



Temperature

THERMASGARD® active sensors – precise thermal management

Our active 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 Areas

- 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® ACTIVE TEMPERATURE SENSORS



Room sensors, room control units

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Room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room temperature measuring transducer **THERMASGARD® RTM 1**, with eight switchable measuring ranges (max. $-20...+150\text{ }^{\circ}\text{C}$), active output, in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. Optionally available as a design with vandal-proof housing made of stainless steel (top and base screwed together).

The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. The unit with **Automatic Output Switching (AOS)** detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

This room temperature sensor is used to detect temperatures in closed dry rooms such as flats, in offices and business facilities. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

RTM 1 - I

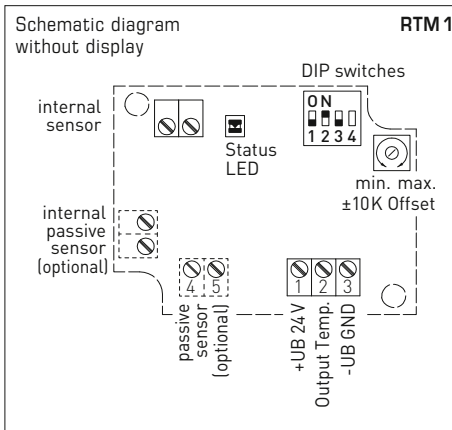
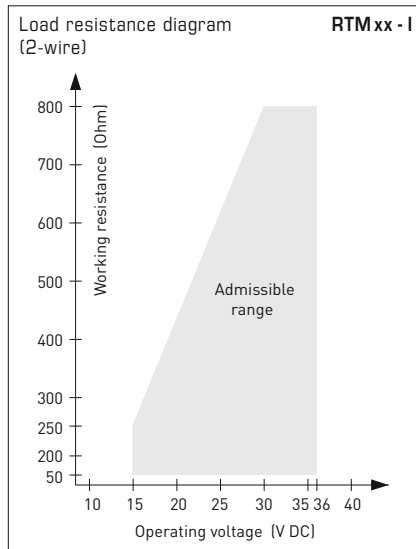
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

RTM 1 - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{ W} / 24\text{ V DC}$; $< 2.2\text{ VA} / 24\text{ V AC}$
Measuring ranges:	multi-range switching with 8 measuring ranges see table (other ranges optional) with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016), optional stainless steel V2A (1.4301)
Housing dimensions:	85 x 85 x 27 mm (Baldur 1) 75 x 75 x 25 mm (stainless steel)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws on circuit board
Installation:	wall mounting or on in-wall flush box $\varnothing 55\text{ mm}$, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Ambient temperature:	measuring transducer $-30...+70\text{ }^{\circ}\text{C}$
Permitted humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU



2-wire without display		RTM 1 - I
	+UB 24V DC	
	Output Temp. 4...20mA	
	free	

3-wire (AOS) without display		RTM 1 - A
	+UB 24V AC/DC	
	Output Temp. 0-10V / 4...20mA	
	-UB GND	

Measuring ranges [$^{\circ}\text{C}$] (adjustable)	DIP 1	DIP 2	DIP 3
$-20...+150\text{ }^{\circ}\text{C}$	ON	ON	ON
$-50...+50\text{ }^{\circ}\text{C}$	OFF	ON	ON
$-20...+80\text{ }^{\circ}\text{C}$	ON	OFF	ON
$-30...+60\text{ }^{\circ}\text{C}$	OFF	OFF	ON
$0...+40\text{ }^{\circ}\text{C}$	ON	ON	OFF
$0...+50\text{ }^{\circ}\text{C}$ (default)	OFF	ON	OFF
$0...+100\text{ }^{\circ}\text{C}$	ON	OFF	OFF
$0...+150\text{ }^{\circ}\text{C}$	OFF	OFF	OFF

DIP4 has no function!

For further technical information, see the operating instructions

**NEW**

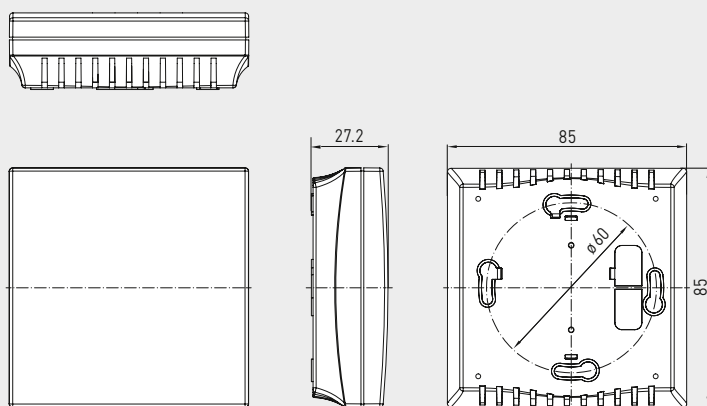
S+S REGELTECHNIK

THERMASGARD® RTM 1

Room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)



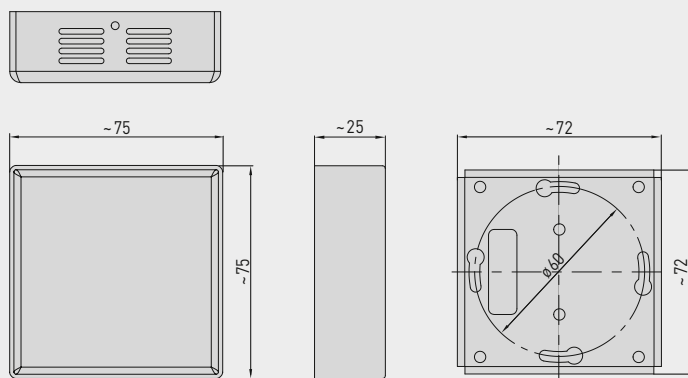
Dimensional drawing
[mm]

Housing **Baldur 1**

RTM 1
without display
(Baldur 1)



Dimensional drawing
[mm]

Housing **stainless steel**

RTM 1
without display
(stainless steel)



Automatic detection and switching
to standard signal 0...10V or 4...20 mA



AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

THERMASGARD® RTM 1 Room temperature measuring transducers with multi-range switching (without display)			
Type / WG01	Output	Features	Item No.
RTM1-I	(2-wire)		
RTM1-I	4...20 mA	–	1101-41A2-0000-200
RTM1-I VA	4...20 mA	Stainless steel housing V2A (1.4301)	1101-4152-0000-200
RTM1-A	(3-wire AOS)		
RTM1-A	0-10 V / 4...20 mA	–	1101-41AE-0000-200
RTM1-A VA	0-10 V / 4...20 mA	Stainless steel housing V2A (1.4301)	1101-415E-0000-200
Automatic Output Switching:	patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Measuring range:	multi-range switching with 8 switchable measuring ranges (see DIP table) 0...+50 °C (default), max. –20...+150 °C		
Extra charge:	other measuring ranges optional additional passive sensor (pin 4/5) optionally upon request		
Note:	for units with display and/or potentiometer, see the following pages		

**Room temperature measuring transducers, calibratable,
with display and/or potentiometer and
active output (Automatic Output Switching)**

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room temperature measuring transducer **THERMASGARD® RTM xx** with active output, temperature range (0...+50 °C), in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, optionally with potentiometer and/or display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0- 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I) with 2-wire connection and I output is available.

This room temperature sensor is used to detect temperatures in closed dry rooms such as flats, in offices and business facilities. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

RTM - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

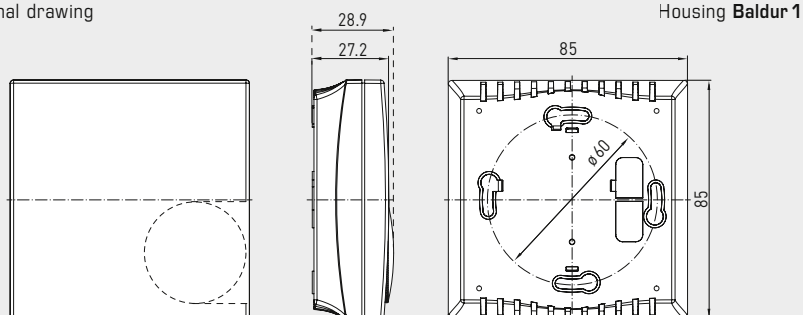
RTM - A (AOS)

Power supply:	24 V AC / DC (±10 %)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ for AOS I variant $R_L > 15 \text{ kOhm}$ for AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	0...+50 °C (other ranges optional) with manual zero point correction (±10 K)
Sensor:	digital temperature sensor
Accuracy, temperature:	typically ±0.2 K at +25 °C
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Housing dimensions:	85 x 85 x 27 mm (Baldur 1)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Installation:	wall mounting or on in-wall flush box Ø55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	<95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Control element:	potentiometer , with angle of rotation limiter, the standard marking is a swelling arrow with centre position, unfilled (others upon request)
Optional:	Two-line display with illumination , cutout 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

Dimensional drawing
[mm]



RTM xx
without potentiometer,
with display



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

	Temperature [°C]
	Temperature [°F]
	Sensor breakage
	Sensor short circuit

Display (switchable)	DIP 1
Imperial	[°F] ON
SI (default)	[°C] OFF

Display
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP 1**).

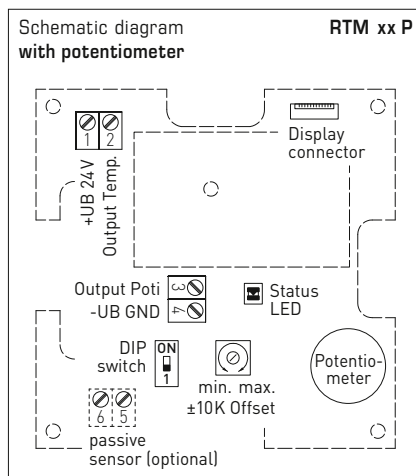
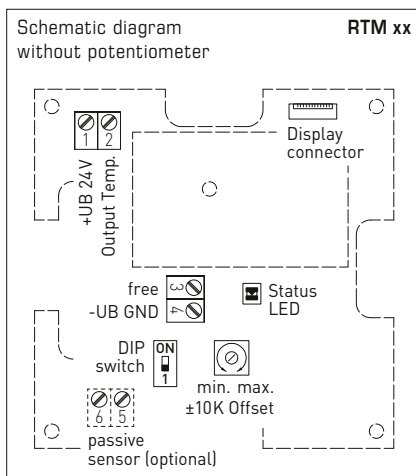
For further technical information, see the operating instructions

**NEW**

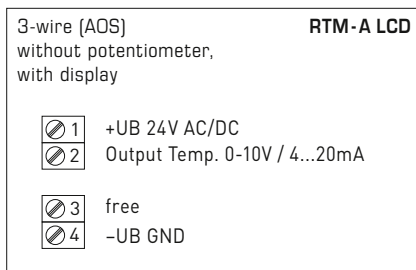
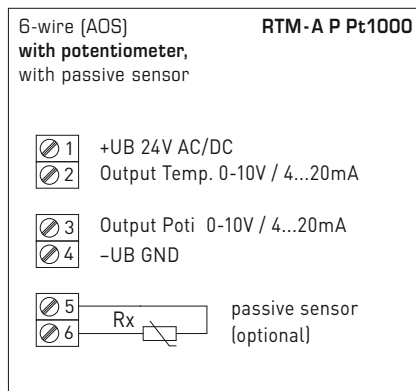
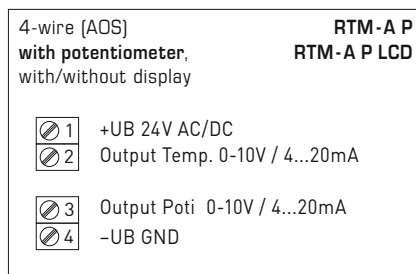
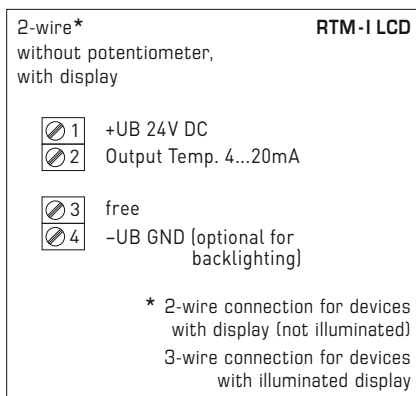
S+S REGELTECHNIK

THERMASGARD® RTM xx

Room temperature measuring transducers, calibratable,
with display and/or potentiometer and
active output (Automatic Output Switching)



RTM xx
with Potentiometer,
with/without display



Automatic detection and switching
to standard signal 0...10V or 4...20mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

THERMASGARD® RTM xx Room temperature measuring transducers (with display and/or potentiometer)						
Type / WG01	Output Temperature active	Output Temperature passive	Output Potentiometer active	Poti	Display	Item No.
RTM-I	(2-wire)					
RTM-I LCD	4...20 mA	(optional)	—		■	1101-41A2-2000-200
RTM-A	(AOS)					
RTM-A LCD	0-10V / 4...20 mA	(optional)	—		■	1101-41AE-2000-200
RTM-A P LCD	0-10V / 4...20 mA	(optional)	0-10V / 4...20 mA	●	■	1101-41AE-2004-346
RTM-A P	0-10V / 4...20 mA	(optional)	0-10V / 4...20 mA	●		1101-41AE-0004-346
RTM-A P Pt1000	0-10V / 4...20 mA	Pt1000	0-10V / 4...20 mA	●		1101-41AE-0054-346
Automatic Output Switching:	patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10V or 4...20 mA.					
Measuring range:	0...+ 50 °C (permanently set)					
Extra charge:	other measuring ranges optional additional passive sensor (pin 5/6) optionally upon request					
Potentiometer:	the standard marking is a swelling arrow with centre position, (—•+), unfilled optionally wedge-shaped without centre position (—...+) or with marking points (—3K...+3K) – special print upon request					

**Room temperature sensor or measuring transducer,
in-wall in the panel switch programme,
with active output**

The room sensor **THERMASGARD® FSTM / FSTM-P** in the in-wall housing, optionally with potentiometer, is used for measuring the room temperature, and for setpoint adjustment. It converts the measured values into a standard signal of 0-10 V. A digital, long-term stable sensor is used for temperature measurement.

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

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

TECHNICAL DATA

Power supply:	24 V AC / DC ($\pm 10\%$)
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC

TEMPERATURE

Sensor:	digital temperature sensor , low hysteresis, high long-term stability
Long-term stability:	$\pm 1\%$ per year
Measuring range:	0...+50 °C
Accuracy, temperature:	typically $\pm 0.8\text{ K}$ at +25 °C
Output, temperature:	0-10 V

POTENTIOMETER

Output, potentiometer:	0-10 V (FSTM-P with setpoint adjustment, not possible with Busch-Jaeger)
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GENERAL

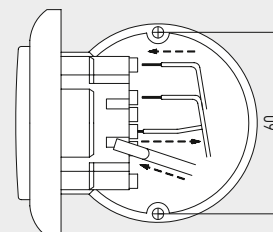
Mounting:	in-wall flush box $\varnothing 55\text{ mm}$
Electrical connection:	1,0-2,5 mm ² , via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU

SWITCH PROGRAMME

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

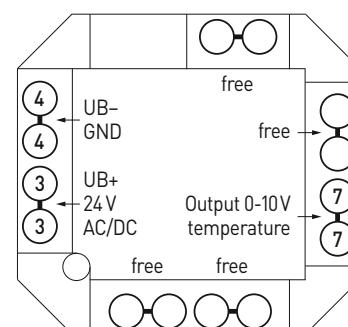
Mounting diagram
[mm]

in-wall



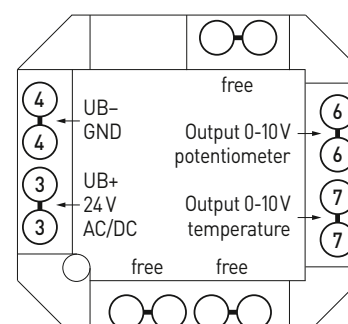
Connection diagram

FSTM



Connection diagram

FSTM - P





S+S REGELTECHNIK

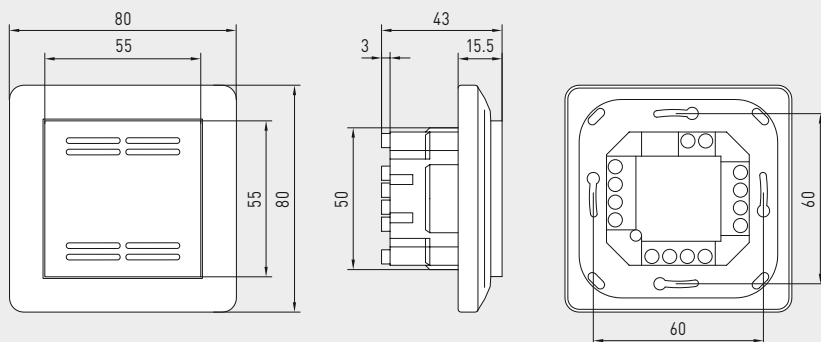
THERMASGARD® FSTM
THERMASGARD® FSTM-P

Room temperature sensor or measuring transducer,
in-wall in the panel switch programme,
with active output



Dimensional drawing
[mm]

FSTM

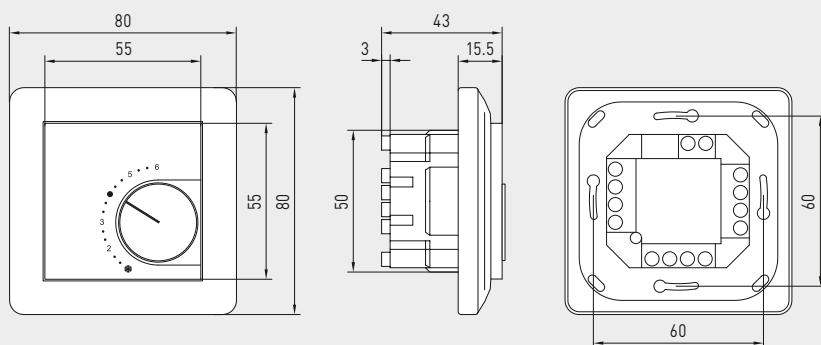


FSTM
Standard



Dimensional drawing
[mm]

FSTM-P



FSTM-P
with potentiometer



Temperature table
MR: 0...+50 °C

°C	U _A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

THERMASGARD® FSTM Room temperature sensor or measuring transducer, in-wall
THERMASGARD® FSTM-P Room temperature sensor or measuring transducer, in-wall with potentiometer

Type / WG02	Measuring Range Temperature	Output Temperature	Potentiometer	Item No.
FSTM				
FSTM-U	0...+50 °C	0-10V	–	1101-9121-0000-162
FSTM-P				
FSTM-U P	0...+50 °C	0-10V	0-10V	1101-9121-0004-282

**Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)**

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable outside temperature measuring transducer **THERMASGARD® ATM 2**, with eight switchable measuring ranges (max. $-20...+150^{\circ}\text{C}$), active output, external sensor, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with /without display. The standard display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

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 **SS02** (on request). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

ATM 2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_b (\text{Ohm}) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

ATM 2 - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}; < 2.2\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Protective tube:	made from stainless steel V4A (1.4571), $\varnothing 6\text{ mm}$, NL = 65 mm
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Process connection:	by means of screws
Ambient temperature:	measuring transducer $-30...+70^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36x15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

ACCESSORIES (see table)

ATM 2
with sun protection SS02
(on request)



ATM 2 - Q
with M12 connector



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

	Temperature [$^{\circ}\text{C}$]
	Temperature [$^{\circ}\text{F}$]
	Sensor breakage
	Sensor short circuit



