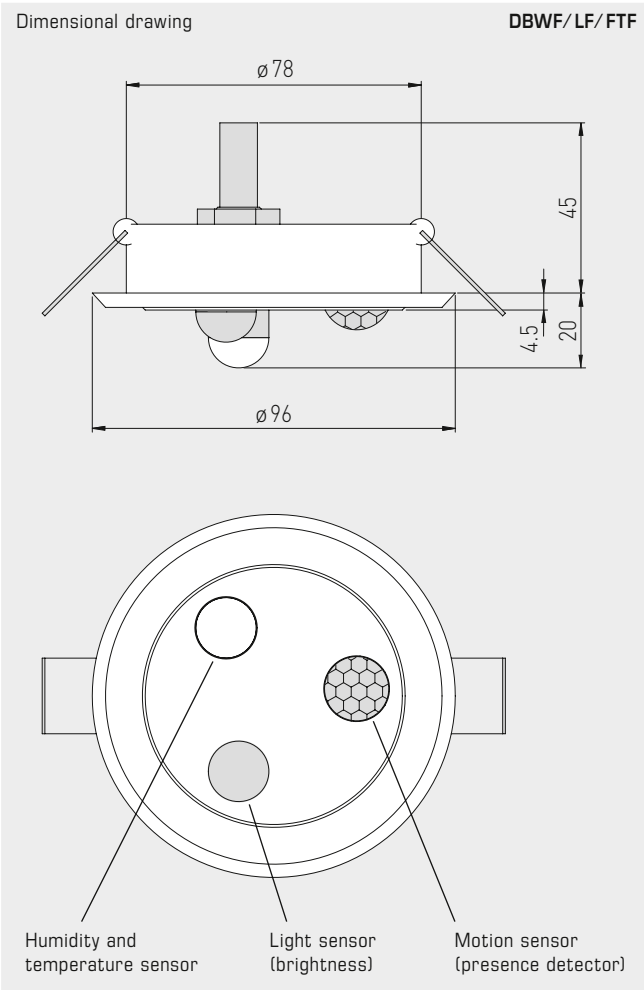
Sensor protection:	mounted inside ceiling installation housing
Protection class:	III (according to EN 60 730)
Protection type (housing):	IP 20 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Function output (direction adjustable)	DIP 1
normal (default) 0 % = 0 V 100 % = 10 V	OFF
inverted 0 % = 10 V 100 % = 0 V	ON

Brightness (adjustable measuring range)	DIP 3
0... 1000 Lux (default)	OFF
0... 5000 Lux	ON

Motion (mode selectable)	DIP 4
Motion mode (default) Motion detector is independent of threshold value	OFF
Auto mode If the set threshold value is not reached, the motion detector is active	ON





KINASGARD® DBWF/LF/FTF In-ceiling motion, light, temperature and humidity sensor				
Type / WG02	Detection, Measuring Range	Output	Item No.	Price
DBWF-LF-FTF-W				
1. Presence + Motion	yes / no (relay on / off)	Changeover contact	1401-6114-3100-000	207,95 €
2. Light Intensity	0...1000 lux / 0...5000 lux (DIP)	0-10V (linearised)		
3. Temperature	0 ... 50 °C	0- 10V		
4. Humidity	0...100% r.H.	0- 10V		
Outputs: 0-10V or inverted 10-0V (selectable via DIP switches)				



Air Quality & Flow

Increased CO₂ values, fine dust or VOC pollution are detrimental with regard to energy costs and well-being.

With **AERASGARD**[®] air quality sensors and **RHEASGARD**[®] flow sensors, you can monitor the entire room climate in a controlled way.

And with our **RHEASREG**[®] flow monitors and controllers you are firmly in control of lines carrying air, gas or liquid.

APPLICATION RANGE

- > Ventilation and air conditioning
- > Ventilator flow monitoring, butterfly valves, heating registers and humidifiers
- > Energy management
- > Residential, working and conference rooms
- > Movie theaters, showrooms and retail stores
- > Institutes and laboratories



AERASGARD®, RHEASGARD® & RHEASREG®

520 – 573

CO₂ sensors

FSC02	In-wall CO ₂ sensor	545
FSTM-CO2	In-wall temperature / CO ₂ sensor	545
RCO2-A NT	Room CO ₂ traffic light with power supply	NEW 531
RCO2-SD	Room CO ₂ sensor	535
RCO2-W	Room CO ₂ sensor	535
RTM-CO2-SD	Room temperature CO ₂ sensor	539
RFTM-CO2-W	Room humidity / temperature / CO ₂ sensor	539
ACO2-SD	On-wall CO ₂ sensor	547
ACO2-W	On-wall CO ₂ sensor	547
ATM-CO2-SD	On-wall temperature / CO ₂ sensor	553
AFTM-CO2-W	On-wall humidity / temperature / CO ₂ sensor	553
KCO2-SD	Duct CO ₂ sensor	561
KCO2-W	Duct CO ₂ sensor	561
KTM-CO2-SD	Duct temperature / CO ₂ sensor	567
KFTM-CO2-W	Duct humidity / temperature / CO ₂ sensor	567

VOC sensors

RLQ-SD	Room air-quality sensor	529
RLQ-W	Room air-quality sensor	529
KLQ-SD	Duct air-quality sensor	557
KLQ-W	Duct air-quality sensor	557

Fine dust sensors (PM)

RPS-SD	Room fine dust sensor	NEW 543
RFTM-PS-W	Room humidity / temperature / fine dust sensor	NEW 543

Multifunctional room climate sensor VOC / CO₂ / fine dust (PM)

RLQ-CO2-W	Room air-quality / CO ₂ sensor	539
RFTM-LQ-CO2-W	Room humidity / temperature / air-quality / CO ₂ sensor	539
RFTM-PS-CO2-W	Room humidity / temperature / fine dust / CO ₂ sensor	NEW 543
ALQ-CO2-W	On-wall air-quality / CO ₂ sensor	553
AFTM-LQ-CO2-W	On-wall humidity / temperature / air-quality / CO ₂ sensor	553
KLQ-CO2-W	Duct air-quality / CO ₂ sensor	567
KFTM-LQ-CO2-W	Duct humidity / temperature / air-quality / CO ₂ sensor	567

Airflow monitors

KLGF	Duct airflow monitor	569
KLSW	Duct airflow monitor	569
SW	Flow monitor	573
WFS	Wind vane switch	571

Accessories

see chapter Accessories	612
-------------------------	------------

Note concerning type designation:
W = with changeover contact



Air Quality & Flow



AERASGARD[®], RHEASGARD[®] & RHEASREG[®] Multifunctional sensor technology for air quality and more

Broad Spectrum

Our active devices for measuring and regulating CO₂, gas mixtures (VOC), fine dust (PM) and flows are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. DIP switches are used to select functions such as multi-range switching, automatic mode, and manual calibration.

Optimum Precision

The devices are tested according to the latest criteria. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Approved Safety



RoHS conforming materials



ESD compliant manufacturing



CE compliance tested by external laboratories

Certified Quality



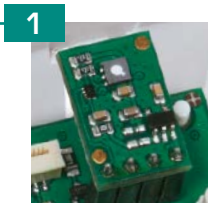
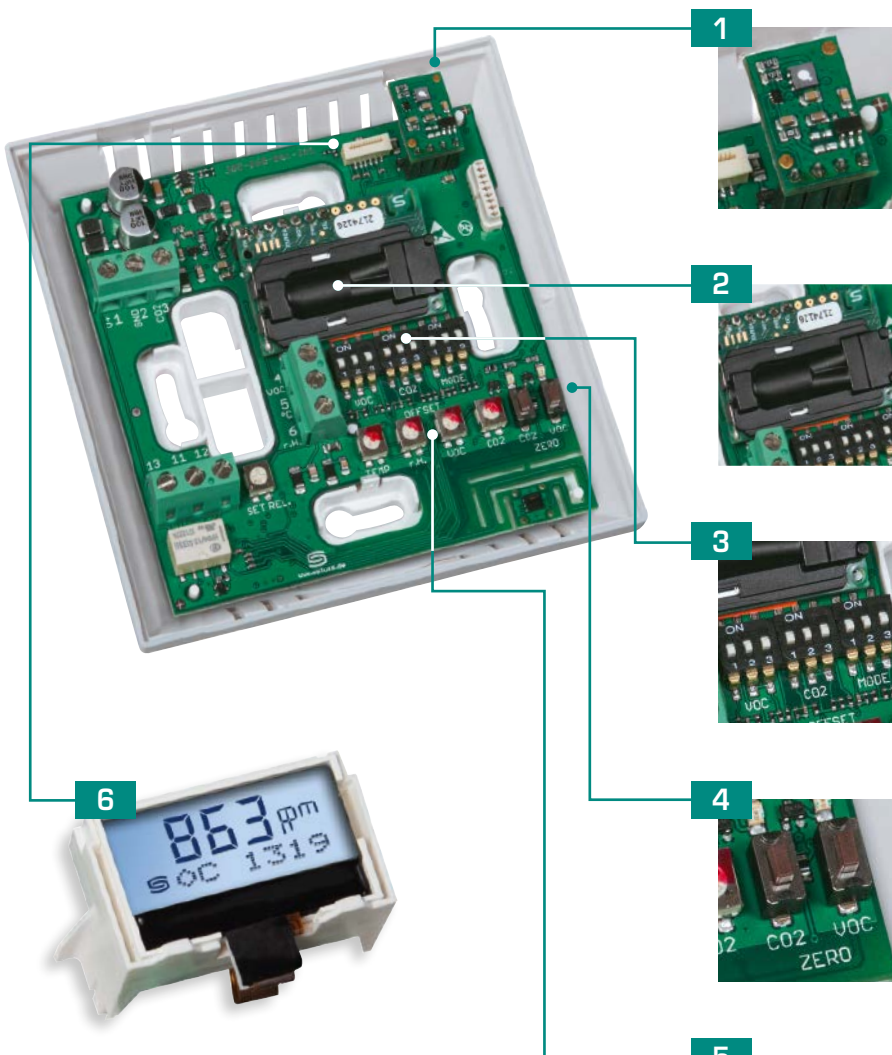
Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.



GOST certificates



EAC certified



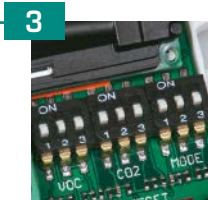
VOC Sensor

For mixed gases and air quality



CO₂ Sensor

Calibration and balancing is done by means of the bus system in climate cabinets



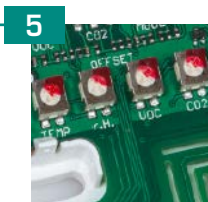
DIP Switches

For individual adjustment of measuring ranges, output, automatic zero point and relay assignment



Trigger

For CO₂ or VOC zero point



Potentiometer

For setting the relay thresholds for CO₂ and VOC.
For setting the offsets for temperature, humidity, CO₂ and VOC



Optional Display

With backlighting



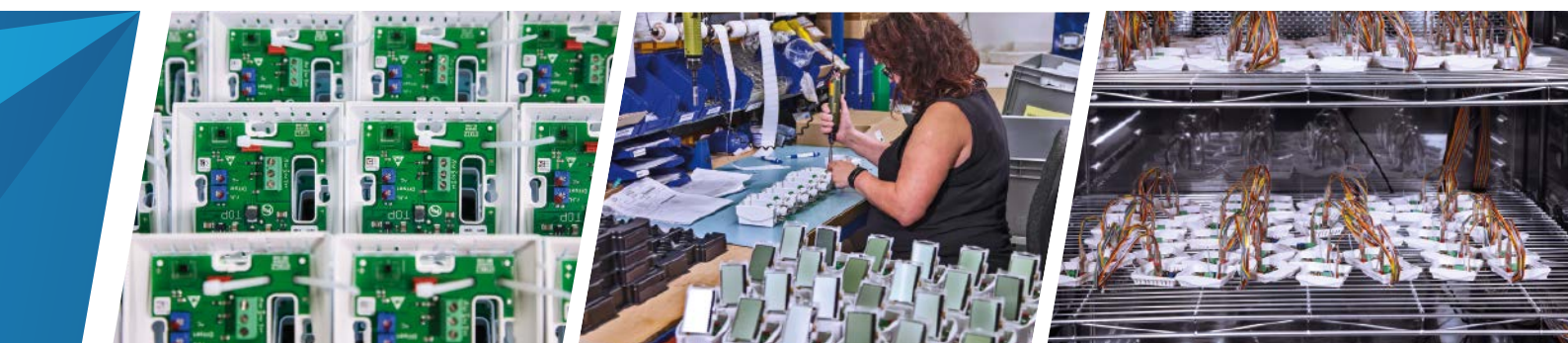
PLEUROFORM™

Multi-channel pipe for simultaneous measuring of CO₂ and VOC or gas pressure, with threaded end for receiving an additional screw-in humidity/temperature sensor



Air Pressure Compensation

Premium duct sensors with barometric air pressure compensation of CO₂ readings



General information

Atmospheric pressure, measurement methods and compensation

Due to the increasing demands for accuracy, low maintenance, and long-term stability, we have further developed and improved our established switchable measuring system. The new generation of devices now includes two-beam measurement technology and atmospheric pressure compensation for CO₂ measurement.

Single-beam measurement method

The single-beam measurement method is particularly suitable for applications where the rooms to be monitored are periodically unoccupied. A prerequisite for reliable measurement results is a regular supply of fresh air – at least three times in seven days. This is the most frequent application.

Dual-beam measurement method

The dual-beam measurement method consists of a reference channel and a measuring channel. In this case, the reference channel operates in a spectrum that is not influenced by the CO₂ concentration of the medium. Ageing, soiling, and drifts affect both channels. With the help of these relationships, the phenomena mentioned can be largely offset without having to rely on a supply of fresh air. The dual-beam measurement method is always used if the application involved unusual circumstances – such as rooms that are in continuous use, 24 hours a day, 7 days a week.

Compensation

In building automation up to now, compensating for the influence of atmospheric pressure was neglected. Due to low- and high-pressure weather conditions and differing altitudes above sea level, barometric pressure variations of up to ± 100 mbar can apply. This can result in measurement errors of up to ± 16 % of the measured value in an uncompensated systems. Our new generation of devices features an integrated atmospheric pressure measurement that compensates CO₂ reading accordingly.



S+S Regeltechnik supplies measuring instruments for CO₂ or VOC measurement in various types of design and, in contrast to other manufacturers, combined devices for CO₂ and VOC measurement with separate sensors for both of these measurands in addition to several switchable measuring ranges.

The most important aspect of ventilation on an as-needed basis is the general room air quality, often also referred to as the "comfort zone". Aside from the generally known and accepted control variables, such as relative humidity and temperature, CO₂ and VOC concentrations in the air are also important parameters to be controlled. Each individual interprets room air and its quality differently.

For that reason, air quality can only be defined in rather general terms. The air must be perceived as pleasant by a majority of people and it must not lead to any discomfort. Air must not contain any hazardous concentrations of pollutants. In this respect, the opinions of persons entering the room are decisive. This is because they soon become accustomed to their surroundings and therefore to the various pollution burdens, which they then no longer notice. An important function of systems for energy-saving ventilation on an as-needed basis is to guarantee good room air quality.

Carbon dioxide

A measuring system based on NDIR (non-dispersive infra-red sensor) technology for CO₂ measurement consists of a light source and a receptor. A certain range of wavelengths of light radiated by the source is damped and absorbed by CO₂ molecules in the measured section. This damping is detected by the receptor.

In building automation applications, detection of the CO₂ content in air is primarily undertaken to control non-smoking rooms occupied by varying numbers of persons, such as conference rooms, break rooms, cinemas, schools, etc. Here, the increased CO₂ content caused by the presence of persons is interpreted as a "deterioration" of the air quality.

Over the last few years, a standard measuring range of 0...2000 ppm (parts per million) has become established for CO₂ measuring instruments. Although this measuring range covers the recommended maximum CO₂ concentrations for working and residential rooms (1000...1500 ppm), in practice however it became apparent that in many applications the measuring range of 2000 ppm does not suffice. Therefore, we have developed and launched a new generation of devices with switchable upper measuring range limits of 2000 ppm, 5000 ppm, and 10000 ppm.

Mixed gas VOC

VOC is the abbreviation for Volatile Organic Compounds. According to the definition by the World Health Organization WHO, VOC are organic substances with a boiling range from +60 to +250°C.

Examples of VOCs include compounds of the substance groups alkanes / alkenes, aromatic compounds, terpenes, halogenated hydrocarbons, esters, aldehydes, and ketones. There is a large number of naturally occurring VOCs, some of which are also released into the atmosphere in substantial quantities, e.g. terpenes and isoprene from forests.

Environmental pollution by VOC caused by human activities increased significantly throughout the last century. The biggest contributor is traffic, followed in second place by the construction sector with construction chemistry products such as coating compounds, adhesives, or sealing compounds. Potential sources of VOC in indoor spaces in addition to construction materials include furnishing objects, cleaning and care products, hobby and do-it-yourself products, office chemicals and, above all, tobacco smoke. An essential carrier of VOC is floor carpeting. Odour problems due to VOC can also be caused by microbes, or metabolic substances from bacteria and fungi.

It is precisely these types of substances mentioned and their increased occurrence that are ascertained. Since the air to be monitored contains a multitude of different substances to which the sensor reacts and since gas mixtures are forming, this sensor does not function selectively but reflects the overall air quality. Also the statement as to what constitutes "good air" or "bad air" cannot be definitively made, as this is an entirely subjective sensation. Ventilation is recommended starting from a value between 60 - 80 % VOC.

The sensor alters its conductivity depending on the concentration, the nature, and the mixture ratio of reducing molecules in ambient air.

CO₂ and/ or VOC?

The above explanations demonstrate that there are applications for CO₂ measurement, for VOC measurement, but from our perspective, above all, for a combination of both measurands. The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. A NDIR CO₂ measuring instrument measures selectively and cannot detect any VOC, a VOC mixed gas sensor cannot recognize CO₂ molecules.

The new duct sensor featuring the Tyr2 housing design with PLEUROFORM™ multi-channel pipe handles this separation perfectly, can record both CO₂ concentration as well as VOC mixed gas (or gas pressure) and, if necessary, can function as a genuine multifunctional device that delivers humidity and temperature data.

Room air quality sensor (VOC) and measuring transducer, self-calibrating, with multi-range switching and active/switching output

Maintenance-free room sensor **AERASGARD® RLQ-SD** with active output, automatic calibration, in an elegant plastic housing with snap-on lid, for determining the air quality (0...100% VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

Maintenance-free room sensor **AERASGARD® RLQ-W** with active/switching output, automatic calibration in an elegant plastic housing with snap-on lid, optional with traffic light indicator (five coloured LEDs), for determining the air quality (0...100% VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.

**RLQ-W
RLQ-SD**



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA
Sensor:	VOC sensor (metal oxide) (VOC = volatile organic compounds),, with manual calibration (via zero button), with automatic calibration (permanently active)
Measuring range:	0...100% air quality; referred to calibrating gas; multi-range switching (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0V = clean air, 10V = polluted air) RLQ-SD 0-10 V (fixed) RLQ-W 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	RLQ-SD without changeover contact RLQ-W with potential-free changeover contact (24 V / 1 A) (switchpoint can be adjusted from 0...100% of the output signal)
Measuring accuracy:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions), depending on the type of loading and gas concentration
Gas exchange:	by diffusion
Ambient temperature:	0...+ 50 °C
Warm-up time:	approx. 1 hour
Response time:	approx. 1 minute
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), optional stainless steel V2A (1.4301)
Dimensions:	85 x 85 x 27 mm (BalduR 1) 100 x 100 x 25 mm (stainless steel)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	with traffic light indicator (five coloured LEDs, see table) for displaying the air quality.



S+S REGELTECHNIK

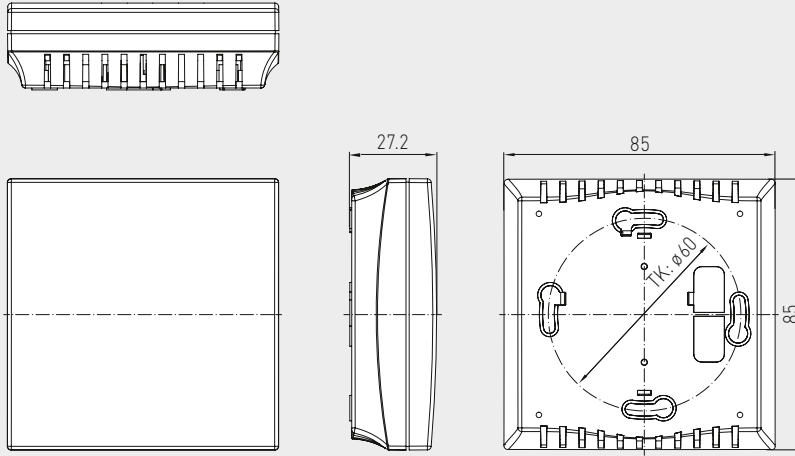
AERASGARD® RLQ-W
AERASGARD® RLQ-SD

Room air quality sensor (VOC) and measuring transducer,
self-calibrating, with multi-range switching
and active /switching output



Dimensional drawing

RLQ-W
RLQ-SD



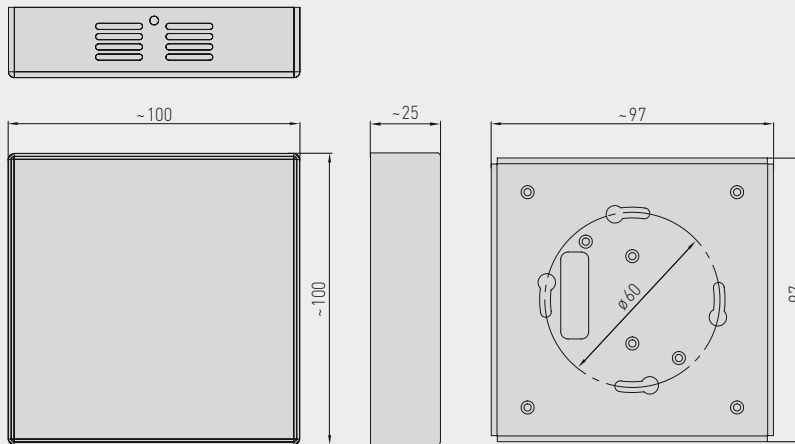
RLQ-W-A
with LEDs



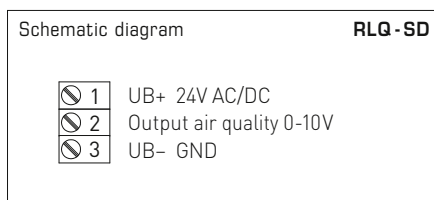
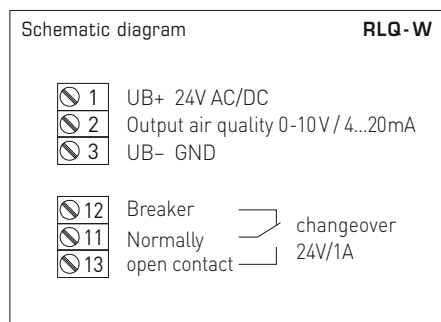
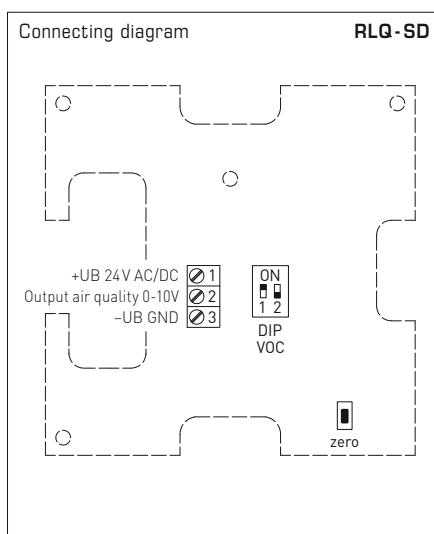
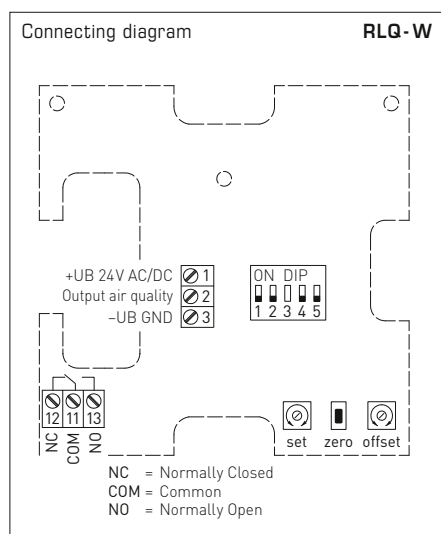
Dimensional drawing

RLQ-W VA

RLQ-W VA
(stainless steel housing)



Room air quality sensor (VOC) and measuring transducer,
self-calibrating, with multi-range switching
and active/switching output



DIP switches		RLQ-W	
VOC sensitivity	DIP 1	DIP 2	
LOW	OFF	OFF	
MEDIUM (default)	ON	OFF	
HIGH	OFF	ON	
IAQ (Indoor Air Quality)	ON	ON	
Output		DIP 4	
Voltage 0-10V (default)		OFF	
Current 4...20mA		ON	
Traffic light (5x LEDs)		DIP 5	
deactivated		OFF	
activated		ON	
Note: DIP 3 is not assigned!			

DIP switches	RLQ-SD	
VOC sensitivity	DIP 1	DIP 2
LOW	OFF	OFF
MEDIUM (default)	ON	OFF
HIGH	OFF	ON
IAQ (Indoor Air Quality)	ON	ON

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19%
2	good prompt airing recommended	20...39%
3	moderate airing recommended	40...59%
4	poor increased airing required	60...79%
5	unhealthy intense airing necessary	80...100%

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
 (Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 2007, 50: 990-1005)



S+S REGELTECHNIK

AERASGARD® RLQ-W
AERASGARD® RLQ-SD

Room air quality sensor (VOC) and measuring transducer,
self-calibrating, with multi-range switching
and active/switching output



Traffic light indicator					RLQ-W-A
VOC content	LED 1 green	LED 2 green	LED 3 yellow	LED 4 yellow	LED 5 red
0 %	25 %	–	–	–	–
5 %	50 %	–	–	–	–
10 %	75 %	–	–	–	–
15 %	100 %	–	–	–	–
20 %		25 %	–	–	–
25 %		50 %	–	–	–
30 %		75 %	–	–	–
35 %		100 %	–	–	–
40 %			25 %	–	–
45 %			50 %	–	–
50 %			75 %	–	–
55 %			100 %	–	–
60 %				25 %	–
65 %				50 %	–
70 %				75 %	–
75 %				100 %	–
80 %					25 %
85 %					50 %
90 %					75 %
95 %					100 %
100 %					

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 25 %, 50 %, 75 % and 100 %); LEDs that are already active continue to be illuminated.

RLQ-W-A
with LEDs



Type / WG02	Measuring Range VOC	Output VOC	Equipment	Item No.	Price
AERASGARD® RLQ-SD Room air quality sensor (VOC) and measuring transducer, <i>Standard</i>					
AERASGARD® RLQ-W Room air quality sensor (VOC) and measuring transducer, <i>Premium</i>					
RLQ-SD		(fixed)			
RLQ-SD-U	0...100 %	0-10 V	–	1501-61C0-1001-500	151,98 €
RLQ-W		(switchable)			
RLQ-W	0...100 %	0-10 V / 4...20 mA	Changeover contact	1501-61C0-7301-500	159,30 €
RLQ-W VA	0...100 %	0-10 V / 4...20 mA	Changeover contact, stainless steel housing	1501-61C0-7301-505	254,73 €
RLQ-W-A		(switchable)		with traffic light	
RLQ-W-A	0...100 %	0-10 V / 4...20 mA	Changeover contact, LEDs	1501-61C0-7331-500	181,75 €
A = with "traffic light" (five coloured LEDs) for displaying the air quality (VOC).					
Note:	This unit must not be used as safety-relevant device!				



Mobile CO₂ sensor for schools with traffic light display and power supply unit, room CO₂ sensor or measuring transducer, self-calibrating, with active output

Maintenance-free AERASGARD® CO₂ sensor for schools (RCO2-A NT) with traffic light display, incl. power supply unit, self-calibrating, in an elegant plastic housing, for determining the CO₂ content of room air (0...3000 ppm). The measuring transducer converts the measurand to a standard signal, which is directly presented visually by five coloured LEDs (traffic light indicator). Available in device versions RCO2-A NT for direct wall mounting, RCO2-A UPNT for recessed installation on flush-mounting socket and RCO2-A NT ST with metal stand for flexible positioning.

The room sensor is designed for use in class, seminar and meeting rooms, offices, hotels, homes, shops etc. and provides a simple and fast way of assessing the room climate. This enables an energy saving and on-demand room ventilation, thus reducing the overall operating costs and enhancing the well-being of occupants.

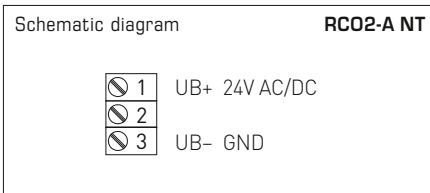
The CO₂ content is measured with an optical NDIR sensor (non-dispersive infra-red technology). For more information, see the start of the chapter.

RCO2-A UPNT with flush-mount power supply unit

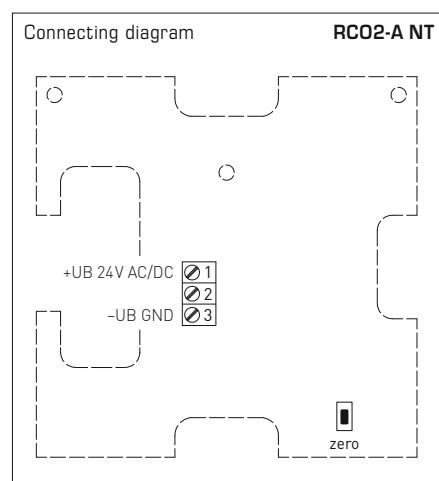


TECHNICAL DATA

Power supply:	RCO2-A UPNT: 24V AC / DC (± 10%) RCO2-A NT, RCO2-A NT ST: 230V AC (50-60 Hz)
Electrical connection:	power supply unit 230V / 50-60 Hz (included in the scope of delivery)
Sensor:	optical NDIR sensor (non-dispersive infrared technology), with manual calibration (via zero button), with automatic calibration
Measurement range:	0...3000 ppm
Measuring accuracy:	typically ± 30 ppm ± 3% of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5% of measured value / °C (whichever is greater)
Pressure dependence:	± 0.13% / mm Hg
Long-term stability:	< 2% in 15 years
Gas exchange:	by diffusion
Ambient temperature:	0...+ 50 °C
Warm-up time:	approx. 1 hour
Response time:	< 2 minutes
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	RCO2-A NT, RCO2-A UPNT: directly on wall or on flush-mounting socket, Ø 55 mm, 4-hole base part, for installation on vertically or horizontally installed flush-mounting socket with cable entry from behind, with breaking points for on-wall installation and cable entry from above or below RCO2-A NT ST: mobile CO ₂ measuring instrument on stand holder (table-top unit)
Protection class:	III (according to EN 60 730)
IP rating:	IP 30 (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU, low voltage directive 2014 / 35 / EU
Equipment:	Traffic light display (five coloured LEDs, see table) for indication of CO ₂ concentration Plug-in power supply unit (connection cable approx. 1.5 m) or Flush-mount power supply unit for installation on flush-mount socket Stainless steel stand (RCO2-A NT ST)



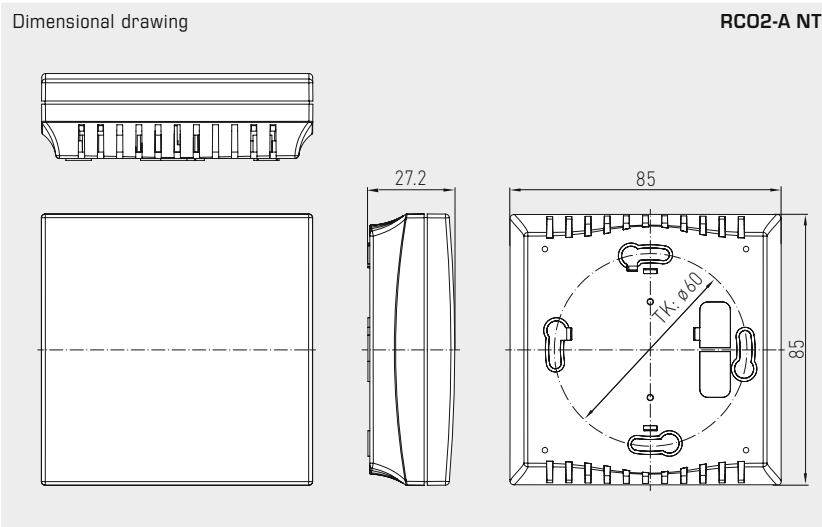
RCO2-A NT ST with plug-in power supply unit and stainless steel stand (desktop device)





NEW

Mobile CO₂ sensor for schools with traffic light display and power supply unit, room CO₂ sensor or measuring transducer, self-calibrating, with active output



RCO2-A NT
with plug-in power supply unit



Traffic light indicator					RCO2-A NT
CO ₂ content in ppm	LED 1 Green	LED 2 Green	LED 3 Yellow	LED 4 Yellow	LED 5 Red
350	20 %	-	-	-	-
416	40 %	-	-	-	-
482	60 %	-	-	-	-
548	80 %	-	-	-	-
614	100 %	-	-	-	-
680		20 %	-	-	-
746		40 %	-	-	-
812		60 %	-	-	-
878		80 %	-	-	-
944		100 %	-	-	-
1010			20 %	-	-
1076			40 %	-	-
1142			60 %	-	-
1208			80 %	-	-
1274			100 %	-	-
1340				20 %	-
1406				40 %	-
1472				60 %	-
1538				80 %	-
1604				100 %	-
1670					20 %
1736					40 %
1802					60 %
1868					80 %
1934					100 %
2000					
3000					

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 20%, 40%, 60%, 80% and 100%); LEDs that are already active continue to be illuminated.

LED	Recommendation	RCO2-A NT
1 ● Green:	no action required	
2 ● Green:	prompt airing recommended	
3 ● Yellow:	airing recommended	
4 ● Yellow:	airing required	
5 ● Red:	intensive airing necessary	

AERASGARD® RCO2-A NT CO ₂ sensor for schools with traffic light display and power supply unit					
Type/WG02	Measuring ranges CO ₂	Display CO ₂	Equipment	Item no. (Baldur 1)	Price
RCO2-A NT					
RCO2-A NT	0...3000 ppm	5 LEDs	Plug-in power supply unit	1501-61A0-7331-232	191,25 €
RCO2-A NT ST	0...3000 ppm	5 LEDs	Plug-in power supply unit, stainless steel stand	1501-61A0-7331-231	198,75 €
RCO2-A UPNT	0...3000 ppm	5 LEDs	Flush-mount power supply unit	1501-61A0-7331-233	312,50 €
Note:	This unit must not be used as safety-relevant device!				

**Room CO₂ sensor and measuring transducer,
self-calibrating, with multi-range switching
and active/switching output**

Maintenance-free room sensor **AERASGARD® RCO₂-SD** with active output, automatic calibration (fixed), in an elegant plastic housing with snap-on lid, for determining the CO₂ content of the air (0...2000ppm). The measuring transducer converts the measured values into a standard signal of 0-10V.

Maintenance-free room sensor **AERASGARD® RCO₂-W** with active/switching output, automatic calibration (can be deactivated), in an elegant plastic housing with snap-on lid, optional with traffic light indicator (five coloured LEDs), for determining the CO₂ content of the air (0...2000ppm/0...5000ppm). The measuring transducer converts the measured values into a standard signal of 0-10V or 4...20mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The CO₂ measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

For more information, see the start of the chapter.

TECHNICAL DATA

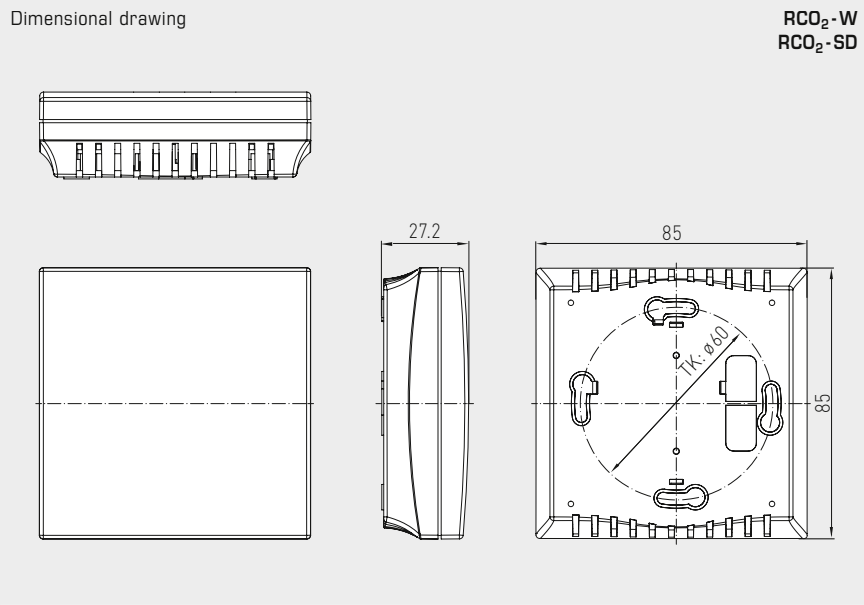
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA
Sensor:	Optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), RCO₂-SD with automatic calibration (fixed) RCO₂-W with automatic calibration (can be deactivated via DIP switches)
Measuring range:	RCO₂-SD 0...2000 ppm (fixed) RCO₂-W 0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output:	RCO₂-SD 0-10 V (fixed) RCO₂-W 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	RCO₂-SD without changeover contact RCO₂-W with potential-free changeover contact (24 V / 1 A)
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Ambient temperature:	0...+ 50 °C
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), stainless steel housing optional V2A (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) 100 x 100 x 25 mm (stainless steel)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	with traffic light indicator (five coloured LEDs, see table) for displaying the CO ₂ concentration with display (see AERASGARD® RFTM-LQ-CO₂) for displaying the actual CO ₂ content in ppm



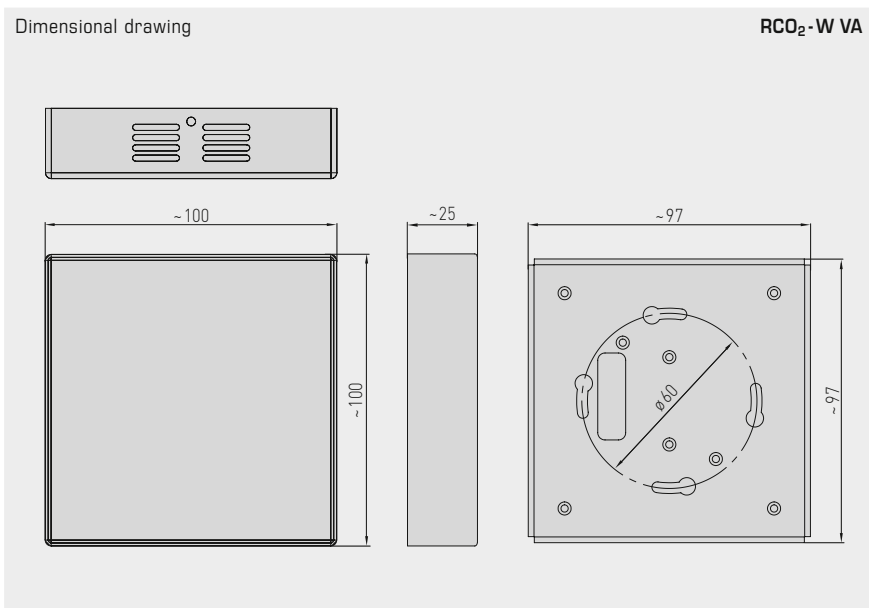
S+S REGELTECHNIK

AERASGARD® RCO₂-W
AERASGARD® RCO₂-SD

Room CO₂ sensor and measuring transducer,
self-calibrating, with multi-range switching
and active /switching output

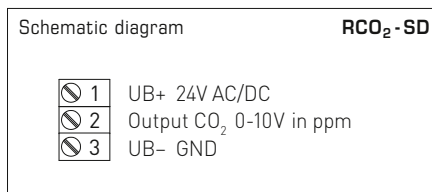
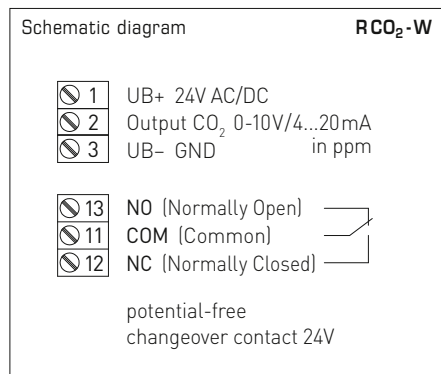
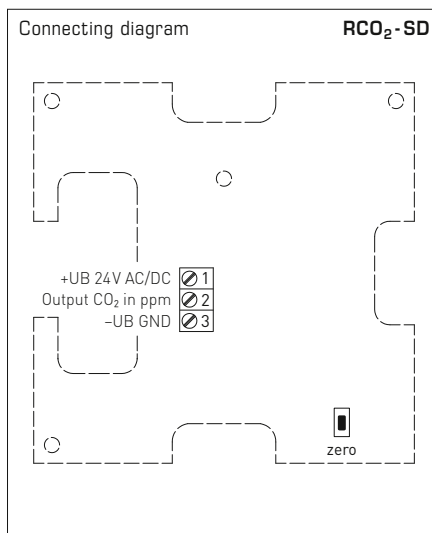
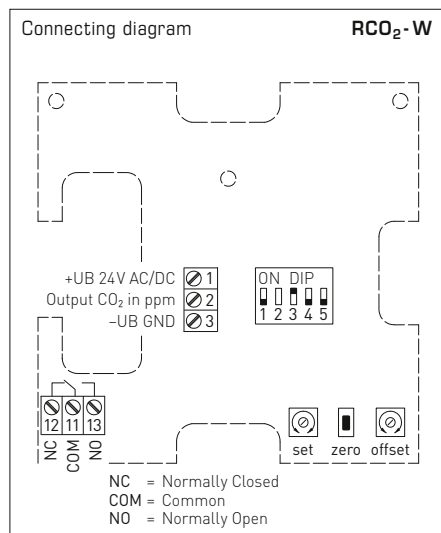


RCO₂-W
RCO₂-SD



RCO₂-W VA
(stainless steel housing)

Room CO₂ sensor and measuring transducer,
self-calibrating, with multi-range switching
and active/switching output



DIP switches RCO ₂ -W	
CO₂ content	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON
CO₂ automatic zero point	DIP 3
deactivated	OFF
activated (default)	ON
Output	DIP 4
Voltage 0-10V (default)	OFF
Current 4...20mA	ON
Traffic light (5x LEDs)	DIP 5
deactivated	OFF
activated	ON
Note: DIP 2 is not assigned!	



S+S REGELTECHNIK

AERASGARD® RCO₂-W
AERASGARD® RCO₂-SD

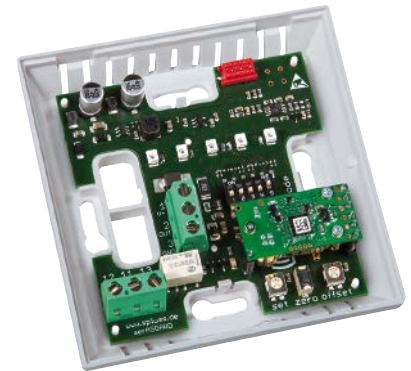
Room CO₂ sensor and measuring transducer,
self-calibrating, with multi-range switching
and active/switching output



Traffic light indicator		RCO ₂ -W-A				
CO ₂ content in ppm		LED 1	LED 2	LED 3	LED 4	LED 5
0...2000 ppm	0...5000 ppm	green	green	yellow	yellow	red
350	350	20 %	-	-	-	-
416	536	40 %	-	-	-	-
482	722	60 %	-	-	-	-
548	908	80 %	-	-	-	-
614	1094	100 %	-	-	-	-
680	1280		20 %	-	-	-
746	1466		40 %	-	-	-
812	1652		60 %	-	-	-
878	1838		80 %	-	-	-
944	2024		100 %	-	-	-
1010	2210			20 %	-	-
1076	2396			40 %	-	-
1142	2582			60 %	-	-
1208	2768			80 %	-	-
1274	2954			100 %	-	-
1340	3140				20 %	-
1406	3326				40 %	-
1472	3512				60 %	-
1538	3698				80 %	-
1604	3884				100 %	-
1670	4070					20 %
1736	4256					40 %
1802	4442					60 %
1868	4628					80 %
1934	4814					100 %
2000	5000					

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 20%, 40%, 60%, 80% and 100%); LEDs that are already active continue to be illuminated.

RCO₂-W-A
with LEDs



AERASGARD® RCO₂-SD Room CO₂ sensor and measuring transducer, *Standard*
AERASGARD® RCO₂-W Room CO₂ sensor and measuring transducer, *Premium*

Type / WG02	Measuring Range CO ₂	Output CO ₂	Equipment	Display	Item No. (Baldur 1)	Price
RCO₂-SD	(fixed)	(fixed)				
RCO2-SD-U	0...2000 ppm	0-10 V	-		1501-61A0-1001-200	184,93 €
RCO₂-W	(switchable)	(switchable)				
RCO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact		1501-61A0-7301-200	219,08 €
RCO2-W VA	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, stainless steel housing		1501-61A0-7301-205	313,11 €
RCO2-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, display	■ see RFTM-LQ-CO ₂		
RCO₂-W-A	(switchable)	(switchable)			with traffic light	
RCO2-W-A	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, LEDs		1501-61A0-7331-200	257,47 €

A = with "traffic light" (five coloured LEDs) for displaying the CO₂ concentration.

Note: This unit **must not** be used as safety-relevant device!

**Multifunctional room sensors and measuring transducers,
 for humidity, temperature, air quality (VOC) and CO₂ content,
 calibratable, with active/switching output**

Maintenance-free room sensor **AERASGARD® RTM-CO₂-SD** with active output, automatic calibration, in an elegant plastic housing with snap-on lid, for determining the CO₂ content of the air (0...2000 ppm) and the temperature (0...+50°C). The measuring transducer converts the measured values into a standard signal of 0-10V.

Maintenance-free room sensor **AERASGARD® RFTM-LQ-CO₂-W** with active/switching output, automatic calibration, in an elegant plastic housing with snap-on lid, optionally with/without display, for determining the CO₂ content of the air (0...2000 ppm/0...5000 ppm), the quality in three VOC sensitivity (0...100% VOC), the temperature (0...+50°C) as well as the relative air humidity (0...100% r.H.). The measuring transducer converts the measured values into a standard signal of 0-10V or 4...20mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results.

The CO₂ measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology).

The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances).

This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	RCO₂-W / RTM-CO₂-SD: < 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA RLQ-CO₂-W / RFTM-LQ-CO₂-W: < 4.4 W / 24 V DC typical; < 6.4 VA / 24 V AC typical; peak current 200 mA
Outputs:	RTM-CO₂-SD 0-10V (fixed) Rxx-CO₂-W 0-10V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10% of the measuring range)
Relay output:	RTM-CO₂-SD without changeover contact Rxx-CO₂-W with potential-free changeover contact (24 V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)

HUMIDITY

Sensor (RH / °C):	digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability
Measuring range (RH):	0...100% r. H.
Output (RH):	0-10 V or 4...20 mA (selectable via DIP switches)
Deviation (RH):	typically ± 2.0% (20...80% r. H.) bei +25 °C, sonst ± 3.0%

TEMPERATURE

Measuring range (°C):	0...+ 50 °C
Deviation (°C):	typically ± 0.2K bei +25 °C
Output (°C):	RTM-CO₂-SD 0-10V (fixed) Rxx-CO₂-W 0-10V or 4...20 mA (selectable via DIP switches)

AIR QUALITY (VOC)

Sensor (VOC):	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (via zero button) and automatic calibration (permanently active)
Measuring range (VOC):	0...100% air quality; referred to calibrating gas; multi-range switching (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output (VOC):	0-10 V (0V = clean air, 10V = polluted air) or 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100% of the output signal)
Measuring accuracy (VOC):	typically ± 20% of final value (referred to calibrating gas)
Service life (VOC):	> 60 months (under normal load conditions) depending on the type of loading and gas concentration

CARBON DIOXIDE (CO₂)

Sensor (CO ₂):	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), RTM-CO₂-SD with automatic calibration (fixed) Rxx-CO₂-W with automatic calibration (can be deactivated via DIP switches)
Measuring range (CO ₂):	RTM-CO₂-SD 0...2000 ppm (fixed) Rxx-CO₂-W 0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output (CO ₂):	RTM-CO₂-SD 0-10V (fixed) Rxx-CO₂-W 0-10V or 4...20 mA (selectable via DIP switches)
Measuring accuracy (CO ₂):	typically ± 30 ppm (± 3% of measured value)
Temperature dependence (CO ₂):	± 5 ppm / °C or ± 0.5% of measured value / °C (whichever is higher)
Pressure dependence (CO ₂):	± 0.13% / mm Hg
Long-term stability (CO ₂):	< 2% in 15 years
Gas exchange (CO ₂):	by diffusion

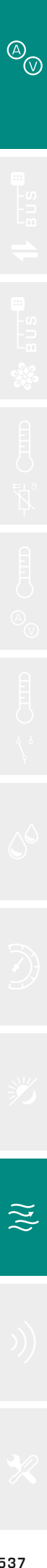
continued on next page!



