

# TER8

Front-flush and low-invasive resistance thermometers



## Product highlights

- 3-A fulfillment without elastomers
- Front-flush or immersed types
- Accurate reading independent on ambient temperature
- Fast response time
- Hermetically sealed towards process
- Capable of SIP (Sterilization in Place)
- Compact stainless steel housing, protection up to IP69K
- Optional integrated 4 ... 20 mA transmitter

## User benefits

- Safe process with less downtime
- Free choice of mounting position even with agitators and pigging systems
- Ability for mounting in small tubes down to DN 25
- High process effectiveness
- Long life time even in wash-down areas
- Reliable in SIP operation
- High flexibility by programmable output range

## Technical data

### Housing

Style	■ Compact design
Overall size	■ Refer to section „Dimensional drawings“
Material	■ Stainless steel

### Electrical connection

Connector variants	■ M12, 4-pin
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### Ambient conditions

Operating temperature range	■ -40 ... 85 °C
Storage temperature range	■ -50 ... 85 °C
Degree of protection (EN 60529)	■ IP67 ■ IP69K (with appropriate cable)
Humidity	■ < 98 % RH, condensing
Vibration (sinusoidal) (EN 60068-2-6)	■ 1.6 mm p-p (2 ... 25 Hz), 4 g (25 ... 100 Hz), 1 octave / min.

### Process connection

Connection variants	■ G 1/2 A hygienic ■ Others with adapters (please refer to section „Accessories“)
Material	■ AISI 316L (1.4404)
Wetted parts material	■ PEEK Natura
Immersion length	■ Front-flush ■ 20 mm ■ 50 mm
Surface roughness wetted parts	■ Ra < 0.8 µm

### Process conditions

Process temperature	■ -40 ... 115 °C ■ 135 °C max. (t < 1 h)
Process pressure	■ Refer to section „Process conditions“

### Power supply [1]

Voltage supply range	■ 8 ... 35 V DC
Reverse polarity protection	■ Yes
Power-up time	■ < 20 s

### Output signal

Resistance	■ Pt100 (4-wire)
Current output [1]	■ 4 ... 20 mA (2-wire)
Shunt resistance	■ $R_s \leq 680 \text{ Ohm}$ ( $V_s = 24 \text{ V DC}$ ) ■ $R_s \leq (V_s - 8 \text{ V}) / 0.023 \text{ A}$
Output range	■ -50 ... 150 °C (programmable)
Min. output span	■ 25 °C
Sampling interval	■ 0.5 s
Damping	■ 0.0 ... 30.0 s (programmable)
Max. measuring error	■ $\pm 0.25 \text{ °C}$
Max. output error	■ $\pm 0.1 \text{ % FS}$ ( $\pm 0.016 \text{ mA}$ )
Temperature drift (ambient)	■ $< \pm 0.003 \text{ % FS / °C typ.}$ ■ $< \pm 0.01 \text{ % FS / °C max.}$

[1] Only applicable with integrated 4 ... 20 mA transmitter

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Technical data	
Performance characteristics	
Pt100 accuracy class (EN 60751)	<ul style="list-style-type: none"> <li>■ B (<math>\pm 0.3\text{ °C}</math> at <math>0\text{ °C}</math>)</li> <li>■ A (<math>\pm 0.15\text{ °C}</math> at <math>0\text{ °C}</math>)</li> <li>■ AA (<math>\pm 0.1\text{ °C}</math> at <math>0\text{ °C}</math>)</li> <li>■ 1/6 B (<math>\pm 0.05\text{ °C}</math> at <math>0\text{ °C}</math>)</li> </ul>
Response time T50	<ul style="list-style-type: none"> <li>■ <math>\leq 9.0\text{ s}</math> (front-flush)</li> <li>■ <math>\leq 2.5\text{ s}</math> (20 mm)</li> <li>■ <math>\leq 2.7\text{ s}</math> (50 mm)</li> </ul>
Response time T90	<ul style="list-style-type: none"> <li>■ <math>\leq 66.0\text{ s}</math> (front-flush)</li> <li>■ <math>\leq 6.5\text{ s}</math> (20 mm)</li> <li>■ <math>\leq 6.7\text{ s}</math> (50 mm)</li> </ul>
Factory settings [1]	
Output range	<ul style="list-style-type: none"> <li>■ <math>0 \dots 150\text{ °C}</math></li> </ul>
Output at sensor fault	<ul style="list-style-type: none"> <li>■ <math>23\text{ mA}</math></li> </ul>
Damping	<ul style="list-style-type: none"> <li>■ <math>0.0\text{ s}</math></li> </ul>
Compliance and approvals	
EMC	<ul style="list-style-type: none"> <li>■ EN 61326-1</li> <li>■ EN 61000-6-2</li> <li>■ EN 61000-6-3</li> </ul>
Hygiene	<ul style="list-style-type: none"> <li>■ 1935/2004/EG</li> <li>■ 10/2011/EU</li> <li>■ 2023/2006/EG</li> <li>■ FDA (21 CFR 177.2416)</li> <li>■ 3-A (74-07) [2]</li> </ul>

