

rexroth  
A Bosch Company

Electronic contact thermometer

RE 50225/2022-06 1/10  
replaces: 50224

Type ABZMT

Component series 2X



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Features

- Electronic contact thermometers are used for the temperature control of hydraulic systems.
- The contact thermometers have two or four programmable temperature switching outputs, or alternatively one programmable switching output and one analog output 4-20 mA, with display and control unit.
- The "T2" version has an IO-Link output and a programmable switching output. If the thermometer is not addressed via IO-Link, this output becomes a further programmable switching output.
- The temperature display can be selected in °C or °F.

Ordering code

ABZMT

T

-2X

/

/

-

K24

Power unit accessories

Measuring devices = ABZM

Electronic contact thermometer = T

Component series 20 to 29 (20 to 29: unchanged installation and connection dimensions) = 2X

Sensor length in mm [inch]

L= 0200 mm [7.86] = 0200

L= 0300 mm [11.82] = 0300

L= 0500 mm [19.69] = 0500

L= 1000 mm [39.37] = 1000

Sensor

Brass MS (with NBR seal) = MS

Stainless steel 1.4571 (with FKM seal) = ES

Display and control unit

directly attached display and control unit = D0

external display and control unit with cable set M12x1; 4-pole, PUR

1.5 m, angled mating connector and straight line connector = E1<sup>2)</sup>

3.0 m, angled mating connector and straight line connector = E3<sup>2)</sup>

5.0 m, angled mating connector and straight line connector = E5<sup>2)</sup>

1) Electrical connection

K24 = Connector M12x1; 4-pole

Temperature

T2 = Temperature display with IO-Link output and one programmable switching output or temperature display and two programmable switching outputs

T4 = Temperature display and four programmable switching outputs

T1A = Temperature display, one programmable switching output and one analog output 4-20 mA

1) The mating connectors are not included in the scope of delivery and must be ordered separately, if required (see page 3).  
2) Delivery with cable set

**Order example:**  
Electronic contact thermometer, sensor length 300 mm, sensor in brass, directly attached display and control unit, temperature display and two programmable switching outputs, connector K24:  
**ABZMT-2X/0300MS/D0-T2-K24**  
**Material no. R901247784**

Preferred types

Type	Mat. No.
ABZMT-2X/0300MS/D0-T2-K24	R901531534
ABZMT-2X/0300MS/D0-T4-K24	R901531535
ABZMT-2X/0300MS/D0-T1A-K24	R901531536
ABZMT-2X/0300MS/E3-T2-K24	R901531538
ABZMT-2X/0300MS/E3-T4-K24	R901531540
ABZMT-2X/0300MS/E3-T1A-K24	R901531541

Symbol

two program-mable switching outputs for temperature (T2)

four programmable switching outputs for temperature (T4)

one programmable switching output and one analog output 4-20 mA for temperature (T1A)

Knowledge is POWER – Motion Force Control is our Business  
HYQUIP Limited New Brunswick Street Horwich Bolton Lancashire BL6 7JB UK

Resistance

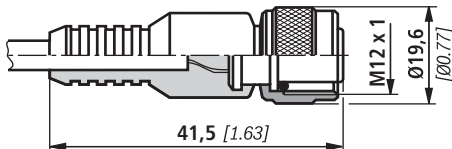
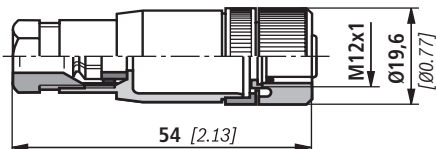
Hydraulic fluids				Seals	
				NBR	FKM
Mineral oils	Mineral oil	HL / HLP	according to DIN 51524	resistant	resistant
Flame-resistant	Emulsions	HFA-E	according to DIN 24320	not resistant	
	Aqueous solutions	HFC	according to VDMA 24317	not resistant	
	Phosphoric acid esters	HFD-R		resistant	
	Organic esters	HFD-U			
Fast biodegradable	Triglycerides (rape-seed oil)	HETG	according to VDMA 24568	resistant	
	Synthetic esters	HEES		not resistant	
	Polyglycols	HEPG			

Mating connectors (dimensions in mm [inch])