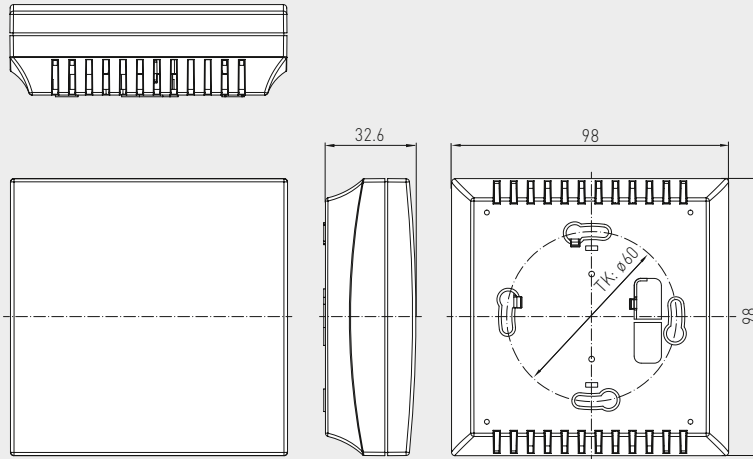
S+S REGELTECHNIK

AERASGARD® RCO₂-W / RLQ-CO₂-W
AERASGARD® RFTM-(LQ)-CO₂-W / RTM-CO₂-SD

Multifunctional room sensors and measuring transducers,
 for humidity, temperature, air quality (VOC) and CO₂ content,
 calibratable, with active/switching output



Dimensional drawing

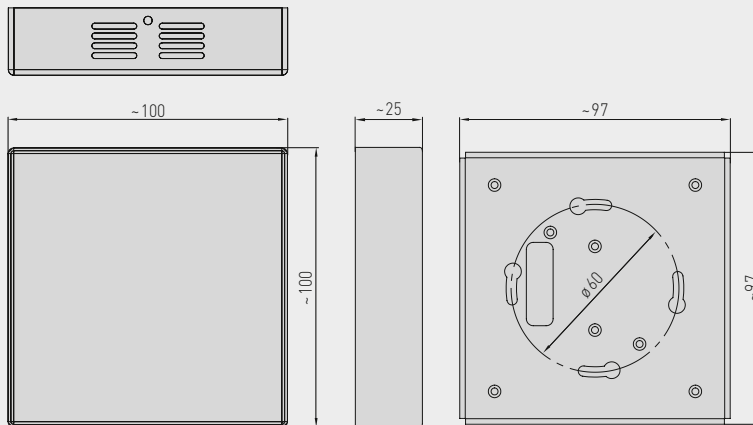


RCO₂-W with display
RLQ-CO₂-W
RFTM-LQ-CO₂-W
RTM-CO₂-SD

RLQ-CO₂-W
RFTM-LQ-CO₂-W
RTM-CO₂-SD



Dimensional drawing



Stainless steel housing
 (See picture
 on next page)

RCO₂-W
RLQ-CO₂-W
RFTM-LQ-CO₂-W
 without display



TECHNICAL DATA [continued]

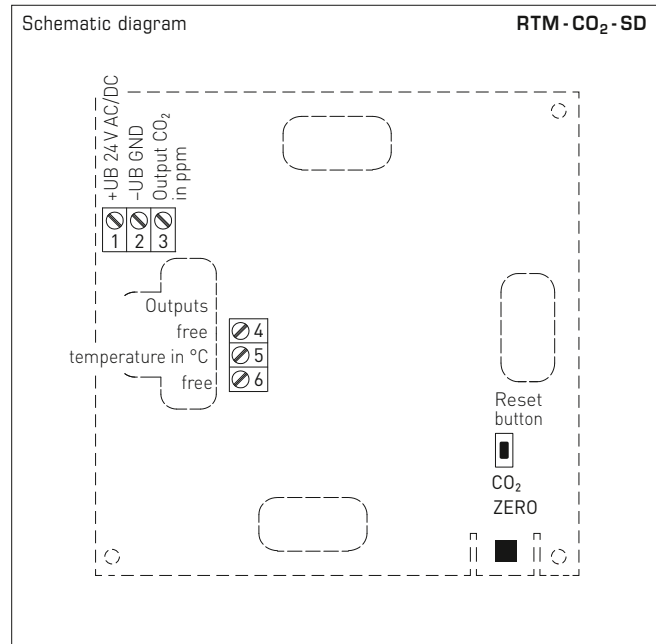
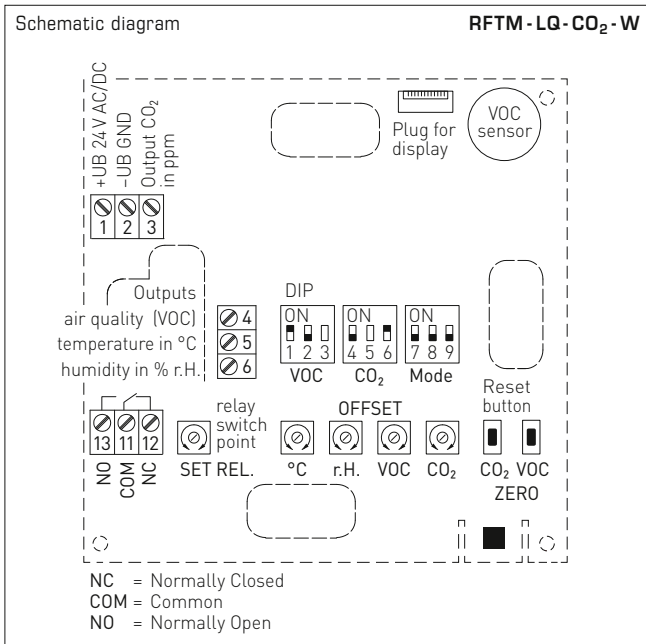
Ambient temperature:	0...+50 °C
Permitted humidity:	0...95% r. H. (non-precipitating air)
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), stainless steel V2A (1.4301) housing optional
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	display with illumination , two line, cutout approx. 36 x 15 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO ₂ content

AERASGARD® RCO₂-W / RLQ-CO₂-W AERASGARD® RFTM-(LQ)-CO₂-W / RTM-CO₂-SD



S+S REGELTECHNIK

Multifunctional room sensors and measuring transducers,
for humidity, temperature, air quality (VOC) and CO₂ content,
calibratable, with active/switching output



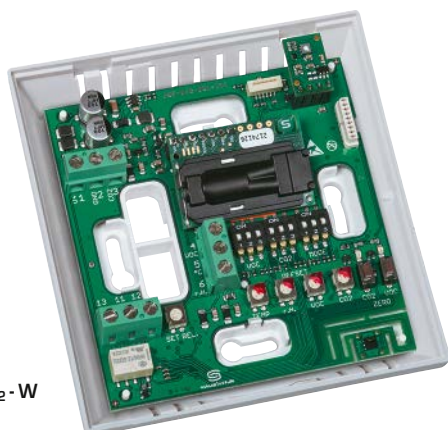
DIP switches (Baldur 2)	RFTM-LQ-CO ₂ -W	
VOC sensitivity	DIP 1	DIP 2
LOW	OFF	OFF
MEDIUM (default)	ON	OFF
HIGH	OFF	ON
IAQ (Indoor Air Quality)	ON	ON
CO₂ content	DIP 4	
0...2000 ppm (default)	OFF	
0...5000 ppm	ON	
CO₂ automatic zero point	DIP 6	
deactivated	OFF	
activated (default)	ON	
Relay assignment	DIP 7	DIP 8
CO ₂ (default): 600...1900 ppm / 900...4700 ppm	OFF	OFF
VOC: 10...95 %	ON	OFF
Temperature: +5...+48 °C	OFF	ON
Humidity: 10...95% r.H.	ON	ON
Output	DIP 9	
Voltage 0-10V (default)	OFF	
Current 4...20mA	ON	

Note: DIP 3 and DIP 5 are not assigned!

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19 %
2	good prompt airing recommended	20...39 %
3	moderate airing recommended	40...59 %
4	poor increased airing required	60...79 %
5	unhealthy intense airing necessary	80...100 %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990-1005)

RFTM-LQ-CO₂-W
(Baldur 2)



Stainless steel housing
(optionally available upon request)





Humidity table

MR: 0...100% r.H.

% r.H.	U _A in V	I _A in mA
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
Continued at the right ...		

% r.H.	U _A in V	I _A in mA
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Temperature table

MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

AERASGARD® RTM-CO ₂ -SD	Room temperature and CO ₂ sensor, <i>Standard</i>
AERASGARD® RCO ₂ -W	Room CO ₂ sensor, <i>Premium</i>
AERASGARD® RLQ-CO ₂ -W	Room air quality (VOC) and CO ₂ sensor, <i>Premium</i>
AERASGARD® RFTM-CO ₂ -W	Multifunctional room sensor for humidity, temperature and CO ₂ content, <i>Deluxe</i>
AERASGARD® RFTM-LQ-CO ₂ -W	Multifunctional room sensor for humidity, temperature, CO ₂ content and air quality (VOC), <i>Deluxe</i>

Type / WG02	Measuring Range				Equipment	Item No.	Price
	Humidity	Temperature	CO ₂	VOC	Display	(Balduz 2)	
RTM-CO₂-SD			(fixed)				
RTM-CO2-SD-U	-	0...+50 °C	0...2000 ppm	-	-	1501-61B2-1001-200	202,47 €
RCO₂-W			(switchable)				
RCO2-W (without display)	-	-	0...2000 / 5000 ppm	-	W	see RCO ₂ -W / RCO ₂ -SD	
RCO2-W LCD	-	-	0...2000 / 5000 ppm	-	W ■	1501-61B0-7321-200	263,02 €
RLQ-CO₂-W			(switchable)				
RLQ-CO2-W	-	-	0...2000 / 5000 ppm	0...100%	W	1501-61B1-7301-200	334,56 €
RLQ-CO2-W LCD	-	-	0...2000 / 5000 ppm	0...100%	W ■	1501-61B1-7321-200	377,64 €
RFTM-CO₂-W			(switchable)				
RFTM-CO2-W	0...100% r.H.	0...+50 °C	0...2000 / 5000 ppm	-	W	1501-61B6-7301-200	309,26 €
RFTM-CO2-W LCD	0...100% r.H.	0...+50 °C	0...2000 / 5000 ppm	-	W ■	1501-61B6-7321-200	343,01 €
RFTM-LQ-CO₂-W			(switchable)				
RFTM-LQ-CO2-W	0...100% r.H.	0...+50 °C	0...2000 / 5000 ppm	0...100%	W	1501-61B8-7301-200	365,93 €
RFTM-LQ-CO2-W LCD	0...100% r.H.	0...+50 °C	0...2000 / 5000 ppm	0...100%	W ■	1501-61B8-7321-200	409,01 €
Outputs:	0-10V or 4...20 mA (selectable via DIP switches, selected variant applies for all outputs) – <i>Standard</i> room sensor RTM-CO₂-SD with fixed output 0-10V!						
Equipment:	W = changeover contact – <i>Standard</i> room sensor RTM-CO₂-SD without changeover contact!						
Note:	This unit must not be used as safety-relevant device!						

Multifunctional room sensor and measuring transducer for humidity, temperature, fine dust (PM) and CO₂ content, calibratable, with active/switching output

Maintenance-free room sensor **AERASGARD® RPS-SD** with active output, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, for detecting the fine dust content (0...500 µg/m³). The measuring transducer converts the measurand into a standard signal of 0-10V (fixed).

Maintenance-free, multifunctional room sensor **AERASGARD® RFTM-PS-CO₂-W** with active/switching output, automatic calibration, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with/without display, for detection of measurands air humidity (0...100% r.H.), temperature (0...+50°C), fine dust (PM) (0...50/100/300/500 µg/m³) and CO₂ content (0...2000/5000 ppm). The measuring transducer converts the measurand into a standard signal of 0-10V or 4...20 mA (switchable).

Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO₂ content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology). An optical **particulate sensor** precisely detects **fine dust (PM)** of the size category 0.3 to 10 micrometers. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10%)	
Power consumption:	RPS-SD	typically < 1.5 W / 24 V DC; < 2.9 VA / 24 V AC; peak current 200 mA
	RFTM-PS-CO₂-W	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
Output:	RPS-SD	0-10 V (fixed)
	RFTM-PS-CO₂-W	0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected version applies uniformly to all outputs), with offset potentiometer (± 10% of measuring range)
Relay output:	RPS-SD	without changeover contact
	RFTM-PS-CO₂-W	with potential-free changeover contact (24 V / 1 A) (assignment selectable via DIP switches, switch point can be set)

HUMIDITY

Sensor (RH / °C):	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability	
Measuring range (RH):	0...100% r. H.	
Output (RH):	0-10 V or 4...20 mA (selectable via DIP switches)	
Deviation (RH):	typically ± 2.0% (20...80% r. H.) at +25 °C, otherwise ± 3.0%	

TEMPERATURE

Measuring range (°C):	0...+50 °C	
Output (°C):	0-10 V or 4...20 mA (selectable via DIP switches)	
Deviation (°C):	typically ± 0.2 K at +25 °C	

FINE DUST (PM)

Sensor (PM):	optical fine-dust sensor (PM = particulate matter), particulate sensor with laser- and soiling-resistant technology	
Measuring range (PM):	RPS-SD	0...500 µg/m ³ (fixed)
	RFTM-PS-CO₂-W	multi-range switching (selectable via DIP switches) 0...50, 0...100, 0...300 or 0...500 µg/m ³
Output (PM):	RPS-SD	0-10 V (fixed)
	RFTM-PS-CO₂-W	0-10 V or 4...20 mA (selectable via DIP switches)
Particle size (PM):	PM 2.5 (0.3...2.5 µm); PM 10 (0.3...10 µm)	
Measuring accuracy (PM):	typically ± 10 µg/m ³ (± 10% of measured value) at PM 2.5 typically ± 25 µg/m ³ (± 25% of measured value) at PM 10	
Long-term stability (PM):	± 1.25 µg/m ³ (± 1.25% of measured value/year)	
Service life (PM):	> 10 years	

CARBON DIOXIDE (CO₂)

Sensor (CO ₂):	Optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), with automatic calibration (can be deactivated via DIP switches)	
Measuring range (CO ₂):	0...2000 ppm or 0...5000 ppm (selectable via DIP switches)	
Output (CO ₂):	0-10 V or 4...20 mA (selectable via DIP switches)	
Measuring accuracy (CO ₂):	typically ± 30 ppm (± 3% of measured value)	
Temperature dependence (CO ₂):	± 5 ppm / °C or ± 0.5% of measured value / °C (whichever is greater)	
Pressure dependence (CO ₂):	± 0.13% / mm Hg	
Long-term stability (CO ₂):	< 2% in 15 years	
Gas exchange (CO ₂):	Diffusion	

Continued on next page!



NEW

S+S REGELTECHNIK

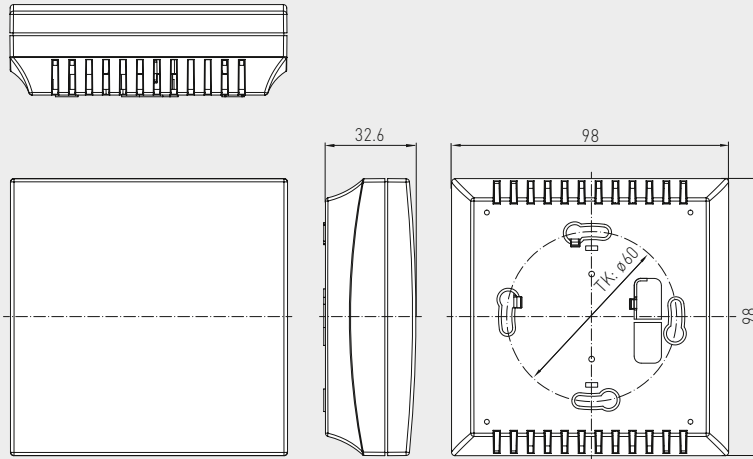
AERASGARD® RPS - SD
AERASGARD® RFTM - PS - CO₂ - W

Multifunctional room sensor and measuring transducer
for humidity, temperature, fine dust (PM) and CO₂ content,
calibratable, with active /switching output



Dimensional drawing

RPS - SD
RFTM - PS - CO₂ - W



RPS - SD
RFTM - PS - CO₂ - W
without display



RFTM - PS - CO₂ - W
with display

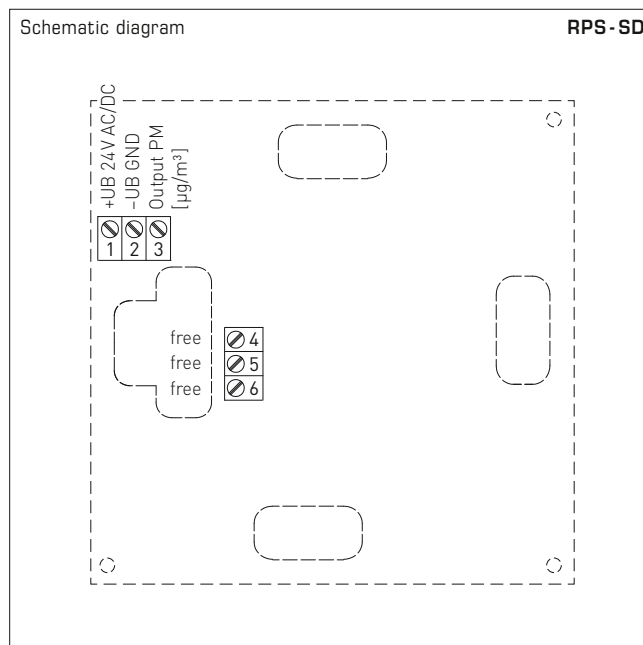
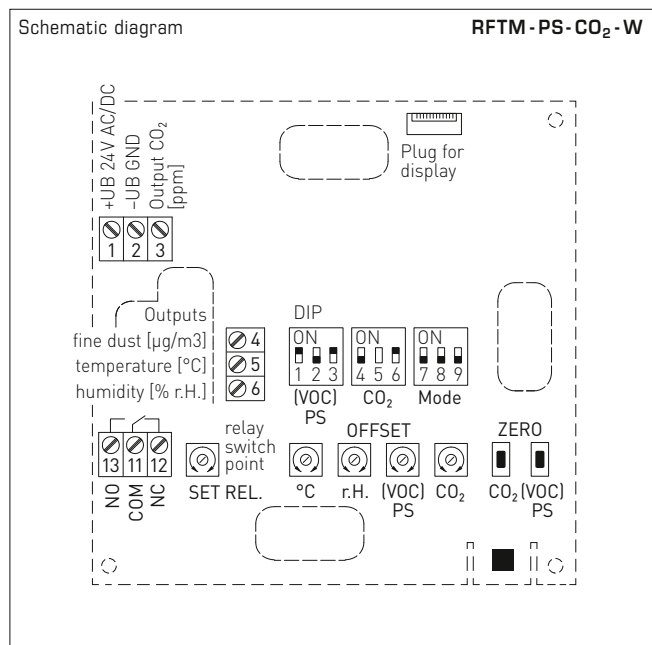


TECHNICAL DATA [continued]

Ambient temperature:	0...+50 °C
Permitted humidity:	0...95% r. H. (non-precipitating air)
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (BalduR2)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Protection class:	III (according to EN 60 730)
IP rating:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	Display with illumination , 2-line, cutout approx. 36 x 15 mm (W x H), to display the actual humidity, actual temperature, of the fine-dust and CO ₂ content as well as for switch point display

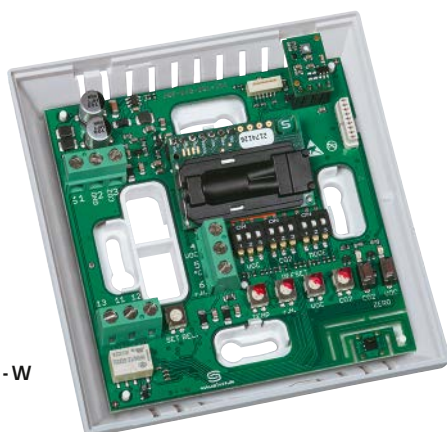


Multifunctional room sensor and measuring transducer for humidity, temperature, fine dust (PM) and CO₂ content, calibratable, with active/switching output



DIP switch		RFTM-PS-CO ₂ -W	
Fine dust (PM)		DIP 1	DIP 2
0...50 µg/m ³		OFF	OFF
0...100 µg/m ³ (default)		ON	OFF
0...300 µg/m ³		OFF	ON
0...500 µg/m ³		ON	ON
CO₂ content		DIP 4	
0...2000 ppm (default)		OFF	
0...5000 ppm		ON	
CO₂ automatic zero point		DIP 6	
deactivated		OFF	
activated (default)		ON	
Relay assignment		DIP 7	DIP 8
CO ₂ (default)	600...1900 ppm / 900...4700 ppm	OFF	OFF
Fine dust	10...490 µg/m ³	ON	OFF
Temperature	+5...+48 °C	OFF	ON
Humidity	10...95 % r.H.	ON	ON
Output		DIP 9	
Voltage	0-10V (default)	OFF	
Current	4...20 mA	ON	

Note: DIP 3 and DIP 5 are not assigned!



RFTM-PS-CO₂-W (Balduur 2)



NEW

S+S REGELTECHNIK

AERASGARD® RPS-SD
AERASGARD® RFTM-PS-CO₂-W

Multifunctional room sensor and measuring transducer
for humidity, temperature, fine dust (PM) and CO₂ content,
calibratable, with active/switching output

Humidity table

MR: 0...100% r.H.

% r.H.	U _A in V	I _A in mA
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
Continued at the right ...		

% r.H.	U _A in V	I _A in mA
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Temperature table

MR: 0...+50 °C

°C	U _A in V	I _A in mA
0	0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

AERASGARD® RPS-SD	Room sensor for fine dust (PM), <i>Standard</i>
RFTM-PS-W	Multifunctional room sensor for humidity, temperature and fine dust (PM), <i>Premium</i>
RFTM-PS-CO₂-W	Multifunctional room sensor for humidity, temperature, fine dust (PM) and CO ₂ content, <i>Deluxe</i>

Type / WG02	Measuring Range		PM	CO ₂	Equipment Display	Item No.	Price
	Humidity	Temperature					
RPS-SD			(fixed)				
RPS-SD	–	–	0...500 µg/m ³	–		1501-2110-1001-000	270,81 €
RFTM-PS-W			(switchable)	(switchable)			
RFTM-PS-W	0...100% r.H.	0...+50 °C	0... 50 µg/m ³ 0...100 µg/m ³ 0...300 µg/m ³ 0...500 µg/m ³	–	W	1501-2116-7301-000	353,25 €
RFTM-PS-W LCD	0...100% r.H.	0...+50 °C	(4x as above)	–	W ■	1501-2116-7321-000	429,18 €
RFTM-PS-CO₂-W							
RFTM-PS-CO ₂ -W	0...100% r.H.	0...+50 °C	0... 50 µg/m ³ 0...100 µg/m ³ 0...300 µg/m ³ 0...500 µg/m ³	0...2000 ppm / 0...5000 ppm	W	1501-2113-7301-000	411,26 €
RFTM-PS-CO ₂ -W LCD	0...100% r.H.	0...+50 °C	(4x as above)	0...2000 ppm / 0...5000 ppm	W ■	1501-2113-7321-000	455,21 €
Outputs:	0-10V or 4...20mA (selectable via DIP switches, selected variant applies for all outputs) – <i>Standard</i> room sensor RPS-SD with fixed output 0-10V!						
Equipment:	W = changeover contact – <i>Standard</i> room sensor RPS-SD without changeover contact!						
Note:	These units must not be used as safety-relevant devices!						

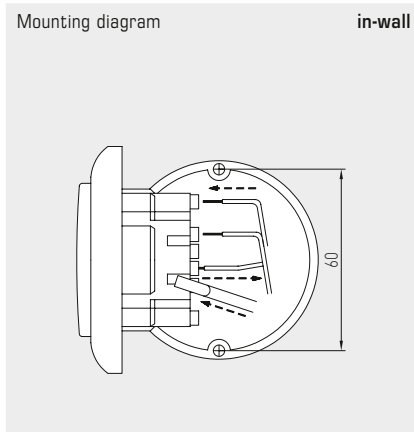
**Room CO₂ and temperature sensor or measuring transducer,
in-wall in the panel switch programme,
with active output**

The room sensor **AERASGARD® FSCO₂ / FSTM-CO₂** in the in-wall housing is used for measuring the CO₂ content and temperature of the air. It converts the measured values into a standard signal of 0-10 V.

The CO₂ content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). A digital, long-term stable sensor is used for temperature measurement.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC; < 2.9 VA / 24 V AC

CARBON DIOXIDE [CO₂]

Sensor, CO ₂ :	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration (fixed)
Long-term stability:	< 2 % in 15 years
Measuring range, CO ₂ :	0...2000 ppm
Output, CO ₂ :	0-10 V
Measuring accuracy, CO ₂ :	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO ₂ :	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes

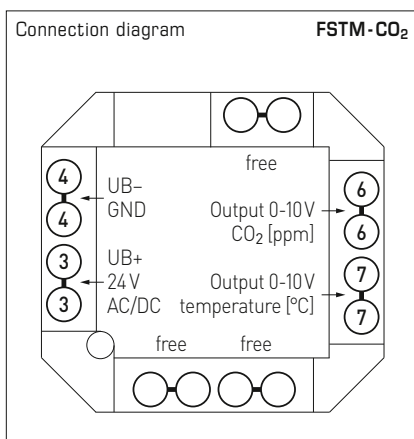
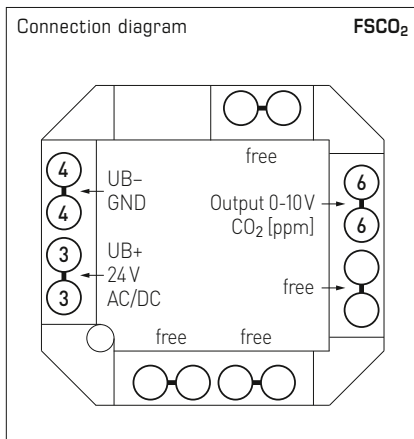
TEMPERATURE

Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0-10 V

Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % r.H., non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

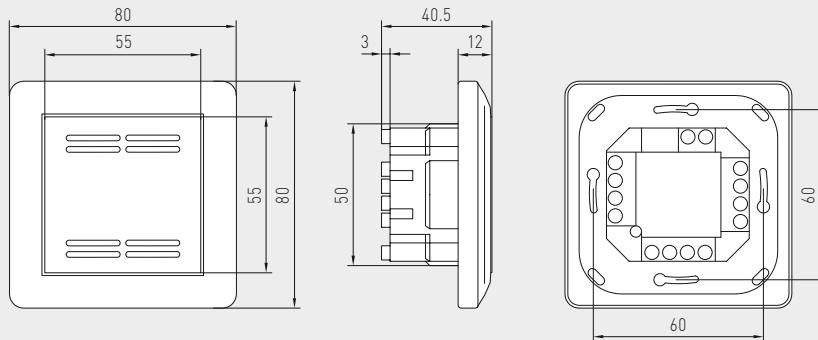
SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)





Dimensional drawing



FSCO₂
FSTM-CO₂

FSCO₂
FSTM-CO₂



CO₂ content table
MR: 0...2000 ppm

ppm	U _A [V]
0	0.00
350	1.75
400	2.00
450	2.25
500	2.50
550	2.75
600	3.00
700	3.50
800	4.00
900	4.50

Continued to the right ...

ppm	U _A [V]
1000	5.0
1100	5.5
1200	6.0
1300	6.5
1400	7.0
1500	7.5
1600	8.0
1700	8.5
1800	9.0
1900	9.5
2000	10.0

Temperature table
MR: 0...+50 °C

°C	U _A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

AERASGARD® FSCO₂ Room CO₂ sensor or measuring transducer, in-wall
AERASGARD® FSTM-CO₂ Room temperature and CO₂ sensor or measuring transducer, in-wall

Type / WG02	Measuring Range CO ₂	Temperature	Output CO ₂	Temperature	Item No.	Price
FSCO₂						
FSCO2-U	0...2000 ppm	-	0-10 V	-	1501-9120-1001-162	297,97 €
FSTM-CO₂						
FSTM-CO2-U	0...2000 ppm	0...+50 °C	0-10 V	0-10 V	1501-9122-1001-162	302,15 €



On-wall CO₂ sensor and measuring transducer, self-calibrating, with multi-range switching and active/switching output

Maintenance-free on-wall sensor **AERASGARD® ACO₂-SD** with active output, automatic calibration (fixed), in an impact-resistant housing with quick-locking screws, for determining the CO₂ content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10V.

Maintenance-free on-wall sensor **AERASGARD® ACO₂-W** with active/switching output, automatic calibration (can be deactivated), in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, for determining the CO₂ content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10V or 4...20mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

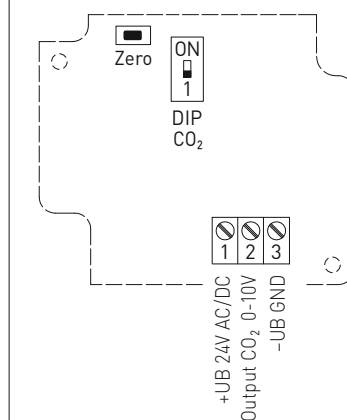
The CO₂ measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

For more information, see the start of the chapter.

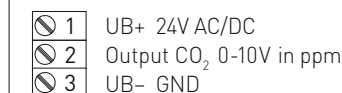
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; Peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), ACO₂-SD with automatic calibration (fixed) ACO₂-W with automatic calibration (can be deactivated via DIP switches)
Measuring range:	Multi-range switching (selectable via DIP switches) 0...2000 ppm; 0...5000 ppm
Output:	ACO₂-SD 0-10 V (fixed) ACO₂-W 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	ACO₂-SD without changeover contact ACO₂-W with potential-free changeover contact (24 V / 1 A), switchpoint adjustable
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Ambient temperature:	-10...+60 °C
Response time:	approx. 1 minute
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	with display (see AERASGARD® AFTM-LQ-CO₂) for displaying the actual CO ₂ content in ppm
ACCESSORIES	see table

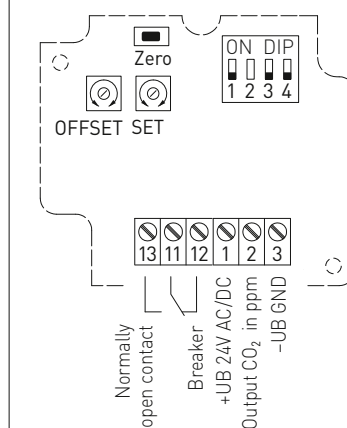
Schematic diagram **ACO₂-SD**



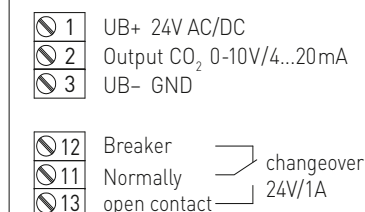
Connecting diagram **ACO₂-SD**



Schematic diagram **ACO₂-W**



Connecting diagram **ACO₂-W**





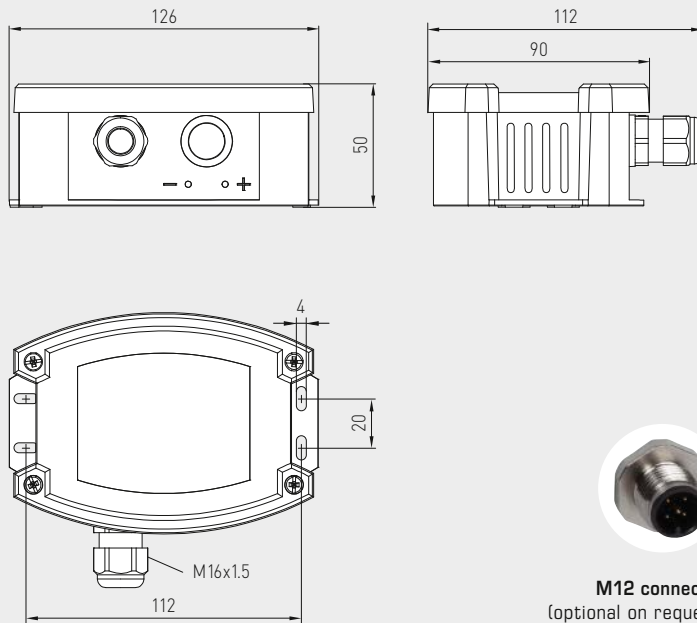
S+S REGELTECHNIK

AERASGARD® ACO₂-W
AERASGARD® ACO₂-SD

On-wall CO₂ sensor and measuring transducer,
self-calibrating, with multi-range switching
and active/switching output



Dimensional drawing



ACO₂-W
ACO₂-SD

ACO₂-W
ACO₂-SD



WS-03

Weather and sun protection hood
(optional)

DIP switch	ACO ₂ -W
CO₂ content	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON
CO₂ automatic zero point	DIP 3
deactivated	OFF
activated (default)	ON
Output	DIP 4
Voltage 0-10 V (default)	OFF
Current 4...20 mA	ON

Note: **DIP 2** is not assigned!

DIP switch	ACO ₂ -SD
CO₂ content	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON



AERASGARD® ACO₂-SD On-wall CO₂ sensor and measuring transducer, *Standard*
AERASGARD® ACO₂-W On-wall CO₂ sensor and measuring transducer, *Premium*

Type / WG02B	Measuring Range CO ₂	Output CO ₂	Equipment	Display	Item No.	Price
ACO₂-SD	(switchable)	(fixed)				
ACO2-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	–		1501-7110-1001-200	215,88 €
ACO₂-W	(switchable)	(switchable)				
ACO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-7110-7301-200	309,72 €
ACO2-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■ see AFTM-LQ-CO ₂		
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)					
Note:	This unit must not be used as safety-relevant device!					

ACCESSORIES

WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €
--------------	--	--------------------	----------------

For further information see last chapter!



Multifunctional on-wall sensors and measuring transducers,
 for humidity, temperature, CO₂ content and air quality (VOC),
 calibratable, with active/switching output

Maintenance-free on-wall sensor **AERASGARD® ATM-CO₂-SD** with active output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, for determining the CO₂ content of the air (0...2000 ppm/0...5000 ppm) and the temperature (-35...+80 °C). The measuring transducer converts the measured values into a standard signal of 0-10V.

Maintenance-free on-wall sensor **AERASGARD® AFTM-LQ-CO₂-W** with active/switching output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, optionally with/without Display, for determining the CO₂ content of the air (0...2000 ppm/0...5000 ppm), the quality (0...100 % VOC), the temperature (-35...+80 °C) as well as the relative air humidity (0...100 % r.H.). The measuring transducer converts the measured values into a standard signal of 0-10V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO₂ measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air

For more information, see the start of the chapter.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Outputs:	Axx-SD 0-10V (fixed) Axx-W 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	Axx-SD without changeover contact Axx-W with potential-free changeover contact (24 V / 1 A)

HUMIDITY

Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter , Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter , Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % r. H.
Operating range, humidity:	0...95 % r. H. (without dew formation)
Deviation of humidity:	typically ± 2.0 % (20...80 % r. H.) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0-10 V or 4...20 mA (selectable via DIP switches)

TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Temperature deviation:	typically ± 0.4 K at 25 °C
Output, temperature:	Axx-SD 0-10V (fixed) Axx-W 0-10V or 4...20 mA (selectable via DIP switches)

AIR QUALITY (VOC)

Sensor, VOC:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (using zero button) and automatic calibration (permanently active)
Measuring range, VOC:	0...100 % air quality; referred to calibrating gas; multi-range switching (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output, VOC:	0-10 V (0V = clean air, 10V = polluted air) or 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Measuring accuracy, VOC:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions) depending on the type of loading and gas concentration

CARBON DIOXIDE (CO₂)

Sensor, CO ₂ :	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), Axx-SD with automatic calibration (fixed) Axx-W with automatic calibration (can be deactivated via DIP switches)
Measuring range, CO ₂ :	0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output, CO ₂ :	Axx-SD 0-10V (fixed) Axx-W 0-10V or 4...20 mA (selectable via DIP switches)
Measuring accuracy, CO ₂ :	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO ₂ :	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)

continued on next page!



S+S REGELTECHNIK

AERASGARD® ACO₂-W / ALQ-CO₂-W AERASGARD® AFTM-(LQ)-CO₂-W / ATM-CO₂-SD

Multifunctional on-wall sensors and measuring transducers,
for humidity, temperature, CO₂ content and air quality (VOC),
calibratable, with active/switching output



Dimensional drawing

AFTM-LQ-CO₂-W

M12 connector
(optional on request)

SF-K
plastic sinter filter
(standard)

SF-M
metal sinter filter
(optional)

AFTM-LQ-CO₂-W
with plastic sinter filter
(standard)

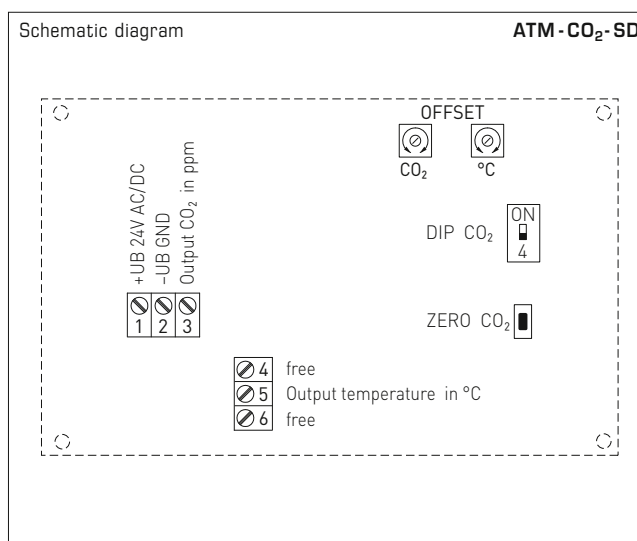
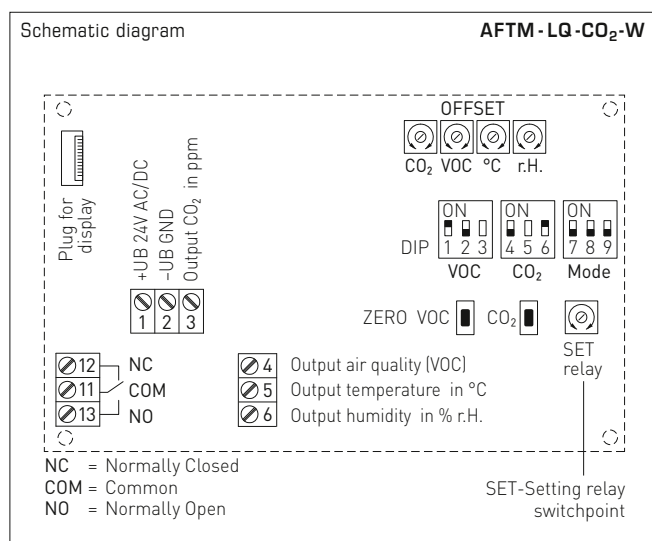


AFTM-LQ-CO₂-W
with display and
plastic sinter filter
(standard)



TECHNICAL DATA		(continued)
Pressure dependence:	± 0.13 % / mm Hg	
Long-term stability:	< 2% in 15 years	
Gas exchange:	by diffusion	
Ambient temperature:	-10...+60 °C	
Response time:	< 2 minutes	
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals	
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!	
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)	
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)	
Protective tube:	stainless steel V2A (1.4301), Ø 16 mm, NL = 55 mm	
Process connection:	by screws	
Protection class:	III (according to EN 60 730)	
Protection type:	IP 65 (according to EN 60 529)	
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014/30/EU	
Optional:	three-line display with illumination , cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and/or the actual CO ₂ content	

Multifunctional on-wall sensors and measuring transducers,
 for humidity, temperature, CO₂ content and air quality (VOC),
 calibratable, with active/switching output



DIP switches	AFTM-LQ-CO ₂ -W	
VOC sensitivity	DIP 1	DIP 2
LOW	OFF	OFF
MEDIUM (default)	ON	OFF
HIGH	OFF	ON
IAQ (Indoor Air Quality)	ON	ON
CO₂ content	DIP 4	
0...2000 ppm (default)	OFF	
0...5000 ppm	ON	
CO₂ automatic zero point	DIP 6	
deactivated	OFF	
activated (default)	ON	
Relay assignment	DIP 7	DIP 8
CO ₂ (default): 600...1900 ppm / 900...4700 ppm	OFF	OFF
VOC: 10...95%	ON	OFF
Temperature: -23...+74 °C	OFF	ON
Humidity: 10...95% r.H.	ON	ON
Output	DIP 9	
Voltage 0-10V (default)	OFF	
Current 4...20mA	ON	
Note: DIP 3 and DIP 5 are not assigned!		

DIP switches	ATM-CO ₂ -SD	
CO₂ content	DIP 4	
0...2000 ppm (default)	OFF	
0...5000 ppm	ON	

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19%
2	good prompt airing recommended	20...39%
3	moderate airing recommended	40...59%
4	poor increased airing required	60...79%
5	unhealthy intense airing necessary	80...100%

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
 (Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990-1005)



S+S REGELTECHNIK

AERASGARD® ACO₂-W / ALQ-CO₂-W
 AERASGARD® AFTM-(LQ)-CO₂-W / ATM-CO₂-SD

Multifunctional on-wall sensors and measuring transducers,
 for humidity, temperature, CO₂ content and air quality (VOC),
 calibratable, with active/switching output

AFTM-LQ-CO₂-W
 with display



Humidity table

MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8

Continued at the right ...

% r.H.	U _A in V	I _A in mA
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Temperature table

MR: -35...+80 °C

°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.4	4.7
-25	0.9	5.4
-20	1.3	6.1
-15	1.7	6.8
-10	2.2	7.5
-5	2.6	8.2
0	3.0	8.9
+5	3.5	9.6
+10	3.9	10.3
+15	4.3	11.0
+20	4.8	11.7

Continued at the right ...

°C	U _A in V	I _A in mA
+25	5.2	12.3
+30	5.7	13.0
+35	6.1	13.7
+40	6.5	14.4
+45	7.0	15.1
+50	7.4	15.8
+55	7.8	16.5
+60	8.3	17.2
+65	8.7	17.9
+70	9.1	18.6
+75	9.6	19.3
+80	10.0	20.0

AERASGARD® ACO₂-W / ALQ-CO₂-W
AERASGARD® AFTM-(LQ)-CO₂-W / ATM-CO₂-SD

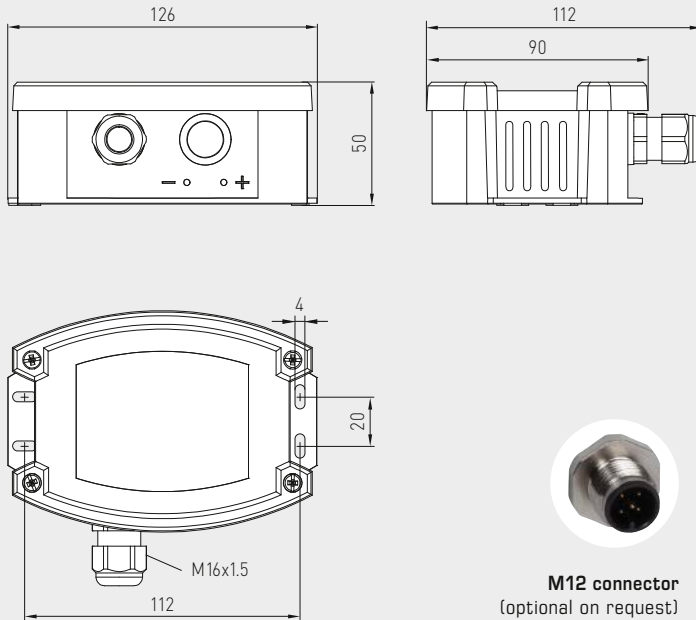


Multifunctional on-wall sensors and measuring transducers,
 for humidity, temperature, CO₂ content and air quality (VOC),
 calibratable, with active/switching output

S+S REGELTECHNIK

Dimensional drawing

ACO₂-W
ALQ-CO₂-W



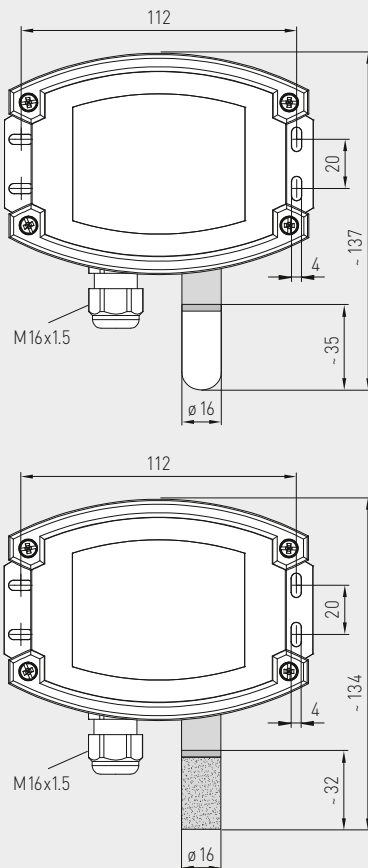
M12 connector
 (optional on request)

ACO₂-W
ALQ-CO₂-W



Dimensional drawing

AFTM-CO₂-W
AFTM-LQ-CO₂-W
ATM-CO₂-SD



SF-K
 plastic sinter filter
 (standard)



SF-M
 metal sinter filter
 (optional)



AFTM-CO₂-W
AFTM-LQ-CO₂-W
ATM-CO₂-SD
 with metal sinter filter
 (optional)





S+S REGELTECHNIK

AERASGARD® ACO₂-W / ALQ-CO₂-W AERASGARD® AFTM-(LQ)-CO₂-W / ATM-CO₂-SD

Multifunctional on-wall sensors and measuring transducers,
for humidity, temperature, CO₂ content and air quality (VOC),
calibratable, with active/switching output



WS-03

Weather and sun protection hood
(optional)



AFTM-CO₂-W AFTM-LQ-CO₂-W ATM-CO₂-SD

with plastic sinter filter
(standard)



AERASGARD® ATM-CO ₂ -SD	On-wall temperature and CO ₂ sensor, <i>Standard</i>
AERASGARD® ACO ₂ -W	On-wall CO ₂ sensor, <i>Premium</i>
AERASGARD® ALQ-CO ₂ -W	On-wall air quality (VOC) and CO ₂ sensor, <i>Premium</i>
AERASGARD® AFTM-CO ₂ -W	Multifunctional on-wall sensor for humidity, temperature and CO ₂ content, <i>Deluxe</i>
AERASGARD® AFTM-LQ-CO ₂ -W	Multifunctional on-wall sensor for humidity, temperature, CO ₂ content and air quality (VOC), <i>Deluxe</i>

Type / WG02	Measuring Range				Equipment	Item No.	Price
	Humidity	Temperature	CO ₂	VOC	Display	(Baldur 2)	
ATM-CO₂-SD			(switchable)				
ATM-CO2-SD-U	-	-35...+80 °C	0...2000 / 5000 ppm	-	-	1501-7112-1001-200	274,81 €
ACO₂-W			(switchable)				
ACO2-W (without display)	-	-	0...2000 / 5000 ppm	-	W	see ACO₂-W / ACO₂-SD	
ACO2-W LCD	-	-	0...2000 / 5000 ppm	-	W ■	1501-7110-7371-200	362,83 €
ALQ-CO₂-W			(switchable)				
ALQ-CO2-W	-	-	0...2000 / 5000 ppm	0...100 %	W	1501-7111-7301-200	426,56 €
ALQ-CO2-W-DISPLAY	-	-	0...2000 / 5000 ppm	0...100 %	W ■	1501-7111-7371-200	500,59 €
AFTM-CO₂-W			(switchable)				
AFTM-CO2-W	0...100 % r.H.	-35...+80 °C	0...2000 / 5000 ppm	-	W	1501-7116-7301-200	398,97 €
AFTM-CO2-W LCD	0...100 % r.H.	-35...+80 °C	0...2000 / 5000 ppm	-	W ■	1501-7116-7371-200	476,09 €
AFTM-LQ-CO₂-W			(switchable)				
AFTM-LQ-CO2-W	0...100 % r.H.	-35...+80 °C	0...2000 / 5000 ppm	0...100 %	W	1501-7118-7301-200	509,37 €
AFTM-LQ-CO2-W DISPLAY	0...100 % r.H.	-35...+80 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-7118-7371-200	609,74 €
Outputs:	0-10V or 4...20 mA (selectable via DIP switches, selected variant applies for all outputs) – <i>Standard</i> on-wall sensor ATM-CO₂-SD with fixed output 0-10V!						
Equipment:	W = changeover contact – <i>Standard</i> on-wall sensor ATM-CO₂-SD without changeover contact!						
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)						
Note:	This unit must not be used as safety-relevant device!						
ACCESSORIES							
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)					7000-0050-2200-100	37,32 €
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)					7100-0040-6000-000	39,45 €

For further information see last chapter!

Duct air quality sensors (VOC) and measuring transducers, including installation flange, self-calibrating, with multi-range switching and active/switching output

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AERASGARD® KLQ-SD** with active output, automatic calibration, in a compact plastic housing with snap-on lid, for determining the air quality (0...100% VOC). The measuring transducer converts the measured values into a standard signal of 0-10V.

Maintenance-free duct sensor **AERASGARD® KLQ-W** with active/switching output, automatic calibration, in a compact plastic housing with quick-locking screws, for determining the air quality (0...100% VOC). The measuring transducer converts the measured values into a standard signal of 0-10V or 4...20mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.



