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

ABZM | T – 2X / | / – | K24

Power unit accessories
Measuring devices **= ABZM**
Electronic contact thermometer **= T**
Component series 20 to 29 **= 2X**
(20 to 29: unchanged installation and connection dimensions)

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**[2)]
3.0 m, angled mating connector and straight line connector **= E3**[2)]
5.0 m, angled mating connector and straight line connector **= E5**[2)]

[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:

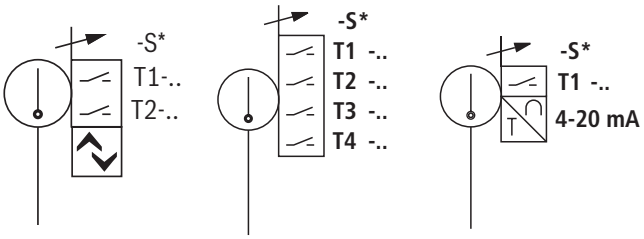
ABZMT-2X/0300MS/D0-T2-K24

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 programmable 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)**

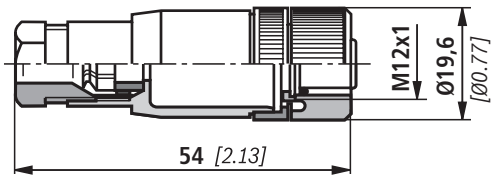
Resistance

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			
	Organic esters	HFD-U		resistant	
Fast biodegradable	Triglycerides (rape-seed oil)	HETG	according to VDMA 24568		
	Synthetic esters	HEES		not resistant	
	Polyglycols	HEPG			

Mating connectors (dimensions in mm *[inch]*)

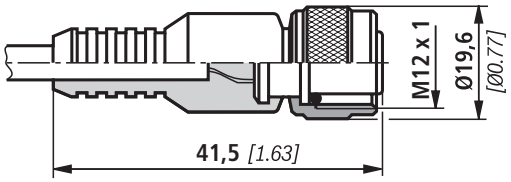
For detailed information see RE 08006

Mating connector for connector K24



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

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



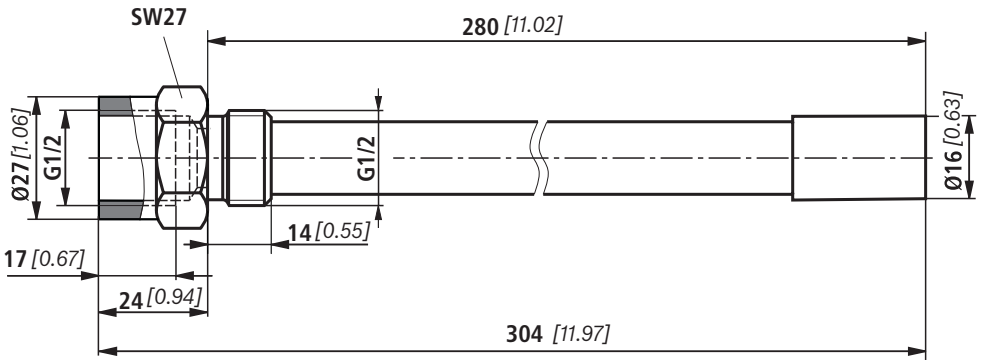
Denomination	Material no.
MATING CONNECTOR 4P Z24M12X1+3MSPEZ	**R900064381**

