



### Product highlights

- Parallel measurement of flow and temperature
- Flow measurement independent of the mounting position
- Large measuring range up to 400 cm/s
- Measurement at high media temperatures up to 125 °C
- High pressure resistance up to 100 bar
- One-piece, compact measuring probe
- Calibrated linear analog outputs for flow and temperature
- IO-Link interface combined with analogue or switching output (programmable)

### User benefits

- Reduced installation effort with only one process connection
- Easy mounting without sensor alignment
- One sensor for all applications
- Less disturbance of process
- Increased process stability by linear regulation
- High acceptance of process connections

### Application examples

- Monitoring of cooling circuits
- Spray jet monitoring in cleaning machines
- Dry run protection of pumps

### Technical data

#### Housing

Style	■ Compact transmitter
Overall size	■ Refer to section "Dimensional drawings"
Material	■ Stainless steel

#### Electrical connection

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

Operating temperature range	■ -25 ... 80 °C
Storage temperature range	■ -25 ... 80 °C
Humidity	■ ≤ 100% RH, condensing
Degree of protection (EN 60529)	■ IP67 ■ IP68 (30 min., 1 mH <sub>2</sub> O) ■ IP69K (with appropriate cable)
Vibration (sinusoidal) (EN 60068-2-6)	■ 5 g (10 ... 2000 Hz)
Shock (EN 60068-2-27)	■ 30 g / 11 ms, 6 impulses per axis and direction

#### Process connection

Connection variants	■ Refer to section "Dimensional drawings"
Mounting position	■ Any (top, bottom, side)
Wetted parts material	■ AISI 316L (1.4404)
Surface roughness wetted parts	■ Ra < 0.8 µm

#### Process conditions

Process temperature	■ -25 ... 150 °C ■ -25 ... 125 °C (Flow measurement)
Process pressure	■ Refer to section "Process conditions"

#### Power supply

Voltage supply range	■ 12 ... 32 V DC (2 x 4 ... 20 mA) ■ 18 ... 30 V DC (IO-Link)
Current consumption (no load)	■ < 45 mA typ.
Reverse polarity protection	■ Yes
Power-up time	■ 10 s max.

#### Output signal

Current output	■ 4 ... 20 mA
Voltage output	■ 0 ... 10 V
Output type	■ PNP ■ NPN ■ Digital (push-pull)
Switching logic	■ Normally open (NO) ■ Normally closed (NC) ■ Active high ■ Active low
Current rating	■ 100 mA max.
Short circuit protection	■ Yes
Voltage drop switching output	■ < 2 V
Residual current	■ < 250 µA
Interface	■ IO-Link 1.1

# FlexFlow PF20S

Flow sensor for industrial applications

## Technical data

### Performance characteristics

Measuring range flow	■ 10 ... 400 cm/s
Max. measuring error	■ ± 2 % (± 8 cm/s)
Down time at temperature step	■ < 10 s
Measuring range temperature	■ -25 ... 150 °C
Max. measuring error	■ ± 1 °C
Response time T90	■ < 5 s

### Factory settings

Output range	■ 10 ... 400 cm/s
	■ -25 ... 150 °C

### Compliance and approvals

EMC	■ 2014/30/EU
EAC (Eurasian Conformity)	■ EAC (TR CU 020/2011)

## Process conditions

Process connection	BCID	Ordering key	Sensor length mm	Process pressure bar
Sealing cone M18x1.5	T44	T445	50	-1 ... 100
Sealing cone M18x1.5	T44	T447	100	-1 ... 100
Compression fitting Ø 6	T52	T527	100	-1 ... 100
Compression fitting Ø 6	T52	T528	200	-1 ... 100
G 1/2 A ISO 228-1 with cone	G08	G081	16.4	-1 ... 100
G 1/2 A ISO 228-1 with cone	G08	G085	50	-1 ... 100

**Note:**

Information on product characteristics may relate to defined product options.

# FlexFlow PF20S

Flow sensor for industrial applications

## Field of application

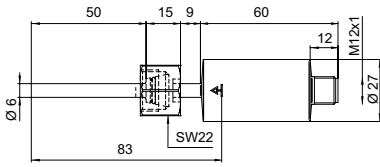
The FlexFlow sensor detects the flow rate of aqueous media (e. g. CIP cleaning agents, beverages, cooling agents without oil content, water-glycol mixtures and cooling emulsions) in contained systems. The sensor operates on the calorimetric principle and besides flow measurements will also detect the media temperature. Two variants are available, with either two analog outputs or one IO-Link interface and one configurable switching or analog output.