S+S REGELTECHNIK

NEW

THERMASGARD® ATM 2

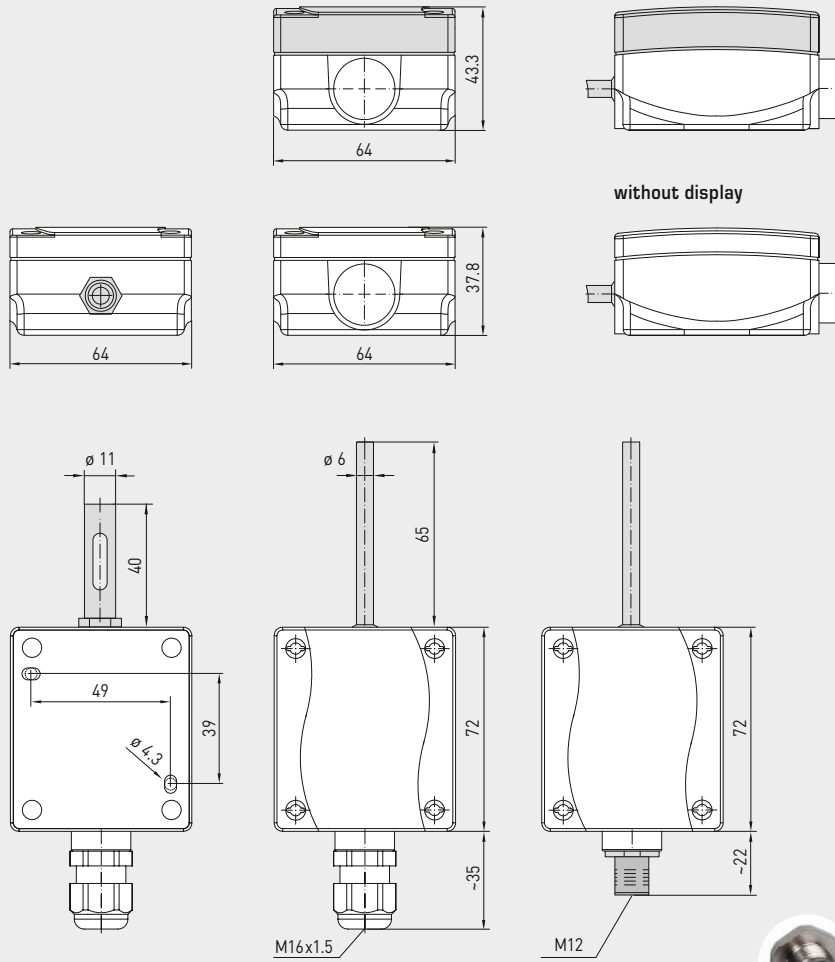
Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)



Dimensional drawing
[mm]

ATM 2

ATM 2
with cable gland
and display



Housing with
SS-02 (on request)

Housing with
cable gland

Housing with
M12 connector



ATM 2-Q
with M12 connector
and display



High-performance encapsulation against
vibration, mechanical stress and humidity

Automatic detection and switching
to standard signal 0...10V or 4...20 mA

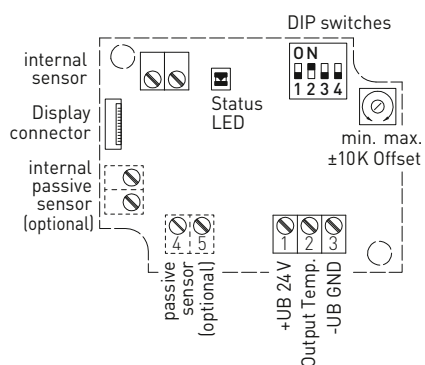
PS-PROTECTION
PERFECT SENSOR PROTECTION

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)

Schematic diagram

ATM 2 xx



2-wire connection*

ATM 2 - I

- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 -UB GND (optional for backlighting)

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

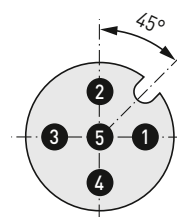
3-wire connection (AOS)

ATM 2 - A

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

Pin assignment (M12)

ATM 2 xx



- 1 +UB 24V
- 2 Output temperature
- 3 free
- 4 -UB GND
- 5 Shield

Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20... +150 °C	ON	ON	ON	-4... +302 °F
-50... +50 °C	OFF	ON	ON	-58... +122 °F
-20... +80 °C	ON	OFF	ON	-4... +176 °F
-30... +60 °C	OFF	OFF	ON	-22... +140 °F
0... +40 °C	ON	ON	OFF	32... +104 °F
0... +50 °C *	OFF	ON	OFF	32... +122 °F *
0... +100 °C	ON	OFF	OFF	32... +212 °F
0... +150 °C	OFF	OFF	OFF	32... +302 °F

* (default)

Display [°C] / [°F]	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

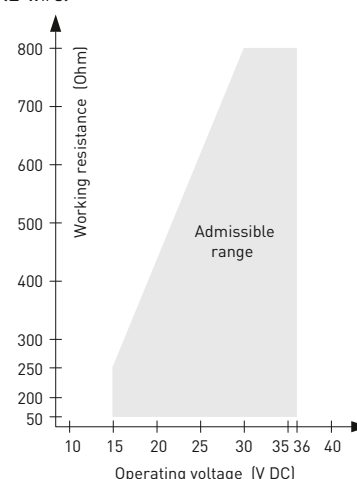
Display switchable

Temperature [°C] → [°F]

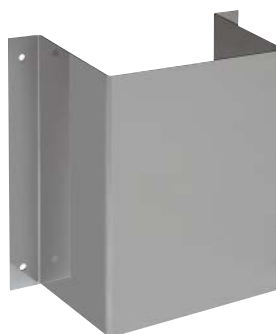
The display value depends on the set unit system (DIP 4).

Load resistance diagram (2-wire)

ATM 2 - I



For further technical information,
see the operating instructions

Accessories
WS-01Accessories
WS-04



NEW

S+S REGELTECHNIK

THERMASGARD® ATM 2

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

ATM 2-Q
with M12 connector



ATM 2
with cable gland

THERMASGARD® ATM 2			
Outside temperature / wet room temperature measuring transducers (with cable gland)			
Type / WG01	Output	Display	Item No.
ATM 2-I	(2-wire)		
ATM2-I	4...20 mA		1101-1142-0009-900
ATM2-I LCD	4...20 mA	■	1101-1142-2009-900
ATM 2-A	(3-wire AOS)		
ATM2-A	0-10 V / 4...20 mA		1101-114E-0009-900
ATM2-A LCD	0-10 V / 4...20 mA	■	1101-114E-2009-900
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Housing variant:	Cable connection with cable gland		
Extra charge:	other measuring ranges optional with sun protection SS02		
			on request

THERMASGARD® ATM 2-Q			
Outside temperature / wet room temperature measuring transducers (with M12 connector)			
Type / WG01	Output	Q / Display	Item No.
ATM 2-I Q	(2-wire)		
ATM2-I Q	4...20 mA	●	2001-6111-2100-001
ATM2-I Q LCD	4...20 mA	● ■	2001-6112-2100-001
ATM 2-A Q	(3-wire AOS)		
ATM2-A Q	0-10 V / 4...20 mA	●	2001-6111-B100-001
ATM2-A Q LCD	0-10 V / 4...20 mA	● ■	2001-6112-B100-001
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:	other measuring ranges optional with sun protection SS02		
			on request

ACCESSORIES			
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)		7100-0040-2000-000
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)		7100-0040-7000-000
Special accessories for M12 connector see chapter Accessories !			

**Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)**

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable outside temperature measuring transducer **THERMASGARD® ATM 2 - VA**, with eight switchable measuring ranges (max. -20...+150 °C), active output, external sensor, rugged housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

It is used to detect outside temperatures, temperatures in wet rooms, e.g. for installation on outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar irradiation, we recommend using our sun and ball-impact protection hood **WS01** or **WS03** (accessories). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

ATM2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

ATM2 - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ with AOS I variant $R_L > 15 \text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Measuring ranges:	multi-range switching with 8 measuring ranges, see table (other ranges optional) with manual zero point correction (± 10 K)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at +25 °C
Protective tube:	made from stainless steel V4A (1.4571), $\varnothing 6 \text{ mm}$, NL = 65 mm
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimension:	143 x 97 x 61 mm (Tyr2E)
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
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Process connection:	by means of screws
Ambient temperature:	measuring transducer -30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)



S+S REGELTECHNIK

NEW

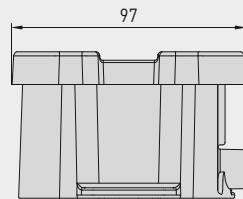
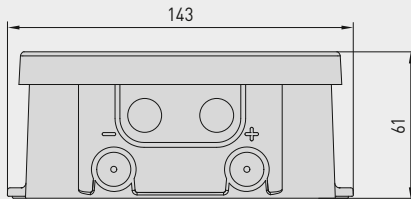
THERMASGARD® ATM 2 - VA

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

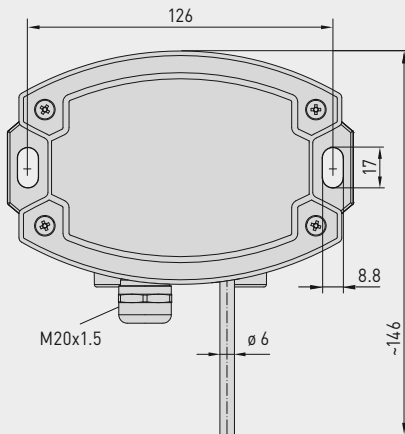


Dimensional drawing [mm]

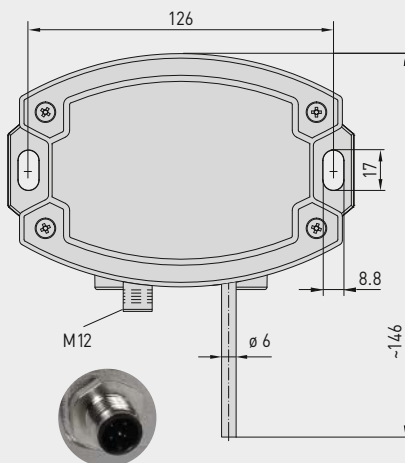
ATM 2 - VA



Housing with cable gland



Housing with M12 connector



ATM 2 - VA
with cable gland



ATM 2 - VAQ
with M12 connector



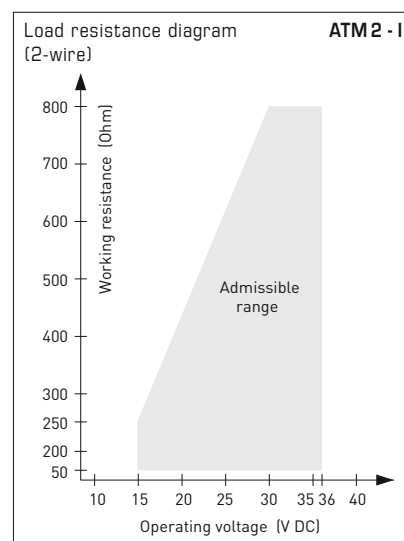
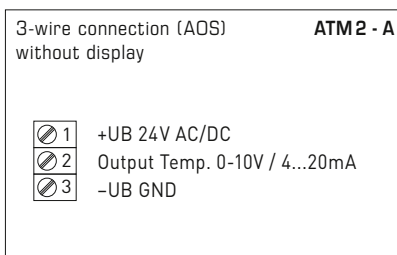
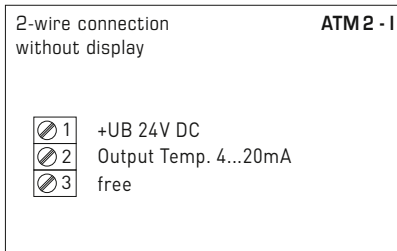
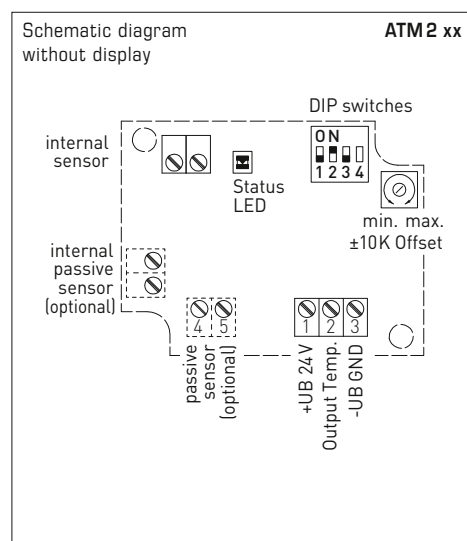
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching to standard signal 0...10V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

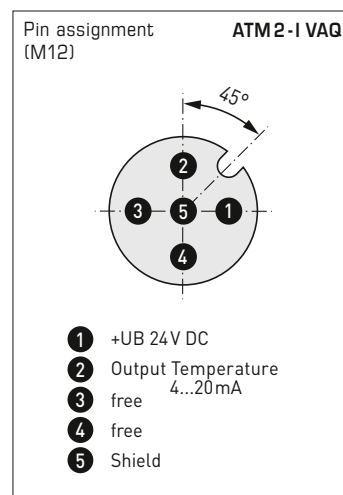
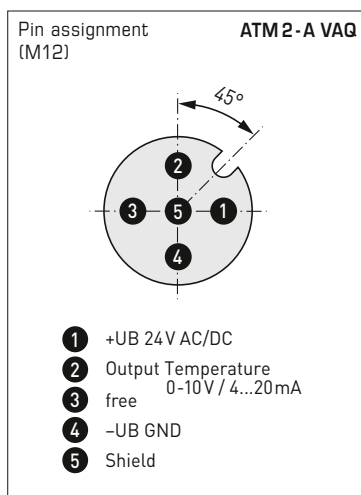
Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)



Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20... +150 °C	ON	ON	ON	-4... +302 °F
-50... +50 °C	OFF	ON	ON	-58... +122 °F
-20... +80 °C	ON	OFF	ON	-4... +176 °F
-30... +60 °C	OFF	OFF	ON	-22... +140 °F
0... +40 °C	ON	ON	OFF	32... +104 °F
0... +50 °C *	OFF	ON	OFF	32... +122 °F *
0... +100 °C	ON	OFF	OFF	32... +212 °F
0... +150 °C	OFF	OFF	OFF	32... +302 °F

* (default)

DIP4 has no function!

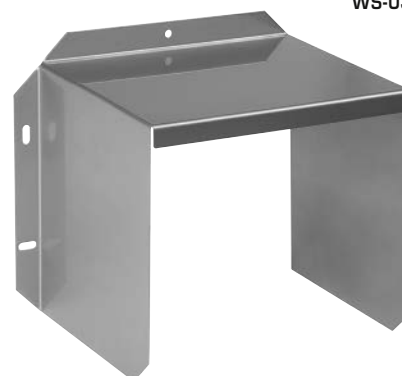


For further technical information,
see the operating instructions

Accessories
WS-01



Accessories
WS-03



**NEW****THERMASGARD® ATM 2 - VA**

S+S REGELTECHNIK

Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)

ATM 2 - VAQ

with M12 connector

**ATM 2 - VA**

with cable gland



THERMASGARD® ATM 2 - VA			Outside temperature / wet room temperature measuring transducers, <i>ID</i> (Stainless steel housing with cable gland)
Type / WG02I	Output	Item No.	
ATM 2 - I VA	(2-wire)		
ATM2-I VA	4...20 mA	2001-6171-2200-001	
ATM 2 - A VA	(3-wire AOS)		
ATM2-A VA	0-10 V / 4...20 mA	2001-6171-B200-001	
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Housing variant:	Cable connection with cable gland		
Extra charge:	other measuring ranges optional		

THERMASGARD® ATM 2 - VAQ			Outside temperature / wet room temperature measuring transducers, <i>ID</i> (Stainless steel housing with M12 connector)
Type / WG02I	Output	● = Q	Item No.
ATM 2 - I VAQ	(2-wire)		
ATM2-I VAQ	4...20 mA	●	2001-6171-2100-001
ATM 2 - A VAQ	(3-wire AOS)		
ATM2-A VAQ	0-10 V / 4...20 mA	●	2001-6171-B100-001
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:	other measuring ranges optional		

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-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000
Special accessories for M12 connector see chapter Accessories !		

Patented quality product (patent no. DE 10 2012 017 500.0 and DE 10 2015 015 941 B4)

Calibratable temperature measuring transducer **THERMASGARD® TM43**, with eight switchable measuring ranges (max. -20...+150 °C), active output, straight protective tube, housing made from impact-resistant plastic with snap-on lid (IP54), optionally with or without display. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. Available as a U variant (3-wire) or I variant (2-wire).

Calibratable temperature measuring transducer **THERMASGARD® TM65**, with eight switchable measuring ranges (max. -20...+150 °C), active output, straight protective tube, housing made from impact-resistant plastic with quick-locking screws (IP67), optionally with or without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

For the detection of temperatures in liquid or gaseous media. For aggressive media, stainless steel immersion sleeves must be used. It is used e.g. in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot-water and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

TMxx - U

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$ with U variant (TM43)
Connection type:	3-wire connection
Output:	0-10V

TMxx - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3 \text{ V}$
Working resistance:	$R_B (\Omega) = (U_B - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

TMxx - A (AOS)

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L = 25...450 \Omega$ with AOS I variant $R_L > 15 \text{ k}\Omega$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	SI (default) or imperial (TM65 can be changed via DIP switch)
Data points:	temperature [°C] [°F]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) with manual zero point correction ($\pm 10 \text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at +25 °C
Protective tube:	stainless steel, V4A (1.4571), $\varnothing = 6 \text{ mm}$, inserted length (EL) = 50-400 mm (see table)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! TM43 with snap-on lid TM65 with quick-locking screws (slotted / Phillips head combination)
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	TM43 IP54 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) TM65 IP67 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

TM43
with snap-on lid
(IP54)



TM65
with quick-locking screws
(IP67)

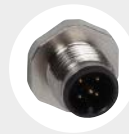
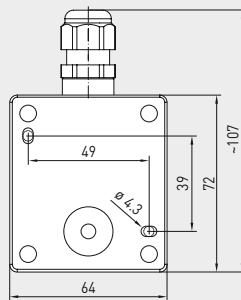
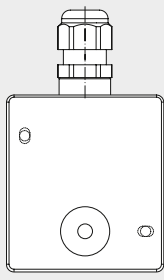
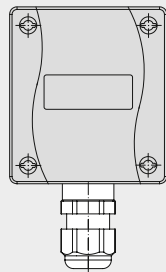
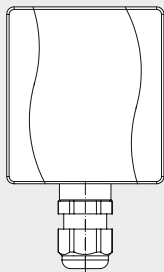
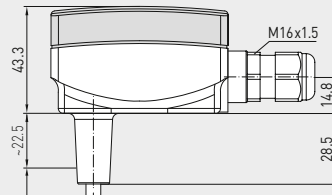
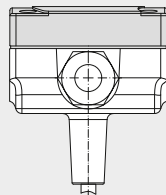
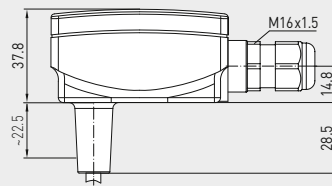
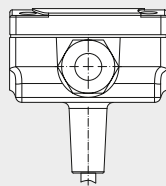


Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

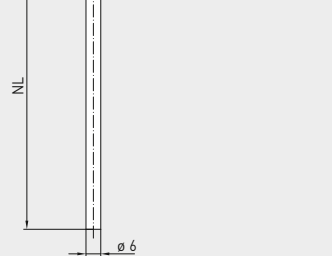
	Temperature [°C]
	Temperature [°F]
	Sensor breakage
	Sensor short circuit