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

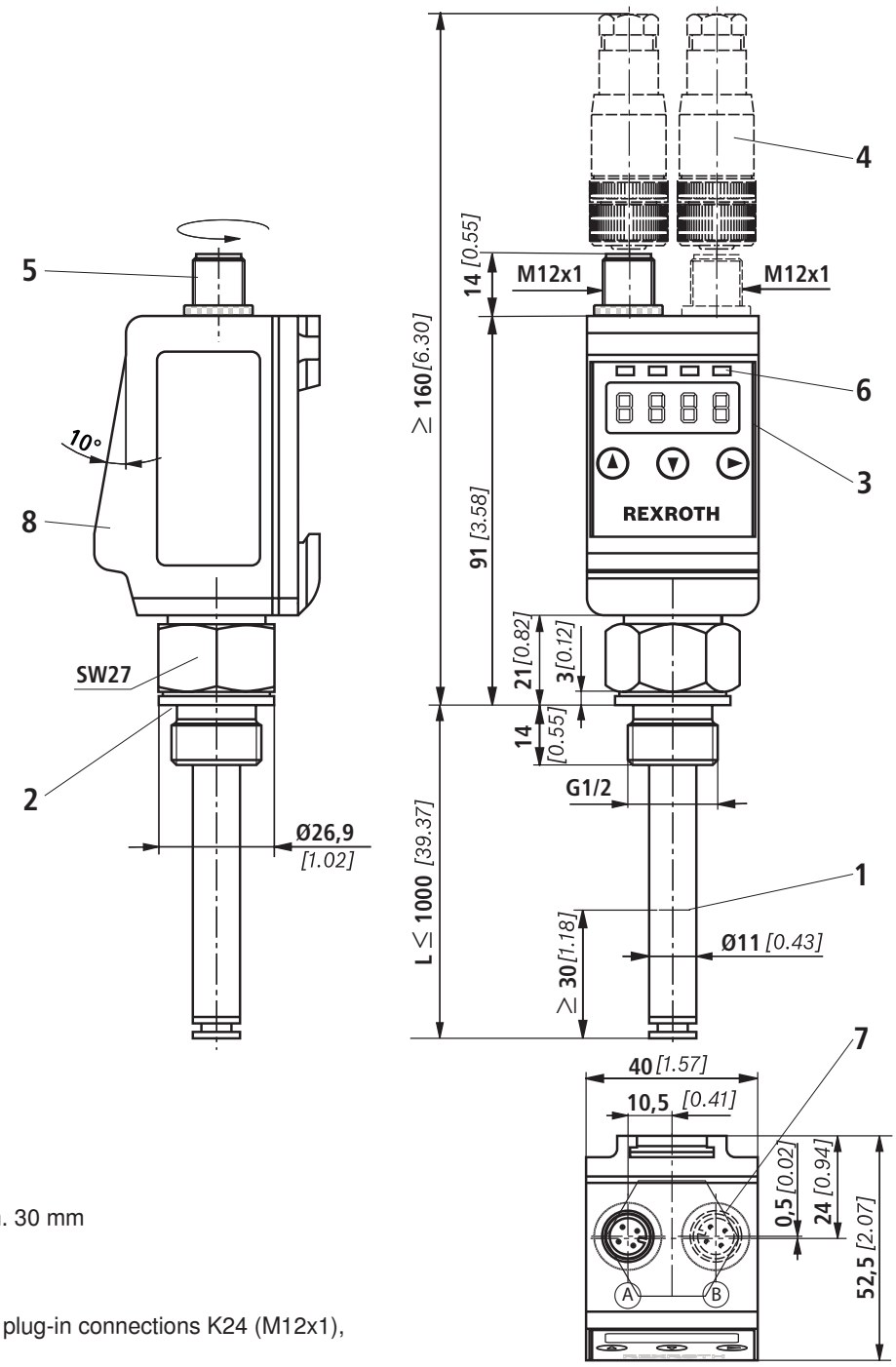
Technical data (For applications outside the stated values, please ask us!)

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]*)

