Temperature sensor

TER8

Operating instruction

Description

Temperature sensor type TER8 comprises a series of basic elements which can be combined in various ways to a TER8 temperature sensor. The product offers great flexibility in respect to modification, service and maintenance.

The sensor can be made to feature a RTD output signal or with a built in temperature transmitter with 4-20 mA output.

Environment

Environment	
Pressure	See page 3
Sideward load on the tip, F_{max}	50 N
Humidity	<98% RH, condensing
Ambient temperature	-40...85°C
Protection class	IP67 / IP69K
Vibrations	GL, test 2 (sensor tube <50 mm)

Field of application

Temperature sensor type TER8 is a compact temperature sensor, based on RTD technology, which is designed with a PEEK sensor tube and produced to meet the requirements in industries where hygienic connections are used.

In the TER8 the ambient temperature influence on the output temperature is minimized to the absolute smallest possible value (see graph page 3).

The wetted parts of the TER8 is made from PEEK (plastic). This is the strongest plastic available and fulfils all requirements from the guide lines of EU regulation 10/2011, FDA, 3-A and EHEDG.

The PEEK part is used for sealing to the Baumer adapter which is approved by 3-A and conforms to the EHEDG guideline.

Safety instruction

This instrument is built and tested according to the current EU-directives and packed in technically safe conditions. In order to maintain this condition and to ensure safe operation, the user must follow the hints and warnings given in this instruction.

During the installation the valid national rules have to be observed. Ignoring the warnings may lead to severe personal injury or substantial damage of property.

The product must be operated by trained staff. Correct and safe operation of this equipment is dependent on proper transport, storage installation and operation.

All electrical wirings must conform to local standards. In order to prevent stray electrical radiation, we recommend twisted and shielded input cables and also to keep power supply cables separated from the input cables. The connection must be made according to the connection diagrams.

Before switching on the power supply take care that other equipment is not affected. Ensure that the power voltage and the conditions in the environment comply with the specification of the device.

Before switching of the power supply voltage, check the possible effects on other equipment and the processing system.

WARNING

The temperature sensor type TER8 is not certified to be mounted in hazardous areas.

After mounting of the device - check that the housing has a ground potential.

The product contains not replaceable parts. In case of malfunction the product must be sent to Baumer for repair.

English

Mounting

1) Use only a Baumer counterpart

2) The inspection hole should be visible and drained

3) Mount the adapter in a self-drained position/angle

4) Level the inner surface of the pipe with the counterpart.

5) The 3-A mark or the arrow shall be placed upwards

6) Welding should be grinded to $R_a \leq 0.8$

7) Tighten the instrument in the adapter with a torque of 10...15 Nm

Example with ZPW2-321 or ZPW2-521

① Example with ZPW2-621
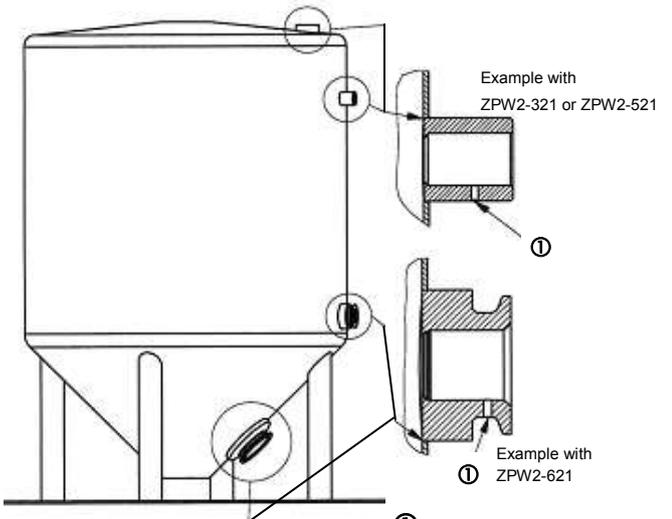
① Leakage indication hole must be placed at the lowest possible point
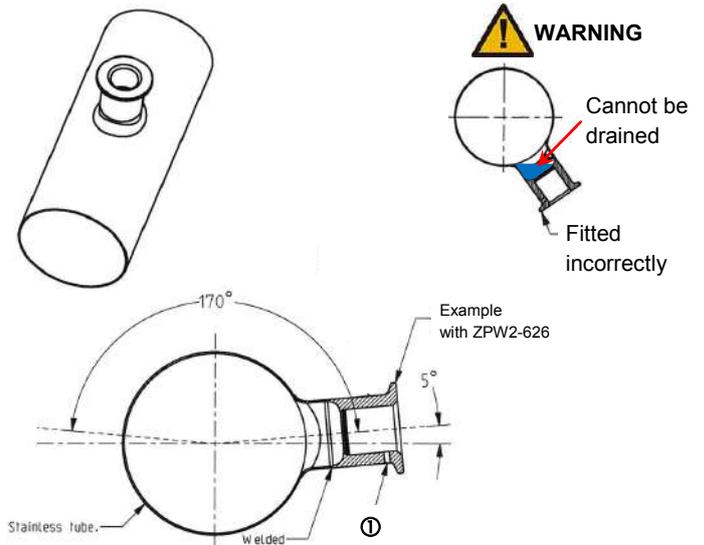
After installation