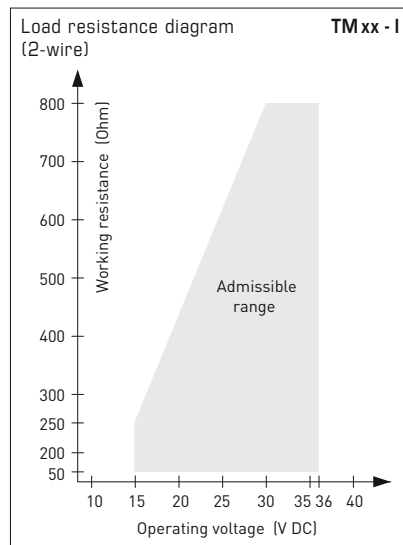
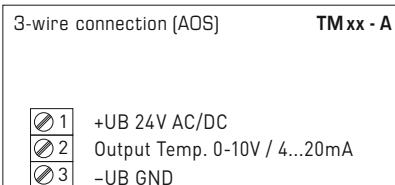
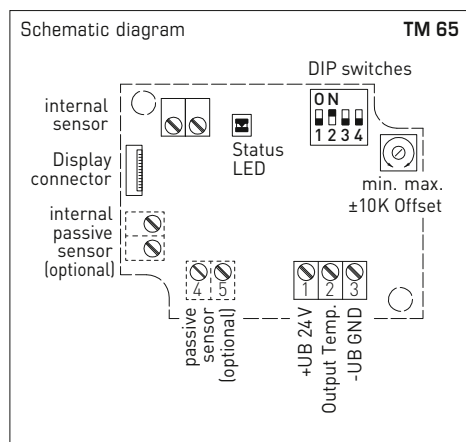
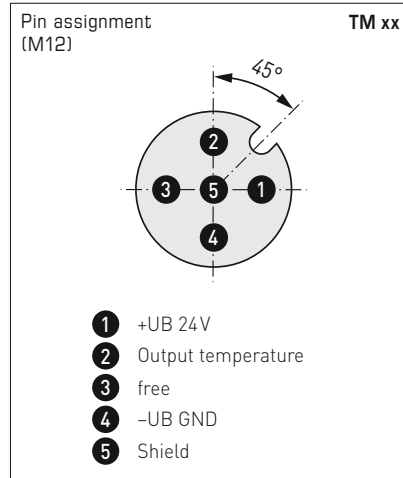
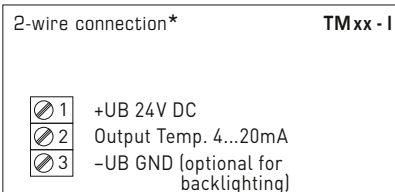
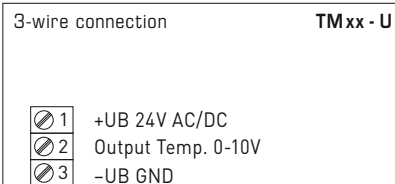
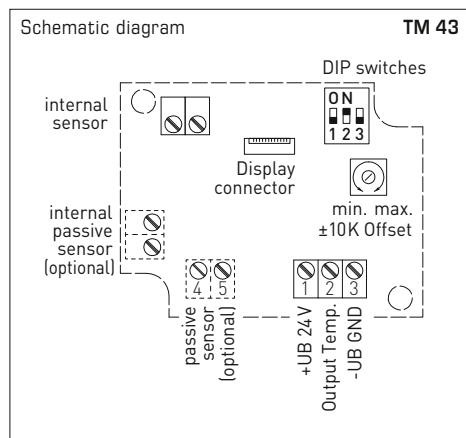
**NEW**

S+S REGELTECHNIK

THERMASGARD® TM 43
THERMASGARD® TM 65Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output (Automatic Output Switching)Dimensional drawing
[mm]**TM 43**
TM 65**M12 connector**
(optional on request)

with snap-on lid

with quick-locking
screws**TM 43**
with display and
snap-on lid
(IP 54)**TM 65**
with display and
quick-locking screws
(IP 67)High-performance encapsulation against
vibration, mechanical stress and humidityAutomatic detection and switching
to standard signal 0...10V or 4...20 mA**PS-PROTECTION**
PERFECT SENSOR PROTECTION**AOS-PATENTED**
AUTOMATIC OUTPUT SWITCHING**TM 65**
Basic device
with accessories



Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20...+150 °C	ON	ON	ON	-4...+302 °F
-50... +50 °C	OFF	ON	ON	-58...+122 °F
-20... +80 °C	ON	OFF	ON	-4...+176 °F
-30... +60 °C	OFF	OFF	ON	-22...+140 °F
0... +40 °C	ON	ON	OFF	32...+104 °F
0... +50 °C *	OFF	ON	OFF	32...+122 °F *
0...+100 °C	ON	OFF	OFF	32...+212 °F
0...+150 °C	OFF	OFF	OFF	32...+302 °F

* (default)

Display [°C] / [°F]	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

TM 65
Display switchable
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP 4**).

For further technical information, see the operating instructions



**NEW**

S+S REGELTECHNIK

THERMASGARD® TM 43
THERMASGARD® TM 65Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output (Automatic Output Switching)

THERMASGARD® TM 43 Temperature measuring transducer (basic device with snap-on lid), <i>Standard</i>				
Type / WG01B	Output	Inserted Length (EL)	Display	Item No.
TM 43-I	(2-wire)			IP54
TM43-I 50mm	4...20 mA	50 mm		1101-7112-0019-900
TM43-I 50mm LCD	4...20 mA	50 mm	■	1101-7112-2019-900
TM43-I 100mm	4...20 mA	100 mm		1101-7112-0029-900
TM43-I 100mm LCD	4...20 mA	100 mm	■	1101-7112-2029-900
TM43-I 150mm	4...20 mA	150 mm		1101-7112-0039-900
TM43-I 150mm LCD	4...20 mA	150 mm	■	1101-7112-2039-900
TM43-I 200mm	4...20 mA	200 mm		1101-7112-0049-900
TM43-I 200mm LCD	4...20 mA	200 mm	■	1101-7112-2049-900
TM43-I 250mm	4...20 mA	250 mm		1101-7112-0059-900
TM43-I 250mm LCD	4...20 mA	250 mm	■	1101-7112-2059-900
TM43-I 300mm	4...20 mA	300 mm		1101-7112-0069-900
TM43-I 300mm LCD	4...20 mA	300 mm	■	1101-7112-2069-900
TM 43-U	(3-wire)			IP54
TM43-U 50mm	0-10 V	50 mm		1101-7111-0019-900
TM43-U 50mm LCD	0-10 V	50 mm	■	1101-7111-2019-900
TM43-U 100mm	0-10 V	100 mm		1101-7111-0029-900
TM43-U 100mm LCD	0-10 V	100 mm	■	1101-7111-2029-900
TM43-U 150mm	0-10 V	150 mm		1101-7111-0039-900
TM43-U 150mm LCD	0-10 V	150 mm	■	1101-7111-2039-900
TM43-U 200mm	0-10 V	200 mm		1101-7111-0049-900
TM43-U 200mm LCD	0-10 V	200 mm	■	1101-7111-2049-900
TM43-U 250mm	0-10 V	250 mm		1101-7111-0059-900
TM43-U 250mm LCD	0-10 V	250 mm	■	1101-7111-2059-900
TM43-U 300mm	0-10 V	300 mm		1101-7111-0069-900
TM43-U 300mm LCD	0-10 V	300 mm	■	1101-7111-2069-900

THERMASGARD® TM 65 Temperature measuring transducer (basic device with quick-locking screws), <i>Premium</i>				
Type / WG01	Output	Inserted Length (EL)	Display	Item No.
TM 65-I	(2-wire)			IP67
TM65-I 50mm	4...20 mA	50 mm		1101-7122-0019-900
TM65-I 50mm LCD	4...20 mA	50 mm	■	1101-7122-2019-900
TM65-I 100mm	4...20 mA	100 mm		1101-7122-0029-900
TM65-I 100mm LCD	4...20 mA	100 mm	■	1101-7122-2029-900
TM65-I 150mm	4...20 mA	150 mm		1101-7122-0039-900
TM65-I 150mm LCD	4...20 mA	150 mm	■	1101-7122-2039-900
TM65-I 200mm	4...20 mA	200 mm		1101-7122-0049-900
TM65-I 200mm LCD	4...20 mA	200 mm	■	1101-7122-2049-900
TM65-I 250mm	4...20 mA	250 mm		1101-7122-0059-900
TM65-I 250mm LCD	4...20 mA	250 mm	■	1101-7122-2059-900
TM65-I 300mm	4...20 mA	300 mm		1101-7122-0069-900
TM65-I 300mm LCD	4...20 mA	300 mm	■	1101-7122-2069-900
TM65-I 400mm	4...20 mA	400 mm		1101-7122-0089-900
TM65-I 400mm LCD	4...20 mA	400 mm	■	1101-7122-2089-900
TM 65-A	* (3-wire AOS)			IP67
TM65-A 50mm	0-10 V / 4...20 mA	50 mm		1101-712E-0019-900
TM65-A 50mm LCD	0-10 V / 4...20 mA	50 mm	■	1101-712E-2019-900
TM65-A 100mm	0-10 V / 4...20 mA	100 mm		1101-712E-0029-900
TM65-A 100mm LCD	0-10 V / 4...20 mA	100 mm	■	1101-712E-2029-900
TM65-A 150mm	0-10 V / 4...20 mA	150 mm		1101-712E-0039-900
TM65-A 150mm LCD	0-10 V / 4...20 mA	150 mm	■	1101-712E-2039-900
TM65-A 200mm	0-10 V / 4...20 mA	200 mm		1101-712E-0049-900
TM65-A 200mm LCD	0-10 V / 4...20 mA	200 mm	■	1101-712E-2049-900
TM65-A 250mm	0-10 V / 4...20 mA	250 mm		1101-712E-0059-900
TM65-A 250mm LCD	0-10 V / 4...20 mA	250 mm	■	1101-712E-2059-900
TM65-A 300mm	0-10 V / 4...20 mA	300 mm		1101-712E-0069-900
TM65-A 300mm LCD	0-10 V / 4...20 mA	300 mm	■	1101-712E-2069-900
TM65-A 400mm	0-10 V / 4...20 mA	400 mm		1101-712E-0089-900
TM65-A 400mm LCD	0-10 V / 4...20 mA	400 mm	■	1101-712E-2089-900

Automatic Output Switching:	* patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Extra charge:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output (Automatic Output Switching)

One basic device in four variants ...



PATENTED

DE 10 2012 017 500.0

**TMxx +
TH08-MS-G/xx**

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

**TMxx +
TH08-VA/xx**

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

**TMxx +
TH08-VA/xx/90**

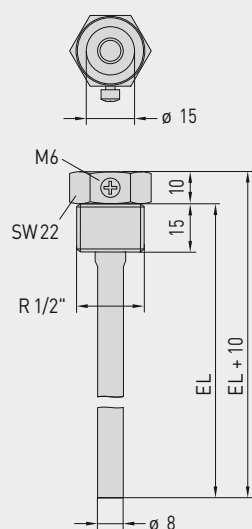
Immersion / screw-in
temperature sensor with
immersion sleeve with neck
tube, stainless steel, V4A

**TMxx +
MF-15-K**

Duct temperature sensor
with mounting flange, plastic

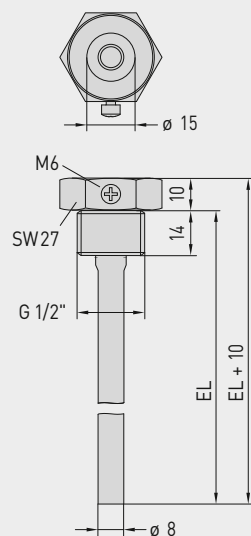
TH08-MS-G/xx

Dimensional drawing
[mm]



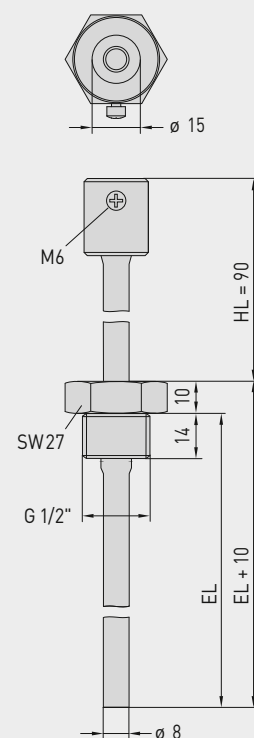
TH08-VA/xx

Dimensional drawing
[mm]



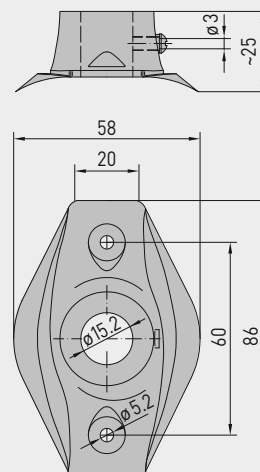
TH08-VA/xx/90

Dimensional drawing
[mm]



MF-15-K

Dimensional drawing
[mm]





S+S REGELTECHNIK

THERMASGARD® TM 43
THERMASGARD® TM 65

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output (Automatic Output Switching)

...through combination with accessories:



TH08-MS-G/xx

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



TH08-VA/xx

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



TH08-VA/xx/90

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



MF-15-K

Mounting flange,
plastic

THERMASGARD® TH08 Immersion sleeve Ø 8 mm (Accessories)				
Type / WG01B	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.
TH08-MS-G xx	polished brass			without neck tube
TH08-MS-G 50MM	10 bar	+150 °C	50 mm	7100-0017-0010-132
TH08-MS-G 100MM	10 bar	+150 °C	100 mm	7100-0017-0020-132
TH08-MS-G 150MM	10 bar	+150 °C	150 mm	7100-0017-0030-132
TH08-MS-G 200MM	10 bar	+150 °C	200 mm	7100-0017-0040-132
TH08-MS-G 250MM	10 bar	+150 °C	250 mm	7100-0017-0050-132
TH08-MS-G 300MM	10 bar	+150 °C	300 mm	7100-0017-0060-132
TH08-MS-G 350MM	10 bar	+150 °C	350 mm	7100-0017-0070-132
TH08-MS-G 400MM	10 bar	+150 °C	400 mm	7100-0017-0080-132
TH08-VA / xx	Stainless steel, V4A (1.4571)			without neck tube
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132
TH08-VA / xx / 90	Stainless steel, V4A (1.4571)			with neck tube (90 mm)
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132
Note:	inner diameter of socket 15.0 mm For further information see last chapter!			
Mounting flange (Accessories)				
Type / WG01B			T _{max}	Item No.
MF				
MF-15-K	Mounting flange, plastic, 56.8x84.3 mm, Ø 15.2 mm tube gland		+100 °C	7100-0032-0000-000
Note:	For further information see last chapter!			

Mean value / rod / duct temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
and active output (Automatic Output Switching)

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable mean-value temperature measuring transducer **THERMASGARD® MWTM** (rod sensor 0.4...20 m), with eight switchable measuring ranges (max. $-20...+150^{\circ}\text{C}$), active output, housing made from impact-resistant plastic with quick-locking screws, with bendable sensor rod (fully active), protective tube made from copper, plastic-coated, and anti-kink spring, incl. mounting flange, optionally with or without display. The standard display can be changed from SI ($^{\circ}\text{C}$) to imperial ($^{\circ}\text{F}$) units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

Calibratable mean-value temperature measuring transducer **THERMASGARD® MWTM-SD** (rod sensor 3 m / 6 m) with eight switchable measuring ranges (max. $-20...+150^{\circ}\text{C}$), active output, housing made from impact-resistant plastic with snap-on lid, with bendable sensor rod (fully active), protective tube made from reinforced thermoplastic hose and anti-kink spring, incl. mounting flange. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. Available as a U variant (3-wire) or I variant (2-wire).

The sensor is used to detect the mean temperature (mean value) in gaseous media, e.g. in ventilation and air conditioning ducts over the entire cross section or over a defined length. Laid along a meandering route, it uniformly detects the surrounding temperature, as a duct temperature sensor. For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

MWTM
Rod length 0.4 m / 3 m / 6 m
(IP 65)

TECHNICAL DATA**MWTM - U**

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L > 15\text{ k}\Omega$ with U variant (MWTM-SD)
Connection type:	3-wire connection
Output:	0-10 V

MWTM - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a (\Omega) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

MWTM - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ }\Omega$ with AOS I variant $R_L > 15\text{ k}\Omega$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}; < 2.2\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or imperial (MWTM can be changed via DIP switch)
Data points:	temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) $T_{\min} -30^{\circ}\text{C}$, $T_{\max} +80^{\circ}\text{C}$ with manual zero point correction ($\pm 10\text{ K}$)

Sensor: Pt1000, DIN EN 60751, class B

Accuracy, temperature: typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$

Sensors: active across the entire length (averaging)

Rod material: **protective tube made from copper, plastic-coated (MWTM)**
(made from reinforced thermoplastic hose for the **MWTM-SD**),
with anti-kink spring and sleeve, stainless steel V4A (1.4571)

Rod dimensions: $\varnothing = 5.0\text{ mm}$, nominal length (NL) = 0.4 m / 3 m / 6 m
(nominal length optionally up to max. 20 m), see table

Rod laying: **Observe the admissible values!**
Bending radius: **$> 35\text{ mm}$**
Vibration load: **$\leq 0.5\text{ g}$**
Tensile load: **$< 480\text{ N}$ (MWTM) / $< 100\text{ N}$ (MWTM-SD)**

Housing: plastic, UV-resistant, material polyamide,
30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
MWTM-SD with snap-on lid
MWTM with quick-locking screws
(slotted / Phillips head combination),
housing cover for display is transparent!

Housing dimension: 72 x 64 x 37.8 mm (Tyr 1 without display)
72 x 64 x 43.3 mm (Tyr 1 with display)

Cable connection: **cable gland**, plastic (M 16 x 1.5; with strain relief,
exchangeable, max. inner diameter 10.4 mm) **or**
M12 connector according to DIN EN 61076-2-101 (optional on request)

Electrical connection: 0.14 - 1.5 mm², via terminal screws

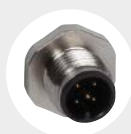
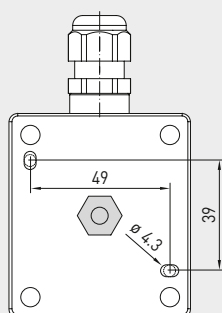
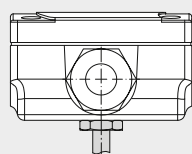
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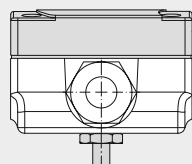
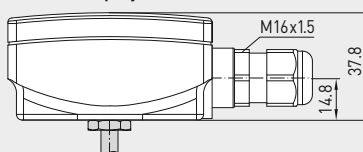
MWTM-SD
Rod length 3 m / 6 m
(IP 54)

**NEW**

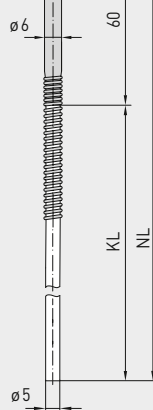
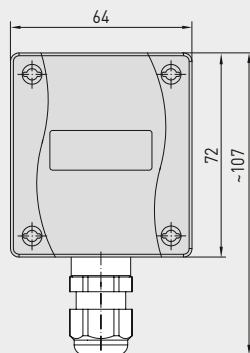
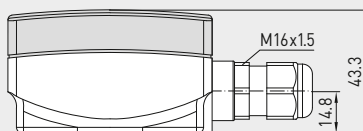
S+S REGELTECHNIK

THERMASGARD® MWTM
THERMASGARD® MWTM-SDMean value / rod / duct temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
and active output (Automatic Output Switching)Dimensional drawing
(mm)**M12 connector**
(optional on request)

without display



with display

**MWTM****MWTM**Rod length 0.4 m / 3 m / 6 m
with Display
(IP 65)Automatic detection and switching
to standard signal 0...10V or 4...20 mA**AOS-PATENTED**
AUTOMATIC OUTPUT SWITCHING**TECHNICAL DATA**