[1] Only applicable with integrated 4 ... 20 mA transmitter

[2] The requirements of the respective 3-A Sanitary Standard will be only fulfilled in combination with appropriate mounting accessories. Those are marked with the 3-A logo.

**Note:**

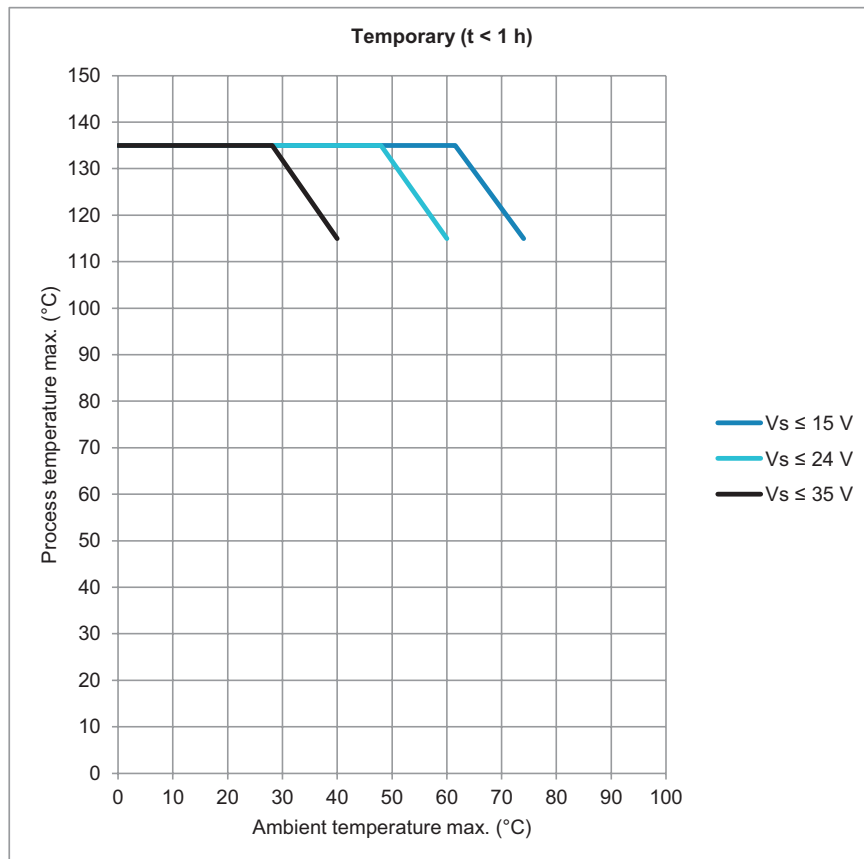
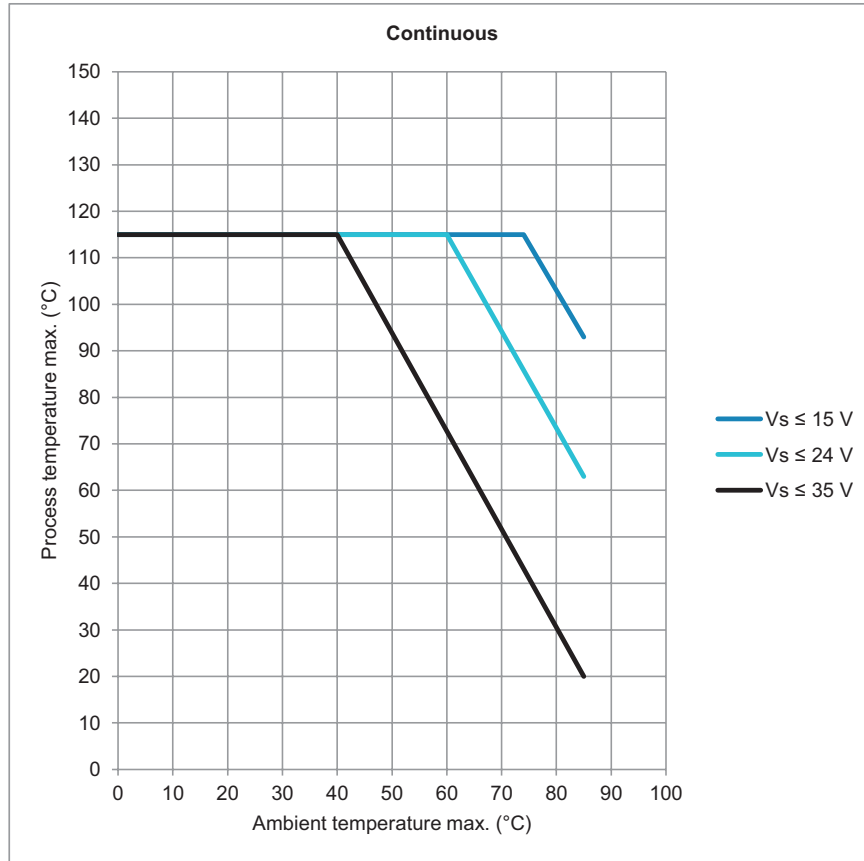
Information on product characteristics may relate to defined product options.