## Measuring principle

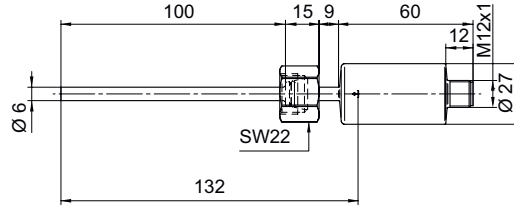
The sensor tip integrates both a temperature sensing and heating element warming up the tip at regular intervals. After the heating phase, the media-specific cooling behavior is identified under consideration of temperature drop, reference temperature and the medium's heating capacity. The measured result is proportional to the flow rate of the medium. It is either provided at the analog output or may serve as switching output trigger.

**Dimensional drawings**

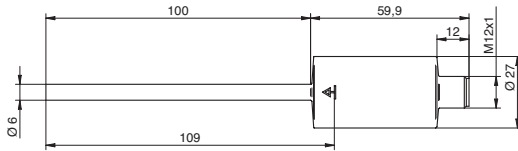
**Process connection**



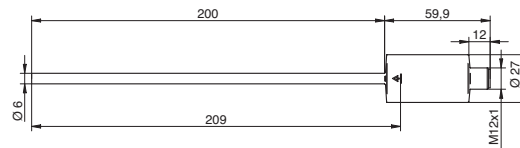
**Sealing cone M18x1.5,  
Sensor length 50 mm**  
T44-T445



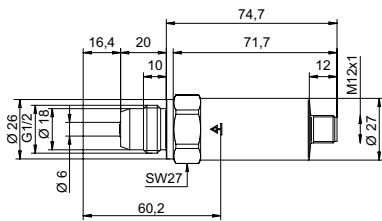
**Sealing cone M18x1.5,  
Sensor length 100 mm**  
T44-T447



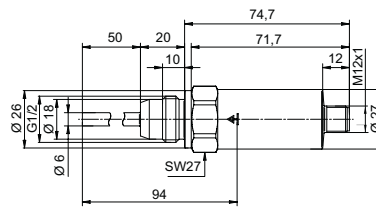
**Compression fitting Ø 6,  
Sensor length 100 mm**  
T52-T527



**Compression fitting Ø 6,  
Sensor length 200 mm**  
T52-T528



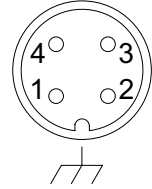
**G 1/2 A ISO 228-1 with cone,  
Sensor length 16.4 mm**  
G08-G081

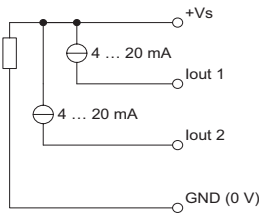
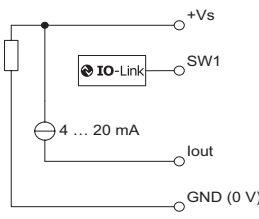
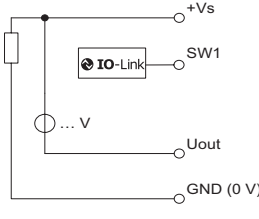


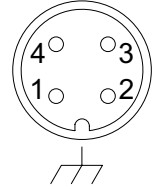
**G 1/2 A ISO 228-1 with cone,  
Sensor length 50 mm**  
G08-G085

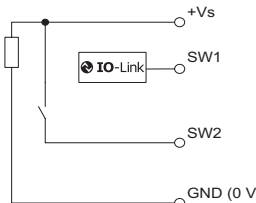
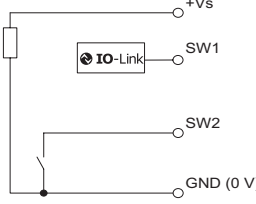
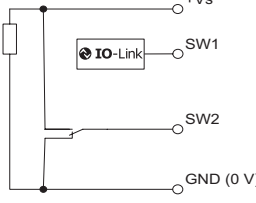
**Note:**

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

**Electrical connection**
**Pin assignment**


Output signal	Equivalent circuit	Function	M12-A, 4-pin, X04-000
<b>Multi-parameter output</b>			
4 ... 20 mA (3-wire) (flow)		+Vs	1
		lout 1 (flow)	2
4 ... 20 mA (3-wire) (temperature)		lout 2 (temperature)	4
		GND (0 V)	3
		Frame ground	Plug thread
<b>Programmable output</b>			
<b>Factory setting with IO-Link</b>			
IO-Link		+Vs	1
		SW1 (IO-Link)	4
4 ... 20 mA (3-wire) (programmable)		lout	2
		GND (0 V)	3
		Frame ground	Plug thread
<b>Programmable output</b>			
<b>Configuration programmable by customer</b>			
IO-Link		+Vs	1
		SW1 (IO-Link)	4
0 ... 10 V (programmable)		Uout	2
		GND (0 V)	3
		Frame ground	Plug thread

