



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	<ul style="list-style-type: none"> Compact transmitter
Overall size	<ul style="list-style-type: none"> Refer to section "Dimensional drawings"
Material	<ul style="list-style-type: none"> Stainless steel

Electrical connection

Connector	<ul style="list-style-type: none"> M12, 4-pin
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Ambient conditions

Operating temperature range	<ul style="list-style-type: none"> -25 ... 80 °C
Storage temperature range	<ul style="list-style-type: none"> -25 ... 80 °C
Humidity	<ul style="list-style-type: none"> ≤ 100% RH, condensing
Degree of protection (EN 60529)	<ul style="list-style-type: none"> IP67 IP68 (30 min., 1 mH₂O) IP69K (with appropriate cable)
Vibration (sinusoidal) (EN 60068-2-6)	<ul style="list-style-type: none"> 5 g (10 ... 2000 Hz)
Shock (EN 60068-2-27)	<ul style="list-style-type: none"> 30 g / 11 ms, 6 impulses per axis and direction

Process connection

Connection variants	<ul style="list-style-type: none"> Refer to section "Dimensional drawings"
Mounting position	<ul style="list-style-type: none"> Any (top, bottom, side)
Wetted parts material	<ul style="list-style-type: none"> AISI 316L (1.4404)
Surface roughness wetted parts	<ul style="list-style-type: none"> Ra < 0.8 μm

Process conditions

Process temperature	<ul style="list-style-type: none"> -25 ... 150 °C -25 ... 125 °C (Flow measurement)
Process pressure	<ul style="list-style-type: none"> Refer to section "Process conditions"

Power supply

Voltage supply range	<ul style="list-style-type: none"> 12 ... 32 V DC (2 x 4 ... 20 mA) 18 ... 30 V DC (IO-Link)
Current consumption (no load)	<ul style="list-style-type: none"> < 45 mA typ.
Reverse polarity protection	<ul style="list-style-type: none"> Yes
Power-up time	<ul style="list-style-type: none"> 10 s max.

Output signal

Current output	<ul style="list-style-type: none"> 4 ... 20 mA
Voltage output	<ul style="list-style-type: none"> 0 ... 10 V
Output type	<ul style="list-style-type: none"> PNP NPN Digital (push-pull)
Switching logic	<ul style="list-style-type: none"> Normally open (NO) Normally closed (NC) Active high Active low
Current rating	<ul style="list-style-type: none"> 100 mA max.
Short circuit protection	<ul style="list-style-type: none"> Yes
Voltage drop switching output	<ul style="list-style-type: none"> < 2 V
Residual current	<ul style="list-style-type: none"> < 250 μA
Interface	<ul style="list-style-type: none"> 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

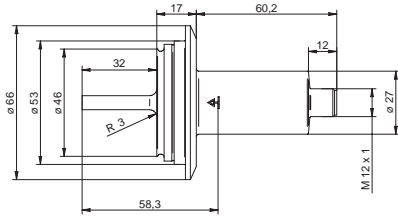
The FlexFlow sensor detects the flow rate of aqueous media (e. g. CIP cleaning agents, beverages, cooling agents without oil content, water-glycol mixtures and cooling emulsions) in contained systems. The sensor operates on the calorimetric principle and besides flow measurements will also detect the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

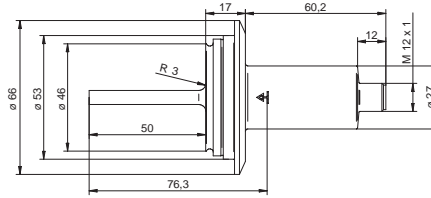
The sensor tip integrates both a temperature sensing and heating element warming up the tip at regular intervals. After the heating phase, the media-specific cooling behavior is identified under consideration of temperature drop, reference temperature and the medium's heating capacity. The measured result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

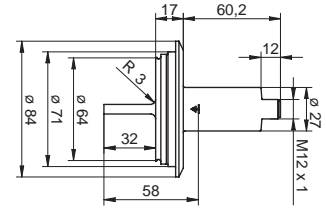
Process connection



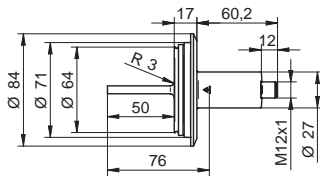
**Varivent® DN 25; 1" (Type F), Ø 50,
Sensor length 32 mm
V01-V013**



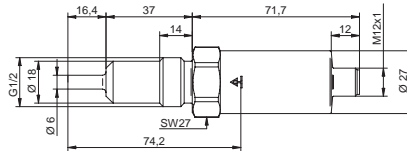
**Varivent® DN 25; 1" (Type F), Ø 50,
Sensor length 50 mm
V01-V015**



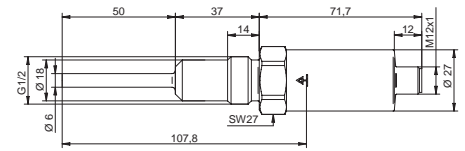
**Varivent® DN 32 ... 125; 1 1/2" ... 6" (Type
N), Ø 68, Sensor length 32 mm
V02-V023**



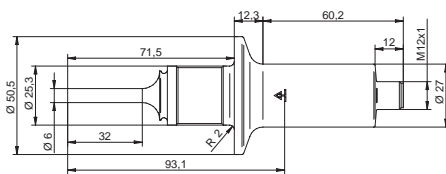
**Varivent® DN 32 ... 125; 1 1/2" ... 6" (Type
N), Ø 68, Sensor length 50 mm
V02-V025**



