



Industrial Design | 2019-II

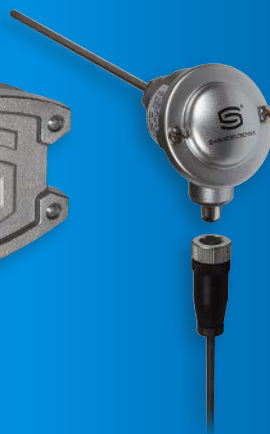
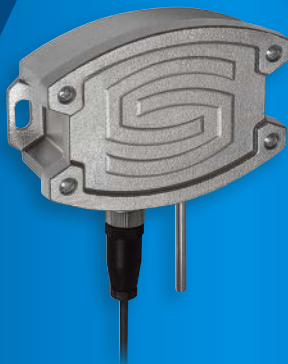


S+S REGELTECHNIK



NEW

SENSOR TECHNOLOGY & FIELD DEVICES



Order Hotline: +49 (0) 911 / 5 19 47-0 | Online Shop: www.SplusS.de



S+S Regeltechnik – a Synonym for Process Security

Sensor and control devices for plants and equipment in process and manufacturing industries must meet higher demands on uptime availability, reliability, ruggedness, hygiene and efficiency.

For this reason we have complemented our housing designs with the Tyr 2E, which features a rugged stainless steel enclosure and a high-impact display cover – naturally without any compromises in proven quality and easy parametering. And as an alternative to the cable gland, all our Tyr housings are also available with M12 connector for fast installation on site.

Moreover, we assign great importance to security of supply and investment. Our technology is "Made in Germany", and each device is thoroughly tested in-house before being shipped.

Anything missing in our catalogue? Contact us today!
We specialise in customised solutions.

Tino Schulze
Managing Director
S+S Regeltechnik GmbH®

Heiko Linke
Managing Director
S+S Regeltechnik GmbH®

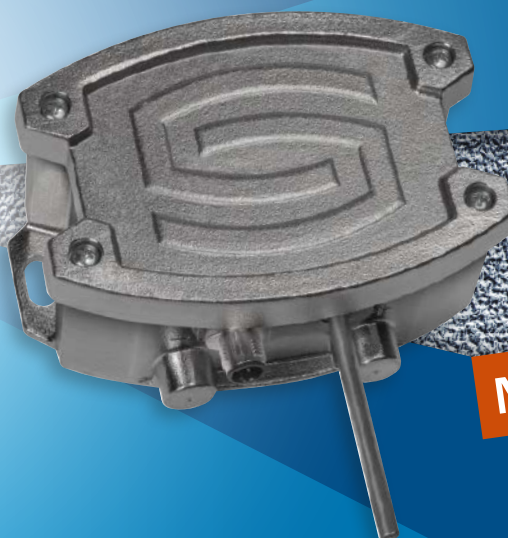




S+S REGELTECHNIK

FOCUS 2019

INDUSTRIAL DESIGN



NEW

TYR 2E

STAINLESS STEEL HOUSING
IN INDUSTRIAL DESIGN
FOR IP 69 PROTECTION TYPE

» [Page 006](#)

PREMASREG® PREMASGARD®

OPTIONAL PORTS
FOR PRESSURE HOSES
OR PRESSURE LINES

» [Page 094](#)



M12 CONNECTOR

DIVERSITY BY
MODULAR DESIGN:
ALTERNATIVE
CABLE CONNECTION

» [Page 008](#)



FOR PROCESS AND
MANUFACTURING INDUSTRIES



CUSTOM MANUFACTURING

In addition to our comprehensive range of catalogue items, 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.

INDUSTRY FOCUSED SOLUTIONS

Based on our comprehensive experience gained from a wide range of public and institutional projects, we develop complete system solutions for seamless integration of sensor and control technology in industrial engineering, from chemical processing plants to heating, ventilation and cooling units as well as agricultural facilities.

As pioneers in our business, we keep an ear to the market and are firmly committed to the continuous innovation of our product offering – always with an eye on the sustainability and total cost of ownership of our devices.

And true to our promise of providing precision you can feel, made in Germany to the highest standards of quality, at best terms and conditions, including 24-hours shipment of catalogue items on stock.

**TEMPERATURE SENSORS
PASSIVE****Duct, immersion, screw-in sensors**

TF 54	Immersion / screw-in / duct sensor	021
ETF 6	Screw-in sensor with neck tube	027
RGTF 1	Smoke gas screw-in sensor	031
RGTF 2	Smoke gas duct sensor with neck tube	035

**TEMPERATURE SENSORS
ACTIVE****Duct, immersion, screw-in sensors**

TM 54	Immersion / screw-in / duct temperature measuring transducer	041
RGTM 1	Smoke gas temperature measuring transducer	047
RGTM 2	Smoke gas temperature measuring transducer with neck tube	051

Outdoor sensors, cable sensors, surface-contact sensors

ATM 2	Outdoor temperature measuring transducer	055
ATM 2 - VA	Outdoor temperature measuring transducer	059
HFTM	Sleeve sensor with measuring transducer	063
HFTM - VA	Sleeve sensor with measuring transducer	067
ALTM 2	Surface-contact temperature measuring transducer	071
ALTM 2 - VA	Surface-contact temperature measuring transducer	075

**HUMIDITY AND
TEMPERATURE SENSORS****Outdoor sensors**

AFTF-20	Outdoor humidity and temperature sensor	081
AFTF-20-VA	Outdoor humidity and temperature sensor	085
Duct sensors		
KFTF-20	Duct humidity and temperature sensor	089
KFTF-20-VA	Duct humidity and temperature sensor	093

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

PREMASGARD® 711x	Pressure transducer [mbar/Pa]	101
PREMASGARD® 711x-VA	Pressure transducer [mbar/Pa]	107
PREMASREG® 711x	Pressure transducer / switch [mbar/Pa]	113
PREMASREG® 711x-VA	Pressure transducer / switch [mbar/Pa]	119

for volume flow

PREMASREG® 716x	Volume flow measuring transducer/switch [mbar/Pa]	125
PREMASREG® 716x-VA	Volume flow measuring transducer/switch [mbar/Pa]	131

for liquid media

SHD	Pressure transducer [bar]	133
SHD 400	Differential pressure transmitter [bar]	135
SHD 692	Differential pressure transmitter [bar]	137

**IMMERSION SLEEVES
MOUNTING ACCESSORIES****Immersion sleeves**

TH	Immersion sleeves for temperature sensor	140
THE	Immersion sleeves for sleeve sensor	142

Mounting flanges

MFT-20-K	Mounting flanges, plastic	145
MF-xx-K	Mounting flanges, plastic	145
MF-xx-M	Mounting flanges, metal	145

Accessories for M12 connectors

ALxx	Connecting cables	144
ALGxx	Connecting cables, shielded	144
VLxx	Interconnecting cables	144
VLGxx	Interconnecting cables, shielded	144
KBxx	Cable Socket (female), unassembled	144
KSxx	Cable Connector (male), unassembled	144

**SPECIAL ACCESSORIES
SPARE PARTS****Accessories for differential pressure switches**

ASD-06	Connection set	146
ASD-07	Connection nipple (90°)	146
ASS-UV	Connection hose, UV-resistant	146
DAL	Pressure outlet	146

Special accessories

WS-01	Sun and ball-impact protection hood	148
WS-03	Weather and sun protection hood (Tyr 2)	148
WS-04	Weather and sun protection hood (Tyr 1)	148
WLP-1	Heat-conductive paste, silicone-free	148

Spare parts for humidity sensors

SF-K	plastic sinter filter	148
SF-M	metal sinter filter	148

Other		149
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TYR 2E

OUR NEW **STAINLESS STEEL** HOUSING –
RUGGED AND INDUSTRY FOCUSSED



For Rugged Operating Environments

For higher demands of durability and hygiene, our proven TYR 2 plastic housing design is now also available in V4A (1.4571) stainless steel for protection type IP 69. The all-metal design ensures good basic holding.

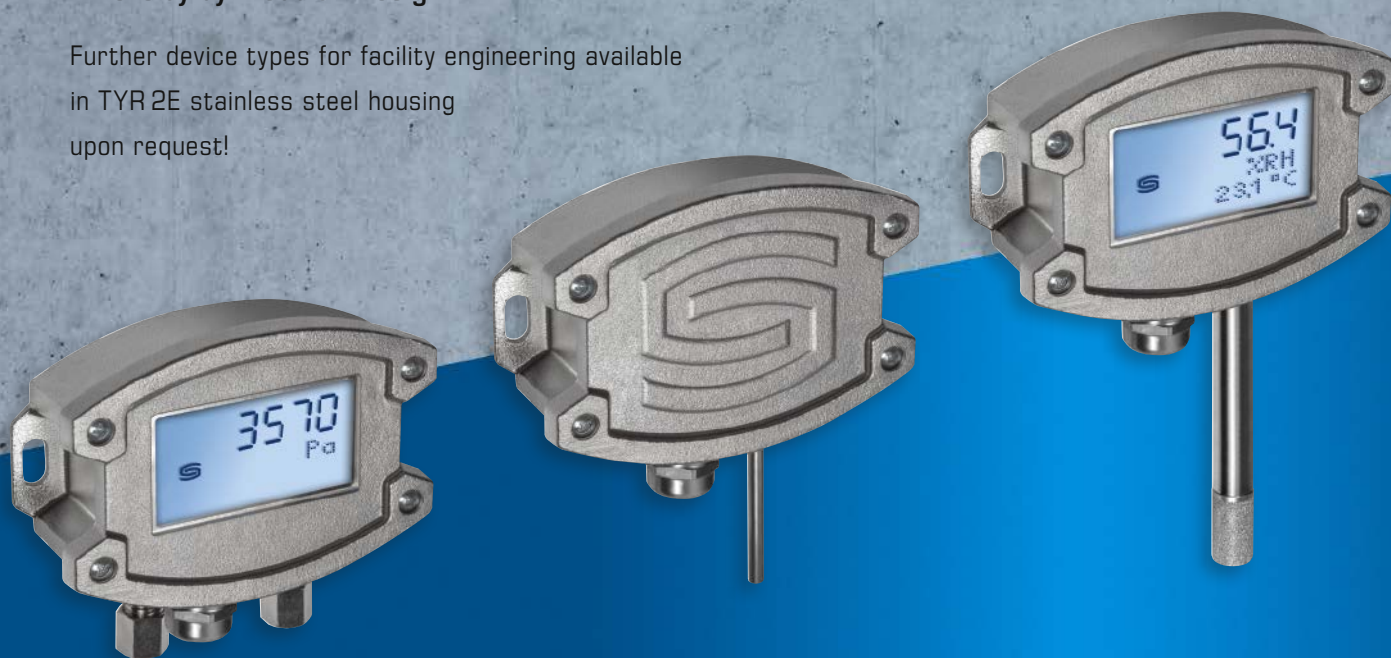
The convenient installation, commissioning and parameterisation features have been maintained. New is the additional housing version with M12 connector (according to DIN EN 61076-2-101) for fast and easy installation on site.



S+S REGELTECHNIK

Diversity by Modular Design

Further device types for facility engineering available in TYR 2E stainless steel housing upon request!



S+S Facility Engineering

Durable metal cover without display

Cable gland in metal, also available for Modbus



Optionally with pressure port in rugged pipe fitting design

NEW

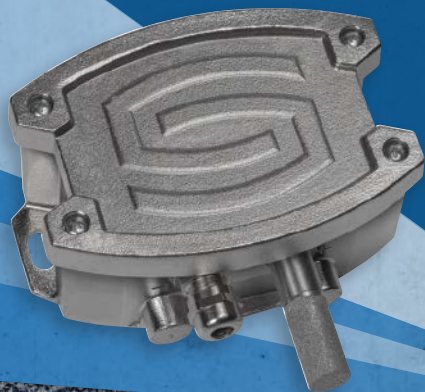


Quick connect for pressure hoses

Good basic shielding, high EMI resistance

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**, 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

NEW

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

Please see the
S+S Facility Engineering
main catalogue for
Modbus capable devices and
further product lines.

People and Quality

Technology is our business, but above all it is our qualified and motivated employees who make the difference. Each day, they drive the success of S+S Regeltechnik, which we measure by the satisfaction of our customers.

S+S is determined to adhere to its "Made in Germany" principle. We will even go one step further: If it says S+S on the outside, then there's 100 percent S+S technology inside. The quality and reliability of our products speak for themselves. That's what our customers value.



- > 65 employees
- > 500 m² of office / administration space
- > 4000 m² of manufacturing space
- > 800 m² finished parts warehouse
- > 24-hours shipment service
- > made-to-order production



In our climate chambers, we test all S+S measuring and control devices under the toughest conditions for function, ruggedness and reliability.





S+S REGELTECHNIK

Everything from a Single Source

S+S stands for a fully integral value chain. All products are designed, developed, manufactured and programmed in-house. In our test center, which includes climate chambers

and calibration equipment for all variables, our systems are tested under the toughest conditions for function, ruggedness and longevity.



S+S REGELTECHNIK

Design



Construction



Toolmaking



Hard- & Software



Test Equipment



Production



Testing



Shipping



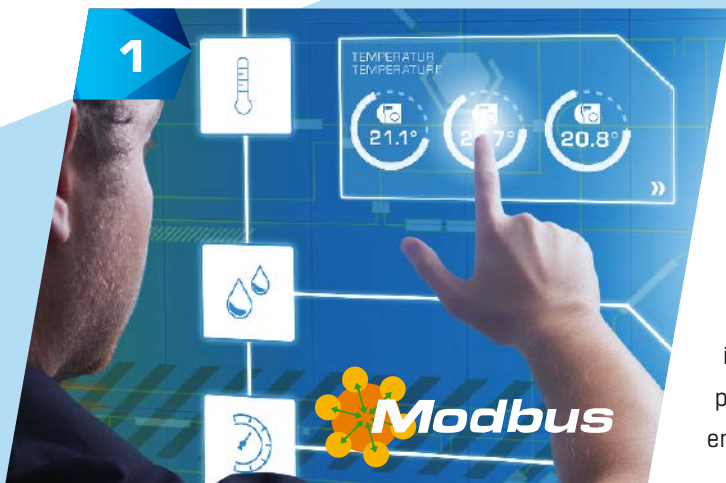
Five Benefits for Satisfied Customers

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:



S+S INNOVATION



We think ahead and transform the art of the possible into reality. We listen to the market and maintain a focus on practical application at all times. For advanced building sensor technology with a high degree of usability. Our Modbus capable devices, for instance, are characterized by their galvanic isolation from the bus cable, which helps to minimize interferences. Moreover, they can be conveniently programmed and addressed even when not energized.

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.



S+S REGELTECHNIK

S+S QUALITY

3

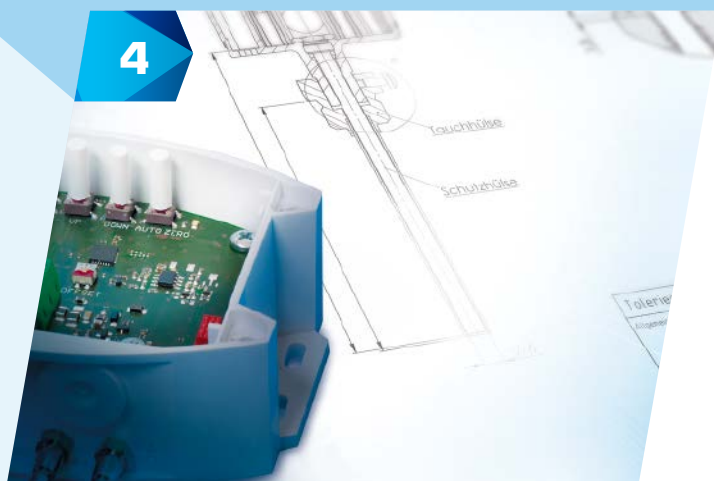


We measure ourselves against the highest standards – and continuously set new benchmarks ourselves. Our integral quality management system is certified to DIN EN ISO 9001:2015. We comply with the European and German regulations on the restricted use of hazardous substances in electrical and electronic equipment.

In our own climate chambers, our products are tested under the toughest conditions for functionality, ruggedness and durability.

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

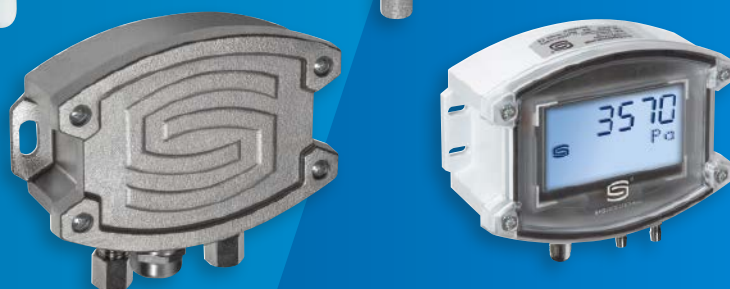
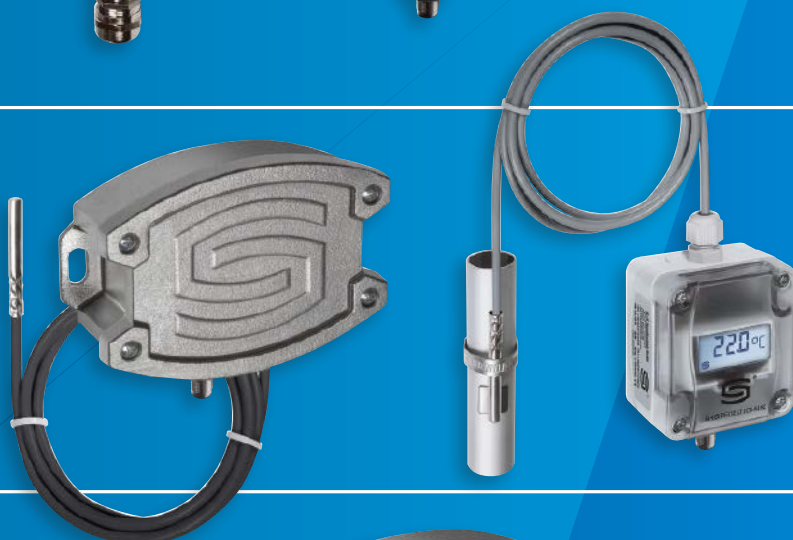
5



Our hotline looks forward to your requests for special versions.

S+S stock items are ready for shipment at short notice – ensuring maximum security of supply.

Product Lines





THERMASGARD®

Temperature sensors
passive

Pages 016 - 035



THERMASGARD®

Temperature sensors
active

Pages 036 - 075



HYGRASGARD®

Humidity and
temperature sensors

Pages 076 - 093



PREMASGARD® & PREMASREG®

Pressure transducers and
pressure controllers

Pages 094 - 137



Immersion sleeves and Accessories

Appendix, legal notice,
useful information

Pages 138 -163





Temperature sensors passive

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®

016 – 035

Duct, immersion, screw-in sensors

TF 54	Immersion / screw-in / duct sensor (Connecting head: form B)	021
ETF 6	Screw-in sensor with neck tube (Connecting head: form B)	027
RGTF 1	Smoke gas duct sensor (Connecting head: form B)	031
RGTF 2	Smoke gas screw-in sensor with neck tube (Connecting head: form B)	035

**Immersion / screw-in / duct temperature sensor,
with passive output**

Resistance thermometer / temperature sensor **THERMASGARD® TF 54**
with passive output, straight protective tube, connecting head made from aluminium,
optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It is used to detect temperatures in liquid or gaseous media,
in pipes, vessels or storage tanks.

TF 54
Basic unit

TECHNICAL DATA

Measuring range:	-35...+180 °C
Sensors / output:	Pt100/Pt1000 (according to DIN EN 60751, class B) (Perfect Sensor Protection) (optionally also with two or other sensors)
Connection type:	2-wire connection for Pt1000 4-wire connection for Pt100, optional for other sensors
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 mm², via terminal screws, on ceramic base
Cable connection:	cable gland , brass, nickel-plated (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
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 = 6 mm, installation length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Permitted humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
ACCESSORIES	(see table)
MF-06-M	mounting flange , metal (galvanised steel), Ø = 32 mm, Ø = 6.3 mm tube gland, T _{max} = +700 °C
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





S+S REGELTECHNIK

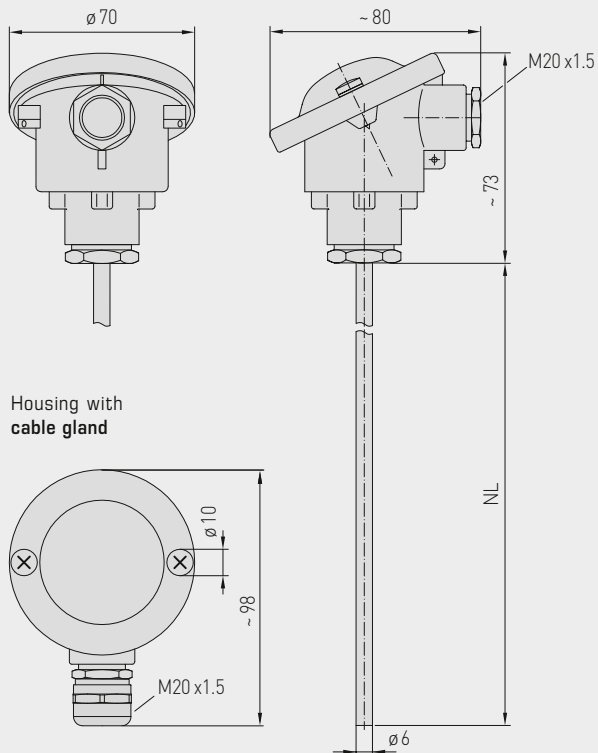
THERMASGARD® TF 54 ID

Immersion / screw-in / duct temperature sensor,
with passive output

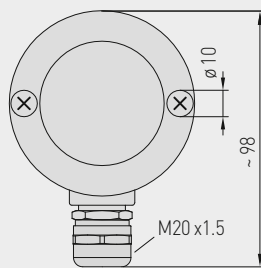


Dimensional drawing

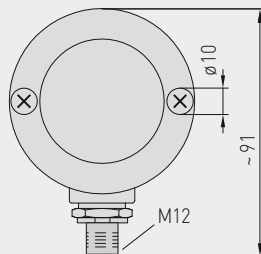
TF 54



Housing with
cable gland



Housing with
M12 connector



M12 connector
(male)

TF54-KV
with cable gland



TF54-Q
with M12 connector



High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Immersion / screw-in / duct temperature sensor,
with passive output

S+S REGELTECHNIK

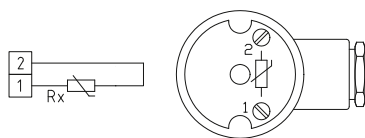
2-wire connection
(Pt1000)

4-wire connection
(Pt100)

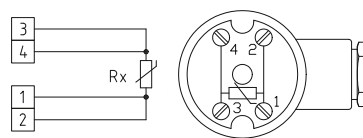
form B
top view



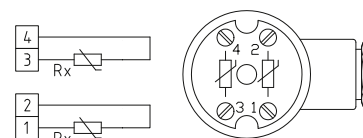
1x two-wire connection
(Pt1000)



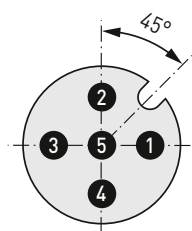
1x four-wire connection
(Pt100)



2x two-wire connection
(optional)

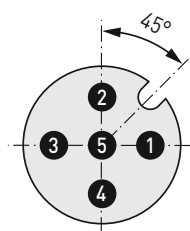


1x two-wire connection
pin assignment (M12)



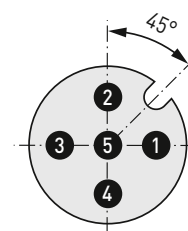
- 1 Rx
- 2 Rx
- 3 frei / free
- 4 frei / free
- 5 frei / free

1x four-wire connection
pin assignment (M12)



- 1 Rx
- 2 Rx
- 3 Rx
- 4 Rx
- 5 frei / free

2x two-wire connection
pin assignment (M12)



- 1 Rx
- 2 Rx
- 3 Rx
- 4 Rx
- 5 frei / free



S+S REGELTECHNIK

THERMASGARD® TF 54 ID

Immersion / screw-in / duct temperature sensor,
with passive output



THERMASGARD® TF 54 Temperature sensor (basic device), ID

Type / WG03	Sensor / Output	Installation length (EL)	Item No.
TF54 PT100 xx KV	Pt100		with cable gland
TF54 PT100 50MM KV	Pt100 (according to DIN EN 60751, class B)	50 mm	1101-7070-1013-000
TF54 PT100 100MM KV	Pt100 (according to DIN EN 60751, class B)	100 mm	1101-7070-1023-000
TF54 PT100 150MM KV	Pt100 (according to DIN EN 60751, class B)	150 mm	1101-7070-1033-000
TF54 PT100 200MM KV	Pt100 (according to DIN EN 60751, class B)	200 mm	1101-7070-1043-000
TF54 PT100 250MM KV	Pt100 (according to DIN EN 60751, class B)	250 mm	1101-7070-1053-000
TF54 PT100 300MM KV	Pt100 (according to DIN EN 60751, class B)	300 mm	1101-7070-1063-000
TF54 PT100 400MM KV	Pt100 (according to DIN EN 60751, class B)	400 mm	1101-7070-1083-000
TF54 PT1000 xx KV	Pt1000		with cable gland
TF54 PT1000 50MM KV	Pt1000 (according to DIN EN 60751, class B)	50 mm	1101-7070-5011-000
TF54 PT1000 100MM KV	Pt1000 (according to DIN EN 60751, class B)	100 mm	1101-7070-5021-000
TF54 PT1000 150MM KV	Pt1000 (according to DIN EN 60751, class B)	150 mm	1101-7070-5031-000
TF54 PT1000 200MM KV	Pt1000 (according to DIN EN 60751, class B)	200 mm	1101-7070-5041-000
TF54 PT1000 250MM KV	Pt1000 (according to DIN EN 60751, class B)	250 mm	1101-7070-5051-000
TF54 PT1000 300MM KV	Pt1000 (according to DIN EN 60751, class B)	300 mm	1101-7070-5061-000
TF54 PT1000 400MM KV	Pt1000 (according to DIN EN 60751, class B)	400 mm	1101-7070-5081-000
TF54 PT100 xx Q	Pt100		with M12 connector
TF54 PT100 50MM Q	Pt100 (according to DIN EN 60751, class B)	50 mm	2201-4111-0100-011
TF54 PT100 100MM Q	Pt100 (according to DIN EN 60751, class B)	100 mm	2201-4111-0100-021
TF54 PT100 150MM Q	Pt100 (according to DIN EN 60751, class B)	150 mm	2201-4111-0100-031
TF54 PT100 200MM Q	Pt100 (according to DIN EN 60751, class B)	200 mm	2201-4111-0100-041
TF54 PT100 250MM Q	Pt100 (according to DIN EN 60751, class B)	250 mm	2201-4111-0100-051
TF54 PT100 300MM Q	Pt100 (according to DIN EN 60751, class B)	300 mm	2201-4111-0100-061
TF54 PT100 400MM Q	Pt100 (according to DIN EN 60751, class B)	400 mm	2201-4111-0100-081
TF54 PT1000 xx Q	Pt1000		with M12 connector
TF54 PT1000 50MM Q	Pt1000 (according to DIN EN 60751, class B)	50 mm	2205-4111-0100-011
TF54 PT1000 100MM Q	Pt1000 (according to DIN EN 60751, class B)	100 mm	2205-4111-0100-021
TF54 PT1000 150MM Q	Pt1000 (according to DIN EN 60751, class B)	150 mm	2205-4111-0100-031
TF54 PT1000 200MM Q	Pt1000 (according to DIN EN 60751, class B)	200 mm	2205-4111-0100-041
TF54 PT1000 250MM Q	Pt1000 (according to DIN EN 60751, class B)	250 mm	2205-4111-0100-051
TF54 PT1000 300MM Q	Pt1000 (according to DIN EN 60751, class B)	300 mm	2205-4111-0100-061
TF54 PT1000 400MM Q	Pt1000 (according to DIN EN 60751, class B)	400 mm	2205-4111-0100-081
Extra charge:	two or other sensors optional		on request
Note	For additional device variants, see S+S Facility Engineering!		

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Immersion / screw-in / duct temperature sensor,
with passive output

S+S REGELTECHNIK

A basic unit in three variants...

**TF 54**

Basic unit

**TF 54 +
TH -VA /xx**

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

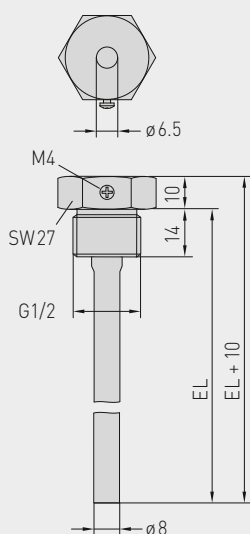
**TF 54 +
TH -VA /xx / 90**

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

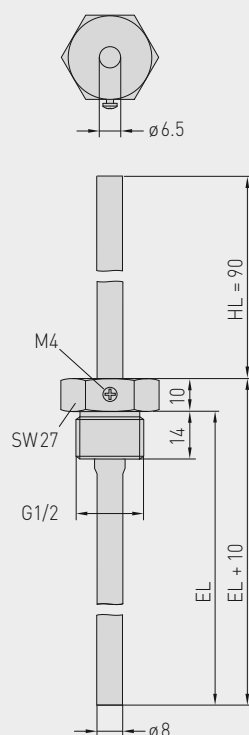
**TF 54 +
MF-06-M**

Duct temperature sensor
with mounting flange, metal

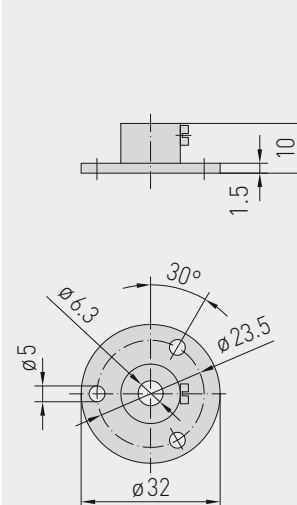
Dimensional drawing
TH -VA /xx



Dimensional drawing
TH -VA /xx / 90



Dimensional drawing
MF-06-M





...through combination with accessories:



TH-VA/xx



TH-VA/xx/90



MF-06-M

THERMASGARD® TH Immersion sleeve Ø 8 mm (accessories)				
Type / WG01	p _{max} (static)	T _{max}	Installation length (EL)	Item No.
TH-VA/xx	Stainless steel, V4A (1.4571)			without neck tube
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001
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
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001
Note: inner diameter of socket 6.5 mm For further information see chapter Accessories!				

Mounting flange (accessories)			
Type / WG01		T _{max}	Item No.
MF			
MF-06-M	Mounting flange, metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm	+700 °C	7100-0030-5000-000
Note: For further information, see chapter Accessories!			

Screw-in/immersion temperature sensor with neck tube, with passive output

Screw-in resistance thermometer with neck tube **THERMASGARD® ETF 6** with passive output, with straight protective tube, connecting head made from aluminium, optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It is used for temperature detection in liquid or gaseous media, in piping systems, in vessels or storage tanks, preferably in cases where pipes or tanks need to be insulated.