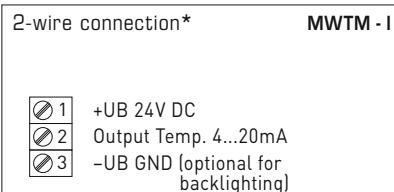
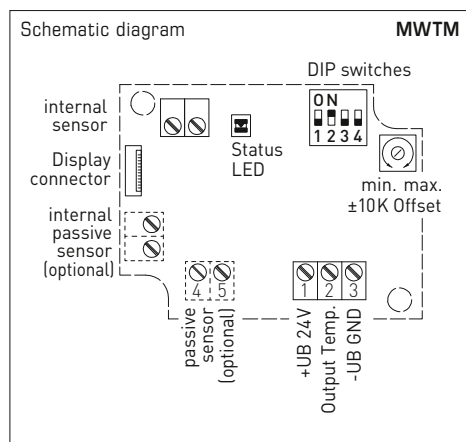
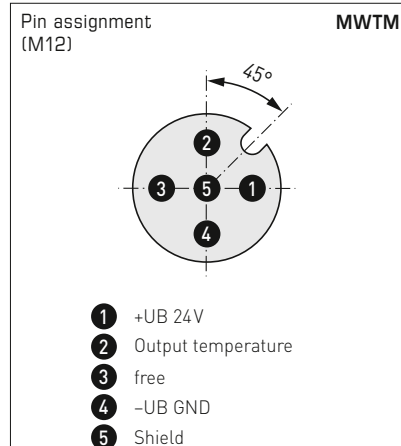
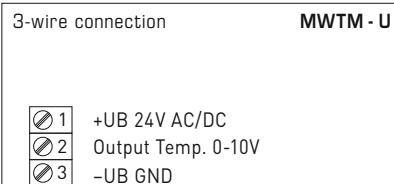
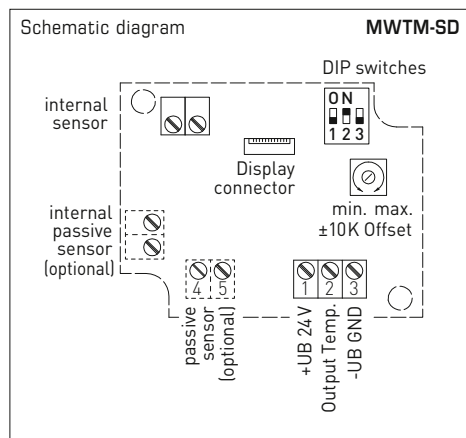
(continued)

Process connection:	by mounting flange, plastic MF-06-K (included in the scope of delivery, galvanised steel optional) and mounting clamps MK-05-M (from 3 m rod length, included in the scope of delivery)
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	MWTM-SD IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) MWTM IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36 x15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

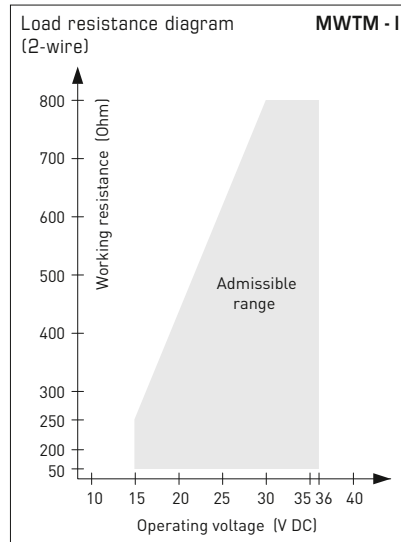
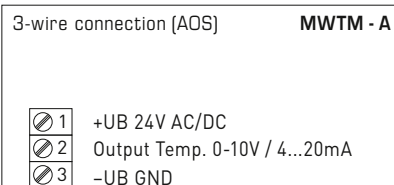
Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

	Temperature [°C]
	Temperature [°F]
	Sensor breakage
	Sensor short circuit

Mean value / rod / duct temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
and active output (Automatic Output Switching)



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



Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20...+150 °C	ON	ON	ON	-4...+302 °F
-50... +50 °C	OFF	ON	ON	-58...+122 °F
-20... +80 °C	ON	OFF	ON	-4...+176 °F
-30... +60 °C	OFF	OFF	ON	-22...+140 °F
0... +40 °C	ON	ON	OFF	32...+104 °F
0... +50 °C *	OFF	ON	OFF	32...+122 °F *
0...+100 °C	ON	OFF	OFF	32...+212 °F
0...+150 °C	OFF	OFF	OFF	32...+302 °F

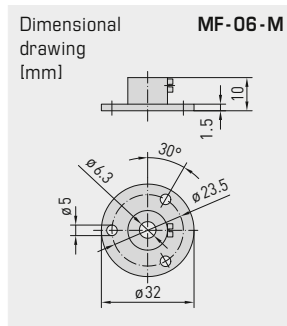
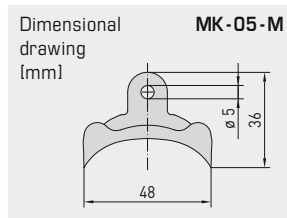
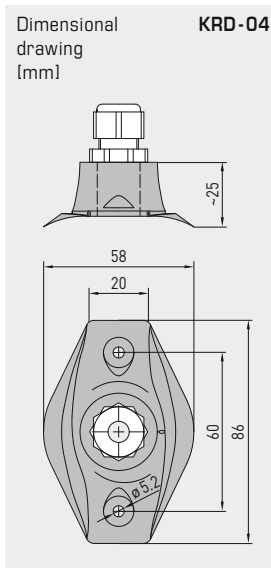
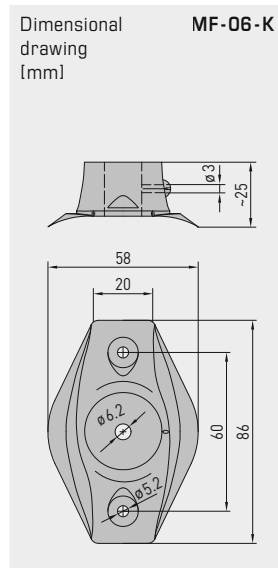
* (default)

Display [°C] / [°F]	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

MWTM
Display switchable
Temperature [°C] → [°F]

The display value depends on the set unit system (DIP 4).

For further technical information, see the operating instructions



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

KRD-04
Capillary tube bushing, plastic (optional)

MK-05-M
Mounting clamps, galvanised steel (from 3m rod length, included in the scope of delivery)

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





NEW

S+S REGELTECHNIK

THERMASGARD® MWTM
THERMASGARD® MWTM-SDMean value / rod / duct temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
and active output (Automatic Output Switching)

THERMASGARD® MWTM-SD		Mean-value temperature measuring transducer with rod made from reinforced thermoplastic hose (black), <i>Standard</i>		
Type / WG01B	Output	Rod length	(without display)	Item No.
MWTM-SD-I	(2-wire)			IP 54
MWTM-SD-I 3m	4...20 mA	3.0 m		1101-3132-0239-90K
MWTM-SD-I 6m	4...20 mA	6.0 m		1101-3132-0269-90K
MWTM-SD-U	(3-wire)			IP 54
MWTM-SD-U 3m	0-10 V	3.0 m		1101-3131-0239-90K
MWTM-SD-U 6m	0-10 V	6.0 m		1101-3131-0269-90K

THERMASGARD® MWTM		Mean-value temperature measuring transducer with rod made from copper, plastic-coated (blue), <i>Premium</i>		
Type / WG01	Output	Rod length	Display	Item No.
MWTM-I	(2-wire)			IP 65
MWTM-I 0,4m	4...20 mA	0.4 m		1101-3132-0089-900
MWTM-I 0,4m LCD	4...20 mA	0.4 m	■	1101-3132-1089-900
MWTM-I 3m	4...20 mA	3.0 m		1101-3132-0239-900
MWTM-I 3m LCD	4...20 mA	3.0 m	■	1101-3132-1239-900
MWTM-I 6m	4...20 mA	6.0 m		1101-3132-0269-900
MWTM-I 6m LCD	4...20 mA	6.0 m	■	1101-3132-2269-900
MWTM-A	(3-wire AOS)			IP 65
MWTM-A 0,4m	0-10 V / 4...20 mA	0.4 m		1101-313E-0089-900
MWTM-A 0,4m LCD	0-10 V / 4...20 mA	0.4 m	■	1101-313E-1089-900
MWTM-A 3m	0-10 V / 4...20 mA	3.0 m		1101-313E-0239-900
MWTM-A 3m LCD	0-10 V / 4...20 mA	3.0 m	■	1101-313E-2239-900
MWTM-A 6m	0-10 V / 4...20 mA	6.0 m		1101-313E-0269-900
MWTM-A 6m LCD	0-10 V / 4...20 mA	6.0 m	■	1101-313E-1269-900
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Extra charge:	other ranges optional per meter sensor cable (from 6 m to max. 20 m)			on request
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request

ACCESSORIES		
MF-06-K	Mounting flange, plastic (included in the scope of delivery)	7100-0030-1000-000
MF-06-M	Mounting flange, metal (Galvanised steel), Ø 35 mm	7100-0030-5000-100
KRD-04	Capillary tube gland bracket, plastic	7100-0030-7000-000
MK-05-M	Mounting clamps, galvanised steel (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000
For further information see chapter Accessories!		

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

S+S REGELTECHNIK

TM 54
Basic unit

Calibratable temperature measuring transducer **THERMASGARD® TM 54** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

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

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_B \text{ (ohm)} = (U_B - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60571, class B) (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) $T_{\max} = +150^\circ\text{C}$ with manual zero point correction (± 10 K)
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Cable connection:	TM 54 (standard) adjusting screw made of metal (M20 x 1.5) TM 54-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) TM 54-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -30...+70 °C
Protective tube:	stainless steel, V4A (1.4571) Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) TM 54 IP 65 (according to EN 60 529) TM 54-KV / TM 54-Q
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)
TH-MS / xx	Immersion sleeve, brass, nickel-plated / galvanised Ø = 8 mm, $T_{\max} = +150^\circ\text{C}$, $p_{\max} = 10 \text{ bar}$
TH-VA / xx	Immersion sleeve, stainless steel, V4A (1.4571), Ø = 8 mm, $T_{\max} = +600^\circ\text{C}$, $p_{\max} = 40 \text{ bar}$
TH-VA / xx / 90	Immersion sleeve, stainless steel, V4A (1.4571), with neck tube (90 mm), Ø = 8 mm, $T_{\max} = +600^\circ\text{C}$, $p_{\max} = 40 \text{ bar}$
MF-06-M	Mounting flange, metal, galvanised steel, Ø = 32 mm, Ø = 6.3 mm tube gland, $T_{\max} = +700^\circ\text{C}$

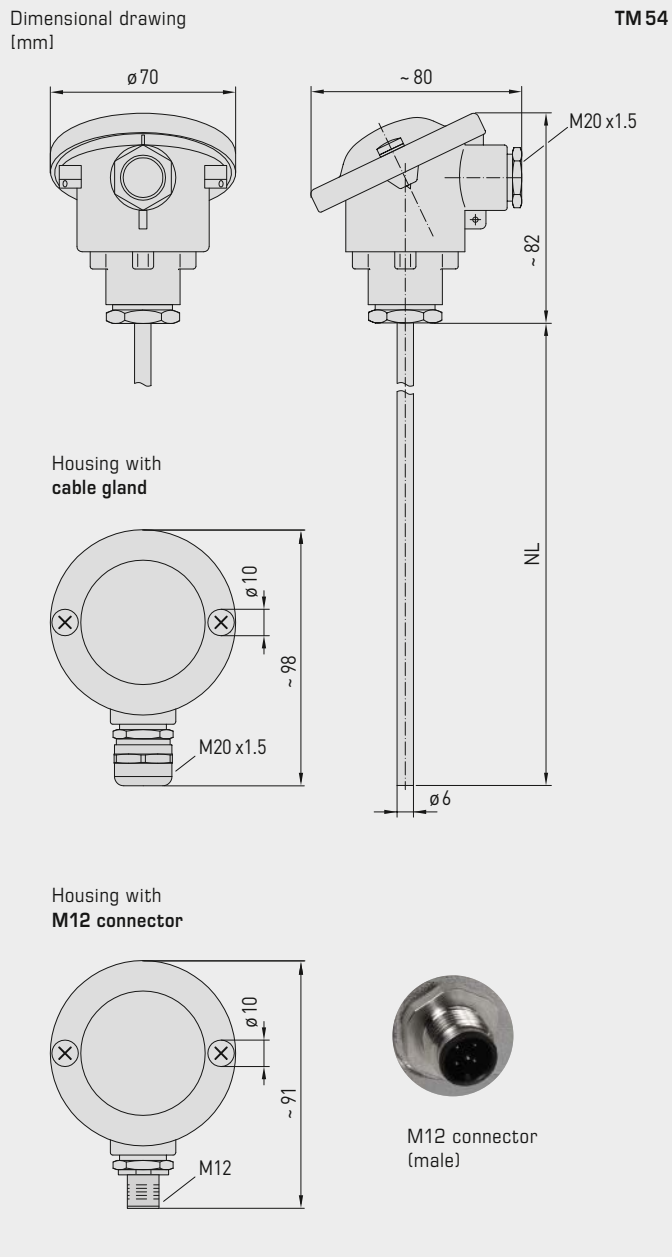




S+S REGELTECHNIK

THERMASGARD® TM 54

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



High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

TM 54
standard
(IP 54)



TM 54 - KV
with cable gland
(IP 65)



TM 54 - Q
with M12 connector
(IP 65)



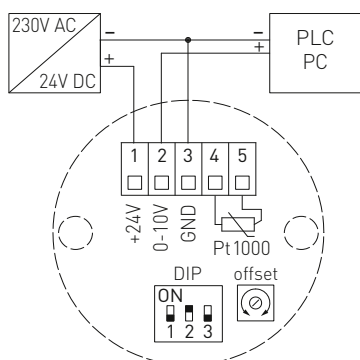
Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output



S+S REGELTECHNIK

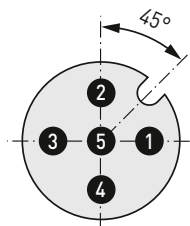
Connecting diagram

TM 54-U



Pin assignment
(M12)

TM 54-U



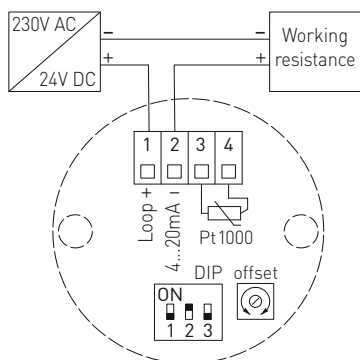
- 1 +UB 24V AC/DC
- 2 Output temperature 0-10V
- 3 free
- 4 -UB GND
- 5 Shield

TM 54-U
Connecting head



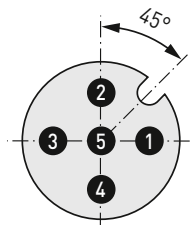
Connecting diagram

TM 54-I



Pin assignment
(M12)

TM 54-I



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

TM 54-I
Connecting head



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
standard
(IP 54)



TM 54-KV
with cable gland
(IP 65)



TM 54-Q
with M12 connector
(IP 65)



THERMASGARD® TM 54				
Temperature measuring transducer (Standard)				
Type / WG01	Output	Installation length (EL)	Item No. Output 0-10 V	Item No. Output 4...20 mA
TM 54-x	x = U / I		IP 54, U-variant	IP 54, I-variant
TM 54-x 50mm	0-10 V / 4...20 mA	50 mm	1101-7151-0019-910	1101-7152-0019-910
TM 54-x 100mm	0-10 V / 4...20 mA	100 mm	1101-7151-0029-910	1101-7152-0029-910
TM 54-x 150mm	0-10 V / 4...20 mA	150 mm	1101-7151-0039-910	1101-7152-0039-910
TM 54-x 200mm	0-10 V / 4...20 mA	200 mm	1101-7151-0049-910	1101-7152-0049-910
TM 54-x 250mm	0-10 V / 4...20 mA	250 mm	1101-7151-0059-910	1101-7152-0059-910
TM 54-x 300mm	0-10 V / 4...20 mA	300 mm	1101-7151-0069-910	1101-7152-0069-910
TM 54-x 350mm	0-10 V / 4...20 mA	350 mm	1101-7151-0079-910	1101-7152-0079-910
TM 54-x 400mm	0-10 V / 4...20 mA	400 mm	1101-7151-0089-910	1101-7152-0089-910
Housing variant:		with pressure screw (IP 54)		
Extra charge:		other measuring ranges optional		

THERMASGARD® TM 54-KV				
Temperature measuring transducer (with cable gland)				
Type / WG01	Output	Installation length (EL)	Item No. Output 0-10 V	Item No. Output 4...20 mA
TM 54-x KV	x = U / I		IP 65, U-variant	IP 65, I-variant
TM 54-x 50mm KV	0-10 V / 4...20 mA	50 mm	1101-7171-0019-910	1101-7172-0019-910
TM 54-x 100mm KV	0-10 V / 4...20 mA	100 mm	1101-7171-0029-910	1101-7172-0029-910
TM 54-x 150mm KV	0-10 V / 4...20 mA	150 mm	1101-7171-0039-910	1101-7172-0039-910
TM 54-x 200mm KV	0-10 V / 4...20 mA	200 mm	1101-7171-0049-910	1101-7172-0049-910
TM 54-x 250mm KV	0-10 V / 4...20 mA	250 mm	1101-7171-0059-910	1101-7172-0059-910
TM 54-x 300mm KV	0-10 V / 4...20 mA	300 mm	1101-7171-0069-910	1101-7172-0069-910
TM 54-x 350mm KV	0-10 V / 4...20 mA	350 mm	1101-7171-0079-910	1101-7172-0079-910
TM 54-x 400mm KV	0-10 V / 4...20 mA	400 mm	1101-7171-0089-910	1101-7172-0089-910
Housing variant "KV":		with cable gland (IP 65)		
Extra charge:		other measuring ranges optional		

THERMASGARD® TM 54-Q					
Temperature measuring transducer (with M12 connector)					
Type / WG02	Output	Installation length (EL)	Q ●	Item No. Output 0-10 V	Item No. Output 4...20 mA
TM 54-x Q	x = U / I			IP 65, U-variant	IP 65, I-variant
TM 54-x 50mm Q	0-10 V / 4...20 mA	50 mm	●	2001-4111-1100-011	2001-4111-2100-011
TM 54-x 100mm Q	0-10 V / 4...20 mA	100 mm	●	2001-4111-1100-021	2001-4111-2100-021
TM 54-x 150mm Q	0-10 V / 4...20 mA	150 mm	●	2001-4111-1100-031	2001-4111-2100-031
TM 54-x 200mm Q	0-10 V / 4...20 mA	200 mm	●	2001-4111-1100-041	2001-4111-2100-041
TM 54-x 250mm Q	0-10 V / 4...20 mA	250 mm	●	2001-4111-1100-051	2001-4111-2100-051
TM 54-x 300mm Q	0-10 V / 4...20 mA	300 mm	●	2001-4111-1100-061	2001-4111-2100-061
TM 54-x 350mm Q	0-10 V / 4...20 mA	350 mm	●	2001-4111-1100-071	2001-4111-2100-071
TM 54-x 400mm Q	0-10 V / 4...20 mA	400 mm	●	2001-4111-1100-081	2001-4111-2100-081
Housing variant "Q":		with M12 connector (male, 5-pin, A-code) (IP 65)			
Extra charge:		other measuring ranges optional			

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

One basic device in four variants ...



**TM54 +
TH-MS/xx**

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



**TM54 +
TH-VA/xx**

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



**TM54 +
TH-VA/xx/90**

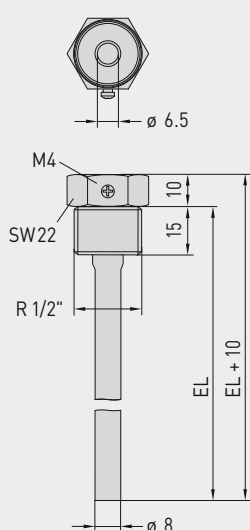
Immersion / screw-in
temperature sensor with
immersion sleeve with neck
tube, stainless steel, V4A



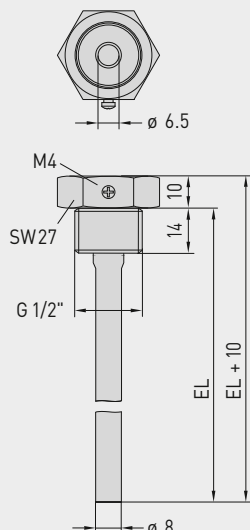
**TM54 +
MF-06-M**

Duct temperature sensor
with mounting flange, metal

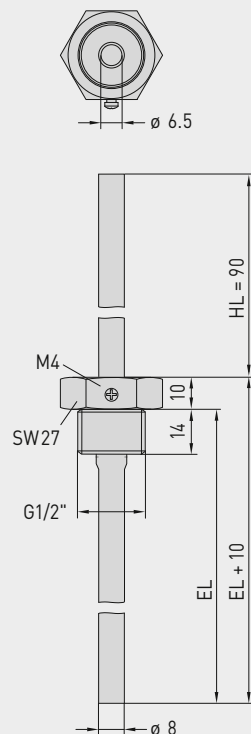
Dimensional drawing
TH-MS/xx



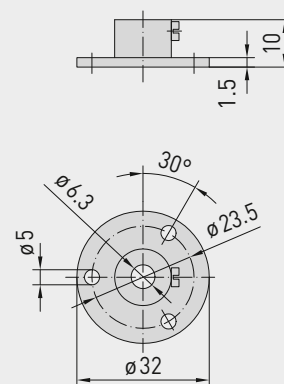
Dimensional drawing
TH-VA/xx



Dimensional drawing
TH-VA/xx/90



Dimensional drawing
MF-06-M





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THERMASGARD® TM 54

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

...through combination with accessories:



TH-MS/xx

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



TH-VA/xx

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



TH-VA/xx/90

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



MF-06-M

Mounting flange,
metal

THERMASGARD® TH					Immersion sleeve Ø 8 mm (accessories)	
Type / WG01	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.		
TH-MS / xx	Brass nickel-plated / galvanised			without neck tube		
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001		
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001		
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001		
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001		
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001		
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001		
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001		
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001		
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 last chapter!	
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	7100-0030-5000-100	
Note:					For further information see last chapter!	

