



### 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
- 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 <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 PF20H

Hygienic flow sensor

## 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
Hygiene	■ EU 1935/2004, 2023/2006 ■ FDA compliant
EAC (Eurasian Conformity)	■ EAC (TR CU 020/2011)

## Process conditions

Process connection	BCID	Ordering key	Sensor length mm	Process pressure bar
G 1/2 A hygienic	A03	A031	16,4	-1 ... 100
G 1/2 A hygienic	A03	C035	50	-1 ... 100
Tri-Clamp Ø 34.0	C02	C023	32	-1 ... 68
Tri-Clamp Ø 50.5	C04	C043	32	-1 ... 68
Tri-Clamp Ø 64.0	C05	C055	50	-1 ... 68
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
Varivent® DN 32 ... 125; 1 1/2" ... 6" (Type N), Ø 68	V02	V023	32	-1 ... 16
Varivent® DN 32 ... 125; 1 1/2" ... 6" (Type N), Ø 68	V02	V025	50	-1 ... 16
Varivent® DN 25; 1" (Type F), Ø 50	V01	V013	32	-1 ... 16
Varivent® DN 25; 1" (Type F), Ø 50	V01	V015	50	-1 ... 16
BHC 3A DN 38	B01	B013	32	-1 ... 68
BHC 3A DN 38	B01	B015	50	-1 ... 68

**Note:**

Information on product characteristics may relate to defined product options.  
The process conditions are only valid in combination with appropriate mounting accessories.

# FlexFlow PF20H

Hygienic flow sensor

## Field of application

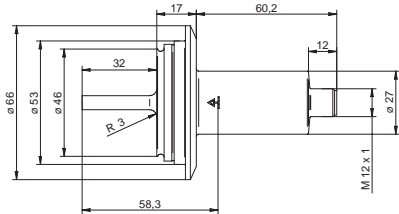
The FlexFlow sensor detects the flow rate of aqueous media (e. g. CIP cleaning agents, beverages, cooling agents without oil content, water-glycol mixtures and cooling emulsions) in contained systems. The sensor operates on the calorimetric principle and besides flow measurements will also detect the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

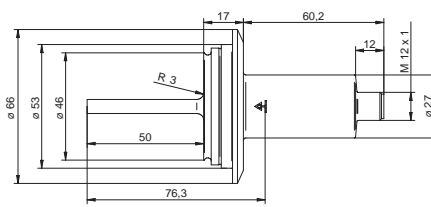
The sensor tip integrates both a temperature sensing and heating element warming up the tip at regular intervals. After the heating phase, the media-specific cooling behavior is identified under consideration of temperature drop, reference temperature and the medium's heating capacity. The measured result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

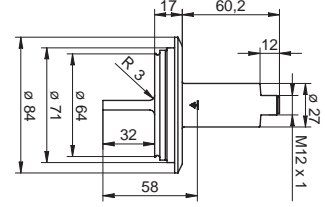
### Process connection



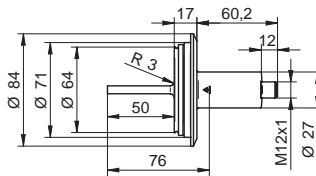
**Varivent® DN 25; 1" (Type F), Ø 50,  
Sensor length 32 mm  
V01-V013**



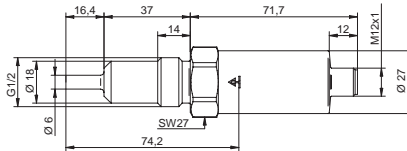
**Varivent® DN 25; 1" (Type F), Ø 50,  
Sensor length 50 mm  
V01-V015**



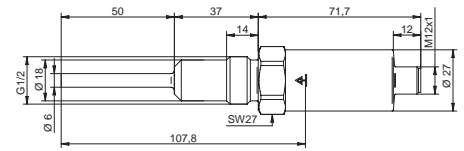
**Varivent® DN 32 ... 125; 1 1/2" ... 6" (Type  
N), Ø 68, Sensor length 32 mm  
V02-V023**



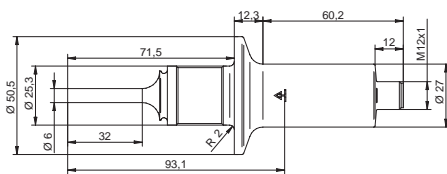
**Varivent® DN 32 ... 125; 1 1/2" ... 6" (Type  
N), Ø 68, Sensor length 50 mm  
V02-V025**