ETF 6
Basic unit

TECHNICAL DATA

Measuring range:	−35...+180 °C
Sensors / output:	Pt100/Pt1000 (according to DIN EN 60751, class B) (Perfect Sensor Protection) (optionally also with two or other sensors)
Connection type:	2-wire connection for Pt1000 4-wire connection for Pt100, optional for other sensors
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 mm², via terminal screws, on a ceramic base
Cable connection:	cable gland , brass, nickel-plated (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
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", SW 27, p _{max} = 40 bar, Ø = 8 mm neck tube length (HL) = 80 mm installation length (EL) = 100 - 400 mm (see table)
Process connection:	by means of screw thread G ½"
Permitted humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)

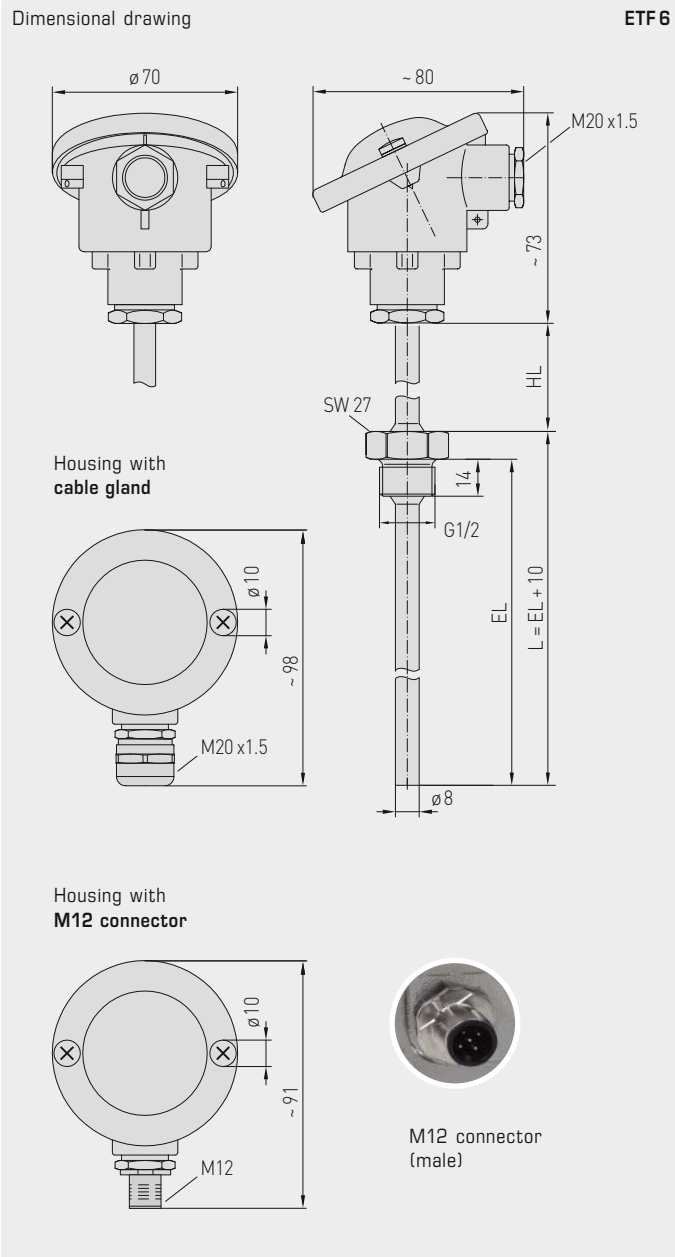




S+S REGELTECHNIK

THERMASGARD® ETF 6 ID

Screw-in/immersion temperature sensor with neck tube,
with passive output



ETF6-KV
with cable gland



ETF6-Q
with M12 connector



High-performance encapsulation against
vibration, mechanical stress and humidity



**Screw-in/immersion temperature sensor with neck tube,
with passive output**

S+S REGELTECHNIK

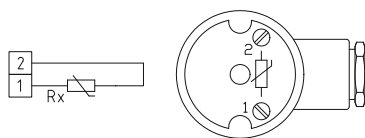
2-wire connection
(Pt1000)

4-wire connection
(Pt100)

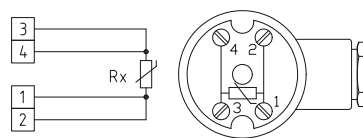
form B
top view



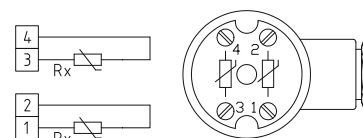
1x two-wire connection
(Pt1000)



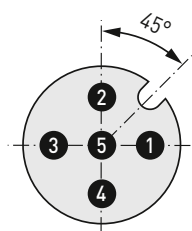
1x four-wire connection
(Pt100)



2x two-wire connection
(optional)

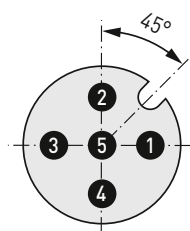


1x two-wire connection
pin assignment (M12)



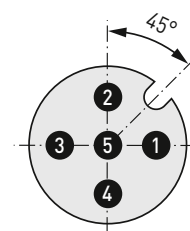
- 1 Rx
- 2 Rx
- 3 frei / free
- 4 frei / free
- 5 frei / free

1x four-wire connection
pin assignment (M12)



- 1 Rx
- 2 Rx
- 3 Rx
- 4 Rx
- 5 frei / free

2x two-wire connection
pin assignment (M12)



- 1 Rx
- 2 Rx
- 3 Rx
- 4 Rx
- 5 frei / free



S+S REGELTECHNIK

THERMASGARD® ETF 6 ID

Screw-in/immersion temperature sensor with neck tube,
with passive output



THERMASGARD® ETF 6					Temperature measuring transducers with neck tube, ID				
Type / WG03		Sensor / Output		Installation length (EL)		Item No.			
ETF6 PT100 xx KV		Pt100				with cable gland			
ETF6 PT100 100/80MM KV		Pt100	(according to DIN EN 60751, class B)	100 mm		1101-20C0-1023-000			
ETF6 PT100 150/80MM KV		Pt100	(according to DIN EN 60751, class B)	150 mm		1101-20C0-1033-000			
ETF6 PT100 200/80MM KV		Pt100	(according to DIN EN 60751, class B)	200 mm		1101-20C0-1043-000			
ETF6 PT100 250/80MM KV		Pt100	(according to DIN EN 60751, class B)	250 mm		1101-20C0-1053-000			
ETF6 PT100 400/80MM KV		Pt100	(according to DIN EN 60751, class B)	400 mm		1101-20C0-1083-000			
ETF6 PT1000 xx KV		Pt1000				with cable gland			
ETF6 PT1000 100/80MM KV		Pt1000	(according to DIN EN 60751, class B)	100 mm		1101-20C0-5021-000			
ETF6 PT1000 150/80MM KV		Pt1000	(according to DIN EN 60751, class B)	150 mm		1101-20C0-5031-000			
ETF6 PT1000 200/80MM KV		Pt1000	(according to DIN EN 60751, class B)	200 mm		1101-20C0-5041-000			
ETF6 PT1000 250/80MM KV		Pt1000	(according to DIN EN 60751, class B)	250 mm		1101-20C0-5051-000			
ETF6 PT1000 400/80MM KV		Pt1000	(according to DIN EN 60751, class B)	400 mm		1101-20C0-5081-000			
ETF6 PT100 xx Q		Pt100				with M12 connector			
ETF6 PT100 100/80MM Q		Pt100	(according to DIN EN 60751, class B)	100 mm		2Z01-4121-0100-041			
ETF6 PT100 150/80MM Q		Pt100	(according to DIN EN 60751, class B)	150 mm		2Z01-4121-0100-051			
ETF6 PT100 200/80MM Q		Pt100	(according to DIN EN 60751, class B)	200 mm		2Z01-4121-0100-061			
ETF6 PT100 250/80MM Q		Pt100	(according to DIN EN 60751, class B)	250 mm		2Z01-4121-0100-071			
ETF6 PT100 400/80MM Q		Pt100	(according to DIN EN 60751, class B)	400 mm		2Z01-4121-0100-081			
ETF6 PT1000 xx Q		Pt1000				with M12 connector			
ETF6 PT1000 100/80MM Q		Pt1000	(according to DIN EN 60751, class B)	100 mm		2Z05-4121-0100-041			
ETF6 PT1000 150/80MM Q		Pt1000	(according to DIN EN 60751, class B)	150 mm		2Z05-4121-0100-051			
ETF6 PT1000 200/80MM Q		Pt1000	(according to DIN EN 60751, class B)	200 mm		2Z05-4121-0100-061			
ETF6 PT1000 250/80MM Q		Pt1000	(according to DIN EN 60751, class B)	250 mm		2Z05-4121-0100-071			
ETF6 PT1000 400/80MM Q		Pt1000	(according to DIN EN 60751, class B)	400 mm		2Z05-4121-0100-081			
Extra charge:		two or other sensors optional				on request			
Note		For additional device variants, see S+S Facility Engineering!							

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Duct/smoke gas temperature sensor, incl. mounting flange, with passive output

Resistance thermometer / smoke gas temperature sensor **THERMASGARD® RGTF 1** with passive output, straight protective tube, incl. mounting flange, connecting head made from aluminium, optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It serves for measuring the relatively high temperatures in gaseous media, e.g. for exhaust air and smoke gas temperature measurement.

RGTF 1
Basic unit

TECHNICAL DATA

Measuring range:	–35...+600 °C (extended measuring range limits optional from –100...+750 °C)
Sensor / output:	Pt100/Pt1000 (according to DIN EN 60751, class B) (Perfect Sensor Protection)
Connection type:	2-wire connection (3- or 4-wire connection also available)
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:	cable gland , brass, nickel-plated (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
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 installation length (EL) = 200 - 500 mm (see table)
Process connection:	by means of mounting flange, stainless steel V2A (1.4305) (included in the scope of delivery)
Permitted humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)



RGTF 1
Measuring insert with ceramic tubelet



S+S REGELTECHNIK

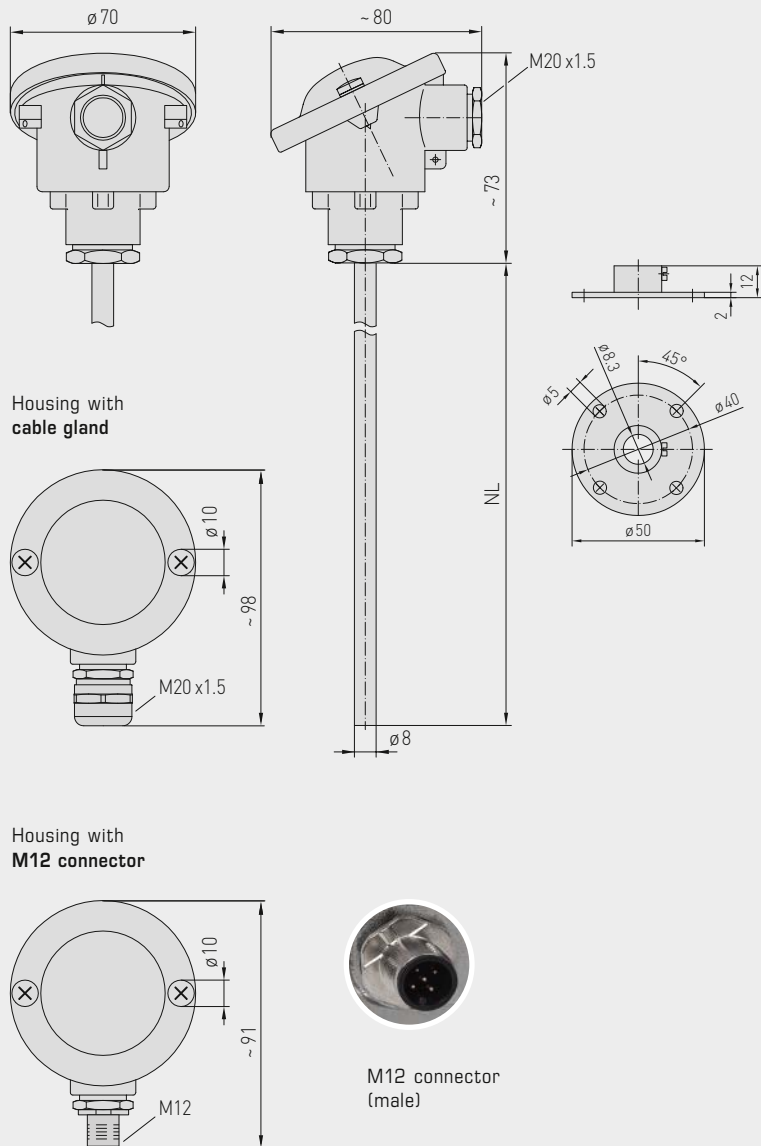
THERMASGARD® RGTF 1 ID

Duct/smoke gas temperature sensor, incl. mounting flange,
with passive output



Dimensional drawing

RGTF 1



RGTF 1 - KV
with cable gland



RGTF 1 - Q
with M12 connector



High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Duct/smoke gas temperature sensor, incl. mounting flange,
with passive output

S+S REGELTECHNIK

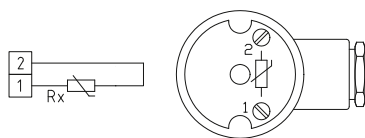
2-wire connection
(Pt100 / Pt1000)

4-wire connection
(optional)

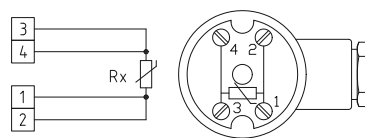
form B
top view



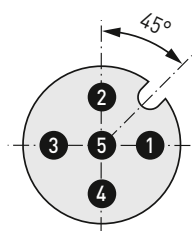
1x two-wire connection
(Pt100 / Pt1000)



1x four-wire connection
(optional)

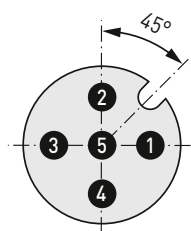


1x two-wire connection
pin assignment (M12)



- 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 Rx
- 4 Rx
- 5 frei / free



S+S REGELTECHNIK

THERMASGARD® RGTF 1 ID

Duct/smoke gas temperature sensor, incl. mounting flange,
with passive output



THERMASGARD® RGTF 1 Duct/smoke gas temperature sensor, incl. mounting flange, ID

Type / WG03	Sensor / Output	Installation length (EL)	Item No.
RGTF 1 PT100 xx KV	Pt100		with cable gland
RGTF1 PT100 200MM KV	Pt100 (according to DIN EN 60751, class B)	200 mm	1101-30D0-1041-000
RGTF1 PT100 250MM KV	Pt100 (according to DIN EN 60751, class B)	250 mm	1101-30D0-1051-000
RGTF1 PT100 300MM KV	Pt100 (according to DIN EN 60751, class B)	300 mm	1101-30D0-1061-000
RGTF1 PT100 500MM KV	Pt100 (according to DIN EN 60751, class B)	500 mm	1101-30D0-1101-000
RGTF 1 PT1000 xx KV	Pt1000		with cable gland
RGTF1 PT1000 200MM KV	Pt1000 (according to DIN EN 60751, class B)	200 mm	1101-30D0-5041-000
RGTF1 PT1000 250MM KV	Pt1000 (according to DIN EN 60751, class B)	250 mm	1101-30D0-5051-000
RGTF1 PT1000 300MM KV	Pt1000 (according to DIN EN 60751, class B)	300 mm	1101-30D0-5061-000
RGTF1 PT1000 500MM KV	Pt1000 (according to DIN EN 60751, class B)	500 mm	1101-30D0-5101-000
RGTF 1 PT100 xx Q	Pt100		with M12 connector
RGTF1 PT100 200MM Q	Pt100 (according to DIN EN 60751, class B)	200 mm	2Z01-4131-0100-011
RGTF1 PT100 250MM Q	Pt100 (according to DIN EN 60751, class B)	250 mm	2Z01-4131-0100-021
RGTF1 PT100 300MM Q	Pt100 (according to DIN EN 60751, class B)	300 mm	2Z01-4131-0100-031
RGTF1 PT100 500MM Q	Pt100 (according to DIN EN 60751, class B)	500 mm	2Z01-4131-0100-041
RGTF 1 PT1000 xx Q	Pt1000		with M12 connector
RGTF1 PT1000 200MM Q	Pt1000 (according to DIN EN 60751, class B)	200 mm	2Z05-4131-0100-011
RGTF1 PT1000 250MM Q	Pt1000 (according to DIN EN 60751, class B)	250 mm	2Z05-4131-0100-021
RGTF1 PT1000 300MM Q	Pt1000 (according to DIN EN 60751, class B)	300 mm	2Z05-4131-0100-031
RGTF1 PT1000 500MM Q	Pt1000 (according to DIN EN 60751, class B)	500 mm	2Z05-4131-0100-041
Extra charge:	other sensors optional		on request
Note	For additional device variants, see S+S Facility Engineering!		

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Screw-in / smoke gas temperature sensor, with neck tube, with passive output

Screw-in resistance thermometer / smoke gas temperature sensor with neck tube
THERMASGARD® RGTF 2 with passive output, straight protective tube,
connecting head made from aluminium, optionally with **cable gland** or **M12 connector**
according to DIN EN 61076-2-101.

It serves for measuring the relatively high temperatures in gaseous media,
e.g. for exhaust air and smoke gas temperature measurement.

TECHNICAL DATA

Measuring range:	-35...+600 °C (extended measuring range limits optional from -100...+750 °C)
Sensor / output:	Pt100/Pt1000 (according to DIN EN 60751, class B) (Perfect Sensor Protection)
Connection type:	2-wire connection (3- or 4-wire connection also available)
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:	cable gland , brass, nickel-plated (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
Dimensions:	see dimensional drawing
Connecting head:	shape B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -20...+100 °C
Protective tube:	stainless steel V4A (1.4571), G ½", SW 27, p _{max} = 40 bar, Ø = 8 mm Neck tube length (HL) = 80 mm Installation length (EL) = 100 - 500 mm (see table)
Process connection:	by means of screw thread G ½"
Permitted humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)

RGTF 2
Basic unit



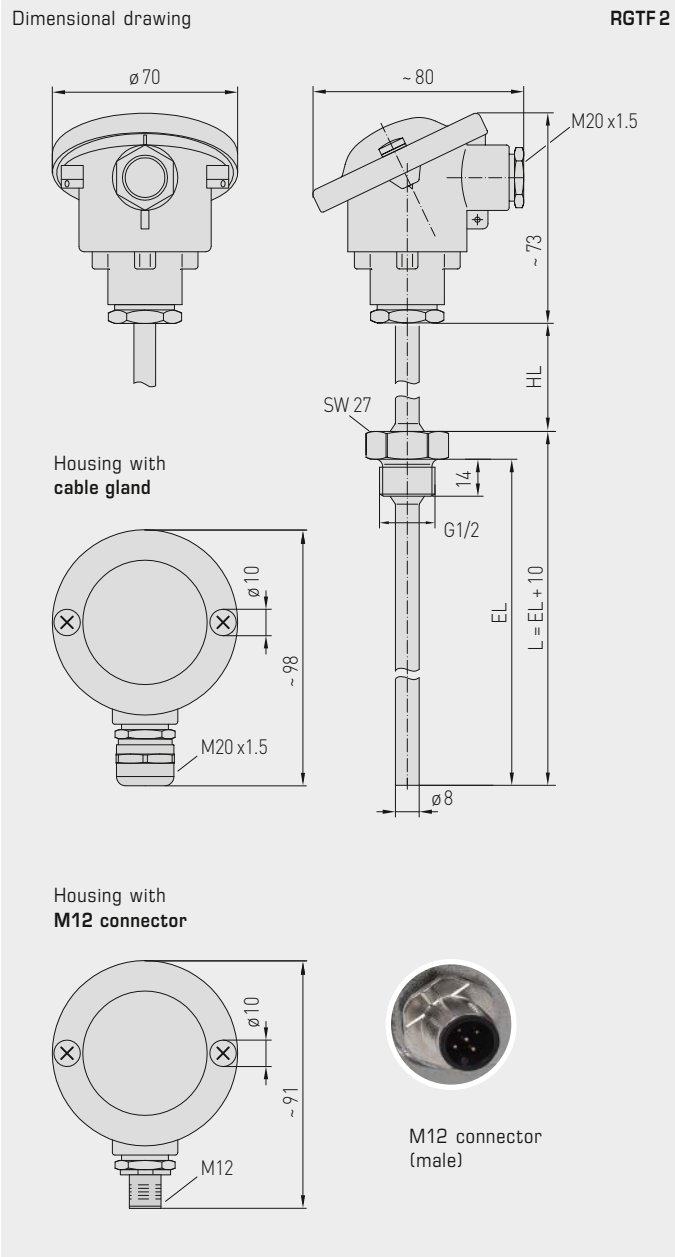
RGTF 2
Measuring insert with
ceramic tubelet



S+S REGELTECHNIK

THERMASGARD® RGTF 2 ID

Screw-in / smoke gas temperature sensor, with neck tube,
with passive output



RGTF2 - KV
with cable gland



RGTF2 - Q
with M12 connector



High-performance encapsulation against
vibration, mechanical stress and humidity



**Screw-in / smoke gas temperature sensor, with neck tube,
with passive output**

S+S REGELTECHNIK

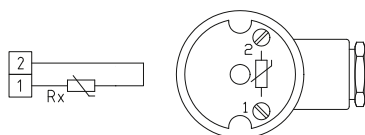
2-wire connection
(Pt100 / Pt1000)

4-wire connection
(optional)

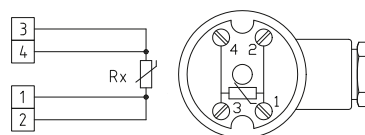
form B
top view



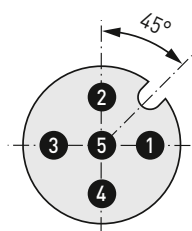
1x two-wire connection
(Pt100 / Pt1000)



1x four-wire connection
(optional)

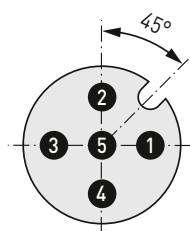


1x two-wire connection
pin assignment (M12)



- 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



S+S REGELTECHNIK

THERMASGARD® RGTF 2 ID

Screw-in / smoke gas temperature sensor, with neck tube,
with passive output



THERMASGARD® RGTF 2 Screw-in / smoke gas temperature sensor, with neck tube, ID

Type / WG03	Sensor / Output	Inserted Length (EL)	Item No.
RGTF2 PT100 xx KV	Pt100		with cable gland
RGTF2 PT100 100/80MM KV	Pt100 (according to DIN EN 60751, class B)	100 mm	1101-20D0-1021-000
RGTF2 PT100 150/80MM KV	Pt100 (according to DIN EN 60751, class B)	150 mm	1101-20D0-1031-000
RGTF2 PT100 200/80MM KV	Pt100 (according to DIN EN 60751, class B)	200 mm	1101-20D0-1041-000
RGTF2 PT100 250/80MM KV	Pt100 (according to DIN EN 60751, class B)	250 mm	1101-20D0-1051-000
RGTF2 PT100 300/80MM KV	Pt100 (according to DIN EN 60751, class B)	300 mm	1101-20D0-1061-000
RGTF2 PT100 500/80MM KV	Pt100 (according to DIN EN 60751, class B)	500 mm	1101-20D0-1101-000
RGTF2 PT1000 xx KV	Pt1000		with cable gland
RGTF2 PT1000 100/80 KV	Pt1000 (according to DIN EN 60751, class B)	100 mm	1101-20D0-5021-000
RGTF2 PT1000 150/80 KV	Pt1000 (according to DIN EN 60751, class B)	150 mm	1101-20D0-5031-000
RGTF2 PT1000 200/80 KV	Pt1000 (according to DIN EN 60751, class B)	200 mm	1101-20D0-5041-000
RGTF2 PT1000 250/80 KV	Pt1000 (according to DIN EN 60751, class B)	250 mm	1101-20D0-5051-000
RGTF2 PT1000 300/80 KV	Pt1000 (according to DIN EN 60751, class B)	300 mm	1101-20D0-5061-000
RGTF2 PT1000 500/80 KV	Pt1000 (according to DIN EN 60751, class B)	500 mm	1101-20D0-5101-000
RGTF2 PT100 xx Q	Pt100		with M12 connector
RGTF2 PT100 100/80MM Q	Pt100 (according to DIN EN 60751, class B)	100 mm	2Z01-4141-0100-011
RGTF2 PT100 150/80MM Q	Pt100 (according to DIN EN 60751, class B)	150 mm	2Z01-4141-0100-021
RGTF2 PT100 200/80MM Q	Pt100 (according to DIN EN 60751, class B)	200 mm	2Z01-4141-0100-031
RGTF2 PT100 250/80MM Q	Pt100 (according to DIN EN 60751, class B)	250 mm	2Z01-4141-0100-041
RGTF2 PT100 300/80MM Q	Pt100 (according to DIN EN 60751, class B)	300 mm	2Z01-4141-0100-051
RGTF2 PT100 500/80MM Q	Pt100 (according to DIN EN 60751, class B)	500 mm	2Z01-4141-0100-061
RGTF2 PT1000 xx Q	Pt1000		with M12 connector
RGTF2 PT1000 100/80M Q	Pt1000 (according to DIN EN 60751, class B)	100 mm	2Z05-4141-0100-011
RGTF2 PT1000 150/80M Q	Pt1000 (according to DIN EN 60751, class B)	150 mm	2Z05-4141-0100-021
RGTF2 PT1000 200/80M Q	Pt1000 (according to DIN EN 60751, class B)	200 mm	2Z05-4141-0100-031
RGTF2 PT1000 250/80M Q	Pt1000 (according to DIN EN 60751, class B)	250 mm	2Z05-4141-0100-041
RGTF2 PT1000 300/80M Q	Pt1000 (according to DIN EN 60751, class B)	300 mm	2Z05-4141-0100-051
RGTF2 PT1000 500/80M Q	Pt1000 (according to DIN EN 60751, class B)	500 mm	2Z05-4141-0100-061
Extra charge:	other ranges optional		on request
For special orders please specify:	Type, sensor, measuring range, connection type, process connection, inserted length		

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



Temperature sensors active

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®

036 – 075

Duct, immersion, screw-in sensors

TM 54	Immersion / screw-in / duct temperature measuring transducer (Connecting head: form B)	041
RGTM 1	Smoke gas duct temperature measuring transducer (Connecting head: form B)	047
RGTM 2	Smoke gas screw-in temperature measuring transducer (Connecting head: form B)	051

Outdoor sensors

ATM 2	Outdoor temperature measuring transducer (Housing: Tyr 1)	055
ATM 2 - VA	Outdoor temperature measuring transducer (Stainless Steel Housing: Tyr 2E)	059

Cable sensors, surface-contact sensors

HFTM	Sleeve sensor with measuring transducer (Housing: Tyr 1)	063
HFTM - VA	Sleeve sensor with measuring transducer (Stainless Steel Housing: Tyr 2E)	067
ALTM 2	Surface-contact temperature measuring transducer (Housing: Tyr 1)	071
ALTM 2 - VA	Surface-contact temperature measuring transducer (Stainless Steel Housing: Tyr 2E)	075

**Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output**

Calibratable temperature sensor **THERMASGARD® TM 54** with eight switchable measuring ranges and continuous output, with straight protective tube, connecting head made from aluminium, optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101. A basic unit in three variants through combination with accessories, e.g. for robust applications with separate stainless steel immersion sleeve.

It is used to detect temperatures in liquid and gaseous media. It is used e.g. in piping systems in heating engineering, in storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, in mechanical, apparatus and plant engineering and throughout the industrial sector.

The measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).

TM 54
Basic unit



TECHNICAL DATA

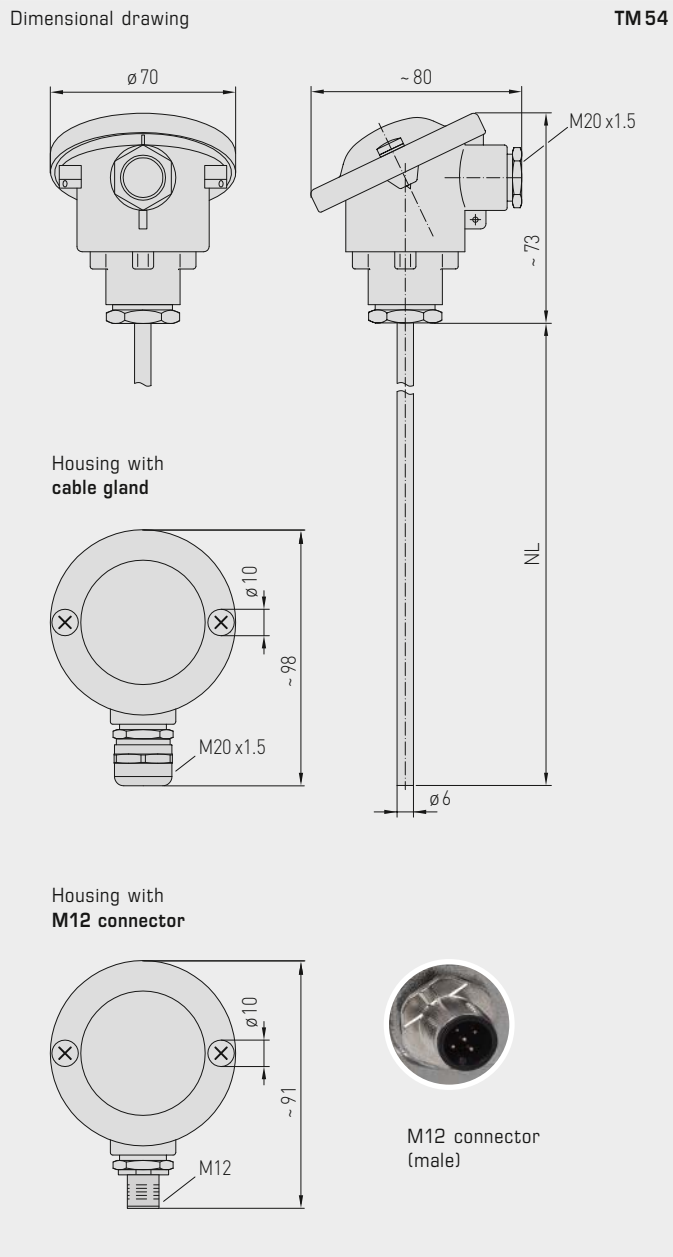
Power supply:	15...36 V DC depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$
Power consumption:	< 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60751, class B) (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges see table (other measuring ranges optional) $T_{\max} = +150^\circ\text{C}$ with manual zero point correction (± 10 K)
Deviation in temperature:	typically ± 0.2 K at $+25^\circ\text{C}$
Output:	4...20 mA
Ambient temperature:	measuring transducer $-30...+70^\circ\text{C}$
Connection type:	2-wire connection
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Cable connection:	cable gland , brass, nickel-plated (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
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature $-20...+100^\circ\text{C}$
Protective tube:	stainless steel, V4A (1.4571), $\varnothing = 6$ mm, installation length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Permitted humidity:	< 95% r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326, EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)
MF-06-M	mounting flange , metal (galvanised steel), $\varnothing = 32$ mm, $\varnothing = 6.3$ mm tube gland, $T_{\max} = +700^\circ\text{C}$
TH-VA / xx	immersion sleeve , stainless steel V4A (1.4571), $\varnothing = 8$ mm, $T_{\max} = +600^\circ\text{C}$, $p_{\max} = 40$ bar
TH-VA / xx / 90	immersion sleeve, stainless steel V4A (1.4571), with neck tube (90 mm), $\varnothing = 8$ mm, $T_{\max} = +600^\circ\text{C}$, $p_{\max} = 40$ bar



S+S REGELTECHNIK

THERMASGARD® TM 54 ID

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output



TM 54 - KV
with cable gland



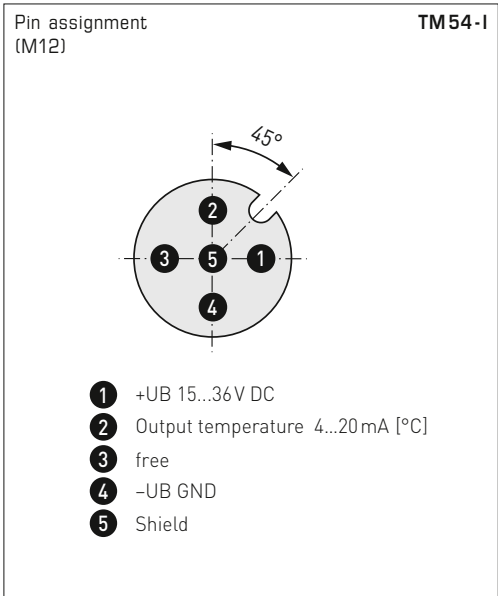
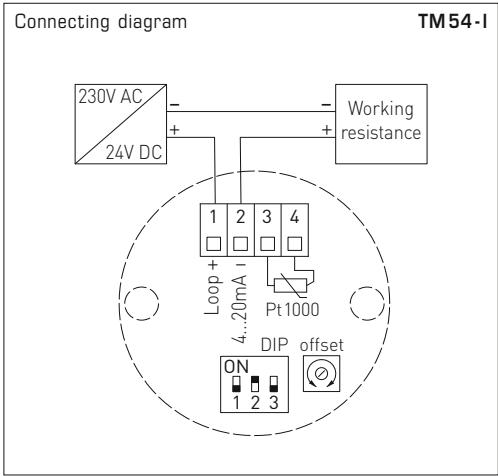
TM 54 - Q
mit M12-Steckverbinder



High-performance encapsulation against
vibration, mechanical stress and humidity



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

TM 54
top view



TM 54-I
Connecting head





S+S REGELTECHNIK

THERMASGARD® TM 54 ID

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output



THERMASGARD® TM 54 Temperature measuring transducers (basic device), ID

Type / WG01	Sensor	Output	Installation length (EL)	Item No.
TM 54-I xx KV	Pt1000			with cable gland
TM54-I 50MM KV	Pt1000	4...20 mA	50 mm	1101-7172-0019-910
TM54-I 100MM KV	Pt1000	4...20 mA	100 mm	1101-7172-0029-910
TM54-I 150MM KV	Pt1000	4...20 mA	150 mm	1101-7172-0039-910
TM54-I 200MM KV	Pt1000	4...20 mA	200 mm	1101-7172-0049-910
TM54-I 250MM KV	Pt1000	4...20 mA	250 mm	1101-7172-0059-910
TM54-I 300MM KV	Pt1000	4...20 mA	300 mm	1101-7172-0069-910
TM54-I 350MM KV	Pt1000	4...20 mA	350 mm	1101-7172-0079-910
TM54-I 400MM KV	Pt1000	4...20 mA	400 mm	1101-7172-0089-910
TM 54-I xx Q	Pt1000			with M12 connector
TM54-I 50MM Q	Pt1000	4...20 mA	50 mm	2001-4111-2100-011
TM54-I 100MM Q	Pt1000	4...20 mA	100 mm	2001-4111-2100-021
TM54-I 150MM Q	Pt1000	4...20 mA	150 mm	2001-4111-2100-031
TM54-I 200MM Q	Pt1000	4...20 mA	200 mm	2001-4111-2100-041
TM54-I 250MM Q	Pt1000	4...20 mA	250 mm	2001-4111-2100-051
TM54-I 300MM Q	Pt1000	4...20 mA	300 mm	2001-4111-2100-061
TM54-I 350MM Q	Pt1000	4...20 mA	350 mm	2001-4111-2100-071
TM54-I 400MM Q	Pt1000	4...20 mA	400 mm	2001-4111-2100-081
Extra charge:	two or other sensors optional			on request
Note	For additional device variants, see S+S Facility Engineering!			

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output

S+S REGELTECHNIK

A basic unit in three variants...

**TM 54**

Basic unit

**TM 54 +
TH - VA / xx**

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

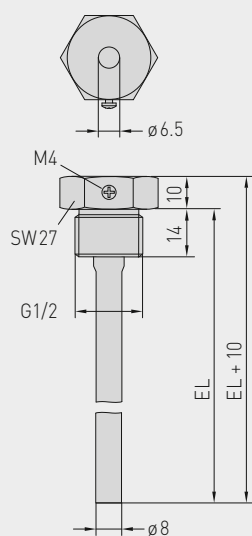
**TM 54 +
TH - VA / xx / 90**

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

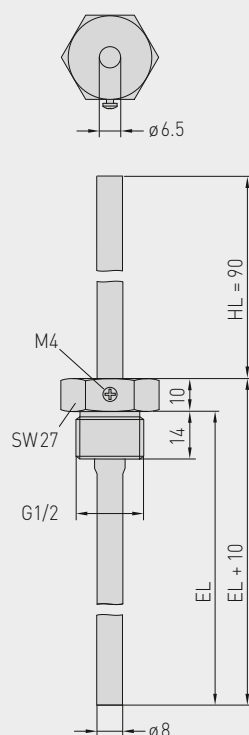
**TM 54 +
MF-06-M**

Duct temperature sensor
with mounting flange, metal

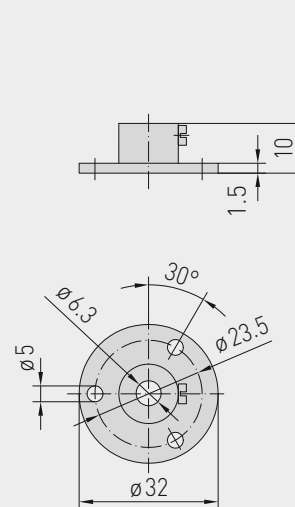
Dimensional drawing
TH - VA / xx



Dimensional drawing
TH - VA / xx / 90



Dimensional drawing
MF-06-M





S+S REGELTECHNIK

THERMASGARD® TM 54 ID

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output

...through combination with accessories:



TH-VA/xx



TH-VA/xx/90



MF-06-M

THERMASGARD® TH		Immersion sleeve Ø 8 mm (accessories)		
Type / WG01	p _{max} (static)	T _{max}	Installation length (EL)	Item No.
TH-VA/xx	Stainless steel, V4A (1.4571)			without neck tube
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001
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
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001
Note:		inner diameter of socket 6.5 mm For further information see chapter Accessories!		

Mounting flange (accessories)			
Type / WG01		T _{max}	Item No.
MF			
MF-06-M	Mounting flange, metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm	+700 °C	7100-0030-5000-000
Note:		For further information, see chapter Accessories!	

**Duct/smoke gas temperature sensor,
incl. 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, spring-mounted measuring insert, straight protective tube and mounting flange, connecting head made from aluminium, optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It is used to detect high temperatures in gaseous media, e.g. for exhaust air or smoke gas temperature measurement.

The measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).