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

The duct sensor is used to detect high temperatures in gaseous media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60751, class B) (Perfect Sensor Protection)
Measuring ranges:	Multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) with manual zero point correction (± 10 K)
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Cable connection:	RGTM 1 (Standard) adjusting screw made of metal (M20 x 1.5); RGTM 1-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTM 1-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	Form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -30...+70 °C
Protective tube:	Stainless steel, V4A (1.4571), Ø = 8 mm inserted length (EL) = 200 - 400 mm (see table)
Process connection:	by mounting flange stainless steel V2A (1.4305) (included in the scope of delivery)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) RGTM 1 IP 65 (according to EN 60 529) RGTM 1-KV / RGTM 1-Q
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

RGTM 1
Basic unit



RGTM 1
Measuring insert with
ceramic tubelet
in metal sleeve



S+S REGELTECHNIK

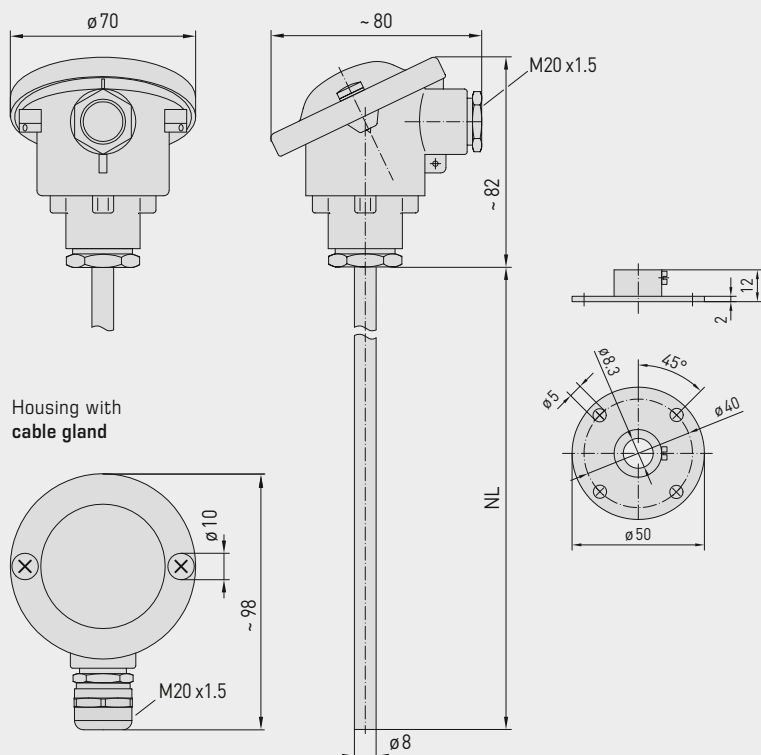
THERMASGARD® RGTM 1

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

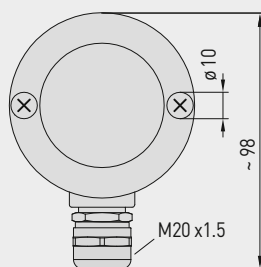


Dimensional drawing
[mm]

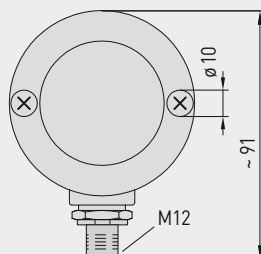
RGTM 1



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

RGTM 1
standard
(IP 54)



RGTM 1 - KV
with cable gland
(IP 65)



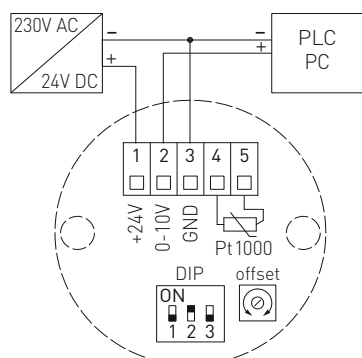
RGTM 1 - Q
with M12 connector
(IP 65)



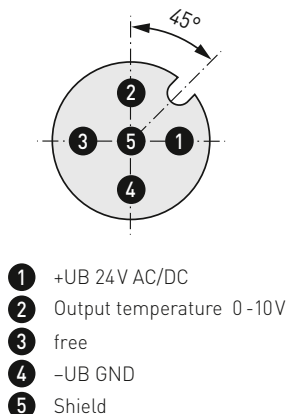
Duct/smoke gas temperature measuring transducer,
incl. mounting flange, calibratable, with multi-range switching
and active output

S+S REGELTECHNIK

Connecting diagram **RGTM 1-U**



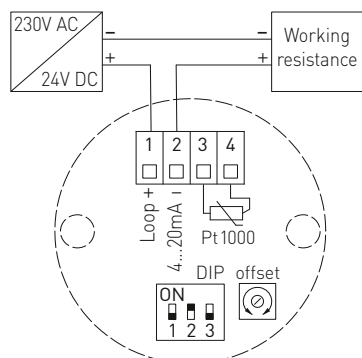
Pin assignment (M12) **RGTM 1-U**



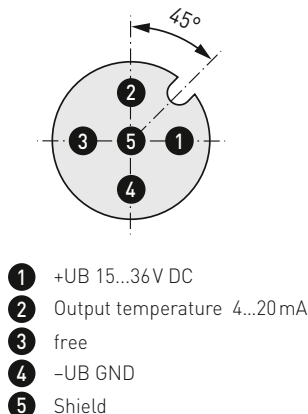
RGTM 1-U
Connecting head



Connecting diagram **RGTM 1-I**



Pin assignment (M12) **RGTM 1-I**



RGTM 1-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
0...+50 °C (default)	OFF	ON	ON
0...+100 °C	ON	OFF	ON
0...+200 °C	OFF	OFF	ON
0...+300 °C	ON	ON	OFF
0...+400 °C	OFF	ON	OFF
0...+500 °C	ON	OFF	OFF
0...+600 °C	OFF	OFF	OFF





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

THERMASGARD® RGTM 1				
Duct / smoke gas temperature sensor, incl. mounting flange (standard)				
Type / WG01	Output	Installation length (EL)	Item No. Output 0-10 V	Item No. Output 4...20 mA
RGTM 1-x	x = U / I		IP 54, U-variant	IP 54, I-variant
RGTM 1-x 200mm	0-10 V / 4...20 mA	200 mm	1101-3121-0049-810	1101-3122-0049-810
RGTM 1-x 250mm	0-10 V / 4...20 mA	250 mm	1101-3121-0059-810	1101-3122-0059-810
RGTM 1-x 300mm	0-10 V / 4...20 mA	300 mm	1101-3121-0069-810	1101-3122-0069-810
RGTM 1-x 400mm	0-10 V / 4...20 mA	400 mm	1101-3121-0089-810	1101-3122-0089-810
Housing variant:		with pressure screw (IP 54)		
Extra charge:		other measuring ranges optional		

THERMASGARD® RGTM 1 - KV				
Duct / smoke gas temperature sensor, incl. mounting flange (with cable gland)				
Type / WG01	Output	Installation length (EL)	Item No. Output 0-10 V	Item No. Output 4...20 mA
RGTM 1-x KV	x = U / I		IP 65, U-variant	IP 65, I-variant
RGTM 1-x 200mm KV	0-10 V / 4...20 mA	200 mm	1101-31D1-0049-810	1101-31D2-0049-810
RGTM 1-x 250mm KV	0-10 V / 4...20 mA	250 mm	1101-31D1-0059-810	1101-31D2-0059-810
RGTM 1-x 300mm KV	0-10 V / 4...20 mA	300 mm	1101-31D1-0069-810	1101-31D2-0069-810
RGTM 1-x 400mm KV	0-10 V / 4...20 mA	400 mm	1101-31D1-0089-810	1101-31D2-0089-810
Housing variant "KV":		with cable gland (IP 65)		
Extra charge:		other measuring ranges optional		

THERMASGARD® RGTM 1 - Q					
Duct / smoke gas temperature sensor, incl. mounting flange (with M12 connector)					
Type / WG01	Output	Installation length (EL)	Q ●	Item No. Output 0-10 V	Item No. Output 4...20 mA
RGTM 1-x Q	x = U / I			IP 65, U-variant	IP 65, I-variant
RGTM 1-x 200mm Q	0-10V / 4...20 mA	200 mm	●	2001-4131-1100-011	2001-4131-2100-011
RGTM 1-x 250mm Q	0-10V / 4...20 mA	250 mm	●	2001-4131-1100-021	2001-4131-2100-021
RGTM 1-x 300mm Q	0-10V / 4...20 mA	300 mm	●	2001-4131-1100-031	2001-4131-2100-031
RGTM 1-x 400mm Q	0-10V / 4...20 mA	400 mm	●	2001-4131-1100-041	2001-4131-2100-041
Housing variant "Q":	with M12 connector (male, 5-pin, A-code) (IP 65)				
Extra charge:	other measuring ranges optional				

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

RGTM 2
Basic unit

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

The duct sensor is used to detect high temperatures in gaseous or liquid media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60 751, class B) (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) with manual zero point correction (± 10 K)
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Cable connection:	RGTM 2 (Standard) adjusting screw made of metal (M20 x 1.5); RGTM 2-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTM 2-Q (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -30...+70 °C
Protective tube:	stainless steel, V4A (1.4571), G ½ " straight pipe thread, wrench size 27 mm, $p_{\text{max}} = 40 \text{ bar}$, $\varnothing = 8 \text{ mm}$ length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 400 mm (see table)
Process connection:	screwed socket with G ½ "
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) RGTM 2 IP 65 (according to EN 60 529) RGTM 2-KV / RGTM 2-Q
Standards:	CE conformity according to EMC directive 2014 / 30 / EU



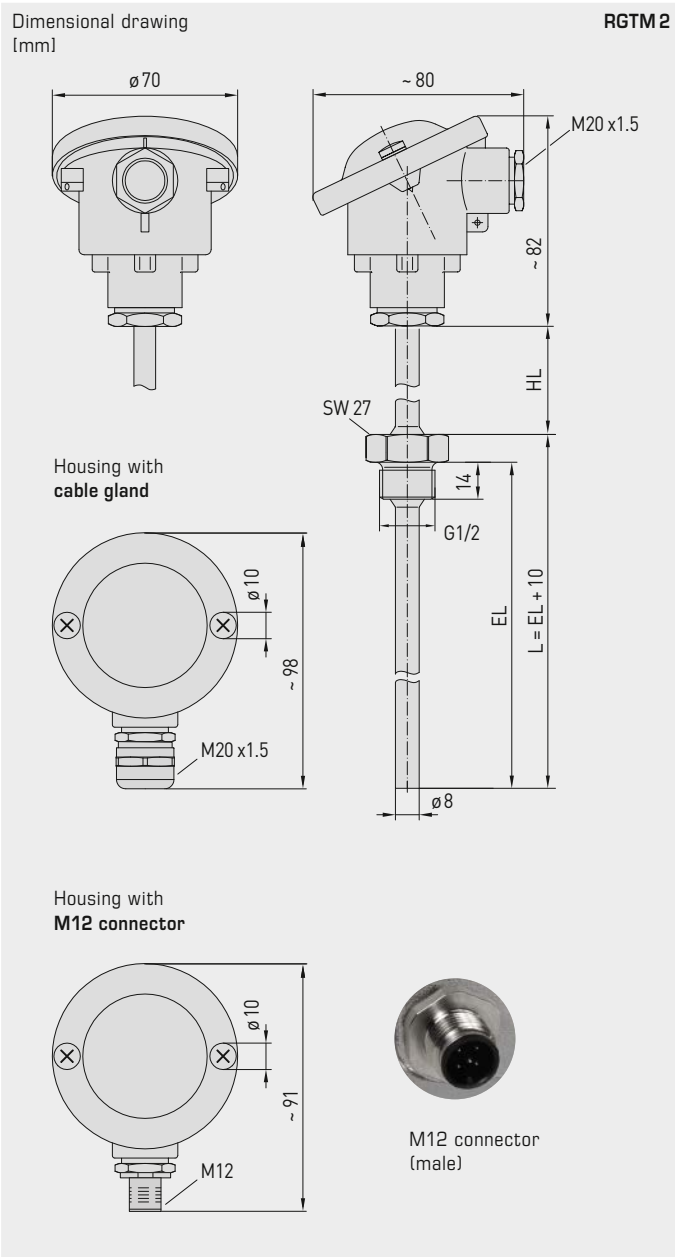
RGTM 2
Measuring insert with
ceramic tubelet
in metal sleeve



S+S REGELTECHNIK

THERMASGARD® **RGTM 2**

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



High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

RGTM 2
standard
(IP 54)



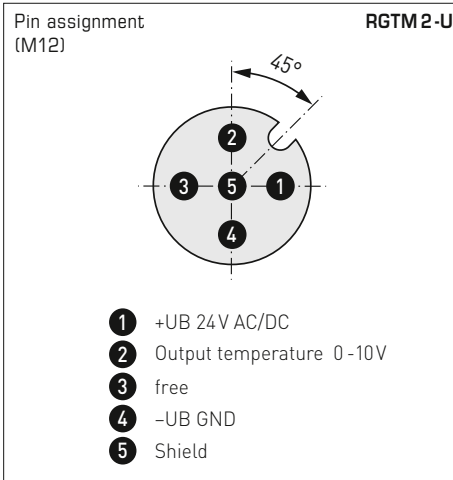
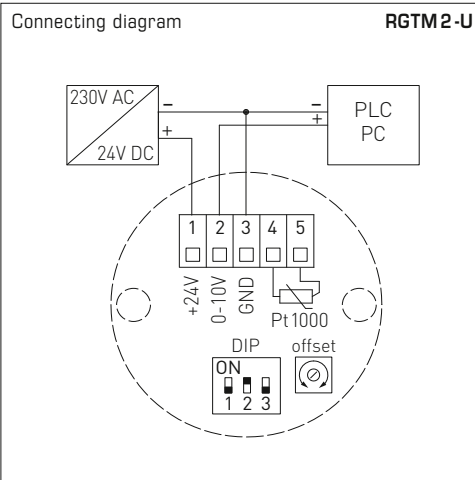
RGTM 2 - KV
with cable gland
(IP 65)



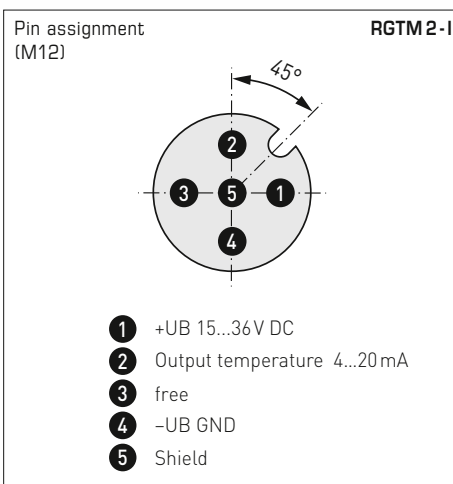
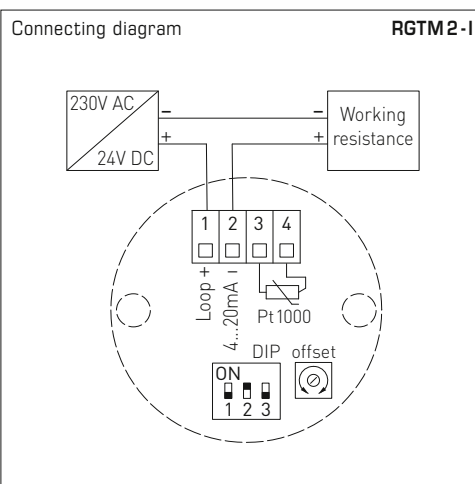
RGTM 2 - Q
with M12 connector
(IP 65)



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



RGTM 2-U
Connecting head



RGTM 2-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
0... +50 °C (default)	OFF	ON	ON
0...+100 °C	ON	OFF	ON
0...+200 °C	OFF	OFF	ON
0...+300 °C	ON	ON	OFF
0...+400 °C	OFF	ON	OFF
0...+500 °C	ON	OFF	OFF
0...+600 °C	OFF	OFF	OFF





S+S REGELTECHNIK

THERMASGARD® RGTM 2

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



THERMASGARD® RGTM 2		Screw-in / smoke gas temperature measuring transducer with neck tube (standard)		
Type/WG01	Output	Installation length (EL)	Item No. Output 0-10 V	Item No. Output 4...20 mA
RGTM 2-x	$x = U / I$		IP 54, U-variant	IP 54, I-variant
RGTM 2-x 100/80mm	0-10 V / 4...20 mA	100 mm	1101-2161-0029-810	1101-2162-0029-810
RGTM 2-x 150/80mm	0-10 V / 4...20 mA	150 mm	1101-2161-0039-810	1101-2162-0039-810
RGTM 2-x 200/80mm	0-10 V / 4...20 mA	200 mm	1101-2161-0049-810	1101-2162-0049-810
RGTM 2-x 250/80mm	0-10 V / 4...20 mA	250 mm	1101-2161-0059-810	1101-2162-0059-810
RGTM 2-x 300/80mm	0-10 V / 4...20 mA	300 mm	1101-2161-0069-810	1101-2162-0069-810
RGTM 2-x 400/80mm	0-10 V / 4...20 mA	400 mm	1101-2161-0089-810	1101-2162-0089-810
Housing variant:		with pressure screw (IP 54)		
Extra charge:		other measuring ranges optional		

THERMASGARD® RGTM 2-KV		Screw-in / smoke gas temperature measuring transducer with neck tube (with cable gland)		
Type/WG01	Output	Installation length (EL)	Item No. Output 0-10 V	Item No. Output 4...20 mA
RGTM 2-x KV	$x = U / I$		IP 65, U-variant	IP 65, I-variant
RGTM 2-x 100/80mm KV	0-10 V / 4...20 mA	100 mm	1101-21D1-0029-810	1101-21D2-0029-810
RGTM 2-x 150/80mm KV	0-10 V / 4...20 mA	150 mm	1101-21D1-0039-810	1101-21D2-0039-810
RGTM 2-x 200/80mm KV	0-10 V / 4...20 mA	200 mm	1101-21D1-0049-810	1101-21D2-0049-810
RGTM 2-x 250/80mm KV	0-10 V / 4...20 mA	250 mm	1101-21D1-0059-810	1101-21D2-0059-810
RGTM 2-x 300/80mm KV	0-10 V / 4...20 mA	300 mm	1101-21D1-0069-810	1101-21D2-0069-810
RGTM 2-x 400/80mm KV	0-10 V / 4...20 mA	400 mm	1101-21D1-0089-810	1101-21D2-0089-810
Housing variant "KV":		with cable gland (IP 65)		
Extra charge:		other measuring ranges optional		

THERMASGARD® RGTM 2-Q		Screw-in / smoke gas temperature measuring transducer with neck tube (with M12 connector)			
Type/WG01	Output	Installation length (EL)	Q ●	Item No. Output 0-10 V	Item No. Output 4...20 mA
RGTM 2-x Q	$x = U / I$			IP 65, U-variant	IP 65, I-variant
RGTM 2-x 100/80mm Q	0-10 V / 4...20 mA	100 mm	●	2001-4141-1100-011	2001-4141-2100-011
RGTM 2-x 150/80mm Q	0-10 V / 4...20 mA	150 mm	●	2001-4141-1100-021	2001-4141-2100-021
RGTM 2-x 200/80mm Q	0-10 V / 4...20 mA	200 mm	●	2001-4141-1100-031	2001-4141-2100-031
RGTM 2-x 250/80mm Q	0-10 V / 4...20 mA	250 mm	●	2001-4141-1100-041	2001-4141-2100-041
RGTM 2-x 300/80mm Q	0-10 V / 4...20 mA	300 mm	●	2001-4141-1100-051	2001-4141-2100-051
RGTM 2-x 400/80mm Q	0-10 V / 4...20 mA	400 mm	●	2001-4141-1100-061	2001-4141-2100-061
Housing variant "Q":		with M12 connector (male, 5-pin, A-code) (IP 65)			
Extra charge:		other measuring ranges optional			

**Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output (Automatic Output Switching)**

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable temperature measuring transducer with sleeve sensor **THERMASGARD® HFTM**, with eight switchable measuring ranges (max. $-20...+150\text{ }^{\circ}\text{C}$), aktivem Ausgang, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with /without display. The standard display can be changed from SI $^{\circ}\text{C}$ to imperial $^{\circ}\text{F}$ units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

HFTM - I

Power supply: 15...36 V DC,
depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$

Working resistance: $R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$

Connection type: 2-wire connection

Output: 4...20 mA

HFTM - A (AOS)

Power supply: 24 V AC / DC ($\pm 10\%$)

Load resistance: $R_L = 25...450\text{ Ohm}$ with AOS I variant
 $R_L > 15\text{ kOhm}$ with AOS U variant

Connection type: 3-wire connection

Output: **automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption: $< 1.0\text{ VA} / 24\text{ V DC}$; $< 2.2\text{ VA} / 24\text{ V AC}$

System of units: **SI** (default) or **Imperial** (switchable via DIP switch)

Data points: Temperature $^{\circ}\text{C}$ / $^{\circ}\text{F}$

Measuring ranges: **multi-range switching with 8 measuring ranges**,
see table (other ranges optional)
with manual zero point correction ($\pm 10\text{ K}$)

Sensor: Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**) at IP68

Accuracy, temperature: typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$

Insulating resistance: $\geq 100\text{ M}\Omega$, at $+20\text{ }^{\circ}\text{C}$ (500V DC)

Sensor protection: sensor sleeve, stainless steel V4A (1.4571),
 $\varnothing = 6\text{ mm}$, nominal length NL = 50 mm (optional 30...400 mm)

Sensor cable: Silicone, SiHF, $2 \times 0.25\text{ mm}^2$; cable length (KL) = 1.5m
(other lengths and jacket materials, e.g. PTFE or
glass fibre with steel mesh, available on request)

Housing: plastic, UV-resistant, material polyamide, 30% glass-globe reinforced,
with quick-release screws (slotted / Phillips head combination),
colour traffic white (similar to RAL 9016),
cover for display is transparent!

