



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

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 mH₂O)
 - 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

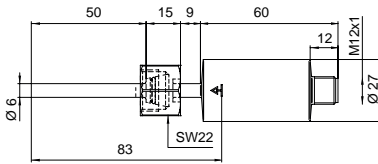
The FlexFlow sensor detects the flow rate of aqueous media (e. g. CIP cleaning agents, beverages, cooling agents without oil content, water-glycol mixtures and cooling emulsions) in contained systems. The sensor operates on the calorimetric principle and besides flow measurements will also detect the 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

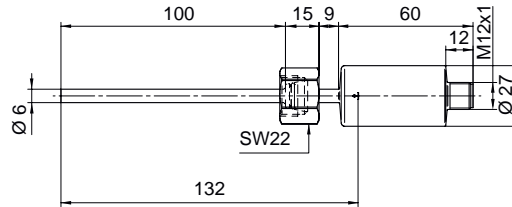
The sensor tip integrates both a temperature sensing and heating element warming up the tip at regular intervals. After the heating phase, the media-specific cooling behavior is identified under consideration of temperature drop, reference temperature and the medium's heating capacity. The measured result 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

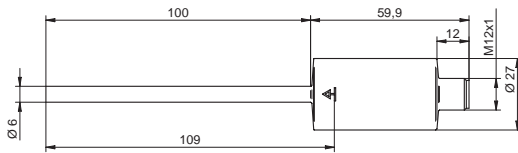
Process connection



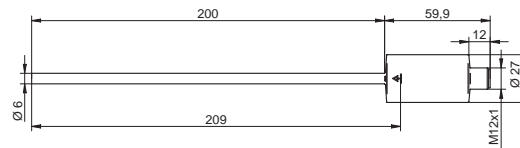
**Sealing cone M18x1.5,
Sensor length 50 mm**
T44-T445



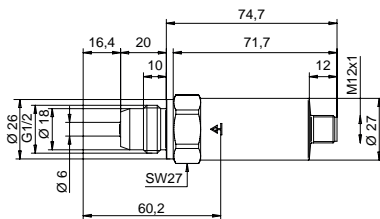
**Sealing cone M18x1.5,
Sensor length 100 mm**
T44-T447



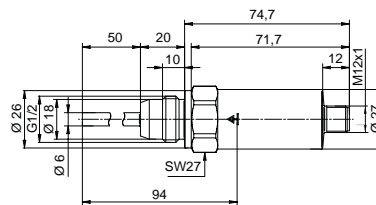
**Compression fitting Ø 6,
Sensor length 100 mm**
T52-T527



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



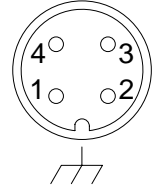
**G 1/2 A ISO 228-1 with cone,
Sensor length 16.4 mm**
G08-G081

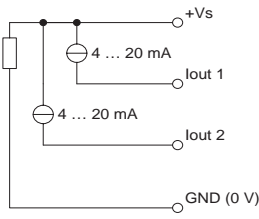
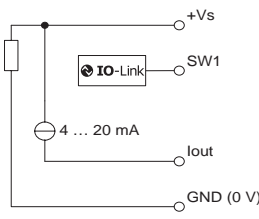
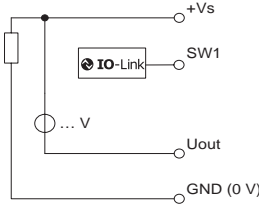


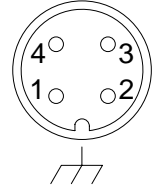
**G 1/2 A ISO 228-1 with cone,
Sensor length 50 mm**
G08-G085

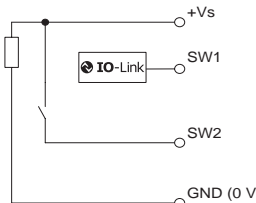
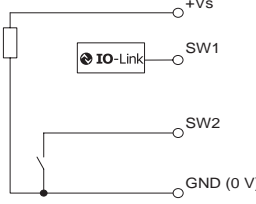
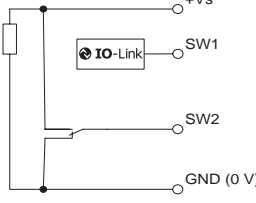
Note:

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
Multi-parameter output			
4 ... 20 mA (3-wire) (flow)		+Vs	1
4 ... 20 mA (3-wire) (temperature)		lout 1 (flow)	2
		lout 2 (temperature)	4
		GND (0 V)	3
		Frame ground	Plug thread
Programmable output			
Factory setting with IO-Link			
IO-Link		+Vs	1
4 ... 20 mA (3-wire) (programmable)		SW1 (IO-Link)	4
		lout	2
		GND (0 V)	3
		Frame ground	Plug thread
Programmable output			
Configuration programmable by customer			
IO-Link		+Vs	1
0 ... 10 V (programmable)		SW1 (IO-Link)	4
		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
Programmable output Configuration programmable by customer IO-Link PNP (programmable)		+Vs	1
		SW1 (IO-Link)	4
		SW2	2
		GND (0 V)	3
		Frame ground	Plug thread
Programmable output Configuration programmable by customer IO-Link NPN (programmable)		+Vs	1
		SW1 (IO-Link)	4
		SW2	2
		GND (0 V)	3
		Frame ground	Plug thread
Programmable output 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

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)

ZPW1-121

Ø 35 x 20, AISI 316L (1.4435)

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

Industrial weld-in sleeves 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)

ZPI1-E7H

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

ZPI1-E7A

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

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)

ZPI1-C7H

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

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)

ZPI1-D7H

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

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