For detailed information see RE 08006

Mating connector for connector K24

Mating connector for device connector K24 with potted-in PVC cable, 3 m long



Denomination	Material no.
MATING CONNECTOR 4P Z24 SPEZ	R9000311 55

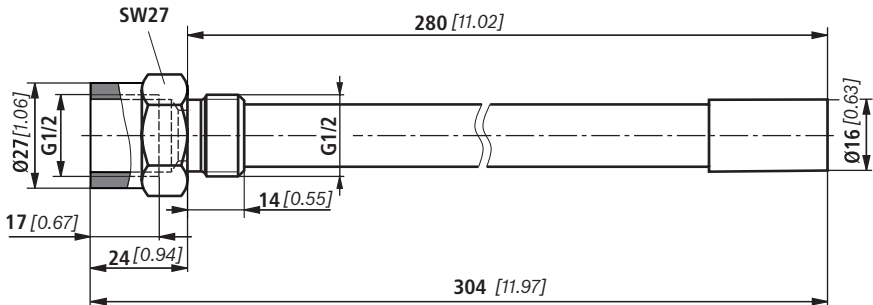
Denomination	Material no.
MATING CONNECTOR 4P Z24M12X1+3MSPEZ	R900064381

Accessories: (not included in the scope of delivery)

Tank installation sleeve

Material no. R901248320

Material 1.430, seal NBR



For version with long-distance line (E1, E3 or E5) and a length of 200 mm

## Technical data (For applications outside the stated values, please ask us!)

General		Version MS	Version VA
Temperature range	°C [°F]	0 to 100 [32 to 212]	0 to 100 [32 to 212]
Maximum operating pressure	bar [psi]	5 [72.52]	10 [145.04]
Installation position		Any (preferably vertical)	Any (preferably vertical)
Ambient temperature range	°C [°F]	-20 ... 70 [-4 to 158]	-20 ... 70 [-4 to 158]
Material	– Pipe	Cu alloy	Stainless steel 1.4571
	– Flange	Anodized aluminum	Stainless steel 1.4571
Seal material		NBR seal	FKM seal
Maximum sensor length	mm [inch]	1000 [39.37]	1000 [39.37]
Sensor connection		G ½	G ½
Mass at L = 300 mm	kg [lbs]	0.25 [0.55]	0.35 [0.77]

### Electrical

Protection class according to DIN EN 60529	IP 65
Plug-in connection	M12x1; 4-pole (material: metal)

### Temperature sensor

Sensor element	PT100 class B; DIN EN 60751
Measurement range	°C [°F] 0 ... 100 [32 ... 212]; 0 °C = 4 mA; 100 °C = 20 mA
Accuracy	K +/- 0.8

### Display and control unit

Supply voltage	V DC	10 ... 32; IO-Link 18 ... 30 V
Display range	°C [°F]	-20 ... 120 [-4 to 248]
Alarm adjustment range	°C [°F]	0 ... 100 [32 ... 212]
Housing design		PA, IP65 (antistatic)
Display		4-digit, seven-segment LED display
Current consumption upon switch-on		Approx. 100 mA over 100 ms
Current consumption during operation		Approx. 50 mA at UB 24 V
Max. ambient temperature	°C [°F]	-20 ... 70 [-4 ... +158]
Accuracy		1% of the measurement range end value
Operation		3 keys

### Version T2

Switching points		2 programmable switching outputs
Max. switching current	A	T1: 0.2; T2: 0.5