TECHNICAL DATA

Power supply:	15...36 V DC depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	max. 750 Ohm / 24 V DC
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 measuring ranges optional) with manual zero point correction (± 10 K)
Deviation in temperature:	typically ± 0.2 K at $+25$ °C
Output:	4...20 mA
Ambient temperature:	measuring transducer $-30...+70$ °C
Connection type:	2-wire connection
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Cable connection:	cable gland , brass, nickel-plated (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
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), $\varnothing = 8$ mm, installation length (EL) = 200 - 400 mm (see table)
Process connection:	by means of mounting flange, stainless steel V2A (1.4305) (included in the scope of delivery)
Permitted humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326, EMC Directive 2014 / 30 / EU

RGTM 1
Basic unit



RGTM 1
Measuring insert with
ceramic tubelet



S+S REGELTECHNIK

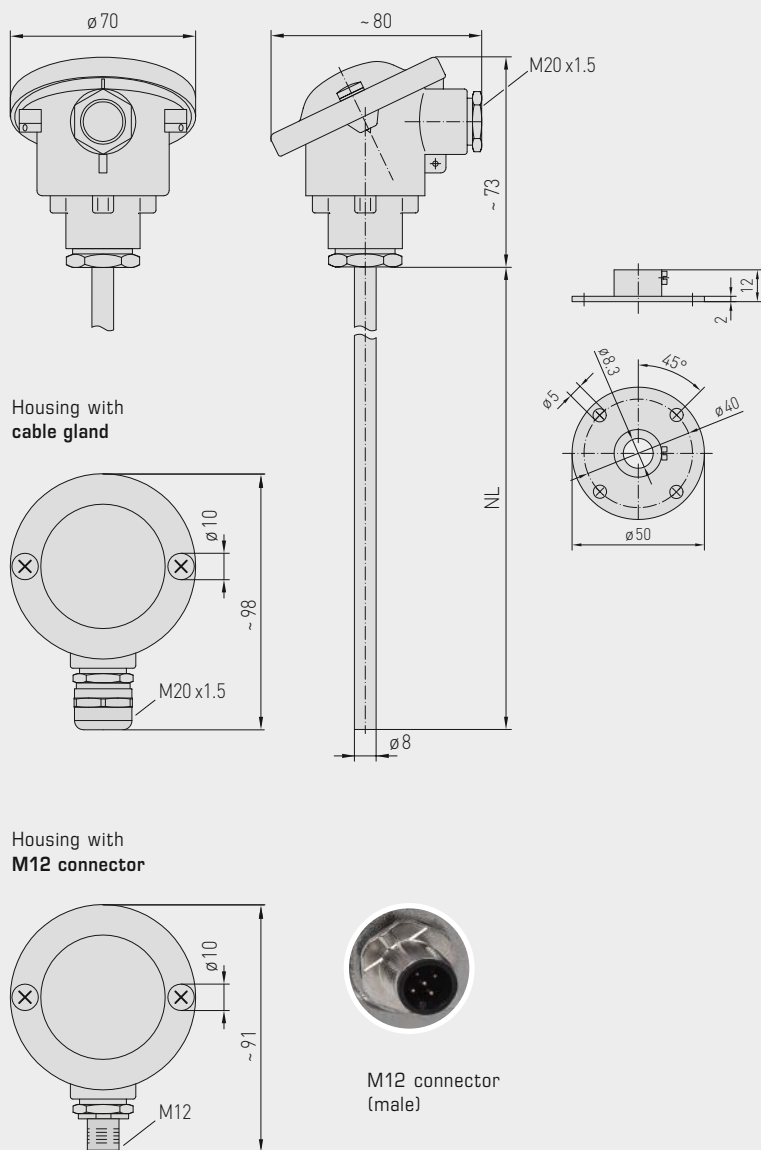
THERMASGARD® **RGTM 1** ID

Duct / smoke gas temperature sensor,
incl. mounting flange, calibratable, with multi-range switching
and active output



Dimensional drawing

RGTM 1



RGTM 1 - KV
with cable gland



RGTM 1 - Q
with M12 connector



High-performance encapsulation against
vibration, mechanical stress and humidity

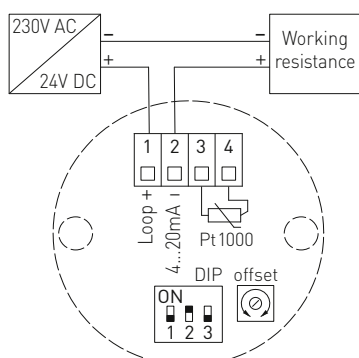
PS-PROTECTION
PERFECT SENSOR PROTECTION

Duct/smoke gas temperature sensor,
incl. mounting flange, calibratable, with multi-range switching
and active output

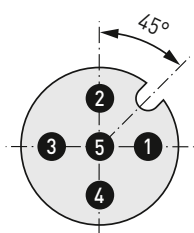
S+S REGELTECHNIK

Connecting diagram

RGTM - I

RGTM
top viewPin assignment
(M12)

RGTM - I



- 1 +UB 15...36V DC
- 2 Output temperature 4...20mA [°C]
- 3 free
- 4 -UB GND
- 5 Shield

RGTM - 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



S+S REGELTECHNIK

THERMASGARD® RGTM 1 ID

Duct / smoke gas temperature sensor,
incl. mounting flange, calibratable, with multi-range switching
and active output

RGTM 1 - KV
with cable gland



RGTM 1 - Q
with M12 connector



THERMASGARD® RGTM 1 Duct / smoke gas temperature sensor, incl. mounting flange, ID

Type / WG01	Sensor	Output	Installation length (EL)	Item No.
RGTM 1 - I xx KV	Pt1000			with cable gland
RGTM1-I 200MM KV	Pt1000	4...20 mA	200 mm	1101-31D2-0049-810
RGTM1-I 250MM KV	Pt1000	4...20 mA	250 mm	1101-31D2-0059-810
RGTM1-I 300MM KV	Pt1000	4...20 mA	300 mm	1101-31D2-0069-810
RGTM1-I 400MM KV	Pt1000	4...20 mA	400 mm	1101-31D2-0089-810
RGTM 1 - I xx Q	Pt1000			with M12 connector
RGTM1-I 200MM Q	Pt1000	4...20 mA	200 mm	2001-4131-2100-011
RGTM1-I 250MM Q	Pt1000	4...20 mA	250 mm	2001-4131-2100-021
RGTM1-I 300MM Q	Pt1000	4...20 mA	300 mm	2001-4131-2100-031
RGTM1-I 400MM Q	Pt1000	4...20 mA	400 mm	2001-4131-2100-041
Extra charge:	other sensors optional			on request
Note	For additional device variants, see S+S Facility Engineering!			

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**

Calibratable screw-in / smoke gas temperature measuring transducer **THERMASGARD® RGTM 2** with eight switchable measuring ranges and continuous output, spring-mounted measuring insert, straight protective tube, connecting head made from aluminium, optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It is used to detect high temperatures in gaseous or liquid media, e.g. for exhaust air or smoke gas temperature measurement.

The measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).

TECHNICAL DATA

Power supply:	15...36 V DC depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	max. 750 Ohm / 24 V DC
Power consumption:	< 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 measuring ranges optional) with manual zero point correction (± 10 K)
Deviation in temperature:	typically ± 0.2 K at $+25$ °C
Output:	4...20 mA
Ambient temperature:	measuring transducer $-30...+70$ °C
Connection type:	2-wire connection
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Cable connection:	cable gland , brass, nickel-plated (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
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 $\frac{1}{2}$ ", SW 27, $p_{\max} = 40$ bar, $\varnothing = 8$ mm Neck tube length (HL) = 80 mm Installation length (EL) = 100 - 400 mm (see table)
Process connection:	by means of screw thread G $\frac{1}{2}$ "
Permitted humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326, EMC Directive 2014 / 30 / EU

RGTM 2
Basic unit



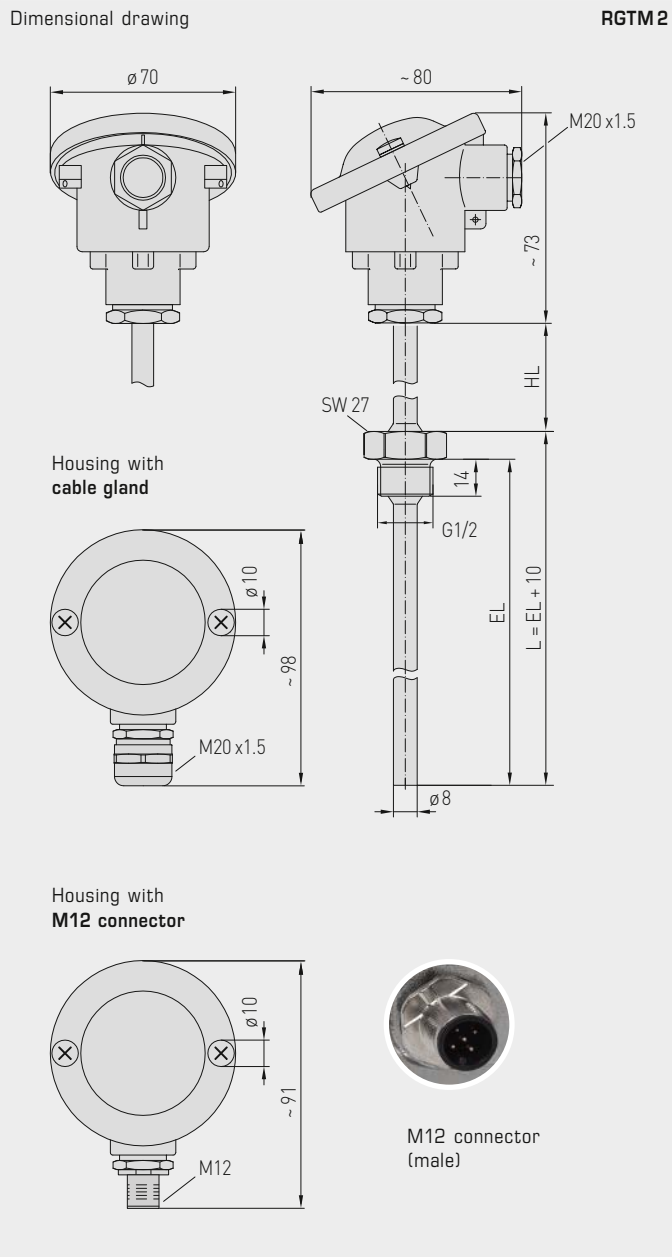
RGTM 2
Measuring insert with
ceramic tubelet



S+S REGELTECHNIK

THERMASGARD® **RGTM 2** ID

Screw-in / smoke gas temperature measuring transducer,
with neck tube, calibratable, with multi-range switching
and active output



RGTM 2 - KV
with cable gland



RGTM 2 - Q
with M12 connector

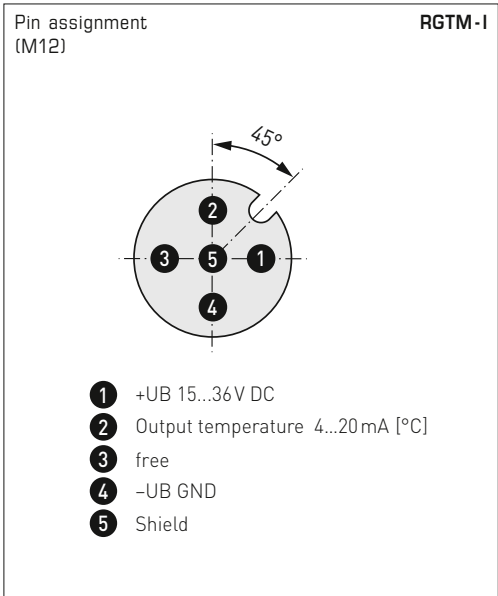
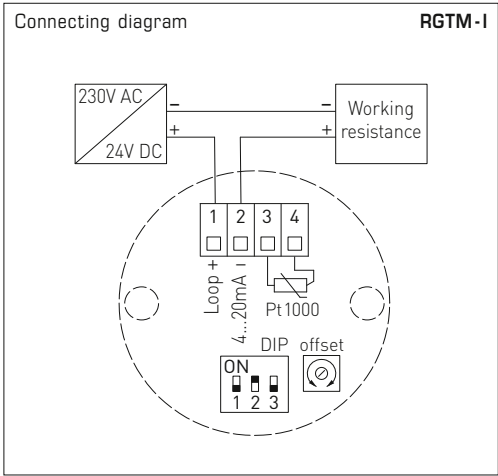


High-performance encapsulation against
vibration, mechanical stress and humidity





Screw-in / smoke gas temperature measuring transducer,
with neck tube, calibratable, with multi-range switching
and active output



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

RGTM
top view



RGTM - I
Connecting head





S+S REGELTECHNIK

THERMASGARD® RGTM 2 ID

Screw-in / smoke gas temperature measuring transducer,
with neck tube, calibratable, with multi-range switching
and active output

RGTM 2-KV
with cable gland



RGTM 2-Q
with M12 connector



THERMASGARD® RGTM 2 Screw-in / smoke gas temperature measuring transducer, with neck tube, ID				
Type / WG01	Sensor	Output	Installation length (EL)	Item No.
RGTM 2-I xx KV	Pt1000			with cable gland
RGTM2-I 100/80MM KV	Pt1000	4...20 mA	100 mm	1101-21D2-0029-810
RGTM2-I 150/80MM KV	Pt1000	4...20 mA	150 mm	1101-21D2-0039-810
RGTM2-I 200/80MM KV	Pt1000	4...20 mA	200 mm	1101-21D2-0049-810
RGTM2-I 250/80MM KV	Pt1000	4...20 mA	250 mm	1101-21D2-0059-810
RGTM2-I 300/80MM KV	Pt1000	4...20 mA	300 mm	1101-21D2-0069-810
RGTM2-I 400/80MM KV	Pt1000	4...20 mA	400 mm	1101-21D2-0089-810
RGTM 2-I xx Q	Pt1000			with M12 connector
RGTM2-I 100/80MM Q	Pt1000	4...20 mA	100 mm	2001-4141-2100-011
RGTM2-I 150/80MM Q	Pt1000	4...20 mA	150 mm	2001-4141-2100-021
RGTM2-I 200/80MM Q	Pt1000	4...20 mA	200 mm	2001-4141-2100-031
RGTM2-I 250/80MM Q	Pt1000	4...20 mA	250 mm	2001-4141-2100-041
RGTM2-I 300/80MM Q	Pt1000	4...20 mA	300 mm	2001-4141-2100-051
RGTM2-I 400/80MM Q	Pt1000	4...20 mA	400 mm	2001-4141-2100-061
Extra charge:	other sensors optional			on request
Note	For additional device variants, see S+S Facility Engineering!			

ACCESSORIES

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** 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 measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.0 VA / 24 V DC
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 $-30...+70^\circ\text{C}$ with manual zero point correction ($\pm 10\text{K}$)
Deviation in temperature:	typically $\pm 0.2\text{K}$ at $+25^\circ\text{C}$
Output:	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 , plastic (M16 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-stabilised, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL9016), 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), $\varnothing 6$ mm, NL = 65 mm
Process connection:	by means of screws (on the housing base)
Ambient temperature:	measuring transducer $-30...+70^\circ\text{C}$
Permissible humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP67 (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 , 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)

ATM 2
with cable gland



ATM 2-Q
with M12 connector





S+S REGELTECHNIK

THERMASGARD® ATM 2 ID

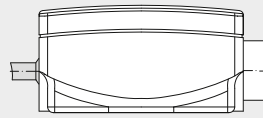
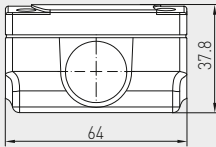
Outside temperature / wet room temperature
measuring transducers, calibratable,
with multi-range switching and active output



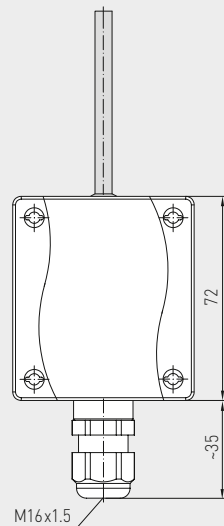
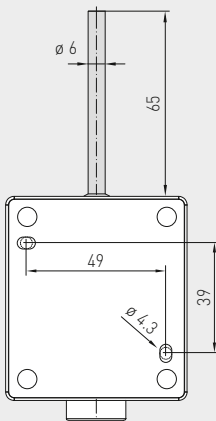
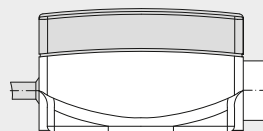
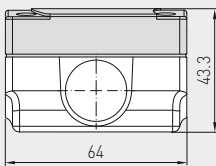
Dimensional drawing

ATM 2

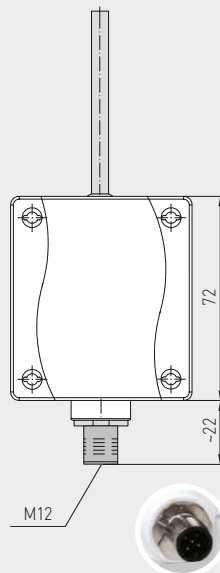
without display



with display



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

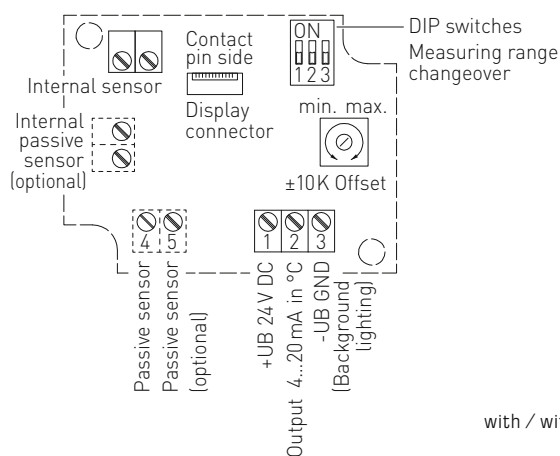


PS-PROTECTION
PERFECT SENSOR PROTECTION

Outside temperature / wet room temperature
measuring transducers, calibratable,
with multi-range switching and active output

Schematic diagram*

ATM 2-I



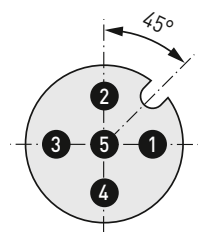
Connection*:

2-wire connection for devices
with / without display (not illuminated)

3-wire connection for devices
with illuminated display

Pin assignment
(M12)

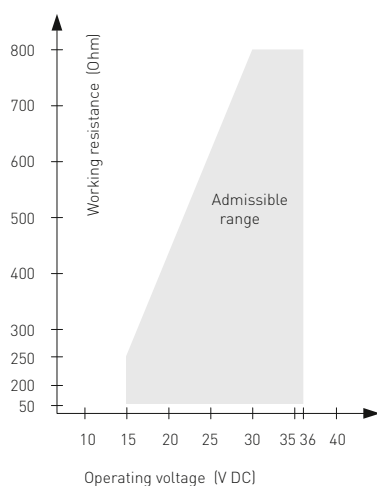
ATM 2-I



- ① +UB 24V DC
- ② Output temperature 4...20 mA [°C]
- ③ free
- ④ -UB GND (optional for LCD backlighting)
- ⑤ Shield

Load resistance diagram

ATM 2-I



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



S+S REGELTECHNIK

THERMASGARD® ATM 2 ID

Outside temperature / wet room temperature
measuring transducers, calibratable,
with multi-range switching and active output

ATM 2 - Q
with display,
hinged



THERMASGARD® ATM 2 Outside temperature / wet room temperature measuring transducers, *ID*

Type / WG01	Sensor	Output	Display	Item No.
ATM 2				with cable gland
ATM2-I	Pt1000	4...20 mA		1101-1142-0009-900
ATM2-I DISPLAY	Pt1000	4...20 mA	■	1101-1142-2009-900
ATM 2 - Q				with M12 connector
ATM2-I Q	Pt1000	4...20 mA		2001-6111-2100-001
ATM2-I Q_LCD	Pt1000	4...20 mA	■	2001-6112-2100-001
Extra charge:	other ranges optional with sun protection hood SS02			on request
Note	For additional device variants, see S+S Facility Engineering!			

ACCESSORIES

WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000

For further information, 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,
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 **WS04** (accessories).

The measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user
is possible (range and zero point are adjustable).

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.0 VA / 24 V DC
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 $-30...+70^\circ\text{C}$ with manual zero point correction (± 10 K)
Deviation in temperature:	typically ± 0.2 K at $+25^\circ\text{C}$
Output:	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:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, UV and weathering resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Protective tube:	made from stainless steel V4A (1.4571), \varnothing 6 mm, NL = 65 mm
Process connection:	by screws
Ambient temperature:	measuring transducer $-30...+70^\circ\text{C}$
Permissible humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP69 (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)



S+S REGELTECHNIK

NEW

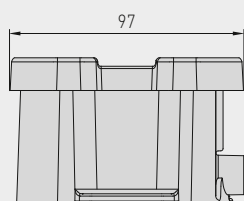
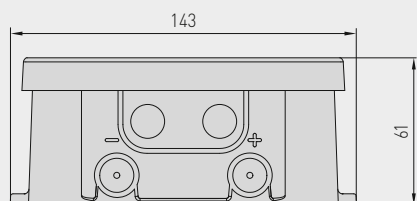
THERMASGARD® ATM 2 - VA ID

Outside temperature / wet room temperature
measuring transducers, calibratable,
with multi-range switching and active output

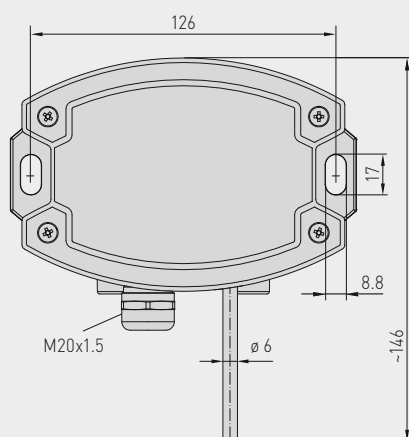


Dimensional drawing

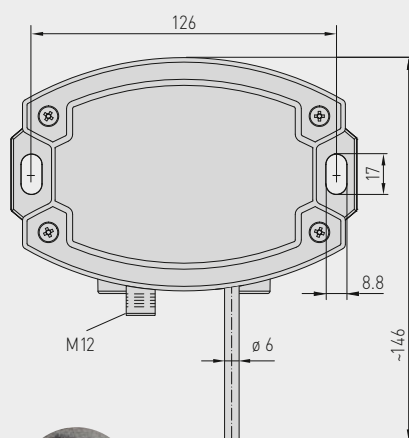
ATM 2 - VA



Housing with
cable gland



Housing with
M12 connector



M12 connector
(male)

High-performance encapsulation against
vibration, mechanical stress and humidity



PS-PROTECTION

PERFECT SENSOR PROTECTION

ATM 2 - VA
with cable gland



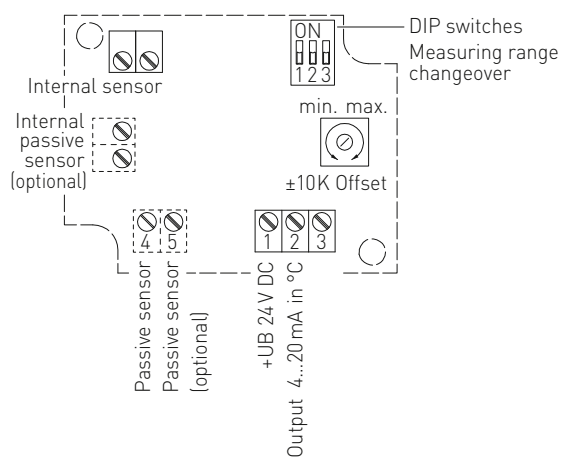
ATM 2 - VAQ
with M12 connector



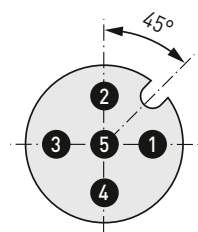
Outside temperature / wet room temperature
measuring transducers, calibratable,
with multi-range switching and active output

Schematic diagram

ATM 2-I

Pin assignment
(M12)

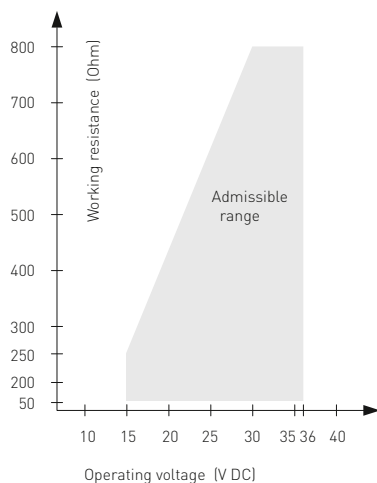
ATM 2-I



- ① +UB 24V DC
- ② Output temperature 4...20 mA [°C]
- ③ free
- ④ -UB GND (optional)
- ⑤ Shield

Load resistance diagram

ATM 2-I



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



S+S REGELTECHNIK

NEW

THERMASGARD® ATM 2 - VA ID

Outside temperature / wet room temperature
measuring transducers, calibratable,
with multi-range switching and active output

ATM 2 - VAQ
with M12 connector



THERMASGARD® ATM 2 - VA Outside temperature / wet room temperature measuring transducers, ID

Type / WG02	Sensor	Output	Item No.
ATM 2 - VA			with cable gland
ATM2-I VA	Pt1000	4...20 mA	2001-6171-2200-001
ATM 2 - VAQ			with M12 connector
ATM2-I VAQ	Pt1000	4...20 mA	2001-6171-2100-001
Extra charge:	other ranges optional		
Note	For additional device variants, see S+S Facility Engineering!		

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** 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.

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).

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.0 VA / 24 V DC
Insulating resistance:	$\geq 100 \text{ M}\Omega$, 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:	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 , 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-stabilised, 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)
Connecting cable:	silicone, SiHF, 2 x 0.25 mm ² ; CL = 1.5 m (other lengths and measuring range limits optionally available, e.g. PTFE up to +250 °C or glass fibre with steel mesh up to +350 °C)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), $\varnothing = 6$ mm, nominal length NL = 50 mm (other dimensions optionally available) cable entry stamped (optionally rolled)
Ambient temperature:	measuring transducer -30...+70 °C
Permissible humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP65 (according to EN 60529) humidity-tight stamped IP68 (optionally watertight compound-filled*) rolled IP54 (optionally with glass fibre cable)
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)

HFTM
with cable gland



HFTM-Q
with M12 connector





S+S REGELTECHNIK

THERMASGARD® HFTM ID

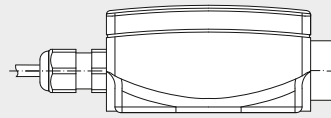
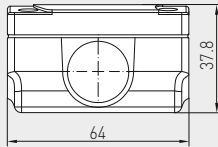
Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output



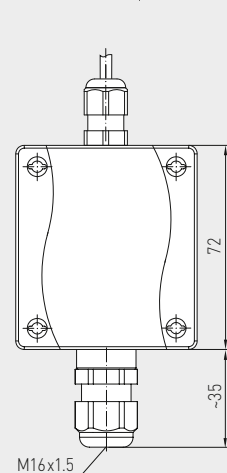
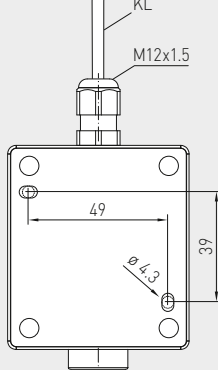
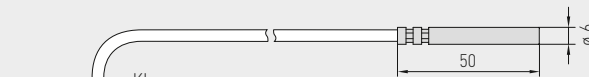
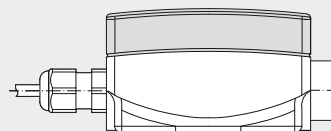
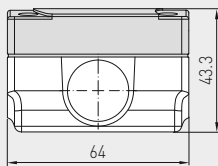
Dimensional drawing

HFTM

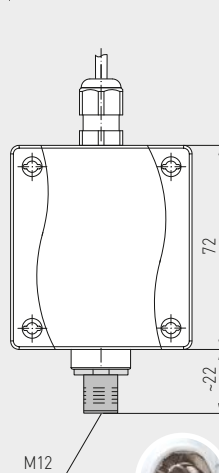
without display



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 **stamped**



IP68 (optional)
watertight compound-filled*,
rolled



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

* High-performance encapsulation against
vibration, mechanical stress and humidity

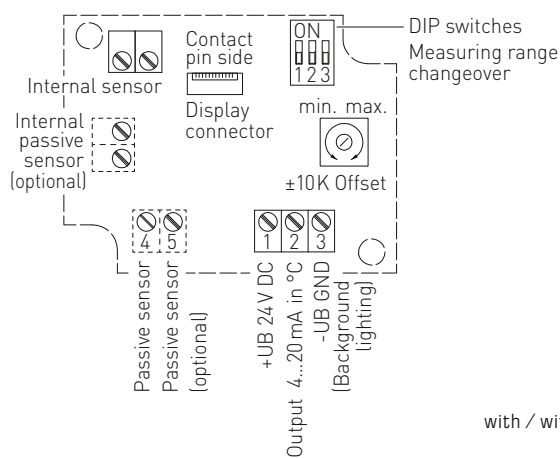
PS-PROTECTION
PERFECT SENSOR PROTECTION

Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output

S+S REGELTECHNIK

Schematic diagram*

HFTM-I



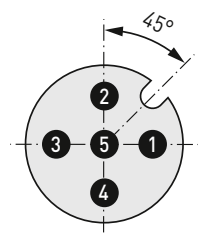
Connection*:

2-wire connection for devices
with / without display (not illuminated)

3-wire connection for devices
with illuminated display

Pin assignment
(M12)

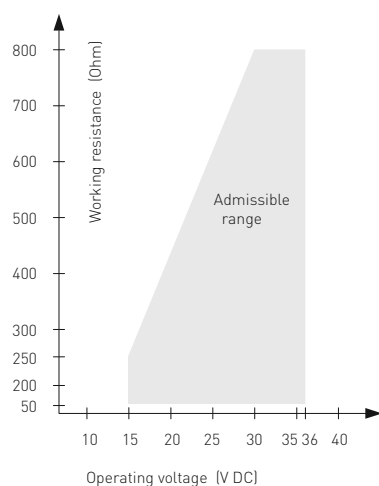
HFTM-I



- ① +UB 24V DC
- ② Output temperature 4...20 mA [°C]
- ③ free
- ④ -UB GND (optional for LCD backlighting)
- ⑤ Shield

Load resistance diagram

HFTM-I



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



Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output

HFTM-Q
with display,
hinged



THERMASGARD® HFTM Sleeve sensor with temperature measuring transducer, *ID*

Type / WG01	Sensor	Output	Type	Display	Item No.
HFTM					with cable gland
HFTM-I	Pt1000	4...20 mA	Remote sensor		1101-1152-0219-920
HFTM-I DISPLAY	Pt1000	4...20 mA	Remote sensor	■	1101-1152-2219-920
HFTM-Q					with M12 connector
HFTM-I Q	Pt1000	4...20 mA	Remote sensor		2001-2111-2100-001
HFTM-I Q_LCD	Pt1000	4...20 mA	Remote sensor	■	2001-2112-2100-001
Extra charge:	Other ranges optional Protection type IP68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone/PTFE/glass fibre) Other lengths of protection sleeve (NL) optional				on request on request
Note	For additional device variants, see S+S Facility Engineering!				

ACCESSORIES

THE-xx Immersion sleeve, stainless steel **V4A** (1.4571) or nickel-plated brass, Ø = 9 mm

For further information, 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, 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).

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.0 VA / 24 V DC
Insulating resistance:	$\geq 100 \text{ M}\Omega$, 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 ($\pm 10 \text{ K}$)
Deviation in temperature:	typically $\pm 0.2 \text{ K}$ at +25 °C
Output:	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:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, UV and weathering resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Connecting cable:	silicone, SiHF, 2 x 0.25 mm ² ; CL = 1.5 m (other lengths and measuring range limits optionally available, e.g. PTFE up to +250 °C or glass fibre with steel mesh up to +350 °C)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), $\varnothing = 6 \text{ mm}$, nominal length NL = 50 mm (other dimensions optionally available) cable entry stamped (optionally rolled)
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:	IP69 (according to EN 60 529) IP65 (according to EN 60 529) humidity-tight stamped IP68 (optionally watertight compound-filled*) rolled IP54 (optionally with glass fibre cable)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)



NEW

S+S REGELTECHNIK

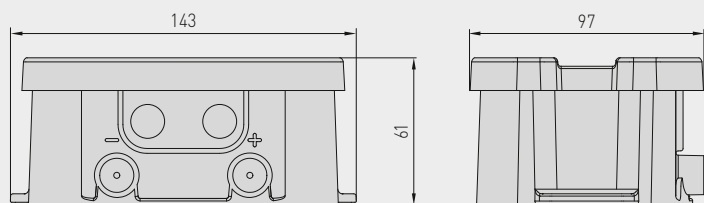
THERMASGARD® HFTM-VA ID

Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output

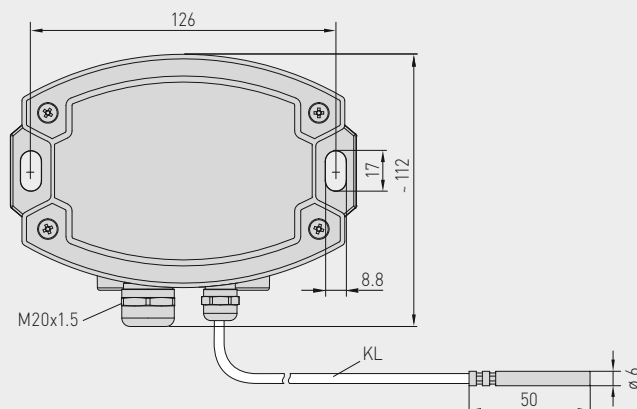


Dimensional drawing

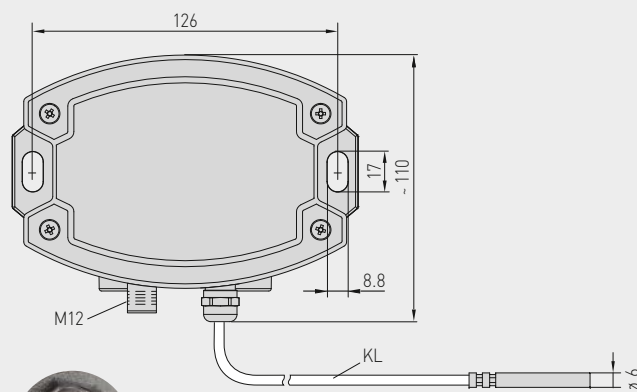
HFTM-VA



Housing with
cable gland



Housing with
M12 connector



M12 connector
(male)



IP65 (standard)
humidity-tight **stamped**



IP68 (optional)
watertight compound-filled*,
rolled



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

* High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

HFTM-VA
with cable gland



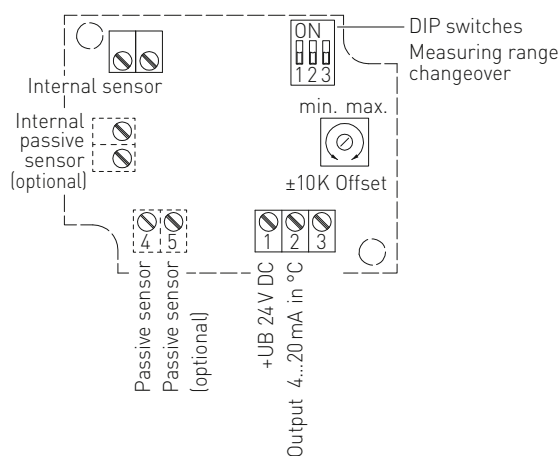
HFTM-VAQ
with M12 connector



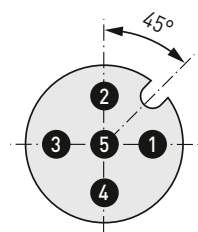
Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output

Schematic diagram

HFTM-I

Pin assignment
(M12)

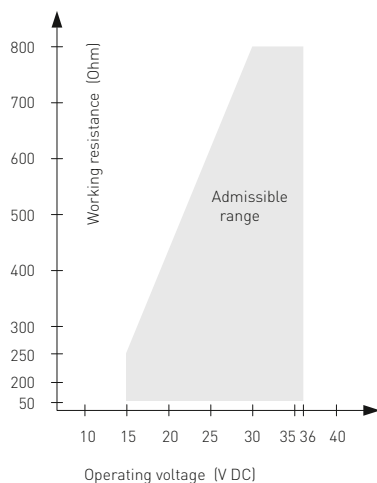
HFTM-I



- ① +UB 24V DC
- ② Output temperature 4...20 mA [°C]
- ③ free
- ④ -UB GND (optional)
- ⑤ Shield

Load resistance diagram

HFTM-I



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



S+S REGELTECHNIK

NEW

THERMASGARD® HFTM-VA ID

Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output

HFTM-VAQ
with M12 connector



THERMASGARD® HFTM-VA Sleeve sensor with temperature measuring transducer, ID

Type / WG02	Sensor	Output	Type	Item No.
HFTM-VA				with cable gland
HFTM-I VA	Pt1000	4...20 mA	Remote sensor	2001-2141-2200-001
HFTM-VAQ				with M12 connector
HFTM-I VAQ	Pt1000	4...20 mA	Remote sensor	2001-2141-2100-001
Extra charge:	Other ranges optional Protection type IP68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone/PTFE/glass fibre) Other lengths of protection sleeve (NL) optional			on request on request
Note	For additional device variants, see S+S Facility Engineering!			