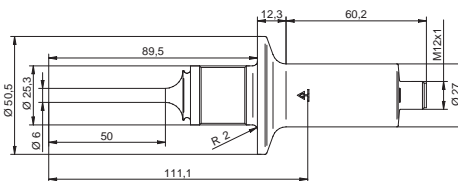
**G 1/2 A hygienic,  
Sensor length 16.4 mm  
A03-A031**



**G 1/2 A hygienic,  
Sensor length 50 mm  
A03-A035**



**BHC 3A DN 38,  
Sensor length 32 mm  
B01-B013**



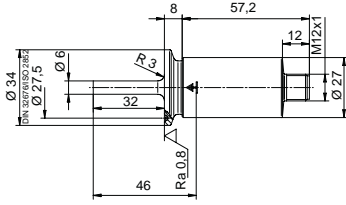
**BHC 3A DN 38,  
Sensor length 50 mm  
B01-B015**

**Note:**

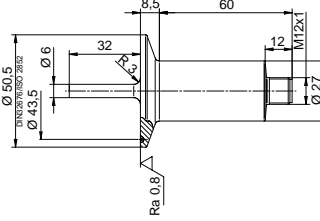
Information in format AXX-X... relates to „Baumer Connection Identifier“ (BCID) and dedicated ordering code.

**Dimensional drawings**

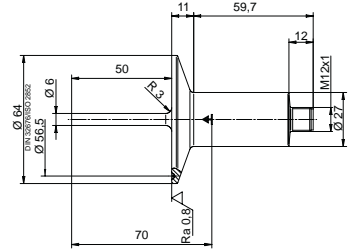
**Process connection**



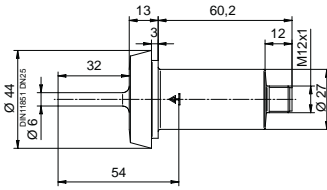
**Tri-Clamp Ø 34.0,  
Sensor length 32 mm**  
C02-C023



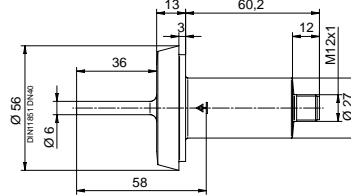
**Tri-Clamp Ø 50.5,  
Sensor length 32 mm**  
C04-C043



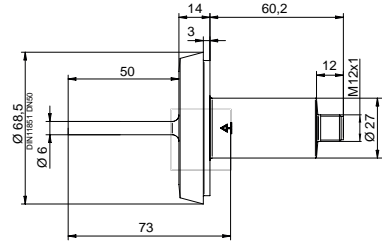
**Tri-Clamp Ø 64.0,  
Sensor length 50 mm**  
C05-C055



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



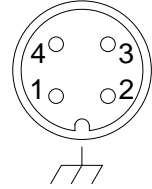
**DIN 11851 (dairy pipe connection), DN 40,  
Sensor length 36 mm**  
D03-D034

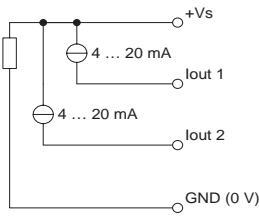
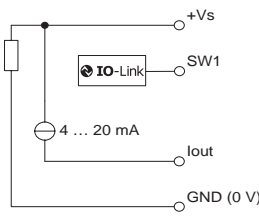
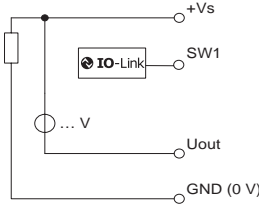


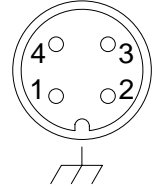
**DIN 11851 (dairy pipe connection), DN 50,  
Sensor length 50 mm**  
D04-D045

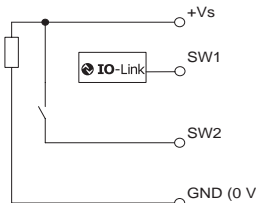
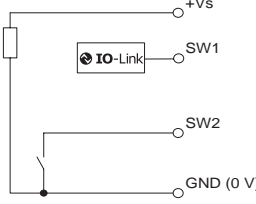
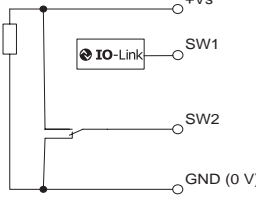
## Electrical connection

