

PF20S

Flow sensor for industrial applications



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 ₂ 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

Technical data	
Performance characteristics	Factory settings
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
	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.

Field of application

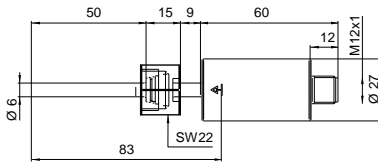
The FlexFlow sensor detects the flow rate of aqueous media (e. g. CIP cleaning agents, beverages, cooling agents without oil content, water-glycol mixtures and cooling emulsions) in contained systems. The sensor operates on the calorimetric principle and besides flow measurements will also detect the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

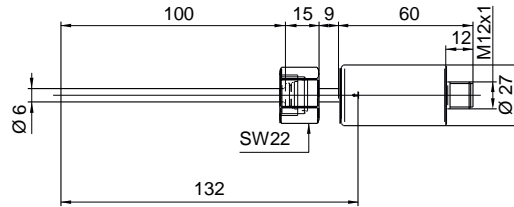
The sensor tip integrates both a temperature sensing and heating element warming up the tip at regular intervals. After the heating phase, the media-specific cooling behavior is identified under consideration of temperature drop, reference temperature and the medium's heating capacity. The measured result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

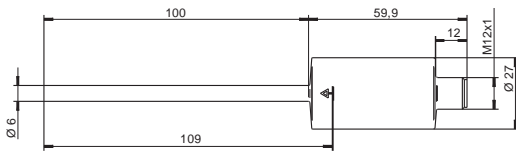
Process connection



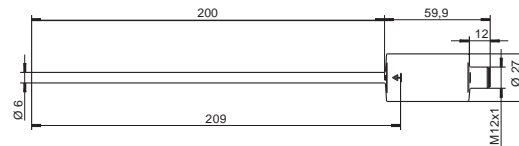
**Sealing cone M18x1.5,
Sensor length 50 mm**
T44-T445



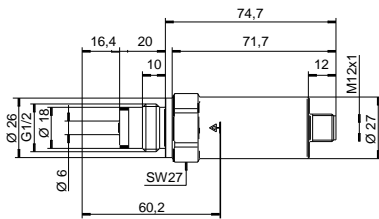
**Sealing cone M18x1.5,
Sensor length 100 mm**
T44-T447



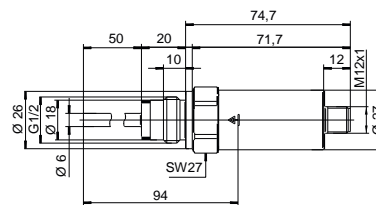
**Compression fitting Ø 6,
Sensor length 100 mm**
T52-T527



**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**



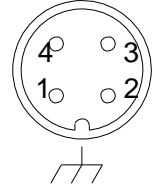
**G 1/2 A ISO 228-1 with cone,
Sensor length 50 mm G08-
G085**

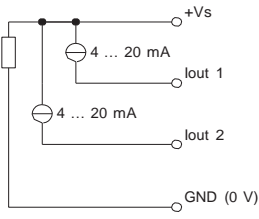
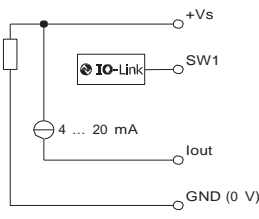
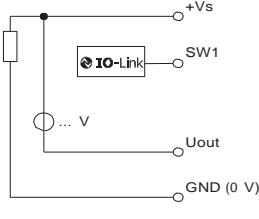
Note:

Information in format AXX-X... relates to Connection Identifier[®] (BCID) and dedicated ordering code.

Electrical connection

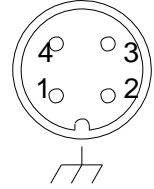
Pin assignment

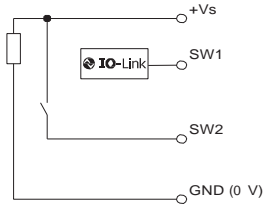
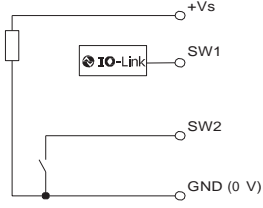
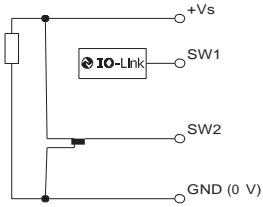


Output signal	Equivalent circuit	Function	M12-A, 4-pin, X04-000
Multi-parameter output 4 ... 20 mA (3-wire) (flow) 4 ... 20 mA (3-wire) (temperature)		+Vs lout 1 (flow) lout 2 (temperature) GND (0 V) Frame ground	1 2 4 3 Plug thread
Programmable output Factory setting with IO-Link IO-Link 4 ... 20 mA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

Ordering information

Ordering key

PF20S - 1 1 . 010 . xxxx 2 x . x . 0 xx 0 . x

Product line

Flow sensor for industrial applications

PF20S

Version

Standard

1

Housing

Stainless steel, AISI 316L (1.4404)

1

Electrical connection

M12-A, 4-pin, stainless steel

BCID

X04

010

Process connection

Sensor length

BCID

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

Wetted parts material

AISI 316L (1.4404)

2

Gasket

Without [1]

0

FKM (Viton®) [2]

3

Output signal

Multi-parameter output, 2 x 4 ... 20 mA (3-wire)

0

Programmable output, IO-Link

1

Explosion protection

Without

0

Industrial approvals

Standard

00

EAC

01

Special approvals

Standard

0

Configuration

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	ESG 34AY0200
	5 m, TPE	ESG 34AY0500
	10 m, TPE	ESG 34AY1000
	25 m, TPE	ESG 34AY2500
	Female connector angular with attached cable	
	2 m, TPE	ESW 33AY0200
	5 m, TPE	ESW 33AY0500
	10 m, TPE	ESW 33AY1000
	25 m, TPE	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	ESG 34AH0200
	5 m, PUR	ESG 34AH0500
	10 m, PUR	ESG 34AH1000
	Female connector angular with attached cable	
	2 m, PUR	ESW 33AH0200
	5 m, PUR	ESW 33AH0500
	10 m, PUR	ESW 33AH1000
	15 m, PUR	ESW 33AH1500
	20 m, PUR	ESW 33AH2000
	Female connector straight with attached cable, shielded	
	2 m, PUR	ESG 34AH0200G
	5 m, PUR	ESG 34AH0500G
	10 m, PUR	ESG 34AH1000G
	Female connector angular with attached cable, shielded	
	2 m, PUR	ESW 33AH0200G
	5 m, PUR	ESW 33AH0500G
	10 m, PUR	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