ACCESSORIES

THE-xx	Immersion sleeve, stainless steel V4A (1.4571) or nickel-plated brass, Ø = 9 mm
For further information, 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** 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 measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable).

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.0 VA / 24 V DC
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 at IP68) sensor external
Measuring ranges:	multi-range switching with 8 switchable measuring ranges see table (other measuring ranges optional) T_{max} above $+100^\circ\text{C}$, operating range $-50\ldots+150^\circ\text{C}$ with manual zero point correction ($\pm 10 \text{ K}$)
Deviation in temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output:	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 , 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-stabilised, 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)
Connecting cable:	silicone, SiHF, 2 x 0.25 mm ² ; CL = 1.5 m (other lengths and measuring range limits optionally available, e.g. PTFE up to $+250^\circ\text{C}$ or glass fibre with steel mesh up to $+350^\circ\text{C}$)
Sensor protection:	pipe feeder, stainless steel V4A (1.4571), $\varnothing = 6 \text{ mm}$, nominal length NL = 50 mm, cable entry stamped
Strap dimensions:	$\varnothing = 13 - 92 \text{ mm}$ (1/4 - 3"), L = 300 mm
Process connection:	endless strap in metal tightener (included in the scope of delivery)
Ambient temperature:	measuring transducer $-30\ldots+70^\circ\text{C}$
Permissible humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP65 (according to EN 60529) humidity-tight stamped IP68 (optional sensor sleeve watertight compound-filled*)
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)

ALTM 2
with cable gland



ALTM 2-Q
with M12 connector





S+S REGELTECHNIK

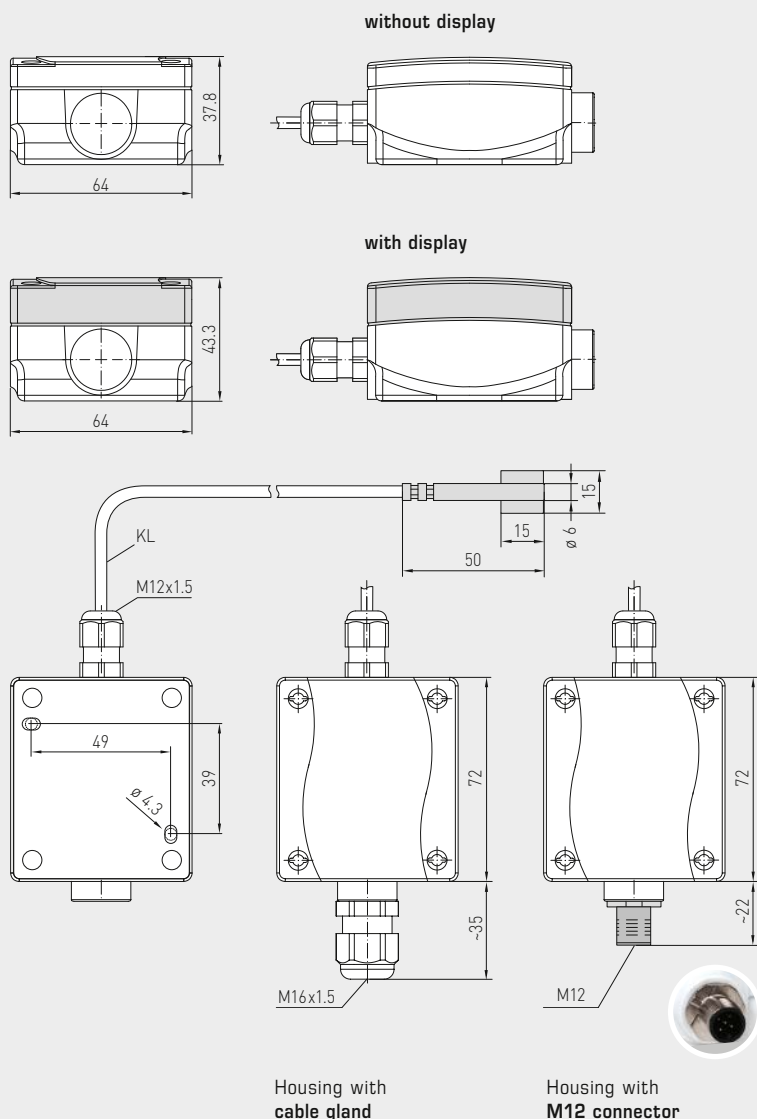
THERMASGARD® ALTM 2 ID

Surface contact / tube contact temperature measuring transducers,
incl. strap, with detached sensor head, calibratable,
with multi-range switching and active output



Dimensional drawing

ALTM 2



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



IP65 (standard)
humidity-tight stamped

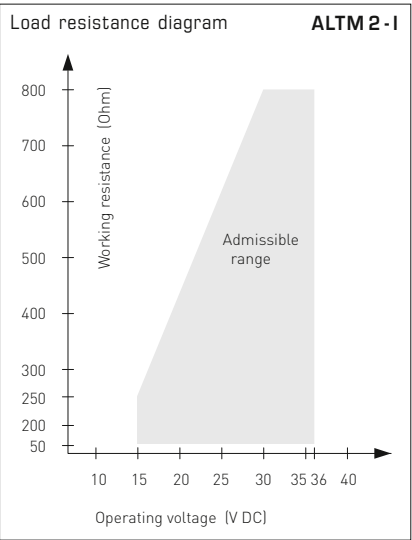
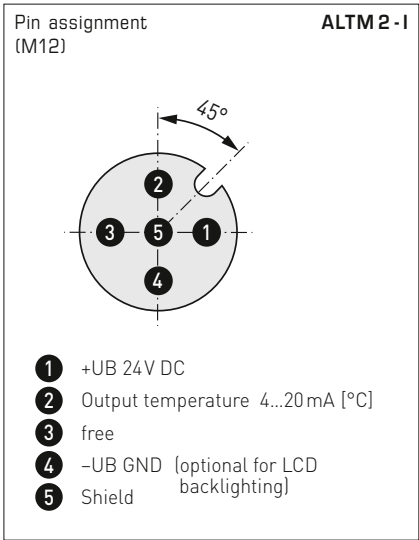
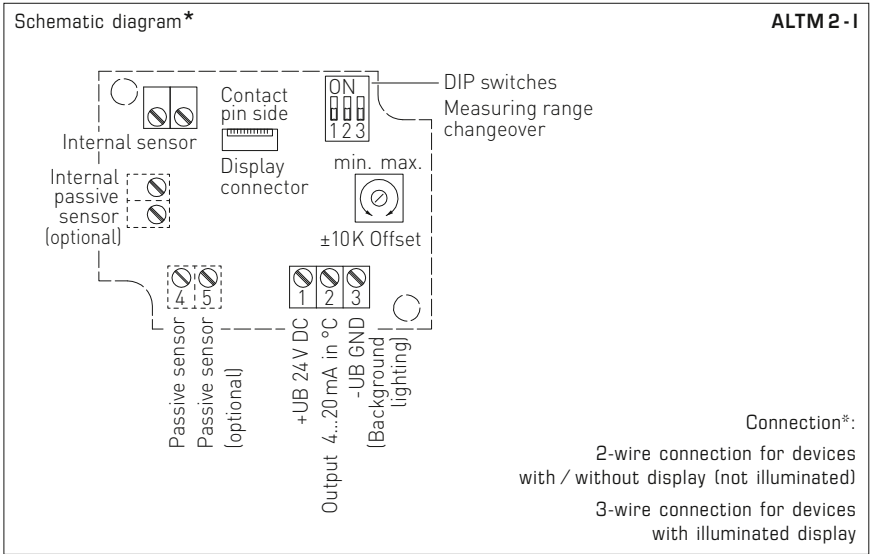


IP68 (optional)
watertight compound-filled*,
rolled

* High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

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



S+S REGELTECHNIK

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 display,
hinged



THERMASGARD® ALTM 2 Surface contact / tube contact temperature measuring transducers, *ID*

Type / WG01	Sensor	Output	Type	Display	Item No.
ALTM 2					with cable gland
ALTM2-I	Pt1000	4...20 mA	Remote sensor		1101-1122-0219-920
ALTM2-I DISPLAY	Pt1000	4...20 mA	Remote sensor	■	1101-1122-2219-920
ALTM 2-Q					with M12 connector
ALTM2-I Q	Pt1000	4...20 mA	Remote sensor		2001-2121-2100-001
ALTM2-I Q LCD	Pt1000	4...20 mA	Remote sensor	■	2001-2122-2100-001
Extra charge:	other ranges optional Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (PVC / silicone)				on request
Note	For additional device variants, see S+S Facility Engineering!				

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
For further information, 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,
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 measuring transducer is factory-calibrated. Adjustment / fine adjustment
by the user is possible (zero point offset is adjustable)..

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.0 VA / 24 V DC
Insulating resistance:	$\geq 100 \text{ M}\Omega$, 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:	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:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, UV and weathering resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Connecting cable:	silicone, SiHF, 2 x 0.25 mm ² ; CL = 1.5 m (other lengths and measuring range limits optionally available, e.g. PTFE up to +250 °C or glass fibre with steel mesh up to +350 °C)
Sensor protection:	pipe feeder, stainless steel V4A (1.4571), $\varnothing = 6$ mm, nominal length NL = 50 mm, cable entry stamped
Strap dimensions:	$\varnothing = 13 - 92$ mm (1/4 - 3"), L = 300 mm
Process connection:	endless strap in metal tightener (included in the scope of delivery)
Ambient temperature:	measuring transducer -30...+70 °C
Permissible humidity:	< 95 % r.H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP69 (according to EN 60529) only housing! IP65 (according to EN 60529) humidity-tight stamped IP68 (optional sensor sleeve watertight compound-filled*)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
ACCESSORIES	(see table)

**NEW**

S+S REGELTECHNIK

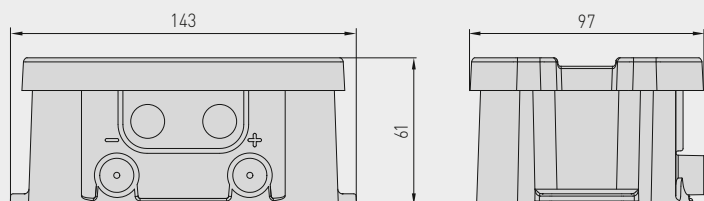
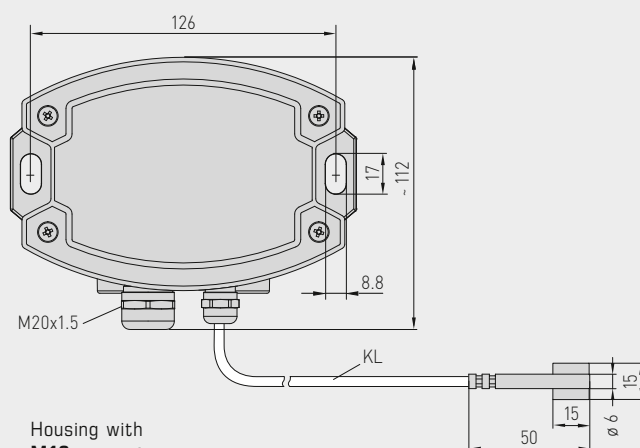
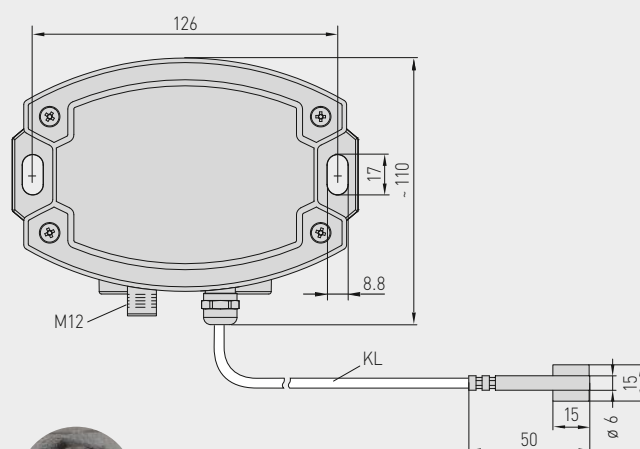
THERMASGARD® **ALTM 2 - VA** ID

Surface contact / tube contact temperature measuring transducers,
incl. strap, with detached sensor head, calibratable,
with multi-range switching and active output



Dimensional drawing

ALTM 2 - VA

Housing with
cable glandHousing with
M12 connectorM12 connector
(male)

High-performance encapsulation against
vibration, mechanical stress and humidity



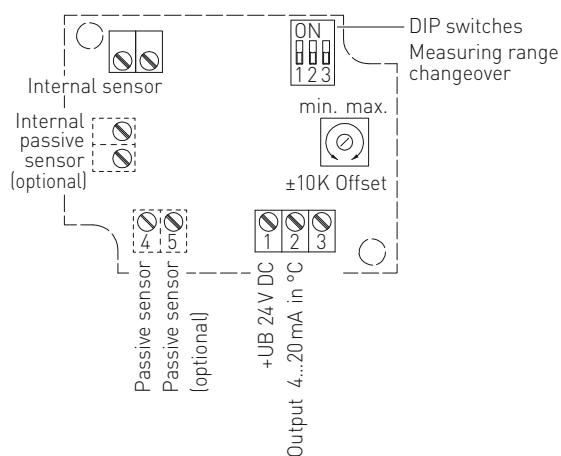
PS-PROTECTION
PERFECT SENSOR PROTECTION

ALTM 2 - VA
with cable glandALTM 2 - VAQ
with M12 connector

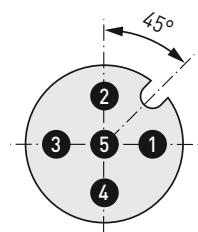
Surface contact / tube contact temperature measuring transducers,
incl. strap, with detached sensor head, calibratable,
with multi-range switching and active output

Schematic diagram

ALTM 2-I

Pin assignment
(M12)

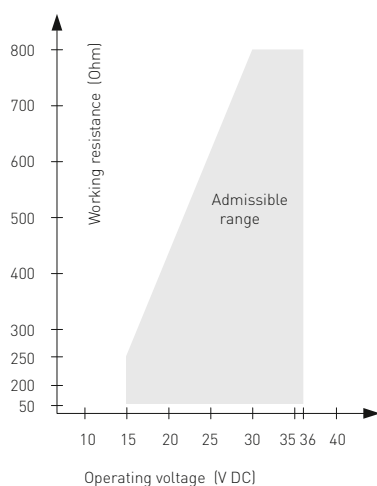
ALTM 2-I



- ① +UB 24V DC
- ② Output temperature 4...20 mA [°C]
- ③ free
- ④ -UB GND (optional)
- ⑤ Shield

Load resistance diagram

ALTM 2-I



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



S+S REGELTECHNIK

NEW

THERMASGARD® ALTM 2 - VA ID

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



THERMASGARD® ALTM 2 - VA Surface contact / tube contact temperature measuring transducers, ID				
Type / WG01	Sensor	Output	Type	Item No.
ALTM 2 - VA				with cable gland
ALTM2-I VA	Pt1000	4...20 mA	Remote sensor	2001-2151-2200-001
ALTM 2 - VAQ				with M12 connector
ALTM2-I VAQ	Pt1000	4...20 mA	Remote sensor	2001-2151-2100-001
Extra charge:	other ranges optional			
Note	For additional device variants, see S+S Facility Engineering!			

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!



Humidity and temperature sensors

HYGRASGARD® humidity sensors 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®

076 – 093

Duct sensors

KFTF-20	Duct humidity and temperature sensor (Housing: Tyr 1 / Tyr 2)	089
KFTF-20-VA	Duct humidity and temperature sensor (Stainless Steel Housing: Tyr 2E)	093

Outdoor sensors

AFTF-20	Outdoor humidity and temperature sensor (Housing: Tyr 2)	081
AFTF-20-VA	Outdoor humidity and temperature sensor (Stainless Steel Housing: Tyr 2E)	085

**On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output**

Calibratable outdoor humidity and temperature sensor **HYGRASGARD® AFTF-20** ($\pm 1.8\%$) with plastic sinter filter (optional metal sinter filter), housing made from impact-resistant plastic, 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 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. Relative humidity (in % r. H.) is the quotient of water vapour partial pressure and 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. Fine adjustment by the user is possible.

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.1 VA / 24 V DC
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 4...20 mA)
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:	4...20 mA

TEMPERATURE

Temperature measuring range:	multi-range switching (see table) -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 4...20 mA)
Ambient temperature:	storage -35...+85 °C; operation -30...+80 °C, non-precipitating
Deviation in temperature:	typically ± 0.2 K at +25 °C
Temperature output:	4...20 mA
Electrical connection:	2-, 3-, or 4-wire connection (see connection diagram), 0.14 - 1.5 mm ² , via terminal screws
Cable connection:	cable gland , plastic (M16 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-stabilised, 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)
Protective tube:	made from stainless steel V2A (1.4301), \varnothing 16 mm, NL = 137 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 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 only!
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)

AFTF-20
with cable gland



AFTF-20-Q
with M12 connector





S+S REGELTECHNIK

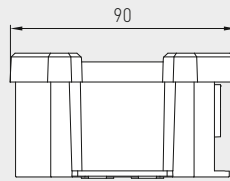
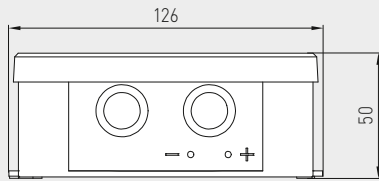
HYGRASGARD® AFTF-20 ID

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



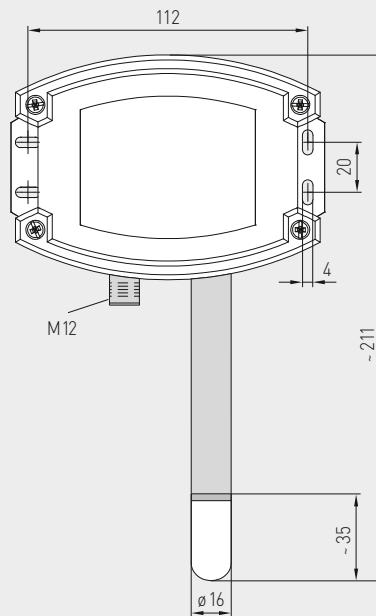
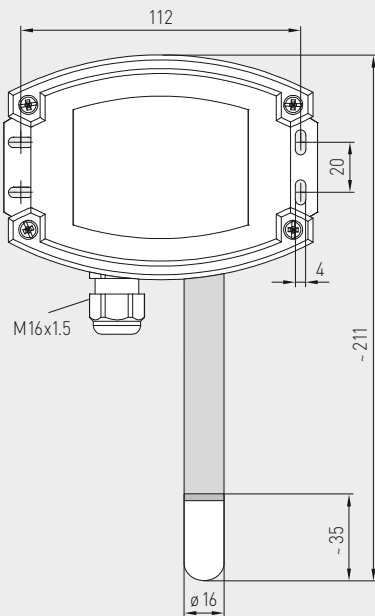
Dimensional drawing

AFTF-20



Housing with
cable gland

Housing with
M12 connector



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



M12 connector
(male)

AFTF-20
with cable gland
and display



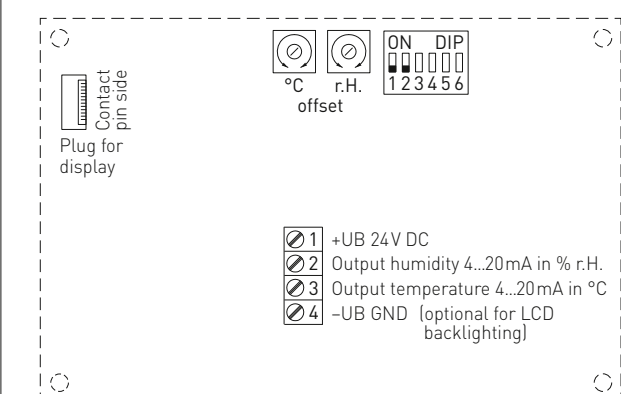
AFTF-20-Q
with M12 connector
and display



On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

Schematic diagram**

AFTF-20-I



Connection**:

3-wire connection for devices
with / without display (not illuminated)4-wire connection for devices
with illuminated displayFor the I variant, the humidity path
must be connected!3- or 4-wire
connection**

AFTF-20-I

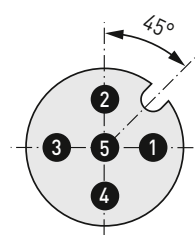
- 1 +UB 24V DC
2 Output humidity in % r.H. 4...20mA
3 Output temperature in °C 4...20mA
4 -UB-GND (optional for backlighting)

Temperature
measuring ranges
(adjustable)DIP
1DIP
2

-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF

Pin assignment
(M12)

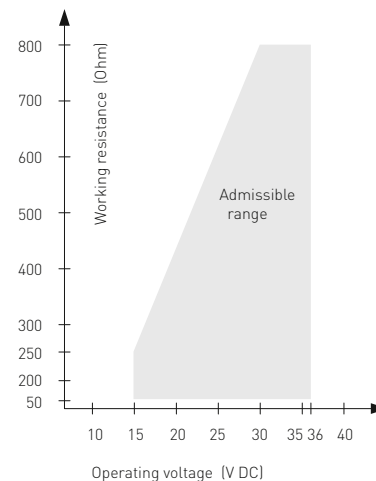
AFTF-20-I



- 1 +UB 24V DC
2 Output humidity 4...20mA [% r.H.]
3 Output temperature 4...20mA [°C]
4 -UB GND (optional for LCD backlighting)
5 Shield

Load resistance diagram

AFTF-20-I

Temperature table
MB: -35...+75 °C

°C	I _A [mA]
-35	4.0
-30	4.7
-25	5.5
-20	6.2
-15	6.9
-10	7.6
-5	8.4
0	9.1
5	9.8
10	10.5
15	11.3
20	12.0
25	12.7
30	13.5
35	14.2
40	14.9
45	15.6
50	16.4
55	17.1
60	17.8
65	18.5
70	19.2
75	20.0

Temperature table
MB: -35...+35 °C

°C	I _A [mA]
-35	4.0
-30	5.1
-25	6.3
-20	7.4
-15	8.6
-10	9.7
-5	10.9
0	12.0
5	13.1
10	14.3
15	15.4
20	16.6
25	17.7
30	18.9
35	20.0

Temperature table
MB: 0...+50 °C

°C	I _A [mA]
0	4.0
5	5.6
10	7.2
15	8.8
20	10.4
25	12.0
30	13.6
35	15.2
40	16.8
45	18.4
50	20.0

Temperature table
MB: 0...+80 °C

°C	I _A [mA]
0	4.0
5	5.0
10	6.0
15	7.0
20	8.0
25	9.0
30	10.0
35	11.0
40	12.0
45	13.0
50	14.0
55	15.0
60	16.0
65	17.0
70	18.0
75	19.0
80	20.0

Humidity table
MB: 0...100% r.H.

% r.H.	I _A [mA]
0	4.0
5	4.8
10	5.6
15	6.4
20	7.2
25	8.0
30	8.8
35	9.6
40	10.4
45	11.2
50	12.0
55	12.8
60	13.6
65	14.4
70	15.2
75	16.0
80	16.8
85	17.6
90	18.4
95	19.2
100	20.0



S+S REGELTECHNIK

HYGRASGARD® AFTF-20 ID

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

AFTF-20-Q
with display,
hinged



HYGRASGARD® AFTF-20 On-wall humidity sensors and temperature sensors ($\pm 1.8\%$), ID

Type / WG02	Measuring Range / Readout		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		
AFTF-20						with cable gland
AFTF-20-I TYR-2	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
AFTF-20-I TYR-2 LCD	0...100 % r. H.	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-201
AFTF-20-Q						with M12 connector
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
AFTF-20-I Q_LCD	0...100 % r. H.	(4x as above)	4...20 mA	4...20 mA	■	2003-6122-2100-001
Note For additional device variants, see S+S Facility Engineering!						

ACCESSORIES

SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
For further information, see chapter Accessories!		

**On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output**

Calibratable outdoor humidity and temperature sensor **HYGRASGARD® AFTF-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 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. Relative humidity (in % r. H.) is the quotient of water vapour partial pressure and 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. Fine adjustment by the user is possible.

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.1 VA / 24 V DC
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 4...20 mA)
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:	4...20 mA

TEMPERATURE

Temperature measuring range:	multi-range switching (see table) -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 4...20 mA)
Ambient temperature:	storage -35...+85 °C; operation -30...+80 °C, non-precipitating
Deviation in temperature:	typically ± 0.2 K at +25 °C
Temperature output:	4...20 mA
Electrical connection:	2-, 3-, or 4-wire connection (see connection 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 (see table)
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, UV and weathering resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr2E)
Protective tube:	made from stainless steel V2A (1.4301), \varnothing 16 mm, NL = 137 mm
Sensor protection:	metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Process connection:	by screws
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60 730)
Protection type:	IP 69 (according to EN 60 529) housing only!
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)

AFTF-20-VA
with cable gland



AFTF-20-VAQ
with M12 connector



**NEW**

S+S REGELTECHNIK

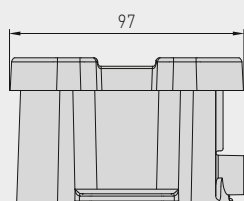
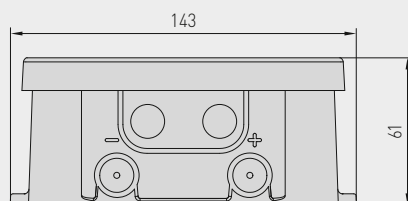
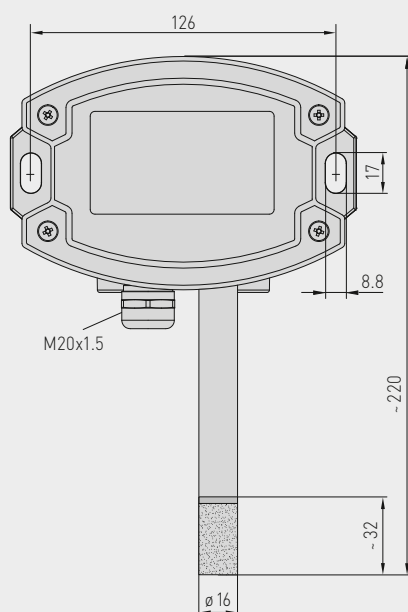
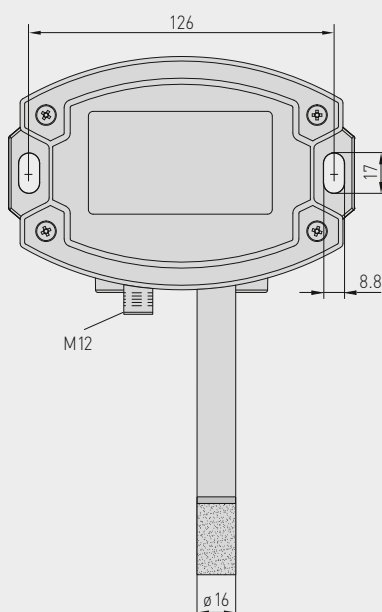
HYGRASGARD® AFTF-20-VA ID

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



Dimensional drawing

AFTF-20-VA

Housing with
cable glandHousing with
M12 connector

SF-M
Metal sinter filter
(optional)



M12 connector
(male)

AFTF-20-VA
with cable gland
and display



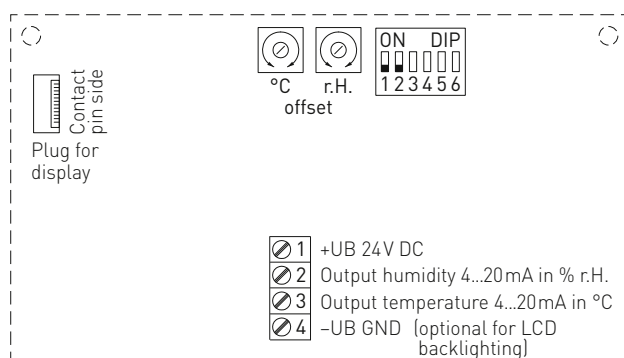
AFTF-20-VAQ
with M12 connector
and display



On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

Schematic diagram**

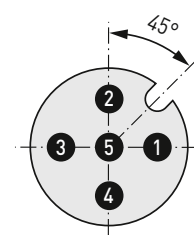
AFTF-20-I



DIP 3, 4, 5, 6 are not assigned!

Pin assignment
(M12)

AFTF-20-I



- 1 +UB 24V DC
- 2 Output humidity 4...20mA [% r.H.]
- 3 Output temperature 4...20mA [°C]
- 4 -UB GND (optional for LCD backlighting)
- 5 Shield

3- or 4-wire
connection**

AFTF-20-I

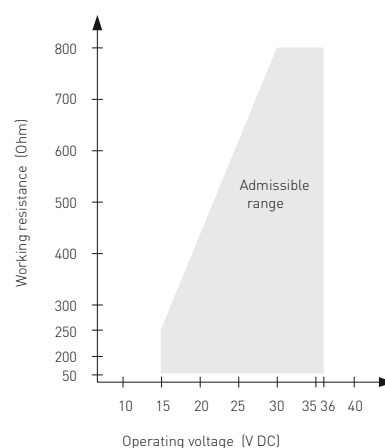
- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4...20mA
- 3 Free
- 4 -UB-GND (optional for backlighting)

Connection**:

3-wire connection for devices
with / without display (not illuminated)4-wire connection for devices
with illuminated displayFor the I variant, the humidity path
must be connected!

Load resistance diagram

AFTF-20-I



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

Temperature table
MB: -35...+75 °C

°C	I _A [mA]
-35	4.0
-30	4.7
-25	5.5
-20	6.2
-15	6.9
-10	7.6
-5	8.4
0	9.1
5	9.8
10	10.5
15	11.3
20	12.0
25	12.7
30	13.5
35	14.2
40	14.9
45	15.6
50	16.4
55	17.1
60	17.8
65	18.5
70	19.2
75	20.0

Temperature table
MB: -35...+35 °C

°C	I _A [mA]
-35	4.0
-30	5.1
-25	6.3
-20	7.4
-15	8.6
-10	9.7
-5	10.9
0	12.0
5	13.1
10	14.3
15	15.4
20	16.6
25	17.7
30	18.9
35	20.0

Temperature table
MB: 0...+50 °C

°C	I _A [mA]
0	4.0
5	5.6
10	7.2
15	8.8
20	10.4
25	12.0
30	13.6
35	15.2
40	16.8
45	18.4
50	20.0

Temperature table
MB: 0...+80 °C

°C	I _A [mA]
0	4.0
5	5.0
10	6.0
15	7.0
20	8.0
25	9.0
30	10.0
35	11.0
40	12.0
45	13.0
50	14.0
55	15.0
60	16.0
65	17.0
70	18.0
75	19.0
80	20.0

Humidity table
MB: 0...100% r.H.

% r.H.	I _A [mA]
0	4.0
5	4.8
10	5.6
15	6.4
20	7.2
25	8.0
30	8.8
35	9.6
40	10.4
45	11.2
50	12.0
55	12.8
60	13.6
65	14.4
70	15.2
75	16.0
80	16.8
85	17.6
90	18.4
95	19.2
100	20.0



NEW

S+S REGELTECHNIK

HYGRASGARD® AFTF-20-VA ID

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

AFTF-20-VAQ
with display,
hinged



HYGRASGARD® AFTF-20-VA On-wall humidity sensors and temperature sensors ($\pm 1.8\%$), ID

Type / WG02	Measuring Range / Readout		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		
AFTF-20-VA						with cable gland
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
AFTF-20-I VA_LCD	0...100 % r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	2003-6182-2200-001
AFTF-20-VAQ						with M12 connector
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
AFTF-20-I VAQ_LCD	0...100 % r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	2003-6182-2100-001
Note For additional device variants, see S+S Facility Engineering!						

ACCESSORIES

SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
For further information, see chapter Accessories!		

**Duct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching
and active output**

Calibratable duct humidity and temperature sensor **HYGRASGARD® KFTF-20** ($\pm 1.8\%$) with plastic sinter filter (optional metal sinter filter), housing made from impact-resistant plastic, optionally with /without display, with **cable gland** or **M12 connector** according to DIN EN 61076-2-101.

It measures the relative humidity and/or the temperature of the air and converts the measurand into a standard signal of 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. Relative humidity (in % r. H.) is the quotient of water vapour partial pressure and 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. Fine adjustment by the user is possible.