### Version T4

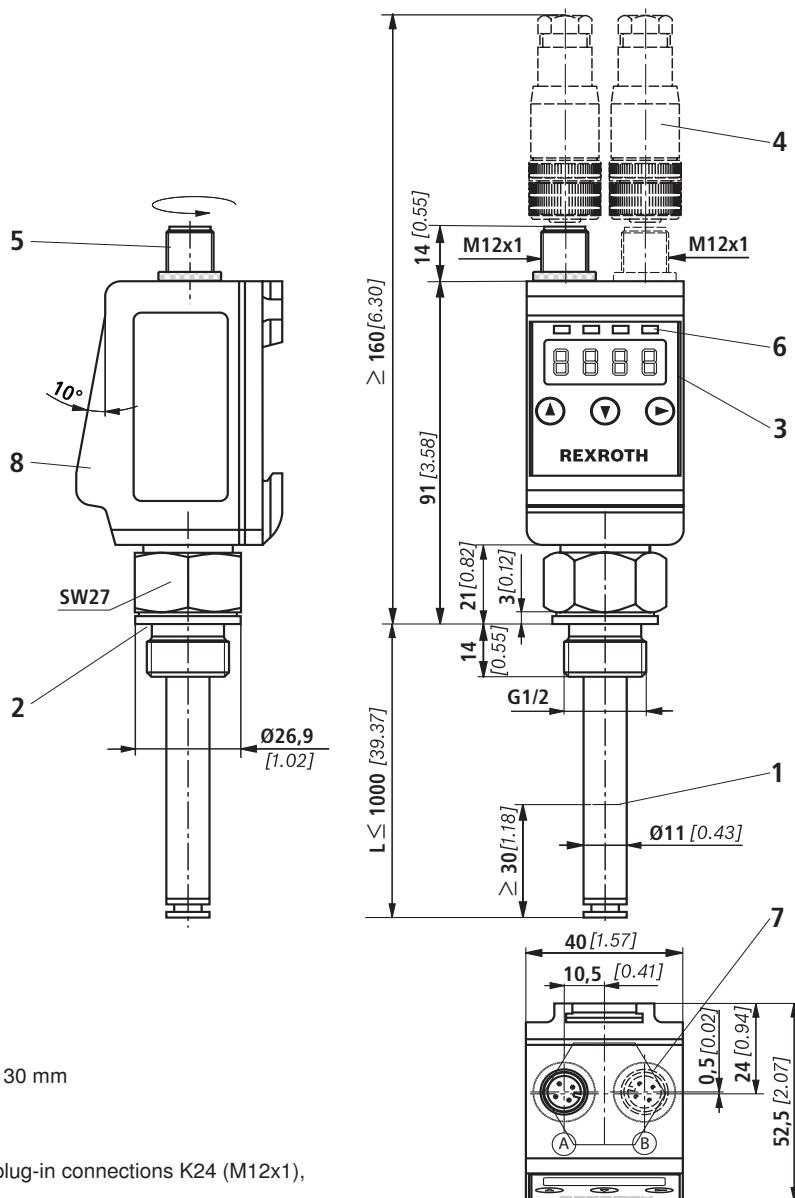
Switching points		4 programmable switching outputs
Max. switching current	A	T1: 0.2; T2, T3, T4: 0.5, max: 1 A total

### Version T1A

Switching point		1 programmable switching output
Max. switching current	A	0.2
Output signal		4 ... 20 mA (alternatively 0-10, 2-10 or 0-5 volt adjustable)
Max. load	Ω	500
Mounting of external display and control unit		Assembly on top hat rail 35 mm

## Unit dimensions (dimensions in mm [inch])

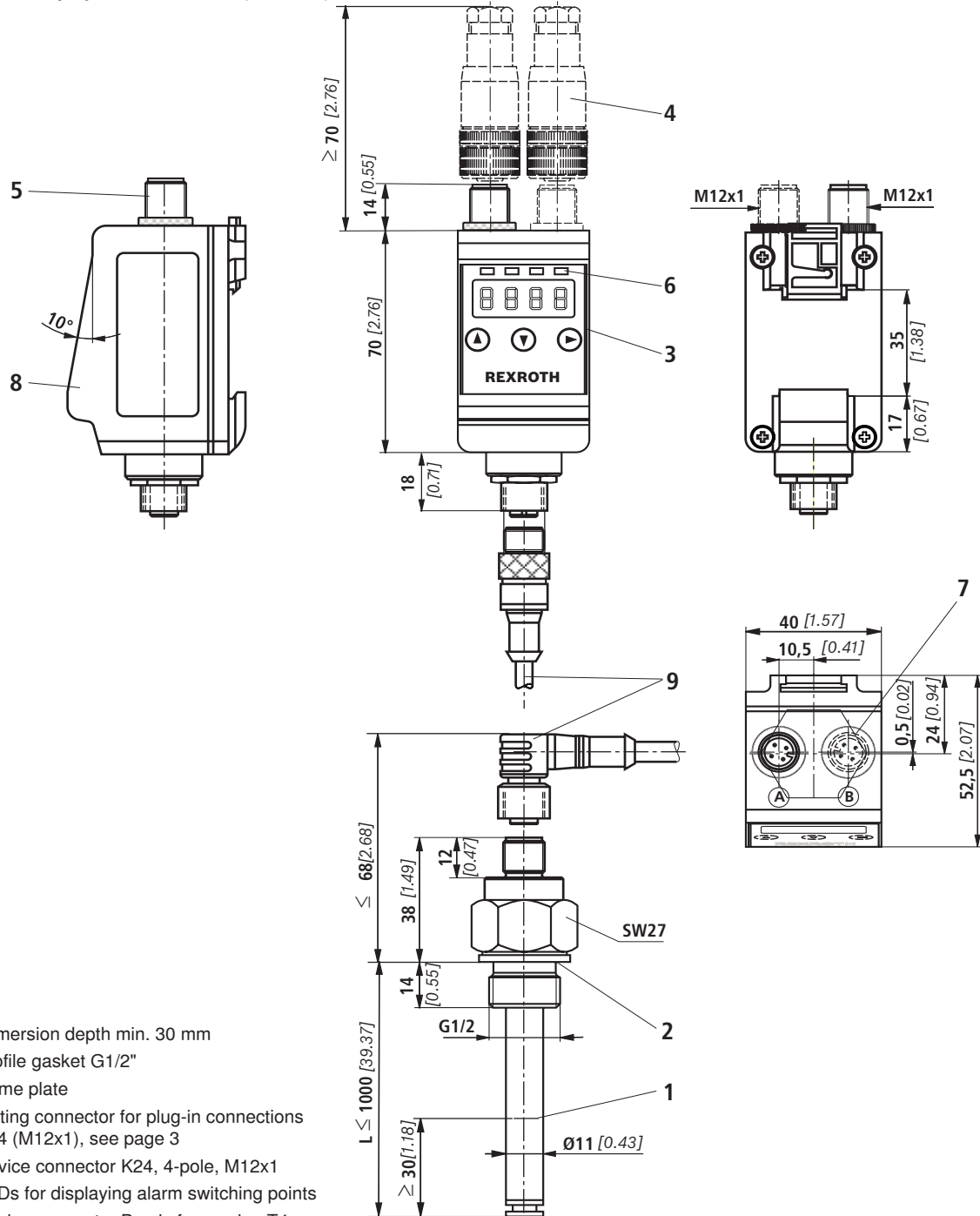
### Directly attached display and control unit (version D)