TECHNICAL DATA

Power supply:	24 V AC/DC (± 10%)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA
Sensor:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (via zero button), with automatic calibration (permanently active)
Measuring range:	0...100% air quality; referred to calibrating gas; multi-range switching (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0V = clean air, 10V = polluted air) KLQ-SD 0-10V (fixed) KLQ-W 0-10V or 4...20mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10% of the measuring range)
Relay output:	KLQ-SD without changeover contact KLQ-W with potential-free changeover contact (24V/1A), switchpoint adjustable
Measuring accuracy:	typically ± 20% of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions), depending on the type of loading and gas concentration
Gas exchange:	by diffusion
Warm-up time:	approx. 1 hour
Response time:	approx. 1 minute, minimum flow rate 0.3 m/s (air)
Ambient temperature:	-10...+60 °C
Electrical connection:	0.14 - 1.5 mm ² , via terminals
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe-reinforced, colour traffic white (similar to RAL 9016), KLQ-SD with snap-on lid, KLQ-W with quick-locking screws (slotted/Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1/Tyr 01 without display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm, v _{max} = 30 m/s (air)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	KLQ-SD IP54 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) KLQ-W IP65 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state (permeable PLEUROFORM: IP30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
ACCESSORIES	see last chapter

MFT-20-K
Mounting flange,
plastic





S+S REGELTECHNIK

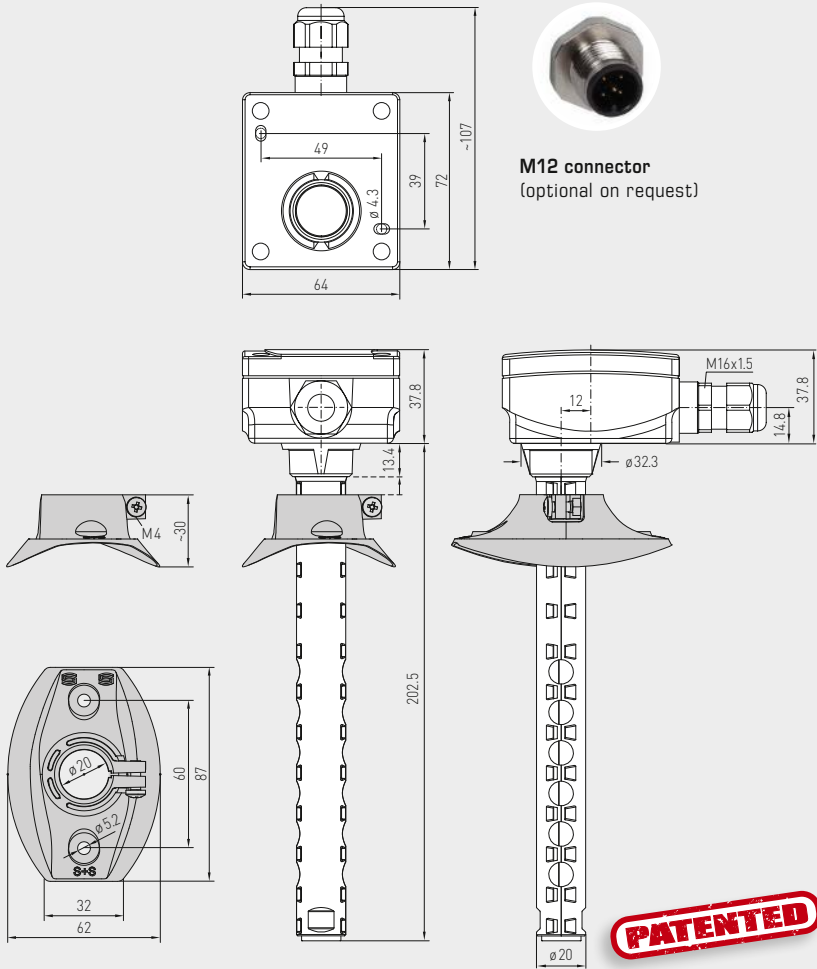
AERASGARD® KLQ-W
AERASGARD® KLQ-SD

Duct air quality sensors (VOC) and measuring transducers,
including installation flange, self-calibrating, with multi-range switching
and active/switching output



Dimensional drawing

KLQ-W
KLQ-SD



KLQ-SD
with snap-on lid
(IP54)

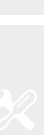
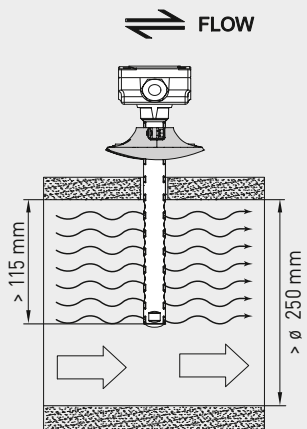


KLQ-W
with quick-locking
screws (IP65)

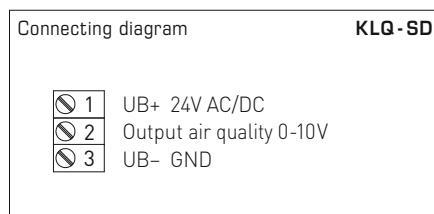
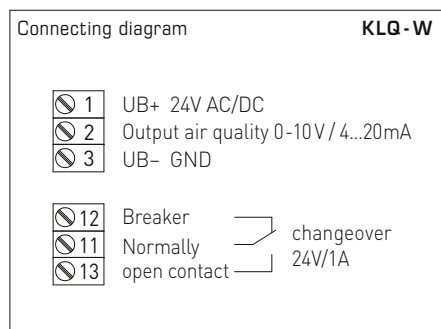
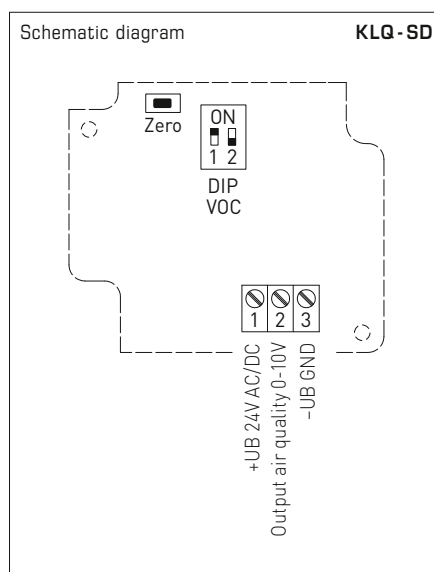
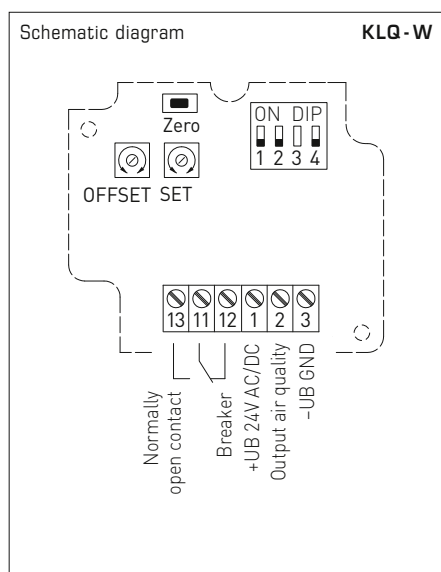


Mounting diagram

KLQ-W
KLQ-SD



Duct air quality sensors (VOC) and measuring transducers,
including installation flange, self-calibrating, with multi-range switching
and active/switching output



DIP switches		KLQ-W	
VOC sensitivity	DIP 1	DIP 2	
LOW	OFF	OFF	
MEDIUM (default)	ON	OFF	
HIGH	OFF	ON	
IAQ (Indoor Air Quality)	ON	ON	
Output		DIP 4	
Voltage 0-10V (default)		OFF	
Current 4...20mA		ON	

Note: **DIP 3** is not assigned!

DIP switches		KLQ-SD	
VOC sensitivity	DIP 1	DIP 2	
LOW	OFF	OFF	
MEDIUM (default)	ON	OFF	
HIGH	OFF	ON	
IAQ (Indoor Air Quality)	ON	ON	

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19%
2	good prompt airing recommended	20...39%
3	moderate airing recommended	40...59%
4	poor increased airing required	60...79%
5	unhealthy intense airing necessary	80...100%

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 2007, 50: 990–1005)



AERASGARD® KLQ-SD Duct air quality sensor and measuring transducer, <i>Standard</i>					
AERASGARD® KLQ-W Duct air quality sensor and measuring transducer, <i>Premium</i>					
Type / WG02	Measuring Range VOC	Output VOC	Equipment	Item No.	Price
KLQ-SD		(fixed)		IP 54	
KLQ-SD-U	0...100 %	0-10 V	–	1501-3170-1001-200	193,73 €
KLQ-W		(switchable)		IP 65	
KLQ-W	0...100 %	0-10 V / 4...20 mA	changeover contact	1501-3150-7301-200	201,78 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)				
Note:	This unit must not be used as safety-relevant device!				

**Duct CO₂ sensors and measuring transducers,
incl. mounting flange, self-calibrating, with multi-range switching
and active / switching output**

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AERASGARD® KCO₂-SD** with active output, automatic calibration (fixed), in a compact plastic enclosure with snap-on lid, for determining the CO₂ content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AERASGARD® KCO₂-W** with active/switching output, automatic calibration (can be deactivated), in a compact plastic enclosure with quick-locking screws, optionally with/without display, for determining the CO₂ content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The CO₂ measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

For more information, see the start of the chapter.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; Peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), KCO₂-SD with automatic calibration (fixed) KCO₂-W with automatic calibration (can be deactivated via DIP switches)
Measuring range:	Multi-range switching (selectable via DIP switches) 0...2000 ppm; 0...5000 ppm
Output:	KCO₂-SD 0-10 V (fixed) KCO₂-W 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	KCO₂-SD without changeover contact KCO₂-W with potential-free changeover contact (24 V / 1 A), switchpoint adjustable
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Ambient temperature:	-10...+60 °C
Response time:	approx. 1 minute, minimum flow rate 0.3 m/s (air)
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! KCO₂-SD with snap-on lid, KCO₂-W with quick-locking screws (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1/Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm, v _{max} = 30 m/s (air)
Process connection:	via flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	KCO₂-SD IP 54 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) KCO₂-W IP 65 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	Display with illumination , two line, cutout approx. 36x15 mm (W x H), for displaying the Actual CO₂ content and for setting the switchpoint
ACCESSORIES	See last chapter

MFT-20-K
Mounting flange,
plastic

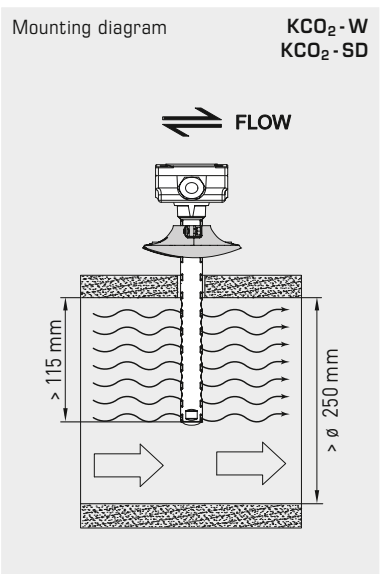
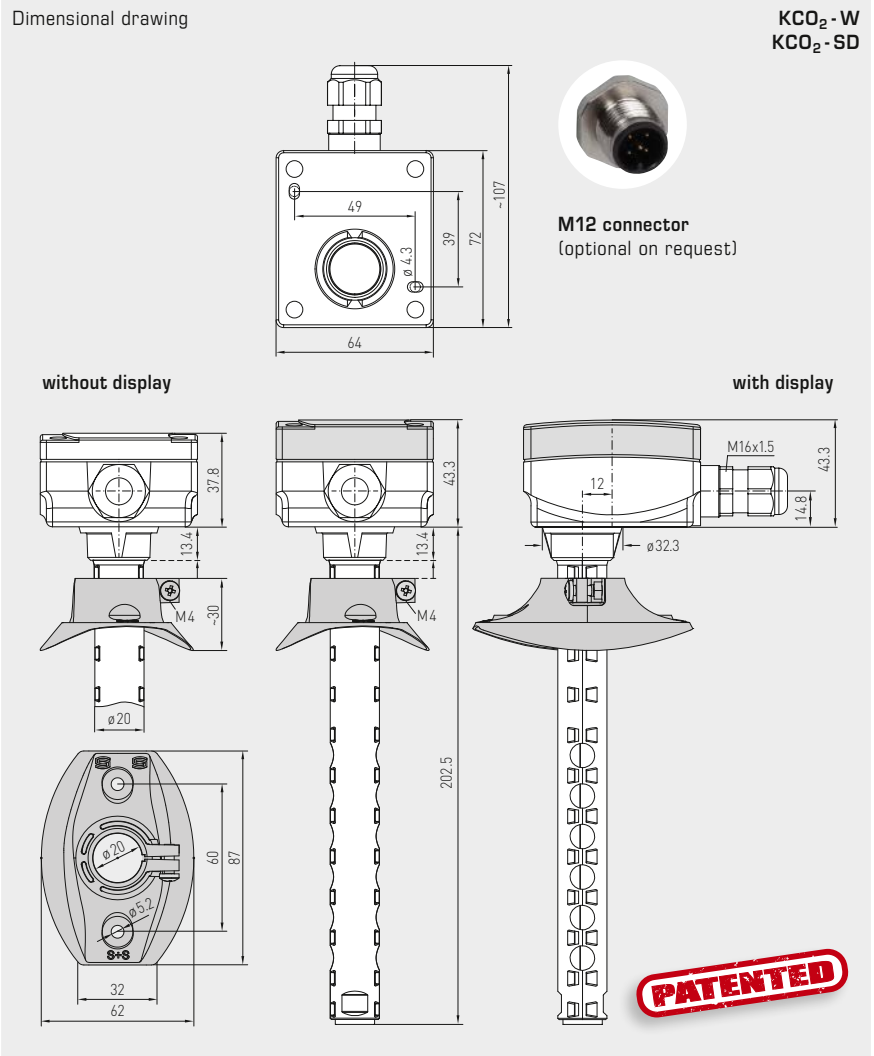




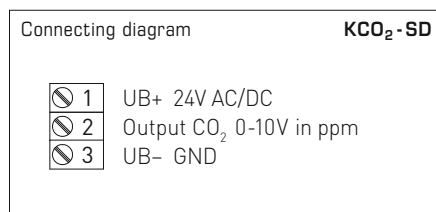
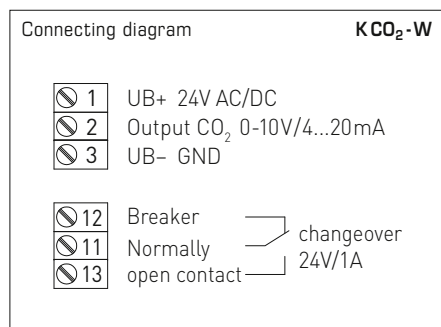
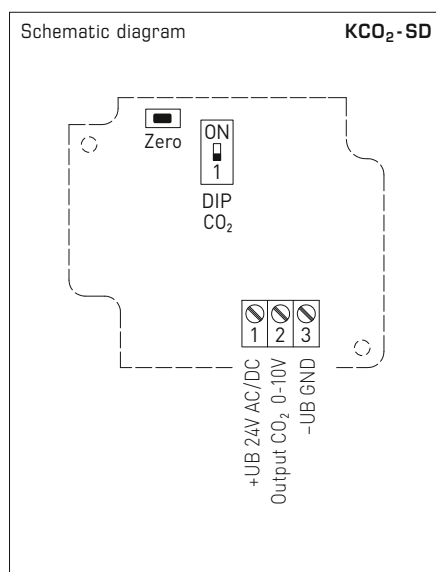
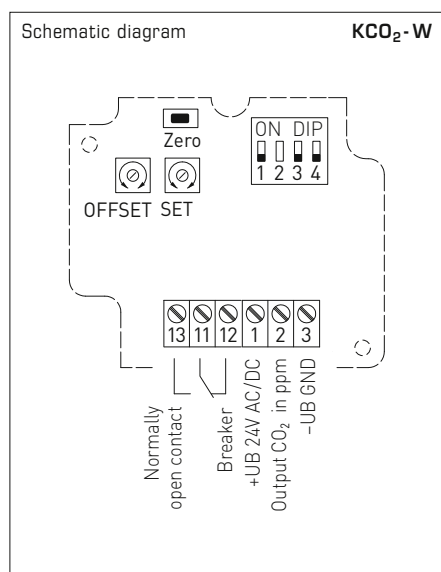
S+S REGELTECHNIK

AERASGARD® KCO₂-W
AERASGARD® KCO₂-SD

Duct CO₂ sensors and measuring transducers,
incl. mounting flange, self-calibrating, with multi-range switching
and active / switching output



Duct CO₂ sensors and measuring transducers,
incl. mounting flange, self-calibrating, with multi-range switching
and active / switching output

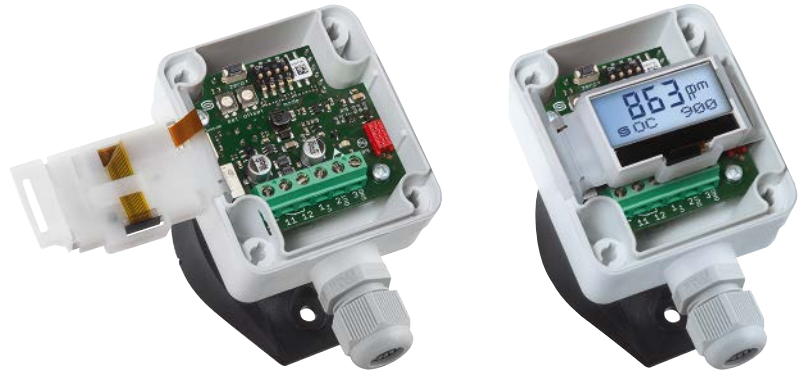


DIP switch KCO₂-W	
CO₂ content	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON
CO₂ automatic zero point	DIP 3
deactivated	OFF
activated (default)	ON
Output	DIP 4
Voltage 0-10V (default)	OFF
Current 4...20 mA	ON
Note: DIP 2 is not assigned!	

DIP switch KCO₂-SD	
CO₂ content	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON



KCO₂-W
with Display



AERASGARD® KCO₂-SD Duct CO₂ sensors and measuring transducers, *Standard*
AERASGARD® KCO₂-W Duct CO₂ sensors and measuring transducers, *Premium*

Type / WG02	Measuring Range CO ₂	Output CO ₂	Equipment	Display	Item No.	Price
KCO₂-SD	(switchable)	(fixed)			IP 54	
KCO2-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	-		1501-3160-1001-200	211,03 €
KCO₂-W	(switchable)	(switchable)			IP 65	
KCO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-3140-7301-200	256,41 €
KCO2-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■	1501-3140-7321-200	300,66 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)					
Note:	This unit must not be used as safety-relevant device!					



AERASGARD® KLQ-CO₂-W

AERASGARD® KFTM-(LQ)-CO₂-W / KTM-CO₂-SD



S+S REGELTECHNIK

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO₂ content and air quality (VOC), calibratable, with active/switching output

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AERASGARD® KTM-CO₂-SD** with active output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, for determining the CO₂ content of the air (0...2000 ppm/0...5000 ppm) and the temperature (-35...+80 °C). The measuring transducer converts the measured values into a standard signal of 0-10V.

Maintenance-free duct sensor **AERASGARD® KFTM-LQ-CO₂-W** with active/switching output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, optionally with/without Display, for determining the CO₂ content of the air (0...2000 ppm/0...5000 ppm), the quality (0...100 % VOC), the temperature (-35...+80 °C) as well as the relative air humidity (0...100 % r.H.). The measuring transducer converts the measured values into a standard signal of 0-10V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO₂ measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10%)
Power consumption:	< 4.8 W / 24V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Outputs:	KTM-CO₂-SD 0-10V (fixed) Kxx-CO₂-W 0-10V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10% of the measuring range)
Relay output:	KTM-CO₂-SD without changeover contact Kxx-CO₂-W with potential-free changeover contact (24V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)

HUMIDITY

Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% r. H.
Operating range, humidity:	0...95% r. H. (without dew formation)
Deviation of humidity:	typically ± 2.0% (20...80% r. H.) at +25 °C, otherwise ± 3.0%
Output, humidity:	0-10 V or 4...20 mA (selectable via DIP switches)

TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Temperature deviation:	typically ± 0.2 K at +25 °C
Output, temperature:	KTM-CO₂-SD 0-10V (fixed) Kxx-CO₂-W 0-10V or 4...20 mA (selectable via DIP switches)

AIR QUALITY (VOC)

Sensor, VOC:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (using zero button) and automatic calibration (permanently active)
Measuring range, VOC:	0...100% air quality; referred to calibrating gas; multi-range switching (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output, VOC:	0-10 V (0V = clean air, 10 V = polluted air) or 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100% of the output signal)
Measuring accuracy, VOC:	typically ± 20% of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions) depending on the type of loading and gas concentration

CARBON DIOXIDE (CO₂)

Sensor, CO ₂ :	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), KTM-CO₂-SD with automatic calibration (fixed) Kxx-CO₂-W with automatic calibration (can be deactivated via DIP switches)
Measuring range, CO ₂ :	0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output, CO ₂ :	KTM-CO₂-SD 0-10V (fixed) Kxx-CO₂-W 0-10V or 4...20 mA (selectable via DIP switches)
Measuring accuracy, CO ₂ :	typically ± 30 ppm ± 3% of measured value
Temperature dependence, CO ₂ :	± 5 ppm / °C or ± 0.5% of measured value / °C (whichever is higher)

continued on next page!

SF-K
Plastic sinter filter (standard)



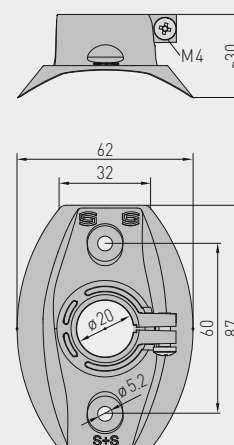
SF-M
Metal sinter filter (optional)



MFT-20-K
Mounting flange, plastic



Dimensional drawing **MFT-20-K**

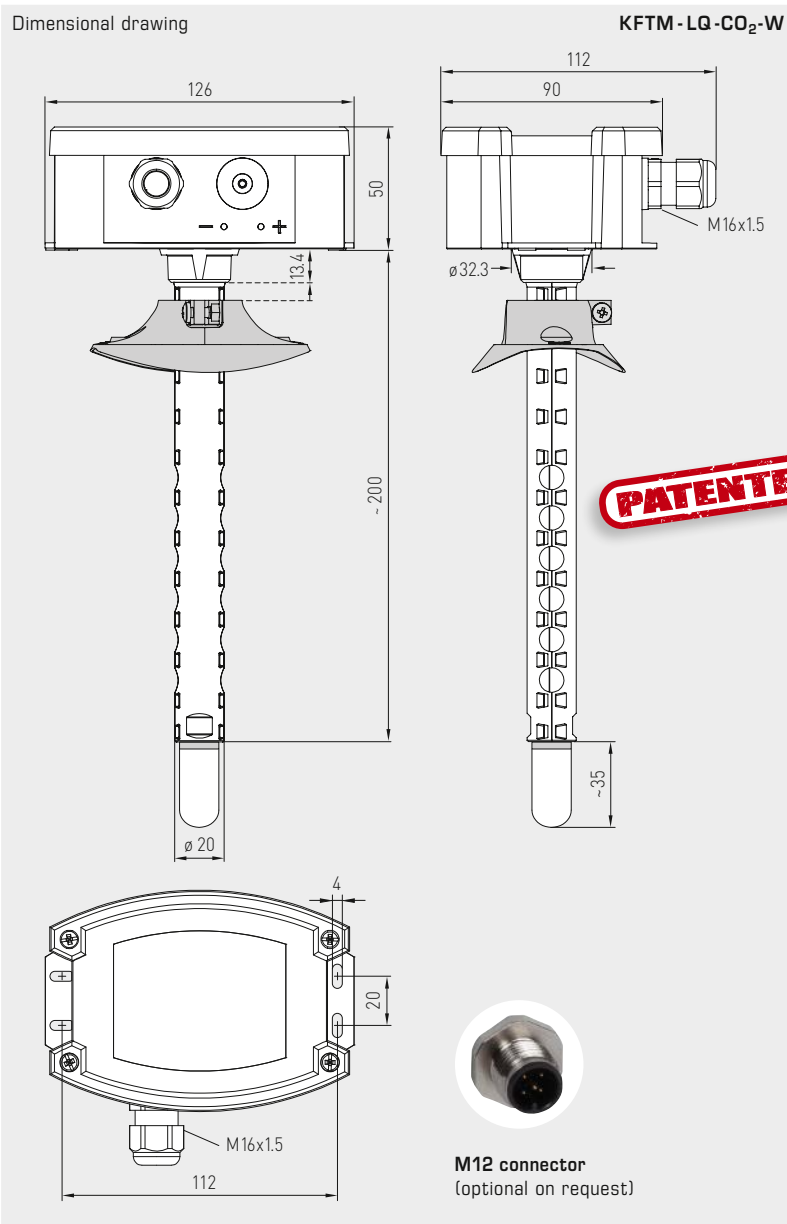




S+S REGELTECHNIK

AERASGARD® KLM-CO₂-W / KTM-CO₂-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO₂ content and air quality (VOC), calibratable, with active/switching output



TECHNICAL DATA		(continued)
Pressure dependence:	± 0.13 % / mm Hg	
Long-term stability:	< 2% in 15 years	
Gas exchange:	by diffusion	
Ambient temperature:	-10...+60 °C	
Response time:	< 2 minutes, minimum flow rate 0.3 m/s (air)	
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals	
Housing:	plastic, UV-resistant, material polyamide (PA6), with torsion protection, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!	
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)	
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)	
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, v _{max} = 30 m/s (air) without filter: NL = 202.5 mm / with plastic filter: NL = 235 mm (optional with metal filter: NL = 227 mm)	
Process connection:	via flange made of plastic (included in scope of delivery)	
Protection class:	III (according to EN 60 730)	
Protection type:	IP 65 (according to EN 60 529) Housing in the built-in state (permeable PLEUROFORM: IP 30)	
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014/30/EU	
Optional:	three-line display with illumination , cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and/or the actual CO ₂ content	

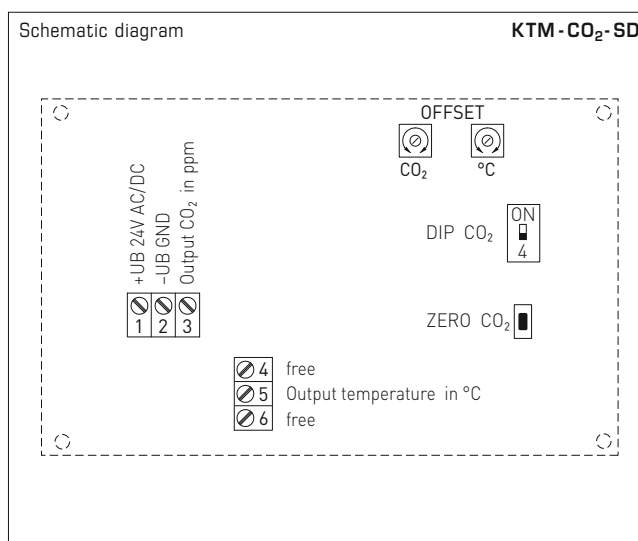
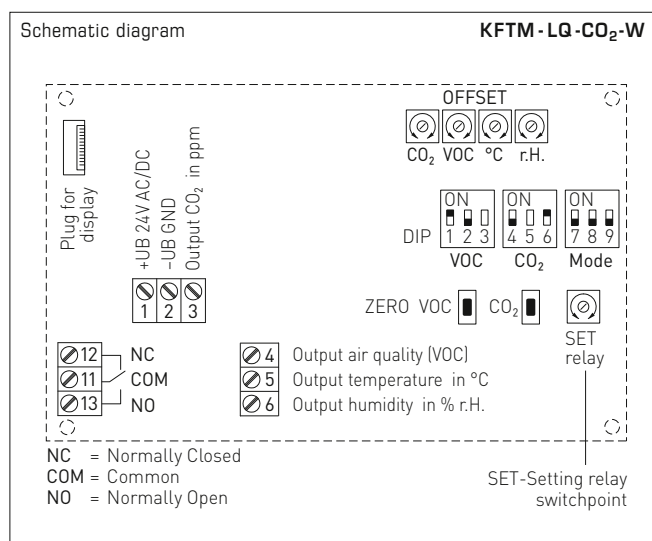


AERASGARD® KLQ-CO₂-W AERASGARD® KFTM-(LQ)-CO₂-W / KTM-CO₂-SD



Multifunctional duct sensors and measuring transducers incl. mounting flange,
for humidity, temperature, CO₂ content and air quality (VOC),
calibratable, with active/switching output

S+S REGELTECHNIK



DIP switches		KFTM-LQ-CO ₂ -W	
VOC sensitivity		DIP 1	DIP 2
LOW		OFF	OFF
MEDIUM (default)		ON	OFF
HIGH		OFF	ON
IAQ (Indoor Air Quality)		ON	ON
CO₂ content		DIP 4	
0...2000 ppm (default)		OFF	
0...5000 ppm		ON	
CO₂ automatic zero point		DIP 6	
deactivated		OFF	
activated (default)		ON	
Relay assignment		DIP 7	DIP 8
CO ₂ (default): 600...1900 ppm / 900...4700 ppm		OFF	OFF
VOC: 10...95%		ON	OFF
Temperature: -23...+74 °C		OFF	ON
Humidity: 10...95% r.H.		ON	ON
Output		DIP 9	
Voltage 0-10V (default)		OFF	
Current 4...20 mA		ON	
Note: DIP 3 and DIP 5 are not assigned!			

DIP switches		KTM-CO ₂ -SD	
CO₂ content		DIP 4	
0...2000 ppm (default)		OFF	
0...5000 ppm		ON	

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19%
2	good prompt airing recommended	20...39%
3	moderate airing recommended	40...59%
4	poor increased airing required	60...79%
5	unhealthy intense airing necessary	80...100%

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990-1005)



S+S REGELTECHNIK

AERASGARD® KLM-CO₂-W AERASGARD® KFTM-(LQ)-CO₂-W / KTM-CO₂-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO₂ content and air quality (VOC), calibratable, with active/switching output

KLQ-CO₂-W
KFTM-LQ-CO₂-W
with display



Humidity table

MR: 0...100% r. H.

% r.H.	U _A in V	I _A in mA	% r.H.	U _A in V	I _A in mA
0	0	4.0	60	6.0	13.6
5	0.5	4.8	65	6.5	14.4
10	1.0	5.6	70	7.0	15.2
15	1.5	6.4	75	7.5	16.0
20	2.0	7.2	80	8.0	16.8
25	2.5	8.0	85	8.5	17.6
30	3.0	8.8	90	9.0	18.4
35	3.5	9.6	95	9.5	19.2
40	4.0	10.4	100	10.0	20.0
45	4.5	11.2			
50	5.0	12.0			
55	5.5	12.8			

Continued at the right ...

Temperature table

MR: -35...+80 °C

°C	U _A in V	I _A in mA	°C	U _A in V	I _A in mA
-35	0.0	4.0	+25	5.2	12.3
-30	0.4	4.7	+30	5.7	13.0
-25	0.9	5.4	+35	6.1	13.7
-20	1.3	6.1	+40	6.5	14.4
-15	1.7	6.8	+45	7.0	15.1
-10	2.2	7.5	+50	7.4	15.8
-5	2.6	8.2	+55	7.8	16.5
0	3.0	8.9	+60	8.3	17.2
+5	3.5	9.6	+65	8.7	17.9
+10	3.9	10.3	+70	9.1	18.6
+15	4.3	11.0	+75	9.6	19.3
+20	4.8	11.7	+80	10.0	20.0

Continued at the right ...

AERASGARD® KLQ-CO₂-W
AERASGARD® KFTM-(LQ)-CO₂-W / KTM-CO₂-SD



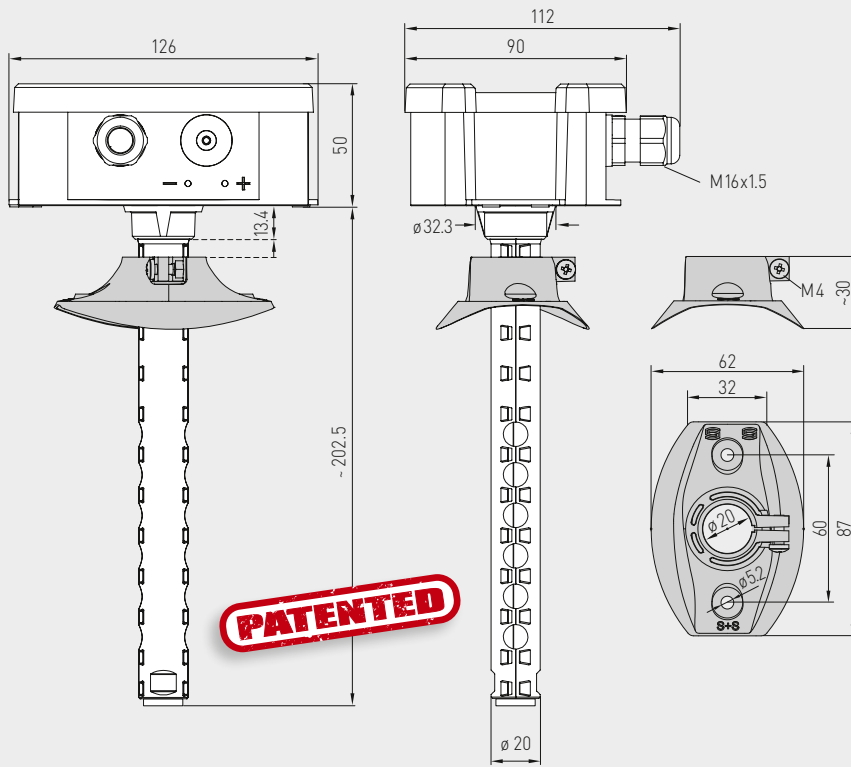
Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO₂ content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Dimensional drawing

KLQ-CO₂-W

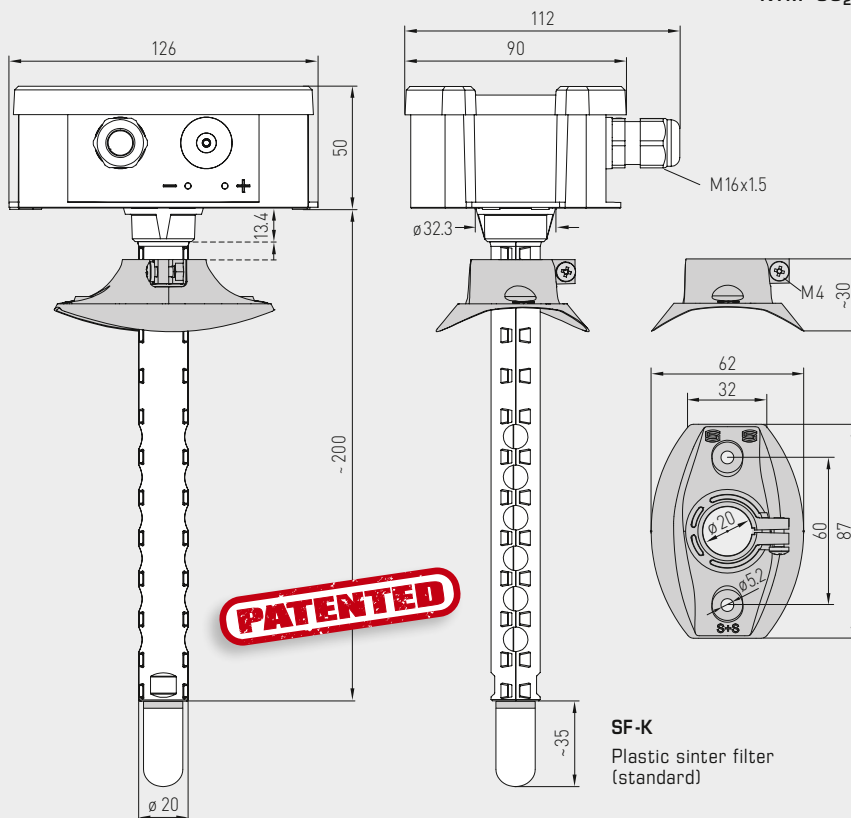
KLQ-CO₂-W



Dimensional drawing

KFTM-CO₂-W
KFTM-LQ-CO₂-W
KTM-CO₂-SD

KFTM-CO₂-W
KFTM-LQ-CO₂-W
KTM-CO₂-SD



SF-M
Metal sinter filter
(optional)



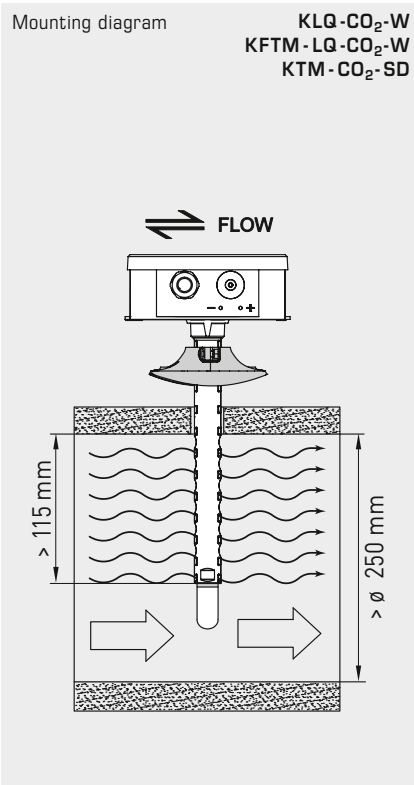
SF-K
Plastic sinter filter
(standard)



S+S REGELTECHNIK

AERASGARD® KLQ-CO₂-W AERASGARD® KFTM-(LQ)-CO₂-W / KTM-CO₂-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO₂ content and air quality (VOC), calibratable, with active/switching output



AERASGARD® KTM-CO ₂ -SD	Duct sensor for temperature and CO ₂ content, <i>Standard</i>
AERASGARD® KLQ-CO ₂ -W	Duct sensor for air quality (VOC) and CO ₂ content, <i>Premium</i>
AERASGARD® KFTM-CO ₂ -W	Multifunctional duct sensor for humidity, temperature and CO ₂ content, <i>Deluxe</i>
AERASGARD® KFTM-LQ-CO ₂ -W	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO ₂ content, <i>Deluxe</i>

Type / WG02	Measuring Range	Humidity	Temperature	CO ₂	VOC	Equipment Display	Item No.	Price
KTM-CO₂-SD				(switchable)				
KTM-CO2-SD-U	-	-	-35...+80 °C	0...2000 / 5000 ppm	-	-	1501-8112-1001-200	268,95 €
KLQ-CO₂-W				(switchable)				
KLQ-CO2-W	-	-	-	0...2000 / 5000 ppm	0...100%	W	1501-8111-7301-500	344,23 €
KLQ-CO2-W LCD	-	-	-	0...2000 / 5000 ppm	0...100%	W ■	1501-8111-7371-500	396,25 €
KFTM-CO₂-W				(switchable)				
KFTM-CO2-W	0...100% r.H.	-	-35...+80 °C	0...2000 / 5000 ppm	-	W	1501-8116-7301-200	328,92 €
KFTM-CO2-W LCD	0...100% r.H.	-	-35...+80 °C	0...2000 / 5000 ppm	-	W ■	1501-8116-7371-200	360,54 €
KFTM-LQ-CO₂-W				(switchable)				
KFTM-LQ-CO2-W	0...100% r.H.	-	-35...+80 °C	0...2000 / 5000 ppm	0...100%	W	1501-8118-7301-500	412,56 €
KFTM-LQ-CO2-W LCD	0...100% r.H.	-	-35...+80 °C	0...2000 / 5000 ppm	0...100%	W ■	1501-8118-7371-500	464,58 €
Outputs:	0-10V or 4...20 mA (selectable via DIP switches, selected variant applies for all outputs) – Standard duct sensor KTM-CO₂-SD with fixed output 0-10V!							
Equipment:	W = changeover contact – Standard duct sensor KTM-CO₂-SD without changeover contact!							
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)							
Note:	This unit must not be used as safety-relevant device!							

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	37,32 €

Duct airflow monitors,
including mounting flange, electronic, one-step and two-step,
with active/switching output

Electronic duct air flow sensor **RHEASGARD® KLGf** with active output, in an impact-resistant plastic housing, optionally with/without display, for determining the flow velocity in m/s. The measuring transducer converts the measurement signal into a standard signal of 0 - 10 V.

Electronic duct air flow monitor **RHEASREG® KLSW** with switching output (relay one-step or two-step), in a plastic housing, for determining the flow velocity in m/s. Fine adjustment of the measuring range end value by the user is possible with the help of a potentiometer.

The flow sensors are suitable for monitoring or controlling airflows in ducts, at ventilators and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, part 420, or for use in connection with DDC systems.

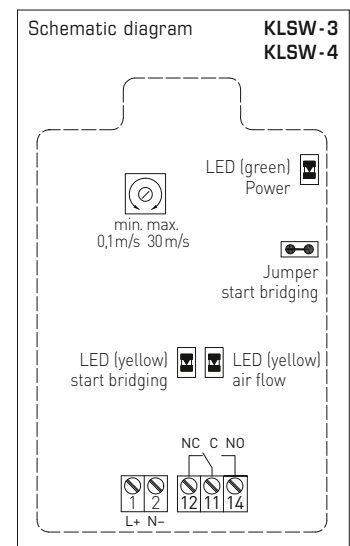
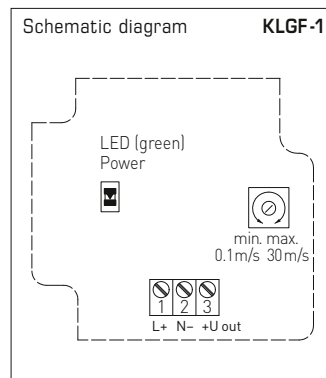
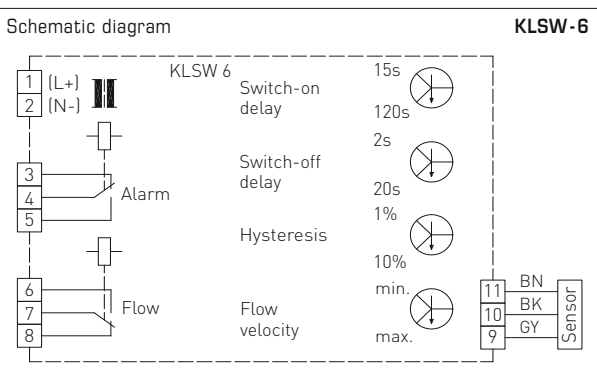
TECHNICAL DATA

Power supply:	24 V AC / DC or 230V AC +5/-13%, 50...60 Hz	
Output:	1 or 2 potential-free relays (changeover contacts), 8 A, max. 2 kW or 0 - 10V (relative, linearised on request), see table	
Current consumption:	approx. 3VA	
	KLGf-1, KLSW-3, KLSW-4	KLSW-6
Measuring range:	0.1...30 m/s	0.1...15 m/s
Sensitivity:	0.1...30 m/s (adjustable)	0.1...15 m/s (adjustable)
Switching hysteresis:	2% (permanently set)	approx. 1...10% (adjustable)
Start bridging:	-	approx. 15...120 s (adjustable)
Switch-off delay:	-	approx. 2...20 s (adjustable)
Connection cable:	max. 50 m at minimum cross section 1.5 mm ² per conductor; avoid laying parallel with mains voltage-carrying lines, or use shielded cables, apply cable screen one-sided	
Ambient temperature:	0...+60 °C at the device; 0...+80 °C medium	
Medium:	pollutant-free, non-precipitating air	
Sensor:	sensor breakage protection, temperature-compensated	
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)	
	KLSW-xx, KLGf-1 with display: 108 x 70 x 73.5 mm (Thor 2)	
	KLGf-1 without display: 72 x 64 x 37.8 mm (Tyr 1), with quick-locking screws (slotted/Phillips head combination)	
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm)	
Protective tube:	metal (brass, nickel-plated), Ø 10 mm, nominal length NL = 140 mm	
Process connection:	by mounting flange (included in the scope of delivery)	
Electrical connection:	0.25 - 2.5 mm ² , via screw terminals	
Protection class:	II (according to EN 60 730) at KLSW 3 (UB = 230 V AC) III (according to EN 60 730) at UB = 24 V	
Protection type:	IP 65 (according to EN 60 529)	
Standards:	CE conformity, EMC directive 2014/30/EU, low-voltage directive 2014/35/EU	

KLSW-xx



KLGf-1 with display



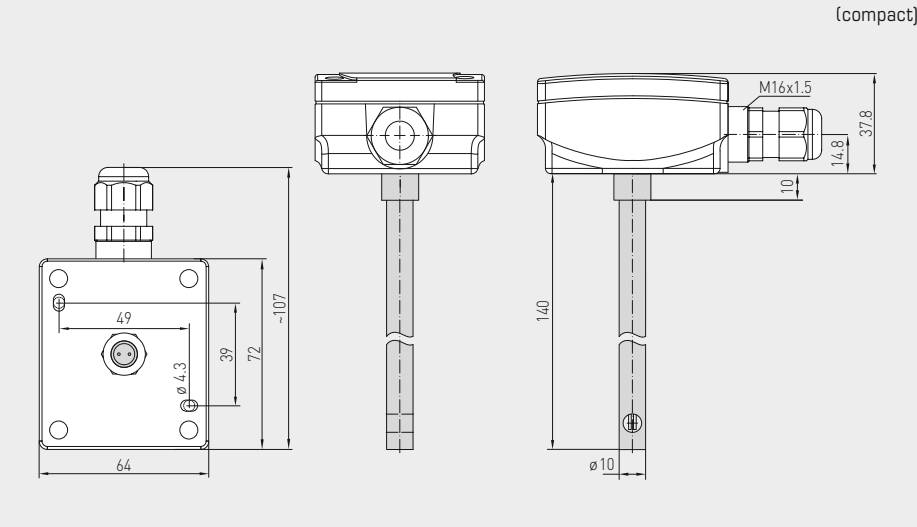


S+S REGELTECHNIK

RHEASGARD® KLGf
RHEASREG® KLSW

Duct airflow monitors,
including mounting flange, electronic, one-step and two-step,
with active/switching output

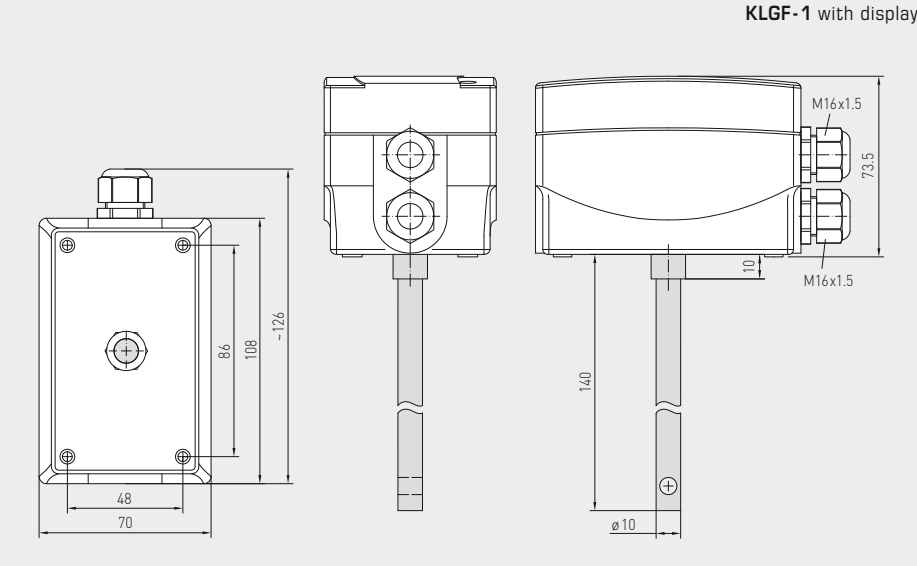
Dimensional drawing



KLGf-1
without display
(compact)

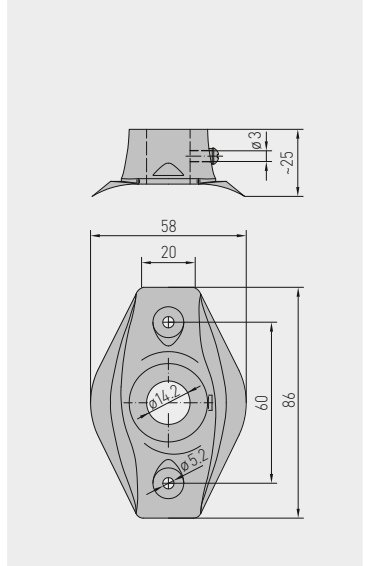


Dimensional drawing



KLSW-xx
KLGf-1 with display

Dimensional drawing



MF-14-K

RHEASGARD® KLGf Duct airflow monitors
RHEASREG® KLSW Duct airflow monitors, one-step and two-step

Type / WG01	Relay (Steps)	Power-Supply	Output	Display	Item No.	Price
KLGf						
KLGf 1	–	24 V AC / DC	0-10 V (relative)		1701-3120-1000-000	243,61 €
KLGf 1_Display	–	24 V DC	0-10 V (linearised)	■	on request	
KLSW one-step						
KLSW 3	1	230 V AC	1 x Changeover contact		1701-3011-0001-000	180,73 €
KLSW 4	1	24 V AC / DC	1 x Changeover contact		1701-3021-0000-000	180,73 €
KLSW two-step						
KLSW 6	2	24 V AC / DC	2 x Changeover contact		1701-3022-0000-000	227,89 €
Note:	KLSW 6 is supplied as standard with a manual reset button! Automatic reset (without reset button)					on request
ACCESSORIES				Tube Gland		
MF-14-K	Mounting flange , plastic (included in the scope of delivery)			Ø 14.2 mm	7100-0030-2000-000	8,43 €
MF-10-K	Mounting flange , plastic			Ø 10.2 mm	7100-0031-1000-000	8,43 €
For further information see last chapter!						

**Vane switch, mechanical, with paddle,
with switching output**

WFS

Mechanical wind vane switch **RHEASREG® WFS** with switching output, in an impact-resistant plastic housing, with stainless-steel paddle, for flow monitoring of gaseous, non-aggressive media.

The flow sensor is used as a flow controller or air flow monitor in air conditioning ducts, in air intake or exhaust devices of ventilators or electric heating registers (also for contaminated, oily air).