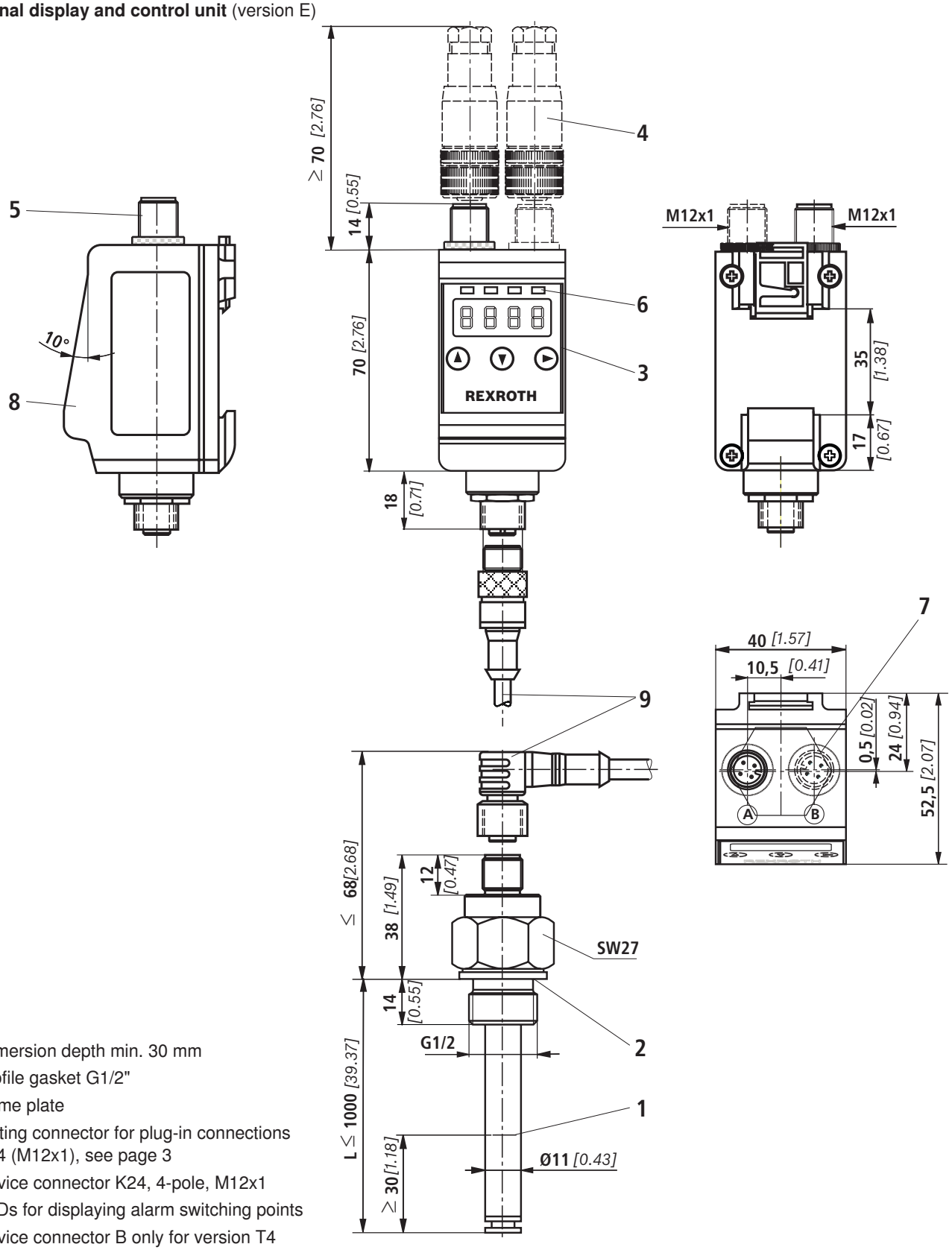
Directly attached display and control unit (version D)