### 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

**Accessories**

Hygienic weld-in sleeves for „Process connection“ A031, A035 (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) DN 65 ... 150, Ø 30 x 36.5, AISI 316L (1.4404)	ZPW2-326 ZPW2-327
Hygienic weld-in sleeves for „Process connection“ B013, B015 (BHC 3A DN 38, BCID: B01)		
	Description	Bestellbezeichnung
	<b>Universal use, with leak detection port</b> Ø 55 x 32, AISI 316L (1.4404)	ZPW2-621
	<b>Pipes with collar</b> DN 38, Ø 38 x 40 (Pipes with collar)	ZPW2-626
	<b>Pipe ends ISO 2037</b> Ø 38.0 x 1.2, AISI 316L (1.4404) Ø 38.0 x 1.6, AISI 316L (1.4404)	ZPW2-626 ZPW2-626
	<b>BS 4825-1</b> DN 1 1/2" x 1.2, AISI 316L (1.4404) DN 1 1/2" x 1.6, AISI 316L (1.4404)	ZPW2-626 ZPW2-626
	<b>3A ASTM A270</b> DN 1 1/2" x 1.65, AISI 316L (1.4404)	ZPW2-626
	<b>SMS 3008</b> DN 1 1/2" x 1.2, AISI 316L (1.4404)	ZPW2-626
	<b>Dutch Dairy</b> Ø 38.1 x 1.5, AISI 316L (1.4404)	ZPW2-626



**Accessories**
**Hygienic adapters for „Process connection“ A031, A035 (G 1/2 A hygienic, BCID: A03)**

Description

Ordering information


**ISO 2852 (Tri-Clamp)**

 DN 25, Ø 50.5, AISI 316L (1.4404)  
 DN 33.7; 38, Ø 50.5, AISI 316L (1.4404)  
 DN 40; 51, Ø 64.0, AISI 316L (1.4404)

 ZPH3-3213  
 ZPH3-3213  
 ZPH3-3216

**DIN 32676-A (Tri-Clamp)**

 DN 25; 32; 40, Ø 50.5, AISI 316L (1.4404)  
 DN 50, Ø 64.0, AISI 316L (1.4404)  
 DN 1", Ø 50.5, AISI 316L (1.4404)  
 DN 1 1/2", Ø 50.5, AISI 316L (1.4404)  
 DN 2", Ø 64.0, AISI 316L (1.4404)

 ZPH3-3213  
 ZPH3-3216  
 ZPH3-3213  
 ZPH3-3213  
 ZPH3-3216

**Varivent®**

 DN 25; 1" (Type F), Ø 50, 1.4435 BN2  
 DN 32 ... 125; 1 1/2" ... 6" (Type N), Ø 68,  
 AISI 316L (1.4404)

 ZPH3-344F  
 ZPH3-324E

**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


**Baumer Hygienic Connection**

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

ZPH1-32D3

**Accessoires**
**Thread adapters for „Process connection“  
A031, A035 (G 1/2 A hygienic, BCID: A03)**

Description

Ordering information


**Industry standard**

G 1 A ISO 228-1, AISI 316L (1.4404)	ZPH1-32B
G 1 1/2 A ISO 228-1, AISI 316L (1.4404)	ZPH1-32D
G 2 A ISO 228-1, AISI 316L (1.4404)	ZPH1-32E
1-11 1/2 NPT, AISI 316L (1.4404)	ZPH1-32G


**Vibration fork replacement**

G 3/4 A ISO 228-1 (EH FTL GQ2), AISI 316L (1.4404)	ZPH1-32BA
G 3/4 A ISO228-1 (VS Ø 21.3), AISI 316L (1.4404)	ZPH1-32BC
G 1 A ISO 228-1 (EH FTL GW2), AISI 316L (1.4404)	ZPH1-32CB
G 1 A ISO228-1 (VS Ø 21.3), AISI 316L (1.4404)	ZPH1-32CD


**Hygienic interfacing**

G1 A hygiénique, AISI 316L (1.4404)	ZPH1-32C0
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**Thread adapters for „Process connection“  
A031, A035 (G 1/2 A hygienic, BCID: A03)**

Description

Ordering information


**Baumer Hygienic Connection**

BHC 3A DN 38, EPDM	ZPX2-123
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**Varivent®**

Varivent® DN 32 ... 125; 1 1/2" ... 6" (Type N), Ø 68, EPDM	ZPX2-323
Varivent® DN 25; 1" (Type F), Ø 50, EPDM	ZPX2-823

**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