



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 40 bar
- One-piece, compact measuring probe
- FDA-compliant hygienic design
- Capable of SIP (Sterilization in Place) up to 150 °C (interminable)
- Resistant to all common CIP cleaning agents
- 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
- Support for food safety
- Increased process stability by linear regulation
- High acceptance of process connections

Application examples

- Flow control in CIP processes for optimum cleaning results
- Flow measurement of highly pure media, e. g. ultrapure water
- 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	■ beliebig (oben, seitlich, unten)
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

Measuring range flow	■ 10 ... 400 cm/s
Max. measuring error	■ $\pm 2\%$ (± 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
Hygiene	■ EU 1935/2004, 2023/2006
	■ FDA compliant

Process conditions

	BCID	Ordering key	Sensor length mm	Process pressure bar
Process connection				
Tri-Clamp Ø 34.0	C02	C023	32	-1 ... 25
Tri-Clamp Ø 50.5	C04	C043	32	-1 ... 25
Tri-Clamp Ø 64.0	C05	C055	50	-1 ... 16
DIN 11851 (dairy pipe connection), DN 25	D01	D013	32	-1 ... 40
DIN 11851 (dairy pipe connection), DN 40	D03	D034	36	-1 ... 40
DIN 11851 (dairy pipe connection), DN 50	D04	D045	45	-1 ... 25



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.

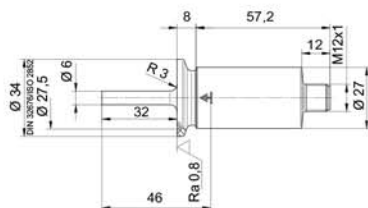
Measuring principle

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.

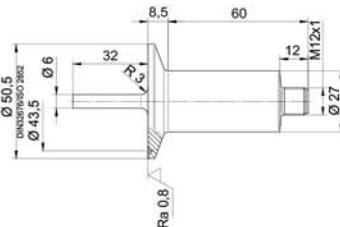


Dimensional drawings

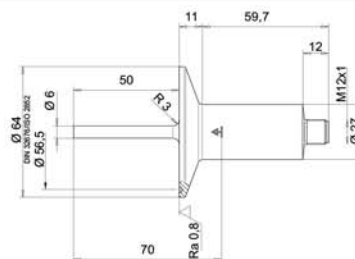
Process connection



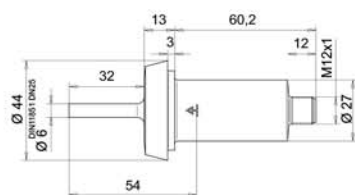
**Tri-Clamp Ø 34.0,
Sensor length 32 mm
C02-C023**



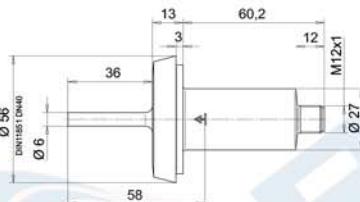
**Tri-Clamp Ø 50.5,
Sensor length 32 mm
C04-C043**



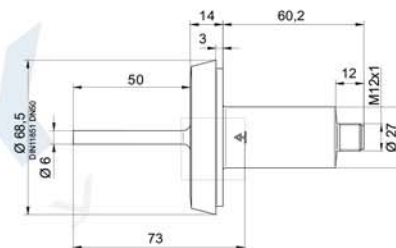
**Tri-Clamp Ø 64.0,
Sensor length 50 mm
C05-C055**



**DIN 11851 (dairy pipe connection), DN 25,
Sensor length 32 mm
D01-D013**



**DIN 11851 (dairy pipe connection), DN 40,
Sensor length 36 mm
D03-D034**



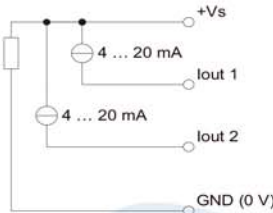
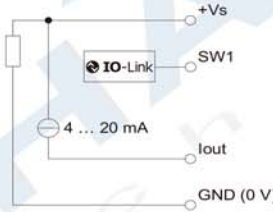
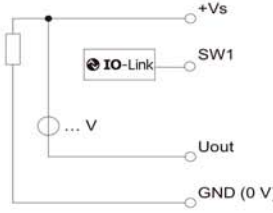
**DIN 11851 (dairy pipe connection), DN 65,
Sensor length 50 mm
D04-D045**



Electrical connection

Pin assignment



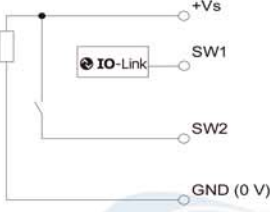
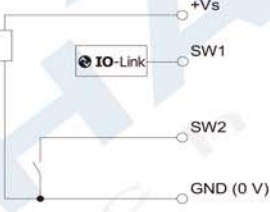
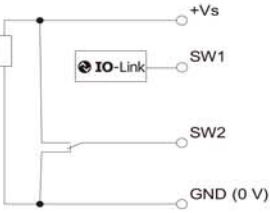
Output signal	Equivalent circuit	Function	M12-A, 4-Pin, X04-000
Multi-parameter output			
4 ... 20 mA (3-wire) (flow)		+Vs	1
4 ... 20 mA (3-wire) (temperature)		lout 1 (flow)	4
		lout 2 (temperature)	2
		GND (0 V)	3
		Frame ground	Plug thread
Programmable output			
IO-Link		+Vs	1
4 ... 20 mA (3-wire) (programmable)		SW1 (IO-Link)	4
		lout	2
		GND (0 V)	3
		Frame ground	Plug thread
Programmable output			
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			
IO-Link		+Vs	1
PNP (programmable)		SW1 (IO-Link)	4
		SW2	2
		GND (0 V)	3
		Frame ground	Plug thread
Programmable output			
IO-Link		+Vs	1
NPN (programmable)		SW1 (IO-Link)	4
		SW2	2
		GND (0 V)	3
		Frame ground	Plug thread
Programmable output			
IO-Link		+Vs	1
Digital (push-pull) (programmable)		SW1 (IO-Link)	4
		SW2	2
		GND (0 V)	3
		Frame ground	Plug thread



Ordering information

Ordering key

Product line

Hygienic flow sensor

PF20H - 1 1 . 010 . xxxx 2 0 . x . 0 00 0 . x

PF20H

Process connection

ISO 2852 (Tri-Clamp), DN 21.3, Ø 34.0
DIN 32676-A (Tri-Clamp), DN 20, Ø 34.0

Sensor length

32

BCID

C02

C023

ISO 2852 (Tri-Clamp), DN 25; 33.7; 38, Ø 50.5
DIN 32676-A (Tri-Clamp), DN 25; 32; 40, Ø 50.5
DIN 32676-B (Tri-Clamp), DN 33.7, Ø 50.5
DIN 32676-C (Tri-Clamp), DN 1"; 1 1/2", Ø 50.5

32

C04

C043

ISO 2852 (Tri-Clamp), DN 40; 51, Ø 64.0
DIN 32676-A (Tri-Clamp), DN 50, Ø 64.0
DIN 32676-B (Tri-Clamp), DN 42.4; 48.3, Ø 64.0
DIN 32676-C (Tri-Clamp), DN 2", Ø 64.0

50

C05

C055

DIN 11851 (dairy pipe connection), DN 25

32

D01

D013

DIN 11851 (dairy pipe connection), DN 40

36

D03

D034

DIN 11851 (dairy pipe connection), DN 50

50

D04

D045

Output signal

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

0

Programmable output, IO-Link

1

Configuration

Factory settings

0

Customer-specific

1



Accessories

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

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