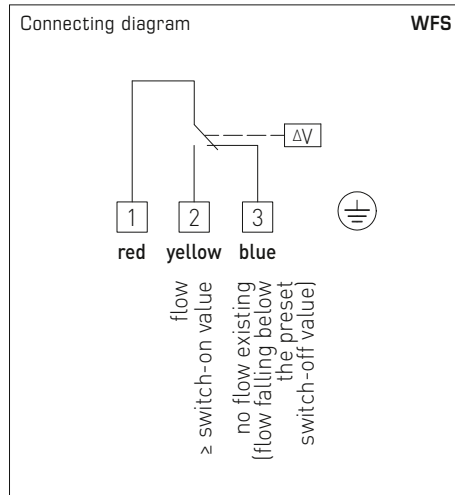


TECHNICAL DATA

Switching capacity: (Contact load)	15 (8) A; 24...250 V AC at 24 V AC min. 150 mA
Contact:	dustproof microswitch as single-pole, potential-free changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Base body:	galvanised steel
Moving arm:	brass
Vane:	stainless steel V2A (1.4301)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Housing temperature:	-40...+85 °C
Operating difference:	≥ 1 m/s
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

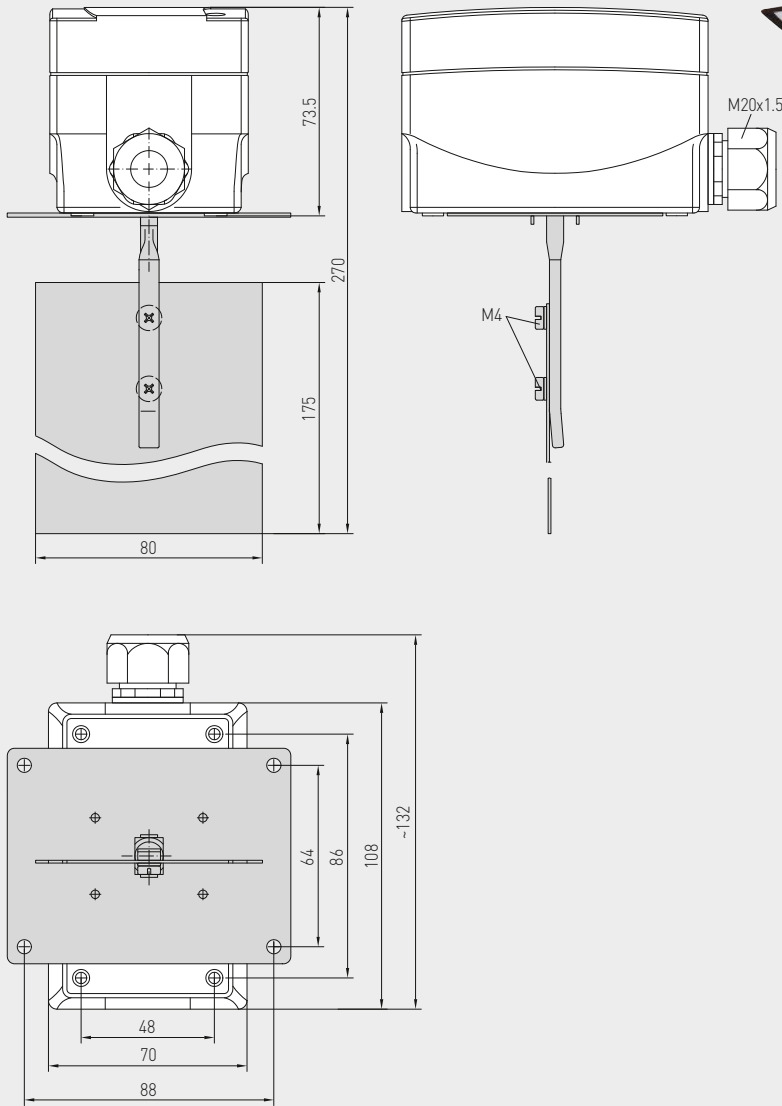
Monitor:	Contact 1 - 3 breaks when flow rate drops to the preset value. Simultaneously, contact 1 - 2 closes and can be used as signal contact. Device is factory-set to the minimum switch-off value, which can be increased by turning the range adjusting screw clockwise.
Installation:	vertical in horizontal air ducts. Min. smoothing distance = 5 x duct diameter upstream and downstream of vane. For airspeeds > 5 m/s, vane is to be trimmed at the marked spots. Thereby the minimum switch-off value increases to approx. 2.5 m/s and the minimum switch-on value to approx. 4 m/s.



Dimensional drawing

WFS

WFS



RHEASREG® WFS Vane switch, mechanical, with paddle

Type / WG01	Switch-on value		Switch-off value		Item No.	Price
	min.	max.	min.	max.		
WFS						
WFS-1E	2.5 m/s	9.2 m/s	1 m/s	8 m/s	1702-3020-0000-000	71,09 €
Spare part						
PWFS-08	Spare paddle for WFS (Stainless steel vane)				7700-0010-2000-000	16,41 €

Flow monitors, mechanical, with paddle, with switching output

Mechanical paddle flow monitor **RHEASREG® SW** with switching output, in an impact-resistant plastic housing, with stainless-steel paddle, for flow monitoring of liquid and gaseous, non-aggressive media in pipes, hydraulic systems of 3/4" through 1/2" to 8" diameter.

The flow sensor is used as a flow controller or low water alarm, e.g. for pumps in oil and cooling circuits, cooling systems, evaporators, compressors and heat exchangers, with brass or stainless-steel bodies.

SW

TECHNICAL DATA

Switching capacity:	15 (8) A; 24...250 V AC, at 24 V AC min. 150mA
Contact:	dustproof microswitch as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor2)
Base body:	galvanised steel
Screwed socket:	brass or stainless steel (see table)
Paddle:	stainless steel V4A (1.4401)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Housing temperature:	-40...+85 °C
Max. temperature of medium:	+120 °C
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014/30/EU, low-voltage directive 2014/35/EU

FUNCTION

Monitor:	Contact COM-NO (red - yellow) breaks when flow rate drops to the preset value. Simultaneously, contact COM-NC (red - blue) closes and can be used as signal contact. Device is factory-set to the minimum switch-off value, which can be increased by turning the range adjusting screw clockwise.
Installation:	vertical in horizontal pipes, tee R x" according to DIN 2950, min. smoothing distance = 5 x pipe diameter upstream and downstream of paddle

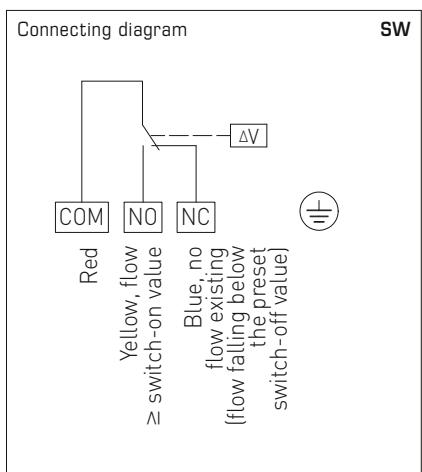
Table of switching values

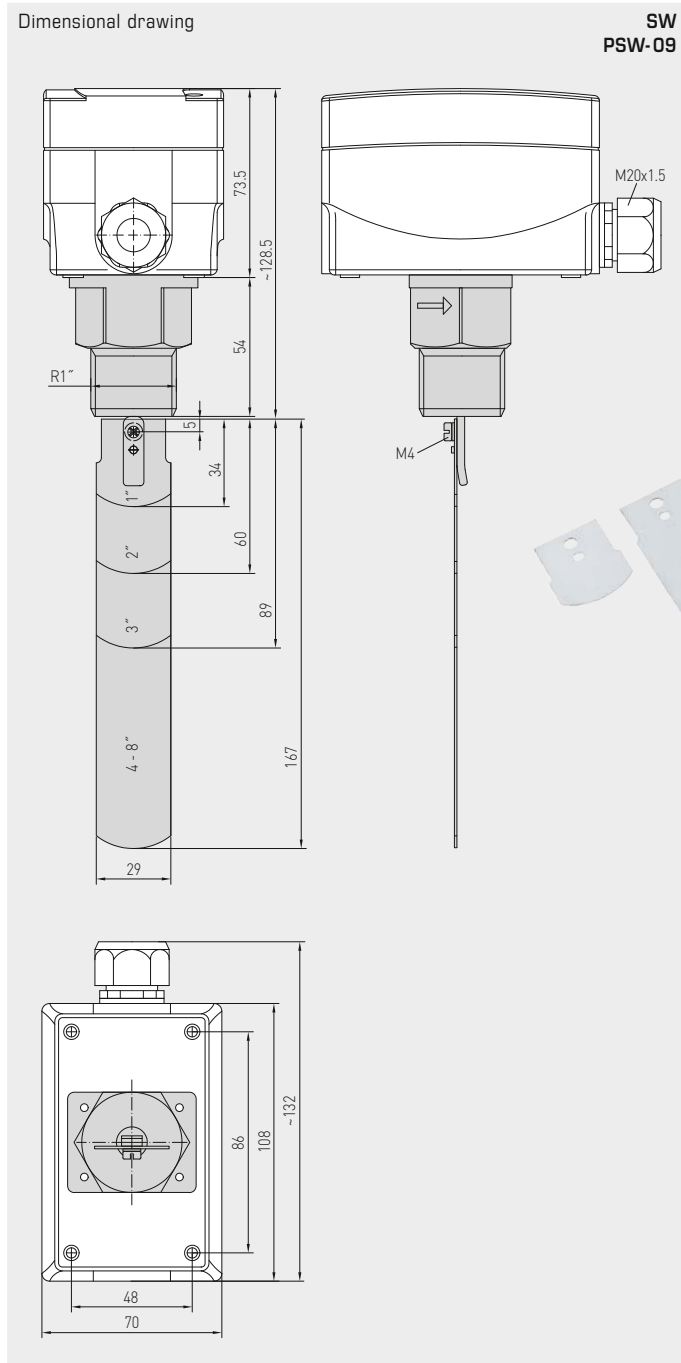
Pipe Ø DN in inches	Factory Setting OFF / ON (m ³ /h)	Max. Setting OFF / ON (m ³ /h)
SW-1 / SW-2		
1"	0.6 / 1.0	2.0 / 2.1
1 1/4"	0.8 / 1.3	2.8 / 3.0
1 1/2"	1.1 / 1.7	3.7 / 4.0
2"	2.2 / 3.1	5.7 / 6.1
2 1/2"	2.7 / 4.0	6.5 / 7.0
3"	4.3 / 6.2	10.7 / 11.4
4"	11.4 / 14.7	27.7 / 29.0
4" Z	6.1 / 8.0	17.3 / 18.4
5"	22.9 / 28.4	53.3 / 55.6
5" Z	9.3 / 12.9	25.2 / 26.8
6"	35.9 / 43.1	81.7 / 85.1
6" Z	12.3 / 16.8	30.6 / 32.7
8"	72.6 / 85.1	165.7 / 172.5
8" Z	38.6 / 46.5	90.8 / 94.2
SW-3 / SW-4		
1/2"	0.174 / 0.48	0.846 / 0.948
3/4"	0.138 / 0.408	0.768 / 0.858



**SW-3E
SW-4E**

Incl. attached Tee Fitting according to DIN 2950





PSW-09
Set of stainless steel
paddles (Spare part)

Pipe diameters with paddle combinations

Pipe Ø DN	in inches	in mm	Paddle combination PSW-09
1/2"		15 mm	1
3/4"		20 mm	1
1"		25 mm	1
1 1/4"		32 mm	1
1 1/2"		40 mm	1
2"		50 mm	1, 2
2 1/2"		65 mm	1, 2
3"		80 mm	1, 2, 3
4" Z		100 mm	1, 2, 3 plus 4 (shorten to 92 mm)
5" Z		125 mm	1, 2, 3 plus 4 (shorten to 117 mm)
6" Z		150 mm	1, 2, 3 plus 4 (shorten to 143 mm)
7 - 8" Z		200 mm	1, 2, 3 plus 4 (unshortened)

RHEASREG® SW Flow monitors, mechanical, with paddle								
Type/ WG01	Pipe Ø DN	Max. Operating Pressure PN max	Medium	(Contacting Parts Made of)	Incl. attached Tee Fitting according to DIN 2950	Item No.	Price	
SW								
SW-1E	1" - 8"	11 bar	normal	(brass)	–	1702-3011-0000-000	102,46 €	
SW-2E	1" - 8"	30 bar	aggressive	(stainless steel V4A)	–	1702-3012-0101-000	324,11 €	
SW-3E	1/2"	11 bar	normal	(brass)		1702-3013-0031-000	188,75 €	
SW-4E	3/4"	11 bar	normal	(brass)		1702-3014-0041-000	188,75 €	
Spare part								
PSW-09	Set of stainless steel paddles 1-8" (4 pieces)						7700-0010-1000-000	16,94 €
Note: Z = Fourth paddle included in the scope of delivery to be used in addition to the three paddles already factory-mounted (1, 2, 3 plus 4)!								



Radio Sensors

KYMASGARD®, the radio transmission range of our product lines, helps you achieve significant savings. Without additional energy costs, these devices minimize your wiring needs and provide cost savings even at the very installation level.

KYMASGARD® combines appealing aesthetics with a host of application possibilities. A thoroughly clever solution!

APPLICATION RANGE

- > Reconstruction of facilities
- > Modernization and extension of offices, hotels and residential buildings
- > Listed, historical and sacred buildings under monumental protection
- > Schools, museums and hospitals
- > Industrial buildings and administration centers



KYMASGARD®

574 – 601

EnOcean radio transmitter KYMASGARD® 9000

RFTM-xx-FSE	Multifunctional room radio sensor for humidity, temperature, air quality (VOC), and motion/presence	581
--------------------	---	------------

EnOcean radio transmitters

RTF2-FSE	Room temperature radio sensor	582
RFTF2-FSE	Room humidity and temperature radio sensor	582
RTF2-FSE-P	Room temperature radio sensor	583
RFTF2-FSE-P	Room humidity and temperature radio sensor	583
RTF2-FSE-PT	Room temperature radio sensor	584
RFTF2-FSE-PT	Room humidity and temperature radio sensor	584
RTF2-FSE-PD	Room temperature radio sensor	585
RFTF2-FSE-PD	Room humidity and temperature radio sensor	585
RTF2-FSE-PDT	Room temperature radio sensor	586
WT-FSE	Wall pushbutton	587
FK-1-FSE	Door and window contact unit	589
HT4-FSE	Hand-held remote control unit	588
IN400-FSE-UP	Tushbutton interface, in-wall	596
AFTF-HK-FSE	Multifunctional outside radio sensor for humidity, temperatures and light intensity	600
AWFS-HK-FSE	Multifunctional outside radio sensor for wind strength and light intensity	601

EnOcean radio receiver / actuators, in-wall

JA100-FEM-UP	Venetian blind actuator, in-wall	591
SA100-FEM-UP	Switching actuator, in-wall	592
SA200-FEM-UP	Switching actuator, in-wall	593
TA100-FEM-UP	Thermostat actuator, in-wall	594
TA200-FEM-UP	Thermostat actuator, in-wall	595

EnOcean radio receiver / actuators, on-wall

JA200-FEM-AP	Venetian blind actuator, on-wall	597
SA400-FEM-AP	Switching actuator, on-wall	598
SV600-FEM-AP	Dimmer actuator, on-wall	599

EnOcean communication

USB-FEM	USB communication flash drive	579
----------------	-------------------------------	------------

EnOcean Gateway

GW-RS485-FEM	Gateway for RS485 bus	590
---------------------	-----------------------	------------



Radio Sensors



KYMASGARD® – Intelligent radio sensor equipment for multifunctional requirements

Broad Spectrum

Our product line for wireless radio installations using EnOcean technology are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. The bus addresses are adjustable via DIP switches.

Optimum Precision

All devices are developed, manufactured and tested according to the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.



enocean®



Approved Safety



RoHS conforming materials



ESD compliant manufacturing



CE compliance tested by external laboratories

Certified Quality



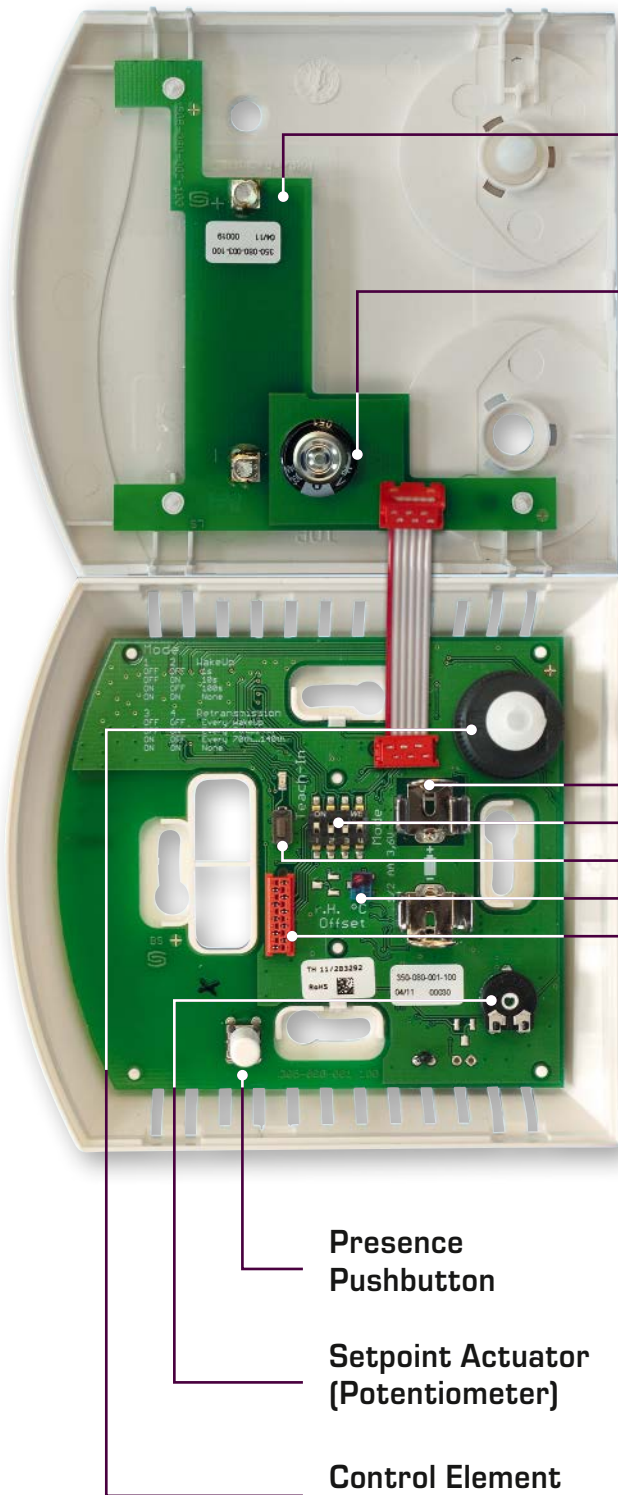
Our development and production in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.



GOST certificates



EAC certified



Extra-large Solar Cell

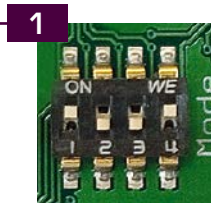
With solar generator for energy supply, battery-free, maintenance-free

Goldcap

For energy store (internal)

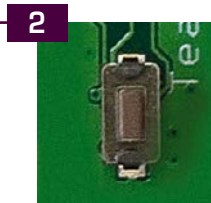
Optional Battery Operation

Change-over to lithium cell based energy supply at times of poor ambient light



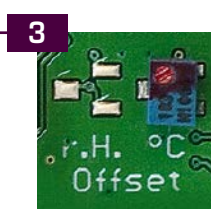
DIP Switches

For multi-range switching and setting of measuring and transmission cycle



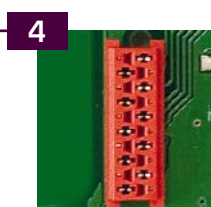
Teach-In

For teaching the sensor and establishing connection between transmitter and receiver



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration



Quality Assurance

Calibration and balancing are done by means of the bus system

Presence Pushbutton

Setpoint Actuator (Potentiometer)

Control Element (Rotary Switch)



CONTROLLERS / ACTUATORS / GATEWAYS

	SA400-FEM-AP	JA200-FEM-AP	SV600-FEM-AP	IN400-FSE-UP	SA100-FEM-UP	SA200-FEM-UP	TA100-FEM-UP	TA200-FEM-UP	JA100-FEM-UP	GW-RS485-FEM	USB - FEM
KYMASGARD® 9000 system											
RFTM-FSE						●	●	●		●	●
RFTM-FSE-ST						●	●	●		●	●
RFTM-VOC-FSE										●	●
RFTM-BW-FSE	●		●		●	●	●	●		●	●
Frija ROOM CONTROL UNITS											
RTF2 - FSE										●	●
RFTF2 - FSE										●	●
RTF2 - FSE - P			●				●	●		●	●
RFTF2 - FSE - P										●	●
RTF2 - FSE - PT										●	●
RFTF2 - FSE - PT										●	●
RTF2 - FSE - PD2										●	●
RTF2 - FSE - PD5										●	●
RFTF2 - FSE - PD2										●	●
RTF2 - FSE - PD5T										●	●
WINDOW CONTACT											
FK - FSE - xx	●	●	●		●	●			●	●	●
WALL PUSHBUTTON											
WT - FSE - xx	●		●				●	●		●	●
WT - FSE - Oxx	●						●	●		●	●
WT - FSE - Vxx		●							●	●	●
MANUAL PUSHBUTTON											
HT - FSE - xx	●	●	●		●	●	●	●	●	●	●
OUTSIDE SENSOR											
AFTF-HK-FSE										●	●
AWSF-HK-FSE		●							●	●	●

● = optimum compatibility



Communication USB flash drive with protocol on EnOcean basis for showing the active radio communication subscribers. The addresses of all registered radio communication subscribers are displayed. It is used for checking the field intensity and the transmitted data.

USB-FEM



TECHNICAL DATA

Operation:	connection via USB port at the PC
Radio technology:	EnOcean protocol, transmission power max. 10 mW
Radio transmitter module:	TCM 300
Communication:	ESP 3 protocol for communication between USB-FEM and application software like EnOcean-Analyse-Software (software included in the scope of delivery)
Range of coverage:	indoors typically 30 - 100m, outdoors up to 300m
Dimensions:	71 x 23 x 11 mm
Housing:	plastic, material ABS, transparent
Ambient temperature:	0...+40°C
Humidity:	0...95% r.H., non-precipitating air
Scope of supply:	USB-FEM, USB flash drive with EnOcean-Analyse-Software

FUNCTION

With EnOcean-Analyse-Software installed, the necessary drivers are automatically installed as soon as the USB receiver is connected to the laptop.

The green LED shows that a USB connection exists. In the software, select the respective Com Port and click on Connect.

If the yellow LED is blinking, data is being received. Radio transmitters are recognized automatically (depending on the setting of the time interval, it may take several seconds until all transmitters have been recognized).

Push the Learn button on the radio transmitter to display the EEP symbol in the corresponding ID number.

Double-click to transfer that radio transmitter to the workspace. Only radio transmitters that are in the workspace can be read out.

KYMASGARD® USB - FEM Communications USB flash drive

Type / WG02	Scope of supply	Item No.	Price
USB-FEM			
USB-FEM	USB-FEM, USB flash drive with EnOcean-Analyse-Software	1801-7460-7002-000	280,65 €
Compatibility	all KYMASGARD® radio transmitters and radio signal receivers		



Multi-functional room radio sensors / room control units with solar cell for temperature, humidity, air quality (VOC) and motion / presence

Radio bus system KYMASGARD® 9000

The room radio sensors of the radio bus system **KYMASGARD® 9000** are maintenance-free radio transmitters that operate without batteries (except for **RFTM-LQ-FSE**). Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. If the ambient light is too low for power generation, the sensors can optionally be powered by two AAA batteries (not included). These sensors are used to detect the indoor climate and the setpoint values, and to transmit the recorded values to radio actuators and radio signal receivers / gateways via radio signals. The following device configurations are available:

The room sensor **KYMASGARD® RFTM-FSE** is used to measure room temperature and room humidity.

The room control unit **KYMASGARD® RFTM-FSE-ST** is used to measure room temperature and humidity, and to display and set the setpoint for temperature.

The setpoint is set directly on site using touch buttons.

The room sensor **KYMASGARD® RFTM-LQ-FSE** is used to measure room temperature, room humidity and air quality (VOC = Volatile Organic Compounds).

The room sensor **KYMASGARD® RFTM-BW-FSE** is used to measure room temperature, room humidity and the movement (or presence) of persons.

Optional accessories include the wall holder **WH-3100** and the stand holder **SH-3110**, which enable them to be used as table-top units.

Room devices (Ø 90 mm) with stand holder (optional)



TECHNICAL DATA

Operation:	Power generated by solar cell, battery-free, (except for RFTM-LQ-FSE) maintenance-free (battery operation optional)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity, 1 setpoint, 1 air quality (VOC), 1 motion/presence
Radio transmitter module:	EnOcean Dolphin
Measurand acquisition:	adjustable, every 1s / 10s / 100s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material: ABS, colour: pure white (similar to RAL 9010)
Dimensions:	Ø 88 mm, height 18 mm
Mounting:	Wall-mounted or free-standing using accessories
Ambient temperature:	-5...+55 °C
Storage temperature:	-25...+60 °C
Permitted humidity:	0...90% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU and according to R&TTE Directive 2014 / 53 / EU

SH-3110
Stand holder (optional)



WH-3100
Wall holder (optional)



HUMIDITY

Operating range, humidity:	0...100% r. H.
Deviation in humidity:	typically ±2.0% (20...80% r. H.) at +25 °C, otherwise ±3.0%

TEMPERATURE

Operating range, temperature:	0...+40 °C
Deviation in temperature:	typically ±0.2K at +25 °C

AIR QUALITY (VOC)

VOC measuring range:	0...100% air quality; with reference to calibration gas
VOC measuring accuracy:	±20% final value (with reference to the calibration gas)

MOTION

Detection:	yes/no (motion + presence)
------------	----------------------------

SETPOINT / DISPLAY

Operating elements:	The setpoint for temperature can be set and displayed on a touch panel.
---------------------	---





S+S REGELTECHNIK

Multi-functional room radio sensors / room control units with solar cell for temperature, humidity, air quality (VOC) and motion / presence

Radio bus system KYMASGARD® 9000

RFTM - FSE - ST
Room control unit



RFTM - FSE
RFTM - LQ - FSE
Room radio sensors



RFTM - BW - FSE
Room radio sensors



KYMASGARD® RFTM - FSE	Room radio sensor / room control unit for temperature and humidity
KYMASGARD® RFTM - LQ - FSE	Room radio sensor for temperature, humidity and air quality (VOC)
KYMASGARD® RFTM - BW - FSE	Room radio sensor for temperature, humidity and motion / presence detection

Type / WG02	Channels	Measuring ranges / detection		VOC	Movement	Set point	EnOcean-Profile	Item no.	Price
		Temperature	Humidity						
RFTM - FSE									
RFTM-FSE	2	0...+40 °C	0...100% r.H.	-	-	-	EEP A5-04-01	1801-4280-0000-000	240,78 €
RFTM-FSE ST	3	0...+40 °C	0...100% r.H.	-	-	●	EEP A5-10-12	1801-4280-0869-000	271,01 €
RFTM - LQ - FSE									
RFTM-LQ-FSE	4	0...+40 °C	0...100% r.H.	0...100%	-	-		1801-4280-3000-000	334,04 €
RFTM - BW - FSE									
RFTM-BW-FSE	3	0...+40 °C	0...100% r.H.	-	yes / no	-		1801-4280-4000-000	322,33 €
Equipment:	The setpoint for temperature can be set via the operating and display elements.								

ACCESSORIES			
SH-3110	Stand holder for room radio units (Ø 90 mm)	1801-8490-2000-000	27,18 €
WH-3100	Wall holder for room radio units (Ø 90 mm and Ø 130 mm)	1801-8490-1000-000	7,86 €
Compatibility	For an overview, see the start of the chapter		

Wireless room humidity and temperature radio sensors with solar cell

The room temperature sensors **KYMASGARD® RTF 2 - FSE** or **RFTF 2 - FSE** are batteryless and maintenance-free radio transmitters. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided. The device IDs are marked on a label in the device.

RTF 2 - FSE
RFTF 2 - FSE

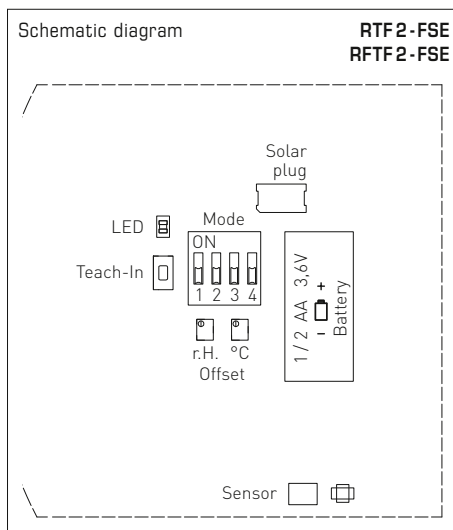
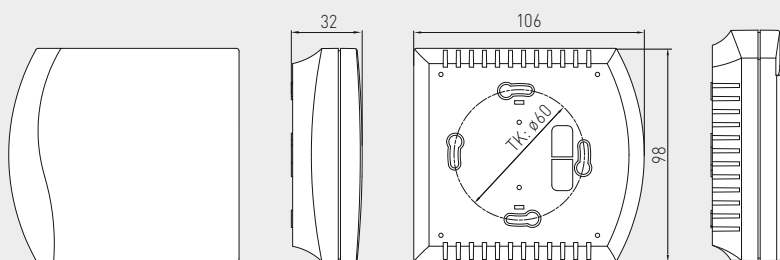


TECHNICAL DATA

Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Measuring range, humidity:	0...100 % r. H.
Deviation humidity:	typically ± 3 % r.H. (30... 80%) at +20 °C
Measurand acquisition:	adjustable, every 1s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 32 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	-5...+55 °C
Storage temperature:	-25...+60 °C
Humidity:	0...90% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU

Dimensional drawing

RTF 2 - FSE
RFTF 2 - FSE



KYMASGARD® RTF 2 - FSE Room temperature radio sensors
KYMASGARD® RFTF 2 - FSE Wireless room humidity and temperature radio sensors

Type / WG02	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
RTF2-FSE	1	0...+40 °C -	Solar cell, battery	1801-4451-0040-040	121,25 €
RFTF2-FSE	2	0...+40 °C 0...100% r.H.	Solar cell, battery	1801-4452-3040-040	280,65 €

ACCESSORIES

ET BATTERIE	Lithium battery LS 14250	7000-4000-5000-000	17,41 €
Compatibility	For an overview, see the start of the chapter		

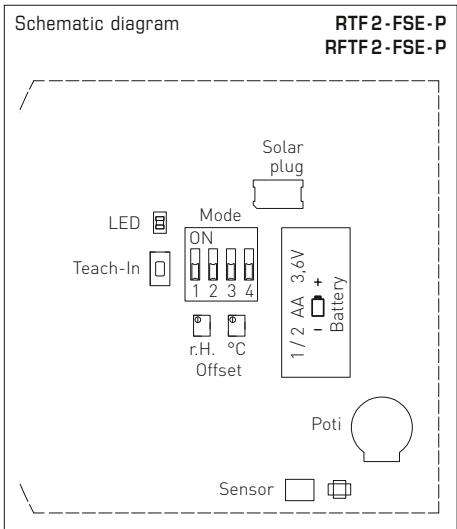
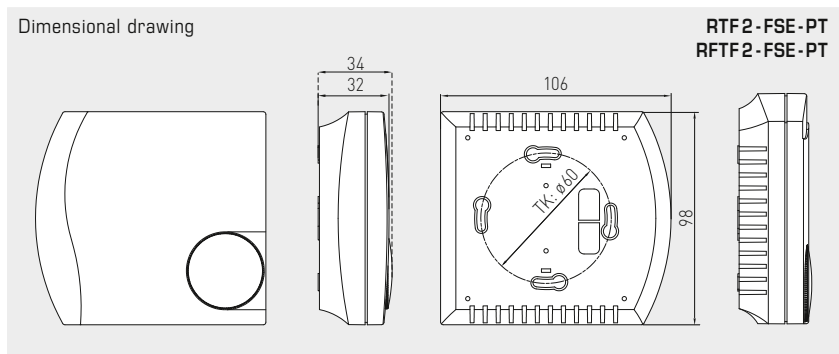


The room temperature sensor **KYMASGARD® RTF 2 - FSE - P** or **RFTF 2 - FSE - P** is a batteryless and maintenance-free radio transmitter. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided. The device IDs are marked on a label in the device.

RTF 2 - FSE - P
RFTF 2 - FSE - P



TECHNICAL DATA	
Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity, 1 setpoint
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ±0.2 K at +25 °C
Measuring range, humidity:	0...100 % r.H.
Deviation humidity:	typically ±3 % r.H. (30...80 %) at +20 °C
Setpoint capture:	turning angle left 0° = 0 bits turning angle right 220° = 255 bits
Measurand acquisition:	adjustable, every 1s / 10s / 100s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, or change of turning angle status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 34 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	-5...+55 °C
Storage temperature:	-25...+60 °C
Humidity:	0...90 % r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU



KYMASGARD® RTF 2 - FSE - P Room temperature radio sensors
KYMASGARD® RFTF 2 - FSE - P Wireless room humidity and temperature radio sensors

Type / WG02	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
RTF2-FSE-P	2	0...+40 °C -	Solar cell, battery	1801-4451-0140-040	142,58 €
RFTF2-FSE-P	3	0...+40 °C 0...100 % r.H.	Solar cell, battery	1801-4452-0140-040	297,47 €
ACCESSORIES					
ET BATTERIE	Lithium battery LS 14250			7000-4000-5000-000	17,41 €
BG KNOFF	Control knob (4°C...34°C) for combination with TA2-FEM			7000-4030-0008-058	5,28 €
Compatibility	For an overview, see the start of the chapter				

**Wireless room humidity and temperature radio sensors
with solar cell, setpoint setter, and push-button**

RTF2-FSE-PT
RFTF2-FSE-PT

The room temperature sensor **KYMASGARD® RTF 2 - FSE - PT** or **RFTF 2 - FSE - PT** is a batteryless and maintenance-free radio transmitter. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided. The device IDs are marked on a label in the device.

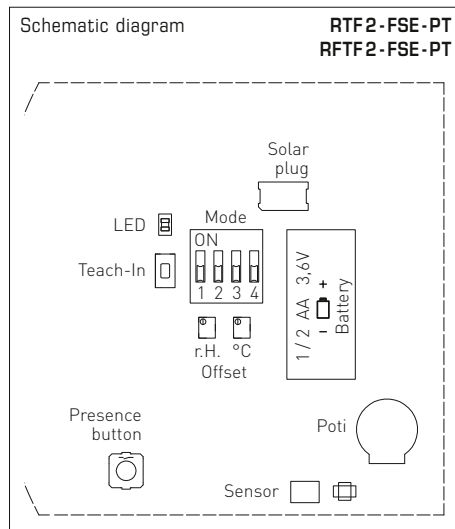
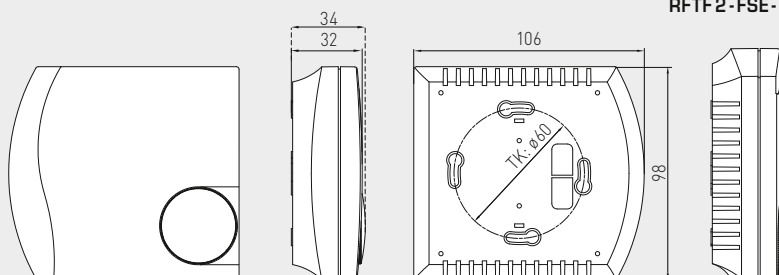


TECHNICAL DATA

Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity, 1 setpoint, 1 presence pushbutton
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ±0.2K at +25 °C
Measuring range, humidity:	0...100 % r.H.
Deviation humidity:	typically ±3 % r.H. (30... 80%) at +20 °C
Setpoint capture:	turning angle left 0° = 0 bits turning angle right 220° = 255 bits
Measurand acquisition:	adjustable, every 1s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, or change of turning angle status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 34 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	-5...+55 °C
Storage temperature:	-25...+60 °C
Humidity:	0...90 % r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU

Dimensional drawing

RTF 2 - FSE - PT
RFTF 2 - FSE - PT



KYMASGARD® RTF 2 - FSE - PT Room temperature radio sensors
KYMASGARD® RFTF 2 - FSE - PT Wireless room humidity and temperature radio sensors

Type / WG02	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
RTF2-FSE-PT	3	0...+40 °C -	Solar cell, battery	1801-4451-0440-040	151,55 €
RFTF2-FSE-PT	4	0...+40 °C 0...100% r.H.	Solar cell, battery	1801-4452-0440-040	306,47 €
ACCESSORIES					
ET BATTERIE	Lithium battery LS 14250			7000-4000-5000-000	17,41 €
Compatibility	For an overview, see the start of the chapter				

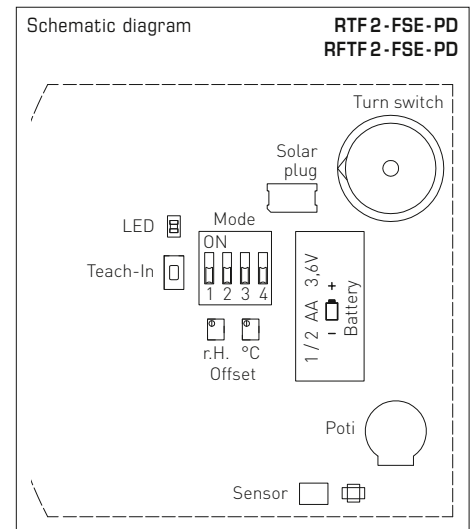
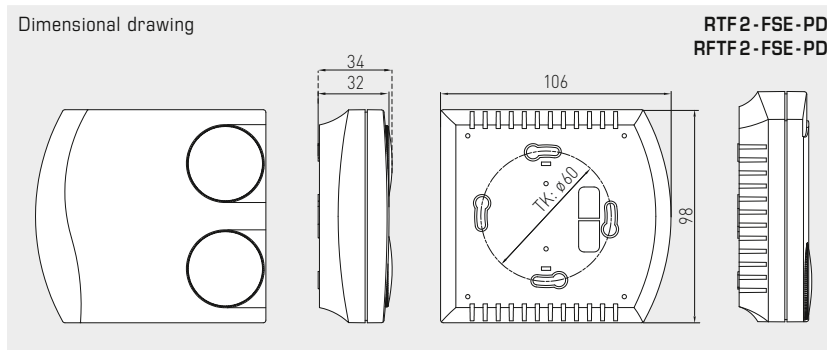


The room temperature sensor KYMASGARD® RTF 2 - FSE - PD or RFTF 2 - FSE - PD is a batteryless and maintenance-free radio transmitter. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided. The device IDs are marked on a label in the device.

RTF 2 - FSE - PD
RFTF 2 - FSE - PD



TECHNICAL DATA	
Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 setpoint, 1 step switch
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ±0.2 K at +25 °C
Measuring range, humidity:	0...100 % r.H.
Deviation humidity:	typically ±3 % r.H. (30... 80 %) at +20 °C
Setpoint capture:	turning angle left 0° = 0 bits turning angle right 220° = 255 bits Step selection: 0 to 255 bits in steps
Measurand acquisition:	adjustable, every 1s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, or change of turning angle status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 34 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	-5...+55 °C
Storage temperature:	-25...+60 °C
Humidity:	0...90 % r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU



KYMASGARD® RTF 2 - FSE - PD Room temperature radio sensors
KYMASGARD® RFTF 2 - FSE - PD Wireless room humidity and temperature radio sensors

Type / WG02	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
RTF2-FSE-PD2	3	0...+40 °C -	Solar cell, battery	1801-4451-0240-040	170,63 €
RTF2-FSE-PD5	3	0...+40 °C -	Solar cell, battery	1801-4451-0340-040	170,63 €
RFTF2-FSE-PD2	4	0...+40 °C 0...100% r.H.	Solar cell, battery	1801-4452-0240-040	319,94 €

ACCESSORIES	
ET BATTERIE	Lithium battery LS 14250 7000-4000-5000-000 17,41 €
Compatibility	For an overview, see the start of the chapter

**Wireless room temperature radio sensors
with solar cell, setpoint setter, step selection, and push-button**

The room temperature sensor **KYMASGARD® RTF 2 - FSE - PDT** is a battery-less and maintenance-free radio transmitter. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided. The device IDs are marked on a label in the device.

RTF2-FSE-PDT

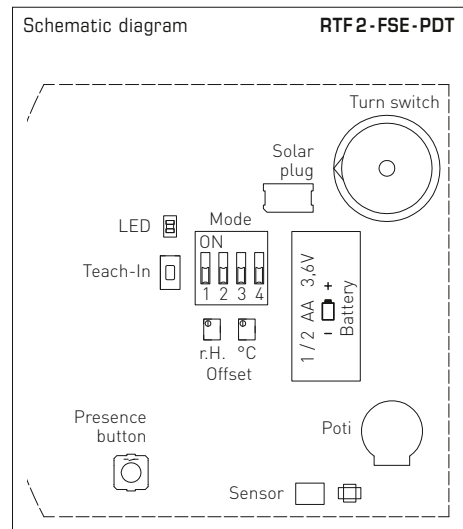
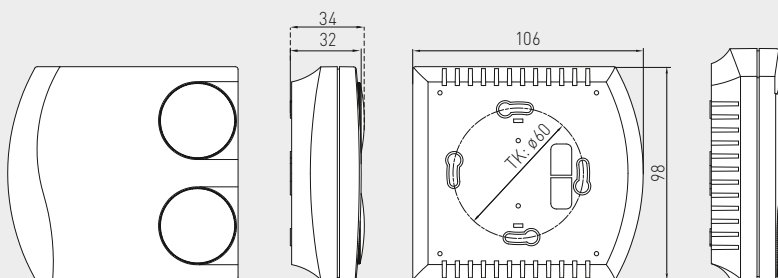


TECHNICAL DATA

Operation:	Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 setpoint, 1 step switch, 1 presence pushbutton
Radio transmitter module:	EnOcean Dolphin
Measuring range, temperature:	0...+40 °C
Deviation, temperature:	typically ±0.2K at +25 °C
Setpoint capture:	turning angle left 0° = 0 bits turning angle right 220° = 255 bits Step selection: 0 to 255 bits in steps
Measurand acquisition:	adjustable, every 1s / 10 s / 100 s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, presence push-button activation, or change of turning angle status telegram approximately every 16 minutes
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 106 x 34 mm (Frija 2)
Mounting:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes
Ambient temperature:	-5...+55 °C
Storage temperature:	-25...+60 °C
Humidity:	0...90% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU

Dimensional drawing

RTF 2 - FSE - PDT



KYMASGARD® RTF 2 - FSE - PDT Room temperature radio sensor

Type / WG02	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
RTF2-FSE-PD5T	4	0...+40 °C -	Solar cell, battery	1801-4451-0540-040	181,87 €
ACCESSORIES					
ET BATTERIE	Lithium battery LS 14250			7000-4000-5000-000	17,41 €
Compatibility	For an overview, see the start of the chapter				

Radio transmitters as wall pushbutton rocker switches with 2 or 4 channels
on-wall, panel switch programme

The radio transmitter **KYMASGARD® WT-FSE** is a batteryless and maintenance-free universal transmitter insert with one rocker or two rockers with central position, matching diverse switch programmes of different leading manufacturers.

Rockers are also available as spare parts with and without printing.

Due to its flat design WT-FSE is applicable for wall mounting, also on glass.

TECHNICAL DATA

Operation:	Energy generation by electrodynamic energy generator (induction principle), batteryless, maintenance-free	
Radio technology:	EnOcean protocol, modulation EIRP / ASK, transmission power max. 10 mW, telegram type RPS-Type 2	
Channels:	2 or 4 channels with 2 statuses each	
Radio transmitter module:	PTM 200	
Operating force:	approx. 7 N at +25°C	
Push-button stroke:	1.8 mm	
Switching cycles:	> 50,000 activations according to EN 60669 / VDE 0632	
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m	
Dimensions:	71 x 71 mm	bottom plate
	55 x 55 mm	frame insert
	55 x 55 mm	single rocker (without frame)
	27.5 x 55 mm	twin rocker (without frame)
Mounting:	on-wall on even surface, for sticking or screw fastening	
Ambient temperature:	-25...+65 °C (in operation)	
Storage temperature:	-40...+85 °C	
Humidity:	0...95% r.H., non-precipitating air	
Standards:	CE conformity, ROHS conformity according to directive 2011 / 65 / EU	

SWITCH PROGRAMME

Manufacturer:	BERKER (S1, B1, B3, B7 glass) GIRA (System 55, E2, Event, Esprit) JUNG (A500, Aplus) MERTEN (M-Smart, M-Arc, M-Plan)
Housing:	plastic, material ABS, colour pure white / matt (similar to RAL 9010), (other colours are available upon request with colour variants depending on the respective light switch programme)

WT-FSE-RW
(with twin rockers)



WT-FSE-RW
(with single rocker)



KYMASGARD® WT-FSE Radio transmitter as wall pushbutton

Type / WG02	Channels	Printing	Housing Colour	Item No.	Price
WT-FSE					
WT-FSE-RW	2 / 4	-	Pure white / mat	1801-8412-1000-000	89,81 €
WT-FSE-ORW	2 / 4	Light I-O	Pure white / mat	1801-8412-1100-000	89,81 €
WT-FSE-VRW	2 / 4	Venetian blind Δ-▽	Pure white / mat	1801-8412-1200-000	89,81 €
Compatibility	For an overview, see the start of the chapter				

Radio transmitters as hand-held remote control units with 4 channels

The radio transmitter **KYMASGARD® HT4 - FSE** is a battery-less and maintenance-free hand-held transmitter with four independent individual buttons. Because of its ergonomic shape, it sits comfortably in the hand, however can also be fixed to the wall using the relevant adhesive mats.

HT4 - FSE



TECHNICAL DATA

Operation:	Energy generation by electrodynamic energy generator (induction principle), batteryless, maintenance-free
Radio technology:	EnOcean protocol, transmission power max. 10 mW, telegram type RPS-Type 2
Channels:	4 channels, each with 2 statuses
Radio transmitter module:	PTM 200
Operating force:	approx. 7 N at +25°C
Push-button stroke:	1.8 mm
Switching cycles:	> 50,000 activations according to EN 60669 / VDE 0632
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Dimensions:	48 x 81 x 19 mm (W x H x D)
Housing:	plastic, material ABS, colours see table
Ambient temperature:	-25...+55 °C (in operation)
Storage temperature:	-40...+85 °C
Humidity:	0...95 % r.H., non-precipitating air
Standards:	CE conformity according to EMC directive 2014 / 30 / EU and according to R&TTE directive 2014 / 53 / EU

KYMASGARD® HT4 - FSE Radio transmitters as hand-held remote control units

Type / WG02	Channels	Housing Colour	Item No.	Price
HT4 - FSE				
HT4-FSE-RW	4	Pure white	1801-8424-1000-000	107,78 €
HT4-FSE-SW	4	Black	1801-8424-2000-000	107,78 €
HT4-FSE-SB	4	Silver	1801-8424-3000-000	107,78 €
Compatibility	For an overview, see the start of the chapter			



The radio transmitter **KYMASGARD® FK1 - FSE** is a battery-less and maintenance-free window contact with one channel. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. It is used for status monitoring of windows and doors employing a reed contact with counter magnet and to transmit the results via radio signal to radio actuators and radio receivers / gateways. It is suitable for mounting on window and door frames made of wood, glass, and aluminium.

FK1-FSE

TECHNICAL DATA

Operation:	energy generation by electrodynamic solar generator, batteryless, maintenance-free
Radio technology:	EnOcean protocol, modulation ASK, transmission power max. 10 mW
Channels:	1 status, 1 control
Radio transmitter module:	STM100
Status acquisition:	reed contact
Measurand acquisition:	every 1000 seconds
Transmission interval:	every 1000 seconds, or at any status change
Range of coverage:	indoors typically 30 - 100m, outdoors up to 300m
Dimensions:	110 x 19 x 15 mm (L x W x D)
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Mounting:	on-wall on even surface, for sticking or screw fastening
Ambient temperature:	-25...+65 °C (in operation)
Storage temperature:	-40...+85 °C
Humidity:	0...70% r. H., non-precipitating air
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE conformity, ROHS conformity according to directive 2011 / 65 / EU

**KYMASGARD® FK1-FSE** Radio transmitter as door and window contact unit

Type / WG02	Channels	Housing Colour	Item No.	Price
FK1-FSE				
FK1-FSE-RW	1	Pure white	1801-8431-1000-000	102,26 €
Compatibility	For an overview, see the start of the chapter			

**Gateway
for RS485 bus, bidirectional**

The KYMASGARD® GW-RS485-FEM is a device for on-wall installation. It serves as unidirectional or bidirectional gateway between radio transmitters / radio receivers and bus systems on basis of RS485 communication. It enables receiving and transmitting of radio telegrams from all radio transmitters that comply with the EnOcean protocol standard.