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.1 VA / 24 V DC
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 4...20 mA)
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:	4...20 mA

TEMPERATURE

Temperature measuring range:	multi-range switching (see table) -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 4...20 mA)
Ambient temperature:	storage -35...+85 °C; operation -30...+80 °C, non-precipitating
Deviation in temperature:	typically ± 0.2 K at +25 °C
Temperature output:	4...20 mA
Electrical connection:	2-, 3-, or 4-wire connection (see connection 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 (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic , UV-stabilised, 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:	72 x 64 x 37.8 mm (Tyr 1) without display 126 x 90 x 50 mm (Tyr 2) with display
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, \varnothing 20 mm, NL = 235 mm, $v_{\max} = 30$ m/s (air) (option available on request: 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 60730)
Protection type:	IP 65 (according to EN 60529) housing only!
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
with cable gland,
without display
(Tyr 1)



KFTF-20-Q
with M12 connector,
without display
(Tyr 1)



MFT-20-K
Mounting flange,
plastic





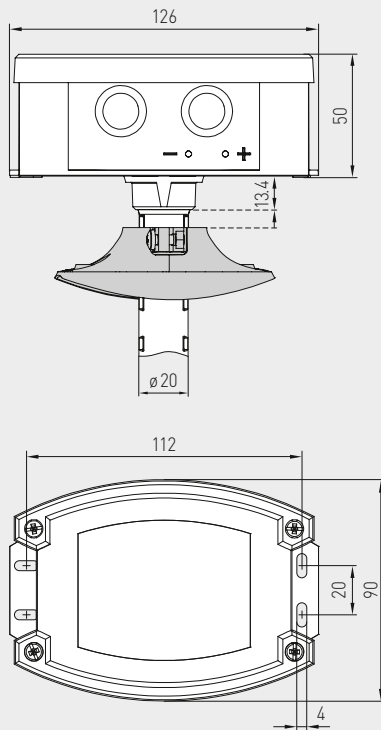
S+S REGELTECHNIK

HYGRASGARD® KFTF-20 ID

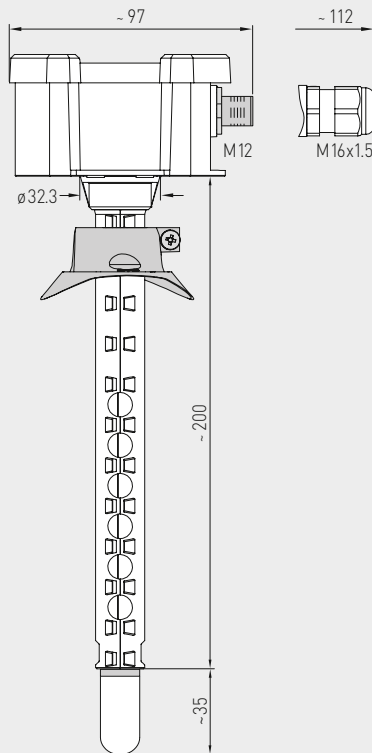
Duct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching
and active output



Dimensional drawing
(Tyr 2)



KFTF-20
with display



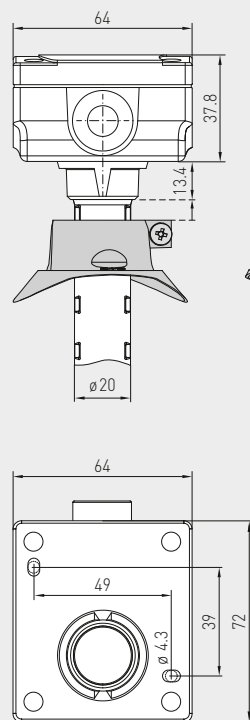
KFTF-20
with cable gland
and display
(Tyr 2)



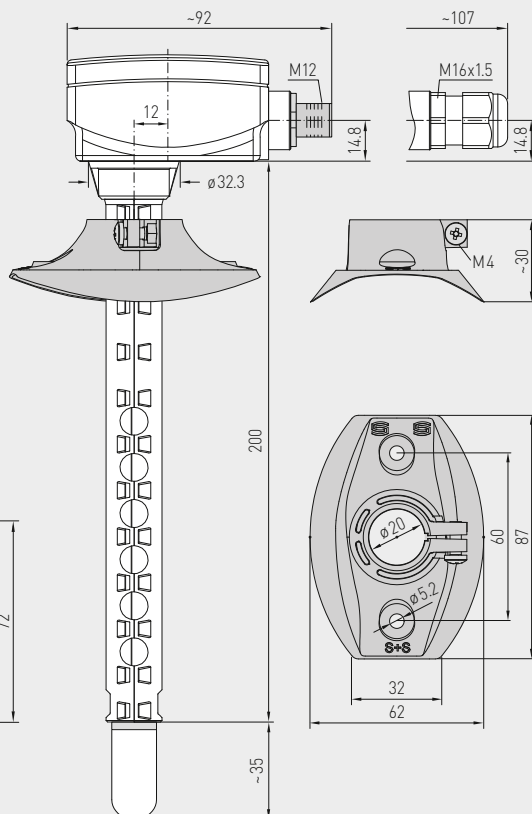
KFTF-20-Q
with M12 connector
and display
(Tyr 2)



Dimensional drawing
(Tyr 1)



KFTF-20
without display



M12 connector
(male)



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)

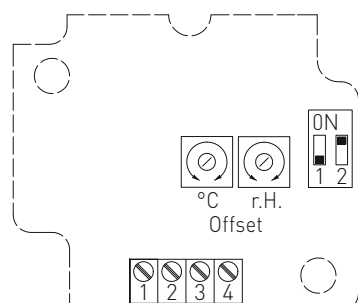
Protective tube
stainless steel
(optional on request)

Duct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching
and active output

S+S REGELTECHNIK

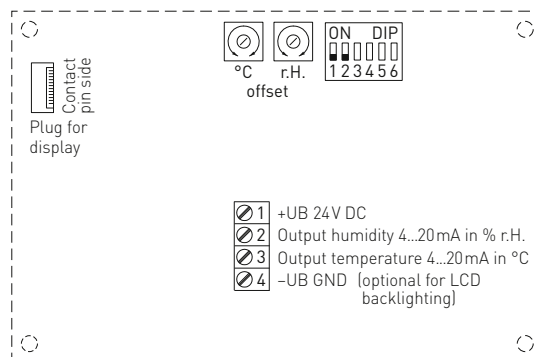
Schematic diagram**
(Tyr 1)

KFTF-20-I
without display



Schematic diagram**
(Tyr 2)

KFTF-20-I
with display



DIP 3, 4, 5, 6 are not assigned!

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!

3- or 4-wire
connection**

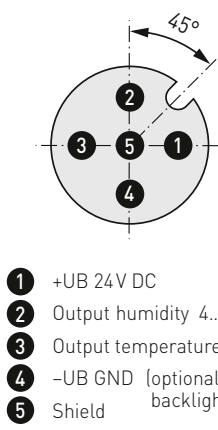
KFTF-20-I

- 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)

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

Pin assignment
(M12)

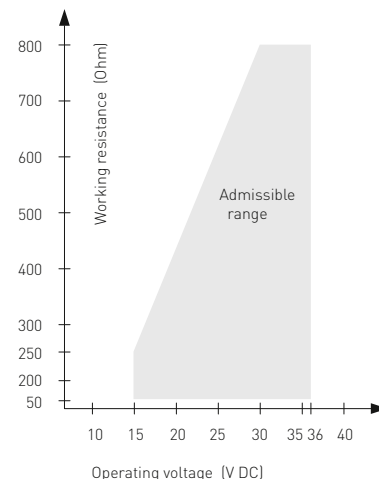
KFTF-20-I



- 1 +UB 24V DC
- 2 Output humidity 4...20mA [% r.H.]
- 3 Output temperature 4...20mA [°C]
- 4 -UB GND (optional for LCD backlighting)
- 5 Shield

Load resistance diagram

KFTF-20-I



Temperature table
MB: -35...+75 °C

°C	I _A [mA]
-35	4.0
-30	4.7
-25	5.5
-20	6.2
-15	6.9
-10	7.6
-5	8.4
0	9.1
5	9.8
10	10.5
15	11.3
20	12.0
25	12.7
30	13.5
35	14.2
40	14.9
45	15.6
50	16.4
55	17.1
60	17.8
65	18.5
70	19.2
75	20.0

Temperature table
MB: -35...+35 °C

°C	I _A [mA]
-35	4.0
-30	5.1
-25	6.3
-20	7.4
-15	8.6
-10	9.7
-5	10.9
0	12.0
5	13.1
10	14.3
15	15.4
20	16.6
25	17.7
30	18.9
35	20.0

Temperature table
MB: 0...+50 °C

°C	I _A [mA]
0	4.0
5	5.6
10	7.2
15	8.8
20	10.4
25	12.0
30	13.6
35	15.2
40	16.8
45	18.4
50	20.0

Temperature table
MB: 0...+80 °C

°C	I _A [mA]
0	4.0
5	5.0
10	6.0
15	7.0
20	8.0
25	9.0
30	10.0
35	11.0
40	12.0
45	13.0
50	14.0
55	15.0
60	16.0
65	17.0
70	18.0
75	19.0
80	20.0

Humidity table
MB: 0...100 % r.H.

% r.H.	I _A [mA]
0	4.0
5	4.8
10	5.6
15	6.4
20	7.2
25	8.0
30	8.8
35	9.6
40	10.4
45	11.2
50	12.0
55	12.8
60	13.6
65	14.4
70	15.2
75	16.0
80	16.8
85	17.6
90	18.4
95	19.2
100	20.0



S+S REGELTECHNIK

HYGRASGARD® KFTF-20 ID

Duct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching
and active output

KFTF-20-Q
with display,
hinged
(Tyr 2)



KFTF-20-Q
without display
(Tyr 1)



HYGRASGARD® KFTF-20 Duct humidity and temperature sensors ($\pm 1.8\%$), ID

Type / WG02	Measuring Range / Readout		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		
KFTF-20						with cable gland
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
KFTF-20-I TYR-2 LCD	0...100 % r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	1201-8112-1400-030
KFTF-20-Q						with M12 connector
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
KFTF-20-I Q LCD	0...100 % r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	2003-4172-2100-001
Note	For additional device variants, see S+S Facility Engineering!					

ACCESSORIES

SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
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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 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. Relative humidity (in % r. H.) is the quotient of water vapour partial pressure and 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. Fine adjustment by the user is possible.

TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ see working resistance diagram
Power consumption:	< 1.1 VA / 24 V DC
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 4...20 mA)
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:	4...20 mA

TEMPERATURE

Temperature measuring range:	multi-range switching (see table) -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 4...20 mA)
Ambient temperature:	storage -35...+85 °C; operation -30...+80 °C, non-precipitating
Deviation in temperature:	typically ± 0.2 K at +25 °C
Temperature output:	4...20 mA
Electrical connection:	2-, 3-, or 4-wire connection (see connection 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 (see table)
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, UV and weathering 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 69 (according to EN 60529) housing only!
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** ID

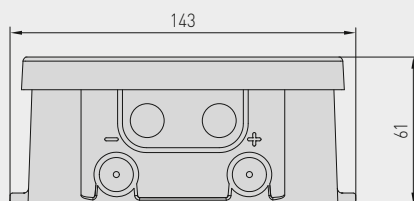
Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



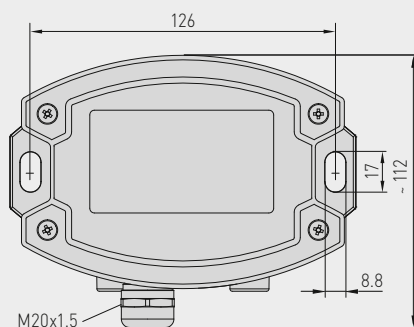
Dimensional drawing

KFTF-20-VA

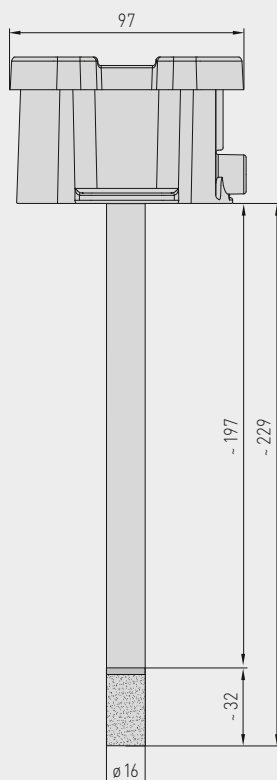
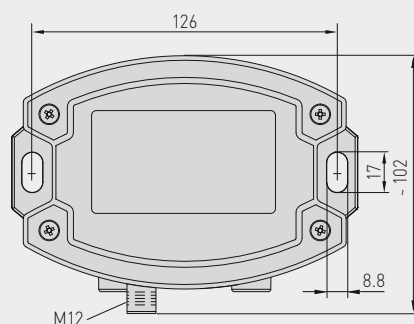
KFTF-20-VA
with cable gland
and display



Housing with
cable gland



Housing with
M12 connector



SF-M
Metal sinter filter
(optional)



M12 connector
(male)



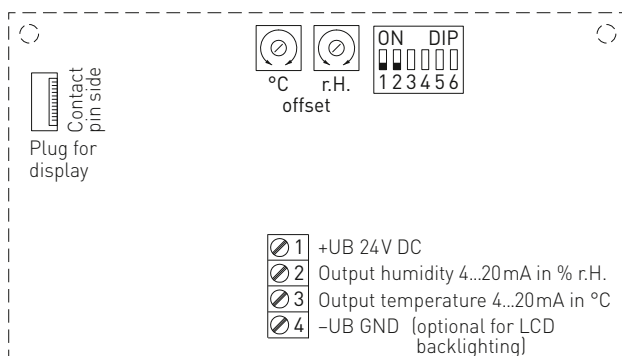
KFTF-20-VAQ
with M12 connector
and display



Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

Schematic diagram**

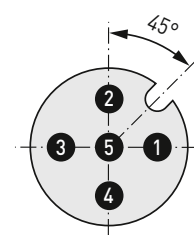
KFTF-20-I



DIP 3, 4, 5, 6 are not assigned!

Pin assignment
(M12)

KFTF-20-I



- 1 +UB 24V DC
- 2 Output humidity 4...20mA [% r.H.]
- 3 Output temperature 4...20mA [°C]
- 4 -UB GND (optional for LCD backlighting)
- 5 Shield

3- or 4-wire
connection**

KFTF-20-I

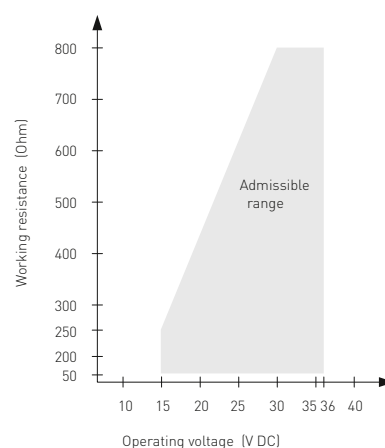
- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4...20mA
- 3 Output temperature in °C 4...20mA
- 4 -UB-GND (optional for backlighting)

Connection**:

3-wire connection for devices
with / without display (not illuminated)4-wire connection for devices
with illuminated displayFor the I variant, the humidity path
must be connected!

Load resistance diagram

KFTF-20-I



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

Temperature table
MB: -35...+75 °C

°C	I _A [mA]
-35	4.0
-30	4.7
-25	5.5
-20	6.2
-15	6.9
-10	7.6
-5	8.4
0	9.1
5	9.8
10	10.5
15	11.3
20	12.0
25	12.7
30	13.5
35	14.2
40	14.9
45	15.6
50	16.4
55	17.1
60	17.8
65	18.5
70	19.2
75	20.0

Temperature table
MB: -35...+35 °C

°C	I _A [mA]
-35	4.0
-30	5.1
-25	6.3
-20	7.4
-15	8.6
-10	9.7
-5	10.9
0	12.0
5	13.1
10	14.3
15	15.4
20	16.6
25	17.7
30	18.9
35	20.0

Temperature table
MB: 0...+50 °C

°C	I _A [mA]
0	4.0
5	5.6
10	7.2
15	8.8
20	10.4
25	12.0
30	13.6
35	15.2
40	16.8
45	18.4
50	20.0

Temperature table
MB: 0...+80 °C

°C	I _A [mA]
0	4.0
5	5.0
10	6.0
15	7.0
20	8.0
25	9.0
30	10.0
35	11.0
40	12.0
45	13.0
50	14.0
55	15.0
60	16.0
65	17.0
70	18.0
75	19.0
80	20.0

Humidity table
MB: 0...100% r.H.

% r.H.	I _A [mA]
0	4.0
5	4.8
10	5.6
15	6.4
20	7.2
25	8.0
30	8.8
35	9.6
40	10.4
45	11.2
50	12.0
55	12.8
60	13.6
65	14.4
70	15.2
75	16.0
80	16.8
85	17.6
90	18.4
95	19.2
100	20.0



NEW

S+S REGELTECHNIK

HYGRASGARD® KFTF-20-VA ID

Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

KFTF-20-VAQ
with display,
hinged



HYGRASGARD® KFTF-20-VA Duct humidity and temperature sensors ($\pm 1.8\%$), ID

Type / WG02	Measuring Range / Readout		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		
KFTF-20-VA						with cable gland
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
KFTF-20-I VA_LCD	0...100 % r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	2003-4162-2200-001
KFTF-20-VAQ						with M12 connector
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		2003-4161-2100-001
KFTF-20-I VAQ_LCD	0...100 % r. H.	(4x as above)	4... 20 mA	4... 20 mA	■	2003-4162-2100-001
Note For additional device variants, see S+S Facility Engineering!						

ACCESSORIES

SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
For further information, see chapter Accessories!		



Pressure transducers and pressure controllers

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®

094 – 137

for gaseous media

PREMASGARD® 711x	Pressure measuring transducer Imbar / PaI (Housing: Tyr 2)	101
PREMASGARD® 711x-VA	Pressure measuring transducer Imbar / PaI (Stainless Steel Housing: Tyr 2E)	106
PREMASREG® 711x	Pressure measuring transducer/switch Imbar / PaI (Housing: Tyr 2)	113
PREMASREG® 711x-VA	Pressure measuring transducer/switch Imbar / PaI (Stainless Steel Housing: Tyr 2E)	118

for volume flow

PREMASREG® 716x	Volume flow measuring transducer/switch Imbar / PaI (Housing: Tyr 2)	125
PREMASREG® 716x-VA	Volume flow measuring transducer/switch Imbar / PaI (Stainless Steel Housing: Tyr 2E)	130

for liquid media

SHD	Pressure measuring transducer [bar]	133
SHD 400	Differential pressure transmitter [bar]	135
SHD 692	Differential pressure transmitter [bar]	137

**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 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:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_b(\Omega) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$, see working resistance diagram
Power consumption:	< 2 VA / 24 V DC
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 $\varnothing 4 / 6 \text{ mm}$, optionally with quick connect made from stainless steel for PVC fabric pressure hose $\varnothing 6 \text{ mm}$
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	$-20...+50^\circ\text{C}$
Accuracy:	Type 7112 (25 Pa): typically $\pm 1 \text{ Pa}$ Type 7110 (100 Pa): typically $\pm 2 \text{ Pa}$ 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 $\pm 2\%$ of final value for pressure ranges < $\pm 250 \text{ Pa}$
Temp. drift values:	$\pm 0.1\% / ^\circ\text{C}$ $\pm 0.3\% / ^\circ\text{C}$ for pressure ranges < 250 Pa
Zero point offset:	< $\pm 0.7\%$ of final value $\pm 1.4\%$ of final value for pressure ranges < 250 Pa
Positive /negative pressure:	max. $\pm 100 \text{ hPa}$
Signal filtering:	switchable 1 s / 10 s (via DIP switches)
Output signal:	4...20 mA
Connection type:	2- or 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, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic , UV-stabilised, 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 60730)
Protection type:	IP 65 (according to EN 60529)
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



S+S REGELTECHNIK

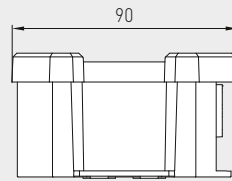
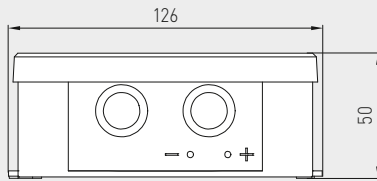
PREMASGARD® 711x ID

Pressure and differential pressure measuring transducers,
including connection set, adjustable, calibratable,
with multi-range switching and active output



Dimensional drawing

PREMASGARD® 711x

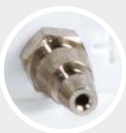
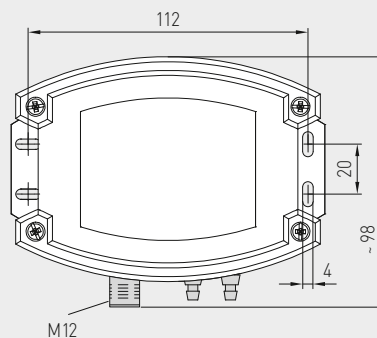
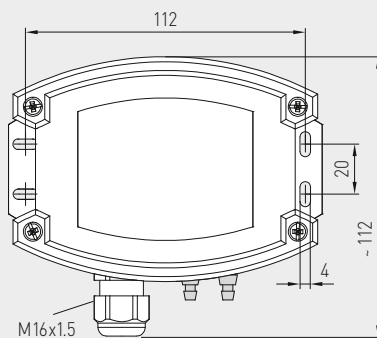


Housing with
cable gland

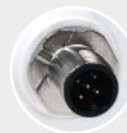
equipped as standard with
pressure port **nozzles**

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

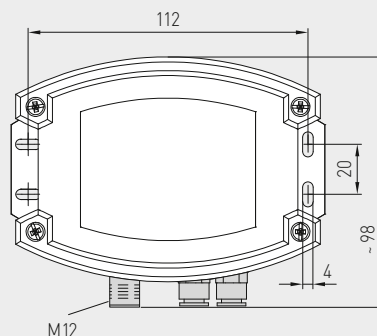
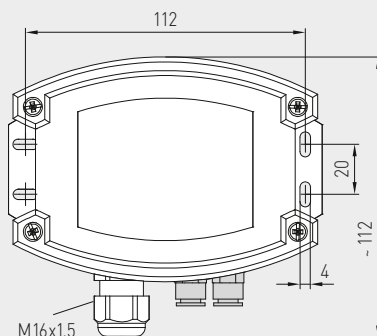


Dimensional drawing

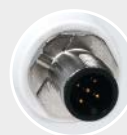
PREMASGARD® 711x

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)

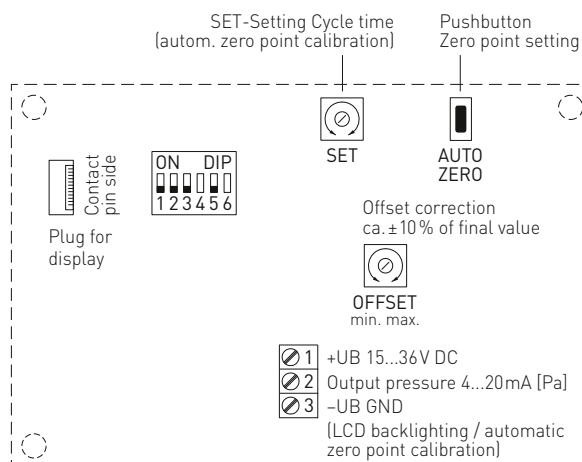
Pressure port
Stainless steel
quick connect
(optional)



Pressure and differential pressure measuring transducers,
including connection set, adjustable, calibratable,
with multi-range switching and active output

Schematic diagram

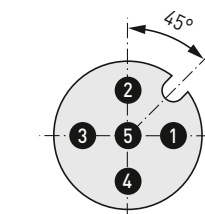
PREMASGARD® 711x-I



DIP switches 4 and 6 are not assigned!

Pin assignment (M12)

PREMASGARD® 711x-I



- ① +UB 15...36 V DC
- ② Output pressure 4...20 mA [Pa]
- ③ free
- ④ -UB GND (LCD backlighting / automatic zero point calibration)
- ⑤ Shield

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

PREMASGARD® 711x



DIP switches 4 and 6 are not assigned!

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

Standard

Actual pressure (in Pa)
Calibration interval (arrows)

Zero point calibration
active

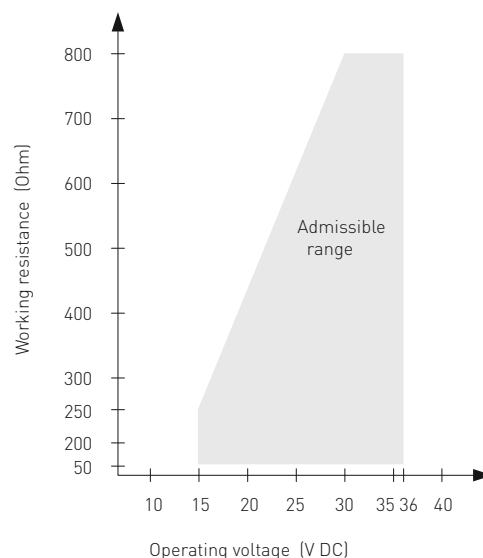
Remaining calibration time
(in seconds)

Adjustment of
zero point calibration

Cycle time (15 min to 24 hours)
adjustable by potentiometer.

Load resistance

PREMASGARD® 711x-I



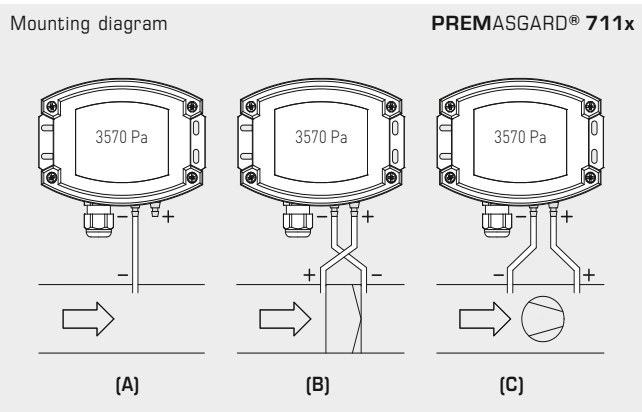


S+S REGELTECHNIK

PREMASGARD® 711x ID

Pressure and differential pressure measuring transducers,
including connection set, adjustable, calibratable,
with multi-range switching and active output

PREMASGARD® 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

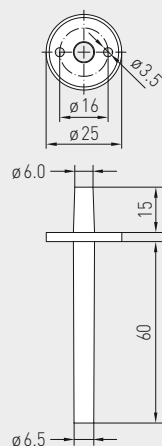
Pressure and differential pressure measuring transducers,
including connection set, adjustable, calibratable,
with multi-range switching and active output

S+S REGELTECHNIK

Dimensional drawing

ASD-06

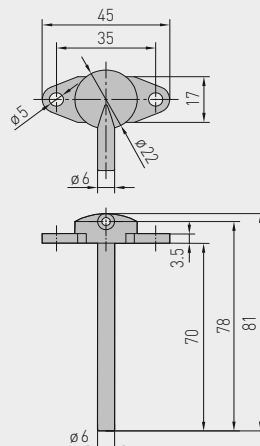
Connection set



Dimensional drawing

ASD-07

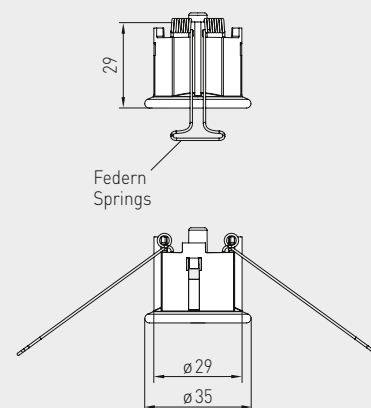
Connection nipple



Dimensional drawing

DAL-01

Pressure outlet

**ASD-06**
Connection set**ASD-07**
Connection nipple**DAL-01**
Pressure outlet

ACCESSORIES

ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws	7100-0060-3000-000	6,45 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	6,45 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	30,18 €

For further information, see chapter Accessories!



S+S REGELTECHNIK

PREMASGARD® 711x ID

Pressure and differential pressure measuring transducers,
including connection set, adjustable, calibratable,
with multi-range switching and active output

PREMASGARD® 711x

with cable gland,
with/without display



PREMASGARD® 711x-Q

with M12 connector,
with/without display



PREMASGARD® 711x		Pressure and differential pressure measuring transducers, <i>ID</i>		
Pressure range (adjustable)	Type / WG02	Output	Display	Item No.
max. - 1000...+ 1000 Pa	PREMASGARD® 7111			with cable gland
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-I	4...20 mA		1301-7112-0010-100
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-I LCD	4...20 mA	■	1301-7112-4010-100
0... 500 Pa / - 500... + 500 Pa	PREMASGARD® 7111-Q			with M12 connector
0... 1000 Pa / -1000... + 1000 Pa	PREMASGARD 7111-I Q	4...20 mA		2004-6131-2100-001
	PREMASGARD 7111-I Q LCD	4...20 mA	■	2004-6132-2100-001
max. - 5000...+ 5000 Pa	PREMASGARD® 7115			with cable gland
0... 1000 Pa / - 1000 ... + 1000 Pa	PREMASGARD 7115-I	4...20 mA		1301-7112-0050-100
0...2000 Pa / - 2000 ... + 2000 Pa	PREMASGARD 7115-I LCD	4...20 mA	■	1301-7112-4050-100
0...3000 Pa / - 3000 ... + 3000 Pa	PREMASGARD® 7115-Q			with M12 connector
0...5000 Pa / - 5000 ... + 5000 Pa	PREMASGARD 7115-I Q	4...20 mA		2004-6131-2100-011
	PREMASGARD 7115-I Q LCD	4...20 mA	■	2004-6132-2100-011
max. -100...+100 Pa	PREMASGARD® 7110			with cable gland
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-I	4...20 mA		1301-7112-0110-100
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-I LCD	4...20 mA	■	1301-7112-4110-100
	PREMASGARD® 7110-Q			with M12 connector
	PREMASGARD 7110-I Q	4...20 mA		2004-6131-2100-021
	PREMASGARD 7110-I Q LCD	4...20 mA	■	2004-6132-2100-021
max. -25...+25 Pa	PREMASGARD® 7112			with cable gland
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-I	4...20 mA		1301-7112-0370-200
	PREMASGARD 7112-I LCD	4...20 mA	■	1301-7112-4370-200
	PREMASGARD® 7112-Q			with M12 connector
	PREMASGARD 7112-I Q	4...20 mA		2004-6131-3100-001
	PREMASGARD 7112-I Q LCD	4...20 mA	■	2004-6132-3100-011
	Equipped as standard with automatic zero point calibration (3-wire connection)			
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			
For additional device variants, see S+S Facility Engineering!				

**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.

PREMASGARD® 711x-VA
with cable gland



PREMASGARD® 711x-VAQ
with M12 connector



Pressure port
Stainless steel
quick connect
(standard)

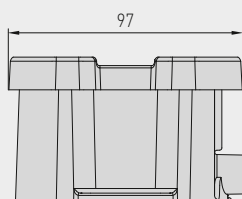
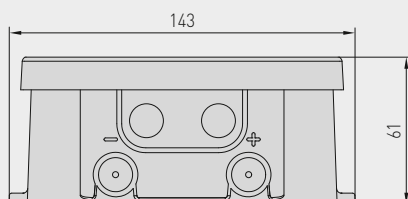


TECHNICAL DATA

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a(\text{Ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$, see working resistance diagram
Power consumption:	< 2 VA / 24 V DC
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 $\varnothing 6$ mm (4 / 8 mm optional) optionally with pipe fitting , stainless steel V2A (1.4305) for pressure lines $\varnothing 6$ 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 signal:	4...20 mA
Connection type:	2- or 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, 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, UV and weathering 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 60 730)
Protection type:	IP 69 (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
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)

Dimensional drawing

PREMASGARD® 711x-VA

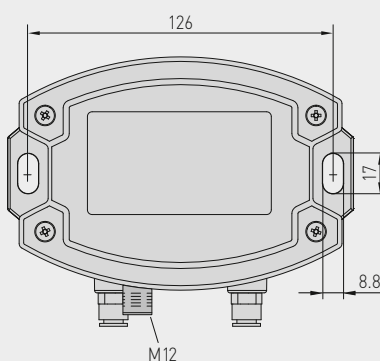
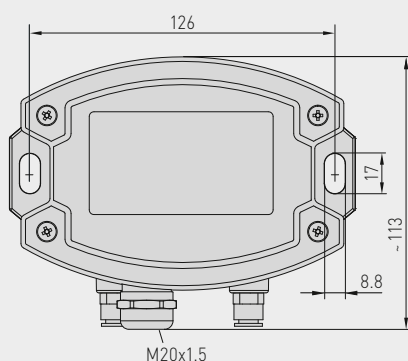


Housing with cable gland

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

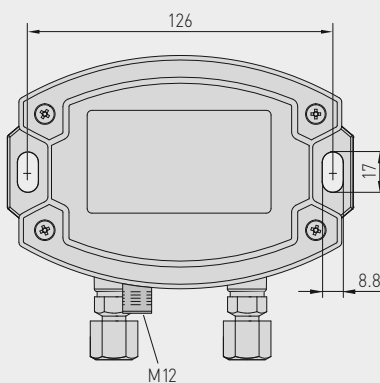
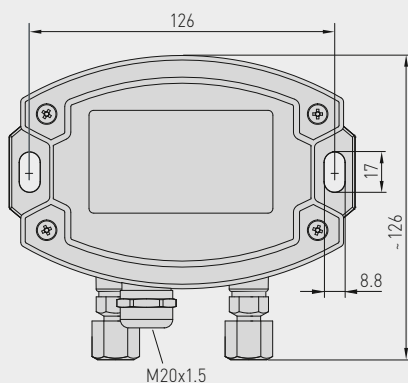
PREMASGARD® 711x-VA

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

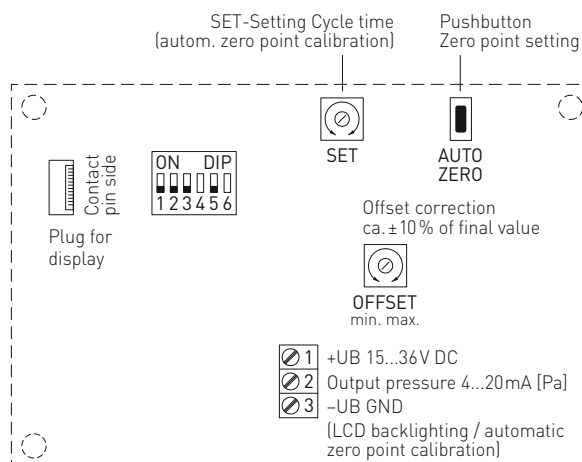
Stainless steel V2A
pipe fitting
(optional)



Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output

Schematic diagram

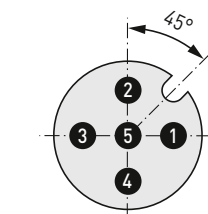
PREMASGARD® 711x-I



DIP switches 4 and 6
are not assigned!

Pin assignment
(M12)

PREMASGARD® 711x-I



- 1 +UB 15...36V DC
- 2 Output pressure 4...20mA [Pa]
- 3 free
- 4 -UB GND (LCD backlighting / automatic zero point calibration)
- 5 Shield

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

PREMASGARD® 711x

DIP switches 4 and 6
are not assigned!

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**Standard**

Actual pressure (in Pa)
Calibration interval (arrows)

**Zero point calibration active**

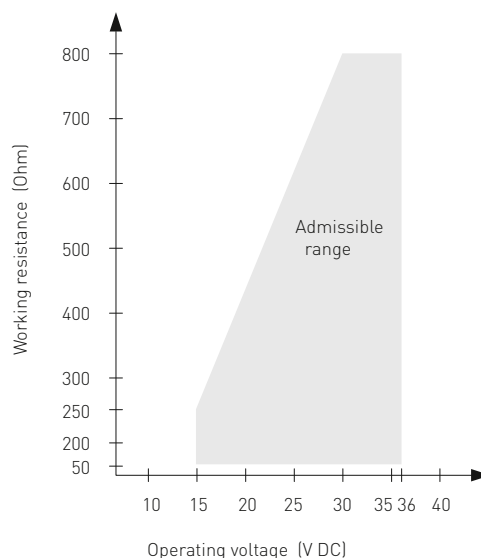
Remaining calibration time
(in seconds)

**Adjustment of zero point calibration**

Cycle time (15 min to 24 hours)
adjustable by potentiometer.

Load resistance

PREMASGARD® 711x-I





S+S REGELTECHNIK

NEW

PREMASGARD® 711x-VA ID

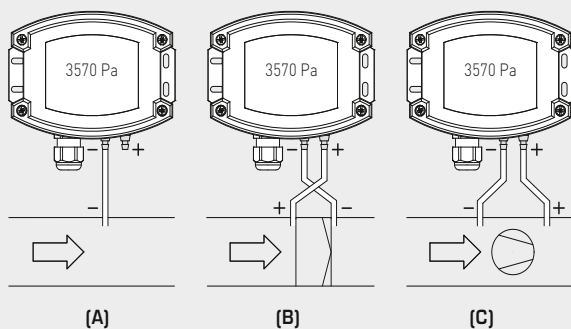
Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output

PREMASGARD® 711x-VAQ
with display,
hinged



Mounting diagram

PREMASGARD® 711x



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-VA

with cable gland,
with/without display



PREMASGARD® 711x-VA Pressure and differential pressure measuring transducer, ID

Pressure range (adjustable)	Type / WG02	Output	Display	Item No.
max. - 1000...+1000 Pa	PREMASGARD® 7111-VA			with cable gland
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-I_VA	4...20 mA		2004-6191-2200-001
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-I_VA LCD	4...20 mA	■	2004-6192-2200-001
0... 500 Pa / - 500... + 500 Pa				
0... 1000 Pa / -1000... +1000 Pa				
max. - 5000...+5000 Pa	PREMASGARD® 7115-VA			with cable gland
0... 1000 Pa / - 1000... +1000 Pa	PREMASGARD 7115-I_VA	4...20 mA		2004-6191-2200-011
0... 2000 Pa / -2000... +2000 Pa	PREMASGARD 7115-I_VA LCD	4...20 mA	■	2004-6192-2200-011
0... 3000 Pa / -3000... +3000 Pa				
0... 5000 Pa / -5000... +5000 Pa				
max. -100...+100 Pa	PREMASGARD® 7110-VA			with cable gland
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-I_VA	4...20 mA		2004-6191-2200-021
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-I_VA LCD	4...20 mA	■	2004-6192-2200-021
max. -25...+25 Pa	PREMASGARD® 7112-VA			with cable gland
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-I_VA	4...20 mA		2004-6191-3200-001
	PREMASGARD 7112-I_VA LCD	4...20 mA	■	2004-6192-3200-001
	Equipped as standard with automatic zero point calibration (3-wire connection)			
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			
	For additional device variants, see S+S Facility Engineering!			