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°

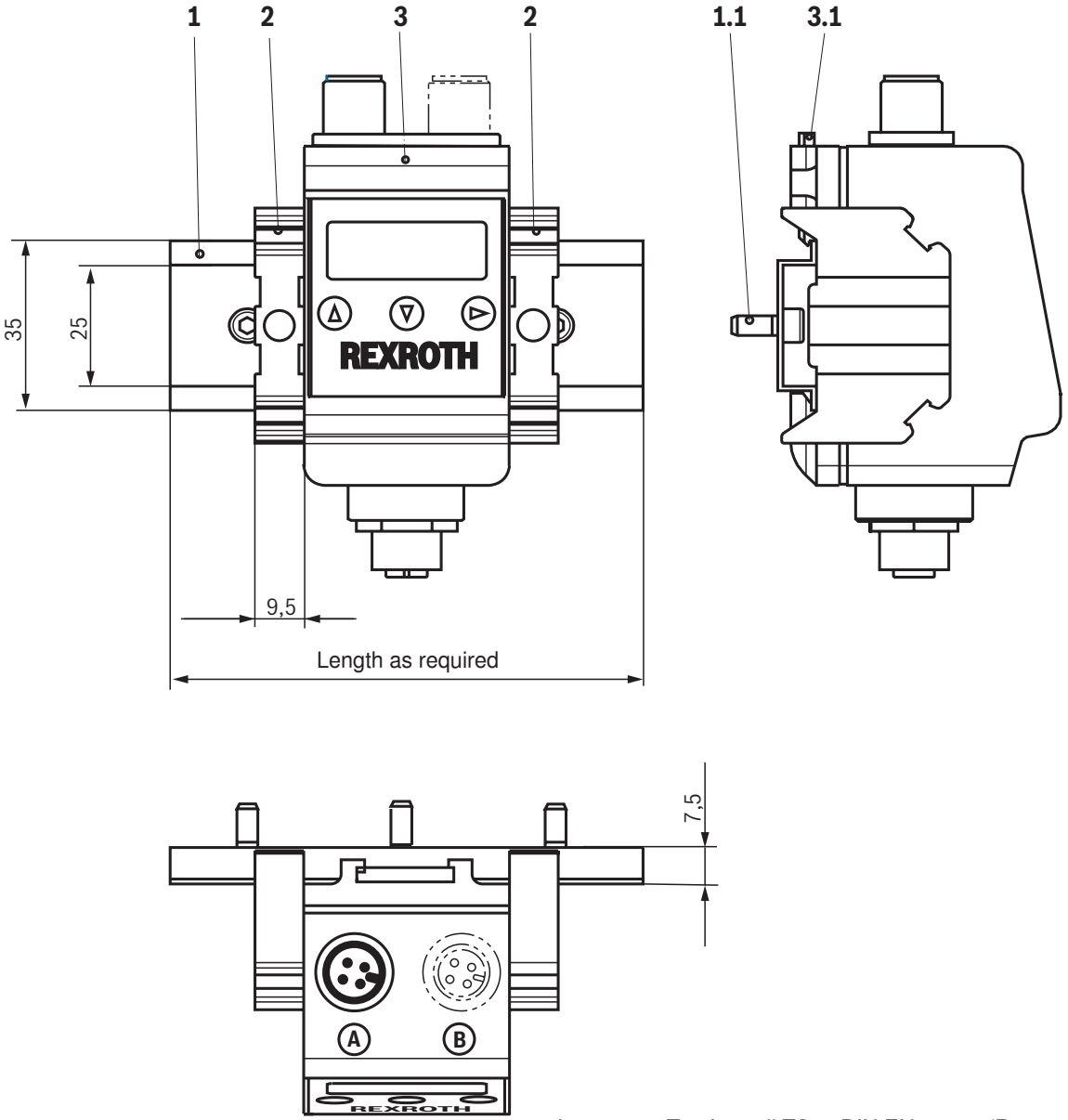
Unit dimensions (dimensions in mm *[inch]*)