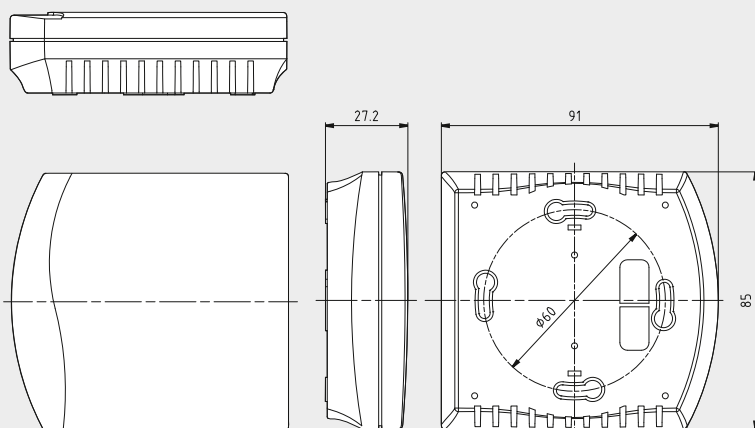
GW-RS485-FEM



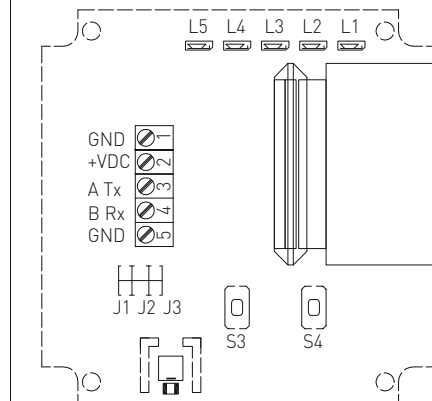
TECHNICAL DATA

Operating mode:	receiving (from up to 30 radio transmitters) and transmitting of radio telegrams according to EnOcean standard
Rated voltage:	10-24 V DC
Current consumption:	45 mA at 12 V DC
Radio module:	TCM320
Fusing:	none
Operating elements:	1 button ("LRN") 1 button („CLR") 5 LEDs
Connection:	5-pole terminal screw
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 91 x 27 mm (Frija 1)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Ambient temperature:	-5...+40°C (in operation)
Humidity:	5...90% r.H., non-precipitating air
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to Directive 2011 / 65 / EU

Dimensional drawing GW-RS485-FEM



Schematic diagram GW-RS485-FEM



KYMASGARD® GW-RS485-FEM Gateway for RS485-Bus

Type / WG02	Type	Communication	Installation	Item No.	Price
GW-RS485-FEM					
GW-RS485-FEM	Bidirectional	RS485	On-wall	1801-7429-0022-300	193,37 €
Note:	other gateways optional				on request
Compatibility	all KYMASGARD® radio transmitters and radio signal receivers				



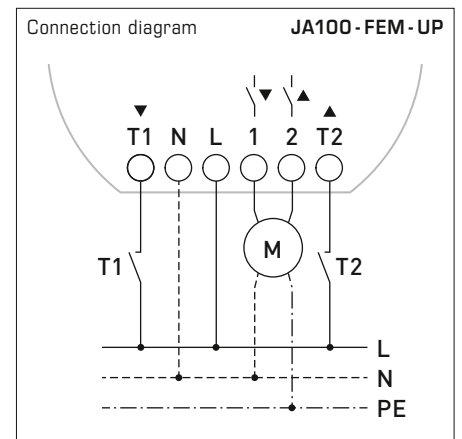
The Venetian blind actuator **KYMASGARD® JA100-FEM-UP** is a device with one channel for in-wall or on-wall installation. Initiated by up to 30 radio transmitters (wall-mounted and hand-held transmitters, motion detectors, outdoor light sensor) as well as by the two auxiliary inputs, a roller shutter/blind motor can be controlled via its output channel.

Each taught-in transmitter can be assigned a different function such as a sequential pushbutton function or a 10-minute switch-off delay. The repeater function can be additionally activated by means of a simple procedure.

JA100-FEM-UP



TECHNICAL DATA	
Operating mode:	moving Up/Down (long push of button), adjusting blades (short push of button)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Rated voltage:	110 - 240 V, 50 / 60 Hz
Fusing:	16 A
Operating elements:	2 buttons ("LRN"/"CLR") 2 LEDs ("LRN"/"CLR") 1 rotary switch with 16 positions
Channels:	1 channel
Standby consumption:	0.6W
Load output / Connected load:	2 secured normally open contacts rated current: 6 A / 240 V AC max. switch-on current: 10 A max. switching capacity AC1: 1500 VA max. switching capacity AC15: 300 VA motor load 1Ph AC3 / 230 V AC: 0.185 kW capacitive load: 10 µF
Switching properties:	parametrisable
Connection:	4 mm ² , via terminal screws
Housing:	Plastic, material ABS, Ø 51 mm, height 25 mm
Mounting:	In-wall, on-wall
Ambient temperature:	-20...+40 °C (in operation)
Storage temperature:	-40...+85 °C
Permitted humidity:	5...90% r.H., non-precipitating air
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to directive 2011 / 65 / EU



KYMASGARD® JA100-FEM-UP Venetian blind actuator						
Type / WG02	Channels	Switching element	Installation	Item no.	Price	
JA100-FEM-UP						
JA100-FEM-UP	1	Normally open contact	In-wall	1801-7441-0500-300	173,67 €	
Compatibility	For an overview, see the start of the chapter					

**Radio receiver,
switching actuator with 1 channel,
in-wall**

The switching actuator **KYMASGARD® SA100-FEM-UP** is a device with one channel for in-wall or on-wall installation and is used for switching electric consumers. Initiated by up to 30 radio transmitters (wall-mounted and hand-held transmitters, motion detectors, window contact) a group of electric consumers can be switched.

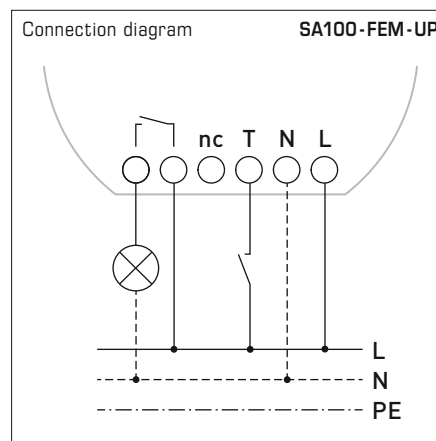
Each taught-in transmitter can be assigned a different function such as a sequential pushbutton function or a 10-minute switch-off delay. The repeater function can be additionally activated by means of a simple procedure.

SA100-FEM-UP



TECHNICAL DATA

Operating mode:	switching ON/OFF, pulse switch, stepping switch
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Rated voltage:	110 - 240 V, 50 / 60 Hz
Fusing:	16 A
Operating elements:	2 buttons ("LRN"/"CLR") 2 LEDs ("LRN"/"CLR") 1 rotary switch with 16 positions
Channels:	1 channel
Standby consumption:	0.6 W
Load output / Connected load:	normally open contact potential free rated current: 16 A / 250 V AC max. switch-on current: 130 A / 20 ms max. switching capacity AC1: 4000 VA max. switching capacity AC15: 750 VA filament bulbs: 2000 W halogen lamps 230 V AC: 2000 W fluorescent lamps, uncompensated: 1000 W fluorescent lamps, compensated: 750 W fluorescent lamps, duo-connection: 1000 W motor load 1Ph AC3 / 230 V AC: 1 kW electronic ballast assuming 30 µF: 3 unit capacitive load: 30 µF
Switching properties:	parametrisable
Connection:	4 mm ² , via terminal screws
Housing:	Plastic, material ABS, Ø 51 mm, height 25 mm
Mounting:	In-wall, on-wall
Ambient temperature:	-20...+40 °C (in operation)
Storage temperature:	-40...+85 °C
Permitted humidity:	5...90 % r.H., non-precipitating air
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to directive 2011 / 65 / EU



KYMASGARD® SA100 - FEM - UP Switching actuator

Type / WG02	Channels	Switching element	Installation	Item no.	Price
SA100-FEM-UP					
SA100-FEM-UP	1	Normally open contact	In-wall	1801-7441-0200-300	153,29 €
Compatibility	For an overview, see the start of the chapter				

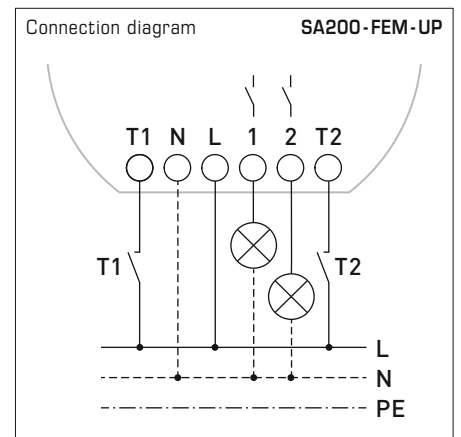


The switching actuator **KYMASGARD® SA200-FEM-UP** is a device with two channels for in-wall or on-wall installation. Initiated by up to 30 radio transmitters (wall-mounted and hand-held transmitters, motion detectors, outdoor light sensors) and the two auxiliary inputs, two groups of electric consumers can be switched via its two outputs. Each taught-in transmitter can be assigned a different function such as a sequential pushbutton function or a 10-minute switch-off delay. The repeater function can be additionally activated by means of a simple procedure.

TECHNICAL DATA

Operating mode:	switching ON/OFF, pulse switch, stepping switch
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Rated voltage:	110 - 240 V, 50 / 60 Hz
Fusing:	16 A
Operating elements:	2 buttons ("LRN"/"CLR") 2 LEDs ("LRN"/"CLR") 1 rotary switch with 16 positions
Channels:	2 channels
Standby consumption:	0.6 W
Load output / Connected load:	normally open contact rated current: 6 A / 240 V AC max. switch-on current: 10 A max. switching capacity AC1: 1500 VA max. switching capacity AC15: 300 VA filament bulbs: 750 W halogen lamps 230 V AC: 500 W fluorescent lamps, uncompensated: 300 W fluorescent lamps, compensated: 200 W fluorescent lamps, duo-connection: 300 W motor load 1Ph AC3 / 230 V AC: 0.185 kW electronic ballast assuming 30 µF: 1 unit capacitive load: 10 µF
Switching properties:	parametrisable
Connection:	4 mm ² , via terminal screws
Housing:	Plastic, material ABS, Ø 51 mm, height 25 mm
Mounting:	In-wall, on-wall
Ambient temperature:	-20...+40 °C (in operation)
Storage temperature:	-40...+85 °C
Permitted humidity:	5...90% r.H., non-precipitating air
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to directive 2011 / 65 / EU

SA200-FEM-UP

**KYMASGARD® SA200-FEM-UP** Switching actuator

Type / WG02	Channels	Switching element	Installation	Item no.	Price
SA200-FEM-UP					
SA200-FEM-UP	2	Normally open contact	In-wall	1801-7443-0200-300	173,67 €
Compatibility	For an overview, see the start of the chapter				

**Radio receiver,
thermostat actuator with 1 channel,
in-wall**

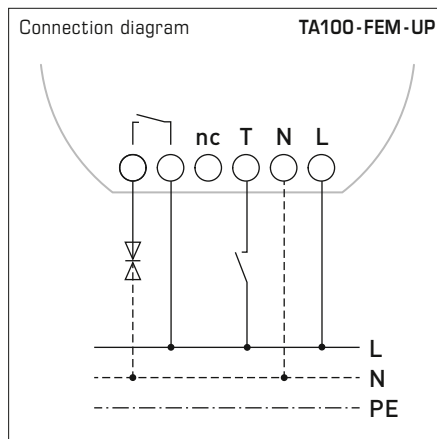
TA100-FEM-UP

The thermostat actuator **KYMASGARD® TA100-FEM-UP** is a device with one channel for in-wall or on-wall installation. With the help of a room temperature sensor (see compatibility overview) and up to 8 radio window contacts (FK1-FSE) in AND conjunction, a group of electric consumers (control valves, electric heating units, etc.) can be switched by a two-position control with frost protection function via an output. Different functions can be allocated to that output, depending on the parameter setting.



TECHNICAL DATA

Operating mode:	switching ON/OFF, pulse switch, stepping switch
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Rated voltage:	110 - 240 V, 50 / 60 Hz
Fusing:	16 A
Operating elements:	2 buttons ("LRN"/"CLR") 2 LEDs ("LRN"/"CLR") 1 rotary switch with 16 positions
Channels:	1 channel
Standby consumption:	0.6 W
Load output / Connected load:	normally open contact potential free rated current: 16 A / 250 V AC max. switch-on current: 130 A / 20 ms max. switching capacity AC1: 4000 VA max. switching capacity AC15: 750 VA motor load 1Ph AC3 / 230 V AC: 1 kW capacitive load: 30 µF
Switching properties:	parametrisable
Connection:	4 mm ² , via terminal screws
Housing:	Plastic, material ABS, Ø 51 mm, height 25 mm
Mounting:	In-wall, on-wall
Ambient temperature:	-20...+40 °C (in operation)
Storage temperature:	-40...+85 °C
Permitted humidity:	5...90 % r.H., non-precipitating air
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to directive 2011 / 65 / EU



KYMASGARD® TA100 - FEM - UP Thermostat actuator

Type/WG02	Channels	Switching element	Installation	Item no.	Price
TA100-FEM-UP					
TA100-FEM-UP	1	Normally open contact	In-wall	1801-7441-0600-300	153,29 €
Compatibility	For an overview, see the start of the chapter				



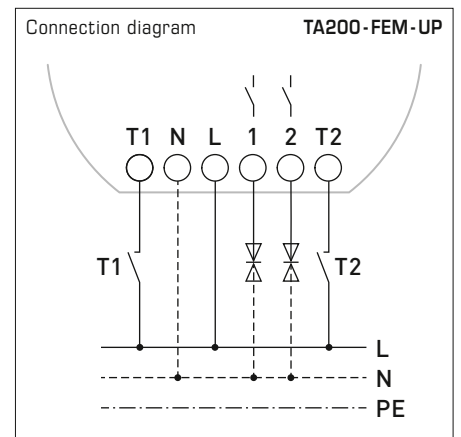
Radio receiver,
thermostat actuator with 2 channels,
in-wall

TA200-FEM-UP

The thermostat actuator **KYMASGARD® TA200-FEM-UP** is a device with two channels for in-wall or on-wall installation. With the help of a room temperature sensor (see compatibility overview) and up to 8 radio window contacts (FK1-FSE) in AND conjunction, a group of electric consumers (control valves, electric heating units, etc.) can be switched by a two-position control with frost protection function via an output. Different functions can be allocated to that output, depending on the parameter setting.

TECHNICAL DATA

Operating mode:	switching ON/OFF, pulse switch, stepping switch
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Rated voltage:	110 - 240 V, 50 / 60 Hz
Fusing:	16 A
Operating elements:	2 buttons ("LRN"/"CLR") 2 LEDs ("LRN"/"CLR") 1 rotary switch with 16 positions
Channels:	2 channels
Standby consumption:	0.6W
Load output / Connected load:	normally open contact rated current: 6 A / 240 V AC max. switch-on current: 10 A max. switching capacity AC1: 1500 VA max. switching capacity AC15: 300 VA motor load 1Ph AC3 / 230 V AC: 0.185 kW capacitive load: 10 µF
Switching properties:	parametrisable
Connection:	4 mm ² , via terminal screws
Housing:	Plastic, material ABS, Ø 51 mm, height 25 mm
Mounting:	In-wall, on-wall
Ambient temperature:	-20...+40 °C (in operation)
Storage temperature:	-40...+85 °C
Permitted humidity:	5...90% r.H., non-precipitating air
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to directive 2011 / 65 / EU

**KYMASGARD® TA200-FEM-UP** Thermostat actuator

Type / WG02	Channels	Switching element	Installation	Item no.	Price
TA200-FEM-UP					
TA200-FEM-UP	2	Normally open contact	In-wall	1801-7443-0600-300	173,67 €
Compatibility	For an overview, see the start of the chapter				

Radio transmitter,
pushbutton interface with 4 channels,
in-wall

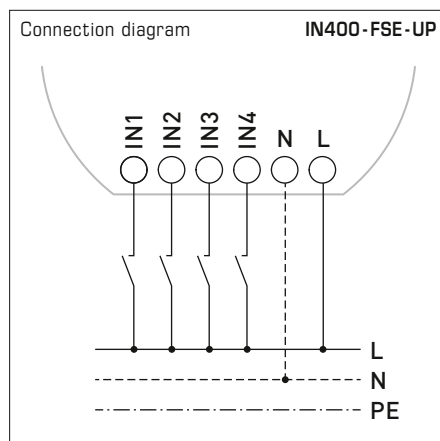
The pushbutton interface **KYMASGARD® IN400-FSE-UP** is a device with four channels for in-wall or on-wall installation and is used for detecting up to four 230 V AC switching/sensor contacts. A corresponding radio telegram is sent every time the status of the 230 V AC switching/sensor contact changes.

IN400 - FSE - UP



TECHNICAL DATA

Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type RPS-Type 2
Rated voltage:	110 - 240 V, 50 / 60 Hz
Fusing:	10 A
Operating elements:	2 buttons ("LRN"/"CLR") 2 LEDs ("LRN"/"CLR") 1 rotary switch with 16 positions
Channels:	4 channels, each with 2 statuses
Standby consumption:	0.4 W
Inputs:	100 V - 230 V AC inputs
Behaviour:	like a transmitter with PTM 200 (wall-mounted transmitter)
Range of coverage:	indoors typically 30 - 100 m, outdoors up to 300 m
Connection:	4 mm ² , via terminal screws
Housing:	Plastic, material ABS, Ø 51 mm, height 25 mm
Mounting:	In-wall, on-wall
Ambient temperature:	-20...+40 °C (in operation)
Storage temperature:	-40...+85 °C
Permitted humidity:	5...90% r.H., non-precipitating air
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to directive 2011 / 65 / EU



KYMASGARD® IN400 - FSE - UP Pushbutton interface

Type / WG02	Channels	Installation	Item no.	Price
IN400-FSE-UP				
IN400-FSE-UP	4	In-wall	1801-7444-0100-300	136,98 €
Compatibility	For an overview, see the start of the chapter			



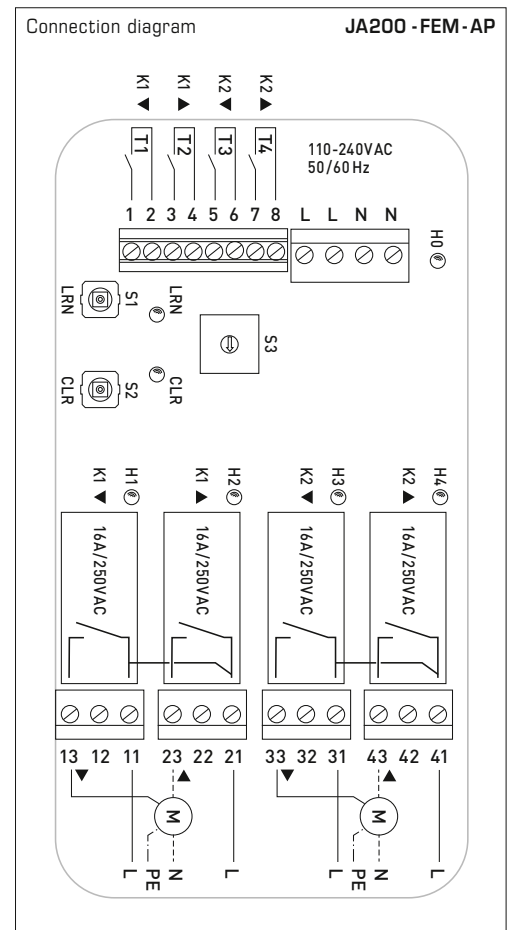
The Venetian blind actuator KYMASGARD® JA200-FEM-AP is a device with two channels for in-wall or on-wall installation. Initiated by up to 30 radio transmitters (wall-mounted and hand-held transmitters, motion detectors, outdoor light sensor) as well as by the four auxiliary inputs, two roller shutter/blind motors can be controlled independently via its four auxiliary inputs.

Different functions can be allocated to that output, depending on the parameter setting. The repeater function can be additionally activated by means of a simple procedure.

JA200 - FEM - AP



TECHNICAL DATA	
Operating mode:	moving Up / Down (long push of button), adjusting blades (short push of button)
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Rated voltage:	110 - 240 V, 50 / 60 Hz
Fusing:	16 A
Operating elements:	2 buttons ("LRN"/"CLR") 2 LEDs ("LRN"/"CLR") 1 rotary switch with 16 positions
Channels:	2 channels
Standby consumption:	0.6 W
Load output / Connected load:	4 secured normally open contacts, potential-free rated current: 16 A / 250 V AC max. switch-on current: 130 A / 20 ms max. switching capacity AC1: 4000 VA max. switching capacity AC15: 750 VA motor load 1Ph AC3 / 230 V AC: 1 kW capacitive load: 30 µF
Switching properties:	parametrisable
Connection:	4 mm ² , via terminal screws
Housing:	plastic, material ABS, 170 x 85 x 40 mm
Mounting:	On-wall
Ambient temperature:	-20...+40 °C (in operation)
Storage temperature:	-40...+85 °C
Permitted humidity:	5...90 % r.H., non-precipitating air
Protection type:	IP 42 (according to EN 60 529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to directive 2011 / 65 / EU



KYMASGARD® JA200 - FEM - AP Venetian blind actuator						
Type / WG02	Channels	Switching element	Installation	Item no.	Price	
JA200 - FEM - AP						
JA200-FEM-AP	2	Normally open contact	On-wall	1801-7453-0500-300	270,37 €	
Compatibility	For an overview, see the start of the chapter					

**Radio receiver,
switching actuator with 4 channels,
on-wall**

SA400 - FEM - AP

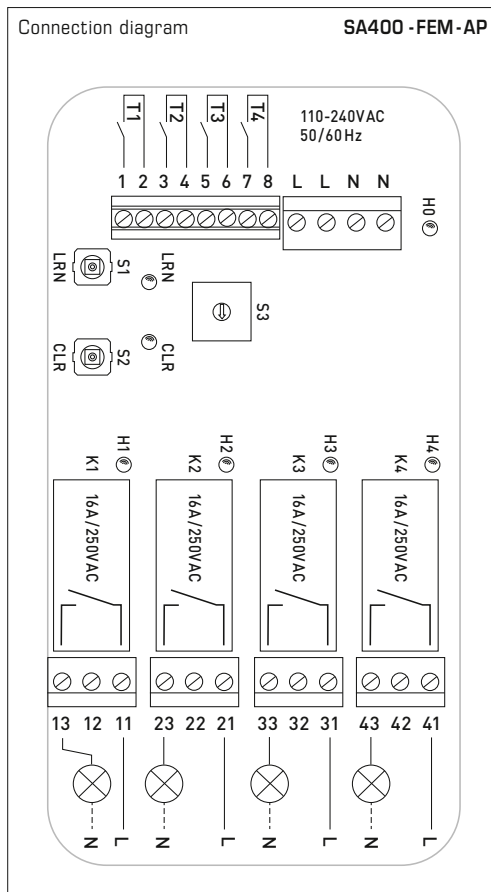
The switching actuator **KYMASGARD® SA400 - FEM - AP** is a device with four potential-free channels for on-wall installation. Initiated by up to 30 radio transmitters (wall-mounted and hand-held transmitters, motion detectors, outdoor light sensors) and the auxiliary inputs, up to four different groups of electric consumers can be switched.

Each taught-in transmitter can be assigned a different function such as a sequential pushbutton function or a 10-minute switch-off delay. The repeater function can be additionally activated by means of a simple procedure.



TECHNICAL DATA

Operating mode:	switching ON/OFF (long push of button), pulse switch, stepping switch
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Rated voltage:	110 - 240 V, 50 / 60 Hz
Fusing:	16 A
Operating elements:	2 buttons ("LRN"/"CLR") 2 LEDs ("LRN"/"CLR") 1 rotary switch with 16 positions
Channels:	4 channels
Standby consumption:	0.6 W
Load output / Connected load:	normally open contact potential free rated current: 16 A / 250 V AC max. switch-on current: 130 A / 20 ms max. switching capacity AC1: 4000 VA max. switching capacity AC15: 750 VA filament bulbs: 2000 W halogen lamps 230 V AC: 2000 W fluorescent lamps, uncompensated: 1000 W fluorescent lamps, compensated: 750 W fluorescent lamps, duo-connection: 1000 W motor load 1Ph AC3 / 230 V AC: 1 kW electronic ballast assuming 30 µF: 3 unit capacitive load: 30 µF
Switching properties:	parametrisable
Connection:	4 mm ² , via terminal screws
Housing:	plastic, material ABS, 170 x 85 x 40 mm
Mounting:	On-wall
Ambient temperature:	-20...+40 °C (in operation)
Storage temperature:	-40...+85 °C
Permitted humidity:	5...90 % r.H., non-precipitating air
Protection type:	IP 42 (according to EN 60529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to directive 2011 / 65 / EU



KYMASGARD® SA400 - FEM - AP Switching actuator

Type / WG02	Channels	Switching element	Installation	Item no.	Price
SA400 - FEM - AP					
SA400-FEM-AP	4	Normally open contact	On-wall	1801-7454-0200-300	292,12 €
Compatibility	For an overview, see the start of the chapter				



The control valve actuator **KYMASGARD® SV600 -FEM -UP** is a device with six channels for on-wall installation. Initiated by up to 30 radio transmitters (wall-mounted and hand-held transmitters, motion detectors, room temperature sensor, window contact), up to six electrothermic actuators in 2-position control can be controlled for room temperature regulation.

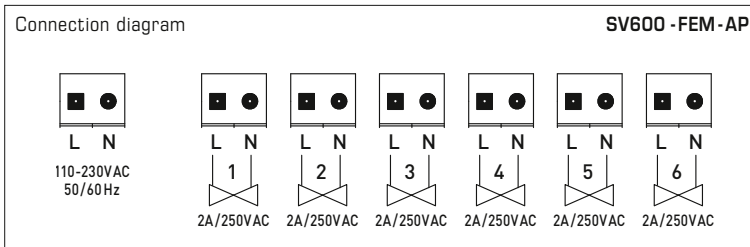
The corresponding fixed function, such as the selection of the operating mode, frost protection function, etc., is assigned directly when teaching-in the transmitter. The repeater function can be additionally activated by means of a simple procedure.

SV600 -FEM-AP



TECHNICAL DATA

Operating mode:	switching ON/OFF in 2-position control
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Rated voltage:	110 - 240 V, 50 / 60 Hz
Fusing:	16 A
Operating elements:	2 buttons ("LRN"/"CLR") 2 LEDs ("LRN"/"CLR") 1 rotary switch with 16 positions
Channels:	6 channels
Standby consumption:	0.6 W
Load output/ Connected load:	electronic switching contact rated current: 2 A / 250 V AC max. switch-on current: 2 A / 2 ms max. switching capacity AC1: 500 VA
Switching properties:	parametrisable
Connection:	4 mm ² , via terminal screws
Housing:	plastic, material ABS, 170 x 85 x 40 mm
Mounting:	On-wall
Ambient temperature:	-20...+40 °C (in operation)
Storage temperature:	-40...+85 °C
Permitted humidity:	5...90% r.H., non-precipitating air
Protection type:	IP 42 (according to EN 60 529)
Standards:	CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to directive 2011 / 65 / EU



KYMASGARD® SV600 -FEM-AP Control valve actuator					
Type / WG02	Channels	Switching element	Installation	Item no.	Price
SV600 -FEM-AP					
SV600-FEM-AP	6	electronic	On-wall	1801-7456-0800-300	267,23 €
Compatibility	For an overview, see the start of the chapter				

**Multifunctional outside radio sensor
for humidity, temperature and light intensity,
with solar cell**

The multifunctional outside sensor **KYMASGARD® AFTF-HK-FSE** is a maintenance-free radio transmitter without battery for on-wall installation. Energy is generated by converting outdoor light into electric energy by means of a solar generator. It is used to detect the outside temperature, outdoor humidity and outdoor light intensity and to transmit the measurands via radio signal to radio actuators and radio receivers/gateways.

AFTF-HK-FSE



TECHNICAL DATA

Operation:	Energy generation by solar cell, batteryless, maintenance-free
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 temperature, 1 humidity, 1 light intensity
Radio transmitter module:	EnOcean Dolphin
Measurand acquisition:	adjustable, every 1s / 10s / 100s
Transmission interval:	adjustable, typically every 100 seconds, or at any measuring value change, status telegram approximately every 16 minutes
Range of coverage:	Indoors typically 30-100m, outdoors up to 300m

HUMIDITY

Operating range, humidity:	0...100% r. H.
Deviation in humidity:	typically $\pm 2.0\%$ (20...80% r.H.) at +25 °C, otherwise $\pm 3.0\%$

TEMPERATURE

Operating range, temperature:	-20...+60 °C
Deviation in temperature:	typically $\pm 0.2\text{K}$ at +25 °C

LIGHT INTENSITY

Light intensity operating range:	Multi-range switching 0...2000 Lux / 0...60 kLux
Deviation in light intensity:	typically < 5% of final value

Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), traffic white colour (similar to RAL 9016), housing cover is transparent!
----------	---

Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
---------------------	---------------------------

Protective tube:	made of stainless steel V2A (1.4301), $\varnothing = 16\text{ mm}$, NL = 55 mm
------------------	--

Sensor protection:	plastic sinter filter, $\varnothing 16\text{ mm}$, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing 16\text{ mm}$, L = 32 mm)
--------------------	--

Ambient temperature:	-25...+60 °C
----------------------	--------------

Storage temperature:	-25...+60 °C
----------------------	--------------

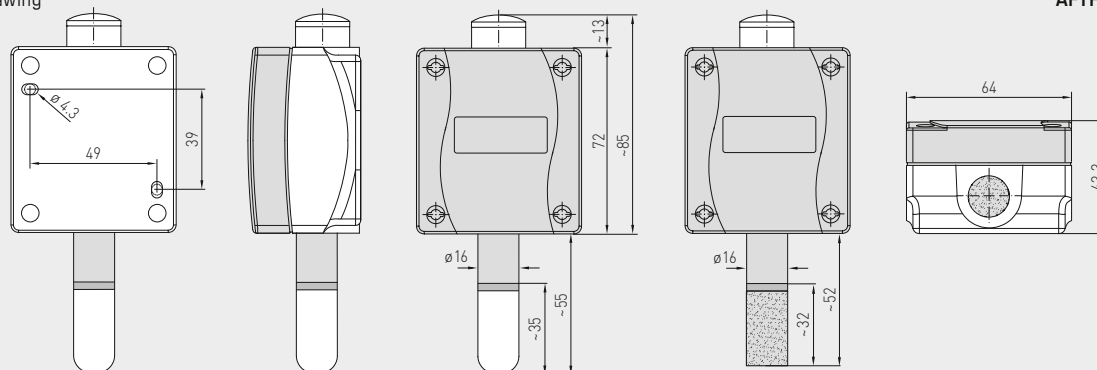
Permitted humidity:	0...90% r.H., non-precipitating air
---------------------	-------------------------------------

Protection class:	III (according to EN 60 730)
-------------------	------------------------------

Protection type:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
------------------	---

Standards:	CE conformity according to EMC Directive 2014 / 30 / EU and according to R&TTE Directive 2014 / 53 / EU
------------	---

Dimensional drawing



AFTF-HK-FSE

KYMASGARD® AFTF-HK-FSE Outside radio sensor for humidity, temperature and light intensity

Type / WG02	Channels	Measuring ranges			Item no.	Price
		Temperature	Humidity	Light intensity		
AFTF-HK-FSE				(switchable)		
AFTF-HK-FSE	3	-20...+60 °C	0...100%r.H.	0...2000 Lux / 0...60 kLux	1801-1140-1000-000	243,08 €
Compatibility	For an overview, see the start of the chapter					



Multifunctional outside radio sensor
for wind strength and light intensity,
with solar cell

The multifunctional outside radio sensor KYMASGARD® AWSF-HK-FSE is a maintenance-free radio sensor without battery for on-wall installation. Energy is generated by converting outdoor light into electric energy by means of a solar generator. It is used to detect the wind speed and outdoor light intensity and to transmit to the measurands via radio signal to radio actuators and radio receivers / gateways.

AWSF-HK-FSE



TECHNICAL DATA	
Operation:	Energy generation by solar cell, batteryless, maintenance-free
Radio technology:	EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
Channels:	1 wind speed, 1 light intensity
Radio transmitter module:	EnOcean Dolphin
Measurand acquisition:	adjustable, 1s / 10 s / 100 s and on event
Transmission interval:	adjustable, typically every 100 seconds at any measuring value change, status telegram approximately every 16 minutes
Range of coverage:	Indoors typically 30 - 100 m, outdoors up to 300 m
WIND STRENGTH	
Wind operating range:	0..100 km/h
Wind deviation:	typically ± 5 km/h
LIGHT INTENSITY	
Light intensity operating range:	Multi-range switching 0..2000 Lux / 0..60 kLux
Deviation in light intensity:	typically < 5% of final value
Housing:	plastic, PC material, UV-resistant light grey colour (similar to RAL 7035)
Housing dimensions:	approx. 200 x 50 x 50 mm
Mounting:	Wall-mounted via screws, on-wall
Ambient temperature:	-25...+60 °C
Storage temperature:	-25...+60 °C
Permitted humidity:	0...90% r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU and according to R&TTE Directive 2014 / 53 / EU

KYMASGARD® AWSF-HK-FSE Outside radio sensor for wind strength and light intensity				
Type / WG02	Channels	Measuring ranges	Item no.	Price
AWSF-HK-FSE		Wind strength		
		Light intensity		
AWSF-HK-FSE	2	0..100 km/h	1801-1150-5000-000	303,77 €
Compatibility	For an overview, see the start of the chapter			



Accessories

Take advantage of our comprehensive range of accessories, which can be used together with our entire product portfolio. This keeps you always a step ahead, and best of all: If you buy and stock up, you will also save on the price.

Our standard devices normally differ in type of design and sensors. Depending on the application, you can install S+S accessories directly on site.



IMMERSION SLEEVES & ACCESSORIES

602 – 621

Immersion sleeves

TH 08	Immersion sleeves for temperature sensors	604
TH	Immersion sleeves for temperature sensors	606
THR	Immersion sleeves for temperature controllers	608
THE	Immersion sleeves for sleeve sensors	610

Mounting accessories

MFT-20-K	Mounting flange, plastic	612
MF-xx-K	Mounting flange, plastic	612
MF-xx-M	Mounting flange, metal	613
KRD-04	Capillary tube gland bracket, plastic	612
MK-xx	Mounting brackets	613
ESSH	Welding protection sleeve	614
KVSS / KVST	Clamp connections	614
TH-Adapter-HW	Immersion sleeve adapter (Honeywell / Centraline)	614

Accessories for differential pressure switches

ASD-06	Connection set	615
ASD-07	Connection nipple (90°)	615
ASS-UV	Connection hose, UV-resistant	615
DAL	Pressure outlet	615
DS-MW	Mounting bracket, sheet steel	615

Protection hoods

WS-01	Sun and ball-impact protection hood	616
WS-03	Weather and sun protection hood (Tyr 2)	616
WS-04	Weather and sun protection hood (Tyr 1)	616

Spare parts, small parts

SF-xx	Sinter filters, replaceable	617
PSW-09	Stainless steel paddle (SW)	617
PWFS-08	Stainless steel vane (WFS)	617
WH-20	Wall holder (KH)	617
HS-Adapter	Universal holder for small housing (top hat rails)	617
Modbus-Y	Y-adapter for cable gland	617
SPB-1	Strap for surface-contact sensor	617
WLP-1	Heat-conductive paste, silicone-free	617

Special accessories for plug-in connectors

Connection accessories, A-coded, 5-pin or 12-pin	618
Connection accessories, EtherCAT-coded, 4-pin	619

Miscellaneous

Optional services, single services	621
Custom-made products	620

THERMASGARD® TH 08

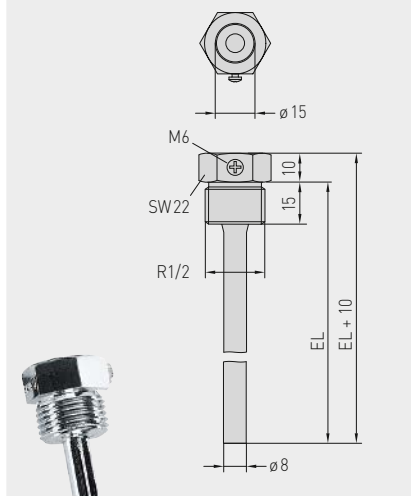
Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors and measuring transducers

TF 43, TM 43, TF 65, TM 65, TM 65-Modbus (Tyr 1)



S+S REGELTECHNIK

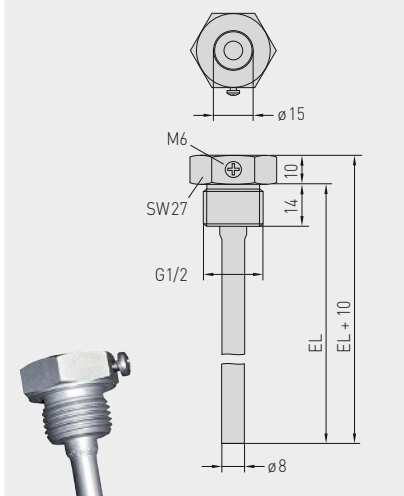
Dimensional drawing TH08-ms/xx



TH08-ms/xx

Immersion sleeve, nickel-plated brass
thread-sealing, conical, according to DIN 10226

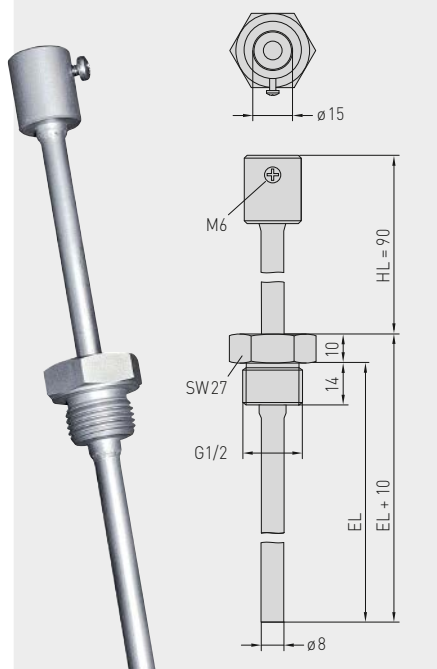
Dimensional drawing TH08-VA/xx



TH08-VA/xx

Immersion sleeve, stainless steel V4A (1.4571)
flat sealing, cylindrical, according to DIN 228

Dimensional drawing TH08-VA/xx/90



TH08-VA/xx/90

Immersion sleeve, stainless steel V4A (1.4571) with neck tube
flat sealing, cylindrical, according to DIN 228

THERMASGARD® TH 08 Immersion sleeve Ø 8 mm

Type / WGD1	p _{max} (static)	T _{max}	Inserted length (EL)	Item No.	Price
TH08-<u>ms</u>/xx	Brass nickel-plated			Ø 8 x 0.75 mm	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	8,21 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	9,35 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	9,88 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	10,19 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	11,81 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	12,13 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	12,23 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	12,34 €
TH08-<u>VA</u>/xx	Stainless steel V4A (1.4571)			Ø 8 x 0.75 mm	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	17,88 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	19,76 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	21,23 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	22,38 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	27,82 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	29,07 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	29,27 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	29,79 €
TH08-<u>VA</u>/xx/90	Stainless steel V4A (1.4571), with neck tube (90mm)			Ø 8 x 0.75 mm	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	25,61 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	26,76 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	28,07 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	29,27 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	30,68 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	33,25 €

Note: Inner diameter of socket 15.0mm

INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

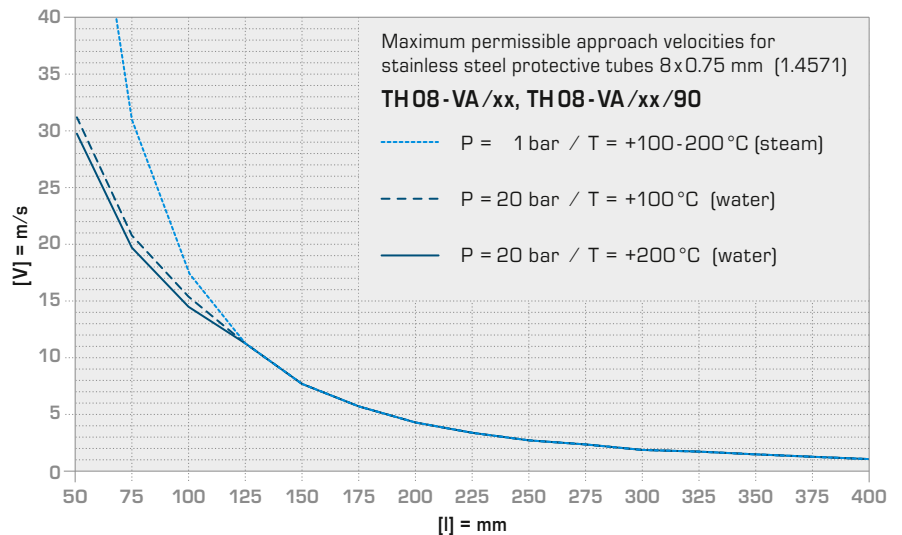
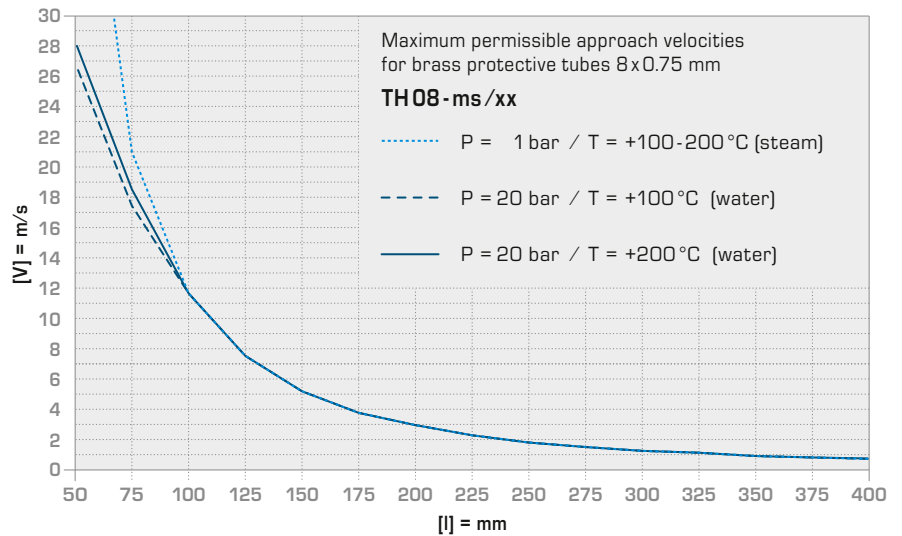
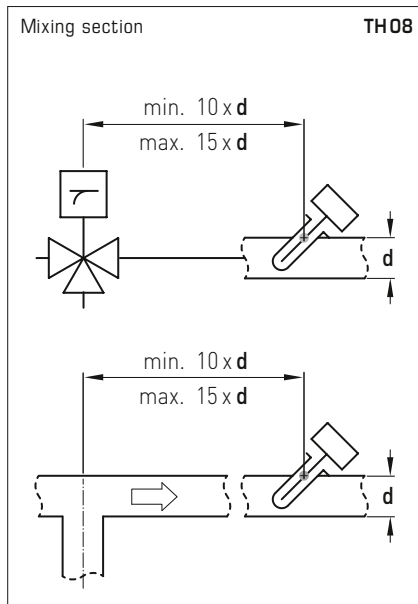
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph TH08-VA) as well as for brass protective tubes (see graph TH08-ms).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.

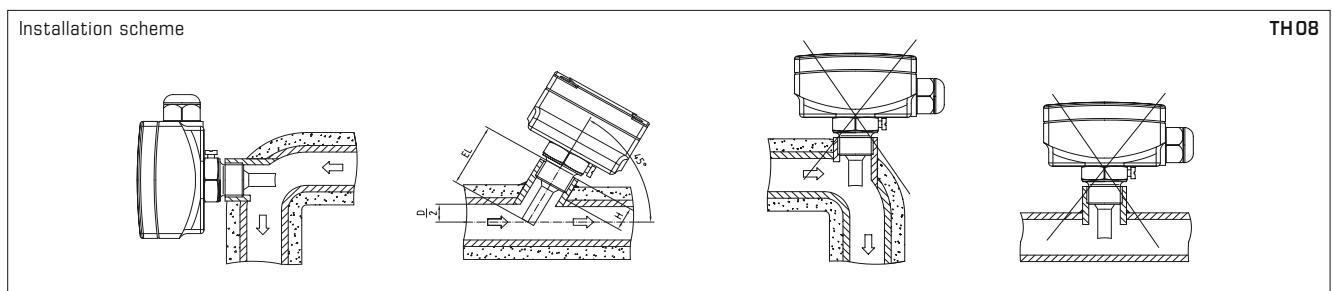


When Copper and Zinc are Not Enough

Uncompromising quality and safety are also paramount in the design of the accessory from S+S. This is why our metal immersion sleeves for duct sensors are made using either nickel plated brass or stainless steel. Brass is an alloy consisting mainly of copper and zinc, which provide good forming and machining properties, mechanical strength, temperature resistance and electrical conductivity.

In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

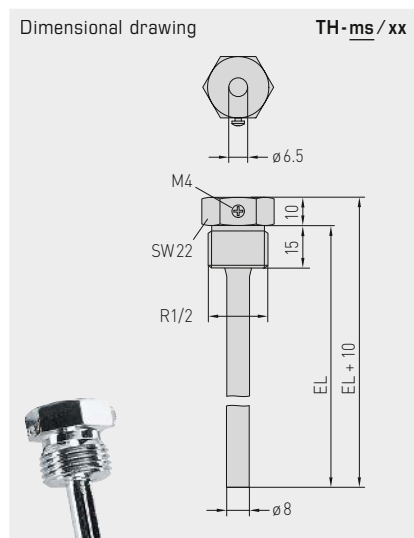


THERMASGARD® TH

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors and measuring transducers TF 54/TM 54 (form B)

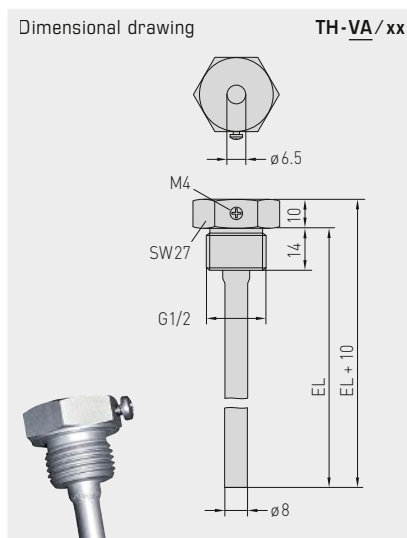


S+S REGELTECHNIK



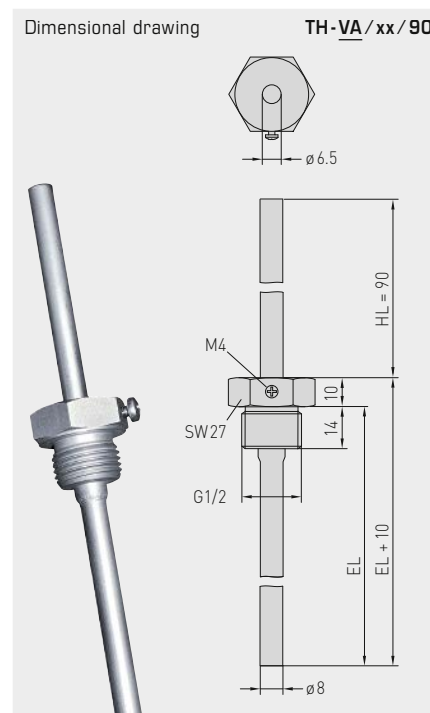
TH-ms/xx

Immersion sleeve, nickel-plated brass, thread-sealing, conical, according to DIN 10226



TH-VA/xx

Immersion sleeve, stainless steel V4A (1.4571), flat sealing, cylindrical, according to DIN 228



TH-VA/xx/90

Immersion sleeve, stainless steel V4A (1.4571) with neck tube, flat sealing, cylindrical, according to DIN 228

THERMASGARD® TH Immersion sleeve Ø 8 mm					
Type / WGD1	p _{max} (static)	T _{max}	Inserted length (EL)	Item No.	Price
TH-ms/xx	Brass nickel-plated			Ø 8 x 0.75 mm	
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	8,21 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	9,35 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	9,88 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	10,19 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	11,81 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	12,13 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	12,23 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	12,34 €
TH-VA/xx	Stainless steel V4A (1.4571)			Ø 8 x 0.75 mm	
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	17,88 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	19,76 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	21,23 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	22,38 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	27,82 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	29,07 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	29,27 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	29,79 €
TH-VA/xx/90	Stainless steel V4A (1.4571), with neck tube (90mm)			Ø 8 x 0.75 mm	
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	25,61 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	26,76 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	28,07 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	29,27 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	30,68 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	33,25 €
Note:	Inner diameter of socket 6.5 mm				

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors and measuring transducers TF54/TM54 (form B)

INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

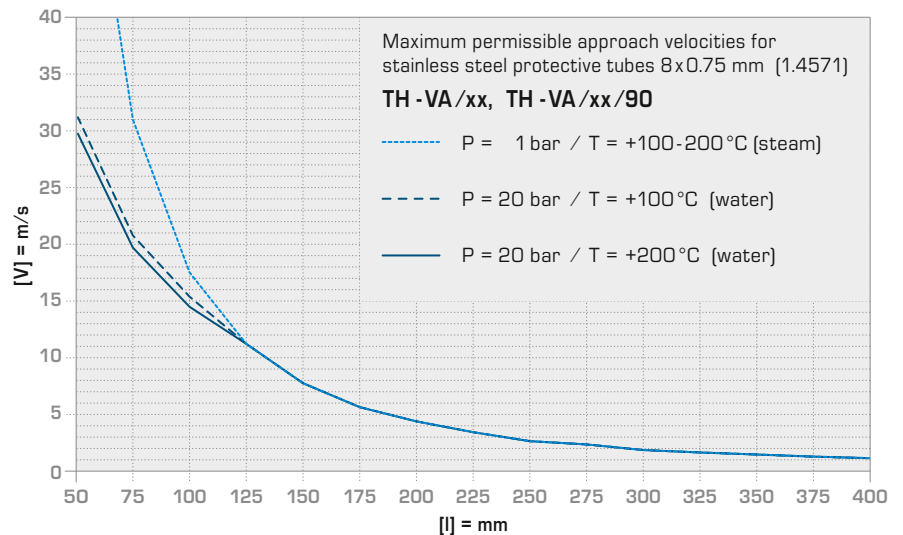
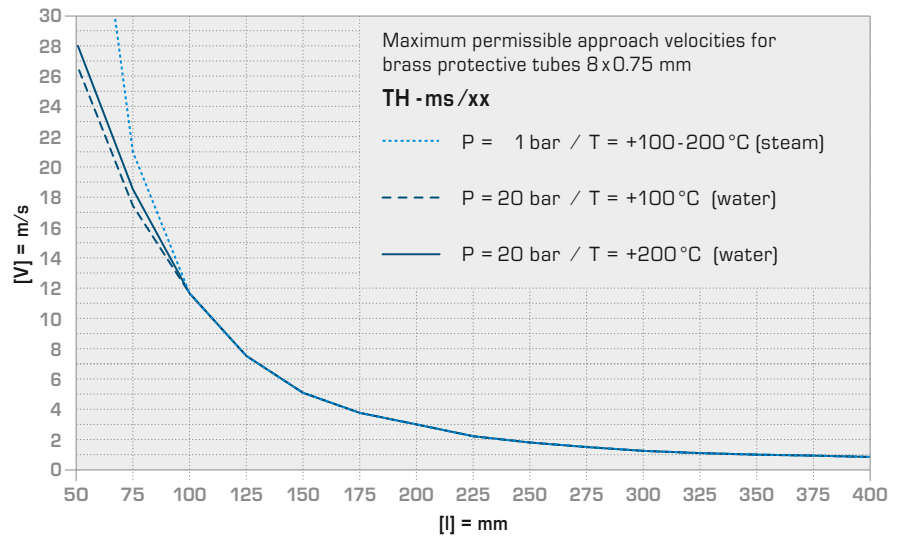
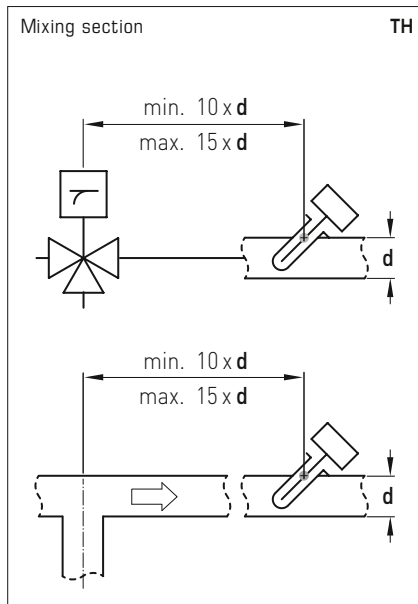
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph TH-VA) as well as for brass protective tubes (see graph TH-ms).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.