Housing dimension: 72 x 64 x 37.8 mm (Tyr 1 without display)
72 x 64 x 43.3 mm (Tyr 1 with display)

Cable connection: **cable gland**, plastic (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

Electrical connection: 0.14 - 1.5 mm², via terminal screws

Ambient temperature: measuring transducer $-30...+70\text{ }^{\circ}\text{C}$

Permissible humidity: $< 95\%$ RH, non-precipitating air

Protection class: III (according to EN 60730)

Protection type housing: **IP65** (according to EN 60529) Housing tested,
TÜV SÜD, Report No. 713139052 (Tyr 1)

Protection type sensor: **IP65** (according to EN 60529) **sleeve** humidity-tight (standard)
IP68 (according to EN 60529) **sleeve** water-tight (optional)
IP54 (according to EN 60529) with **glass fibre** cable (optional)

Standards: CE conformity according to EMC directive 2014 / 30 / EU

Optional: two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H),
for displaying the **ACTUAL** temperature and the internal diagnostics
(sensor breakage, sensor short circuit)

ACCESSORIES (see table)

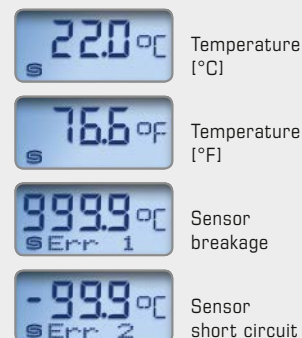
HFTM
with cable gland



HFTM - Q
with M12 connector



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



**NEW**

S+S REGELTECHNIK

THERMASGARD® HFTM

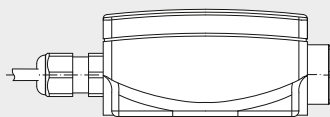
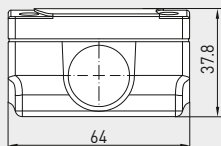
Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output (Automatic Output Switching)



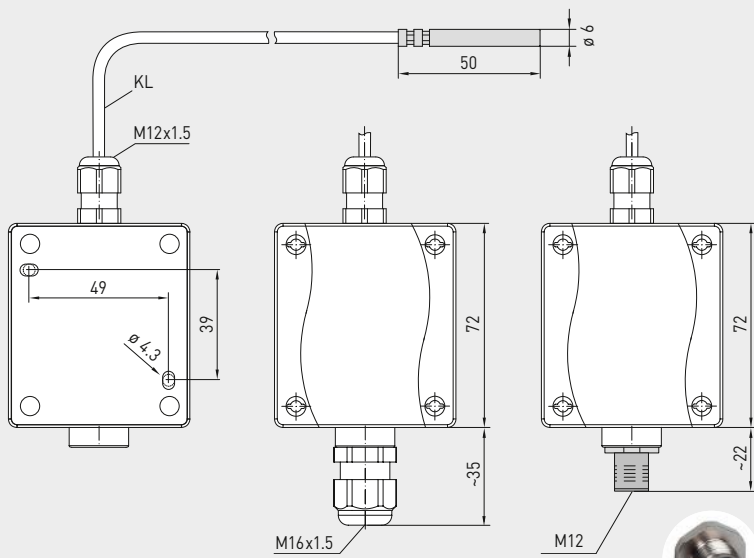
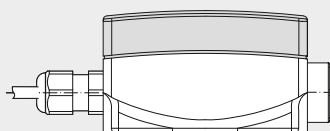
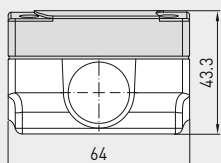
Dimensional drawing
[mm]

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



High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching
to standard signal 0...10V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING



IP 65 (standard)
humidity-tight



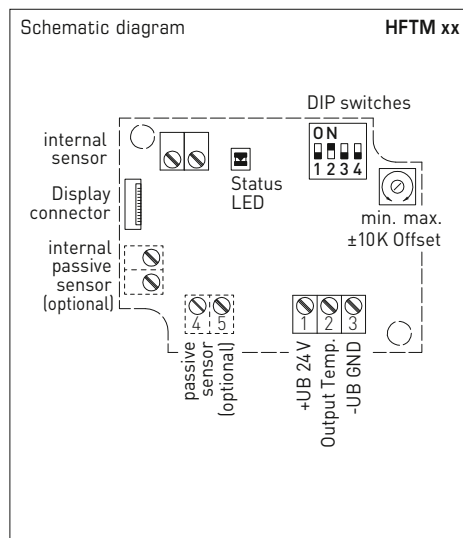
IP 68 (optional)
water-tight
Perfect Sensor Protection



IP 54 (optional)
with glass fibre cable



Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output (Automatic Output Switching)



2-wire connection* HFTM - I

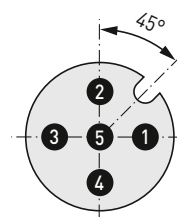
1	+UB 24V DC
2	Output Temp. 4...20mA
3	-UB GND (optional for backlighting)

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

3-wire connection (AOS) HFTM - A

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	-UB GND

Pin assignment (M12) HFTM xx



- 1 +UB 24V
- 2 Output temperature
- 3 free
- 4 -UB GND
- 5 Shield

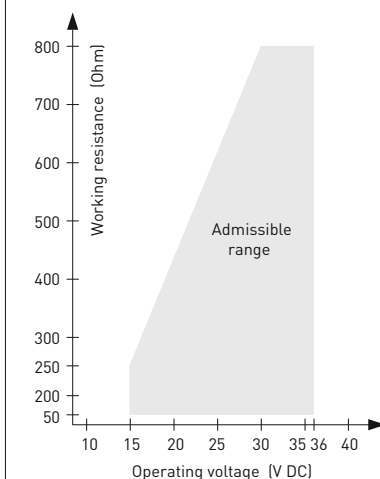
Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20...+150 °C	ON	ON	ON	-4...+302 °F
-50... +50 °C	OFF	ON	ON	-58...+122 °F
-20... +80 °C	ON	OFF	ON	-4...+176 °F
-30... +60 °C	OFF	OFF	ON	-22...+140 °F
0... +40 °C	ON	ON	OFF	32...+104 °F
0... +50 °C *	OFF	ON	OFF	32...+122 °F *
0...+100 °C	ON	OFF	OFF	32...+212 °F
0...+150 °C	OFF	OFF	OFF	32...+302 °F

* (default)

Display [°C] / [°F]	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

Display switchable
Temperature [°C] → [°F]
The display value depends on the set unit system (DIP 4).

Load resistance diagram (2-wire) HFTM - I



For further technical information,
see the operating instructions





NEW

S+S REGELTECHNIK

THERMASGARD® HFTM

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

HFTM-Q
with M12 connector



HFTM
with cable gland

THERMASGARD® HFTM Sleeve sensor with temperature measuring transducer (with cable gland)				
Type / WG01	Output	Type	Display	Item No.
HFTM-I	(2-wire)			
HFTM-I	4...20 mA	Remote sensor		1101-1152-0219-920
HFTM-I LCD	4...20 mA	Remote sensor	■	1101-1152-2219-920
HFTM-A	(3-wire AOS)			
HFTM-A	0-10 V / 4...20 mA	Remote sensor		1101-115E-0219-920
HFTM-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-115E-2219-920
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant:	Cable connection with cable gland			
Extra charge:	other measuring ranges optional Protection type IP68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone/PTFE/glass fibre) Other lengths of protection sleeve optional			
				on request on request

THERMASGARD® HFTM-Q Sleeve sensor with temperature measuring transducer (with M12 connector)				
Type / WG01I	Output	Type	Display ● = Q	Item No.
HFTM-I Q	(2-wire)			
HFTM-I Q	4...20 mA	Remote sensor	●	2001-2111-2100-001
HFTM-I Q LCD	4...20 mA	Remote Sensor	● ■	2001-2112-2100-001
HFTM-A Q	(3-wire AOS)			
HFTM-A Q	0-10 V / 4...20 mA	Remote sensor	●	2001-2111-B100-001
HFTM-A Q LCD	0-10 V / 4...20 mA	Remote Sensor	● ■	2001-2112-B100-001
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)			
Extra charge:	see table above!			

ACCESSORIES	
THE-xx	Immersion sleeve, stainless steel V4A (1.4571) or polished brass, Ø = 9 mm
	Special accessories for M12 connector see chapter Accessories!

**Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output (Automatic Output Switching)**

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable temperature measuring transducer with sleeve sensor **THERMASGARD® HFTM - VA**, with eight switchable measuring ranges (max. $-20...+150^{\circ}\text{C}$), active output, rugged housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101.

The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. The measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable). A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

HFTM - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_g (\text{Ohm}) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

HFTM - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}; < 2.2\text{ VA} / 24\text{ V AC}$
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection at IP68)
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Insulating resistance:	$\geq 100\text{ M}\Omega$, at $+20^{\circ}\text{C}$ (500 V DC)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), $\varnothing = 6\text{ mm}$, nominal length NL = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, $2 \times 0.25\text{ mm}^2$; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimension:	143 x 97 x 61 mm (Tyr2E)
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
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Ambient temperature:	measuring transducer $-30...+70^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according EN 60 730)
Protection type housing:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	IP 65 (according to EN 60 529) sleeve humidity-tight (standard) IP 68 (according to EN 60 529) sleeve water-tight (optional) IP 54 (according to EN 60 529) with glass fibre cable (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)

**NEW**

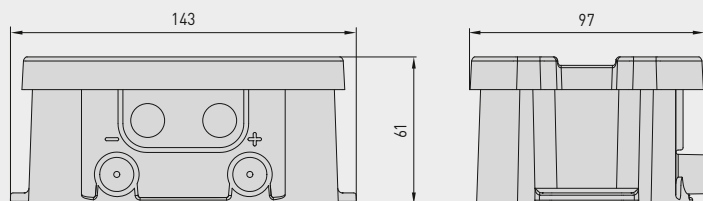
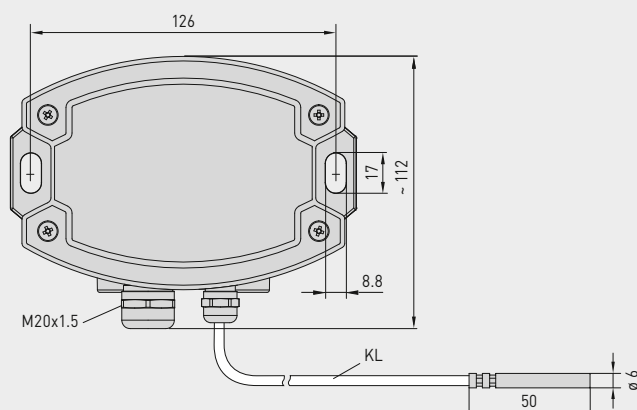
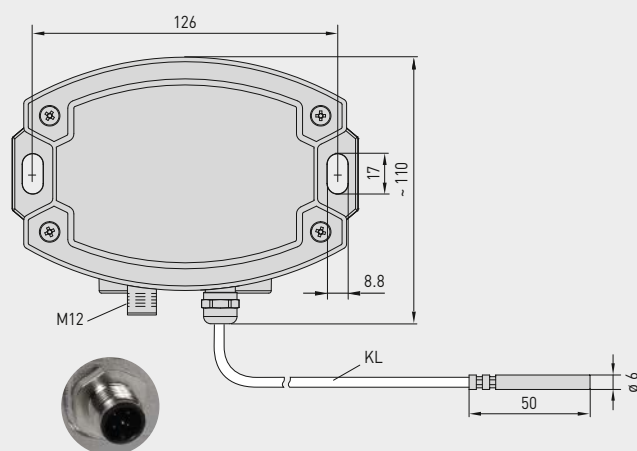
S+S REGELTECHNIK

THERMASGARD® HFTM - VA

Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output (Automatic Output Switching)

Dimensional drawing
[mm]

HFTM - VA

Housing with
cable glandHousing with
M12 connectorHFTM - VA
with cable glandHFTM - VAQ
with M12 connector

High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching
to standard signal 0...10V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING



IP 65 (standard)
humidity-tight

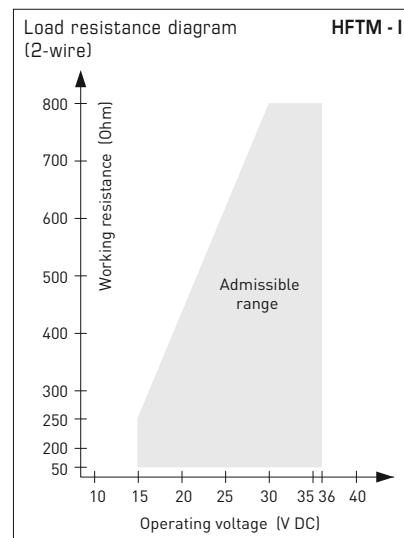
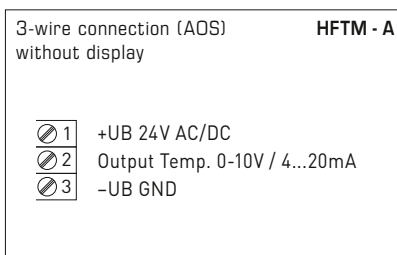
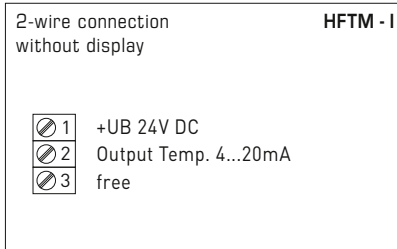
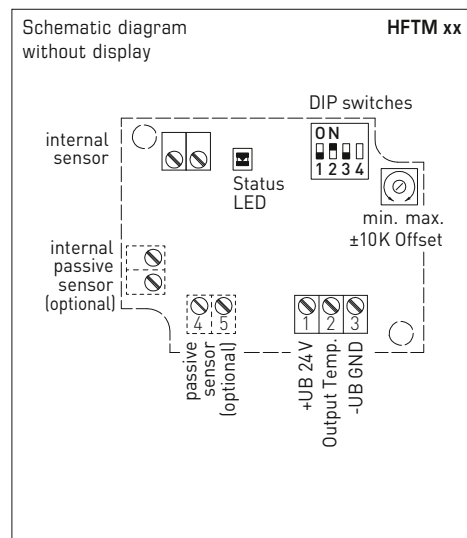


IP 68 (optional)
water-tight
Perfect Sensor Protection



IP 54 (optional)
with **glass fibre** cable

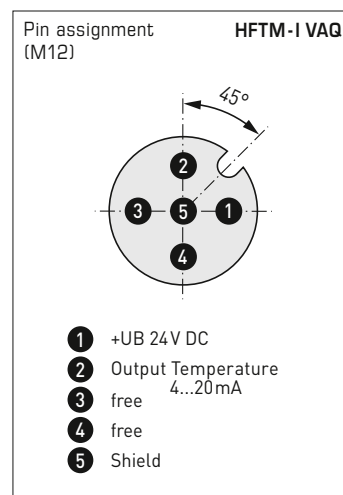
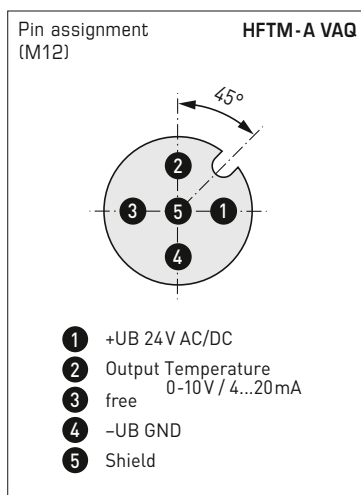
Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output (Automatic Output Switching)



Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20...+150 °C	ON	ON	ON	-4...+302 °F
-50...+50 °C	OFF	ON	ON	-58...+122 °F
-20...+80 °C	ON	OFF	ON	-4...+176 °F
-30...+60 °C	OFF	OFF	ON	-22...+140 °F
0...+40 °C	ON	ON	OFF	32...+104 °F
0...+50 °C *	OFF	ON	OFF	32...+122 °F *
0...+100 °C	ON	OFF	OFF	32...+212 °F
0...+150 °C	OFF	OFF	OFF	32...+302 °F

* (default)

DIP4 has no function!



For further technical information,
see the operating instructions



NEW

THERMASGARD® HFTM - VA



Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

HFTM - VAQ
with M12 connector

HFTM - VA
with cable gland



THERMASGARD® HFTM - VA			
Sleeve sensor with temperature measuring transducer, <i>ID</i> (Stainless steel housing with cable gland)			
Type / WG02I	Output	Type	Item No.
HFTM - I VA	(2-wire)		
HFTM-I VA	4...20 mA	Remote sensor	2001-2141-2200-001
HFTM - A VA	(3-wire AOS)		
HFTM-A VA	0-10 V / 4...20 mA	Remote sensor	2001-2141-B200-001
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Housing variant:	Cable connection with cable gland		
Extra charge:	other measuring ranges optional Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) Other lengths of protection sleeve optional		
			on request on request

THERMASGARD® HFTM - VAQ			
Sleeve sensor with temperature measuring transducer, <i>ID</i> (Stainless steel housing with M12 connector)			
Type / WG01I	Output	Type	● = Q Item No.
HFTM - I VAQ	(2-wire)		
HFTM-I VAQ	4...20 mA	Remote sensor	● 2001-2141-2100-001
HFTM - A VAQ	(3-wire AOS)		
HFTM-A VAQ	0-10 V / 4...20 mA	Remote sensor	● 2001-2141-B100-001
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:	other measuring ranges optional Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) Other lengths of protection sleeve optional		
			on request on request

ACCESSORIES			
THE - xx	Immersion sleeve, stainless steel V4A (1.4571) or polished brass, Ø = 9 mm		
	Special accessories for M12 connector		
			see chapter Accessories!