S+S REGELTECHNIK

NEW

PREMASGARD® 711x-VA ID

Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output

PREMASGARD® 711x-VAQ
with M12 connector,
with/without display



PREMASGARD® 711x-VAQ Pressure and differential pressure measuring transducer, ID				
Pressure range (adjustable)	Type / WG02	Output	Display	Item No.
max. - 1000...+ 1000 Pa	PREMASGARD® 7111 -VAQ			with M12 connector
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-I_VAQ	4...20 mA		2004-6191-2100-001
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-I_VAQ LCD	4...20 mA	■	2004-6192-2100-001
0... 500 Pa / - 500... + 500 Pa				
0... 1000 Pa / -1000... + 1000 Pa				
max. - 5000...+ 5000 Pa	PREMASGARD® 7115 -VAQ			with M12 connector
0... 1000 Pa / - 1000 ... + 1000 Pa	PREMASGARD 7115-I_VAQ	4...20 mA		2004-6191-2100-011
0...2000 Pa / -2000 ... + 2000 Pa	PREMASGARD 7115-I_VAQ LCD	4...20 mA	■	2004-6192-2100-011
0...3000 Pa / -3000 ... + 3000 Pa				
0...5000 Pa / -5000 ... + 5000 Pa				
max. -100...+100 Pa	PREMASGARD® 7110 -VAQ			with M12 connector
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-I_VAQ	4...20 mA		2004-6191-2100-021
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-I_VAQ LCD	4...20 mA	■	2004-6192-2100-021
max. -25...+25 Pa	PREMASGARD® 7112 -VAQ			with M12 connector
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-I_VAQ	4...20 mA		2004-6191-3100-001
	PREMASGARD 7112-I_VAQ LCD	4...20 mA	■	2004-6192-3100-001
	Equipped as standard with automatic zero point calibration (3-wire connection)			
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			
For additional device variants, see S+S Facility Engineering!				

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

**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 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 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 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 $\varnothing 4 / 6 \text{ mm}$, optionally with quick connect made from stainless steel for PVC fabric pressure hose $\varnothing 6 \text{ mm}$
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 signal:	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-stabilised, 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 60730)
Protection type:	IP 65 (according to EN 60529)
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)





S+S REGELTECHNIK

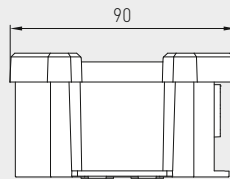
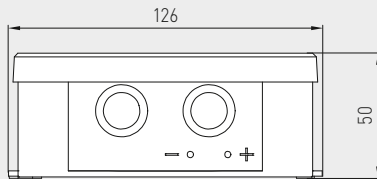
PREMASREG® 711x ID

Pressure and differential pressure measuring transducers/switches,
incl. connection set, with multi-range switching
and adjustable, switching and active output



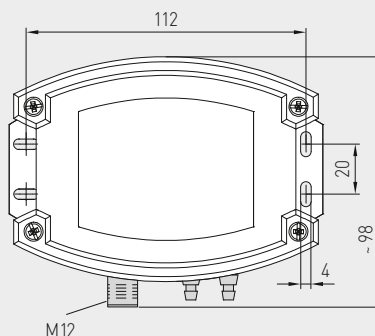
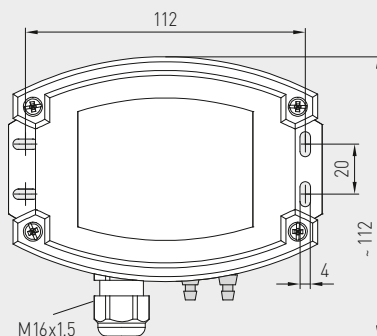
Dimensional drawing

PREMASREG® 711x

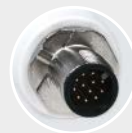


Housing with
cable gland
equipped as standard with
pressure port **nozzles**

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

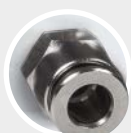
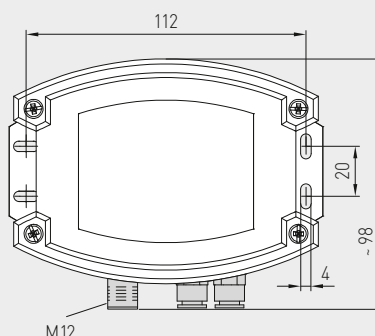
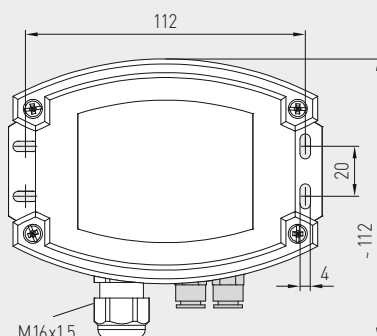


Dimensional drawing

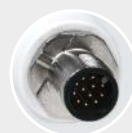
PREMASREG® 711x

Housing with
cable gland
optional on request
with **quick connect**

Housing with
M12 connector
optional on request
with **quick connect**



Stainless steel
quick connect

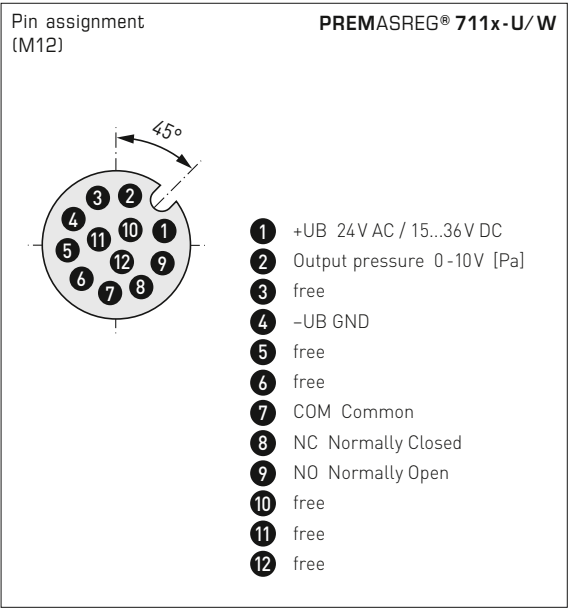
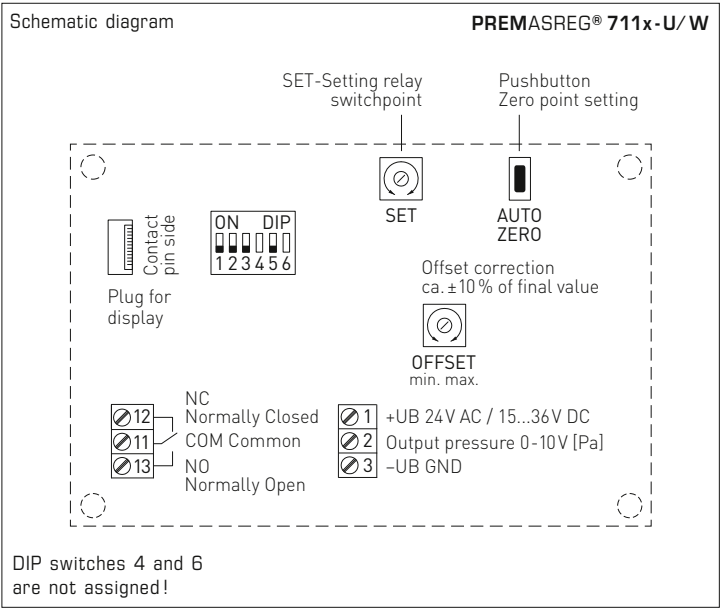


M12 connector
(male)

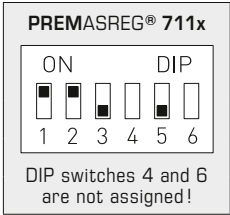
Pressure port
Stainless steel
quick connect
(optional)



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.



S+S REGELTECHNIK

PREMASREG® 711x ID

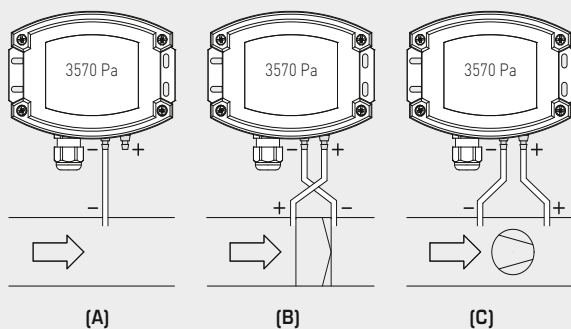
Pressure and differential pressure measuring transducers/switches,
incl. connection set, with multi-range switching
and adjustable, switching and active output

PREMASREG® 711x-Q
with display,
hinged



Mounting diagram

PREMASREG® 711x



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.

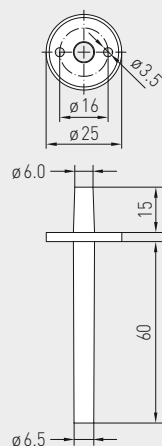
Conversion table for pressure values:

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

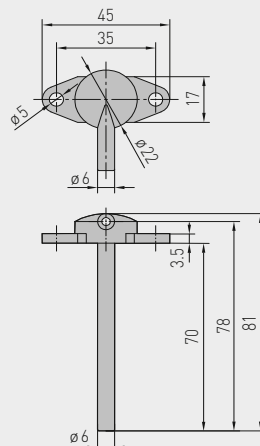
Pressure and differential pressure measuring transducers/switches,
incl. connection set, with multi-range switching
and adjustable, switching and active output

S+S REGELTECHNIK

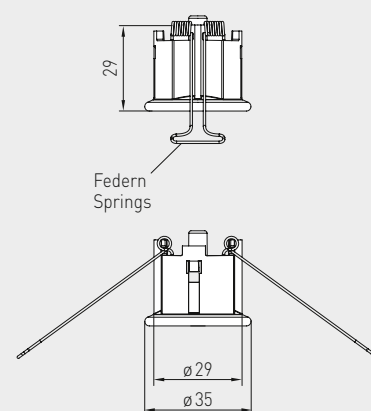
Dimensional drawing

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

ASD-06	Connection set (included in the scope of delivery) , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws	7100-0060-3000-000
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001

For further information, see chapter Accessories!



S+S REGELTECHNIK

PREMASREG® 711x ID

Pressure and differential pressure measuring transducers/switches,
incl. connection set, with multi-range switching
and adjustable, switching and active output

PREMASREG® 711x

with cable gland,
with/without display



PREMASREG® 711x-Q

with M12 connector,
with/without display



PREMASREG® 711x		Pressure and differential pressure measuring transducers/switches, ID			
Pressure range (adjustable)	Type / WG02	Output	Display	Item No.	
max. - 1000...+ 1000 Pa		PREMASREG® 7111			with cable gland
0... 100 Pa / - 100... + 100 Pa	PREMASREG 7111-U/W LCD	0-10 V 1x Changeover contact	■	1302-7111-4011-200	
0... 300 Pa / - 300... + 300 Pa					
0... 500 Pa / - 500... + 500 Pa					
0... 1000 Pa / - 1000... + 1000 Pa					
		PREMASREG® 7111-Q			with M12 connector
	PREMASREG 7111-U/W Q LCD	0-10 V 1x Changeover contact	■	2004-6132-4100-001	
max. - 5000...+ 5000 Pa		PREMASREG® 7115			with cable gland
0...1000 Pa / - 1000 ... + 1000 Pa	PREMASREG 7115-U/W LCD	0-10 V 1x Changeover contact	■	1302-7111-4051-200	
0...2000 Pa / - 2000 ... + 2000 Pa					
0...3000 Pa / - 3000 ... + 3000 Pa					
0...5000 Pa / - 5000 ... + 5000 Pa					
		PREMASREG® 7115-Q			with M12 connector
	PREMASREG 7115-U/W Q LCD	0-10 V 1x Changeover contact	■	2004-6132-4100-011	
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				
For additional device variants, see S+S Facility Engineering!					

**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.

TECHNICAL DATA

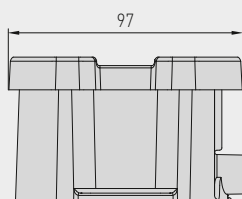
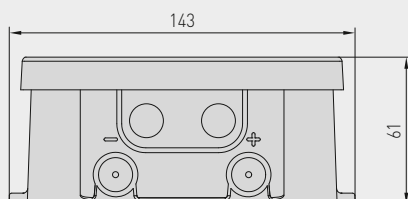
Power supply:	24 V AC / DC (± 20 %)
Load resistance:	$R_L > 5 \text{ k}\Omega$
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Type of pressure:	differential pressure
Pressure port:	equipped as standard with quick connect made from stainless steel for PVC-fabric pressure hose $\varnothing 6 \text{ mm}$ (4 / 8 mm optional) 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 signal:	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, UV and weathering 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 60 730)
Protection type:	IP 69 (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
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)



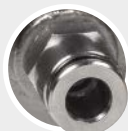
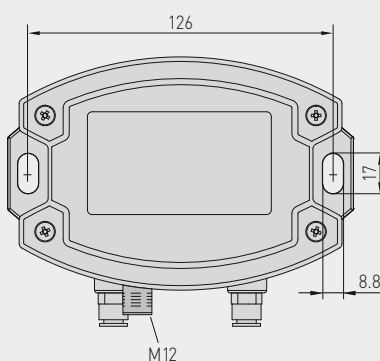
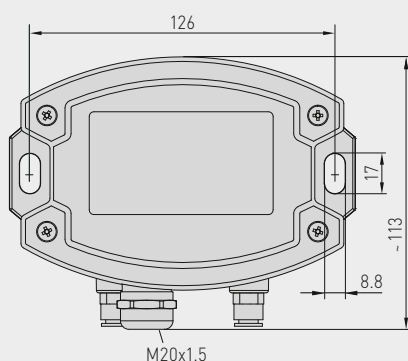
Dimensional drawing

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

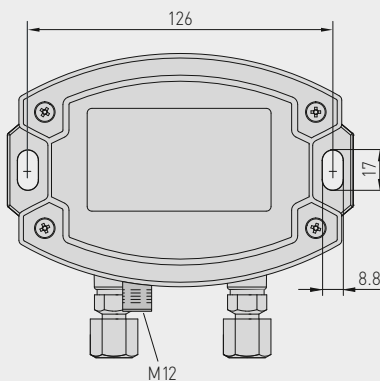
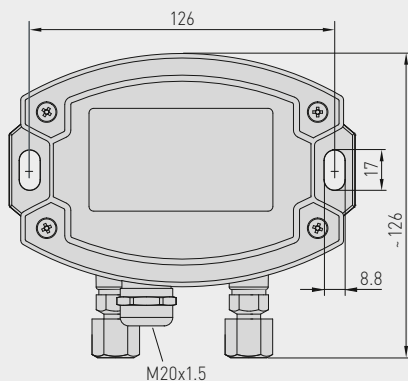


Dimensional drawing

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)

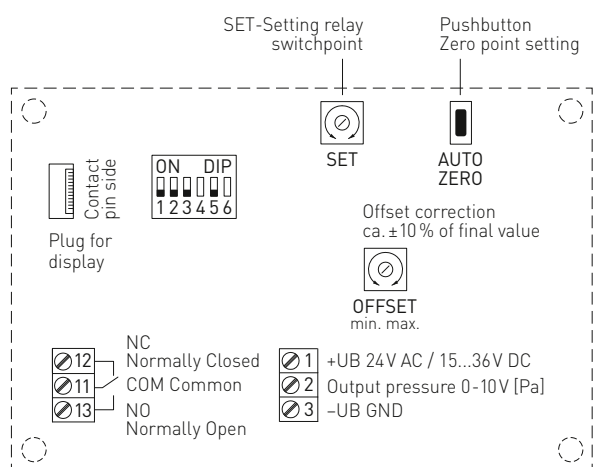
Pressure port Stainless steel V2A pipe fitting (optional)



Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output

Schematic diagram

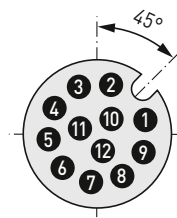
PREMASREG® 711x-U/W



DIP switches 4 and 6
are not assigned!

Pin assignment
(M12)

PREMASREG® 711x-U/W



- 1 +UB 24V AC / 15...36V DC
- 2 Output pressure 0-10V [Pa]
- 3 free
- 4 -UB GND
- 5 free
- 6 free
- 7 COM Common
- 8 NC Normally Closed
- 9 NO Normally Open
- 10 free
- 11 free
- 12 free

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

PREMASREG® 711x

DIP switches 4 and 6
are not assigned!

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.



S+S REGELTECHNIK

NEW

PREMASREG® 711x-VA ID

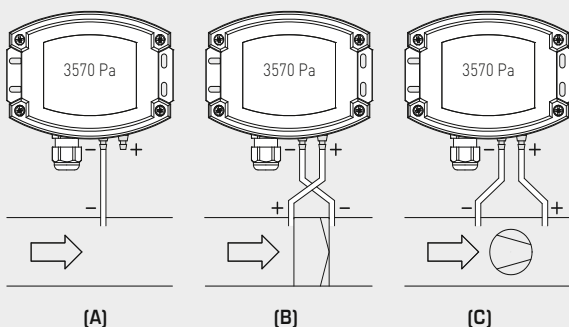
Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output

PREMASREG® 711x-VAQ
with display,
hinged



Mounting diagram

PREMASREG® 711x



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-VA

with cable gland,
with display

**PREMASREG® 711x-VA**

Pressure and differential pressure measuring transducers/switches, ID

Pressure range (adjustable)	Type / WG02	Output	Display	Item No.
max. – 1000...+ 1000 Pa	PREMASREG® 7111 -VA			with cable gland
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / –1000... + 1000 Pa	PREMASREG 7111-U/W_VA LCD	0-10 V 1x Changeover contact		2004-6192-4200-001
max. – 5000...+ 5000 Pa	PREMASREG® 7115 -VA			with cable gland
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / –2000 ... + 2000 Pa 0...3000 Pa / –3000 ... + 3000 Pa 0...5000 Pa / –5000 ... + 5000 Pa	PREMASREG 7115-U/W_VA LCD	0-10 V 1x Changeover contact		2004-6192-4200-011
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			
For additional device variants, see S+S Facility Engineering!				



NEW

S+S REGELTECHNIK

PREMASREG® 711x-VA ID

Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output

PREMASREG® 711x-VAQ
with M12 connector,
with display



PREMASREG® 711x-VAQ					Pressure and differential pressure measuring transducers/switches, ID	
Pressure range (adjustable)	Type / WG02	Output	Display	Item No.		
max. - 1000...+ 1000 Pa	PREMASREG® 7111 -VAQ			with M12 connector		
0... 100 Pa / - 100... + 100 Pa 0... 300 Pa / - 300... + 300 Pa 0... 500 Pa / - 500... + 500 Pa 0... 1000 Pa / -1000... + 1000 Pa	PREMASREG 7111-U/W_VAQ LCD	0-10 V 1x Changeover contact	■	2004-6192-4100-001		
max. - 5000...+ 5000 Pa	PREMASREG® 7115 -VAQ			with M12 connector		
0... 1000 Pa / - 1000 ... + 1000 Pa 0... 2000 Pa / -2000 ... + 2000 Pa 0... 3000 Pa / -3000 ... + 3000 Pa 0... 5000 Pa / -5000 ... + 5000 Pa	PREMASREG 7115-U/W_VAQ LCD	0-10 V 1x Changeover contact	■	2004-6192-4100-011		
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					
For additional device variants, see S+S Facility Engineering!						

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

**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. 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 (± 10 %) and 15...36 V DC
Load resistance:	$R_L > 5 \text{ k}\Omega$
Power consumption:	< 1.5 VA / 24 V DC, < 2.8 VA / 24 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 $\varnothing = 4 / 6 \text{ mm}$, optionally with quick connect made from stainless steel for PVC fabric pressure hose $\varnothing = 6 \text{ mm}$
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °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:	$\pm 0.1 \%$ / °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 signal:	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 (M16 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-stabilised, 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)
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:	m ³ /s, m ³ /min, l/s, l/min, l/h, %, cm (adjustable)
Max. value displayed:	999999
ACCESSORIES	see table

Pressure port
Metal nozzles
(standard)





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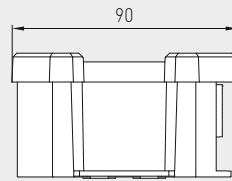
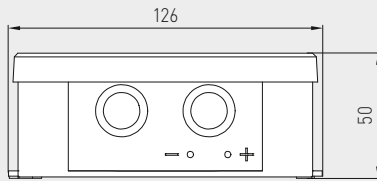
PREMASREG® 716x ID

Pressure measuring transducers/switches/monitors for volume flow,
differential pressure, filter monitoring and liquid level detection,
incl. connection set



Dimensional drawing

PREMASREG® 716x

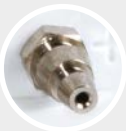
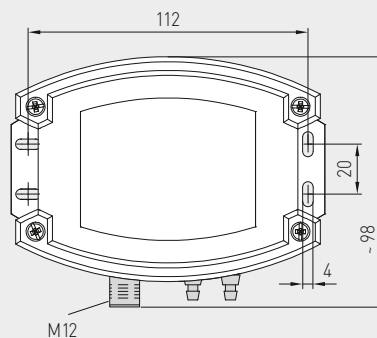
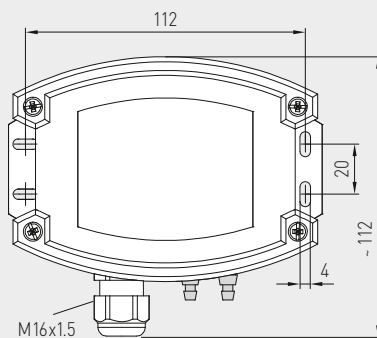


Housing with
cable gland

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

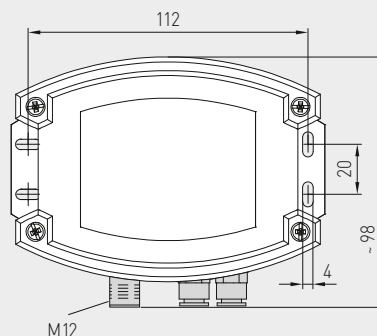
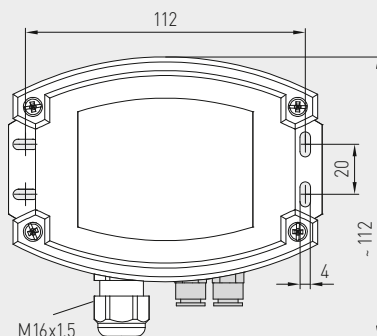
PREMASREG® 716x

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)

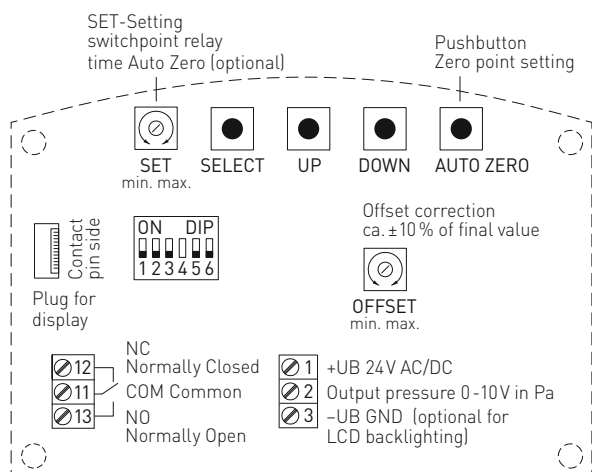


Pressure measuring transducers / switches / monitors for volume flow,
differential pressure, filter monitoring and liquid level detection,
incl. connection set

S+S REGELTECHNIK

Schematic diagram

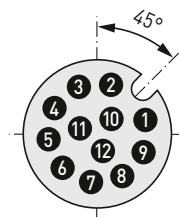
PREMASREG® 716x-U/W



DIP switch 4 is not assigned!

Pin assignment (M12)

PREMASREG® 716x-U/W



- 1 +UB 24V AC / 15...36V DC
- 2 Output pressure 0-10V [Pa]
- 3 free
- 4 -UB GND
- 5 free
- 6 free
- 7 COM Common
- 8 NC Normally Closed
- 9 NO Normally Open
- 10 free
- 11 free
- 12 free

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

PREMASREG® 716x



DIP switch 4 is not assigned!

PREMASREG® 716x
Function types

Volumetric 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 pressurep₋ = 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



S+S REGELTECHNIK

PREMASREG® 716x ID

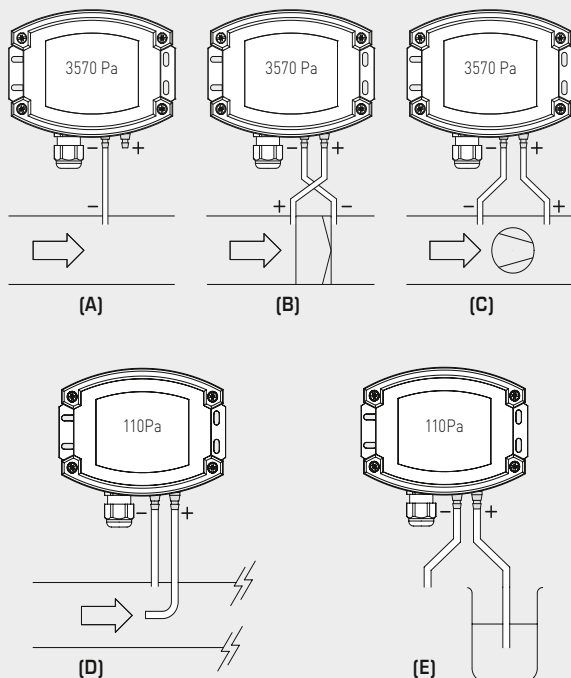
Pressure measuring transducers/switches/monitors for volume flow,
differential pressure, filter monitoring and liquid level detection,
incl. connection set

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:

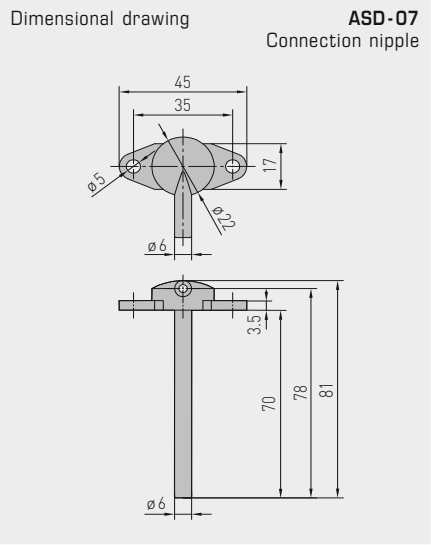
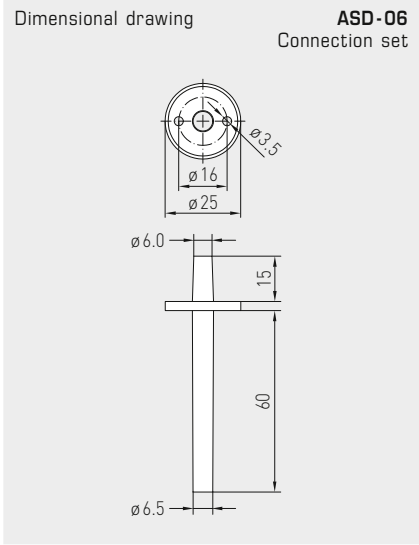
P1 (+) Connection submerged in medium
P2 (-) Connection is open to the atmosphere

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



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, and 4 tapping screws	7100-0060-3000-000
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
For further information, see chapter Accessories!		



S+S REGELTECHNIK

PREMASREG® 716x ID

Pressure measuring transducers / switches / monitors for volume flow,
differential pressure, filter monitoring and liquid level detection,
incl. connection set

PREMASREG® 716x
with cable gland
and display



PREMASREG® 716x-Q
with M12 connector
and display



PREMASREG® 716x		Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, <i>ID</i>			
Measuring Range Pressure / Volume Flow		Type / WG02	Output	Display	Item No.
0 ...1000 Pa		PREMASREG® 7161			with cable gland
k = 3000 94800 m³/h	PREMASREG 7161-U/W LCD	0-10 V 1x Changeover contact	■	1302-7161-4161-200	
	PREMASREG® 7161-Q			with M12 connector	
	PREMASREG 7161-U/W_Q LCD	0-10 V 1x Changeover contact	■	2004-6132-4100-021	
0 ...5000 Pa		PREMASREG® 7165			with cable gland
k = 3000 212100 m³/h	PREMASREG 7165-U/W LCD	0-10 V 1x Changeover contact	■	1302-7161-4171-200	
	PREMASREG® 7165-Q			with M12 connector	
	PREMASREG 7165-U/W_Q LCD	0-10 V 1x Changeover contact	■	2004-6132-4100-031	
Extra charge:		with optional quick connect for PVC fabric pressure hose Ø 6 mm			
For additional device variants, see S+S Facility Engineering !					

For additional device variants, see **S+S Facility Engineering!**

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.

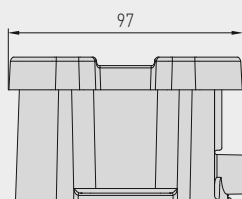
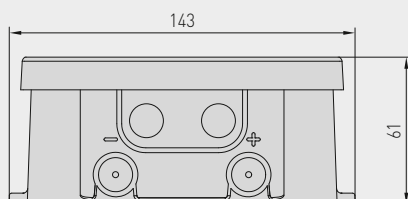
It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) and 15...36 V DC
Load resistance:	$R_L > 5 \text{ k}\Omega$
Power consumption:	< 1.5 VA / 24 V DC, < 2.8 VA / 24 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 $\varnothing 6 \text{ mm}$ (4 / 8 mm optional) 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 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:	$\pm 0.1 \%$ / °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 signal:	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, UV and weathering 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 69 (according to EN 60529)
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:	m ³ /s, m ³ /min, m ³ /h, l/s, l/min, l/h, %, cm (adjustable)
Max. value displayed:	999999
ACCESSORIES	(see table)

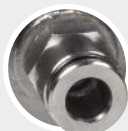
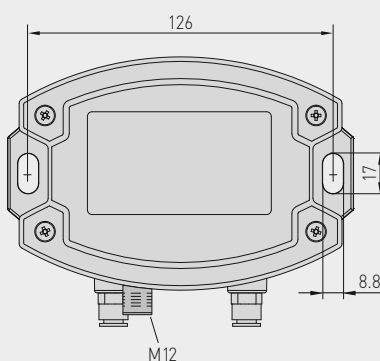
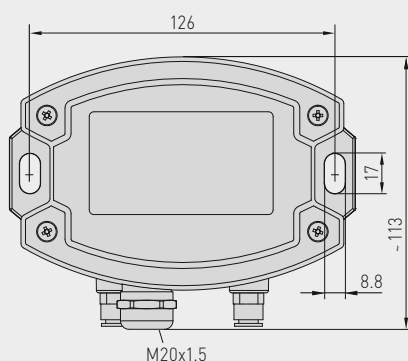
Pressure port
Stainless steel
quick connect
(standard)



Dimensional drawing
PREMASREG® 716x-VA

**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**

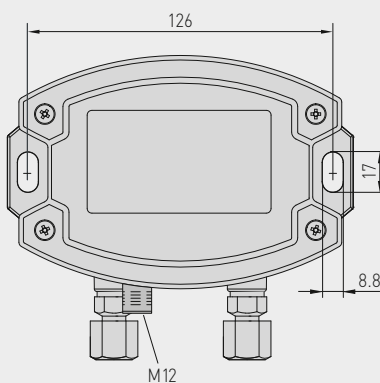
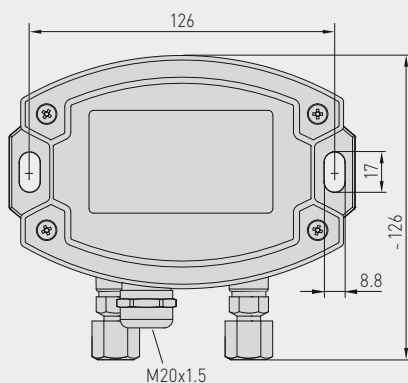
**M12 connector
(male)**
PREMASREG® 716x-VA

 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

**Housing with
M12 connector**
optional on request
with **pipe fitting**
for pressure lines

**Stainless steel V2A
pipe fitting**

**M12 connector
(male)**

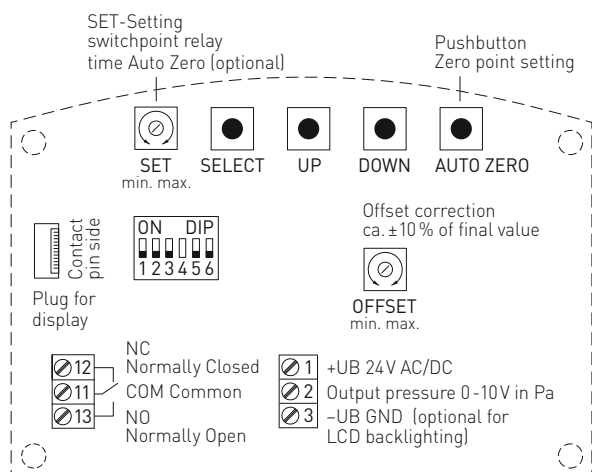
Pressure port

 Stainless steel V2A
pipe fitting
(optional)


Pressure measuring transducers / switches / monitors for volume flow,
differential pressure, filter monitoring and liquid level detection

Schematic diagram

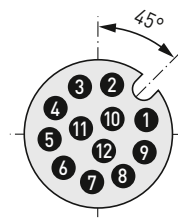
PREMASREG® 716x-U/W



DIP switch 4 is not assigned!

Pin assignment
(M12)

PREMASREG® 716x-U/W



- 1 +UB 24V AC / 15...36V DC
- 2 Output pressure 0-10V [Pa]
- 3 free
- 4 -UB GND
- 5 free
- 6 free
- 7 COM Common
- 8 NC Normally Closed
- 9 NO Normally Open
- 10 free
- 11 free
- 12 free

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

PREMASREG® 716x



DIP switch 4
is not assigned!