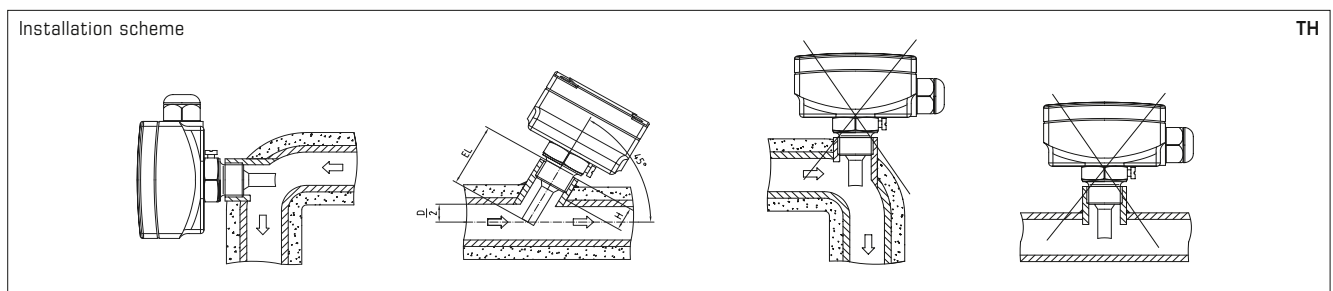


When Copper and Zinc are Not Enough

Uncompromising quality and safety are also paramount in the design of the accessory from S+S. This is why our metal immersion sleeves for duct sensors are made using either nickel plated brass or stainless steel. Brass is an alloy consisting mainly of copper and zinc, which provide good forming and machining properties, mechanical strength, temperature resistance and electrical conductivity.

In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).



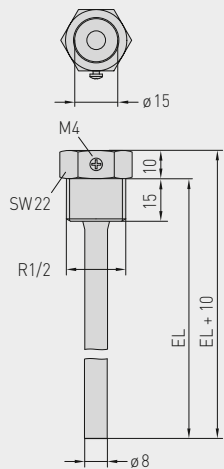
THERMASGARD® THR

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature controllers ETR (Thor 2)



S+S REGELTECHNIK

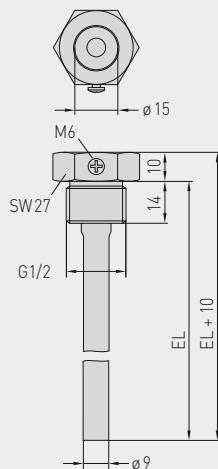
Dimensional drawing **THR -ms-08 / xx**



THR -ms-08 / xx

Immersion sleeve, nickel-plated brass
thread-sealing, conical, according to DIN 10226

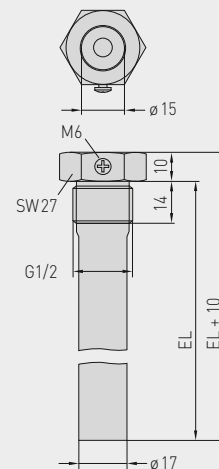
Dimensional drawing **THR -VA-09 / xx**



THR -VA-09 / xx

Immersion sleeve, stainless steel V4A (1.4571)
flat sealing, cylindrical, according to DIN 228

Dimensional drawing **THR -VA-17 / xx**



THR -VA-17 / xx

Immersion sleeve, stainless steel V4A (1.4571)
flat sealing, cylindrical, according to DIN 228

When Copper and Zinc are Not Enough

Uncompromising quality and safety are also paramount in the design of the accessory from S+S. This is why our metal immersion sleeves for duct sensors are made using either nickel plated brass or stainless steel. Brass is an alloy consisting mainly of copper and zinc, which provide good forming and machining properties, mechanical strength, temperature resistance and electrical conductivity.

In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm for THERMASREG® ETR (Thor 2)

Type / WG01	p _{max} (static)	T _{max}	Time Constant for Medium:			Inserted Length (EL)	Item No. Ø	Price
			Air	Water	Oil			
THR -ms-08 / xx	Brass nickel-plated						Ø 8 x 0.5 mm	
THR-MS-08/100	10 bar	+150 °C	106 s	18 s	53 s	100 mm	7100-0011-3022-000	13,60 €
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	150 mm	7100-0011-3404-000	13,71 €
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	200 mm	7100-0011-3403-000	16,29 €
THR -VA-09 / xx	Stainless steel V4A (1.4571)						Ø 9 x 1.0 mm	
THR-VA-09/100	25 bar	+150 °C	92 s	17 s	41 s	100 mm	7100-0012-3022-000	35,03 €
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	150 mm	7100-0012-3032-000	36,15 €
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	200 mm	7100-0012-3042-000	38,73 €
THR -VA-17 / xx	Stainless steel V4A (1.4571)						Ø 17 x 1.0 mm	
THR-VA-17/150	25 bar	+150 °C	-	45 s	55 s	150 mm	7100-0012-3033-000	36,15 €
THR-VA-17/200	25 bar	+150 °C	-	45 s	55 s	200 mm	7100-0012-3404-000	38,73 €
Ordering example:	THR -ms-08 / 100 (Brass immersion sleeve, Ø = 8 mm, EL = 100 mm) THR -VA-09 / 150 (Stainless steel immersion sleeve, Ø = 9 mm, EL = 150 mm) THR -VA-17 / 200 (Stainless steel immersion sleeve, Ø = 17 mm, EL = 200 mm)							
Note:	inner diameter of socket 15.0 mm							

INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

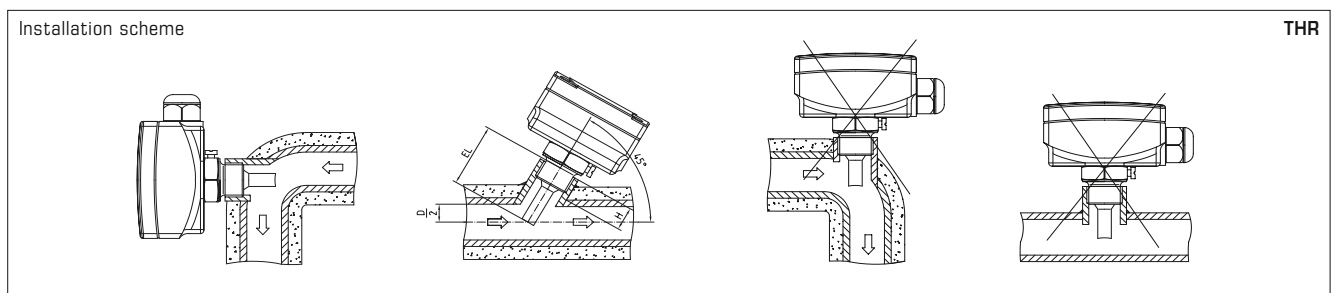
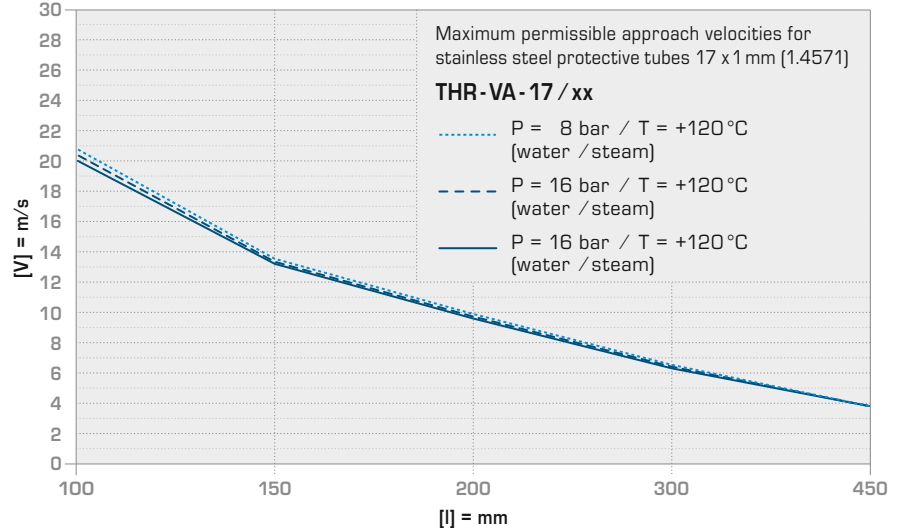
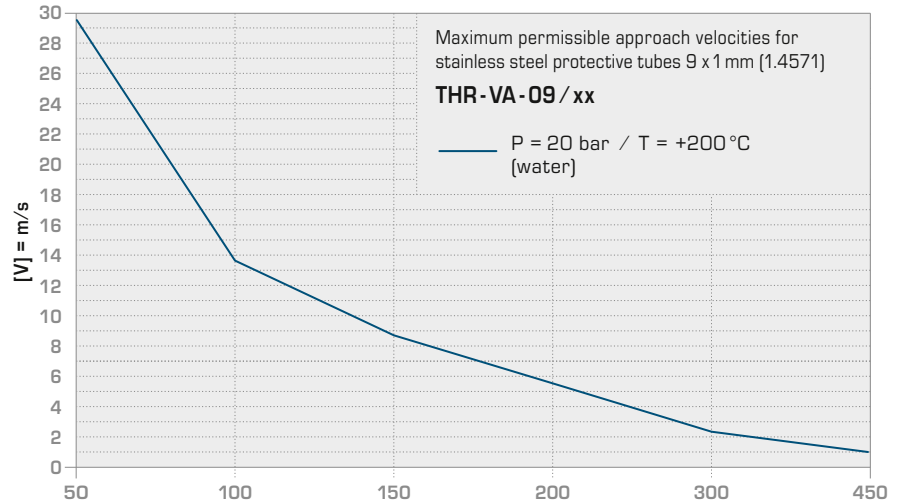
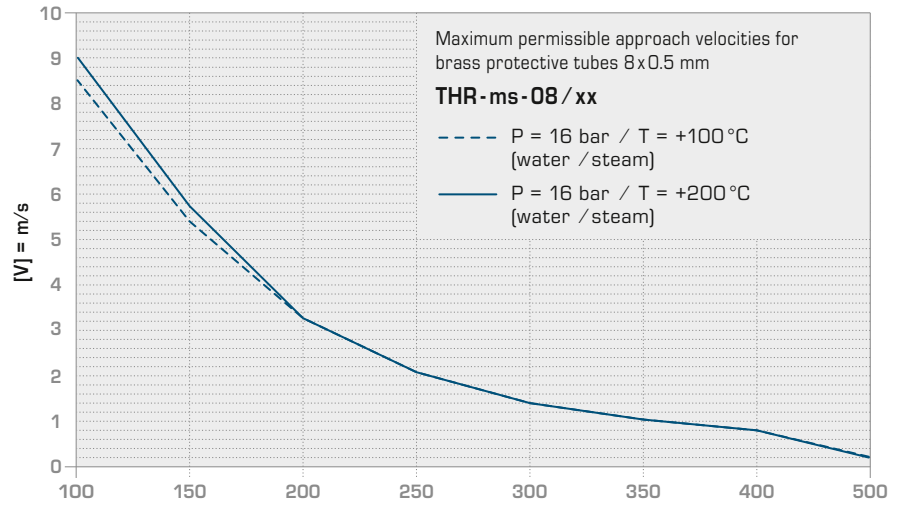
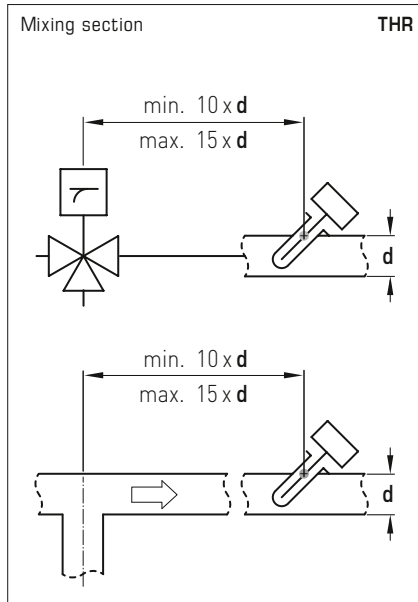
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **THR-VA**) as well as for brass protective tubes (see graph **THR-ms**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

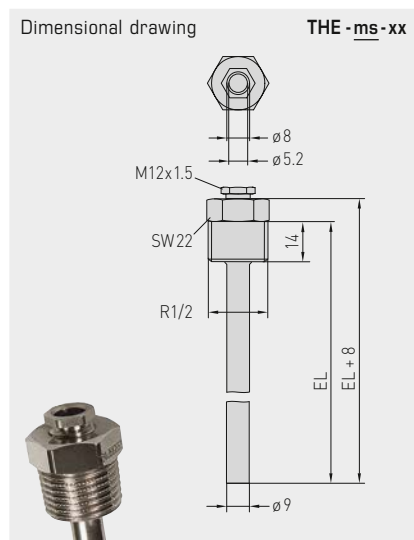
MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.



THERMASGARD® THE

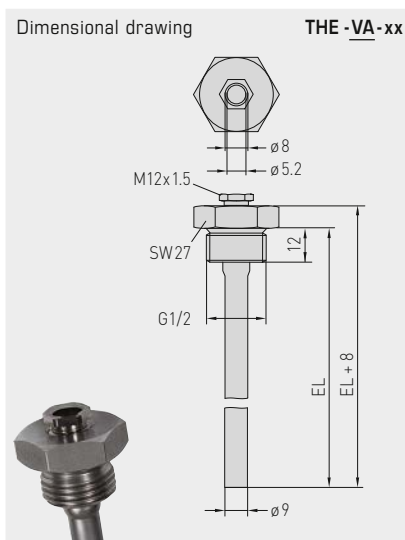
Immersion sleeves made of stainless steel or brass, nickel-plated, with adjusting screw, for sleeve sensor HTF/HFTM



THE -ms-xx

Immersion sleeve, nickel-plated brass

with adjusting screw, thread-sealing, conical, according to DIN 10226



THE -VA-xx

Immersion sleeve, stainless steel V4A (1.4571)

with adjusting screw, flat sealing, cylindrical, according to DIN 228



When Copper and Zinc are Not Enough

Uncompromising quality and safety are also paramount in the design of the accessory from S+S. This is why our metal immersion sleeves for duct sensors are made using either nickel plated brass or stainless steel. Brass is an alloy consisting mainly of copper and zinc, which provide good forming and machining properties, mechanical strength, temperature resistance and electrical conductivity.

In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

THERMASGARD® THE Immersion sleeve Ø 9 mm for THERMASGARD® HTF / HFTM					
Type / WG01	p _{max} static	T _{max}	Inserted Length (EL)	Item No.	Price
THE -ms / xx	Brass nickel-plated			Ø 9 x 1,0 mm	
THE-MS 50MM	16 bar	+130 °C	50 mm	7100-0011-6010-002	9,22 €
THE-MS 100MM	16 bar	+130 °C	100 mm	7100-0011-6020-002	9,96 €
THE-MS 150MM	16 bar	+130 °C	150 mm	7100-0011-6030-002	10,33 €
THE-MS 200MM	16 bar	+130 °C	200 mm	7100-0011-6040-002	11,06 €
THE-MS 250MM	16 bar	+130 °C	250 mm	7100-0011-6050-002	12,39 €
THE -VA / xx	Stainless steel V4A (1.4571)			Ø 9 x 1,0 mm	
THE-VA 50MM	40 bar	+200 °C	50 mm	7100-0012-6010-002	18,25 €
THE-VA 100MM	40 bar	+200 °C	100 mm	7100-0012-6020-002	20,16 €
THE-VA 150MM	40 bar	+200 °C	150 mm	7100-0012-6030-002	21,65 €
THE-VA 200MM	40 bar	+200 °C	200 mm	7100-0012-6040-002	22,83 €
THE-VA 250MM	40 bar	+200 °C	250 mm	7100-0012-6050-002	28,38 €
THE-VA 300MM	40 bar	+200 °C	300 mm	7100-0012-6060-002	29,65 €
THE-VA 400MM	40 bar	+200 °C	400 mm	7100-0012-6080-002	30,61 €
Ordering example:	THE -ms - 150 (Brass immersion sleeve, Ø = 9 mm, EL = 150 mm) THE -VA - 150 (Stainless steel immersion sleeve, Ø = 9 mm, EL = 150 mm) Other inserted lengths on request				
Note:	inner diameter of socket 5.2 mm, with adjusting screw M12 x 1.5				

INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

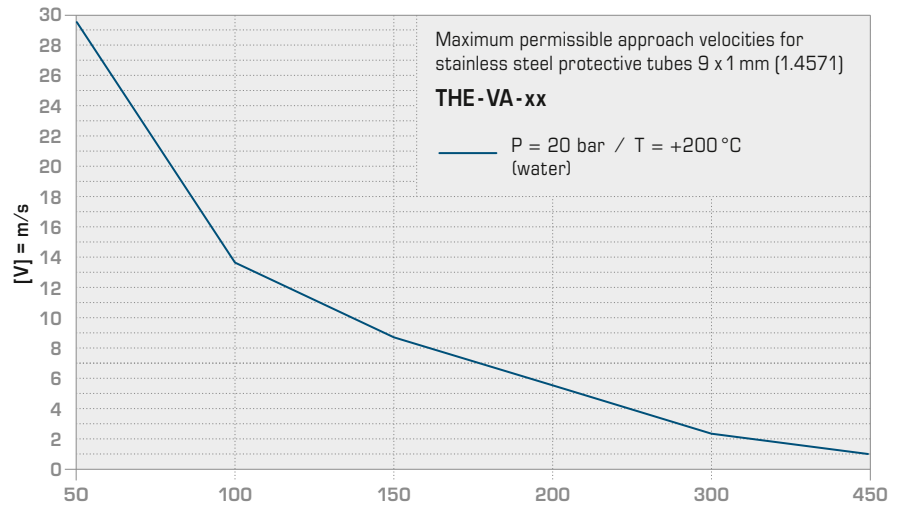
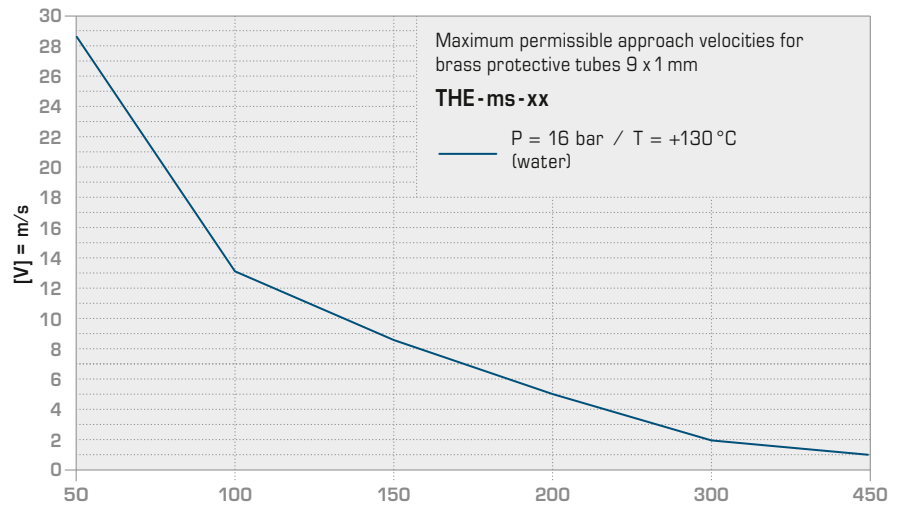
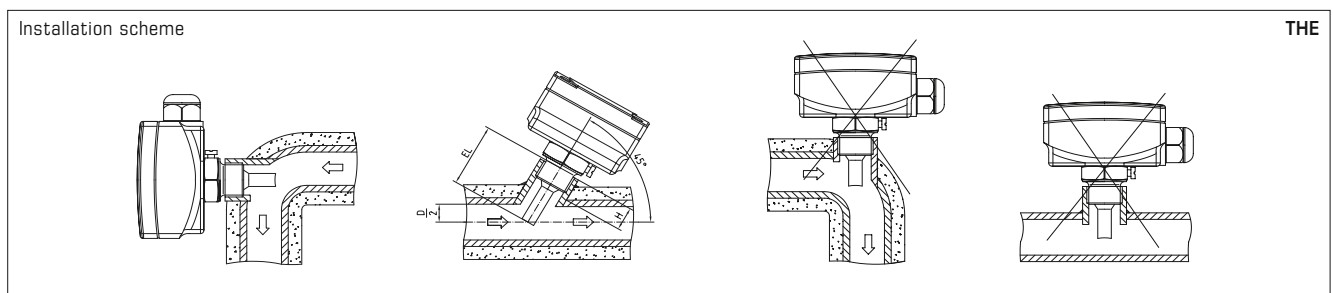
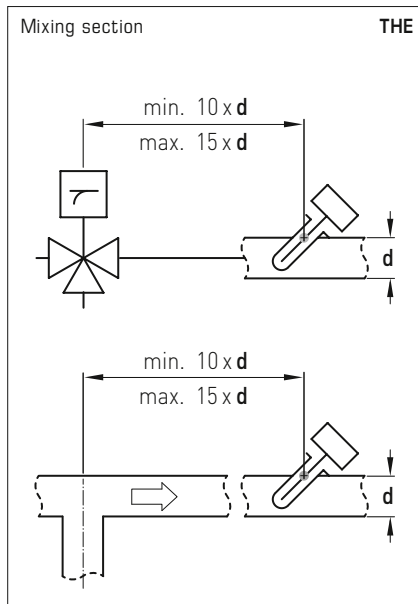
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **THE-VA**) as well as for brass protective tubes (see graph **THE-ms**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

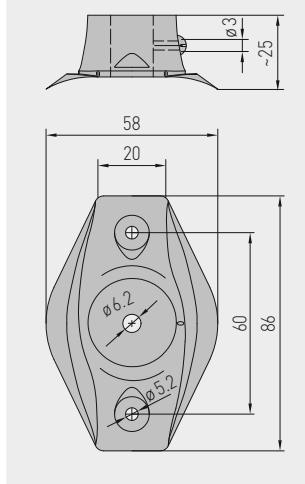
MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.



Mounting flange, plastic
Capillary tube gland bracket

Dimensional drawing **MF-06-K**

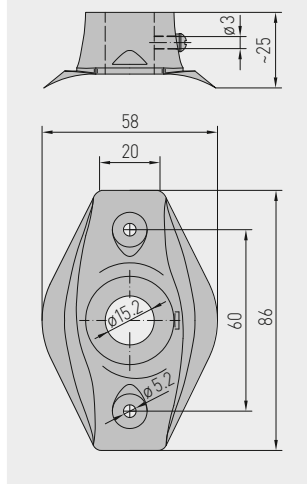


MF-06-K

Mounting flange, plastic



Dimensional drawing **MF-15-K**

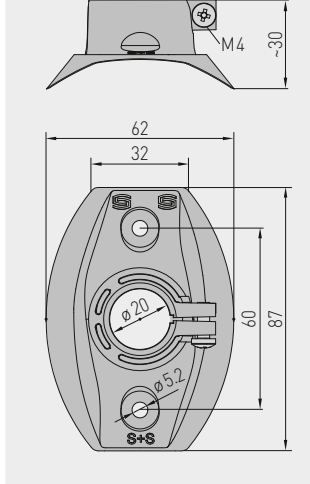


MF-15-K

Mounting flange, plastic



Dimensional drawing **MFT-20-K**

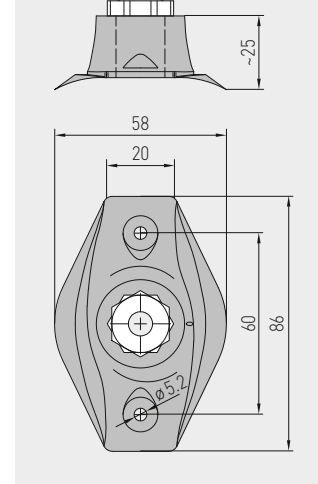


MFT-20-K

Mounting flange, plastic



Dimensional drawing **KRD-04**



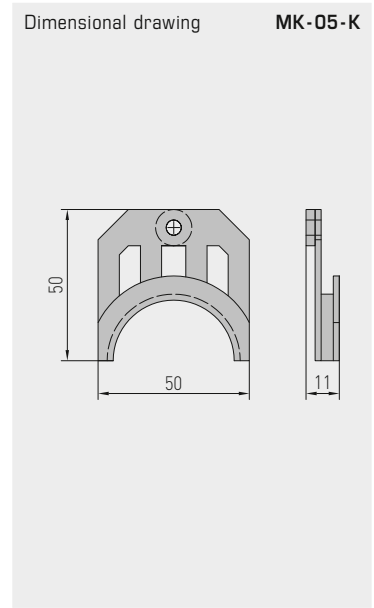
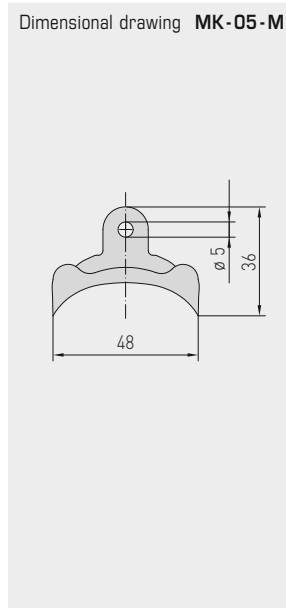
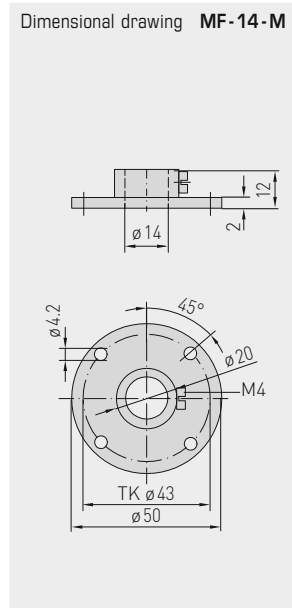
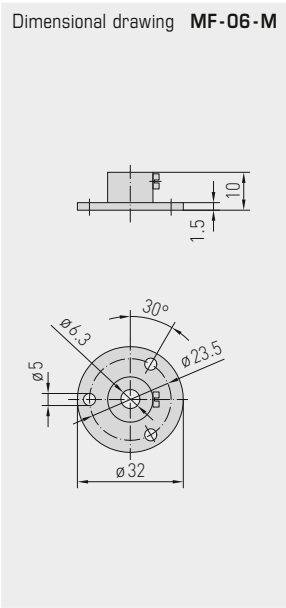
KRD-04

Capillary tube gland bracket, plastic



Type/WG01	Mounting flange, plastic	Tube Gland	T _{max}	Item No.	Price
MF-xx-K	for metal protective tubes!				
MF-06-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for rod sensors MWTF/MWTM	Ø 6.2 mm	+100 °C	7100-0030-1000-000	5,40 €
MF-10-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct air flow monitors KLGF/KLSW	Ø 10.2 mm	+100 °C	7100-0031-1000-000	8,43 €
MF-14-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct humidity sensors KFF/KFTF and pendulum room humidity sensors RPFF/RPFTF as well as for duct air flow monitors KLGF/KLSW	Ø 14.2 mm	+100 °C	7100-0030-2000-000	8,43 €
MF-15-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for temperature sensors TF (series Tyr 1) and temperature measuring transducers TM (series Tyr 1)	Ø 15.2 mm	+100 °C	7100-0032-0000-000	5,40 €
MF-20-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct sensors KH	Ø 20.2 mm	+100 °C	7100-0030-4000-000	8,43 €
MFT-20-K	for PLEUROFORM multi-channel pipes!				
MFT-20-K	Mounting flange, plastic, approx. 62 x 87 x 30 mm for duct sensors (series Tyr 1 / Tyr 2)	Ø 20 mm	+100 °C	7000-0031-0000-000	8,43 €

Type/WG01	Capillary tube gland bracket	Item No.	Price
KRD-04	Capillary tube gland bracket, plastic, approx. 58 x 86 x 25 mm (M 16 x 1.5) for frost protection thermostats (e.g. for air ducts) and rod sensors MWTF/MWTM	7100-0030-7000-000	7,86 €



MF-06-M

Mounting flange, metal



MF-14-M

Mounting flange, metal



MK-05-M

Galvanised steel mounting clamps



MK-05-K

Mounting clamps, plastic

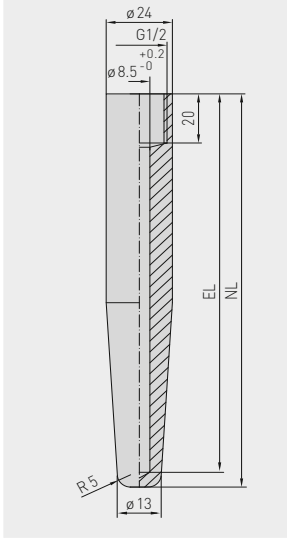


Type / WG01	Mounting flange, metal	Tube Gland	T _{max}	Item No.	Price
MF-xx-M	for metal protective tubes!				
MF-06-M	Mounting flange, metal (galvanised steel), Ø 32 mm, for temperature sensors TF (form B) temperature measuring transducers TM (form B), rod sensors MWTF/MWTM	Ø 6.3 mm	+700 °C	7100-0030-5000-000	8,43 €
MF-14-M	Mounting flange, metal (galvanised steel), Ø 50 mm, for duct humidity sensors KFF/KFTF and pendulum room humidity sensors RPFF/RPFTF	Ø 14.0 mm	+700 °C	7100-0030-6000-000	27,83 €

Type / WG01	Mounting clamps	Item No.	Price
MK-05-M	Galvanised steel mounting clamps (6 pieces) for rod sensors MWTF/MWTM	7100-0034-0000-000	8,71 €
MK-05-K	Plastic mounting clamps (6 pieces) for frost protection thermostats	7100-0034-1000-000	8,71 €

Mounting accessories
for Immersion sensor

Dimensional drawing **ESSH**

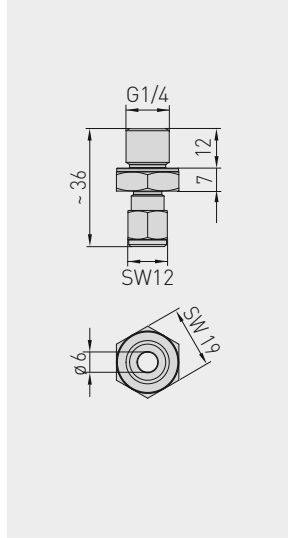


ESSH

Welding protective sleeve



Dimensional drawing **KVSS**

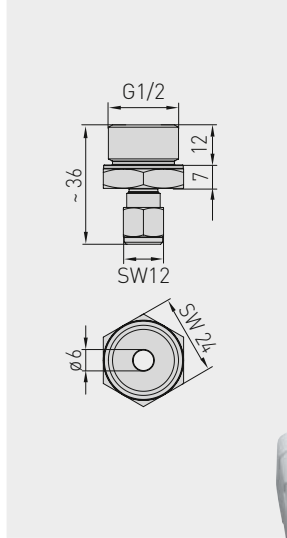


KVSS

Clamp union with cutting ring



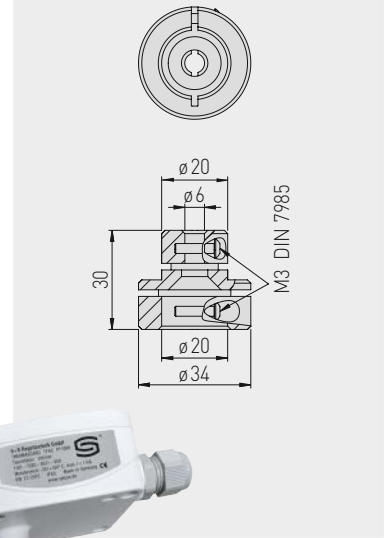
Dimensional drawing **KVST**



KVST

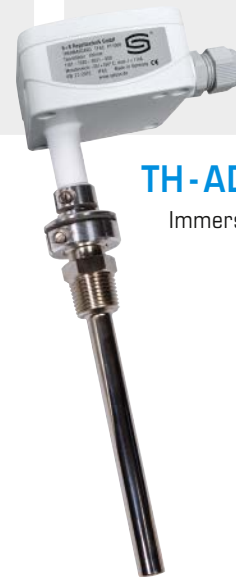
Clamp union with clamp ring

Dimensional drawing **TH-ADAPTER-HW**



TH-ADAPTER-HW

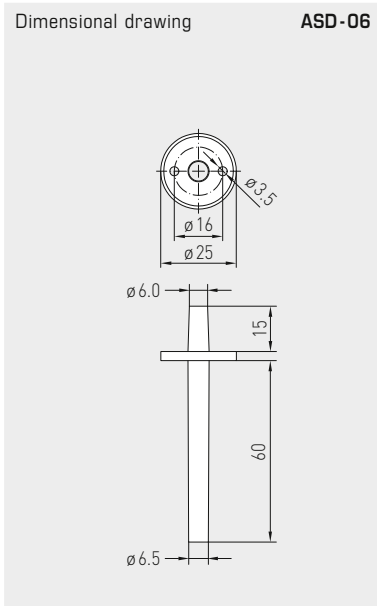
Immersion sleeve adapter, metal



Type / WG01	Welding protective sleeve	Item No.	Price
	Welding protecting sleeves, G 1/2" straight internal pipe thread, stainless steel V4A (1.4571), other materials on request,		
ESSH 100MM	for immersion sleeves (EL) = 100 mm, P _{max} = 100 bar	7100-0052-0020-001	60,73 €
ESSH 150MM	for immersion sleeves (EL) = 150 mm, P _{max} = 100 bar	7100-0052-0030-001	69,72 €
ESSH 200MM	for immersion sleeves (EL) = 200 mm, P _{max} = 100 bar	7100-0052-0040-001	78,69 €

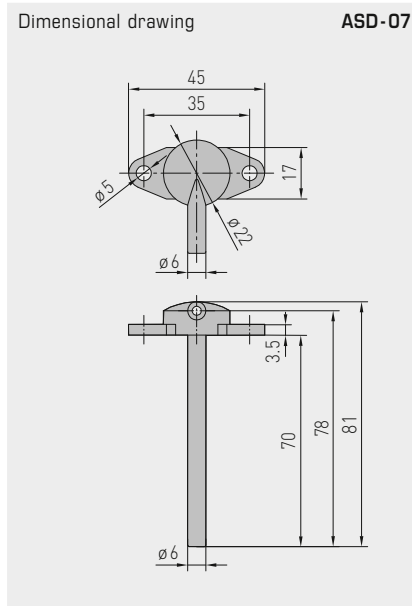
Type / WG01	Clamp union	Item No.	Price
KVST	Clamp union with clamp ring PTFE, Ø 6 mm	7100-0032-0110-000	31,82 €
KVSS	Clamp union with cutting ring VA, Ø 6 mm	7100-0032-1000-000	16,74 €

Type / WG01	Immersion sleeve adapter, metal	Item No.	Price
TH-ADAPTER-HW	Metal immersion sleeve adapter (adaptation Ø 20 mm / Ø 6 mm) for mounting S+S temperature sensors from the TF and TM series in immersion sleeves by Honeywell / CentraLine of the types VFFT, VFL, VFNT, VFLN	7100-0037-0001-000	13,66 €



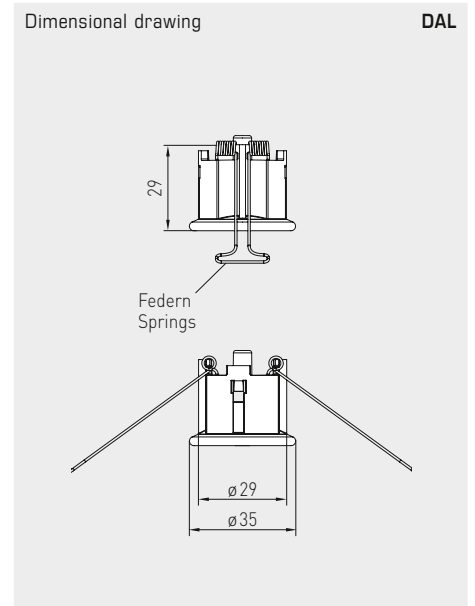
ASD-06

Connection set
(straight nipples)



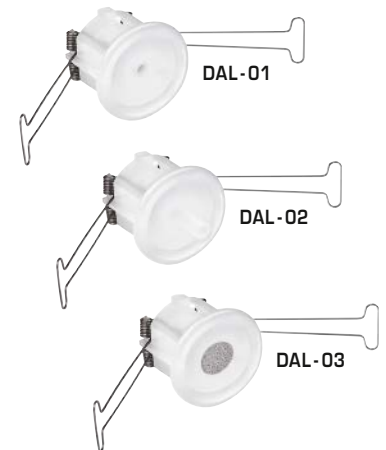
ASD-07

Connection nipples
(at 90 degree angle)



DAL

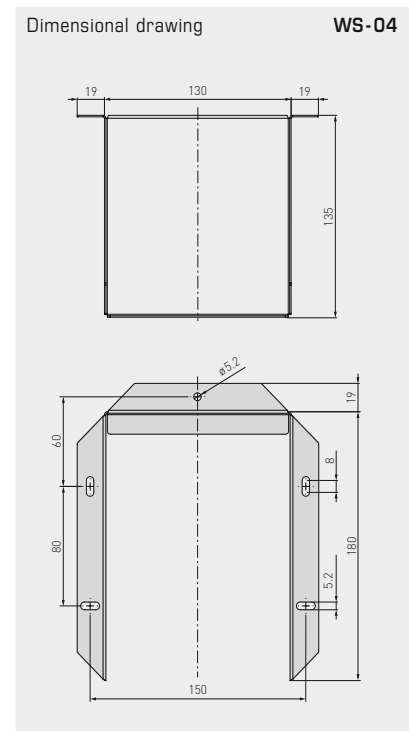
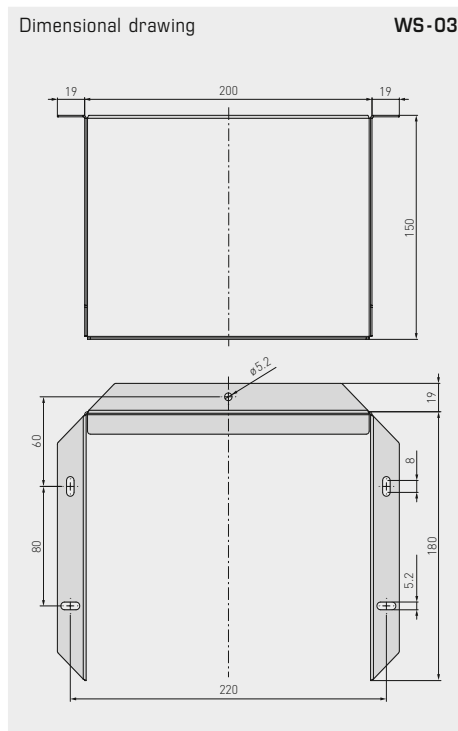
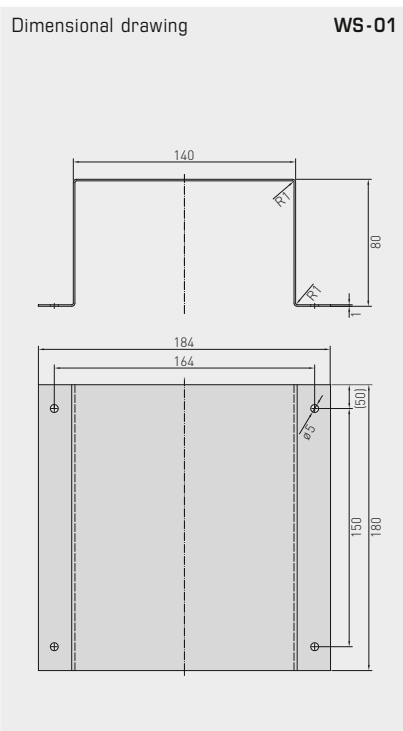
Pressure outlet



Type / WG01	Accessories for differential pressure switches	Item No.	Price
ASD-06	Connection set consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant), 4 Philips head screws (no pre-drilling required)	7100-0060-3000-000	6,74 €
ASD-07	2 connection nipples (at 90 degree angle) made of ABS	7100-0060-7000-000	6,74 €
ASS-UV 100M	Connecting hose, UV-resistant, Ø 6mm, 1 roll (100m)	7100-0060-3101-000	1427,11 €
DAL-01	Pressure outlet for ceiling and in-wall installation as a pressure reference point	7300-0060-3000-001	31,55 €
DAL-02	for hose attachment	7300-0060-3000-100	31,55 €
DAL-03	as a pressure reference point, with sinter filter made of stainless steel V4A (1.4404)	7300-0060-3000-200	59,07 €

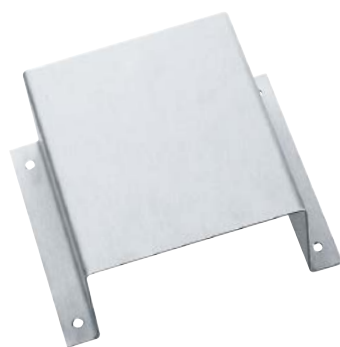
Type / WG01	Accessories for differential pressure switches DS1, DS2	Item No.	Price
DS-MW-Z	Sheet steel mounting angle in Z-Form	7100-0063-0000-000	11,78 €
DS-MW-L	Sheet steel mounting angle in L-Form	7100-0063-1000-000	12,06 €
DS-MW-U	Sheet steel mounting angle in U-Form	7100-0060-9000-000	14,82 €

Protection hoods



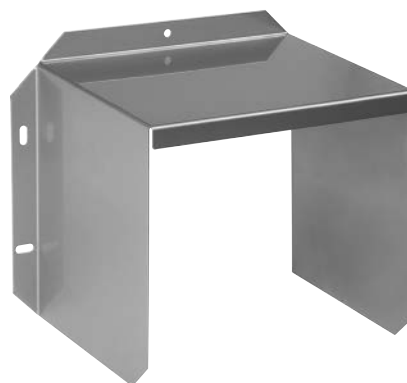
WS-01

Sun and ball-impact protection hood



WS-03

Weather and sun protection hood

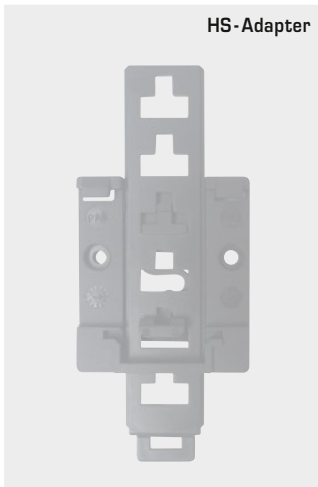


WS-04

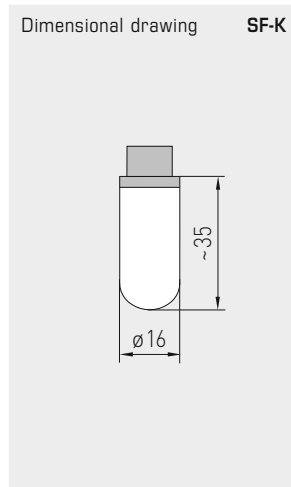
Weather and sun protection hood



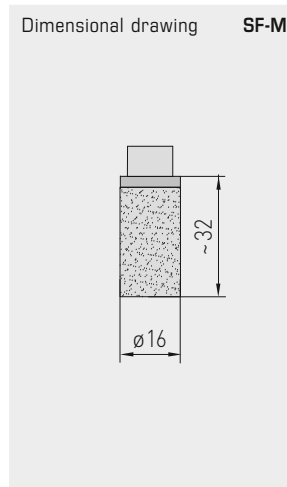
Type / WG01	Protection hoods	Item No.	Price
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000	28,02 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	39,45 €
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000	33,06 €



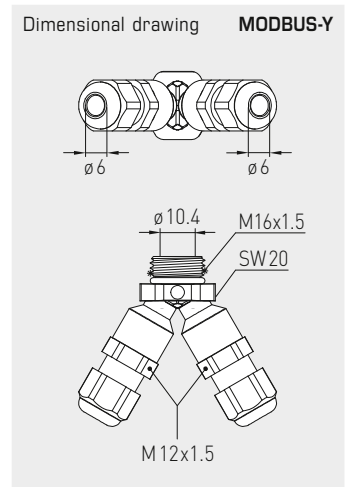
HS-Adapter



Dimensional drawing SF-K



Dimensional drawing SF-M



Dimensional drawing MODBUS-Y

HS-Adapter

Universal holder for small housing on top-hat rails



SF-K

Plastic sinter filter



SF-M

Metal sinter filter



MODBUS-Y

Y-Adapter als Bypass für Busanschluss



Type / WG01	Spare parts, small parts and special accessories	Item No.	Price
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable for humidity sensors	7000-0050-2310-000	11,34 €
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404) for humidity sensors	7000-0050-2200-100	37,32 €
PSW-09	1 set of stainless steel paddles 1-8" (4 pieces), 29 x 34/60/89/157 mm for flow monitors SW	7700-0010-1000-000	16,94 €
PWFS-08	Stainless steel vane for vane switch WFS	7700-0010-2000-000	16,41 €
WH-20	Wall bracket for duct hygrometers KH	1200-0010-4000-000	11,00 €
HS-ADAPTER	Universal holder for small housings made from plastic PA6, black, for installation on 35mm top-hat rails, incl. fixing screws	7100-0038-0000-000	19,66 €
SPB1	Strap for surface-contact sensors	7100-0035-0000-000	3,33 €
WLP-1	Heat-conductive paste, silicone-free (2 ml)	7100-0060-1000-000	2,98 €
MODBUS-Y	Y-adapter for cable gland M16x 1.5 (on 2x M12x 1.5), made of plastic	7000-0005-0002-100	9,28 €

Special accessories for M12 connector

5-pin / 12-pin, A coded,

Circular connector with screw-locking according to DIN EN 61076-2-101

AL xx

Connecting cable with cable socket

VL xx

Interconnecting cable with cable socket and cable connector

KB xx

Cable socket without cable



Connecting cable for M12 connector	Type / WG011	Cable length	Item No.	Price
PVC cable, 5-pin, shielded , with cable socket (M12, A coded, female), approx. Ø = 15 mm, L = 35 mm	ALG xx A5		5-pin, shielded	
	ALG M12-A5 PVC 2M	2 m	2000-9121-0000-031	24,19 €
	ALG M12-A5 PVC 5M	5 m	2000-9121-0000-041	31,02 €
	ALG M12-A5 PVC 10M	10 m	2000-9121-0000-051	42,71 €
PVC cable, 5-pin, unshielded , with cable socket (M12, A coded, female), approx. Ø = 15 mm, L = 35 mm	AL xx A5		5-pin, unshielded	
	AL M12-A5 PVC 2M	2 m	2000-9121-0000-001	15,49 €
	AL M12-A5 PVC 5M	5 m	2000-9121-0000-011	19,17 €
AL M12-A5 PVC 10M	10 m	2000-9121-0000-021	24,95 €	
PVC cable, 12-pin, unshielded , with cable socket (M12, A coded, female), approx. Ø = 15 mm, L = 35 mm	AL xx A12		12-pin, unshielded	
	AL M12-A12 PVC 2M	2 m	2000-9122-0000-001	49,80 €
	AL M12-A12 PVC 5M	5 m	2000-9122-0000-011	58,91 €
AL M12-A12 PVC 10M	10 m	2000-9122-0000-021	74,33 €	

Interconnecting cable for M12 connector	Type / WG011	Cable length	Item No.	Price
PVC cable, 5-pin, shielded , with cable socket (M12, A coded, female) and cable connector (M12, A coded, male) approx. Ø = 15 mm, L = 35 mm	VLG xx A5		5-pin, shielded	
	VLG M12-A5 PVC 2M	2 m	2000-9111-0000-031	52,05 €
	VLG M12-A5 PVC 5M	5 m	2000-9111-0000-041	58,96 €
VLG M12-A5 PVC 10M	10 m	2000-9111-0000-051	70,81 €	
PVC cable, 5-pin, unshielded , with cable socket (M12, A coded, female) and cable connector (M12, A coded, male) approx. Ø = 15 mm, L = 35 mm	VL xx A5		5-pin, unshielded	
	VL M12-A5 PVC 2M	2 m	2000-9111-0000-001	27,66 €
	VL M12-A5 PVC 5M	5 m	2000-9111-0000-011	31,29 €
VL M12-A5 PVC 10M	10 m	2000-9111-0000-021	37,49 €	
PVC cable, 12-pin, unshielded , with cable socket (M12, A coded, female) and cable connector (M12, A coded, male) approx. Ø = 15 mm, L = 35 mm	VL xx A12		12-pin, unshielded	
	VL M12-A12 PVC 2M	2 m	2000-9112-0000-001	103,99 €
	VL M12-A12 PVC 5M	5 m	2000-9112-0000-011	114,20 €
VL M12-A12 PVC 10M	10 m	2000-9112-0000-021	131,51 €	

Mounting accessories for M12 connector	Type / WG02	Contact	Item No.	Price
Cable socket (M12, A coded, female), approx. Ø = 20 mm, L = 54 mm, unassembled, without cable	KB xx		female	
	KB M12-A5	5-pin	7100-0070-0712-000	20,39 €
	KB M12-A12	12-pin	7100-0070-0714-000	60,83 €
Cable connector (M12, A coded, male), approx. Ø = 20 mm, L = 54 mm, unassembled, without cable	KS xx		male	
	KS M12-A5	5-pin	7100-0070-0716-000	20,39 €
	KS M12-A12	12-pin	7100-0070-0718-000	60,83 €



NEW

S+S REGELTECHNIK

Special accessories for M8 connector
4-pin, EtherCATP coded,
for industrial EtherCATP applications

ALG ECATP xx

Connecting cable
with one cable connector



VLG ECATP xx

Interconnecting cable
with two cable connectors



EtherCAT[®] P



Connecting cable for EtherCATP	Type / WG02	Cable length	Item No.	Price
PUR cable, 4-pin, shielded, with one cable connector (MB, EtherCATP coded) and one open cable end	ALG ECATP xx		shielded	
	ALG ECATP 0.5m	0.5 m	2000-9131-0000-001	34,88 €
	ALG ECATP 1m	1.0 m	2000-9131-0000-011	38,05 €
	ALG ECATP 2m	2.0 m	2000-9131-0000-021	41,11 €
	ALG ECATP 5m	5.0 m	2000-9131-0000-031	62,42 €

Interconnecting cable for EtherCATP	Type / WG02	Cable length	Item No.	Price
PUR cable, 4-pin, shielded, with two cable connectors (MB, EtherCATP coded)	VLG ECATP xx		shielded	
	VLG ECATP 0.5m	0.5 m	2000-9131-0000-041	56,03 €
	VLG ECATP 1m	1.0 m	2000-9131-0000-051	58,84 €
	VLG ECATP 2m	2.0 m	2000-9131-0000-061	65,97 €
	VLG ECATP 5m	5.0 m	2000-9131-0000-071	87,02 €

Custom-made products

Custom-made products (for 25 or more pieces)		Unit	Price
Silicone-free sensor production		Per piece	on request!
Factory test certificate (per device)	1-point certificate	One-time cost	on request!
	2-point certificate	One-time cost	on request!
	3-point certificate	One-time cost	on request!
	Each additional test point	One-time cost	on request!
Custom-made products	Setup costs for custom-made products	One-time cost	on request!
Special paintwork	Set-up costs for special paintwork	one-off (net)	167,28 €
	plus costs for special paintwork	from 25 piece per piece	16,11 €
		from 50 piece per piece	11,71 €
Special print (with stereotype)	Set-up costs incl. stereotype production, 1 colour	one-off (net)	167,28 €
	Set-up costs incl. stereotype production, 2 colour	one-off (net)	256,15 €
	plus costs for special print	from 25 piece per piece / colour	10,15 €
		from 50 piece per piece / colour	6,85 €
		from 100 piece per piece / colour	5,50 €
		from 250 piece per piece / colour	4,18 €
	from 500 piece per piece / colour	2,09 €	
Printing customer logo on enclosure cover (for 200 covers of one enclosure series)	Setup costs for printing on enclosure cover	One-time cost	on request!
	Plus printing costs, 2-colour, printing on enclosure cover	Per piece	on request!
Labelling with customer logo	Setup costs for labelling	One-time cost	on request!
	Plus costs for labelling	Per piece	on request!