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active outputg (Automatic Output Switching)

Patented quality product (patent no. DE 10 2015 015 941 B4)

ALTM 1

Calibratable surface-contact temperature measuring transducer **THERMASGARD® ALTM 1**, with eight switchable measuring ranges (max. -20...+150 °C), active output, compact variant incl. strap, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with /without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0- 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.



TECHNICAL DATA

ALTM 1 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

ALTM 1 - A (AOS)

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ with AOS I variant $R_L > 15 \text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) T_{max} up to +100 °C , operating range -50...+100 °C with manual zero point correction (± 10 K)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (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
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	endless strap with metal tightener, (included in the scope of delivery) Ø = 13-92 mm (¼-3"), length L = 300 mm
Ambient temperature:	measuring transducer -30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

ACCESSORIES (see table)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

	Temperature [°C]
	Temperature [°F]
	Sensor breakage
	Sensor short circuit

**NEW**

S+S REGELTECHNIK

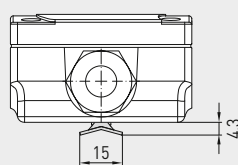
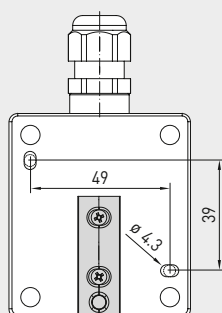
THERMASGARD® ALTM 1

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)

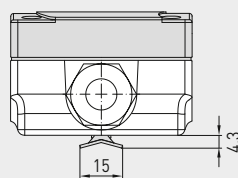
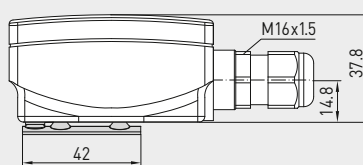


Dimensional drawing [mm]

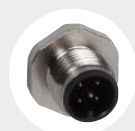
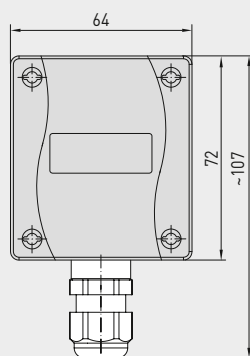
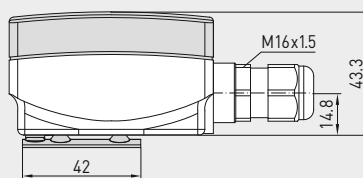
ALTM 1



without display



with display

M12 connector
(optional on request)ALTM 1
with display

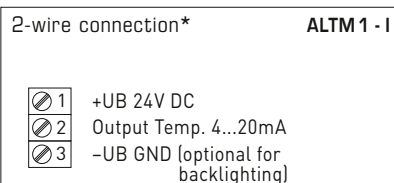
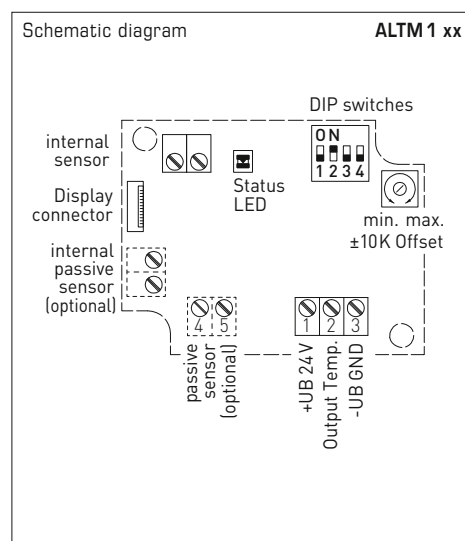
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

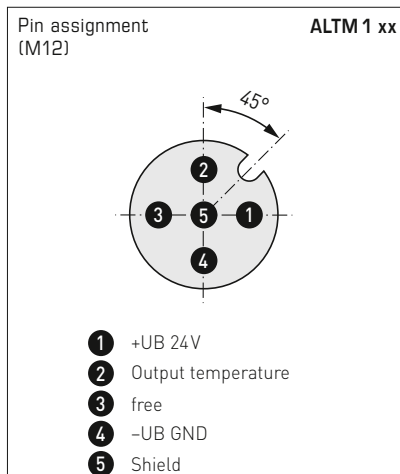
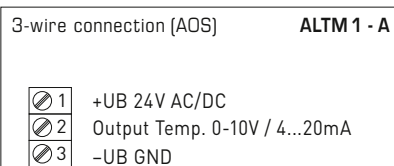
Automatic detection and switching to standard signal 0...10V or 4...20mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)



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



Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20...+150 °C	ON	ON	ON	-4...+302 °F
-50... +50 °C	OFF	ON	ON	-58...+122 °F
-20... +80 °C	ON	OFF	ON	-4...+176 °F
-30... +60 °C	OFF	OFF	ON	-22...+140 °F
0... +40 °C	ON	ON	OFF	32...+104 °F
0... +50 °C *	OFF	ON	OFF	32...+122 °F *
0...+100 °C	ON	OFF	OFF	32...+212 °F
0...+150 °C	OFF	OFF	OFF	32...+302 °F

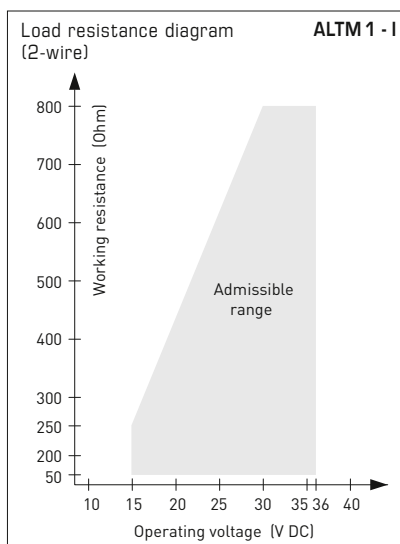
* (default)

Display [°C] / [°F]	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

Display switchable

Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP 4**).



For further technical information, see the operating instructions





NEW

S+S REGELTECHNIK

THERMASGARD® ALTM 1

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)

ALTM 1-Q
with M12 connector
(on request)

ALTM 1
with cable gland



THERMASGARD® ALTM 1				
Surface contact / tube contact temperature measuring transducers (compact variant)				
Type / WG01	Output	Type	Display	Item No.
ALTM 1-I (2-wire)				
ALTM1-I	4...20 mA	compact		1101-1112-0219-920
ALTM1-I LCD	4...20 mA	compact	■	1101-1112-2219-920
ALTM 1-A (3-wire AOS)				
ALTM1-A	0-10 V / 4...20 mA	compact		1101-111E-0219-920
ALTM1-A LCD	0-10 V / 4...20 mA	compact	■	1101-111E-2219-920
Automatic Output Switching (AOS): Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:	Other ranges optional Cable connection with M12 connector according to DIN EN 61076-2-101			on request

ACCESSORIES		
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
Special accessories for M12 connector see chapter Accessories!		

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

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable tube contact temperature measuring transducer **THERMASGARD® ALTM 2**, with eight switchable measuring ranges (max. $-20...+150\text{ }^{\circ}\text{C}$), active output, external sensor, incl. strap, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display. The standard display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

ALTM2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

ALTM2 - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) T_{max} up to $+100\text{ }^{\circ}\text{C}$, operating range $-50...+150\text{ }^{\circ}\text{C}$ with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection) at IP68)
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Insulating resistance:	$\geq 100\text{ M}\Omega$, at $+20\text{ }^{\circ}\text{C}$ (500 V DC)
Sensor protection:	pipe feeder made of stainless steel V4A (1.4571), $\varnothing = 6\text{ mm}$, $L = 50\text{ mm}$
Sensor cable:	silicone, SiHF, $2 \times 0.25\text{ mm}^2$; cable length (KL) = 1.5 m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (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
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Process connection:	endless strap with metal tightener (included in the scope of delivery) $\varnothing = 13 - 92\text{ mm}$ ($\frac{1}{4} - 3"$), $L = 300\text{ mm}$
Ambient temperature:	measuring transducer $-30...+70\text{ }^{\circ}\text{C}$
Permissible humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type housing:	IP65 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Protection type sensor:	IP65 (according to EN 60529) sleeve humidity-tight (standard) IP68 (according to EN 60529) sleeve water-tight (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

ACCESSORIES

(see table)

ALTM 2
with cable gland



ALTM 2 - Q
with M12 connector



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

	Temperature [$^{\circ}\text{C}$]
	Temperature [$^{\circ}\text{F}$]
	Sensor breakage
	Sensor short circuit

**NEW**

S+S REGELTECHNIK

THERMASGARD® ALTM 2

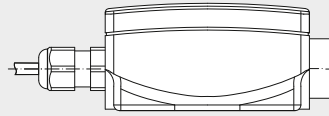
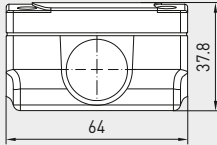
Surface contact / tube contact temperature measuring transducers, incl. strap,
with detached sensor head, calibratable, with multi-range switching and
active output (Automatic Output Switching)



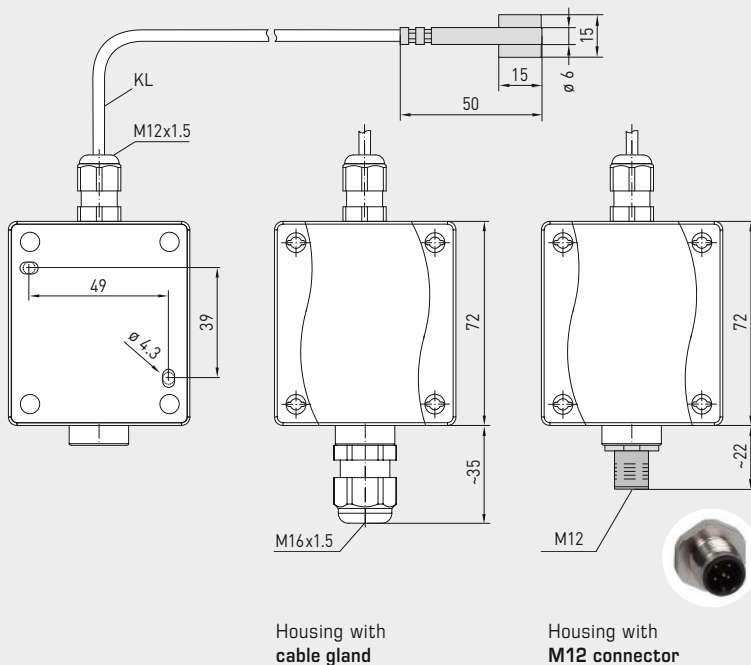
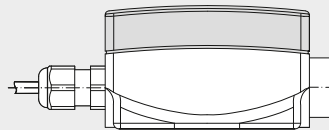
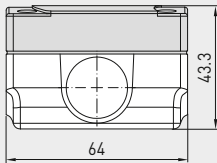
Dimensional drawing
[mm]

ALTM 2

without display



with display

Housing with
cable glandHousing with
M12 connector

ALTM 2
with cable gland
and display



ALTM 2 - Q
with M12 connector
and display



High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching
to standard signal 0...10V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

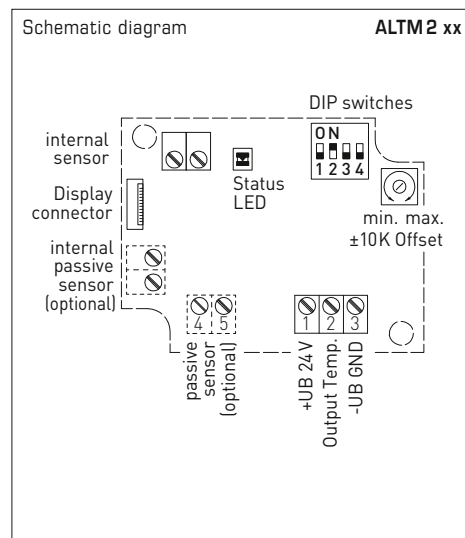


IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection

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



2-wire connection* ALT M 2 - I

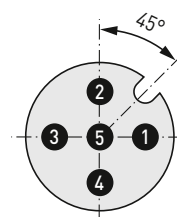
1	+UB 24V DC
2	Output Temp. 4...20mA
3	-UB GND (optional for backlighting)

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

3-wire connection (AOS) ALT M 2 - A

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	-UB GND

Pin assignment (M12) ALT M 2 xx



- 1 +UB 24V
- 2 Output temperature
- 3 free
- 4 -UB GND
- 5 Shield

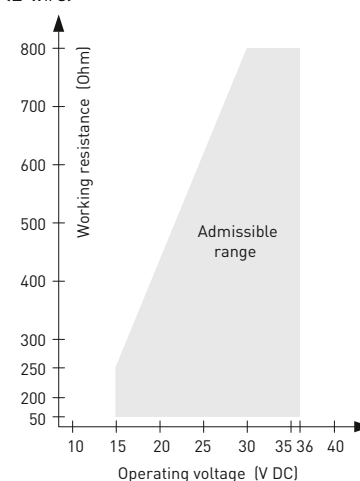
Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20...+150 °C	ON	ON	ON	-4...+302 °F
-50... +50 °C	OFF	ON	ON	-58...+122 °F
-20... +80 °C	ON	OFF	ON	-4...+176 °F
-30... +60 °C	OFF	OFF	ON	-22...+140 °F
0... +40 °C	ON	ON	OFF	32...+104 °F
0... +50 °C *	OFF	ON	OFF	32...+122 °F *
0...+100 °C	ON	OFF	OFF	32...+212 °F
0...+150 °C	OFF	OFF	OFF	32...+302 °F

* (default)

Display [°C] / [°F]	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

Display switchable
Temperature [°C] → [°F]
The display value depends on the set unit system (DIP 4).

Load resistance diagram ALT M 2 - I (2-wire)



For further technical information, see the operating instructions



NEW

THERMASGARD® ALTM 2

S+S REGELTECHNIK

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

ALTM 2 - Q
with M12 connector



ALTM 2
with cable gland

THERMASGARD® ALTM 2				
Surface contact / tube contact temperature measuring transducers (with cable gland)				
Type / WG01	Output	Type	Display	Item No.
ALTM 2 - I	(2-wire)			
ALTM2-I	4...20 mA	Remote sensor		1101-1122-0219-920
ALTM2-I LCD	4...20 mA	Remote sensor	■	1101-1122-2219-920
ALTM 2 - A	(3-wire AOS)			
ALTM2-A	0-10 V / 4...20 mA	Remote sensor		1101-112E-0219-920
ALTM2-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-112E-2219-920
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant:	Cable connection with cable gland			
Extra charge:	other measuring ranges optional Protection type IP68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) on request			

THERMASGARD® ALTM 2 - Q				
Surface contact / tube contact temperature measuring transducers (with M12 connector)				
Type / WG01I	Output	Type	Display ● = Q	Item No.
ALTM 2 - I Q	(2-wire)			
ALTM2-I Q	4...20 mA	Remote sensor	●	2001-2121-2100-001
ALTM2-I Q LCD	4...20 mA	Remote Sensor	● ■	2001-2122-2100-001
ALTM 2 - A Q	(3-wire AOS)			
ALTM2-A Q	0-10 V / 4...20 mA	Remote sensor	●	2001-2121-B100-001
ALTM2-A Q LCD	0-10 V / 4...20 mA	Remote Sensor	● ■	2001-2122-B100-001
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)			
Extra charge:	see table above!			

ACCESSORIES		
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
Special accessories for M12 connector see chapter Accessories!		

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

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable tube contact temperature measuring transducer **THERMASGARD® ALTM 2 - VA**, with eight switchable measuring ranges (max. $-20...+150\text{ }^{\circ}\text{C}$), active output, external sensor, incl. strap, rugged housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101.

The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

ALTM 2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

ALTM 2 - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

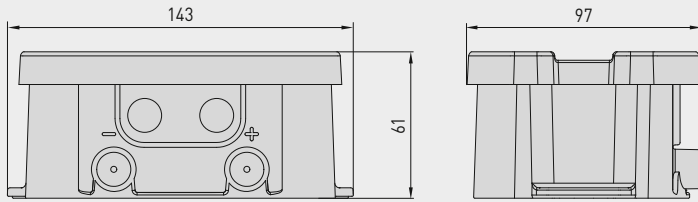
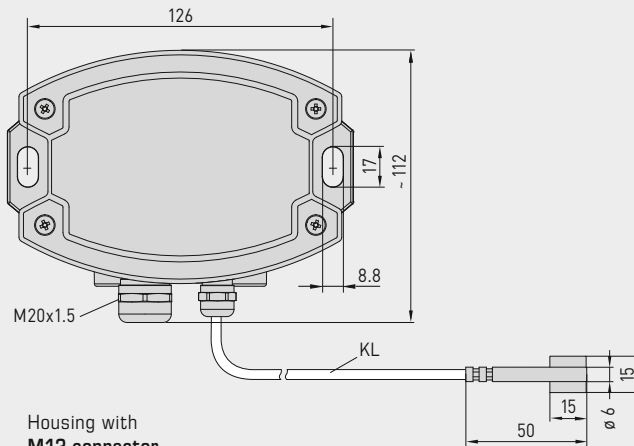
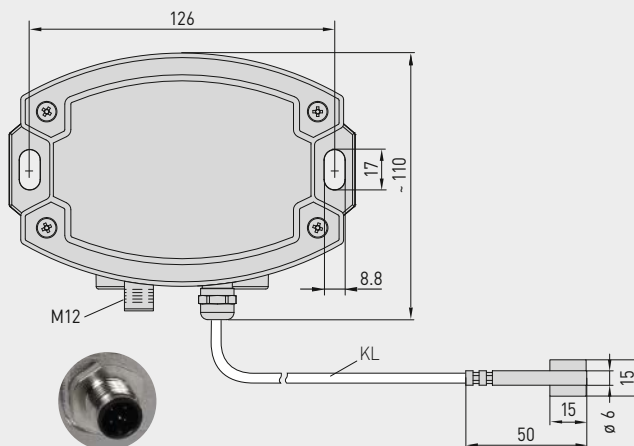
Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}; < 2.2\text{ VA} / 24\text{ V AC}$
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) T_{max} up to $+100\text{ }^{\circ}\text{C}$, operating range $-50...+150\text{ }^{\circ}\text{C}$ with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection) at IP68
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Insulating resistance:	$\geq 100\text{ M}\Omega$, at $+20\text{ }^{\circ}\text{C}$ (500 V DC)
Sensor protection:	pipe feeder made of stainless steel V4A (1.4571), $\varnothing = 6\text{ mm}$, $L = 50\text{ mm}$
Sensor cable:	Silicone, SiHF, $2 \times 0.25\text{ mm}^2$; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimension:	143 x 97 x 61 mm (Tyr2E)
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
Electrical connection:	$0.14 - 1.5\text{ mm}^2$, via terminal screws
Process connection:	endless strap with metal tightener (included in the scope of delivery) $\varnothing = 13 - 92\text{ mm}$ ($\frac{1}{4} - 3"$), $L = 300\text{ mm}$
Ambient temperature:	measuring transducer $-30...+70\text{ }^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type housing:	IP 65 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	IP 65 (according to EN 60529) sleeve humidity-tight (standard) IP 68 (according to EN 60529) sleeve water-tight (optional)
Standards:	CE conformity according to EMC directive 2014/30/EU
ACCESSORIES	(see table)

**NEW**

S+S REGELTECHNIK

THERMASGARD® **ALTM 2 - VA**

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

Dimensional drawing
[mm]**ALTM 2 - VA**Housing with
cable glandHousing with
M12 connector**ALTM 2 - VA**
with cable gland**ALTM 2 - VAQ**
with M12 connector

High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching
to standard signal 0...10V or 4...20mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING



IP 65 (standard)
humidity-tight

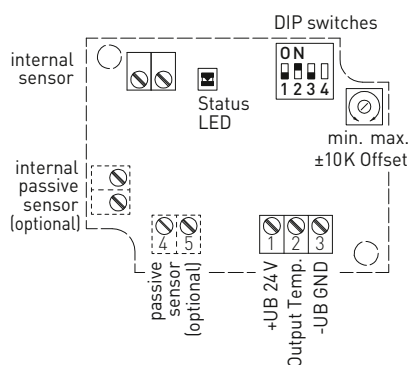


IP 68 (optional)
water-tight
Perfect Sensor Protection

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

Schematic diagram
without display

ALTM 2 xx

2-wire connection
without display

ALTM 2 - I

- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 free

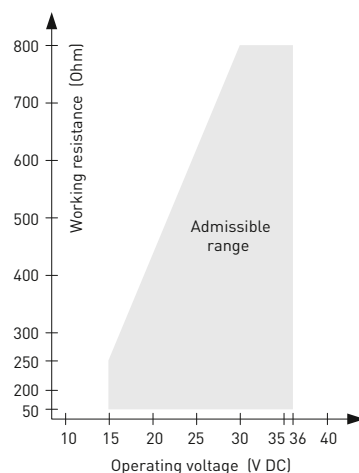
3-wire connection (AOS)
without display

ALTM 2 - A

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

Load resistance diagram
(2-wire)

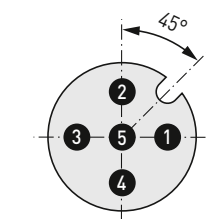
ALTM 2 - I



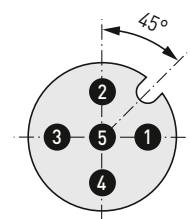
Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20...+150 °C	ON	ON	ON	-4...+302 °F
-50... +50 °C	OFF	ON	ON	-58...+122 °F
-20... +80 °C	ON	OFF	ON	-4...+176 °F
-30... +60 °C	OFF	OFF	ON	-22...+140 °F
0... +40 °C	ON	ON	OFF	32...+104 °F
0... +50 °C *	OFF	ON	OFF	32...+122 °F *
0...+100 °C	ON	OFF	OFF	32...+212 °F
0...+150 °C	OFF	OFF	OFF	32...+302 °F

* (default)

DIP4 has no function!