- 1 Immersion depth min. 30 mm
- 2 Profile gasket G1/2"
- 3 Name plate
- 4 Mating connector for plug-in connections K24 (M12x1), see page 3
- 5 Device connector K24, 4-pole, M12x1
- 6 LEDs for displaying alarm switching points
- 7 Device connector B only for version T4
- 8 Display and control unit rotatable by 270°

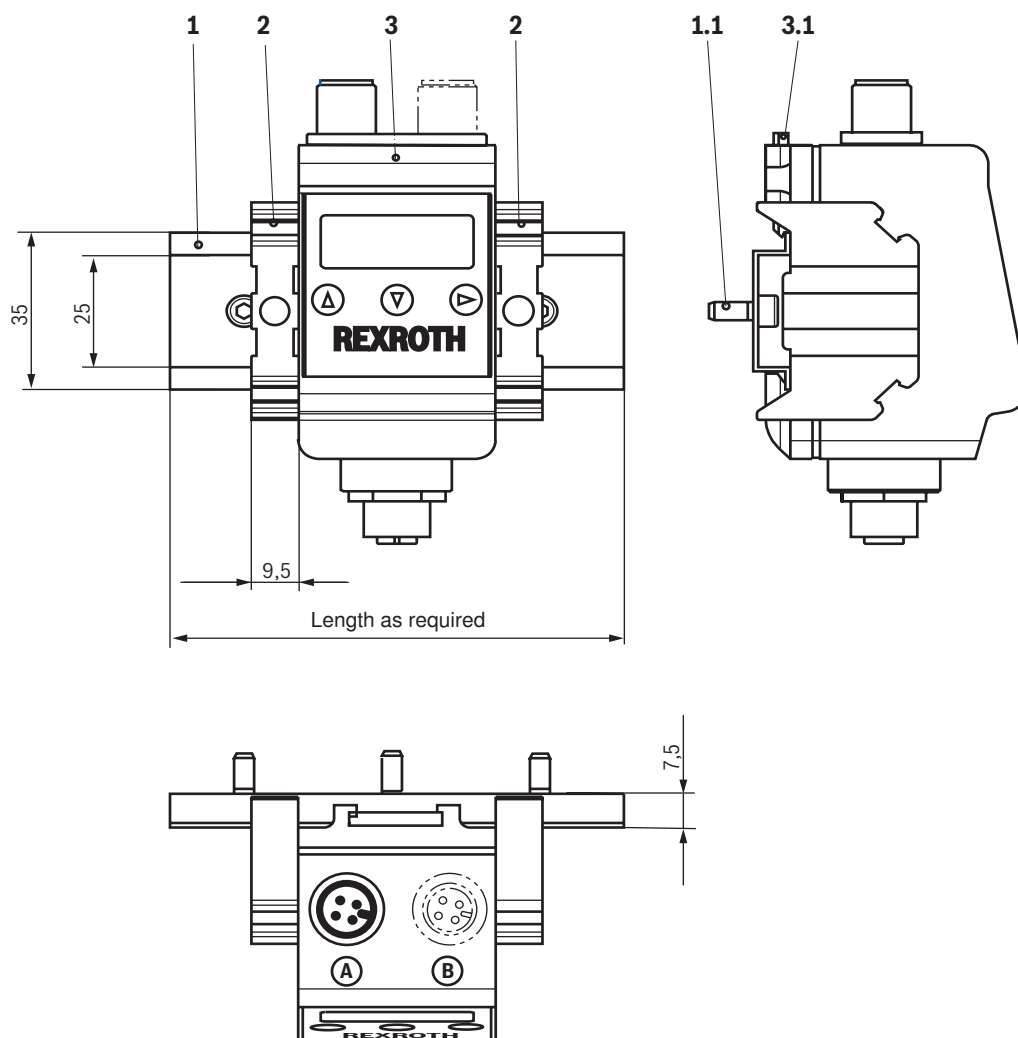
## Unit dimensions (dimensions in mm [inch])