Individual components / WG01		Item No.	Price
FET		7100-0022-4000-000	44,91 €
KTY 81-210		7100-0022-0000-000	4,26 €
LM235Z	(TCR = 10 mV / K; 2.73 V at 0°C), KP10	7100-0022-1000-000	6,84 €
NI1000	(according to DIN EN 43760, class B, TKR = 6180 ppm / K)	7100-0020-9000-000	8,14 €
NI1000TK5000	(according to DIN EN 43760, class B, TKR = 5000 ppm / K), LG-Ni 1000	7100-0021-0000-000	11,45 €
NTC 1,8 KOHM	NTC 1.8K	7100-0021-2000-001	10,00 €
NTC 10 KOHM PRECON	NTC 10K Precon	7100-0021-9000-000	5,23 €
NTC 20 KOHM	NTC 20K	7100-0021-6000-000	5,23 €
NTC 30 KOHM	NTC 30K	7100-0021-7000-000	5,23 €
NTC 50 KOHM	NTC 50K	7100-0021-8000-000	5,23 €
PT100 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-1000-000	6,29 €
PT100 1/2 DIN	(according to DIN EN 60751, class A)	7100-0020-2000-000	8,36 €
PT100 1/3 DIN	(according to DIN EN 60751, class A)	7100-0020-3000-000	9,72 €
PT1000 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-5000-000	8,48 €
PT1000 1/2 DIN	(according to DIN EN 60751, class A)	7100-0020-6000-000	9,60 €
PT1000 1/3 DIN	(according to DIN EN 60751, class A)	7100-0020-7000-000	11,18 €
PT1000 1/10 DIN	(according to DIN EN 60751, class AA)	7100-0020-8000-000	34,98 €
Note:	Other sensors on request.		

Optional services / WG01		Unit	Price
Double sensor		plus 50 % of instrument price	
1 / 2 DIN	(according to DIN EN 60751, class A)	Per piece	6,49 €
1 / 3 DIN	(according to DIN EN 60751, class A)	Per piece	6,49 €
1 / 10 DIN	(according to DIN EN 60751, class AA)	Per piece	25,93 €
Connection type	4-wire connection with ceramic base, head form B	Per piece	5,40 €
	4-wire connection with circuit board, box head	Per piece	3,24 €
Protection class	IP65 at head form B	Per piece	8,32 €
	IP68 (Sensor sleeve watertight compound-filled) for cable sensors	Per piece	3,00 €



**Conversion table -
Anglo-American units of measurement**
TEMPERATURE

Fahrenheit	°F → °C (°F - 32) ÷ 1.8 = (°C)	°C → °F (°C x 1.8) + 32 = (°F)
-------------------	--	--

LENGTH

Inches	" / inch → mm ("/inch) × 25.4 = (mm)	mm → " / inch (mm) ÷ 25.4 = ("/inch)
Feet	ft → m (ft) × 0.3048 = (m)	m → ft (m) ÷ 0.3048 = (ft)
Yards	yd → m (yd) × 0.9144 = (m)	m → yd (m) ÷ 0.9144 = (yd)
Miles	mi → km (mi) × 1.609344 = (km)	km → mi (km) ÷ 1.609344 = (mi)

AREA

Square inches	in² → mm² (in ²) × 645.16 = (mm ²)	mm² → in² (mm ²) ÷ 645.16 = (in ²)
	in² → cm² (in ²) × 6.4516 = (cm ²)	cm² → in² (cm ²) ÷ 6.4516 = (in ²)
Square feet	ft² → m² (ft ²) × 0.09290304 = (m ²)	m² → ft² (m ²) ÷ 0.09290304 = (ft ²)
Square yards	yd² → m² (yd ²) × 0.83612736 = (m ²)	m² → yd² (m ²) ÷ 0.83612736 = (yd ²)

VOLUME

Cubic inches	in³ → cm³ (in ³) × 16.387064 = (cm ³)	cm³ → in³ (cm ³) ÷ 16.387064 = (in ³)
Cubic feet	ft³ → m³ (ft ³) × 0.028316846592 = (m ³)	m³ → ft³ (m ³) ÷ 0.028316846592 = (ft ³)
Cubic yards	yd³ → m³ (yd ³) × 0.764554857984 = (m ³)	m³ → yd³ (m ³) ÷ 0.764554857984 = (yd ³)
US Gallons	Imp. gal. → dm³ (Imp. gal.) × 4.54609 = (dm ³)	dm³ → Imp. gal. (dm ³) ÷ 4.54609 = (Imp. gal.)
US-Gallone	US. liq. gal. → dm³ (US. liq. gal.) × 3.785412 = (dm ³)	dm³ → US. liq. gal. (dm ³) ÷ 3.785412 = (US. liq. gal.)

MASS

Ounces	oz. → g (oz.) × 28.349523 = (g)	g → oz. (g) ÷ 28.349523 = (oz.)
Pounds	lb. → kg (lb.) × 0.45359237 = (kg)	kg → lb. (kg) ÷ 0.45359237 = (lb.)
British tons (long tons)	tn. l. → kg (tn. l.) × 1016.0469088 = (kg)	kg → tn. l. (kg) ÷ 1016.0469088 = (tn. l.)
US tons (short tons)	tn. sh. → kg (tn. sh.) × 907.18474 = (kg)	kg → tn. sh. (kg) ÷ 907.18474 = (tn. sh.)



Sensor type	Manufacturer *	RTF	ATF	TF 65 + MF-15-K	TF 65 + TH 08	ALTF	HTF
10K3A1 NTC 10 kOhm	Aquatrol	●	●	●	●	●	●
	Honeywell	T 8120 B	T 7416 A T 7043 E	●	T 7106 A T 7043 F	T 7044 C	T 7076 D
	Johnson	●	●	TE - 6361 V TE - 636 GV-1	●	●	●
	Satchwell	●	DOT10K2 DOS10 K2	DDT10K1	DWT10K1 DST10K1	●	●
	Seachange	SEN / PTR / ROM	SEN / PR / OAT	SEN / PR / DCT	SEN / PR / IMM	SEN / PR / CLP	SEN / FL
	Trend	TE - TS	TE - TO	TE - TD	TE - TI	TE - TC	●
10K4A1 NTC 10 kOhm Precon	Andover	TTS - S Series	●	TT - O Series	TT - I Series	TT - ST	●
	Delta Controls	●	●	●	●	●	●
	Siebe	●	●	●	●	●	●
	York (< 40°C)	●	●	●	●	●	●
20K6A1 NTC 20 kOhm	Honeywell	T 7460 H T 7470 A DRF 20 - S RF 20 T 4712	AF 20 DAF 20 T 7416 A1022	LF 20	VF 20 T VF 20 NT VF 20 L VF 20 LN WPF 20 T 7425 A	VF 20 A WPF 20 A	KFT 20 KFT 20 B DKF 20
PT 100 DIN EN 60 751 class B	Sauter	EGT430 / F011	●	EGT466 / F011 EGT447 / F011	●	●	EGT456 / F011
	Serck	●	●	●	●	●	●
	Siemens / Landis & Staefa	QAA100 QAA 2010	QAC 2010	FK-TP / 200 QAM 2110	QAE 2110	QAD 2010	GAP 2010
PT 1000 DIN EN 60 751 class B	Honeywell	T 7412	T 7416 A1014	T 7411	T 7413	T 7414	●
	Sauter	EGT430 / F101	EGT401 / F101	EGT446 / F101 EGT447 / F101	-	EGT411 / F101	EGT456 / F101
	Serck	●	●	●	●	●	●
	Siebe	TS - 5811	●	●	●	●	●
	Cylon	●	●	●	●	●	●
Ni 1000 DIN EN 43 760	Sauter	EGT 330 / F101	EGT 301 / F101	EGT 346 / F101 EGT 347 / F101 EGT 348 / F101	EGT 346 / F101 EGT 347 / F101 EGT 348 / F101	EGT 311 / F101	EGT 354 / F101 EGT 356 / F101
Ni 1000 / TCR Ni1000 TK500	Siemens / Landis & Staefa	QAA 24 QAA 25 QAA 26 QAA 27 QAA 64	QAC 22	QAM 2120	QAE 2120	QAD 22 QAD 26	QAP 21 QAP 22 QAZ 21
SAT 1	Satchwell	DRT DU, DUS, DUSF	DOT 0002 DOS 0002	DDT 0001	DWT 0001 DST 0001	●	DDU
FeT (T1)	Landis & Staefa	QAA 2040 FR - T1	FW - T1	QAM 2140 FK - T1	QAE 2140 FT - T1	FA - T1	QAP 2040 FTK - T1
TAC 1 NTC 1.8 kOhm	TAC Schneider	●	●	●	●	●	●
2.2 K3 A1 NTC 2.2 kOhm	Ambiflex	RTN 3060	ETN 3060	DTN 3060	ITN 3060	CTN 3060	●
	Johnson	TE - 6344 P	TE - 6343 P	TE - 6341 P TE - 6341 V TE - 634 GV - 1	TE - 6342 P	-	-
3 K3 A1 NTC 3 kOhm	Alerton	MS - 1000 Series TS - 1050	●	●	●	●	●
3 K6 A1 NTC 30 kOhm	Drayton	A 701	A 702	●	A 703	A 704	●
LM235Z (KP10)	Kieback & Peter	TR TD	TA TAD	TLS TLD	TV, TVD TDN, TVP	TAV TAVD	TEV TKV

* Manufacturer names are brands and / or trademarks of the respective companies.

Sensor type (+)

Thermistor elements with positive temperature coefficient -

Temperature ranges (temperature/resistance)

FeT (T1)		KTY81-210		LM235Z (KP10)		Ni 1000 according to DIN EN 43760 TCR= 6180ppm/K		Ni 1000- TK 5000 (LG-Ni 1000) TCR= 5000ppm/K		PT 100 according to DIN EN 60751 TCR= 3850ppm/K		PT 1000 according to DIN EN 60751 TCR= 3850ppm/K	
°C	Ω	°C	Ω	°C	mV	°C	Ω	°C	Ω	°C	Ω	°C	Ω
- 50	-	- 50	1030	- 50	-	- 50	743	- 50	790.8	- 50	80.3	- 50	803
- 40	-	- 40	1135	- 40	2330	- 40	791	- 40	826.8	- 40	84.3	- 40	843
- 30	1935	- 30	1247	- 30	2430	- 30	842	- 30	871.7	- 30	88.2	- 30	882
- 20	2030	- 20	1367	- 20	2530	- 20	893	- 20	913.4	- 20	92.2	- 20	922
- 15	2078	- 15		- 15	2580	- 15	920	- 15	934.7	- 15	94.1	- 15	941
- 10	2027	- 10	1495	- 10	2630	- 10	946	- 10	956.2	- 10	96.1	- 10	961
- 5	2176	- 5		- 5	2680	- 5	973	- 5	978.0	- 5	98.0	- 5	980
0	2226	0	1630	0	2730	0	1000	0	1000.0	0	100.0	0	1000
1	2236	1		1	2740	5	1028	1	1004.4	5	102.0	5	1020
2	2246	2		2	2750	10	1056	2	1008.9	10	103.9	10	1039
3	2256	3		3	2760	15	1084	3	1013.3	15	105.8	15	1058
4	2266	4		4	2770	20	1112	4	1017.8	20	107.8	20	1078
5	2276	5		5	2780	25	1142	5	1022.3	25	109.8	25	1098
6	2286	6		6	2790	30	1171	6	1026.7	30	111.7	30	1117
7	2298	7		7	2800	35	1200	7	1031.2	35	113.6	35	1136
8	2306	8		8	2810	40	1230	8	1035.8	40	115.5	40	1155
9	2316	9		9	2820	45	1261	9	1040.3	45	117.5	45	1175
10	2326	10	1772	10	2830	50	1291	10	1044.8	50	119.4	50	1194
11	2337	11		11	2840	55	1322	11	1049.3	55	121.3	55	1213
12	2347	12		12	2850	60	1353	12	1053.9	60	123.2	60	1232
13	2357	13		13	2860	65	1385	13	1058.4	65	125.2	65	1252
14	2367	14		14	2870	70	1417	14	1063.0	70	127.1	70	1271
15	2377	15		15	2880	75	1450	15	1067.6	75	129.0	75	1290
16	2388	16		16	2890	80	1483	16	1072.2	80	130.9	80	1309
17	2398	17		17	2900	85	1516	17	1076.8	85	132.8	85	1328
18	2408	18		18	2910	90	1549	18	1081.4	90	134.7	90	1347
19	2418	19		19	2920	95	1584	19	1086.0	95	136.6	95	1366
20	2429	20	1922	20	2930	100	1618	20	1090.7	100	138.5	100	1385
21	2439	21		21	2940	110	1688	21	1095.3	110	142.3	110	1423
22	2449	22		22	2950	120	1760	22	1100.0	120	146.1	120	1461
23	2460	23		23	2960	130	1833	23	1104.6	130	149.8	130	1498
24	2470	24		24	2970	140	1909	24	1109.3	140	153.6	140	1536
25	2480	25	2000	25	2980	150	1987	25	1114.0	150	157.3	150	1573
26	2491	26		26	2990	160	2066	26	1120.0	160	161.0	160	1611
27	2501	27		27	3000	170	2148	27	1123.4	170	164.8	170	1648
28	2512	28		28	3010	180	2232	28	1128.1	180	168.5	180	1685
29	2522	29		29	3020			29	1132.9	190	172.2	190	1722
30	2532	30	2080	30	3030			30	1137.6	200	175.8	200	1758
35	2585	35		35	3080			35	1161.5	210	179.5	210	1795
40	2638	40	2245	40	3130			40	1185.7	220	183.2	220	1832
45	2692	45		45	3180			45	1210.2	230	186.8	230	1868
50	2745	50	2417	50	3230			50	1235.0	240	190.5	240	1905
55	2800	55		55	3280			55	1260.1	250	194.1	250	1941
60	2855	60	2597	60	3330			60	1285.4	260	197.7	260	1977
65	2910	65		65	3380			65	1311.1	270	201.3	270	2013
70	2966	70	2785	70	3430			70	1337.1	280	204.9	280	2049
75	3022	75		75	3480			75	1363.5	290	208.5	290	2085
80	3079	80	2980	80	3530			80	1390.1	300	212.0	300	2121
85	3136	85		85	3580			85	1417.1	310	215.6	310	2156
90	3194	90	3182	90	3630			90	1444.4	320	219.1	320	2191
95	3252	95		95	3680			95	1472.0	330	222.7	330	2227
100	3311	100	3392	100	3730			100	1500.0	340	226.2	340	2262
105	3370	105		105	3780			105	1528.3	350	229.7	350	2297
110	3430	110	3607	110	3830			110	1557.0	360	233.2	360	2332
115	3491	115		115	3880			115	1586.0	370	236.7	370	2367
120	3552	120	3817	120	3930			120	1625.4	380	240.1	380	2401
125	3613	125	3915	125	3980					390	243.6	390	2436
130	3675	130	4008	130	-					400	247.0	400	2470
140	3802	140	4166	140	-								
150	3929	150	4280	150	-								



Sensor type (+)
Thermistor elements with positive temperature coefficient -
Temperature ranges (temperature/resistance)

Accuracy of passive elements			
Sensor elements	Tolerance	Standard	Rated zero-power resistance
Pt 1000	$\pm 0.3 \text{ K} / 0^\circ\text{C}$	DIN EN 60 751, class B	TK = 3850 ppm/K
Pt 1000 1/3 DIN	$\pm 0.1 \text{ K} / 0^\circ\text{C}$	DIN EN 60 751, class A	TK = 3850 ppm/K
Pt 1000 A	$\pm 0.15 \text{ K} / 0^\circ\text{C}$	DIN EN 60 751, class A, TGA	TK = 3850 ppm/K
Pt 1000 1/10 DIN	$\pm 0.03 \text{ K} / 0^\circ\text{C}$	DIN EN 60 751, class A	TK = 3850 ppm/K
Pt 100	$\pm 0.3 \text{ K} / 0^\circ\text{C}$	DIN EN 60 751, class B	TK = 3850 ppm/K
Pt 100 1/3 DIN	$\pm 0.1 \text{ K} / 0^\circ\text{C}$	DIN EN 60 751, class A	TK = 3850 ppm/K
Ni 1000	$\pm 0.4 \text{ K} / 0^\circ\text{C}$	DIN EN 43 760, class B	TCR = 6180 ppm/K
Ni 1000 1/2 DIN	$\pm 0.2 \text{ K} / 0^\circ\text{C}$	DIN EN 43 760, class B	TCR = 6180 ppm/K
Ni 1000 TK5000	$\pm 0.4 \text{ K} / 0^\circ\text{C}$		TCR = 5000 ppm/K
LM235Z, KP10	$\pm 0.2 \text{ K} / 25^\circ\text{C}$	10 mV / K	
NTC 1.8K	$\pm 0.3 \text{ K} / 25^\circ\text{C}$	B25 / 85 = 3499 K	R25 = 1.8 K $\pm 0.3\%$
NTC 2.2K	$\pm 0.3 \text{ K} / 25^\circ\text{C}$	B25 / 85 = 3610 K	R25 = 2.2 K $\pm 1\%$
NTC 10K	$\pm 0.3 \text{ K} / 25^\circ\text{C}$	B25 / 85 = 3977 K	R25 = 10 KOhm $\pm 1\%$
NTC 10K Precon	$\pm 0.3 \text{ K} / 25^\circ\text{C}$	B25 / 85 = 3695 K	R25 = 10 KOhm $\pm 1\%$
NTC 10K Carell	$\pm 0.3 \text{ K} / 25^\circ\text{C}$	B25 / 85 = 3435 K	R25 = 10 KOhm $\pm 1\%$
NTC 20K	$\pm 0.2 \text{ K} / 25^\circ\text{C}$	B25 / 85 = 4262 K	R25 = 20 KOhm $\pm 0.5\%$

ATTENTION, NOTE !

Due to self-heating, the testing current has an influence on the measuring accuracy of the thermometer and should therefore never exceed the following:

Guide values for the testing current:

Maximum sensor current	I_{max}
Pt1000 (thin layer)	< 0.6 mA
Pt100 (thin layer)	< 1.0 mA
Ni1000 (DIN), Ni1000 TK5000	< 0.3 mA
NTC xx	< 2.0 mW
LM235Z	400 μA ... 5 mA
KTY 81 - 210	< 2.0 mA

To avoid damage/errors, it is recommended to use shielded cables. It is imperative to avoid parallel laying of current-carrying lines. The EMC directives must be observed!

These devices must be installed by an authorised qualified expert!



Sensor type (-)
Thermistor elements with negative temperature coefficient -
Temperature ranges (temperature/resistance)

NTC 1,8 kΩ		NTC 2,2 kΩ		NTC 3 kΩ		NTC 5 kΩ		NTC 10 kΩ		NTC 10 kΩ Precon		NTC 10K e.g. Carell	
R ₂₅ = 1.8 kΩ ±0,2K B _{25/85} = 3499 K ±1%		R ₂₅ = 2.2 kΩ ±1% B _{25/85} = 3610 K ±1%		R ₂₅ = 3 kΩ ±1% B _{25/85} = 3977 K ±1%		R ₂₅ = 5 kΩ ±1% B _{25/85} = 3977 K ±1%		R ₂₅ = 10 kΩ ±1% B _{25/85} = 3977 K ±1%		R ₂₅ = 10 kΩ ±1% B _{25/85} = 3695 K ±1%		R ₂₅ = 10 kΩ ±1% B _{25/85} = 3435 K ±1%	
°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω
-50	-	-50	-	-50	-	-50	-	-50	-	-50	-	-50	-
-40	39073	-40	-	-40	-	-40	-	-40	-	-40	-	-40	-
-30	22301	-30	27886	-30	53093	-30	88488	-30	175785	-30	135200	-30	111300
-20	13196	-20	16502	-20	29125	-20	48541	-20	96597	-20	78910	-20	67770
-15	10278	-15	12844	-15	21887	-15	36479	-15	72650	-15	61020	-15	53410
-10	8069	-10	10070	-10	16599	-10	27664	-10	55142	-10	47540	-10	42470
-5	6383	-5	8134	-5	12698	-5	21163	-5	42215	-5	37310	-5	33900
0	5085	0	6452	0	9795	0	16325	0	32590	0	29490	0	27280
1	4863	1	6164	1	9309	1	15515	1	30974	1	28156	1	26130
2	4652	2	5891	2	8849	2	14749	2	29448	2	26890	2	25030
3	4452	3	5631	3	8415	3	14025	3	28007	3	25687	3	23990
4	4261	4	5384	4	8005	4	13341	4	26645	4	24545	4	23000
5	4079	5	5150	5	7617	5	12695	5	25357	5	23460	5	22050
6	3906	6	4927	6	7251	6	12085	6	24138	6	22430	6	21150
7	3742	7	4715	7	6905	7	11508	7	22984	7	21451	7	20300
8	3585	8	4513	8	6575	8	10959	8	21892	8	20519	8	19480
9	3436	9	4321	9	6265	9	10442	9	20858	9	19633	9	18700
10	3294	10	4138	10	5971	10	9951	10	19880	10	18790	10	17960
11	3159	11	3964	11	5691	11	9485	11	18953	11	17987	11	17240
12	3030	12	3797	12	5427	12	9045	12	18074	12	17222	12	16560
13	2906	13	3639	13	5177	13	8628	13	17242	13	16494	13	15900
14	2789	14	3488	14	4938	14	8230	14	16452	14	15801	14	15280
15	2677	15	3345	15	4713	15	7855	15	15704	15	15140	15	14690
16	2570	16	3207	16	4500	16	7500	16	14992	16	14510	16	14120
17	2468	17	3076	17	4298	17	7163	17	14317	17	13910	17	13580
18	2371	18	2952	18	4104	18	6841	18	13676	18	13337	18	13060
19	2278	19	2832	19	3922	19	6536	19	13068	19	12791	19	12560
20	2189	20	2719	20	3747	20	6246	20	12491	20	12270	20	12090
21	2104	21	2610	21	3582	21	5970	21	11941	21	11773	21	11630
22	2023	22	2506	22	3426	22	5710	22	11418	22	11298	22	11200
23	1945	23	2407	23	3277	23	5462	23	10921	23	10845	23	10780
24	1871	24	2289	24	3135	24	5224	24	10450	24	10413	24	10380
25	1800	25	2200	25	3000	25	5000	25	10000	25	10000	25	10000
26	1732	26	2115	26	2872	26	4787	26	9572	26	9606	26	9632
27	1667	27	2034	27	2750	27	4583	27	9166	27	9229	27	9281
28	1605	28	1957	28	2634	28	4389	28	8778	28	8869	28	8944
29	1546	29	1883	29	2522	29	4203	29	8409	29	8525	29	8622
30	1489	30	1812	30	2417	30	4028	30	8058	30	8196	30	8313
35	1238	35	1500	35	1960	35	3266	35	6534	35	6754	35	6940
40	1034	40	1248	40	1597	40	2662	40	5329	40	5594	40	5827
45	869	45	1043	45	1310	45	2184	45	4371	45	4655	45	4911
50	733	50	876	50	1081	50	1801	50	3605	50	3893	50	4160
55	622	55	738	55	896	55	1493	55	2988	55	3270	55	3536
60	529	60	626	60	746	60	1244	60	2489	60	2760	60	3020
65	453	65	532	65	625	65	1042	65	2084	65	2338	65	2588
70	389	70	454	70	526	70	876	70	1753	70	1900	70	2228
75	335	75	390	75	444	75	740	75	1480	75	1700	75	1924
80	290	80	335	80	346	80	627	80	1256	80	1457	80	1668
85	252	85	289	85	321	85	535	85	1070	85	1254	85	1451
90	220	90	251	90	275	90	458	90	915	90	1084	90	1266
95	192	95	218	95	236	95	393	95	786	95	939	95	1108
100	169	100	190	100	204	100	339	100	678	100	817	100	973
105	148	105	167	105	176	105	294	105	586	105	713	105	857
110	131	110	146	110	138	110	255	110	509	110	624	110	758
115	116			115	120	115	223	115	445	115	548	115	671
120	103			120	105	120	195	120	389	120	482	120	597
125	92			125	92	125	171	125	341	125	426	125	531
				130	81	130	151	130	300	130	377	130	474
				140	64	140	118	140	234	140	298	140	381
				150	50	150	93	150	185	150	238	150	308



Sensor type (-)
Thermistor elements with negative temperature coefficient -
Temperature ranges (temperature/resistance)

NTC 20 kΩ		NTC 50 kΩ		Satchwell SAT 1	
R ₂₅ = 20 kΩ ±0.5%		R ₂₅ = 50 kΩ ±1%			
B _{25/85} = 4262 K ±1%		B _{25/85} = 4262 K ±1%			
°C	Ω	°C	Ω	°C	Ω
- 50	-	- 50	-	- 50	9719
- 40	806800	- 40	2017000	- 40	9584
- 30	413400	- 30	1033500	- 30	9349
- 20	220600	- 20	551500	- 20	8968
- 15	163480	- 15	408700	- 15	8708
- 10	122260	- 10	305650	- 10	8396
- 5	92220	- 5	230550	- 5	8031
0	70140	0	175350	0	7614
1	66469	1	166173	1	7525
2	63011	2	157527	2	7434
3	59751	3	149378	3	7341
4	56678	4	141696	4	7246
5	53780	5	134450	5	7150
6	51041	6	127602	6	7053
7	48457	7	121142	7	6954
8	46018	8	115044	8	6853
9	43715	9	109287	9	6752
10	41540	10	103850	10	6649
11	39489	11	98723	11	6545
12	37550	12	93875	12	6440
13	35716	13	89291	13	6334
14	33982	14	84954	14	6228
15	32340	15	80850	15	6121
16	30782	16	76954	16	6013
17	29307	17	73269	17	5905
18	27912	18	69780	18	5786
19	26591	19	66478	19	5684
20	25340	20	63350	20	5580
21	24156	21	60389	21	5471
22	23033	22	57582	22	5362
23	21968	23	54921	23	5254
24	20958	24	52396	24	5147
25	20000	25	50000	25	5039
26	19090	26	47726	26	4933
27	18227	27	45566	27	4827
28	17406	28	43515	28	4721
29	16627	29	41567	29	4617
30	15886	30	39715	30	4513
35	12698	35	31745	35	4012
40	10212	40	25530	40	3545
45	8260	45	20650	45	3117
50	6718	50	16795	50	2730
55	5494	55	13735	55	2386
60	4518	60	11295	60	2082
65	3732	65	9330	65	1816
70	3098	70	7745	70	1585
75	2586	75	6465	75	1385
80	2166	80	5415	80	1213
85	1823	85	4558	85	1064
90	1541	90	3852	90	937
95	1308	95	3269	95	828
100	1114	100	2785	100	734
105	953	105	2382	105	654
110	818	110	2045	110	585
115	704	115	1761	115	525
120	609	120	1523	120	474
125	528	125	1321	125	429
130	460	130	1149	130	391
140	351	140	878	140	329
150	272	150	679	150	281

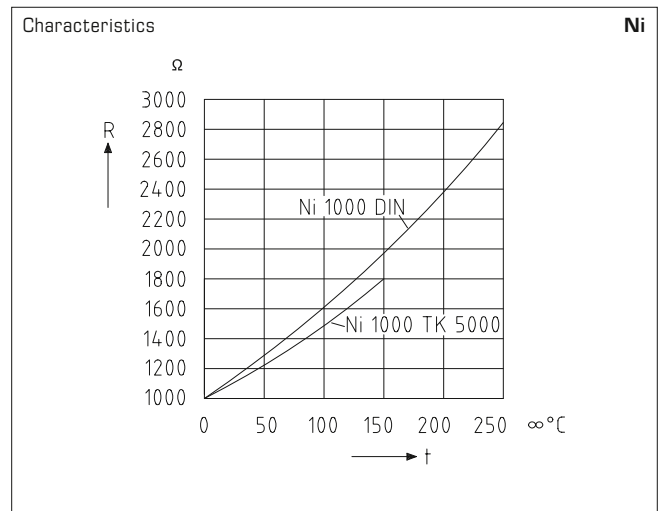
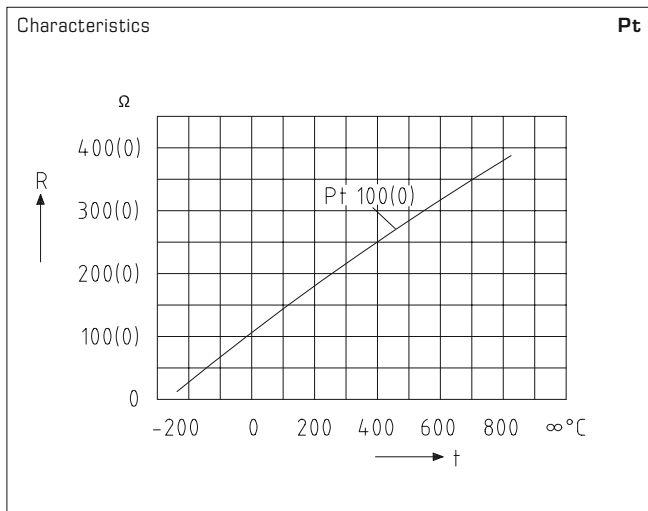
Sensor type (-)

Resistor element with **negative** temperature coefficient, also called negative temperature coefficient thermistor, or NTC thermistor.

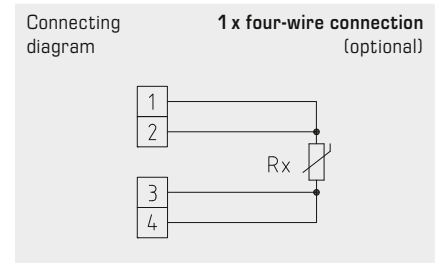
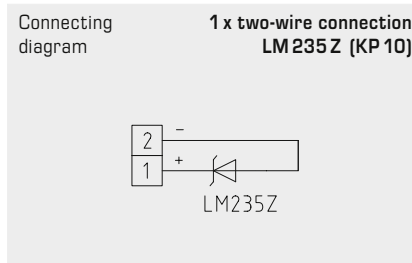
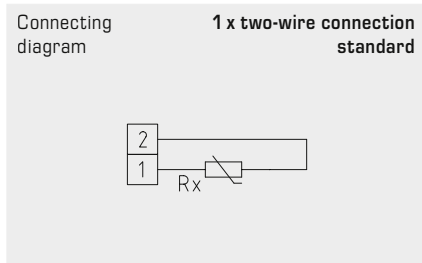
To avoid damage/errors, it is recommended to use shielded cables. It is imperative to avoid parallel laying of current-carrying lines. The EMC directives must be observed!

These devices must be installed by an authorised qualified expert!

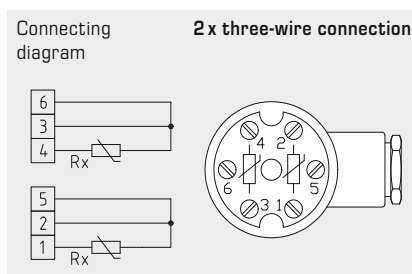
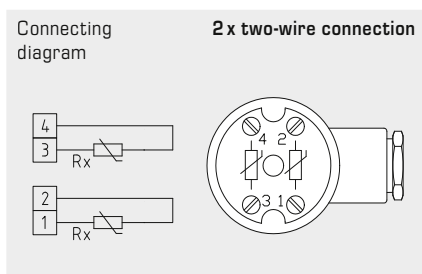
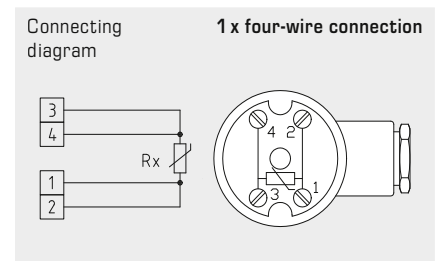
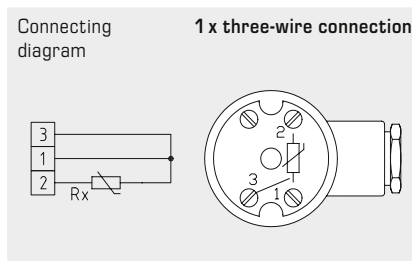
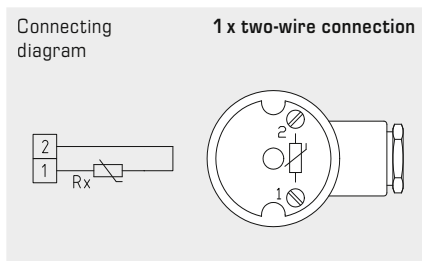
Characteristics and wiring of terminal connections of some passive temperature sensors



Wiring of terminal connections room devices and box head



Wiring of terminal connections head form B

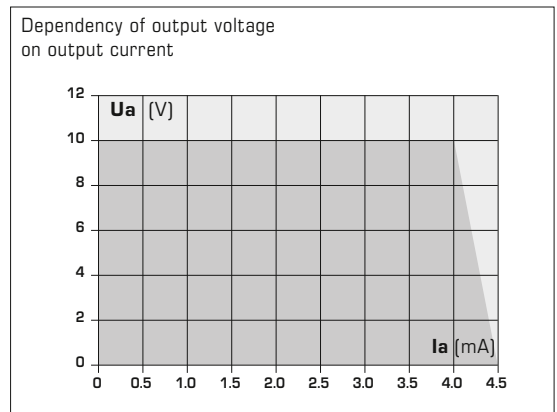
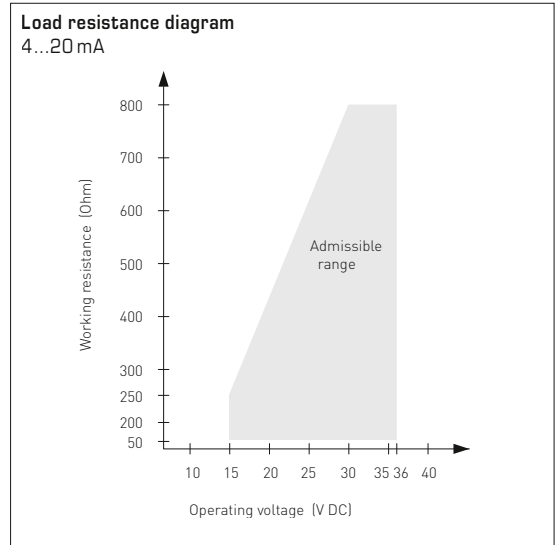


Measuring transducers, calibratable, with active output for THERMASGARD® temperature sensors

TEMPERATURE RANGES:

When selecting measuring transducer ranges, it is necessary to ensure that the maximum temperatures permissible for the sensor/enclosure are not exceeded!

Ambient temperature for measuring transducers: -30...+70°C



SUPPLY VOLTAGE:

For operating voltage reverse polarity protection, a one-way rectifier or reverse polarity protection diode is integrated in this device variant. This internal one-way rectifier also allows operating 0 - 10V devices on AC supply voltage.

The output signal is to be tapped by a measuring instrument. Output voltage is measured here against zero potential (0V) of the input voltage!

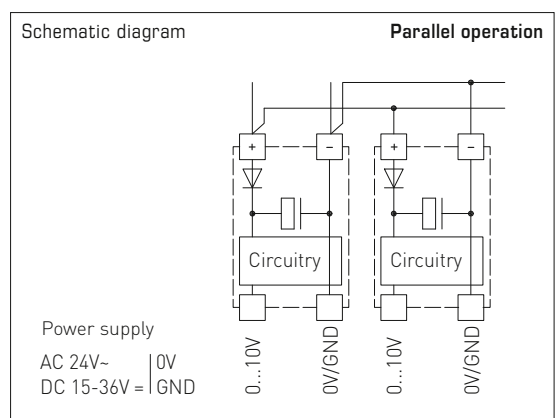
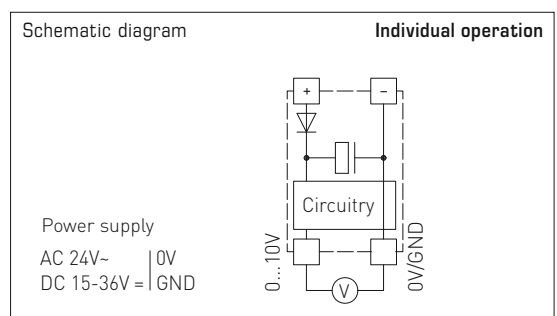
When this device is operated on DC supply voltage, the operating voltage input UB+ is to be used for 15...36V DC supply and UB- or GND for ground wire!

When several devices are supplied by one 24V AC voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (-) = reference potential are connected together (in-phase connection of field devices).

All outputs of field devices must be referenced to the same potential!

In the event of a reversed polarity at one field device, that device would cause a supply voltage short-circuit. The resulting short-circuit current flowing through this field device may cause damage to it.

Therefore, ensure correct wiring!



Range of preferential items permanently available from stock in standard design with S+S company logo

THERMASGARD® TF 43

Temperature sensors (basic device)

Type/WG03B	Output	Item No.	Price
TF 43 PT1000 xx	passive	IP54	
TF43 Pt1000 50mm		1101-7010-5011-000	24,93 €
TF43 Pt1000 100mm		1101-7010-5021-000	25,04 €
TF43 Pt1000 150mm		1101-7010-5031-000	25,83 €
TF43 Pt1000 200mm		1101-7010-5041-000	26,56 €
TF43 Pt1000 250mm		1101-7010-5051-000	27,91 €
TF43 Pt1000 300mm		1101-7010-5061-000	30,20 €
TF43 Pt1000 350mm		1101-7010-5071-000	31,13 €
TF43 Pt1000 400mm		1101-7010-5081-000	32,12 €
TF 43 Ni1000 xx	passive	IP54	
TF43 Ni1000 50mm		1101-7010-9011-000	25,55 €
TF43 Ni1000 100mm		1101-7010-9021-000	27,96 €
TF43 Ni1000 150mm		1101-7010-9031-000	28,17 €
TF43 Ni1000 200mm		1101-7010-9041-000	28,79 €
TF43 Ni1000 250mm		1101-7010-9051-000	29,59 €
TF43 Ni1000 300mm		1101-7010-9061-000	31,55 €
TF43 Ni1000 350mm		1101-7010-9071-000	32,44 €
TF43 Ni1000 400mm		1101-7010-9081-000	33,90 €
TF 43 Ni1000TK xx	passive	IP54	
TF43 NiTK 50mm		1101-7011-0011-000	25,59 €
TF43 NiTK 100mm		1101-7011-0021-000	28,02 €
TF43 NiTK 150mm		1101-7011-0031-000	28,31 €
TF43 NiTK 200mm		1101-7011-0041-000	28,91 €
TF43 NiTK 250mm		1101-7011-0051-000	29,69 €
TF43 NiTK 300mm		1101-7011-0061-000	31,67 €
TF43 NiTK 350mm		1101-7011-0071-000	32,66 €
TF43 NiTK 400mm		1101-7011-0081-000	34,02 €
TF 43 LM235Z xx	passive	IP54	
TF43 LM235Z 50mm		1101-7012-1011-000	26,05 €
TF43 LM235Z 100mm		1101-7012-1021-000	26,33 €
TF43 LM235Z 150mm		1101-7012-1031-000	27,29 €
TF43 LM235Z 200mm		1101-7012-1041-000	27,91 €
TF43 LM235Z 250mm		1101-7012-1051-000	28,23 €
TF43 LM235Z 300mm		1101-7012-1061-000	30,65 €
TF43 LM235Z 350mm		1101-7012-1071-000	31,02 €
TF43 LM235Z 400mm		1101-7012-1081-000	32,96 €
TF 43 NTC 1,8K xx	passive	IP54	
TF43 NTC1,8K 50mm		1101-7011-2011-000	24,93 €
TF43 NTC1,8K 100mm		1101-7011-2021-000	26,28 €
TF43 NTC1,8K 150mm		1101-7011-2031-000	26,94 €
TF43 NTC1,8K 200mm		1101-7011-2041-000	27,57 €
TF43 NTC1,8K 250mm		1101-7011-2051-000	28,91 €
TF43 NTC1,8K 300mm		1101-7011-2061-000	29,86 €
TF43 NTC1,8K 350mm		1101-7011-2071-000	30,87 €
TF43 NTC1,8K 400mm		1101-7011-2081-000	31,67 €
TF 43 NTC10K xx	passive	IP54	
TF43 NTC10K 50mm		1101-7011-5011-000	24,93 €
TF43 NTC10K 100mm		1101-7011-5021-000	26,28 €
TF43 NTC10K 150mm		1101-7011-5031-000	26,94 €
TF43 NTC10K 200mm		1101-7011-5041-000	27,57 €
TF43 NTC10K 250mm		1101-7011-5051-000	28,91 €
TF43 NTC10K 300mm		1101-7011-5061-000	29,86 €
TF43 NTC10K 350mm		1101-7011-5071-000	30,87 €
TF43 NTC10K 400mm		1101-7011-5081-000	31,67 €
TF 43 NTC20K xx	passive	IP54	
TF43 NTC20K 50mm		1101-7011-6011-000	24,93 €
TF43 NTC20K 100mm		1101-7011-6021-000	26,28 €
TF43 NTC20K 150mm		1101-7011-6031-000	26,94 €
TF43 NTC20K 200mm		1101-7011-6041-000	27,57 €
TF43 NTC20K 250mm		1101-7011-6051-000	28,91 €
TF43 NTC20K 300mm		1101-7011-6061-000	29,86 €
TF43 NTC20K 350mm		1101-7011-6071-000	30,87 €
TF43 NTC20K 400mm		1101-7011-6081-000	31,67 €





BASIC

S+S REGELTECHNIK

S+S Basic Programme

Range of preferential items permanently available from stock in standard design with S+S company logo

THERMASGARD® TM 43

Temperature measuring transducer (basic device), calibratable, with multi-range switching



Basic device
(without accessories)



Immersion / screw-in
temperature sensor
with immersion sleeve
(accessories)



Duct temperature sensor
with mounting flange
(accessories)

Type / WG01B	Output	Item No.	Price
TM43-U xx	active	IP54	
TM43-U 50mm	0 -10 V	1101-7111-0019-900	63,75 €
TM43-U 100mm	0 -10 V	1101-7111-0029-900	64,80 €
TM43-U 150mm	0 -10 V	1101-7111-0039-900	65,74 €
TM43-U 200mm	0 -10 V	1101-7111-0049-900	66,06 €
TM43-U 250mm	0 -10 V	1101-7111-0059-900	67,16 €
TM43-U 300mm	0 -10 V	1101-7111-0069-900	68,25 €
TM43-I xx	active	IP54	
TM43-I 50mm	4...20 mA	1101-7112-0019-900	63,75 €
TM43-I 100mm	4...20 mA	1101-7112-0029-900	64,80 €
TM43-I 150mm	4...20 mA	1101-7112-0039-900	65,74 €
TM43-I 200mm	4...20 mA	1101-7112-0049-900	66,06 €
TM43-I 250mm	4...20 mA	1101-7112-0059-900	67,16 €
TM43-I 300mm	4...20 mA	1101-7112-0069-900	68,25 €



Accessories
for basic device
TF43 / TM43

Type / WG01B	Item No.	Price
Immersion sleeves		
TH08- ms / xx (T _{max} +150 °C)	Brass nickel-plated	
TH08-MS 50MM	7100-0011-0010-132	8,21 €
TH08-MS 100MM	7100-0011-0020-132	9,35 €
TH08-MS 150MM	7100-0011-0030-132	9,88 €
TH08-MS 200MM	7100-0011-0040-132	10,19 €
TH08-MS 250MM	7100-0011-0050-132	11,81 €
TH08-MS 300MM	7100-0011-0060-132	12,13 €
TH08-MS 350MM	7100-0011-0070-132	12,23 €
TH08-MS 400MM	7100-0011-0080-132	12,34 €
TH08- VA / xx (T _{max} +600 °C)	Stainless steel V4A (1.4571)	
TH08-VA 50MM	7100-0012-0010-132	17,88 €
TH08-VA 100MM	7100-0012-0020-132	19,76 €
TH08-VA 150MM	7100-0012-0030-132	21,23 €
TH08-VA 200MM	7100-0012-0040-132	22,38 €
TH08-VA 250MM	7100-0012-0050-132	27,82 €
TH08-VA 300MM	7100-0012-0060-132	29,07 €
TH08-VA 350MM	7100-0012-0070-132	29,27 €
TH08-VA 400MM	7100-0012-0080-132	29,79 €
Mounting flanges		Plastic
MF-15-K Ø 15.2 mm (T _{max} +100 °C)	7100-0032-0000-000	5,40 €

Range of preferential items permanently available from stock in standard design with S+S company logo

THERMASGARD® ATF 01

Outside temperature sensors / wet room temperature sensors

Type/WG03B	Output	Item No.	Price
ATF 01 xx	passive	IP 54	
ATF01 Pt1000		1101-1030-5001-000	15,79 €
ATF01 Ni1000		1101-1030-9001-000	16,49 €
ATF01 NiTK		1101-1031-0001-000	19,14 €
ATF01 LM235Z		1101-1032-1001-000	13,90 €
ATF01 NTC1,8K		1101-1031-2001-000	12,81 €
ATF01 NTC10K		1101-1031-5001-000	12,81 €
ATF01 NTC20K		1101-1031-6001-000	12,81 €