**Electrical connection**
**Pin assignment**


Output signal	Equivalent circuit	Function	M12-A, 4-pin, X04-000
<b>Programmable output</b> Configuration programmable by customer IO-Link PNP (programmable)		+Vs	1
		SW1 (IO-Link)	4
		SW2	2
		GND (0 V)	3
		Frame ground	Plug thread
<b>Programmable output</b> Configuration programmable by customer IO-Link NPN (programmable)		+Vs	1
		SW1 (IO-Link)	4
		SW2	2
		GND (0 V)	3
		Frame ground	Plug thread
<b>Programmable output</b> Configuration programmable by customer IO-Link Digital (push-pull) (programmable)		+Vs	1
		SW1 (IO-Link)	4
		SW2	2
		GND (0 V)	3
		Frame ground	Plug thread

**Ordering information**
**Ordering key**

		PF20S	-	1	1	.	010	.	xxxx	2	x	.	x	.	0	xx	0	.	x	
<b>Product line</b>																				
Flow sensor for industrial applications		PF20S																		
<b>Version</b>																				
Standard				1																
<b>Housing</b>																				
Stainless steel, AISI 316L (1.4404)				1																
<b>Electrical connection</b>		<b>BCID</b>																		
M12-A, 4-pin, stainless steel		X04					010													
<b>Process connection</b>		<b>Sensor length</b>		<b>BCID</b>																
Sealing cone M18x1.5		50		T44		T445														
Sealing cone M18x1.5		100		T44		T447														
Compression fitting Ø 6		100		T52		T527														
Compression fitting Ø 6		200		T52		T528														
G 1/2 A ISO 228-1 with cone		16,4		G08		G081														
G 1/2 A ISO 228-1 with cone		50		G08		G085														
<b>Wetted parts material</b>																				
AISI 316L (1.4404)		2																		
<b>Gasket</b>																				
Without [1]		0																		
FKM (Viton®) [2]		3																		
<b>Output signal</b>																				
Multi-parameter output, 2 x 4 ... 20 mA (3-wire)		0																		
Programmable output, IO-Link		1																		
<b>Explosion protection</b>																				
Without		0																		
<b>Industrial approvals</b>																				
Standard		00																		
EAC		01																		
<b>Special approvals</b>																				
Standard		0																		
<b>Configuration</b>																				
Factory settings		0																		
Customer-specific		1																		

[1] Available for "Process connection" T527, T528, G081, G085. Not available for "Process connection" T445, T447.

[2] Available for "Process connection" T445, T447. Not available for "Process connection" T527, T528, G081, G085.

**Accessories**
**Industrial weld-in sleeves for „Process connection“ G081, G085 (G 1/2 A ISO 228-1 with cone, BCID: G08)**

Description

Ordering information


**Universal use**

 Ø 35 x 20, AISI 316L (1.4404)  
 Ø 35 x 20, AISI 316L (1.4435)

 ZPW1-121  
 ZPW1-131

**Industrial weld-in sleeves for „Process connection“ T445, T447 (Sealing cone M18x1.5, BCID: T44)**

Description

Ordering information


**Universal use**

Taper Ø 16, AISI 316Ti (1.4571))

ZPW1-E71

**Thread adapters for „Process connection“ T445, T447 (Sealing cone M18x1.5, BCID: T44)**

Description

Ordering information


**Industrial interfacing**

 G 1/4 A ISO 228-1, AISI 316Ti (1.4571)  
 G 1/2 A ISO 228-1, AISI 316Ti (1.4571)  
 G 1 A ISO 228-1, AISI 316Ti (1.4571)

 ZPI1-E7H  
 ZPI1-E7A  
 ZPI1-E7B

**Thread adapters for „Process connection“ T527, T528 (Compression fitting Ø 6, BCID: T52)**

Description

Ordering information


**Industrial interfacing**

 G 1/4 A ISO 228-1, AISI 316Ti (1.4571)  
 G 1/2 A ISO 228-1, AISI 316Ti (1.4571)

 ZPI1-C7H  
 ZPI1-C7A

**Thread adapters for „Process connection“ T527, T528 (Compression fitting Ø 6, BCID: T52)**

Description

Ordering information


**Industrial interfacing**

 G 1/4 A ISO 228-1, AISI 316Ti (1.4571)  
 G 1/2 A ISO 228-1, AISI 316Ti (1.4571)

 ZPI1-D7H  
 ZPI1-D7A



**Accessories**
**Connectors with stainless steel knurl for demanding applications, 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

**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

## Accessories

### Interfaces

Description

Ordering information



#### T-junction

M12-A, 4-pin with signal extraction

T-junction 4-pol M12 signal extraction

### Interfaces

Description

Ordering information



#### USB IO-Link Master

Kit for sensor parameterization, including programming interface with USB, connecting cables and PC software

11048016