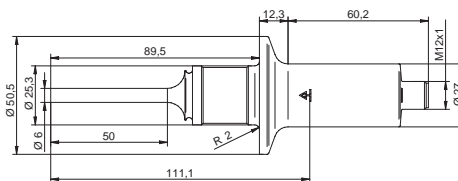
**G 1/2 A hygienic,
Sensor length 16.4 mm
A03-A031**



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



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



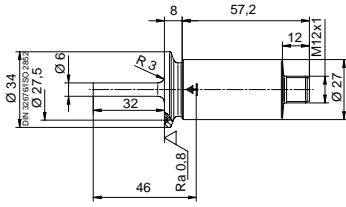
**BHC 3A DN 38,
Sensor length 50 mm
B01-B015**

Note:

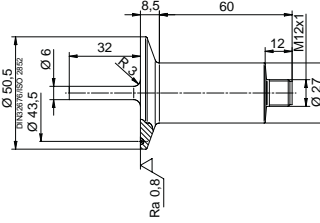
Information in format AXX-X... relates to „Baumer Connection Identifier“ (BCID) and dedicated ordering code.

Dimensional drawings

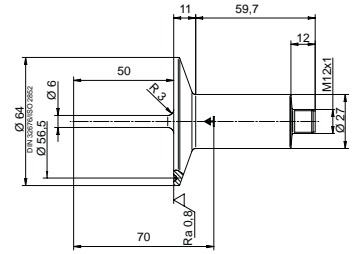
Process connection



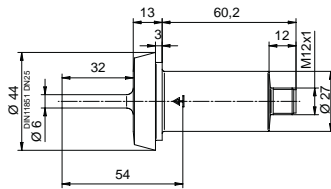
**Tri-Clamp Ø 34.0,
Sensor length 32 mm**
C02-C023



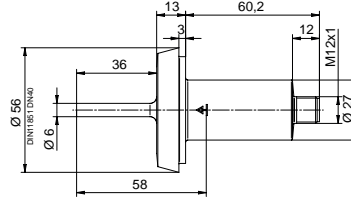
**Tri-Clamp Ø 50.5,
Sensor length 32 mm**
C04-C043



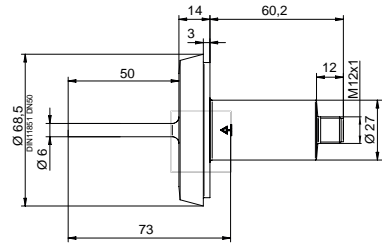
**Tri-Clamp Ø 64.0,
Sensor length 50 mm**
C05-C055



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



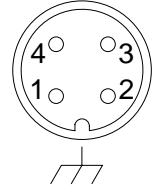
**DIN 11851 (dairy pipe connection), DN 40,
Sensor length 36 mm**
D03-D034

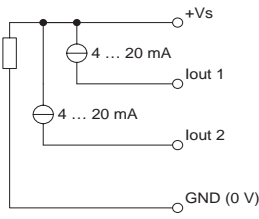
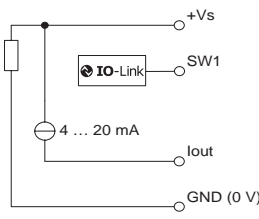
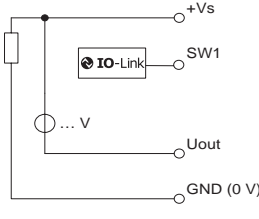


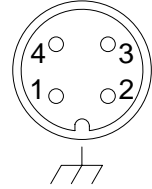
**DIN 11851 (dairy pipe connection), DN 50,
Sensor length 50 mm**
D04-D045

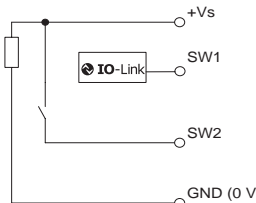
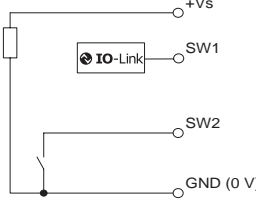
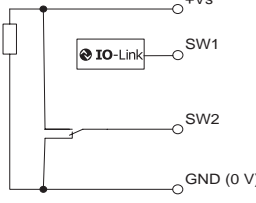
Electrical connection

Pin assignment










Output signal	Equivalent circuit	Function	M12-A, 4-Pin, X04-000
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

Hygienic weld-in sleeves for „Process connection“ A031, A035 (G 1/2 A hygienic, BCID: A03)		
	Description	Ordering information
	Universal use, with leak detection port Ø 30 x 34, AISI 316L (1.4404)	ZPW3-321
	Thin-walled tanks Ø 45 x 34, AISI 316L (1.4404)	ZPW3-322
	Inclined mounting Ø 35 x 34, AISI 316L (1.4404)	ZPW2-324
	Pipes with collar 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
	Universal use, with leak detection port Ø 55 x 32, AISI 316L (1.4404)	ZPW2-621
	Pipes with collar DN 38, Ø 38 x 40 (Pipes with collar)	ZPW2-626
	Pipe ends ISO 2037 Ø 38.0 x 1.2, AISI 316L (1.4404) Ø 38.0 x 1.6, AISI 316L (1.4404)	ZPW2-626 ZPW2-626
	BS 4825-1 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
	3A ASTM A270 DN 1 1/2" x 1.65, AISI 316L (1.4404)	ZPW2-626
	SMS 3008 DN 1 1/2" x 1.2, AISI 316L (1.4404)	ZPW2-626
	Dutch Dairy 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