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**Process conditions**

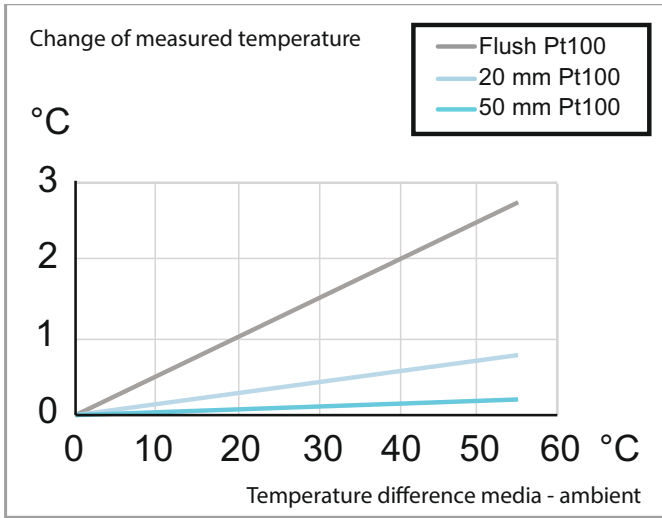
**Process temperature**



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### 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

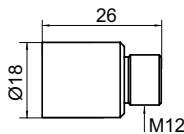
Test conditions:	
Media temperature	Stable at 0.01 °C
Ambient temp. change	30 °C → 85 °C
Total change	55 °C
(compensated for all other possible errors)	

### Process pressure

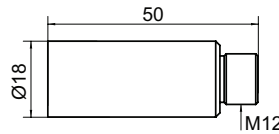
Type	Process pressure bar	Process temperature °C	Time limit
Front-flush	-1 ... 10	-40 ... 115	Unlimited
	-1 ... 5	115 ... 135	< 1 h
Immersion length 20 mm	-1 ... 10	-40 ... 115	Unlimited
	-1 ... 5	115 ... 135	< 1 h
Immersion length 50 mm	-1 ... 10	-40 ... 115	Unlimited
	-1 ... 5	115 ... 135	< 1 h

### Dimensional drawings

#### Housing

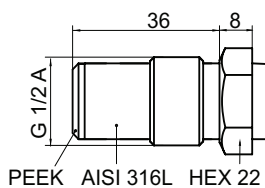


**Pt100 (4-wire)**  
X04-130.0

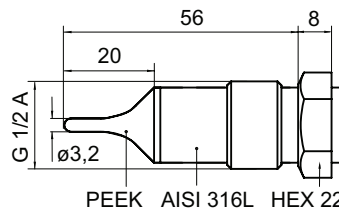


**4 ... 20 mA (2-wire)**  
X04-130.2, X04-130.A

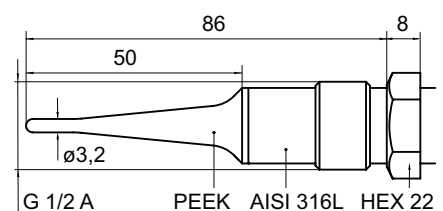
### Process connection



**G 1/2 A hygienic, front-flush**  
A03-A30.0000



**G 1/2 A hygienic, immersion length 20 mm**  
A03-B20.0020



**G 1/2 A hygienic, immersion length 50 mm**  
A03-B20.0050

#### Note:

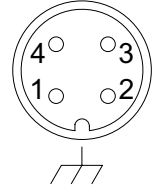
Information in format AXX-X... relates to „Baumer Connection Identifier“ (BCID) and dedicated ordering code