Pin assignment
(M12)ALTM 2-A
VAQ

- 1 +UB 24V AC/DC
- 2 Output Temperature
0-10V / 4...20mA
- 3 free
- 4 -UB GND
- 5 Shield

Pin assignment
(M12)ALTM 2-I
VAQ

- 1 +UB 24V DC
- 2 Output Temperature
4...20mA
- 3 free
- 4 free
- 5 Shield

For further technical information,
see the operating instructions



NEW

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

ALTM 2 - VAQ
with M12 connector

ALTM 2 - VA
with cable gland



THERMASGARD® ALTM 2 - VA			
Surface contact / tube contact temperature measuring transducers, <i>ID</i> (Stainless steel housing with cable gland)			
Type / WG02I	Output	Type	Item No.
ALTM 2 - I VA	(2-wire)		
ALTM2-I VA	4...20 mA	Remote sensor	2001-2151-2200-001
ALTM 2 - A VA	(3-wire AOS)		
ALTM2-A VA	0-10 V / 4...20 mA	Remote sensor	2001-2151-B200-001
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Housing variant:	Cable connection with cable gland		
Extra charge:	other measuring ranges optional Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre)		
			on request

THERMASGARD® ALTM 2 - VAQ			
Surface contact / tube contact temperature measuring transducers, <i>ID</i> (Stainless steel housing with M12 connector)			
Type / WG02I	Output	Type	● = Q Item No.
ALTM 2 - I VAQ	(2-wire)		
ALTM2-I VAQ	4...20 mA	Remote sensor	● 2001-2151-2100-001
ALTM 2 - A VAQ	(3-wire AOS)		
ALTM2-A VAQ	0-10 V / 4...20 mA	Remote sensor	● 2001-2151-B100-001
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:	other measuring ranges optional Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre)		
			on request

ACCESSORIES		
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
	Special accessories for M12 connector see chapter Accessories!	

Pendulum room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room pendulum temperature measuring transducer (with sleeve) **THERMASGARD® RPTM 1**, with eight switchable measuring ranges (max. $-20...+150^{\circ}\text{C}$), active output, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable), housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with /without display. The standard display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0- 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

RPTM 1 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_s (\text{Ohm}) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

RPTM 1 - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}$; $< 2.2\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) $T_{\min} -5^{\circ}\text{C}$, $T_{\max} +60^{\circ}\text{C}$, with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Sensor protection:	plastic sinter filter, $\varnothing 16\text{ mm}$, $L = 35\text{ mm}$, exchangeable (optional metal sinter filter, $\varnothing 16\text{ mm}$, $L = 32\text{ mm}$)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 16\text{ mm}$, $NL = 142\text{ mm}$
Sensor cable:	PVC, H03VV-F, $2 \times 0.5\text{ mm}^2$, $KL = \text{approx. } 1.5\text{ m}$ (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	$72 \times 64 \times 37.8\text{ mm}$ (Tyr 1 without display) $72 \times 64 \times 43.3\text{ mm}$ (Tyr 1 with display)
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
Electrical connection:	$0.14 - 1.5\text{ mm}^2$, via terminal screws
Ambient temperature:	measuring transducer $-30...+70^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. $36 \times 15\text{ mm}$ (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

ACCESSORIES (see table)

RPTM 1
with cable gland



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

22.0 °C

Temperature
[$^{\circ}\text{C}$]

76.6 °F

Temperature
[$^{\circ}\text{F}$]

999.9 °C
sErr 1

Sensor
breakage

-99.9 °C
sErr 2

Sensor
short circuit

**NEW**

S+S REGELTECHNIK

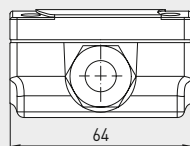
THERMASGARD® RPTM 1

Pendulum room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)

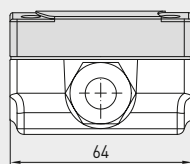
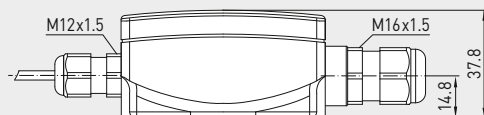
Dimensional drawing
[mm]

RPTM 1

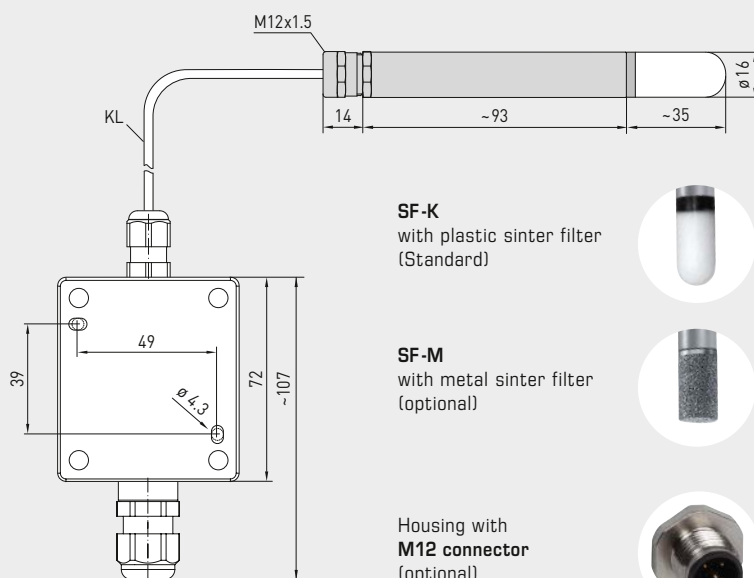
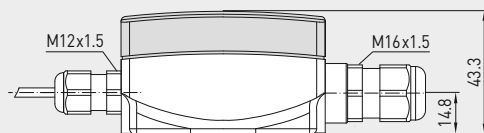
RPTM 1
with cable gland
and display



without display



with display



SF-K
with plastic sinter filter
(Standard)

SF-M
with metal sinter filter
(optional)

Housing with
M12 connector
(optional)



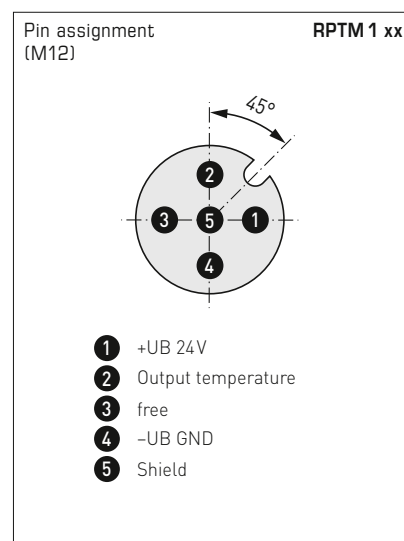
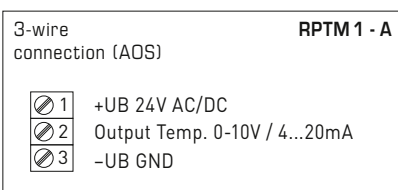
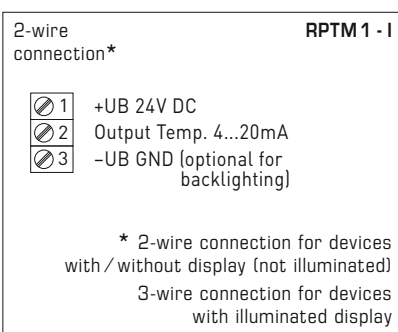
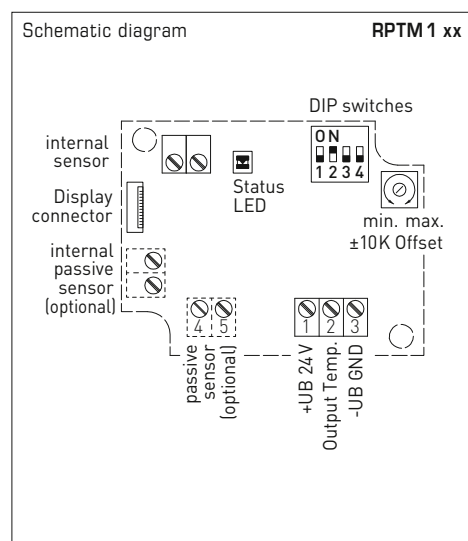
Automatic detection and switching
to standard signal 0...10V or 4...20mA

**AOS-PATENTED**

AUTOMATIC OUTPUT SWITCHING



Pendulum room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)

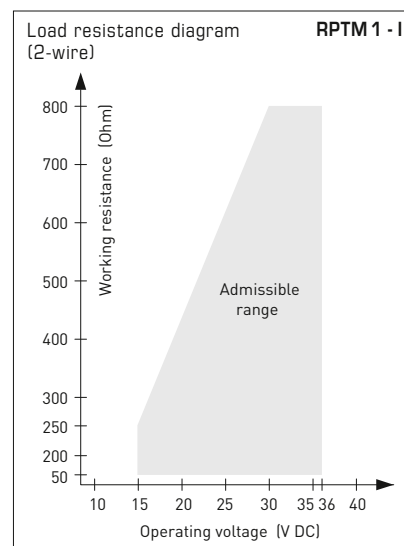


Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20...+ 150 °C	ON	ON	ON	-4...+ 302 °F
-50... + 50 °C	OFF	ON	ON	-58...+ 122 °F
-20... + 80 °C	ON	OFF	ON	-4...+ 176 °F
-30... + 60 °C	OFF	OFF	ON	-22...+ 140 °F
0... + 40 °C	ON	ON	OFF	32...+ 104 °F
0... + 50 °C *	OFF	ON	OFF	32...+ 122 °F *
0...+ 100 °C	ON	OFF	OFF	32...+ 212 °F
0...+ 150 °C	OFF	OFF	OFF	32...+ 302 °F

* (default)

Display [°C] / [°F]	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

Display switchable
Temperature [°C] → [°F]
The display value depends on the set unit system (DIP 4).



For further technical information, see the operating instructions





NEW

S+S REGELTECHNIK

THERMASGARD® RPTM 1

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

RPTM 1-Q
with M12 connector
(on request)



RPTM 1
with cable gland

THERMASGARD® RPTM 1 Pendulum room temperature measuring transducer (with stainless steel sleeve)				
Type / WG01	Output	Type	Display	Item No.
RPTM 1-I (2-wire)				
RPTM1-I	4...20 mA	Remote sensor		1101-1162-0219-910
RPTM1-I LCD	4...20 mA	Remote sensor	■	1101-1162-2219-910
RPTM 1-A (3-wire AOS)				
RPTM1-A	0-10 V / 4...20 mA	Remote sensor		1101-116E-0219-910
RPTM1-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-116E-2219-910
Automatic Output Switching (AOS): Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:				
other measuring ranges optional				
2-wire connecting leads, per running meter (PVC)				on request
Cable connection with M12 connector according to DIN EN 61076-2-101				on request

ACCESSOIRES		
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100

Pendulum room temperature measuring transducers,
calibratable, with multi-range switching
and active output (Automatic Output Switching)

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room pendulum temperature measuring transducer (with globe) **THERMASGARD® RPTM 2**, with eight switchable measuring ranges (max. $-20...+150^{\circ}\text{C}$), active output, cable sensor with a black plastic globe, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display. The standard display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

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

TECHNICAL DATA

RPTM 2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a (\text{Ohm}) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

RPTM 2 - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}$; $< 2.2\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) $T_{\min} -5^{\circ}\text{C}$, $T_{\max} +60^{\circ}\text{C}$, with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Globe:	plastic, colour black, $\varnothing = 50\text{ mm}$
Sensor cable:	PVC, H03VV-F, $2 \times 0.5\text{ mm}^2$, KL = approx. 1.5 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	cable gland , plastic (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
Electrical connection:	$0.14 - 1.5\text{ mm}^2$, via terminal screws
Ambient temperature:	measuring transducer $-30...+70^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. $36 \times 15\text{ mm}$ (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

RPTM 2
with cable gland



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

	Temperature [$^{\circ}\text{C}$]
	Temperature [$^{\circ}\text{F}$]
	Sensor breakage
	Sensor short circuit

**NEW**

S+S REGELTECHNIK

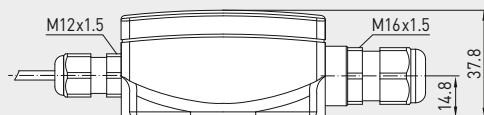
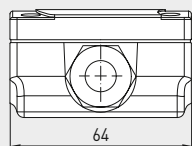
THERMASGARD® RPTM 2

Pendulum room temperature measuring transducers,
calibratable, with multi-range switching
and active output (Automatic Output Switching)

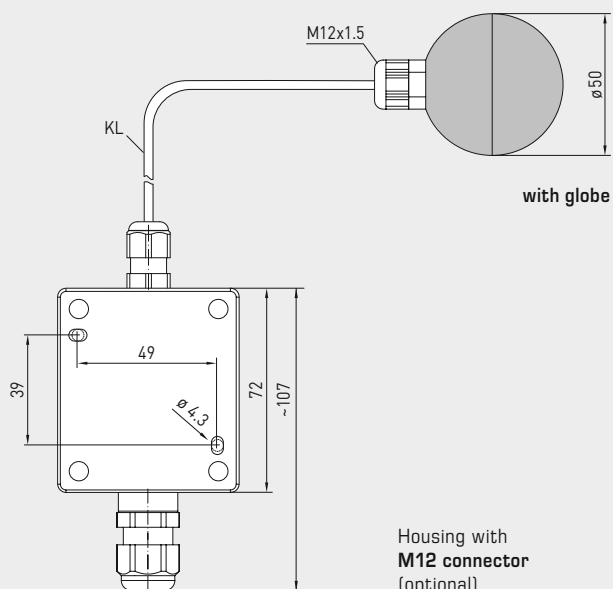
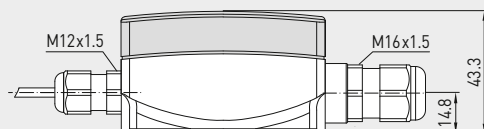
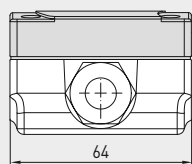
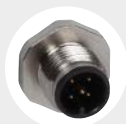
Dimensional drawing
[mm]

RPTM 2

without display



with display

Housing with
M12 connector
(optional)

RPTM 2
with cable gland
and display



Automatic detection and switching
to standard signal 0...10V or 4...20mA

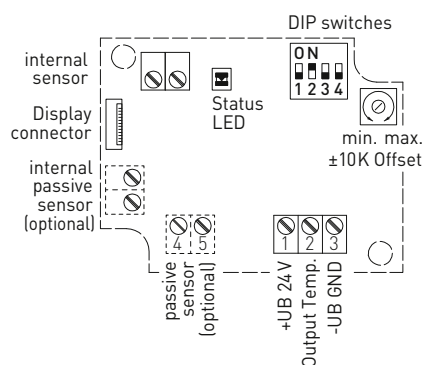
**AOS-PATENTED**

AUTOMATIC OUTPUT SWITCHING



Pendulum room temperature measuring transducers,
calibratable, with multi-range switching
and active output (Automatic Output Switching)

Schematic diagram RPTM 2 xx



2-wire connection* RPTM 2 - I

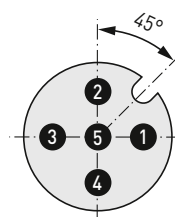
- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 -UB GND (optional for backlighting)

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

3-wire connection (AOS) RPTM 2 - A

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

Pin assignment (M12) RPTM 2 xx



- 1 +UB 24V
- 2 Output temperature
- 3 free
- 4 -UB GND
- 5 Shield

Measuring ranges [°C]	DIP 1	DIP 2	DIP 3	Measuring ranges [°F]
-20...+150 °C	ON	ON	ON	-4...+302 °F
-50...+50 °C	OFF	ON	ON	-58...+122 °F
-20...+80 °C	ON	OFF	ON	-4...+176 °F
-30...+60 °C	OFF	OFF	ON	-22...+140 °F
0...+40 °C	ON	ON	OFF	32...+104 °F
0...+50 °C *	OFF	ON	OFF	32...+122 °F *
0...+100 °C	ON	OFF	OFF	32...+212 °F
0...+150 °C	OFF	OFF	OFF	32...+302 °F

* (default)

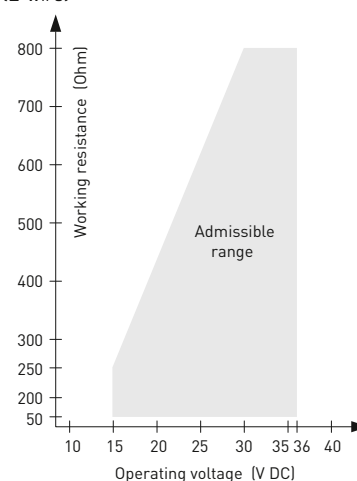
Display [°C] / [°F]	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

Display switchable

Temperature [°C] → [°F]

The display value depends on the set unit system (DIP 4).

Load resistance diagram (2-wire) RPTM 2 - I



For further technical information,
see the operating instructions





NEW

S+S REGELTECHNIK

THERMASGARD® RPTM 2

Pendulum room temperature measuring transducers,
calibratable, with multi-range switching
and active output (Automatic Output Switching)

RPTM 2 - Q
with M12 connector
(on request)



RPTM 2
with cable gland

THERMASGARD® RPTM 2 Pendulum room temperature measuring transducers (with globe)				
Type / WG01	Output	Type	Display	Item No.
RPTM 2 - I (2-wire)				
RPTM2-I	4...20 mA	Remote sensor		1101-1172-0219-910
RPTM2-I LCD	4...20 mA	Remote sensor	■	1101-1172-2219-910
RPTM 2 - A (3-wire AOS)				
RPTM2-A	0-10 V / 4...20 mA	Remote sensor		1101-117E-0219-910
RPTM2-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-117E-2219-910
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Extra charge:	other measuring ranges optional 2-wire connecting leads, per running meter (PVC) Cable connection with M12 connector according to DIN EN 61076-2-101			on request on request