THERMASGARD® ATM2-SD

Outside temperature / wet room temperature measuring transducers calibratable, with multi-range switching

Type/WG01B	Output	Item No.	Price
ATM 2-SD	active	IP 54	
ATM2-SD-U	0 -10 V	1101-1191-0009-900	75,48 €
ATM2-SD-I	4...20 mA	1101-1192-0009-900	75,48 €



THERMASGARD® ALTF 02

Surface contact temperature sensors / tube contact temperature sensors, compact variant

Type/WG03B	Output	Item No.	Price
ALTF02 xx	passive	IP 54	
ALTF02 Pt1000		1101-1010-5001-000	19,09 €
ALTF02 Ni1000		1101-1010-9001-000	19,42 €
ALTF02 NiTK		1101-1011-0001-000	22,23 €
ALTF02 LM235Z		1101-1012-1001-000	19,65 €
ALTF02 NTC1,8K		1101-1011-2001-000	18,52 €
ALTF02 NTC10K		1101-1011-5001-000	18,52 €
ALTF02 NTC20K		1101-1011-6001-000	18,52 €



THERMASGARD® ALTM1-SD

Surface contact / tube contact temperature measuring transducers, compact variant, calibratable, with multi-range switching

Type/WG01B	Output	Item No.	Price
ALTM1-SD	active	IP 54	
ALTM1-SD-U	0 -10 V	1101-6141-0219-920	74,24 €
ALTM1-SD-I	4...20 mA	1101-6142-0219-920	74,24 €



Range of preferential items permanently available from stock in standard design with S+S company logo

THERMASGARD® ALTF 1

Surface contact temperature sensors / tube contact temperature sensors, **with detached sensor head**,
(L = 50 mm, cable material: PVC, cable length: 1.5 m, without housing)

Type / WG03B	Output	Item No.	Price
ALTF 1 xx	passive	IP65	
ALTF1 Pt1000 PVC 1,5M		1101-6020-5211-110	17,86 €
ALTF1 Ni1000 PVC 1,5M		1101-6020-9211-110	18,52 €
ALTF1 NiTK PVC 1,5M		1101-6021-0211-110	19,20 €
ALTF1 LM235Z PVC 1,5M		1101-6022-1211-110	18,86 €
ALTF1 NTC1,8K PVC 1,5M		1101-6021-2211-110	18,31 €
ALTF1 NTC10K PVC 1,5M		1101-6021-5211-110	18,31 €
ALTF1 NTC20K PVC 1,5M		1101-6021-6211-110	18,31 €



THERMASGARD® ALTM2-SD

Surface contact / tube contact temperature measuring transducers, **with detached sensor head**,
calibratable, with multi-range switching
(L = 50 mm, cable material: silicone, cable length: 1.5 m, with housing)

Type / WG01B	Output	Item No.	Price
ALTM2-SD	active	IP54	
ALTM2-SD-U	0 -10 V	1101-6151-0219-920	73,50 €
ALTM2-SD-I	4...20 mA	1101-6152-0219-920	73,50 €



THERMASGARD® HTF 50

Sleeve temperature sensors / cable temperature sensors
(L = 50 mm, cable material: PVC, cable length: 1.5 m, without housing)

Type / WG03B	Output	Item No.	Price
HTF 50 xx	passive	IP65	
HTF50 Pt1000 PVC 1,5M		1101-6030-5211-110	14,21 €
HTF50 Ni1000 PVC 1,5M		1101-6030-9211-110	13,81 €
HTF50 NiTK PVC 1,5M		1101-6031-0211-110	17,41 €
HTF50 LM235Z PVC 1,5M		1101-6032-1211-110	12,36 €
HTF50 NTC1,8K PVC 1,5M		1101-6031-2211-110	11,68 €
HTF50 NTC10K PVC 1,5M		1101-6031-5211-110	11,68 €
HTF50 NTC20K PVC 1,5M		1101-6031-6211-110	11,68 €

THERMASGARD® HFTM-SD

Sleeve sensors with temperature measuring transducer, calibratable, with multi-range switching
(L = 50 mm, cable material: PVC, cable length: 1.5 m, with housing)

Type / WG01B	Output	Item No.	Price
HFTM-SD	active	IP54	
HFTM-SD-U	0 -10 V	1101-6161-0219-920	71,31 €
HFTM-SD-I	4...20 mA	1101-6162-0219-920	71,31 €

Range of preferential items permanently available from stock in standard design with S+S company logo

THERMASGARD® RTF1-SD

Room temperature sensors without operating elements

Type/WG03B	Output	Item No.	Price
RTF1-SD xx	passive	IP30	
RTF1-SD Pt1000		1101-40D0-5000-000	17,15 €
RTF1-SD Ni1000		1101-40D0-9000-000	16,83 €
RTF1-SD NiTK		1101-40D1-0000-000	19,50 €
RTF1-SD LM235Z		1101-40D2-1000-000	15,79 €
RTF1-SD NTC1,8K		1101-40D1-2000-000	14,37 €
RTF1-SD NTC10K		1101-40D1-5000-000	14,37 €
RTF1-SD NTC10K (B=3695K)		1101-40D1-9000-000	14,37 €
RTF1-SD NTC20K		1101-40D1-6000-000	14,37 €

THERMASGARD® RTM1-SD

Room temperature measuring transducers without operating elements

Type/WG01B	Output	Item No.	Price
RTM1-SD	active	IP30	
RTM1-SD-U	0 -10 V	1101-41D1-0000-200	64,46 €
RTM1-SD-I	4...20 mA	1101-41D2-0000-200	64,46 €

THERMASGARD® MWTF-SD

Mean value / rod / duct temperature sensor including mounting flange
(Measuring rod: reinforced thermoplastic tube, NL = 3m / 6m)

Type/WG03B	Output	Item No.	Price
MWTF-SD xx	passive	IP54	
MWTF-SD Pt1000 3m		1101-3050-5231-200	83,44 €
MWTF-SD Pt1000 6m		1101-3050-5261-200	92,84 €

THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer, including mounting flange, calibratable, with multi-range switching
(Measuring rod: reinforced thermoplastic tube, NL = 3m / 6m)

Type/WG01B	Output	Item No.	Price
MWTM-SD-U	active	IP54	
MWTM-SD-U 3m	0 -10 V	1101-3131-0239-90K	138,53 €
MWTM-SD-U 6m	0 -10 V	1101-3131-0269-90K	146,89 €
MWTM-SD-I	active	IP54	
MWTM-SD-I 3m	4...20 mA	1101-3132-0239-90K	141,50 €
MWTM-SD-I 6m	4...20 mA	1101-3132-0269-90K	150,26 €

THERMASREG® FST

Frost protection thermostats, mechanical, one-step, with switching output
(length of capillary 3m / 6m, incl. mounting clamps)

Type/WG03B	Output	Item No.	Price
FST-xxD	switching	IP65	
FST-1D 6m		1102-1021-0102-000	76,85 €
FST-5D 3m		1102-1022-0102-000	74,76 €



**BASIC**

S+S REGELTECHNIK

S+S Basic Programme

Range of preferential items permanently available from stock in standard design with S+S company logo

**HYGRASGARD® RFTF - SD**Room humidity and temperature sensors ($\pm 2\%$), calibratable

Type / WG01B	Output	Item No.	Price
RFTF-SD	active (2x)	IP30	
RFTF-SD-U	0 -10 V	1201-41D1-1000-000	101,18 €
RFTF-SD-I	4...20 mA	1201-41D2-1000-000	101,18 €

**HYGRASGARD® KFF - SD**
HYGRASGARD® KFTF - SDDuct humidity and temperatures sensors ($\pm 2\%$), including mounting flange, calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
KFF-SD	active	IP54	
KFF-SD-U	0 -10 V	1201-3181-0000-029	143,13 €
KFF-SD-I	4...20 mA	1201-3182-0000-029	143,13 €
KFTF-SD	active (2x)	IP54	
KFTF-SD-U	0 -10 V	1201-3181-1000-029	147,06 €
KFTF-SD-I	4...20 mA	1201-3182-1000-029	147,06 €

**HYGRASGARD® AFF - SD**
HYGRASGARD® AFTF - SDOn-wall humidity and temperatures sensors ($\pm 2\%$), calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
AFF-SD	active	IP54	
AFF-SD-U	0 -10 V	1201-1121-0000-100	159,41 €
AFF-SD-I	4...20 mA	1201-1122-0000-100	159,41 €
AFTF-SD	active (2x)	IP54	
AFTF-SD-U	0 -10 V	1201-1121-1000-100	162,78 €
AFTF-SD-I	4...20 mA	1201-1122-1000-100	162,78 €

**HYGRASREG® KW - SD**

Condensation control switches including strap

Type / WG01B	Output	Item No.	Price
KW-SD	switching	IP54	
KW-W-SD	Changeover contact	1202-1075-0001-020	93,13 €

Range of preferential items permanently available from stock in standard design with S+S company logo

PREMASGARD® 212x-SD

Pressure, differential pressure and volume flow measuring transducers, with / without display, including connection set, adjustable, calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
max. - 1000...+ 1000 Pa	active	IP 54	
PREMASGARD 2121-SD	0-10 V / 4...20 mA	1301-11B7-0010-000	120,36 €
PREMASGARD 2121-SD LCD (Display)	0-10 V / 4...20 mA	1301-11B7-2010-000	163,20 €
max. - 5000...+ 5000 Pa	active	IP 54	
PREMASGARD 2125-SD	0-10 V / 4...20 mA	1301-11B7-0050-000	120,36 €
PREMASGARD 2125-SD LCD (Display)	0-10 V / 4...20 mA	1301-11B7-2050-000	163,20 €
max. - 100...+ 100 Pa	active	IP 54	
PREMASGARD 2120-SD	0-10 V / 4...20 mA	1301-11B7-0110-000	120,36 €
PREMASGARD 2120-SD LCD (Display)	0-10 V / 4...20 mA	1301-11B7-2110-000	163,20 €



PREMASREG® DS 2

Mechanical differential pressure switches for air, with / without connection set

Type / WG03B	Pressure range	Item No.	Price
DS2 incl. connection set		IP 54	
DS-205 F	20 ... 300 Pa	1302-4026-0000-000	30,96 €
DS-205 B	50 ... 500 Pa	1302-4022-0000-000	30,96 €
DS-205 D	100 ... 1000 Pa	1302-4027-0000-000	30,96 €
DS-205 E	500 ... 2000 Pa	1302-4028-0000-000	30,96 €
DS2 without connection set		IP 54	Multipack
DS-205 F	20 ... 300 Pa	1302-4026-1000- M40	21,00 €
DS-205 B	50 ... 500 Pa	1302-4022-1000- M40	21,00 €
DS-205 D	100 ... 1000 Pa	1302-4027-1000- M40	21,00 €
DS-205 E	500 ... 2000 Pa	1302-4028-1000- M40	21,00 €
M40 = Special price per piece in the multi-pack (40 pieces)			



AERASGARD® KCO₂-SD

Duct CO₂ sensors, including mounting flange

Type / WG02B	Output	Item No.	Price
KCO₂-SD	active	IP 54	
KCO2-SD-U	0-10V	1501-3160-1001-200	211,03 €

AERASGARD® RCO₂-SD

Room CO₂ sensors, self-calibrating

Type / WG02B	Output	Item No.	Price
RCO₂-SD	active	IP 30	
RCO2-SD-U	0-10V	1501-61A0-1001-200	184,93 €



**NOTE**

All devices supplied display the company logo of S + S Regeltechnik GmbH as standard!
Neutral versions without the logo printed are available on request!

ORDER PLACEMENT

Orders can be placed in writing, by phone, by fax, or by e-mail. In doing so, the requested items shall be identified by denomination and quantities ordered and also the requested delivery date shall be stated. Special orders must generally be placed in writing, precisely specifying all requested special features. Or order directly ONLINE at www.SplusS.de!

DELIVERY PERIODS

The catalogue items are available from stock in partial quantities – subject to prior sale.
Delivery dates for large and special orders are determined after receipt of order / release order and mutual agreement.
We reserve the right to make partial deliveries. Events of force majeure such as difficulties in procurement of materials, strikes, etc. entitle us to withdraw from the contract.

TRADEMARK PROTECTION RIGHTS

S + S Regeltechnik GmbH, S + S logo and S + S brand names are trademarks registered in the register at the German Patent and Trademark Office and must not be used in other publications without the trademark owner's prior written consent.
All other product and company names mentioned here are brands or trademarks of the respective proprietors.

INFRINGEMENT OF INDUSTRIAL PROPERTY RIGHTS

Registered trademarks, trade names and general descriptive names are used in this product catalogue.
Even if these are not expressly marked as such, the pertinent protection provisions and copyrights shall nevertheless apply.

ATTENTION!

We generally only supply commercial, retail and industrial customers. We do not sell to the general public!

Our General Terms and Conditions of Sale and Delivery are applicable in all cases!

This price list supersedes all previous price lists.

LEGAL NOTICE

© Copyright by S + S Regeltechnik GmbH | Version: 11/2020 GB print

Reprints, even excerpts, are only permitted with the approval of S + S Regeltechnik GmbH.
All information provided without prejudice, technical modifications and price changes reserved.

Editor: S + S Regeltechnik GmbH, Mr. Tino Schulze, Managing Director

Graphic design: straub design

PHOTO CREDITS

REFERENCES :

Hotel Elephant Weimar, exterior view © Georg Grainer
Cruise liner MS Grandiosa © MSC Rights/Ivan Sarfatti
iStock-157512295 © iStock.com/„Bertlmann“
iStock-183042951 © iStock.com/„Tomml“
iStock-503865996 © iStock.com/„Lisa-Blue“
shutterstock_19478008 © „K-i-T“/Shutterstock.com
shutterstock_688127869 © „Joann Pate“/Shutterstock.com

NEWS :

One Cable © Beckhoff Automation GmbH & Co. KG (EtherCAT P)
Demowall © powerIO GmbH (powerIO)

APPENDIX :

iStock-480586617 © iStock.com/„xavierarnau“

BEGINNING OF CHAPTERS :

iStock-482550126 © iStock.com/„vm“ (Modbus)
iStock-510487654 © iStock.com/„shironosov“ (Humidity)
iStock-510676770 © iStock.com/„mediaphotos“ (Light intensity)
iStock-637081054 © iStock.com/„alvarez“ (Air quality)
iStock-468377000 © iStock.com/„Tomml“ (Radio sensors)
shutterstock_121578847 © „SnnvSnnvSnnv“/Shutterstock.com (Temperature sensors passive)
shutterstock_412795528 © „Dmitry Kalinovsky“/Shutterstock.com (Temperature sensors active)
shutterstock_373407667 © „Jan Faulkner“/Shutterstock.com (Temperature controllers)
shutterstock_423350014 © „goodluz“/Shutterstock.com (Accessories)
Fotolia_131639768 © "Portrait of a worker, constructing and checking development of a small business hall.
Reliable civil engineer working on a construction site, foreman at work"@„urbans78“ – Fotolia.com (Pressure)



1. Scope

- (1) Any and all quotations, services and agreements are solely made or performed on the basis of these General Terms and Conditions of Sale and Delivery of S+S Regeltechnik GmbH (S+S) in their respective valid version. These General Terms and Conditions of Sale and Delivery apply solely to companies as defined by the BGB (German Civil Code).
- (2) Customers' terms and conditions conflicting with or deviating from these General Terms and Conditions of Sale and Delivery will be acknowledged by S+S only if S+S has expressly consented to the validity of such terms in writing. The General Terms and Conditions of Sale and Delivery of S+S shall also apply if services have been provided to the customer without reservation in the knowledge of conflicting or deviating terms of that customer.
- (3) These General Terms and Conditions of Sale and Delivery of S+S shall be acknowledged by the customer's order placement or acceptance of services provided for the duration of the entire business relationship, even if these terms are not explicitly restated.

2. Quotation / contract conclusion / termination of contract

- (1) The quotations made by S+S are non-binding. A contract is concluded by the written order confirmation or the delivery of goods ordered insofar as S+S does not indicate via other circumstances that the order has been accepted. Insofar as the customer communicates change requests following receipt of the order confirmation, S+S is entitled to charge the additional costs resulting from this if it accepts such changes.
- (2) Illustrations, drawings and other specifications are only binding if agreed upon in writing. The same applies to advisory or informative discussions between S+S and the customer, in particular regarding the possible uses of goods ordered.
- (3) Insofar as the customer cancels the contract for any reason whatsoever for which S+S is not responsible, S+S is entitled to claim fixed compensation amounting to 10% of the agreed total price at the time of order cancellation, unless S+S or the customer provides other evidence in the individual case.

3. Services / dates

- (1) Delivery deadlines are only binding (fixed date transaction), if S+S has expressly confirmed this in writing.
- (2) The adherence to binding delivery deadlines presupposes the clarification of all technical and other issues as well as the timely and proper performance of any obligations by the customer.
- (3) S+S shall not be held responsible for delays in delivery for reasons beyond the control of S+S, specifically unforeseeable events that prevent or impede timely delivery. In such cases, the delivery deadline shall be extended accordingly. In the event of a delay of performance, the customer is entitled to withdraw from the non-performed part of the contract insofar as such impediment to performance continues for more than 6 weeks and a reasonable grace period for delivery has been granted. The customer's claims for damages due to the extension of the delivery deadline or if S+S is exempted from its duty to perform are excluded, insofar as the customer was notified without delay of such impediment to performance.
- (4) Insofar as S+S is responsible for the non-compliance with binding delivery dates, the liability of S+S shall be limited to 0.5% of the order value for each full week of delay, but up to a maximum of 5% of the order value of the delivery affected. The customer can only assert further claims for damages insofar as the customer has granted S+S a reasonable grace period in writing and such delay in delivery is attributable to gross negligence or intent on part of S+S.
- (5) S+S is exempt from its delivery obligation if circumstances come to light during the contractual relationship that give just cause to doubt the solvency of the customer. In this case, S+S will perform the delivery insofar as the customer makes an advance payment in respect of the purchase price, or provides appropriate sureties.
- (6) Insofar as the customer orders goods on call (in particular, pre-order), the full acceptance of the purchase or the full release order respectively shall be completed within 12 months of the date of contract conclusion or order respectively. Otherwise, the customer is obligated to accept the goods within 10 working days insofar as S+S requests this in writing.
- (7) The failure to comply with the time limit mentioned in number (6) will trigger the legal consequences of default of acceptance as defined in the BGB.
- (8) There is no general right to return goods no longer required by the purchaser or for the purpose of stock reduction.

4. Delivery

- (1) Shipment of goods is effected ex principal office of S+S at the customer's risk and expense (Incoterms 2010: EXW). S+S shall only take out transport, breakage, theft, or other insurance at the written request of the customer. The resulting costs shall be charged to the customer's account.
- (2) Insofar as delivery of the goods is to be carried out at a later date than the possible date of shipment at the customer's request, S+S is entitled to charge the costs of storage to the customer's account, starting one month after the notification of readiness for delivery at a flat rate at 0.5% of the order value for each month, subject to the provision of other evidence. One month after notification of readiness for delivery, S+S is alternatively entitled to request the customer to accept the goods and, in case of non-acceptance, to dispose of the goods in another manner. The customer is then to be supplied within a reasonably extended deadline.

- (3) Partial performances are permissible insofar as this is not unreasonable to the customer.

5. Prices / payment terms

- (1) The prices of S+S are subject to the statutory value added tax at the respective rate in effect, ex principal office of S+S and plus transport/shipping and packaging costs to be separately charged. For orders of less than EUR 75.00 in value, we reserve the right to charge a low-quantity surcharge in the amount of EUR 15.00. For custom-made items, we charge setup expenditure at cost. Existing customers whose previous payment was received more than 12 months ago as well as new customers from Germany are supplied two times subject to prepayment and then, after a positive creditworthiness check by our Euler Hermes trade credit default insurance, by payment on account. Deliveries to customers outside Germany are subject to prepayment.
- (2) S+S is entitled to issue partial invoices in accordance with the progress of the order.
- (3) The invoice amount is due for payment on receipt of the invoice. Insofar as payment is not effected within 14 working days of the date of performance of goods and receipt of the invoice, the customer shall be deemed to be in default. All payments must be made in EUR. Notwithstanding evidence of further damages, the customer in the case of payment default shall pay interest on arrears at a rate of 8 percentage points above the respective base rate.
- (4) Bills of exchange and checks are only accepted as conditional payment and take fulfilling effect only after being unconditionally credited. Possible ancillary costs arising due to payment by bills of exchange or check shall be charged to the customer.

6. Warranty entitlements of the purchaser

- (1) The rights of the purchaser regarding material defects and defects of title (including incorrect and under-delivery as well as improper assembly or incorrect assembly instructions) shall be based on the statutory provisions, unless otherwise agreed below. The special statutory provisions for final delivery of the unprocessed goods to a consumer, even if this consumer has further processed these goods, shall remain unaffected in all cases (supplier regress according to §§ 478 BGB). Claims arising from the supplier regress are excluded if the defective goods were subject to further processing, e.g. by installation in another product, by the customer or another company.
- (2) Our liability for defects is based primarily on the agreement reached concerning the quality of the goods. All product descriptions and manufacturer's specifications that form part of an individual contract or that were published by us (specifically in catalogues or on our website) at the time of contract conclusion are deemed to be agreements concerning the quality of the goods.
- (3) Insofar as the quality was not agreed, the existence of a defect shall be evaluated according to the statutory provision (§ 434 par. 1 p. 2 and 3 BGB). However, we accept no liability for public statements by third parties (e.g., advertising statements) to which the customer has not drawn our attention as having influenced his/her purchasing decision.
- (4) In principle, we accept no liability for defects that the customer is aware of, or unaware of due to gross negligence, at the time of conclusion of the contract (§ 442 BGB). Furthermore, the customer's claims for defects require that the customer has fulfilled his/her statutory examination and reporting obligations (§§ 377, 381 German Commercial Code (HGB)). In the case of goods intended for installation or other further processing, an investigation must be carried out in all cases immediately prior to processing. If a defect is discovered during the delivery, the investigation or at any subsequent time, we must be notified of this in writing immediately. In all cases, obvious defects must be reported in writing within 5 working days of delivery and non-visible defects undiscovered during the investigation must be reported in writing within the same period following discovery. If the customer fails to carry out a proper investigation and/or report defects, our liability for defects that are not reported, not reported in time or not reported properly shall be excluded in accordance with the statutory provisions.
- (5) If the item delivered is defective, we can initially choose whether to provide subsequent performance by eliminating the defect (rectification) or by delivering a defect-free item (replacement delivery). This does not affect our right to refuse subsequent performance in accordance with statutory requirements.
- (6) S+S is entitled to refuse subsequent performance if this is only possible at disproportionate costs. Disproportionate costs are deemed to apply if the costs of subsequent performance, including the cost of removing the defective item and installing a defect-free item, exceed the value of the goods in their defect-free condition by 200%.
- (7) S+S is entitled to make the subsequent performance owed dependent on the purchaser paying the purchase price due. However, the purchaser is entitled to withhold a portion of the purchase price that is commensurate with the defect.



- (8) The purchaser must provide us with the necessary time and opportunity to carry out the subsequent performance owed and, in particular, must hand over the rejected goods to us. In the event of a replacement delivery, the purchaser must return the defective item to us in accordance with the statutory provisions.
- (9) In the case of subsequent performance, S+S itself shall remove the defective item and install the defect-free item. The customer is only entitled to remove the defective item and to install a defect-free item with the prior consent of S+S or following the expiry of an appropriate deadline set by the customer. Insofar as a defect actually exists, we will bear or reimburse in accordance with statutory provisions the expenditure incurred for the purpose of inspection and subsequent performance, in particular, transport, travel, labour and material costs as well as any applicable removal and installation costs. Otherwise, we are entitled to demand reimbursement from the customer for the costs incurred due to the unwarranted request for defect rectification (in particular, inspection and transport costs), unless the purchaser was unable to ascertain the freedom from defects.
- (10) If the subsequent performance has failed or if an appropriate deadline to be set by the customer for the subsequent performance has expired without success or is dispensable in accordance with the statutory provisions, the purchaser is entitled to withdraw from the contract or reduce the purchase price. However, the right of withdrawal does not apply for insignificant defects.
- (11) Claims by the purchaser for damages or compensation for wasted expenditure apply even for defects only in accordance with § 8 and are excluded in all other cases.

7. Warranty

- (1) S+S grants a warranty for products that the customer has purchased on or after 1 January 2021 subject to the following provisions. This warranty is provided to customers in addition to and independently of their statutory entitlements in the event of defects.
- (2) S+S will rectify any faults in the design, material or workmanship by repair or replacement delivery within 5 years of delivery. The usual signs of wear, especially due to corrosion, ageing as well as ambient and environmental influences, are excluded from the warranty.
- (3) The warranty only covers the repair or replacement delivery at the discretion of S+S. The warranty does not cover the removal of the defective item and installation of the new defect-free item.
- (4) The assertion of warranty claims requires that the product be purchased on or after 1 January 2021 and was installed and maintained by a qualified technician in compliance with the mounting and operation handouts of S+S.
- (5) The warranty shall expire if the fault is caused by improper installation, operating, usage or handling, or if the product was subject to structural modifications after it was purchased or was repaired or modified using third-party components.
- (6) When a warranty claim is submitted, the product must be sent, securely packaged, accompanied by a complaint number that must be requested from S+S by telephone or by e-mail to "S+S Regeltechnik GmbH, Reklamationsabteilung, Thurn-und-Taxis-Str. 22, D-90411 Nürnberg, Germany". The customer bears all shipping costs. The copy of the invoice with purchase date and the completed "Form for Returns", which can be downloaded at <https://spluss.de/en/downloads/>, must be enclosed with the shipment.

8. Liability

- (1) Unless otherwise specified in these General Terms and Conditions of Sale and Delivery including the following provisions, S+S shall be liable for breaches of contractual and non-contractual obligations in accordance with the statutory provisions.
- (2) S+S is liable for damages – irrespective of the legal grounds – in the case of fault-based liability arising from intent and gross negligence. In the case of simple negligence, S+S shall be liable based on a more lenient liability standard in accordance with statutory provisions (e.g., for care and attention regarding internal matters) only
- for damage arising from the injuries to life and limb or to health;
 - for damage arising from the violation of a material contractual obligation, the fulfilment of which enables the proper execution of the contract in the first place and on whose fulfilment the customer can normally rely on and is entitled to rely on; in this case, however, liability is limited to compensation of the typically foreseeable level of damage.
- (3) The liability limitations arising from number 8 (2) also apply for breaches of duty by or in favour of persons for whose fault S+S is responsible in accordance with statutory provisions. They shall not apply insofar as S+S has maliciously concealed a defect or has assumed a warranty for the quality of the goods and for claims by the customer in accordance with the German Product Liability Act.
- (4) S+S can only be held liable for deliberate breach of duty and not for any consequential damage caused by further processing of unsuitable or defective goods.

9. Limitation period

- (1) Contrary to § 438 par. 1 no. 3 BGB, the general limitation period for claims arising from material defects and defects of title is one year after delivery.
- (2) However, if the good in question is a building or an item that has been used in accordance with its customary purpose for a building and has caused it to be defective (building material), the limitation period according to the statutory provision is 5 years of delivery (§ 438 par. 1 no. 2 BGB). Additional statutory special regulations regarding the limitation period, especially in accordance with § 438 par. 1 no. 1 BGB, also remain unaffected if S+S has maliciously concealed the defect or assumed a warranty for the quality of the goods (§ 438 par. 3, § 444 BGB) or in the case of supplier regress in the sale of consumer goods in accordance with §§ 478, 479 BGB.
- (3) The above limitation periods specified in legislation covering the sale of goods also apply for contractual and non-contractual claims for compensation by the customer that are based on a defect of the goods, unless application of the normal statutory limitation period (§§ 195, 199 BGB) would in this particular case result in a shorter limitation period. Claims for compensation by the customer in accordance with number 8 (2) clause 1 and clause 2 (a) and in accordance with the product liability law shall come under the statute of limitations exclusively in accordance with the statutory limitation periods.

10. Retention of title

- (1) The goods delivered shall remain the property of S+S until the complete settlement of any and all claims by the customer. If the customer sells reserved goods without receiving the purchase price from its buyers on a payment-on-delivery basis or in advance, the customer shall agree the reservation of title with its buyers in accordance with these provisions.
- (2) The customer is not entitled to pledge the reserved goods or to transfer them as collateral. In the event of seizures or other interventions by third parties, the customer shall notify S+S in writing without delay.
- (3) The customer is entitled to resell reserved goods during the course of its regular business operations. The customer now already assigns to S+S all receivables in the amount of the total invoice amount (including VAT) of the claim that are accruing to the customer from its buyers from the resale, irrespective of whether such goods are sold either without or after processing. The customer is also still entitled to collect the receivable after assignment, although this does not affect the entitlement of S+S to collect the outstanding amount itself. However, S+S undertakes to the customer not to collect the outstanding amount as long as the customer does not fall behind with payments, or an application to initiate a judicial settlement or insolvency proceedings has not been filed. If this is the case, the customer is obligated at the request of S+S to disclose the assigned receivables and their debtors, to provide the necessary records, and to notify the debtors of the assignment.

11. Operating and mounting instructions

The customer undertakes to adhere to any operating and mounting instructions delivered with goods, and to make any third-party buyers aware of same. The complete or partial non-observance of such instructions may result in a complete loss of buyers' rights. This does not apply to possible claims for damages according to § 7.

12. Copyright

The customer is not entitled to reproduce or copy any of the content of S+S catalogues, specifically technical drawings and photographs, for his/her own advertising or other purposes without the express written approval of S+S. The customer is not permitted to make quotations or other commercial documents available to third parties.

13. Miscellaneous

- (1) For any disputes arising from or in connection with the contractual relationship, Nuremberg/Germany is agreed as the place of jurisdiction. The place of performance is Nuremberg.
- (2) The customer can only offset against claims that are undisputed or have been legally established as final and absolute. The customer is entitled to a right of retention only if its counter-claims originate from the very same contractual relationship, or if such claims are undisputed or have been legally established as final and absolute.
- (3) Modifications of the contract must be made in writing. This also applies to the alteration of this written-form requirement clause.
- (4) Should one or several provisions of these General Terms and Conditions of Sale and Delivery be ineffective or not have been properly incorporated into the contract, the remaining provisions of these General Terms and Conditions of Sale and Delivery shall remain effective.
- (5) Solely the laws of the Federal Republic of Germany shall apply to the exclusion of the law regarding the United Nations Convention on Contracts for the International Sale of Goods (CISG) – also if the customer has its registered office outside Germany.

These General Terms and Conditions of Sale and Delivery are protected by copyright. Copyright infringements will be legally prosecuted.





You can rely on S+S – We have the paperwork to prove it!

When it comes to quality, we leave nothing to chance. We make sure of this with systematic quality management and uncompromising checks at our in-house testing centre. In addition, we undergo

regular certification by independent inspection authorities and institutions. We are very proud that our quality ‚Made in Germany‘ also passes the strictest international inspections and tests again and again with flying colours.

Approved Safety



DIN tested/certified devices



RoHS conforming materials



ESD compliant manufacturing



CE compliance tested by external laboratories

Certified Quality



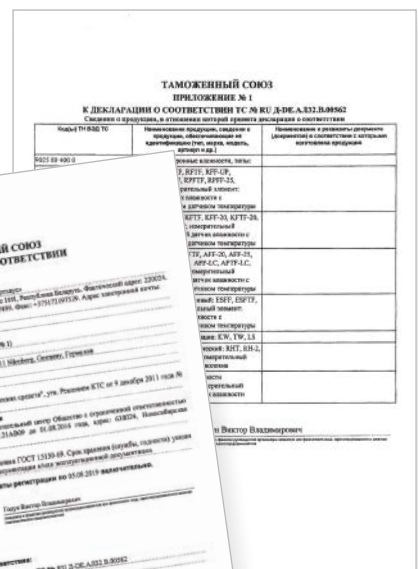
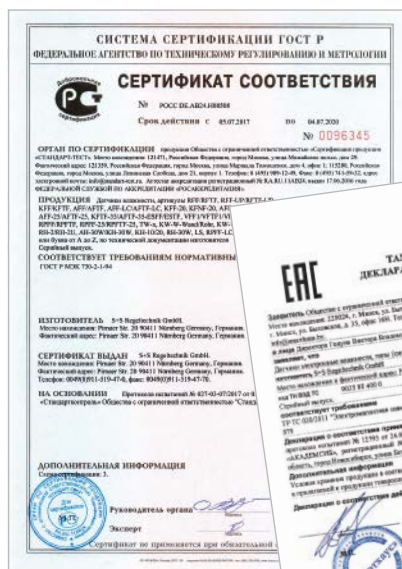
Our development and production in Nuremberg /Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2015.



GOST certificates for exports of all products by S+S Regeltechnik GmbH to the Commonwealth of Independent States and Russia



EAC certified



ZERTIFIKAT
CERTIFICATE

gültig seit: 29.02.2019
valid until: 29.02.2019

EU-Beurteilung (Produkt B) - Bauartener - nach Richtlinie 2014/53/EU
EU Type examination (product B) - construction type - according to Directive 2014/53/EU

Zertifikat-Nr.: 2-85-TAF-MUC-18-03-282130-002
Certificate No.: 2-85-TAF-MUC-18-03-282130-002

Name und Anschrift des Herstellers:
Name and address of manufacturer:
S+S Regeltechnik GmbH
Pirnaer Str. 20
90411 Nürnberg

Prüfbericht Nr.: C-T 1382-0118 vom 2018-03-26
Evaluation report No.: C-T 1382-0118 dated 2018-03-26

Geltungsbereich:
Scope of examination:
Sicherheitsatemungsregler
an Auerdetestgerät mit Sicherheitsfunktion
Typ: ETR und KTR (siehe Seite 3)
Pressure regulating device (see page 3)

Fertigungsstätte:
Manufacturing plant:
S+S Regeltechnik GmbH
Pirnaer Str. 20
90411 Nürnberg

München, 29.02.2019
(Date, Datum)

TÜV SÜD Industrie Service GmbH
Zertifizierungsstelle für Druckregelgeräte
Certification Body for pressure regulators
Johannes Biedermann
889 950-1527
889 950-1528
889 950-1529
889 950-1530
889 950-1531
889 950-1532
889 950-1533
889 950-1534
889 950-1535
889 950-1536
889 950-1537
889 950-1538
889 950-1539
889 950-1540
889 950-1541
889 950-1542
889 950-1543
889 950-1544
889 950-1545
889 950-1546
889 950-1547
889 950-1548
889 950-1549
889 950-1550

Seite 1 of 4 certificate No. 18011-1-0000282130-002, 2-85-TAF-MUC-18-03-282130-002

CERTIFICATE
ZERTIFIKAT

valid until: 29.02.2019
gültig bis: 29.02.2019

EU Type examination (product B) - production type - according to Directive 2014/53/EU
EU-Beurteilung (Produkt B) - Bauartener - nach Richtlinie 2014/53/EU

Certificate No.: 2-85-TAF-MUC-18-03-282130-002
Zertifikat-Nr.: 2-85-TAF-MUC-18-03-282130-002

Name and address of manufacturer:
Name und Anschrift des Herstellers:
S+S Regeltechnik GmbH
Pirnaer Str. 20
90411 Nürnberg

Evaluation report No.: C-T 1382-0118 dated 2018-03-26
Prüfbericht Nr.: C-T 1382-0118 vom 2018-03-26

Scope of examination:
Geltungsbereich:
Safety temperature limiter as safety accessory
type ETR and KTR (see page 3),
back of examination and details see page 3

Manufacturing plant:
Fertigungsstätte:
S+S Regeltechnik GmbH
Pirnaer Str. 20
90411 Nürnberg

München, 29.02.2019
(Place, date)

TÜV SÜD Industrie Service GmbH
Certification Body for pressure regulators
Johannes Biedermann
889 950-1527
889 950-1528
889 950-1529
889 950-1530
889 950-1531
889 950-1532
889 950-1533
889 950-1534
889 950-1535
889 950-1536
889 950-1537
889 950-1538
889 950-1539
889 950-1540
889 950-1541
889 950-1542
889 950-1543
889 950-1544
889 950-1545
889 950-1546
889 950-1547
889 950-1548
889 950-1549
889 950-1550

Page 1 of 4 certificate No. 18011-1-0000282130-002, 2-85-TAF-MUC-18-03-282130-002

СЕРТИФИКАТ
Certificate

Испытание ЕС типового образца (продукт В) в соответствии с
Директивой 2014/53/ЕС
EU Type examination (product B) - production type - according to Directive 2014/53/EU

Certificate No.: 2-85-TAF-MUC-18-03-282130-002
Зertifikat-Nr.: 2-85-TAF-MUC-18-03-282130-002

Name and address of manufacturer:
Name und Anschrift des Herstellers:
S+S Regeltechnik GmbH
Pirnaer Str. 20
90411 Nürnberg

Evaluation report No.: C-T 1382-0118 dated 2018-03-26
Prüfbericht Nr.: C-T 1382-0118 vom 2018-03-26

Scope of examination:
Geltungsbereich:
Safety temperature limiter as safety accessory
type ETR and KTR (see page 3),
back of examination and details see page 3

Manufacturing plant:
Fertigungsstätte:
S+S Regeltechnik GmbH
Pirnaer Str. 20
90411 Nürnberg

München, 29.02.2019
(Place, date)

TÜV SÜD Industrie Service GmbH
Certification Body for pressure regulators
Johannes Biedermann
889 950-1527
889 950-1528
889 950-1529
889 950-1530
889 950-1531
889 950-1532
889 950-1533
889 950-1534
889 950-1535
889 950-1536
889 950-1537
889 950-1538
889 950-1539
889 950-1540
889 950-1541
889 950-1542
889 950-1543
889 950-1544
889 950-1545
889 950-1546
889 950-1547
889 950-1548
889 950-1549
889 950-1550

Page 1 of 4 certificate No. 18011-1-0000282130-002, 2-85-TAF-MUC-18-03-282130-002

ZERTIFIKAT

für das Managementsystem
nach DIN EN ISO 9001:2015

Die regelwerkskonforme Anwendung wurde nachgewiesen
und gemäß Zertifizierungsverfahren bescheinigt für das
Unternehmen

S + S Regeltechnik GmbH
Pirnaer Straße 20
90411 Nürnberg

Geltungsbereich
Entwicklung, Herstellung und Vertrieb von Sensoren, Fühlern
und Feldgeräten für die Gebäude-, Versorgungstechnik und
Infrastrukturautomation

Zertifikat-Registrier-Nr.: TIC 15 100 21333
Audit Bericht Nr.: 3330 208P TD

Gültig bis: 2023-06-22
Gültig ab: 2020-06-26

Diese Zertifizierung wurde gemäß TIC-Verfahren zur Audierung und Zertifizierung durchgeführt und
wird regelmäßig überwacht.

TÜV Thüringen e.V.
Zertifizierungsstelle für
Systeme und Personal

Jena, 2020-06-26

IAF
Dakks

Die jährlich abgibteten Daten unter www.dakks.de sind öffentlich zugänglich.
Zertifizierungsstelle der TÜV Thüringen e.V. • Pirnaer Straße 20 • D-90411 Nürnberg • Tel. +49 91 387 181 • E-Mail: dakks@tuev-thueringen.de

CERTIFICATE

for the management system
according to ISO 9001:2015

The proof of the conforming application with the regulation was
furnished and in accordance with certification procedure it is certified
for the company

S + S Regeltechnik GmbH
Pirnaer Straße 20
90411 Nürnberg / Germany

Scope
Development, production and sale of sensors, detectors
and field instruments for building, supply technology
and infrastructure automation

Certificate Registration No.: TIC 15 100 21333
Audit Report No.: 3330 208P TD

Valid until: 2023-06-22
Valid from: 2020-06-26

This certification was conducted in accordance with the TIC building and certification procedures and
is subject to regular surveillance audits.

TÜV Thüringen e.V.
Certification body for
systems and personnel

Jena, 2020-06-26

IAF
Dakks

The annually published data under www.dakks.de are publicly accessible.
Zertifizierungsstelle der TÜV Thüringen e.V. • Pirnaer Straße 20 • D-90411 Nürnberg • Tel. +49 91 387 181 • E-Mail: dakks@tuev-thueringen.de

СЕРТИФИКАТ

СООТВЕТСТВИЯ СИСТЕМЫ МЕНЕДЖМЕНТА
ТРЕБОВАНИЯМ СТАНДАРТА ISO 9001:2015

В соответствии с правилами сертификации подтверждено
выполнение требований стандарта в организации

S + S Regeltechnik GmbH
Pirnaer Straße 20
90411 Nürnberg / Германия

в области:
Разработка, производство и сбыт сенсоров,
зондов, регулирующих и контрольных приборов
для автоматизации сооружений и инфраструктуры

Регистрационный номер сертификата: TIC 15 100 21333
Действителен до: 2023-06-22
Отчет по аудиту №: 3330 208P TD
Действителен с: 2020-06-26

Эта сертификация проводилась в соответствии с процедурами аудирования и сертификации TIC и
предусматривает проведение регулярных наблюдательных аудитов.

TÜV Thüringen e.V.
Орган по сертификации
систем и персонала

Рейна, 2020-06-26

IAF
Dakks

Данные ежегодно публикуемые данные на сайте www.dakks.de являются общедоступными.
Зertifizierungsstelle der TÜV Thüringen e.V. • Pirnaer Straße 20 • D-90411 Nürnberg • Tel. +49 91 387 181 • E-Mail: dakks@tuev-thueringen.de

DIN CERTCO

ZERTIFIKAT

Zertifikathaber: S + S Regeltechnik GmbH
Pirnaer Str. 20
90411 Nürnberg

Produkt: Temperaturregel- und Begrenzungsrichtungen für Wärmeenergieanlagen
Typ, Modell: ETR-060, ETR-090, ETR-90140, ETR-1, ETR-0120
KTR-060, KTR-090, KTR-90140, KTR-1, KTR-0120
DIN EN 14597-2015-02
Prüfung(s) Zertifikatprogramm Temperatur- und Begrenzungsrichtungen für
Wärmeenergie Anlagen (2009-01)

Konformitätszeichen: DIN CERTCO

Registrierungsnummer: TR1199

Gültig bis: 2023-02-28

Nutzungsrecht: Dieses Zertifikat berechtigt zum Führen des oben stehenden Konformitätszeichens
in Verbindung mit der jeweiligen Registrierungsnummer.
Weitere Angaben siehe Anhang.

2019-01-14
Dirk Hepp, PPI Team Leader
Head of Certification Body

IAF
Dakks

EN CERTCO Geschäftsstelle für Fachverfahren-Zertifizierung mbH • Albstadt-Land 54 • D-72076 Badlin • www.din-certco.de

DIN CERTCO

CERTIFICATE

Certificate holder: S + S Regeltechnik GmbH
Pirnaer Str. 20
90411 Nürnberg
GERMANY

Product: Temperature control and limiting devices for heat generating systems
Type, Model: ETR-060, ETR-090, ETR-90140, ETR-1, ETR-0120
KTR-060, KTR-090, KTR-90140, KTR-1, KTR-0120
DIN EN 14597-2015-02
Testing basis: Certificate scheme Temperature control and limiting devices for heat generating
systems (2009-01)

Mark of conformity: DIN CERTCO

Registration No.: TR1199

Valid until: 2023-02-28

Usage rights: This certificate entitles the holder to use the mark of conformity shown above in
conjunction with the specified registration number.
See annex for further information.

2019-01-14
Dirk Hepp, PPI Team Leader
Head of Certification Body

IAF
Dakks

EN CERTCO Geschäftsstelle für Fachverfahren-Zertifizierung mbH • Albstadt-Land 54 • D-72076 Badlin • www.din-certco.de

DIN CERTCO

СЕРТИФИКАТ

Владелец сертификата: S + S Regeltechnik GmbH
Pirnaer Str. 20
90411 Nürnberg
Германия

Наименование изделия: УСТРОЙСТВА КОНТРОЛЯ И ОГРАНИЧЕНИЯ ТЕМПЕРАТУРЫ
Тип, модель: ETR-060, ETR-090, ETR-90140, ETR-1, ETR-0120
KTR-060, KTR-090, KTR-90140, KTR-1, KTR-0120
DIN EN 14597-2015-02
Основание для выдачи: Программа сертификации устройств контроля и ограничения температуры для
теплоэнергетических систем (2009-01)

Знак соответствия: DIN CERTCO

Регистрационный номер: TR1199

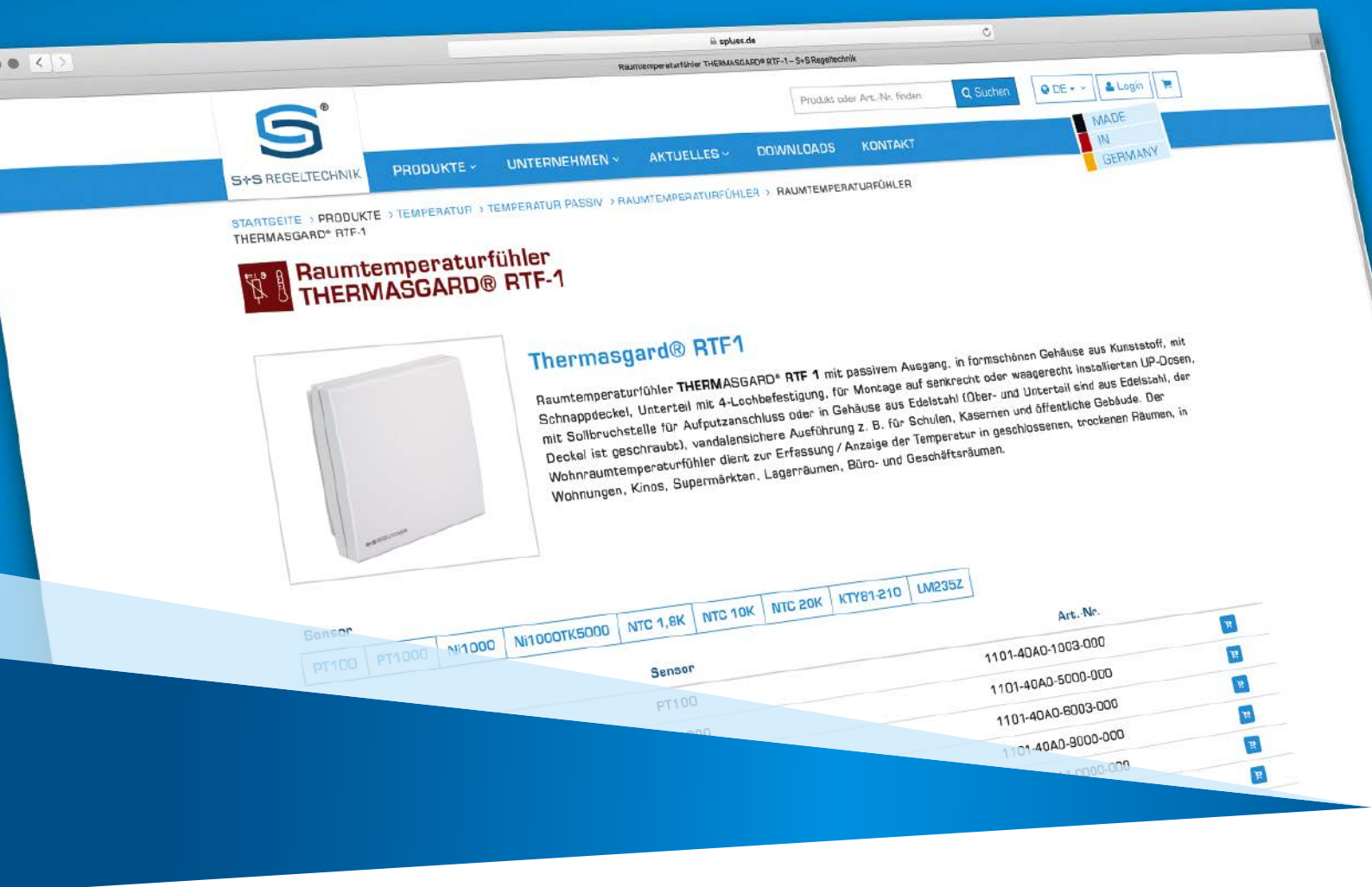
Действителен до: 2023-02-28

Права на использование: Настоящий сертификат дает право на использование вышесказанного знака
соответствия вместе с приведенным регистрационным номером.
Дальнейшая информация - см. приложение.

2019-01-14
Dirk Hepp, PPI Team Leader
Руководитель органа сертификации

IAF
Dakks

EN CERTCO Geschäftsstelle für Fachverfahren-Zertifizierung mbH • Albstadt-Land 54 • D-72076 Badlin • www.din-certco.de



Online Ordering with Ease

Quickly and easily order 24/7 from our S+S online shop. All items from the S+S facility engineering product range are immediately available from stock. On weekdays we ship within 24 hours after receipt of order.



www.SplusS.de



24 / 7 ordering



All catalogue items available ex stock



24-hours shipment on weekdays



At Your Service

All of our staff members are specialists in their jobs and know how to contribute to your satisfaction.

You can reach our motivated team by phone, email or fax.

Don't hesitate to contact us – now!



Contact us by phone:

+49 (0) 911-519 47-0



Write us an email:

mail@SplusS.de



Send us a fax:

+49 (0) 911-519 47-70



S+S REGELTECHNIK



S+S REGELTECHNIK GMBH
THURN-UND-TAXIS-STR. 22
90411 NUREMBERG / GERMANY

PHONE +49 (0) 911 / 5 19 47-0
FAX +49 (0) 911 / 5 19 47-70
FAX +49 (0) 911 / 5 19 47-73

mail@SplusS.de
www.SplusS.de

FÜHLBARE PRÄZISION