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

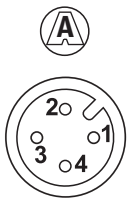
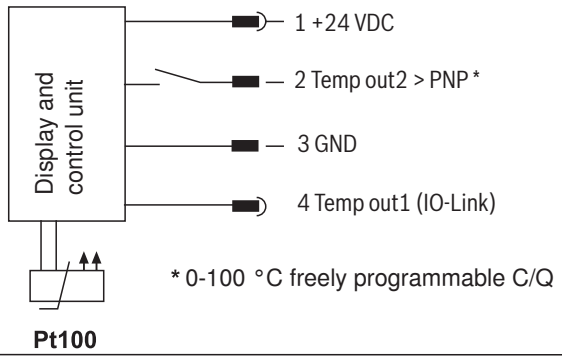
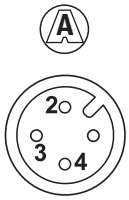
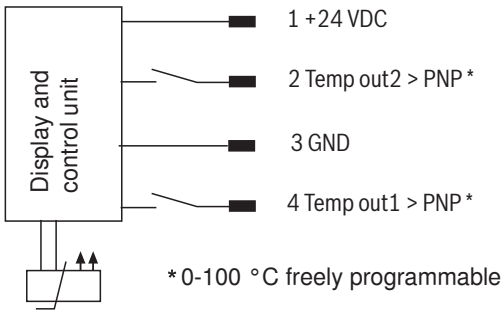
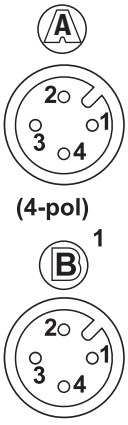
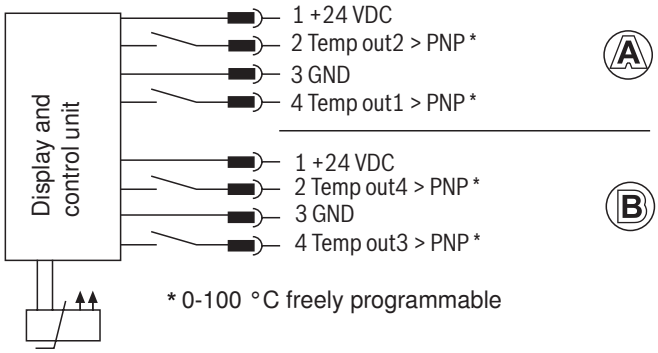
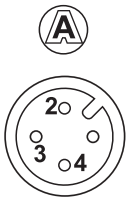
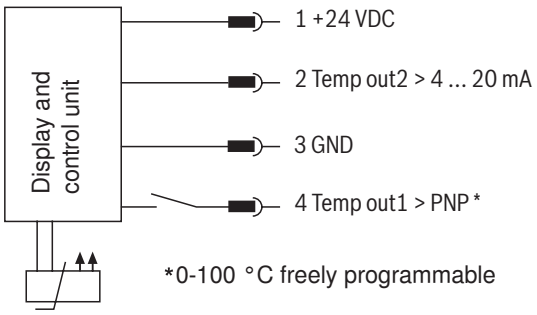
(2) Position the display and control unit item 3 on the top hat rail and fasten it using the fastening clip item 3.1

(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	**IO-Link**  **(4-pol)**	 1 +24 VDC 2 Temp out2 > PNP * 3 GND 4 Temp out1 (IO-Link) Display and control unit * 0-100 °C freely programmable C/Q **Pt100**	Device connector B not present
	T2	**without IO-Link**  **(4-pol)**	 1 +24 VDC 2 Temp out2 > PNP * 3 GND 4 Temp out1 > PNP * Display and control unit * 0-100 °C freely programmable **Pt100**	Device connector B not present
	T4	 **(4-pol)** 1 **(4-pol)**	 1 +24 VDC 2 Temp out2 > PNP * 3 GND 4 Temp out1 > PNP * 1 +24 VDC 2 Temp out4 > PNP * 3 GND 4 Temp out3 > PNP * Display and control unit * 0-100 °C freely programmable **Pt100**	Please always supply both sides A and B with voltage, even if out3 and out4 are not required.
	T1A	 **(4-pol)**	 1 +24 VDC 2 Temp out2 > 4 ... 20 mA 3 GND 4 Temp out1 > PNP * Display and control unit *0-100 °C freely programmable **Pt100**	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/

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	**R900012472**
2 profile gaskets G ½ FKM	**R900012507**
3 CABLE SET M12X1-4POL-P-1.5-ABZMT	**R901352856**
4 CABLE SET M12X1-4POL-P-3.0-ABZMT	**R901319896**
5 CABLE SET M12X1-4POL-P-5.0-ABZMT	**R901352858**

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

DIN 24320
Flame-resistant fluids - Hydraulic fluids of categories HFAE and HFAS - Properties and requirements

DIN 51524
Hydraulic fluids; hydraulic oils

DIN EN 60715
Dimensions of low-voltage switchgear - standardized carrier rails

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

VDMA 24317
Fluid technology – Flame-resistant fluids – Technical minimum requirements

VDMA 24568
Fluid technology – Fast bio-degradable fluids – Technical minimum requirements

VDMA 24574-1
Fluid technology – Terms, menu navigation and electrical connection for fluid sensors

IEC 61131-9
Programmable logic controls - interface for communication with small sensors and actuators via a point-to-point connection.