• Check the leak tightness of the sleeve.

• Check the tightness of the M12 plug.

⚠ **WARNING**

Cannot be drained

Fitted incorrectly

Example with ZPW2-626

170°

5°

Stainless tube.

Welded

①

Before reassembly, clean the hole and inside of the connection with detergent and sanitising liquid. Use a small brush. Verify that all of the inside area is completely clean.

Reassemble and verify that the connection is tight.

Do not use Teflon, elastomer or other types of gaskets.

Mounting adaptors

EH FTL G3/4B	EH FTL G1B	VS G3/4B	VS G1B	G1B	G11/2B	G2B
ZPH1-32BA	ZPH1-32CB	ZPH1-32BC	ZPH1-32CD	ZPI1-32B	ZPI1-32C	ZPI1-32D

Clamp ISO2852	SMS 1145 DN 51	DIN 11851	VARIVENT® N, F	Welding	Welding	Welding	Welding
ZPH1-321x	ZPH1-3236	ZPH1-322x	ZPH1-324x	ZPW2-321	ZPW2-322	ZPW2-324	ZPW2-326 /-327

Note:

The 3-A approval is only valid if the instrument is mounted in an 3-A approved accessories.

The approved accessories is marked with 3-A logo.

The EHEDG approval if the instrument is mounted in an EHEDG approved accessories.

The approved accessories is marked with EHEDG logo.

English

Influence from ambient temperature

With Pt100 output

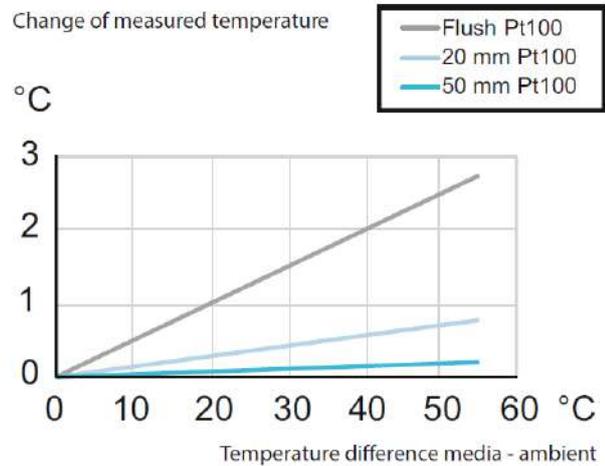|	
Front flush sensor	0,056°C/°C
20 mm sensor	0,017°C/°C
50 mm sensor	0,005°C/°C

Test conditions:

|	
Media temperature	Stable at 0,01°C
Ambient temp. change	30°C → 85°C
Total change	55°

(compensated for all other possible errors)