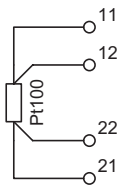
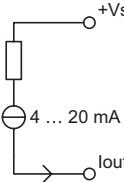
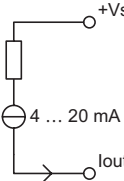
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## Electrical connection

### Pin assignment



Output signal	Equivalent circuit	Function	M12, 4 pin X04.130
<b>Pt100 (4-wire)</b>		Pt100 11	1
		Pt100 12	2
		Pt100 22	3
		Pt100 21	4
		Frame ground	Plug thread
<b>4 ... 20 mA (2-wire), I<sub>out</sub> at pin 2</b> („Output signal“ 2)		+Vs	1
		I <sub>out</sub>	2
		n.c.	3, 4
		Frame ground	Plug thread
<b>4 ... 20 mA (2-wire), I<sub>out</sub> at pin 2, 3</b> („Output signal“ A)		+Vs	1
		I <sub>out</sub>	2, 3 [3]
		n.c.	4
		Frame ground	Plug thread

[3] Internally connected

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**Ordering information**

	TER8	-	1	x	x	0	.	x	0	x	x	.	0	A	0	3	.	0	x	x	0	.	x	x	x	x
<b>Product line</b>	Front-flush and low-invasive resistance thermometers	TER8																								
<b>Electrical connection</b>	M12, 4-pin, stainless steel	<b>BCID</b> X04																								
<b>Output signal</b>	Pt100 (4-wire)																									
	4 ... 20 mA (2-wire), lout at pin 2																									
	4 ... 20 mA (2-wire), lout at pin 2, 3																									
<b>Configuration</b>	Without																									
	Output range																									
<b>Pt100 accuracy class (EN 60751)</b>	B ( $\pm 0.3$ °C at 0 °C)																									
	A ( $\pm 0.15$ °C at 0 °C)																									
	AA ( $\pm 0.1$ °C at 0 °C)																									
	1/6 B ( $\pm 0.05$ °C at 0 °C)																									
<b>Process connection</b>	G 1/2 A hygienic	<b>BCID</b> A03																								
<b>Immersion length</b>	0 mm (front-flush)																							A	3	0 0 0 0
	20 mm																							B	2	0 0 2 0
	50 mm																							B	2	0 0 5 0

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## Accessories

		Hygienic weld-in sleeves for „Process connection“ A030 (G 1/2 A hygienic, BCID: A03)	
		Description	Ordering information
		<b>Universal use, with leak detection port</b> Ø 30 x 34, AISI 316L (1.4404)	ZPW3-321
		<b>Thin-walled tanks</b> Ø 45 x 34, AISI 316L (1.4404)	ZPW3-322
		<b>Inclined mounting</b> Ø 35 x 34, AISI 316L (1.4404)	ZPW2-324
		<b>Pipes with collar</b> DN 25 ... 50, Ø 29 x 36.5, AISI 316L (1.4404)	ZPW2-326
		DN 65 ... 150, Ø 30 x 36.5, AISI 316L (1.4404)	ZPW2-327
		Hygienic adapters for „Process connection“ A030 (G 1/2 A hygienic, BCID: A03)	
		Description	Ordering information
		<b>ISO 2852 (Tri-Clamp)</b> DN 25; 33.7; 38, Ø 50.5, AISI 316L (1.4404)	ZPH3-3213
		DN 33.7; 38, Ø 50.5, AISI 316L (1.4404)	ZPH3-3213
		DN 40; 51, Ø 64.0, AISI 316L (1.4404)	ZPH3-3216
		<b>DIN 32676-A (Tri-Clamp)</b> DN 25; 32; 40, Ø 50.5, AISI 316L (1.4404)	ZPH3-3213
		DN 50; Ø 64.0, AISI 316L (1.4404)	ZPH3-3216
		<b>DIN 32676-C (Tri-Clamp)</b> DN 1"; 1 1/2", Ø 50.5, AISI 316L (1.4404)	ZPH3-3213
		DN 1 1/2"; Ø 50.5, AISI 316L (1.4404)	ZPH3-3213
		DN 2", Ø 64.0, AISI 316L (1.4404)	ZPH3-3216
		<b>Varivent®</b> DN 25; 1" (Type F), Ø 50, AISI 316L (1.4435 BN2)	ZPH3-344F
		DN 32 ... 125; 1 1/2" ... 6" (Type N), Ø 68, AISI 316L (1.4404)	ZPH3-324E