PREMASREG® 716x
Function types

Volumetric 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

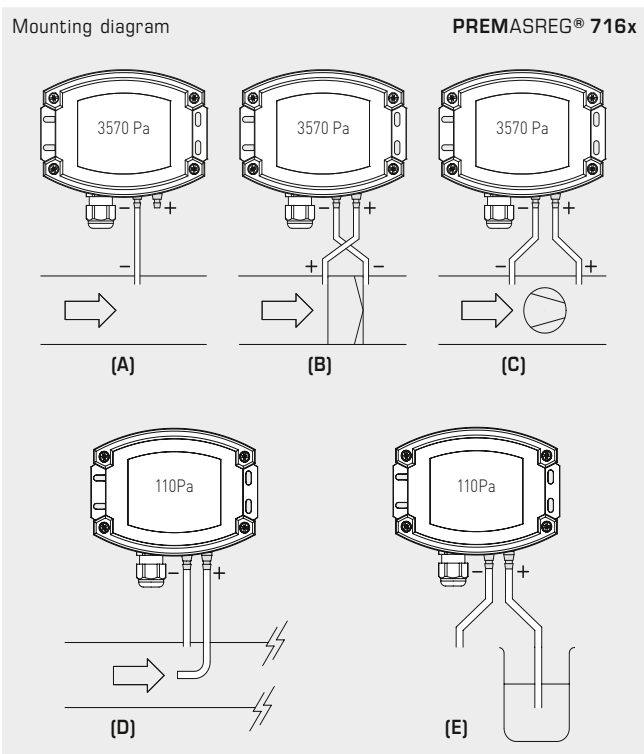
$$h = \Delta p \div (\rho \cdot g)$$

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-VAQ
with display,
hinged

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

PREMASREG® 716x-VA
with cable gland,
with display



PREMASREG® 716x - VA		Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, <i>ID</i>			
Measuring Range Pressure / Volume Flow		Type / WG02	Output	Display	Item No.
0 ...1000 Pa		PREMASREG® 7161 - VA			with cable gland
k = 3000	94800 m³/h	PREMASREG 7161-U/W_VA LCD	0-10 V 1x Changeover contact		2004-6192-4200-021
0 ...5000 Pa		PREMASREG® 7165 - VA			with cable gland
k = 3000	212100 m³/h	PREMASREG 7165-U/W_VA LCD	0-10 V 1x Changeover contact		2004-6192-4200-031
Extra charge:		with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm			
For additional device variants, see S+S Facility Engineering!					



S+S REGELTECHNIK

NEW

PREMASREG® 716x-VA ID



Pressure measuring transducers / switches / monitors for volume flow,
differential pressure, filter monitoring and liquid level detection

PREMASREG® 716x-VAQ
with M12 connector,
with display



PREMASREG® 716x-VAQ

Pressure measuring transducers / switches / monitors for volume flow,
differential pressure, filter monitoring and liquid level detection, ID

Measuring Range Pressure / Volume Flow		Type / WG02	Output	Display	Item No.
0...1000 Pa		PREMASREG® 7161-VAQ			with M12 connector
k = 3000	94800 m³/h	PREMASREG 7161-U/W_VA Q LCD	0-10 V 1x Changeover contact		2004-6192-4100-021
0...5000 Pa		PREMASREG® 7165-VAQ			with M12 connector
k = 3000	212100 m³/h	PREMASREG 7165-U/W_VA Q LCD	0-10 V 1x Changeover contact		2004-6192-4100-031
Extra charge:		with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm			
For additional device variants, see S+S Facility Engineering!					

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

**Pressure measuring transducers,
incl. DIN plug-in connectors,
with active output**

The pressure measuring transducer **PREMASGARD® SHD** measures relative pressures in the bar range. It converts the measurand pressure into standard signals of 4...20 mA. Process connection is G ½" straight external pipe thread.

SHD is used for pressure measurement in gaseous and liquid media.

Applications of this pressure transmitter are in hydraulics, pneumatics, process technology, in mechanical and plant engineering.

The pressure measuring cell is gasketless welded together with the pressure pick-up.

TECHNICAL DATA

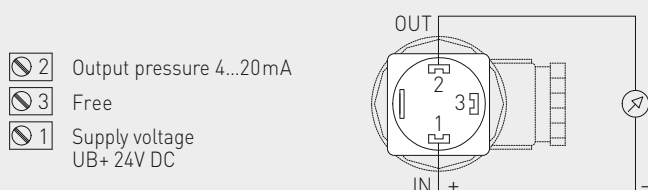
Power supply:	7-33 V DC
Measuring ranges:	see table (other ranges upon request)
Permissible working resistance:	$< (U_B (V) - 7 V) / 0.02 A$; R_L depending on working resistance
Output signal:	4...20 mA
Connection type:	2-wire connection
Electrical connection:	0.25 - 1.5 mm ² , via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	G ½" sealing at the back, and manometer (combined) with profile gasket FPM, special WW G ¼" DIN 3852
Type of pressure:	relative
Measuring principle:	steel measuring cell
Temperature of medium:	-40...+135 °C
Mounting:	directly on pressure line
Enclosure:	stainless steel V2A (1.4305)
Connecting head:	plastic, approx. 98 x 50 x 34 mm
Medium contacting parts:	stainless steel V2A (1.4305)
Response time:	2 ms (1 ms typical)
Characteristic line:	±0.3 %
Overload range:	< 6 bar: 5 x of final value > 6 bar: 3 x of final value (max. 1500 bar)
Bursting pressure:	< 6 bar: 10 x of final value > 6 bar: 6 x of final value (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
Optional:	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)

SHD
with display



Connecting diagram

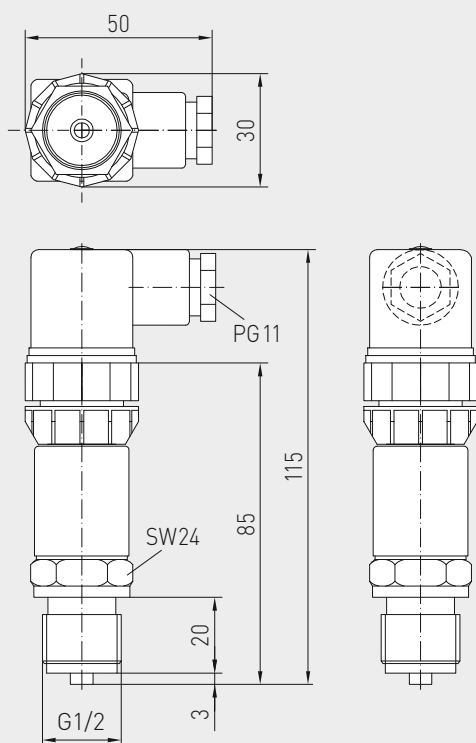
SHD-I





Dimensional drawing

SHD

SHD
without displayDisplay module
(optional)

PREMASGARD® SHD Pressure measuring transducers, ID

Type / WG01	Measuring Range	Output	Display	Item No.
SHD-I				I-variant
SHD-I 1	0...1 bar	4...20 mA		1301-2112-0520-120
SHD-I 2,5	0...2,5 bar	4...20 mA		1301-2112-0530-120
SHD-I 6	0...6 bar	4...20 mA		1301-2112-0550-120
SHD-I 10	0...10 bar	4...20 mA		1301-2112-0560-120
SHD-I 16	0...16 bar	4...20 mA		1301-2112-0570-120
SHD-I 25	0...25 bar	4...20 mA		1301-2112-0580-120
SHD-I 40	0...40 bar	4...20 mA		1301-2112-0590-120
Optional:	Display module, factory-calibrated and configured		■	on request

For additional device variants, see S+S Facility Engineering!

**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 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

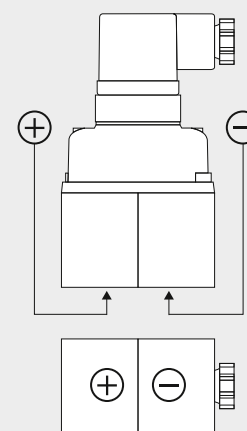
Power supply:	24 V AC / DC (± 20 %)
Measuring ranges:	see table
Output signal:	4...20 mA
Permissible working resistance: (at nominal voltage)	$R_L = 700 \Omega$
Electrical connection:	0.25 - 1.5 mm ² , via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	G 1/8" internal thread (optional connection types upon request)
Type of pressure:	differential pressure, above- or below atmospheric pressure
Temperature of medium:	-20...+80 °C (non-freezing media)
Mounting:	by 2x M4 screw or fixing plate for wall mounting (installation arbitrary)
Enclosure:	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)

Connections

SHD 400

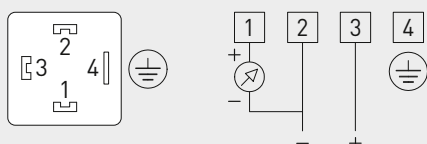


A plus and minus symbol etched on the enclosure identifies the side on which the respective pressure connection is to be connected below:
(+) for higher pressure
(-) for lower pressure



Schematic diagram

SHD 400



Connecting diagram

SHD 400-I

- 1 Output pressure 4...20 mA
- 2 UB- GND
- 3 UB+ 24V DC
- 4 GND



S+S REGELTECHNIK

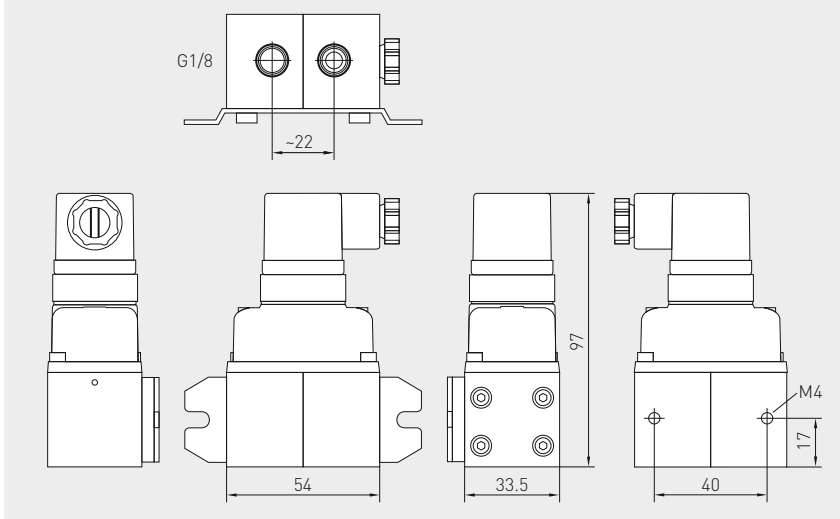
PREMASGARD® SHD 400 ID

Pressure measuring transducers,
incl. DIN plug-in connectors,
with active output



Dimensional drawing

SHD 400



SHD 400



VSD-06-VA
Fitting set
(optional)



WH-400
Wall holder
(optional)



PREMASGARD® SHD 400 Pressure measuring transducers, ID

Type / WG01	Measuring Range	One-sided max. pressure (+) (-)		System pressure	Output	Item No.
SHD 400-I						
SHD 400 I VA 2 BAR	0... 2 bar	10 bar	5 bar	16 bar	4...20 mA	1301-4132-0850-139
SHD 400 I VA 4 BAR	0... 4 bar	21 bar	15 bar	16 bar	4...20 mA	1301-4132-0540-139
SHD 400 I VA 6 BAR	0... 6 bar	21 bar	15 bar	16 bar	4...20 mA	1301-4132-0550-139
SHD 400 I VA 10 BAR	0...10 bar	25 bar	25 bar	45 bar	4...20 mA	1301-4132-0560-139

For additional device variants, see **S+S Facility Engineering!**

ACCESSORIES

VSD-06-MS	Fitting set made of brass, 6 mm	7100-0064-1100-000
VSD-08-MS	Fitting set made of brass, 8 mm	7100-0064-1300-000
VSD-06-VA	Fitting set made of stainless steel VA, 6 mm	7100-0064-1200-000
VSD-08-VA	Fitting set made of stainless steel VA, 8 mm	7100-0064-1400-000
WH-400	Fixing plate for wall mounting (wall holder)	7100-0066-0100-000

**Differential pressure transmitters,
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 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






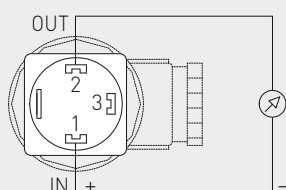
TECHNICAL DATA

Power supply:	24 V DC (±20%)
Measuring ranges:	see table
Permissible working resistance: (at nominal voltage)	$R_L < 600 \Omega$
Insulating resistance:	$\geq 100 \text{ MOhm}$, at +20 °C (500 V DC)
Output signal:	4...20 mA
Connection type:	2-wire connection
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
Enclosure:	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
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-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)

Connecting diagram

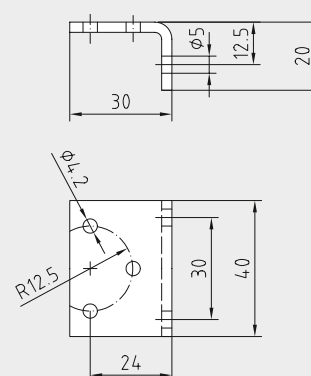
SHD 692-I

-  2 Output pressure 4...20 mA
-  3 Free
-  1 Supply voltage UB+ 24V DC



Dimensional drawing

SHD 692 Mounting angle





S+S REGELTECHNIK

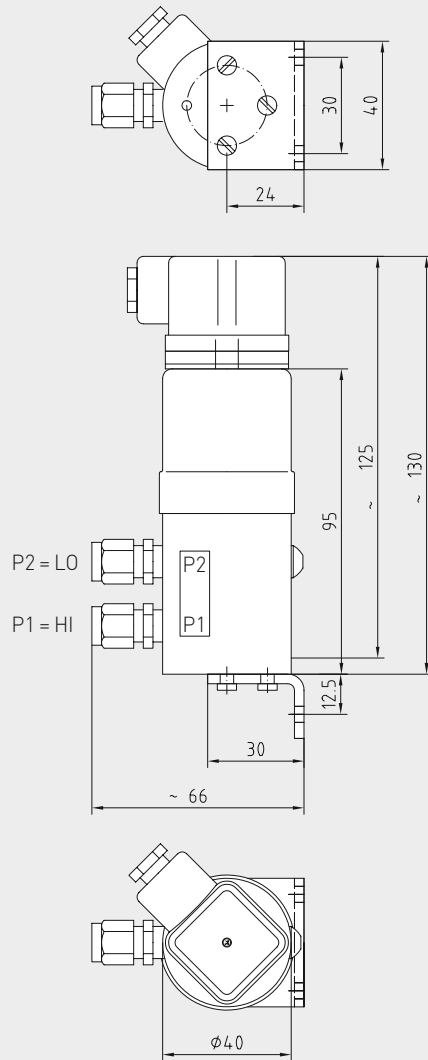
PREMASGARD® SHD 692 ID

Differential pressure transmitters,
incl. DIN plug-in connectors and mounting angle,
with active output



Dimensional drawing

SHD 692



SHD 692
without display



Display module
(optional)



PREMASGARD® SHD 692 Differential pressure transmitters, ID

Type / WG02	Measuring Range	One-Sided max. pressure	Output	Display	Item No.
SHD 692-I					
SHD 692-I-900	0...0.1 bar	0.6 bar	4...20 mA		1301-4122-0500-000
SHD 692-I-907	0...0.5 bar	3 bar	4...20 mA		1301-4122-0510-000
SHD 692-I-912	0...1 bar	5 bar	4...20 mA		1301-4122-0520-000
SHD 692-I-916	0...2.5 bar	12 bar	4...20 mA		1301-4122-0530-000
SHD 692-I-918	0...4 bar	12 bar	4...20 mA		1301-4122-0540-000
Optional:	Display module, factory-calibrated and configured			■	on request

For additional device variants, see **S+S Facility Engineering!**



Accessories – S+S added value

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

138 – 149

Immersion sleeves

TH	Immersion sleeves for temperature sensors	140
THE	Immersion sleeves for sleeve sensors	142

Mounting flanges

MFT-20-K	Mounting flanges, plastic	145
MF-xx-K	Mounting flanges, plastic	145
MF-xx-M	Mounting flanges, metal	145

Accessories for M12 connectors

AL	Connecting cables	144
ALG	Connecting cables, shielded	144
VL	Interconnecting cables	144
VLG	Interconnecting cables, shielded	144
KB	Cable Socket (female), unassembled	144
KS	Cable Connector (male), unassembled	144

Accessories for differential pressure switch

ASD-06	Connection set	146
ASD-07	Connection nipple (90°)	146
ASS-UV	Connection hose, UV-resistant	146
DAL	Pressure outlet	146

Special accessories

WS-01	Sun and ball-impact protection hood	148
WS-03	Weather and sun protection hood (Tyr 2)	148
WS-04	Weather and sun protection hood (Tyr 1)	148
WLP-1	Heat-conductive paste, silicone-free	148

Spare parts for humidity sensors

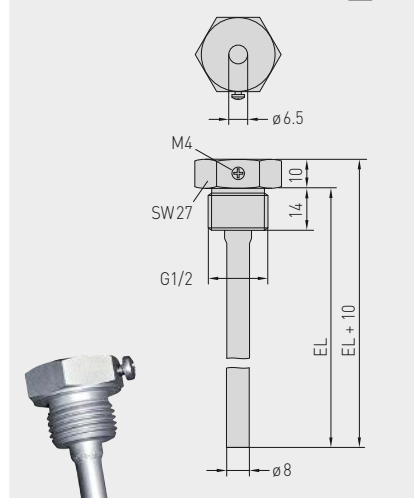
SF-K	plastic sinter filter	148
SF-M	metal sinter filter	148

THERMASGARD® TH

Immersion sleeves made of stainless steel
for temperature sensors and measuring transducers (form B)

S+S REGELTECHNIK

Dimensional drawing TH-VA/xx

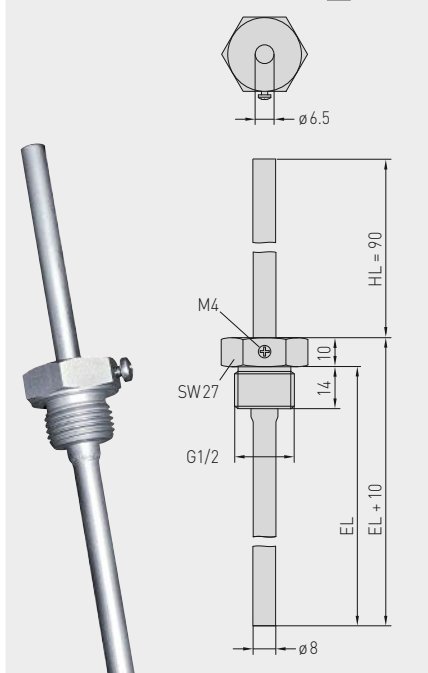


TH-VA/xx

Immersion sleeve,
stainless steel V4A (1.4571)

flat sealing, cylindrical,
according to DIN 228

Dimensional drawing TH-VA/xx/90



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, ID

Type / WG01	p _{max} (static)	T _{max}	Inserted length (EL)	Item No.
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
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001
TH-VA/xx/90	Stainless steel V4A (1.4571), with neck tube (90 mm)			Ø 8 x 0.75 mm
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001
Note: Inner diameter of socket 6.5 mm				
For additional device variants, see S+S Facility Engineering!				

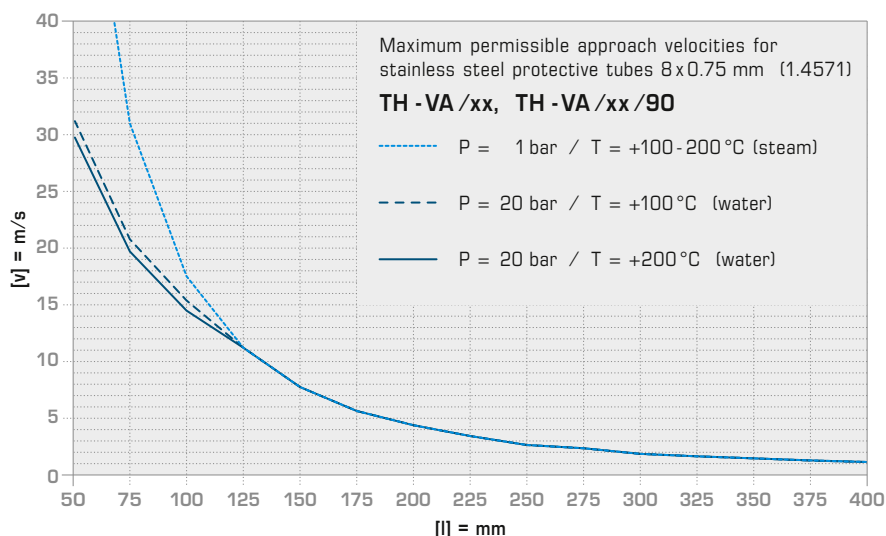
INSTRUCTIONS FOR PLANNING AND INSTALLATION

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).

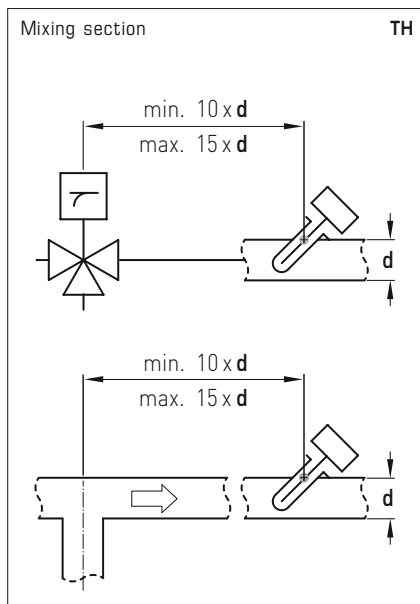
Please observe permissible approach velocities for stainless steel protective tubes (see graph TH-VA).

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

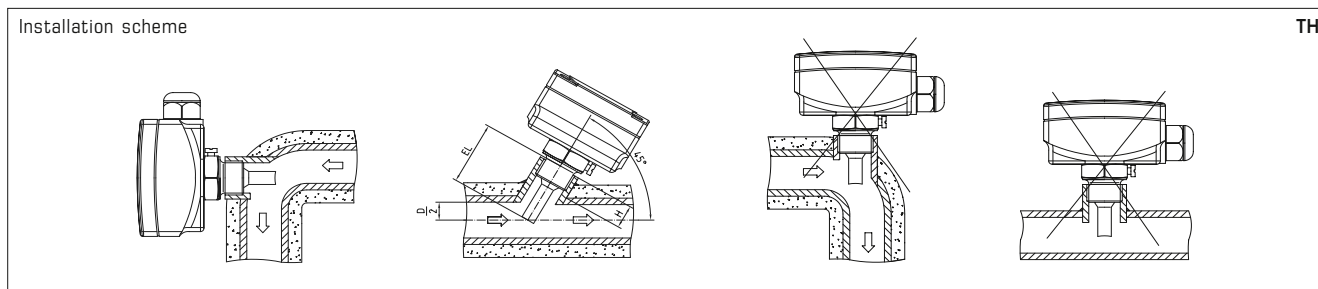
After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.



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.

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).

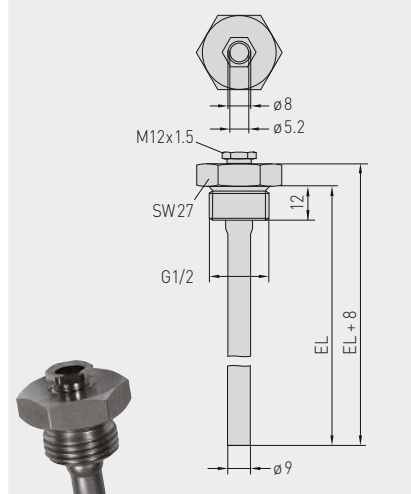


THERMASGARD® THE

Immersion sleeves made of stainless steel, with adjusting screw,
for sensors and measuring transducers sensor HFTM

S+S REGELTECHNIK

Dimensional drawing THE -VA-xx



THE-VA-xx

Immersion sleeve,
stainless steel V4A (1.4571)

with adjusting screw,
flat sealing, cylindrical,
according to DIN 228

THERMASGARD® THE Immersion sleeve Ø 9 mm for THERMASGARD® HFTM, ID

Type / WG01	p _{max} (static)	T _{max}	Inserted length (EL)	Item No.
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
THE-VA 100MM	40 bar	+200 °C	100 mm	7100-0012-6020-002
THE-VA 150MM	40 bar	+200 °C	150 mm	7100-0012-6030-002
THE-VA 200MM	40 bar	+200 °C	200 mm	7100-0012-6040-002
THE-VA 250MM	40 bar	+200 °C	250 mm	7100-0012-6050-002
THE-VA 300MM	40 bar	+200 °C	300 mm	7100-0012-6060-002
THE-VA 400MM	40 bar	+200 °C	400 mm	7100-0012-6080-002
Ordering example:	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 x1.5			
	For additional device variants, see S+S Facility Engineering!			

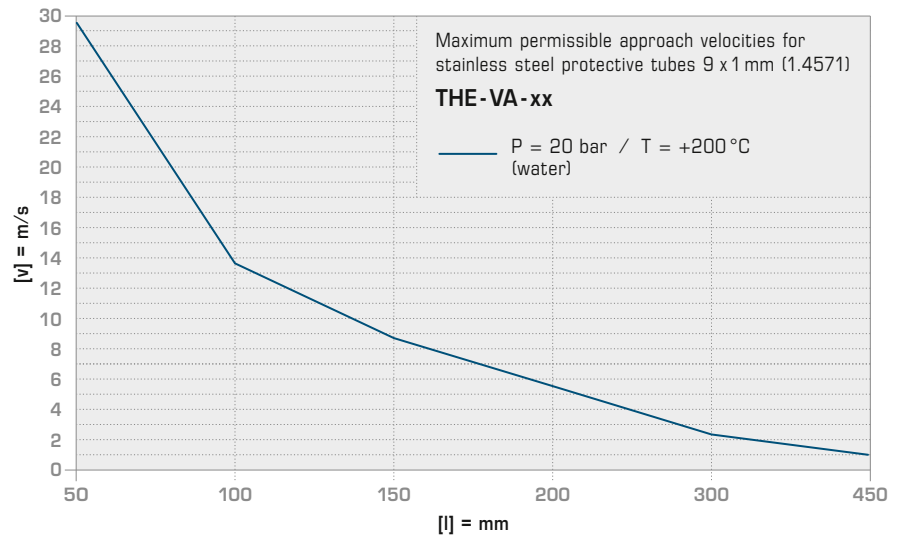
INSTRUCTIONS FOR PLANNING AND INSTALLATION

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).

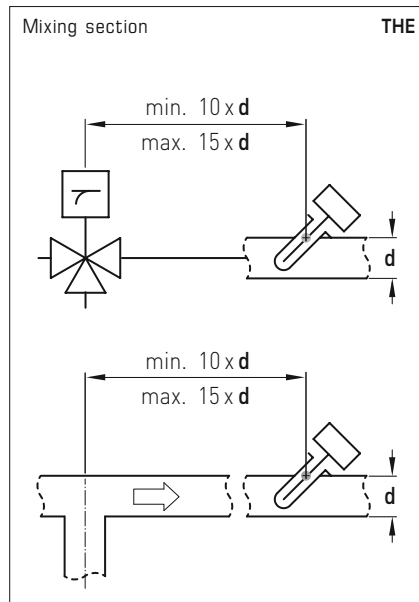
Please observe permissible approach velocities for stainless steel protective tubes (see graph THE-VA).

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.

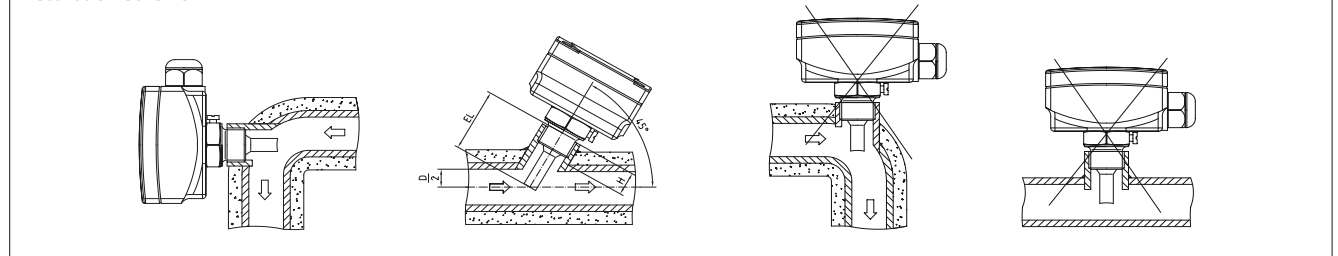


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Installation scheme



Special accessories for M12 connector

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

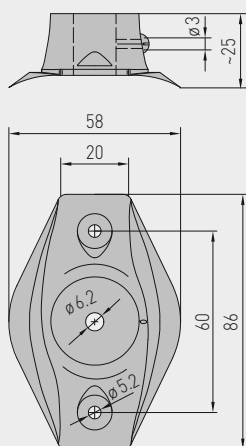
KB xx

Cable socket
without cable

Connecting cable for M12 connector	Type / WG01I	Cable length	Item No.
PVC cable, 5-pin, shielded , with cable socket (M12, A-coding, 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
	ALG M12-A5 PVC 5M	5 m	2000-9121-0000-041
	ALG M12-A5 PVC 10M	10 m	2000-9121-0000-051
PVC cable, 5-pin, unshielded , with cable socket (M12, A-coding, 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
	AL M12-A5 PVC 5M	5 m	2000-9121-0000-011
	AL M12-A5 PVC 10M	10 m	2000-9121-0000-021
PVC cable, 12-pin, unshielded , with cable socket (M12, A-coding, 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
	AL M12-A12 PVC 5M	5 m	2000-9122-0000-011
	AL M12-A12 PVC 10M	10 m	2000-9122-0000-021

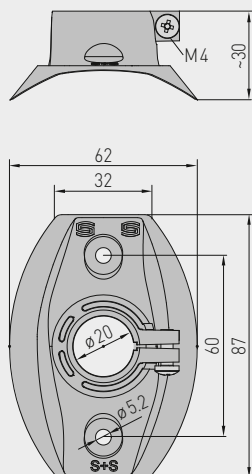
Interconnecting cable for M12 connector	Type / WG01I	Cable length	Item No.
PVC cable, 5-pin, shielded , with cable socket (M12, A-coding, female) and cable connector (M12, A-coding, male) approx. Ø = 15 mm, L = 35 mm	VLG xx A5		5-pin, shielded
	VLG M12-A5 PVC 2M	2 m	2000-9111-0000-031
	VLG M12-A5 PVC 5M	5 m	2000-9111-0000-041
	VLG M12-A5 PVC 10M	10 m	2000-9111-0000-051
PVC cable, 5-pin, unshielded , with cable socket (M12, A-coding, female) and cable connector (M12, A-coding, 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
	VL M12-A5 PVC 5M	5 m	2000-9111-0000-011
	VL M12-A5 PVC 10M	10 m	2000-9111-0000-021
PVC cable, 12-pin, unshielded , with cable socket (M12, A-coding, female) and cable connector (M12, A-coding, 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
	VL M12-A12 PVC 5M	5 m	2000-9112-0000-011
	VL M12-A12 PVC 10M	10 m	2000-9112-0000-021

Mounting accessories for M12 connector	Type / WG01I	Contact	Item No.
Cable socket (M12, A-coding, female), approx. Ø = 20 mm, L = 54 mm, unassembled, without cable	KB xx		female
	KB M12-A5	5-pin	7100-0070-0712-000
	KB M12-A12	12-pin	7100-0070-0714-000
Cable connector (M12, A-coding, male), approx. Ø = 20 mm, L = 54 mm, unassembled, without cable	KS xx		male
	KS M12-A5	5-pin	7100-0070-0716-000
	KS M12-A12	12-pin	7100-0070-0718-000

Dimensional drawing **MF-06-K**


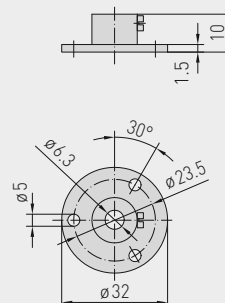
MF-06-K

Mounting flange,
plastic


Dimensional drawing **MFT-20-K**


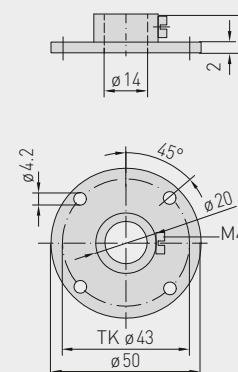
MFT-20-K

Mounting flange,
plastic


Dimensional drawing **MF-06-M**


MF-06-M

Mounting flange,
metal


Dimensional drawing **MF-14-M**


MF-14-M

Mounting flange,
metal

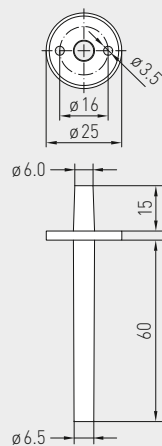
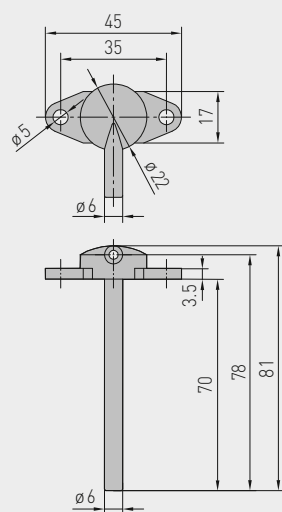
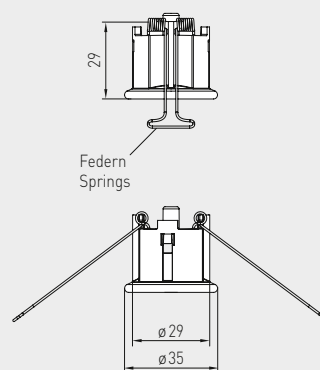


Type / WG01	Mounting flange, plastic	Tube Gland	T _{max}	Item No.
MF-K	for metal protective tubes!			
MF-06-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for sleeve temperature sensor HFTM	Ø 6.2 mm	+100 °C	7100-0030-1000-000
MFT-K	for PLEUROFORM multi-channel pipes!			
MFT-20-K	Mounting flange, plastic, approx. 62 x 87 x 30 mm for duct sensors	Ø 20 mm	+100 °C	7000-0031-0000-000

Type / WG01	Mounting flange, metal	Tube Gland	T _{max}	Item No.
MF-M	for metal protective tubes!			
MF-06-M	Mounting flange, metal (galvanised steel), Ø 32 mm for temperature sensors TF (form B) and temperature measuring transducers TM (form B)	Ø 6.3 mm	+700 °C	7100-0030-5000-000
MF-14-M	Mounting flange, metal (galvanised steel), Ø 50 mm for duct humidity sensors	Ø 14.0 mm	+700 °C	7100-0030-6000-000

Mounting accessories for differential pressure switches

S+S REGELTECHNIK

Dimensional drawing **ASD-06****ASD-06**Connection set
(straight nipples)Dimensional drawing **ASD-07****ASD-07**Connection nipples
(at 90 degree angle)Dimensional drawing **DAL****DAL**

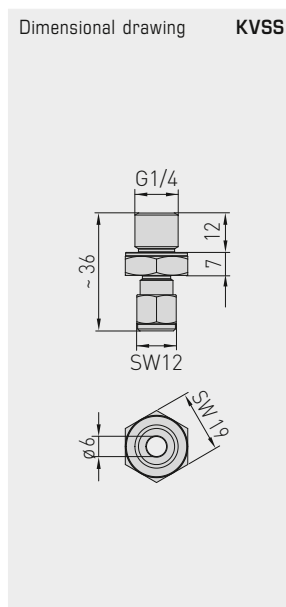
Pressure outlet



Type / WG01	Mounting accessories for differential pressure switches	Item No.
ASD-06	Connection set consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws	7100-0060-3000-000
ASD-07	2 connection nipples (at 90 degree angle) made of ABS	7100-0060-7000-000
ASS-UV 100M	Connecting hose, UV-resistant, Ø 4 mm, 1 roll (100 m)	7100-0060-3100-000