### External display and control unit (version E)



- 1 Immersion depth min. 30 mm
- 2 Profile gasket G1/2"
- 3 Name plate
- 4 Mating connector for plug-in connections K24 (M12x1), see page 3
- 5 Device connector K24, 4-pole, M12x1
- 6 LEDs for displaying alarm switching points
- 7 Device connector B only for version T4
- 8 Display and control unit
- 9 Cable set M12x1; 4-pole, PUR, see page 2

## Installation of external display and control unit



- Item 1.0: Top hat rail TS35 DIN EN 60715 (R900016056)
- Item 1.1: Hexagon socket head cap screw M5
- Item 2.0: Clamping bracket E/NS35N (R900227399)
- Item 3.0: External display and control unit
- Item 3.1: Mounting clip



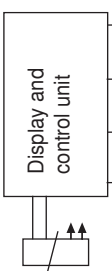


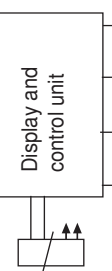




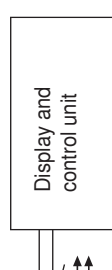


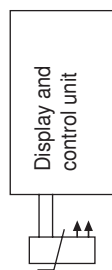
### Installation information

- (1) Shorten the top hat rail item 1 (supplied length 2000 mm) to the required dimension and fasten it on the substructure using hexagon socket head cap screws M5 item 1.1
- (2) Position the display and control unit item 3 on the top hat rail and fasten it using the fastening clip item 3.1
- (3) Fix the display and control unit item 3 by means of the clamping bracket item 2 on both sides

The fastening accessories item 1, item 1.1 and item 2 are not included in the scope of delivery of item 3.

## Pinout

### Switching function of plug-in connection M12x1

Version	T2	<p>IO-Link</p>   <p>(4-pol)</p>	 <p>1 +24 VDC        2 Temp out2 &gt; PNP *        3 GND        4 Temp out1 (IO-Link)</p> <p>* 0-100 °C freely programmable C/Q</p>	Device connector B not present
	T2	<p>without IO-Link</p>   <p>(4-pol)</p>	 <p>1 +24 VDC        2 Temp out2 &gt; PNP *        3 GND        4 Temp out1 &gt; PNP *</p> <p>* 0-100 °C freely programmable</p>	Device connector B not present
	T4	  <p>(4-pol)</p> <p>1</p>   <p>(4-pol)</p>	 <p>1 +24 VDC        2 Temp out2 &gt; PNP *        3 GND        4 Temp out1 &gt; PNP *</p> <p>1 +24 VDC        2 Temp out4 &gt; PNP *        3 GND        4 Temp out3 &gt; PNP *</p> <p>* 0-100 °C freely programmable</p>	<p>Please always supply both sides A and B with voltage, even if out3 and out4 are not required.</p>
	T1A	  <p>(4-pol)</p>	 <p>1 +24 VDC        2 Temp out2 &gt; 4 ... 20 mA        3 GND        4 Temp out1 &gt; PNP *</p> <p>* 0-100 °C freely programmable</p>	Device connector B not present



## Function

### Display and control unit function

The micro-processor controlled display and control unit processes the analog input signals for the analysis of the temperature control. The temperature can be set at the control unit in an easy menu navigation by means of pushbuttons and the settings can be read off at the LED display.