**Accessories**
**Hygienic adapters for „Process connection“ A030 (G 1/2 A hygienic, BCID: A03)**

Description

Ordering information

**DIN 11851 (dairy pipe connection)**

 DN 25, AISI 316L (1.4404)  
 DN 40, AISI 316L (1.4404)  
 DN 50, AISI 316L (1.4404)

 ZPH3-3221  
 ZPH3-3224  
 ZPH3-3225

**SMS 1145**

DN 51, AISI 316L (1.4404)

ZPH1-3236


**DIN 11864-1-A (aseptic screwed union)**

 DN 40, AISI 316L (1.4404)  
 DN 50, AISI 316L (1.4404)

 ZPH3-3254  
 ZPH3-3255

**Baumer Hygienic Connection**

BHC 3A DN 38, AISI 316L (1.4404)

ZPH1-32D3


**Thread adapters for „Process connection“ A030 (G 1/2 A hygienic, BCID: A03)**

Description

Ordering information

**Industry standard**

 G 1 A ISO 228-1, AISI 316L (1.4404)  
 G 1 1/2 A ISO 228-1, AISI 316L (1.4404)  
 G 2 A ISO 228-1, AISI 316L (1.4404)  
 1-11 1/2 NPT, AISI 316L (1.4404)

 ZPI1-32B  
 ZPI1-32D  
 ZPI1-32E  
 ZPI1-32G

**Vibration fork replacement**

 G 3/4 A ISO 228-1 (EH FTL GQ2), AISI 316L (1.4404)  
 G 3/4 A ISO228-1 (VS Ø 21.3), AISI 316L (1.4404)  
 G 1 A ISO 228-1 (EH FTL GW2), AISI 316L (1.4404)  
 G 1 A ISO228-1 (VS Ø 21.3), AISI 316L (1.4404)

 ZPH1-32BA  
 ZPH1-32BC  
 ZPH1-32CB  
 ZPH1-32CD

**Hygienic interfacing**

G 1 A hygienic, AISI 316L (1.4404)

ZPH1-32C0





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## Accessories

### Blind plugs

Description

Ordering information

### Blind plugs

G 1/2 A hygienic, AISI 316L (1.4404)

ZPX5-32



### Welding mandrels for threaded hygienic welded connections

Description

Ordering information

### Welding mandrels

G 1/2 A hygienic, Brass

ZPX6-36



### Hygienic connectors with stainless steel knurl, protection up to IP69K (M12-A, 4-pin, BCID: X04)

Description

Ordering information

### Female connector straight with attached cable

2 m, TPE  
5 m, TPE  
10 m, TPE  
25 m, TPE

ESG 34AY0200  
ESG 34AY0500  
ESG 34AY1000  
ESG 34AY2500



### Female connector angular with attached cable

2 m, TPE  
5 m, TPE  
10 m, TPE  
25 m, TPE

ESW 33AY0200  
ESW 33AY0500  
ESW 33AY1000  
ESW 33AY2500



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## Accessories

### Industrial connectors, protection up to IP67 (M12-A, 4-pin, BCID: X04)

Description

Ordering information



#### Female connector straight with attached cable

2 m, PUR  
5 m, PUR  
10 m, PUR

ESG 34AH0200  
ESG 34AH0500  
ESG 34AH1000



#### Female connector angular with attached cable

2 m, PUR  
5 m, PUR  
10 m, PUR  
15 m, PUR  
20 m, PUR

ESW 33AH0200  
ESW 33AH0500  
ESW 33AH1000  
ESW 33AH1500  
ESW 33AH2000



#### Female connector straight with attached cable, shielded

2 m, PUR  
5 m, PUR  
10 m, PUR

ESG 34AH0200G  
ESG 34AH0500G  
ESG 34AH1000G



#### Female connector angular with attached cable, shielded

2 m, PUR  
5 m, PUR  
10 m, PUR

ESW 33AH0200G  
ESW 33AH0500G  
ESW 33AH1000G



#### Female connector straight with screw terminals

PG7, PBT

ES 18A PG7



#### Female connector angular with screw terminals

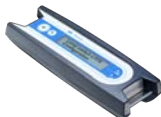
PG7, PBT

ES 14A PG7

### Interfaces

Description

Ordering information



#### FlexProgrammer 9701

Kit for sensor parameterization, including programming interface with USB, connecting cables, carrying strap, CD-ROM with PC software and DTM drivers

9701-0001