Change of measured temperature

Flush Pt100
20 mm Pt100
50 mm Pt100

Temperature difference media - ambient

Maximum media temperature related to ambient temperature and voltage supply range

Max. ambient temp.	85°C
Process temperature	-40 … 115 °C
SIP temperature	<140°C for 1 hour

°C Process temperature

Voltage supply range
24 V - 1 h
24 V
15 V - 1 h
15 V
36 V - 1 h
36 V

Ambient temperature
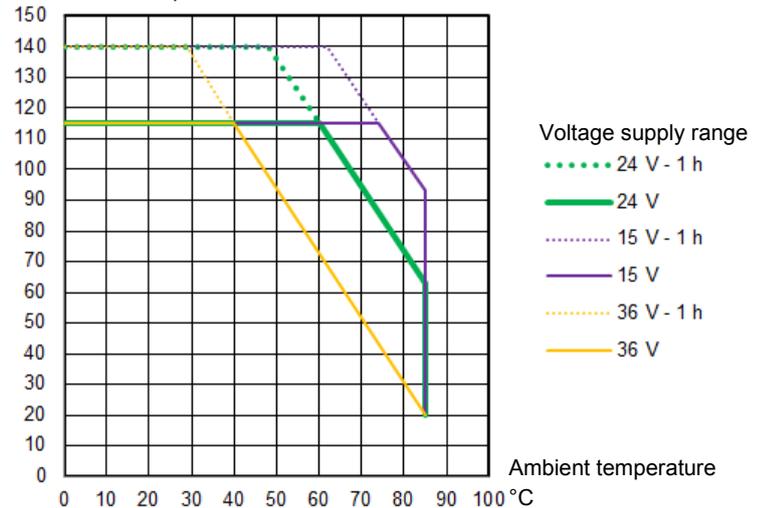
Maximum process pressure

Process pressure	Flush	>100°C	100 bar
	-	>140°C	50 bar
	20...50 mm	>100°C	50 bar
	-	>140°C	25 bar

Note:

For above specifications to apply TER8 must be mounted in a Baumer adapter.

Technical specifications

Process connection material		Stainless steel, AISI 316L	
Sensor material		PEEK	
Housing material		Stainless steel, AISI 304	
Time constant	Front flush [1]	T_{50}	≤9 sec
	-	T_{90}	≤66 sec
	20 mm sensor	T_{50}	≤2,5 sec
	-	T_{90}	≤6,5 sec
	50 mm sensor	T_{50}	≤2,7 sec
	-	T_{90}	≤6,3 sec

Time constant tested acc. to IEC/DIN/EN 60751, with Baumer adapter mounted
[1] Tested with only the surface in contact with the media

English

Sensor element, Pt100 - DIN/EN/IEC 60751

Pt100 DIN class B	$\pm(0,3 + 0,005 \times t)°C$
Pt100 1/3 DIN class B	$\pm 1/3 \times (0,3 + 0,005 \times t)°C$
Pt100 1/6 DIN class B	$\pm 1/6 \times (0,3 + 0,005 \times t)°C$
Pt100 DIN class A	$\pm(0,15 + 0,002 \times t)°C$
Single element	$1 \times Pt100$

Transmitter, type TE2

Input		Pt100 (IEC/DIN/EN 60751-2)
Output		4...20 mA (max. 700 Ω @ 24)
Accuracy,	input	<0,25°C (@ ≤100°C)
	output	<0,1% signal span (16 mA)
	repeatability	<0,1°C
	temperature drift	Typ. <0,003%/°C / Max. <0,01%/°C
Range		-40...150°C (programmable)
Minimum span		25°C
Supply		8...35 VDC
Protection		Reversed polarity protected
Programmability		By FlexProgrammer 9701

Electrical installation with Pt100 output

M12 plug, 4-wire

Pt100
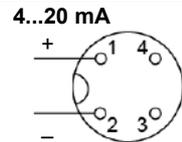
Pt100
2-wire (1 / 4)
3-wire (1 / 2 + 4)
4-wire (1 / 2 + 3 / 4)
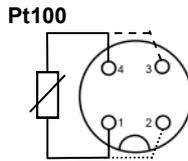
Electrical installation with 4...20 mA output