The display and control unit has a four-digit, red seven-segment LED display and 3 pushbuttons for the operation as well as up to 4 LEDs integrated in the front plate for the display of alarm conditions.

The device moreover has two (T2) and/or four (T4) freely adjustable PNP switching outputs plus the adjustable switch-back points. One PNP output can be programmed as frequency output. Alternatively one freely programmable PNP switching output and one 4-20 mA output for the continuous temperature measurement. The switching conditions are shown in the display which can be rotated by 270° (version D0).

The output 4-20 mA can optionally be set to 0-10 V, 2-10 V or 0-5 V.

Depending on the setting for the measured temperature, the desired unit (°C, °F) will be displayed. By default, the temperature display is set to °C.

During the setting and/or programming of the corresponding process parameters, the parameter values and/or the related menu items are shown in the display.

In case of energy supply failure, all input values will be stored, the max/min values can be called from a permanent memory, if necessary.

### IO-Link

The IO-Link interface can be used to query or set all the information of the thermometer, e.g. via a master.

Thus, the current temperature can be output, switching points set and min. and max. values read out. Furthermore, general information such as type keys, material numbers and pin assignments can also be read out.

The IODD of the thermometers is provided at:

[www.boschrexroth.com/de/de/produkte/](http://www.boschrexroth.com/de/de/produkte/)

### Parameterization

The menu navigation is based on the VDMA standard sheet for fluid sensors 24574-1:2010-11.

The operating menu is designed hierarchically as a tree structure.

That means that frequently used functions and adjustment points are quickly accessible and rarely used menu items can be found in a submenu.

Using the ▲ and ▼ keys, the corresponding parameters are set and/or the next menu item is displayed.

Using the ► key, the selected menu item is selected and/or the set parameter is accepted and stored.

The parameter may be a numerical value and a selection of functions (e.g. NO [output as normally open contact], NC [output as normally closed contact] or i1 [analog output 4-20 mA]).

After confirmation of a parameter or function selection by means of the ► key, the display will switch back to the current menu item. Then, you can use ▲ and ▼ to display the next menu item and the ► key to select it.

## Spare parts

For replacement orders of the electronic contact thermometer, the complete type designation must be indicated.

Seal	Mat. No.
1 profile gasket G ½ NBR	<b>R900012472</b>
2 profile gaskets G ½ FKM	<b>R900012507</b>
3 CABLE SET M12X1-4POL-P-1.5-ABZMT	<b>R901352856</b>
4 CABLE SET M12X1-4POL-P-3.0-ABZMT	<b>R901319896</b>
5 CABLE SET M12X1-4POL-P-5.0-ABZMT	<b>R901352858</b>

## Installation information

- Avoid flows
- Do not expose the switch to heavy impacts and bends
- Avoid external magnetic fields

### Electrical connections:

- Electrical connections may only be established by specialists
- Tighten round connector M12x1 or mating connector after connection
- Plug round connector M12x1 or mating connectors only in the voltage-free state
- Tightening torque of the screw-in stud 25 Nm
- In case of inductive load provide a protection circuit!

### Use in potentially explosive areas according to directive 2014/34/EU (ATEX)

The electronic contact thermometers according to ABZMT are not suitable for use in potentially explosive areas.

## Normative reference

### RE 08006

Mating connectors for controlling electrically operated valves and sensors

### VDMA 24317

Fluid technology – Flame-resistant fluids – Technical minimum requirements

### DIN 24320

Flame-resistant fluids - Hydraulic fluids of categories HFAG and HFAS - Properties and requirements

### VDMA 24568

Fluid technology – Fast bio-degradable fluids – Technical minimum requirements

### DIN 51524

Hydraulic fluids; hydraulic oils

### VDMA 24574-1

Fluid technology – Terms, menu navigation and electrical connection for fluid sensors

### DIN EN 60715

Dimensions of low-voltage switchgear - standardized carrier rails

### IEC 61131-9

Programmable logic controls - interface for communication with small sensors and actuators via a point-to-point connection.

### DIN EN 60751

Industrial platinum resistance thermometers and platinum temperature sensors (IEC 60751:2008)

### DIN EN 175201-804:

Detail specification - Circular connectors - Round contacts, size diameter 1.6mm, threaded coupling; German version EN 175201-804:1999

### DIN EN 60529

Protection classes by housing