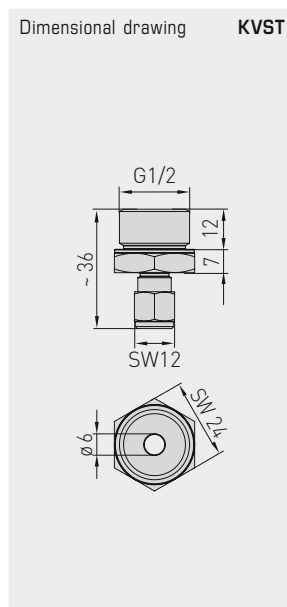
Type / WG01	Special accessories for differential pressure switches	Item No.
	Pressure outlet for ceiling and in-wall installation	
DAL-01	as a pressure reference point	7100-0052-0020-001
DAL-02	for hose attachment	7100-0052-0030-001
DAL-03	as a pressure reference point, with sinter filter made of stainless steel V4A (1.4404)	7100-0052-0040-001

Other mounting accessories and welding protection sleeve for immersion sleeves



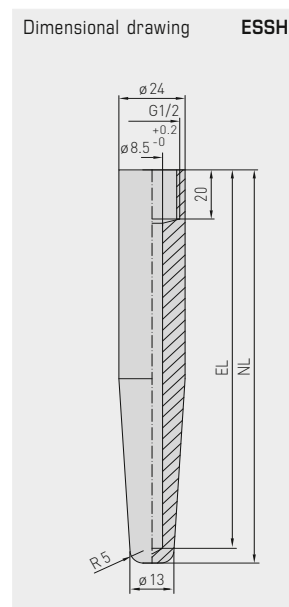
KVSS

Clamp union
with cutting ring



KVST

Clamp union
with clamp ring



ESSH

Welding protective
sleeve



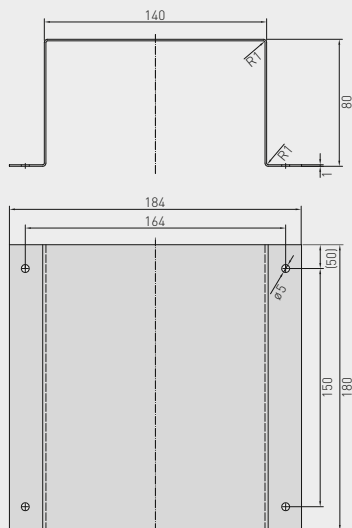
Type / WG01	Miscellaneous mounting accessories	Item No.
KVST	Clamp union with clamp ring PTFE, Ø 6 mm	7100-0032-0110-000
KVSS	Clamp union with cutting ring VA, Ø 6 mm	7100-0032-1000-000
SPB1	Strap for surface-contact sensors	7100-0035-0000-000

Type / WG01	Special accessories for immersion sleeves	Item No.
Welding protecting sleeves , G ½" 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
ESSH 150MM	for immersion sleeves (EL) = 150 mm, P _{max} = 100 bar	7100-0052-0030-001
ESSH 200MM	for immersion sleeves (EL) = 200 mm, P _{max} = 100 bar	7100-0052-0040-001

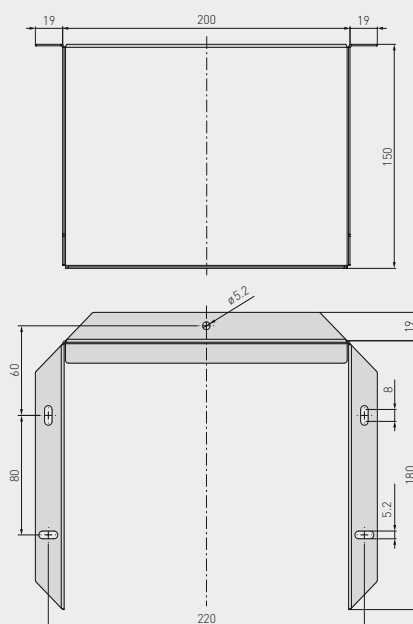
Special accessories and spare parts

S+S REGELTECHNIK

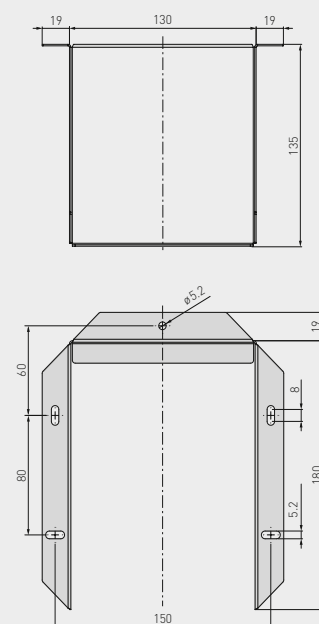
Dimensional drawing

WS-01

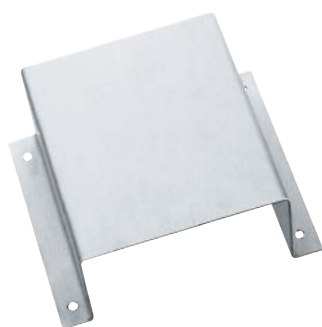
Dimensional drawing

WS-03

Dimensional drawing

WS-04**WS-01**

Sun and
ball-impact protection hood

**WS-03**

Weather and
sun protection hood

**WS-04**

Weather and
sun protection hood



Type / WG01	Special accessories and spare parts	Item No.
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100
WLP-1	Heat-conductive paste, silicone-free (2 ml)	7100-0060-1000-000



Individual components / WG01		Item No.
FET		7100-0022-4000-000
KTY 81-210		7100-0022-0000-000
LM235Z	(TCR = 10 mV / K; 2.73 V at 0°C), KP10	7100-0022-1000-000
NI1000	(according to DIN EN 43760, class B, TKR = 6180 ppm / K)	7100-0020-9000-000
NI1000TK5000	(according to DIN EN 43760, class B, TKR = 5000 ppm / K), LG-Ni 1000	7100-0021-0000-000
NTC 1,8 KOHM	NTC 1.8 K	7100-0021-2000-001
NTC 10 KOHM PRECON	NTC 10 K Precon	7100-0021-9000-000
NTC 20 KOHM	NTC 20 K	7100-0021-6000-000
NTC 30 KOHM	NTC 30 K	7100-0021-7000-000
NTC 50 KOHM	NTC 50 K	7100-0021-8000-000
PT100 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-1000-000
PT100 1/2 DIN	(according to DIN EN 60751, class A)	7100-0020-2000-000
PT100 1/3 DIN	(according to DIN EN 60751, class A)	7100-0020-3000-000
PT1000 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-5000-000
PT1000 1/2 DIN	(according to DIN EN 60751, class A)	7100-0020-6000-000
PT1000 1/3 DIN	(according to DIN EN 60751, class A)	7100-0020-7000-000
PT1000 1/10 DIN	(according to DIN EN 60751, class AA)	7100-0020-8000-000
Note:	Other sensors on request.	

Optional services / WG01		Unit
Double sensor		plus 50 % of instrument price
1 / 2 DIN	(according to DIN EN 60751, class A)	Per piece
1 / 3 DIN	(according to DIN EN 60751, class A)	Per piece
1 / 10 DIN	(according to DIN EN 60751, class AA)	Per piece
Connection type	4-wire connection with ceramic base, head form B	Per piece
	4-wire connection with circuit board, box head	Per piece
Protection class	IP 65 at head form B	Per piece
	IP 68 (Sensor sleeve watertight compound-filled) for cable sensors	Per piece

Custom-made products (for 25 or more pieces)		Unit
Silicone-free sensor production		Per piece
Factory test certificate	1-point certificate	One-time cost
(per device)	2-point certificate	One-time cost
	3-point certificate	One-time cost
	Each additional test point	One-time cost
Printing customer logo on enclosure cover	Setup costs for printing on enclosure cover	One-time cost
(for 200 covers of one enclosure series)	Plus printing costs, 2-colour, printing on enclosure cover	Per piece
Labelling with customer logo	Setup costs for labelling	One-time cost
	Plus costs for labelling	Per piece





Conversion table - Anglo-American units of measurement

TEMPERATURE

Fahrenheit	$^{\circ}\text{F} \rightarrow ^{\circ}\text{C}$ $(^{\circ}\text{F} - 32) \div 1.8 = (^{\circ}\text{C})$	$^{\circ}\text{C} \rightarrow ^{\circ}\text{F}$ $(^{\circ}\text{C} \times 1.8) + 32 = (^{\circ}\text{F})$
------------	--	--

LENGTH

Inches	$" \rightarrow \text{inch} \rightarrow \text{mm}$ $(\text{inch}) \times 25.4 = (\text{mm})$	$\text{mm} \rightarrow \text{inch}$ $(\text{mm}) \div 25.4 = (\text{inch})$
Feet	$\text{ft} \rightarrow \text{m}$ $(\text{ft}) \times 0.3048 = (\text{m})$	$\text{m} \rightarrow \text{ft}$ $(\text{m}) \div 0.3048 = (\text{ft})$
Yards	$\text{yd} \rightarrow \text{m}$ $(\text{yd}) \times 0.9144 = (\text{m})$	$\text{m} \rightarrow \text{yd}$ $(\text{m}) \div 0.9144 = (\text{yd})$
Miles	$\text{mi} \rightarrow \text{km}$ $(\text{mi}) \times 1.609344 = (\text{km})$	$\text{km} \rightarrow \text{mi}$ $(\text{km}) \div 1.609344 = (\text{mi})$

AREA

Square inches	$\text{in}^2 \rightarrow \text{mm}^2$ $(\text{in}^2) \times 645.16 = (\text{mm}^2)$	$\text{mm}^2 \rightarrow \text{in}^2$ $(\text{mm}^2) \div 645.16 = (\text{in}^2)$
	$\text{in}^2 \rightarrow \text{cm}^2$ $(\text{in}^2) \times 6.4516 = (\text{cm}^2)$	$\text{cm}^2 \rightarrow \text{in}^2$ $(\text{cm}^2) \div 6.4516 = (\text{in}^2)$
Square feet	$\text{ft}^2 \rightarrow \text{m}^2$ $(\text{ft}^2) \times 0.09290304 = (\text{m}^2)$	$\text{m}^2 \rightarrow \text{ft}^2$ $(\text{m}^2) \div 0.09290304 = (\text{ft}^2)$
Square yards	$\text{yd}^2 \rightarrow \text{m}^2$ $(\text{yd}^2) \times 0.83612736 = (\text{m}^2)$	$\text{m}^2 \rightarrow \text{yd}^2$ $(\text{m}^2) \div 0.83612736 = (\text{yd}^2)$

VOLUME

Cubic inches	$\text{in}^3 \rightarrow \text{cm}^3$ $(\text{in}^3) \times 16.387064 = (\text{cm}^3)$	$\text{cm}^3 \rightarrow \text{in}^3$ $(\text{cm}^3) \div 16.387064 = (\text{in}^3)$
Cubic feet	$\text{ft}^3 \rightarrow \text{m}^3$ $(\text{ft}^3) \times 0.028316846592 = (\text{m}^3)$	$\text{m}^3 \rightarrow \text{ft}^3$ $(\text{m}^3) \div 0.028316846592 = (\text{ft}^3)$
Cubic yards	$\text{yd}^3 \rightarrow \text{m}^3$ $(\text{yd}^3) \times 0.764554857984 = (\text{m}^3)$	$\text{m}^3 \rightarrow \text{yd}^3$ $(\text{m}^3) \div 0.764554857984 = (\text{yd}^3)$
US Gallons	$\text{Imp. gal.} \rightarrow \text{dm}^3$ $(\text{Imp. gal.}) \times 4.54609 = (\text{dm}^3)$	$\text{dm}^3 \rightarrow \text{Imp. gal.}$ $(\text{dm}^3) \div 4.54609 = (\text{Imp. gal.})$
US-Gallone	$\text{US. liq. gal.} \rightarrow \text{dm}^3$ $(\text{US. liq. gal.}) \times 3.785412 = (\text{dm}^3)$	$\text{dm}^3 \rightarrow \text{US. liq. gal.}$ $(\text{dm}^3) \div 3.785412 = (\text{US. liq. gal.})$

MASS

Ounces	$\text{oz.} \rightarrow \text{g}$ $(\text{oz.}) \times 28.349523 = (\text{g})$	$\text{g} \rightarrow \text{oz.}$ $(\text{g}) \div 28.349523 = (\text{oz.})$
Pounds	$\text{lb.} \rightarrow \text{kg}$ $(\text{lb.}) \times 0.45359237 = (\text{kg})$	$\text{kg} \rightarrow \text{lb.}$ $(\text{kg}) \div 0.45359237 = (\text{lb.})$
British tons (long tons)	$\text{tn. l.} \rightarrow \text{kg}$ $(\text{tn. l.}) \times 1016.0469088 = (\text{kg})$	$\text{kg} \rightarrow \text{tn. l.}$ $(\text{kg}) \div 1016.0469088 = (\text{tn. l.})$
US tons (short tons)	$\text{tn. sh.} \rightarrow \text{kg}$ $(\text{tn. sh.}) \times 907.18474 = (\text{kg})$	$\text{kg} \rightarrow \text{tn. sh.}$ $(\text{kg}) \div 907.18474 = (\text{tn. sh.})$

Sensor type (+)

Thermistor elements with positive temperature coefficient -

Temperature ranges [temperature/resistance]

FeT (T1)		KTY81-210		LM 235 Z (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 μ A ... 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% B _{25/85} = 4262 K ±1%		R ₂₅ = 50 kΩ ±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 [-]

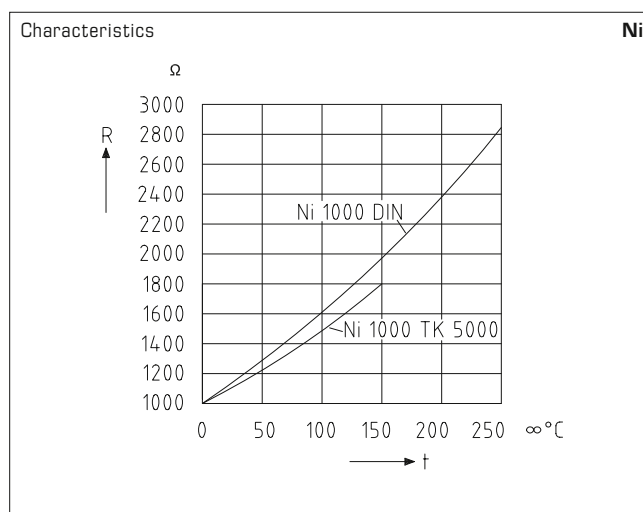
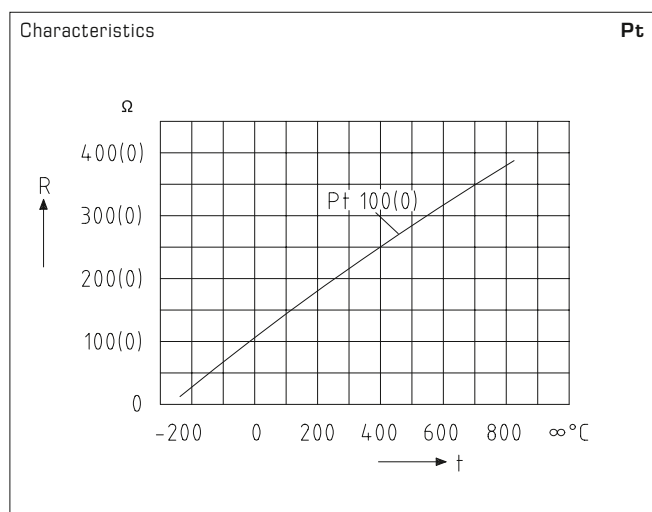
Resistor element with
negative temperature coefficient,
also called negative temperature
coefficient thermistor, or NTC thermistor.

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!

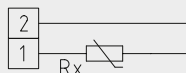
Characteristics and wiring of terminal connections of some passive temperature sensors

S+S REGELTECHNIK

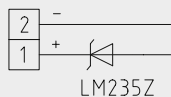


Wiring of terminal connections room devices and box head

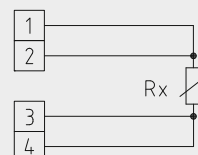
Connecting diagram **1 x two-wire connection standard**



Connecting diagram **1 x two-wire connection LM235Z (KP 10)**

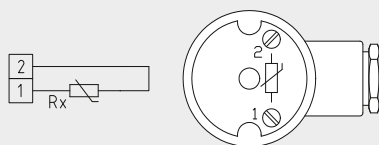


Connecting diagram **1 x four-wire connection (optional)**

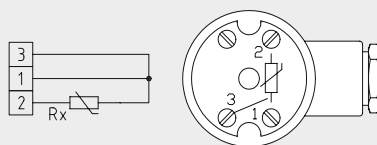


Wiring of terminal connections head form B

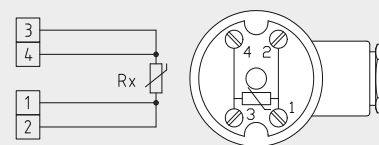
Connecting diagram **1 x two-wire connection**



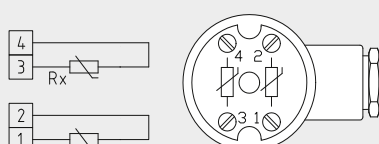
Connecting diagram **1 x three-wire connection**



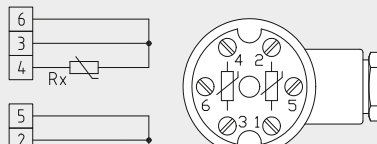
Connecting diagram **1 x four-wire connection**



Connecting diagram **2 x two-wire connection**



Connecting diagram **2 x three-wire connection**



Measuring transducers, calibratable, with active output for THERMASGARD® temperature sensors

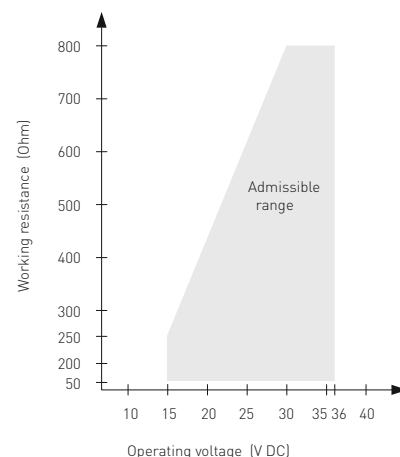
TEMPERATURE RANGES:

When selecting measuring transducer ranges, it is necessary to ensure that the maximum temperatures permissible for the sensor/enclosure are not exceeded!

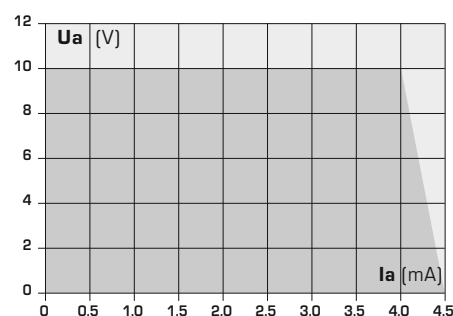
Ambient temperature for measuring transducers:

-30...+70°C

Load resistance diagram
4...20 mA



Dependency of output voltage
on output current



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 24 V 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).

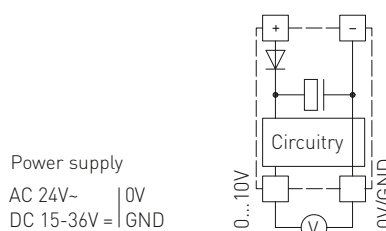
All outputs of field devices must be referenced to the same potential!

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!

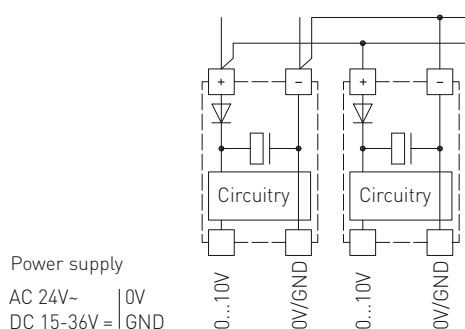
Schematic diagram

Individual operation



Schematic diagram

Parallel operation





Further information and legal notice

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

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S+S REGELTECHNIK

S+S Regeltechnik GmbH

General Terms and Conditions of Sale and Delivery

1. Scope

- (1) Any and all quotations, performances and agreements are solely made on the basis of these S+S Regeltechnik GmbH (S+S) General Terms and Conditions of Sale and Delivery in their respective effective version. These General Terms and Conditions of Sale and Delivery are effective towards entrepreneurs in terms of BGB (German Civil Code) only.
- (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. These S+S General Terms and Conditions of Sale and Delivery shall also be effective when services have been provided in knowledge of conflicting or deviating customers' terms and conditions to such customer without reservation.
- (3) These S+S General Terms and Conditions of Sale and Delivery are being acknowledged through the customer's order placement or acceptance of services provided for the term of the entire business connection, also if they are not expressly repeated.

2. Quotation/contract conclusion/termination of contract

- (1) All quotations made by S+S are without engagement. A contract is concluded through the written order confirmation or the delivery of goods ordered as far as S+S does not indicate via other circumstances that the order has been accepted.
As far as the customer communicates change requests after receipt of the order confirmation, S+S is entitled to charge the additional costs resulting thereof in case of accepting such changes.
- (2) Illustrations, drawings and other specifications are only committal upon written acknowledgement. The corresponding applies for advisory or informative conversations between S+S and the customer, in particular about the applicability of goods ordered.
- (3) As far as the customer cancels the contract regardless of whatever reason without S+S being accountable for, S+S is entitled to the right to claim blanket damages in the amount of 10 % of the total price being agreed at the date of order cancellation unless S+S or the customer provides other evidences in the individual case.

3. Performances / dates

- (1) Delivery terms are binding only (fixed date transaction), if S+S has expressly confirmed that in writing.
- (2) The adherence to binding terms of delivery presupposes the clarification of all technical and other questions as well as the timely and proper performance of any of the customer's duties.
- (3) Delays in delivery for reasons beyond the sphere of influence of S+S, particularly because of unforeseeable occurrences preventing or impeding a delivery in due time, S+S cannot be held responsible for. In such cases the delivery term extends accordingly. In the case of delay of performance the customer is entitled to withdraw from the non-performed part of the contract as far as such impediment to performance continues for more than 6 weeks and a reasonable grace period for delivery has been granted. Customer's claims for damages because of extension of a delivery period or in case of S+S being exempted from its duty to perform are excluded as far as the customer had been forthwith notified of such impediment to performance.
- (4) As far as S+S is responsible for the non-compliance with binding delivery dates, S+S's liability is limited to 0.5 % of the order value for each full week of default, however up to a maximum of 5 % of the order value of the shipment concerned. Any further claims for damages the customer can only assert as far 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 duty to supply when circumstances become known during the term of the contractual relationship that give reason to rightful doubts in the solvency of the customer. In that case S+S will perform the delivery as far as the customer makes an advance payment in respect of the purchase price, or provides appropriate securities.
- (6) As far as a customer orders goods on call (in particular pre-order), the full acceptance of the purchase or the full release order respectively has to be made within 12 months from the date of contract conclusion or order respectively. Otherwise the customer is obligated to accept the goods within 10 working days as far as S+S requests to do so in writing.
- (7) In case of noncompliance with the time limit mentioned under cipher (6), the legal consequences of default of acceptance in terms of BGB will commence.
- (8) Generally no right to return goods not needed anymore by buyer or for the purpose of stock reduction does exist.

4. Delivery

- (1) Shipment of goods is effected ex principal office of S+S at the customer's risk and expense (Incoterms 2010: EXW). Any transport, breakage, theft, or other insurance will be taken out by S+S only at customer's request. Any expenses resulting thereof will be charged to the customer's account.
- (2) As far as a shipment is supposed to be carried out at a later date than the practically possible date of shipment upon the customer's request, S+S is entitled to charge the costs of storage to the customer's account, starting from one month after readiness for shipment at a blanket rate of 0.5 % of the order value for each month, subject to providing other evidences. One month after notification of readiness for shipment 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 any other way. Then the customer is to be supplied within a reasonably extended period of time.
- (3) Partial performances are permissible as far as that is not unreasonable to the customer.

5. Prices / terms of payment

- (1) Prices by S+S are understood plus legal value added tax at the respective rate in effect, ex principal office of S+S plus transport / shipping and packing costs to be separately charged. For orders of less than 75.00 EUR in value we reserve the right to charge a small quantity surcharge in the amount of 8.50 EUR. For special custom-made items we charge 67.00 EUR setup costs.
Existing customers from which the last payment was received more than 12 months ago as well as new customers are supplied two times against prepayment and then after a positive creditworthiness check by our Euler Hermes trade credit default insurance on basis of payment on account. Foreign customers are supplied against prepayment.
- (2) S+S is entitled to invoice partial billing in accordance with the progress of order processing.
- (3) The invoice amount is due for payment upon receipt of the invoice. As far as payment is not effected within 14 working days from the date of performance in form of goods and receipt of the invoice, the customer is in default. All payments must be made in EUR. With the reservation of providing evidence of further damages in case of default of payment the customer has to 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 for processing and take fulfilling effect only after being unconditionally credited. Eventual ancillary costs arising due to payment by bill of exchange or check are for the customer's account.

6. Warranty

- (1) The customer is obligated to inspect the goods immediately after the delivery by S+S as far as that is feasible according to the proper course of business and to forthwith notify S+S of any defects. In case the customer fails to provide such notification, the goods are deemed approved unless a defect is concerned that was not recognizable in the course of inspection. If such a defect appears at a later date, notification must be made immediately after discovery; otherwise the goods are deemed approved also in view of such defect. To maintain the customer's rights the timely dispatch of the notification is sufficient. If S+S has maliciously concealed a defect, then S+S cannot refer to that clause.
- (2) If the suitability or functionality of the goods can only be checked and ascertained in the course of further processing, the customer is obliged to carry out a test processing run. If no notification of defects is made after this test run, the goods shall also be deemed approved.

- (3) Within the scope of supplementary performance S+S has a right of choice. When the first-time attempt to eliminate the defect remains unsuccessful, S+S reserves the right to deliver goods free of defects. In case the supplementary performance has failed, the customer is optionally entitled to the right of withdrawal, or to the right of curtailment.
- (4) Excluded from any warranty are: faults caused by inapplicable or improper application and utilization, faulty mounting & installation or putting into operation, particularly in the case of non-observance of operating instructions, or because of incorrect or negligent treatment by the customer or any third-party person not being within the sphere of responsibility of S+S.
- (5) S+S assigns its warranty claims existing against the manufacturer to the customer. The customer accepts such assignment. The customer is only entitled to assertion of warranty claims against S+S as far as the seriously pursued extra-judicial assertion of claims against the manufacturer has remained unsuccessful. In that case the customer is obligated to assign those claims against the manufacturer back to S+S again.
- (6) Warranty claims prescribe within one year from the date of delivery of goods through S+S.
- (7) If the customer calls upon S+S because of warranty claims and it turns out that either no defect was existing, or the asserted defect is due to a circumstance that does not commit S+S to warranty, then the customer has to reimburse S+S for the expenses resulting thereof as far as the customer has caused such availment of S+S grossly negligent or with intent.
- (8) Eventual supplementary performances or subsequent improvements made by S+S always happen without acknowledgement of any statutory duty and on goodwill basis.
- (9) In case the customer withdraws from the sales contract or rightfully requests delivery of new goods free of defects, or compensation for damages instead of the full performance, then S+S is obligated to dismount such defective goods delivered at its own expense as far as the customer had already installed such goods and to remove them. The customer itself is allowed to dismount defective goods upon request. In that case S+S refunds the customer for the costs arising in the course of doing so, however only as far as such are the customer's primary costs not including any share of profit. As far as the customer commissions a third party contractor with demounting, expenses resulting thereof will only be reimbursed by S+S if the buyer had granted S+S reasonable respite before without success. This does not apply when additional respite is legally superfluous according to statutory regulation.
- (10) In the event of justified complaints, the corresponding returned goods will only be accepted if an RMA number has been issued for them. This must be requested from S+S and should always be quoted on the documents accompanying the returned goods.

7. Liability

- (1) S+S is liable for damages due to wilfully and gross negligently caused violation of duties. S+S is furthermore liable for damages resulting from slightly negligently caused violation of material contractual obligations. Material contractual obligations in terms of this are duties where the performance of which enables the proper performance of the contract in the first place, and in the observance of which the customer regularly trusts and may rely upon. Any liability of S+S for slight negligence apart from that is excluded. The same applies to wilful or grossly negligent violation of duties and the slightly negligent violation of material contractual obligations through a legal representative or vicarious agent of S+S. Liability for personal injury remains unaffected by the aforesaid limitation of liability.
- (2) In case of slightly negligent violation of material contractual obligations, liability of S+S is limited in the amount to the contract-typical damage. Contract-typical in terms of this is a damage, when in the normal course of affairs its occurrence in consequence of the committed violation of duty was to be assumed.
- (3) S+S can only be held liable for deliberate breach of duty and not for any consequential damage caused by processing unsuitable or defective goods.

8. Retention of title

- (1) Goods delivered remain the property of S+S up to the complete settlement of any and all claims by the customer. As far as the customer alienates goods under reserve without receiving the purchase price from its buyer matching payment with physical delivery or in advance, the customer also has to agree with such buyers reservation of title in accordance with this regulation.
- (2) The customer is not entitled to pledge goods under reserve or to assign such goods for security. In cases of garnishment or other third parties' interventions the customer must notify S+S forthwith in writing.
- (3) The customer is entitled to resell goods under reserve in the course of its regular business operations. The customer already now 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 against its buyers in consequence of the resale, in fact irrespective of whether such goods are alienated without or after processing. The customer also remains entitled to collect the receivable even after assignment, whereas the entitlement of S+S to collect the outstanding amount itself remains thereof unaffected. S+S however undertakes towards the customer not to collect the outstanding amount as long as the customer does not fall behind with payments, or an application for institution of composition or insolvency proceedings has not been filed. If that is the case, the customer upon request by S+S is committed to disclose those assigned receivables and their debtors, to provide the necessary records, and to notify the debtors of the assignment.

9. Operating, mounting & installation instructions

The customer undertakes to adhere to operating, mounting & installation instructions being delivered together with goods where appropriate, and also to make possible third-party buyers aware of the same. The complete or partial non-observance of such instructions may cause a complete loss of buyers' rights. This does not apply to possible claims for damages according to § 7.

10. Copyright

The customer is not entitled to reproduce or copy any contents of S+S catalogues, in particular technical drawings and photographs, for its own advertising or other purposes without the express written approval by S+S. The customer is not allowed to make quotations or other entrepreneurial documents available to third parties.

11. Miscellaneous

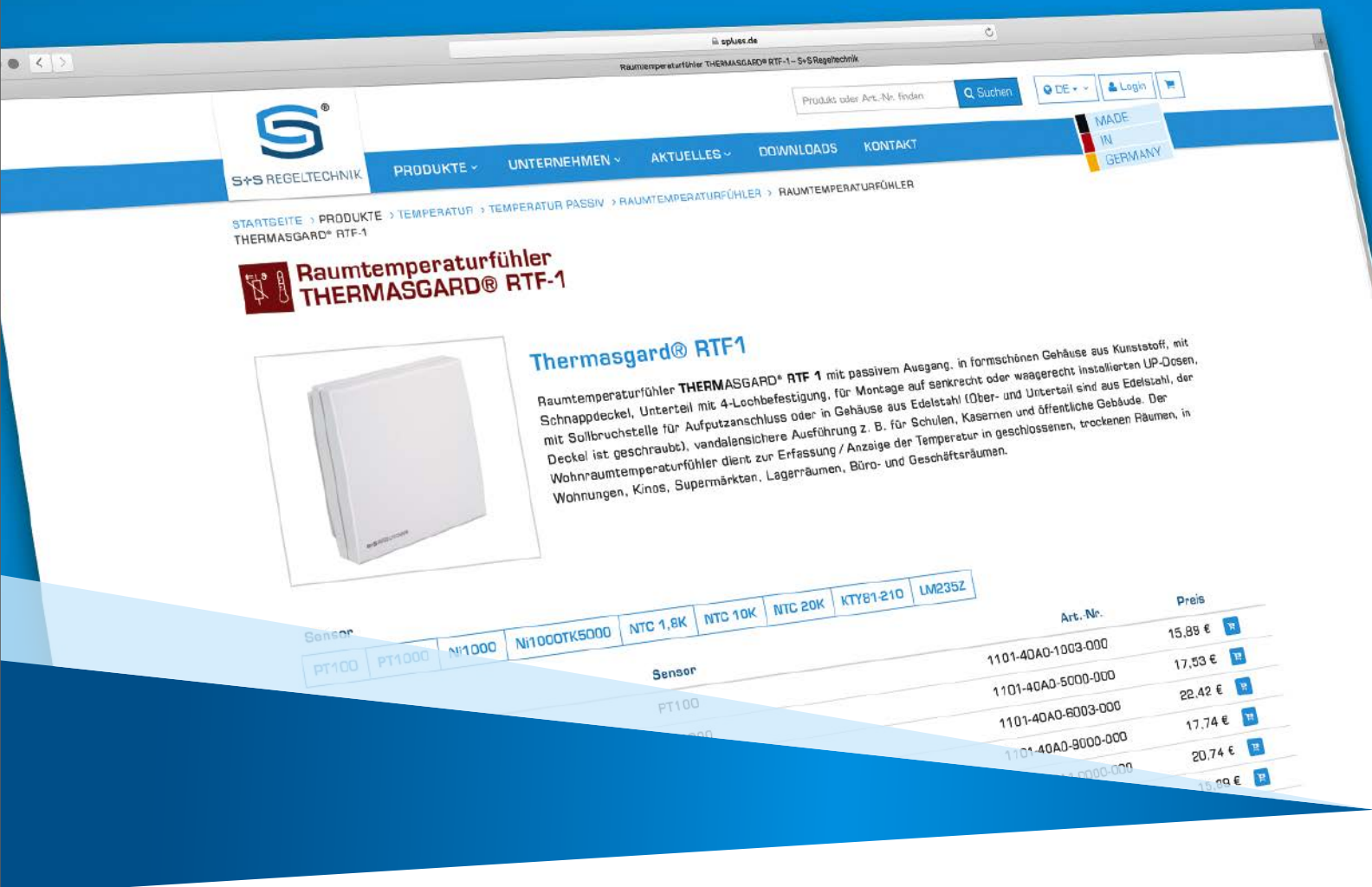
- (1) For any disputes arising from or in connection with the contractual relationship, Nuremberg / Germany is agreed as place of jurisdiction. Place of performance is Nuremberg / Germany.
- (2) The customer can only offset against with claims that are undisputed or have been established as final and absolute. The customer is entitled to a right of retention only if its counterclaims originate from the very same contractual relationship, or such claims are undisputed or have been established as final and absolute.
- (3) Modifications of and amendments to the contract require the written form. That also applies to the alteration of this written-form requirement clause.
- (4) In case one or several provisions of these General Terms and Conditions of Sale and Delivery should be ineffective or have not been properly incorporated into the contract, the rest of the provisions of these General Terms and Conditions of Sale and Delivery remain effective.
- (5) Solely the laws of the Federal Republic of Germany are applicable while excluding the law regarding the United Nations Convention on Contracts for the International Sale of Goods (CISG) – also when the customer has its registered office abroad.

These General Terms and Conditions of Sale and Delivery are protected by copyright.

Infringements of copyright will be legally prosecuted.

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