M12 plug, 4-wire

4...20 mA
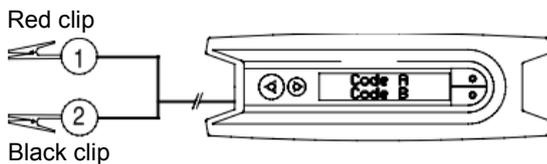
4...20 mA
1 - + V DC
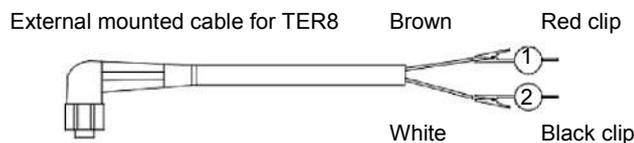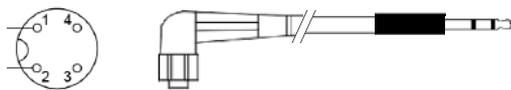2 - – V DC

Connection to the FlexProgrammer

Note:

Disconnect loop supply before connecting the FlexProgrammer to the transmitter.

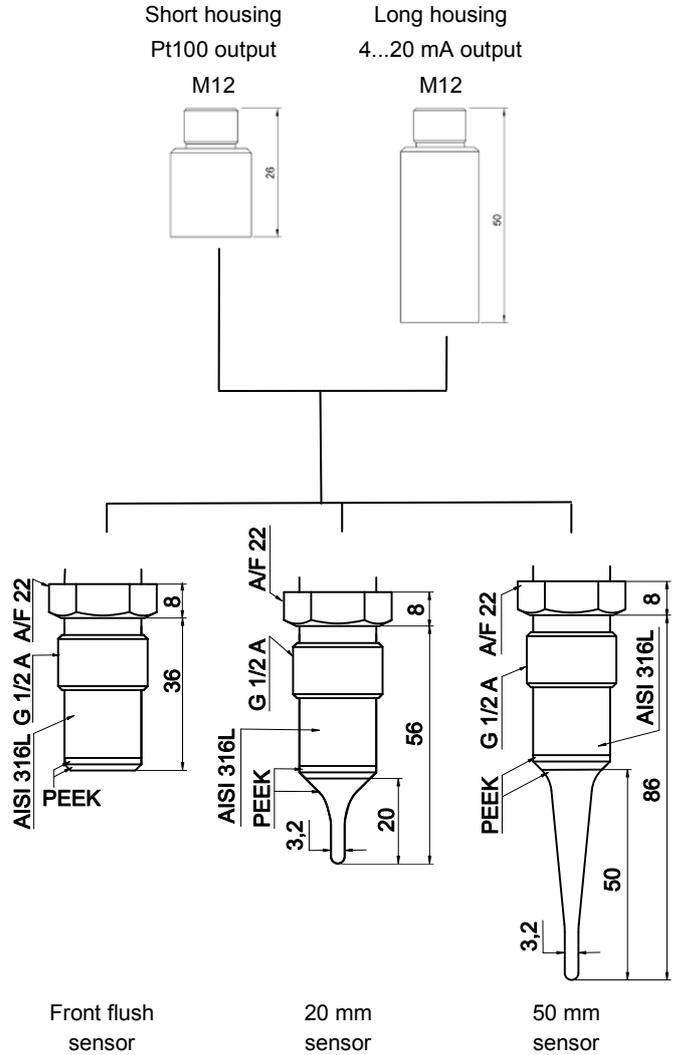Connection of FlexProgrammer - Crocodile clips (included in 9701 kit)

Red clip

Black clip

Connection of FlexProgrammer - M12 cable (included in 9701 kit)

External mounted cable for TER8   Brown   Red clip

White   Black clip

Sensor dimensions

Short housing
Pt100 output
M12

Long housing
4...20 mA output
M12

Front flush sensor

20 mm sensor

50 mm sensor