

**Description**

Compact single point flow monitor with 4 ... 20 mA analogue output and MIN or MAX monitoring options. 10 x LED bar which shows the actual flow speed and the status of the switching point. Suitable for water and air. Available as screw-in type, plug-in type for sensor adapter TP/ball valve BV or push-in type.

**Features**

- wear-resistant compact design, with stainless steel 1.4571 monitoring head and housing
- 4 ... 20 mA analogue output (4 mA = 0 m/s, 20 mA = operating range final value)
- switch point can be adjusted steplessly or to 10 predefined values regardless of the actual flow speed
- 10 x LED bar (red, green, orange) which shows the actual flow speed and the status of the switching point
- fluid temperature -10 ... 90 °C
- 4-core PVC cable, 4x0,34 mm<sup>2</sup>, conductor resistance 56 Ω/km
- signal output with HighSide-FET output
- protected against short circuits and overloads

**FC50-EX**

EU-type-examination certificate to EN IEC 60079-0:2018, EN 60079-7:2015 and EN 60079-31:2014

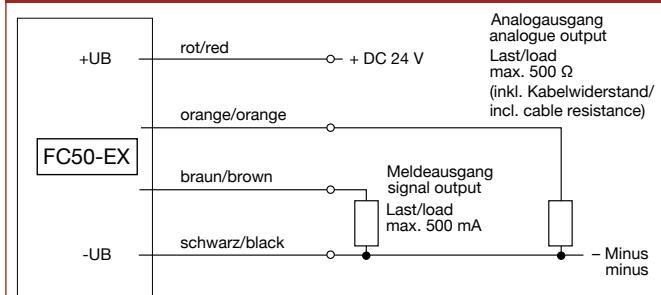


II 3G Ex ec IIC T4 Gc

II 2D Ex tb IIIC T120°C Db

**Ranges of application**

	<b>gases</b>	<b>dust</b>
<b>category 1</b>	<b>zone 0</b>	<b>zone 20</b>
<b>category 2</b>	<b>zone 1</b>	<b>zone 21</b> ✓
<b>category 3</b>	<b>zone 2</b> ✓	<b>zone 22</b> ✓

**Electrical connection****Ordering information****Flow meter (calorimetric)**

**FC50-EX** in compact housing

**Power supply**

**U1** DC 24 V

**Flow switching point**

**MIN** minimum switching point

**MAX** maximum switching point

**Analogue output**

**C11** 4 ... 20 mA (0 m/s ... operating range final value)

**Operating range**

**FB2** operating range final value 100 m/s (air), 4 m/s (water)

**FB1** operating range final value 25 m/s (air), 1 m/s (water)

**Fluid**

**A** air

**W** water

**S** special fluid (on request, from 25 pieces)

**Process connection**

**00** push-in type, length 300 mm - without flange, threaded installation bush as accessory

**22** push-in type, length 200 mm - without flange, threaded installation bush as accessory

**01** screw-in type, G1/2A (to DIN 3852-A), length 36 mm

**02** screw-in type, NPT1/2"-14, length 36 mm

**11** plug-in type (following DIN ISO 6149), length 18.2 mm for TP or BV adapters

**Fitting material**

**M1** stainless steel 1.4571

**Cable length**

**Z02** 2 m cable (standard)

**Z05** 5 m cable

**Z10** 10 m cable

**Z20** 20 m cable

**Z30** 30 m cable

**Z40** 40 m cable

**Certification**

**T5** ATEX approval

**FC50-EX - U1 MIN C11 FB2 A 01 M1 Z02 T5** ordering example

**TECHNICAL DATA ( $T_U = 25^\circ\text{C}$ ,  $U_B = \text{DC } 24\text{ V}$ )**

General data		FC50-EX
Suitable for		air, water
Temperature range	fluid	-10 ... +90 °C
	ambience	-10 ... +65 °C
Status indication		10 x LED bar (red, green, orange)
Electrical data		
Operating voltage $U_B$		DC 24 V ( $\pm 20\%$ , at the device – please consider voltage drop)
Power consumption (without load)		ca. 75 mA
Analogue output	flow speed	4 ... 20 mA (12 bit), 4 mA = 0 m/s, 20 mA = operating range final value
Switching output	flow speed	Power FET, high side switch, short circuit proof max. load 500 mA, inductive load max. 100 mA
MTTF (SN 29500)		267 years
Flow measurement <sup>(6)</sup>		
Measuring range (operating range)	air, operating range FB1	0 ... 20 m/s (0 ... 25 m/s) – FB1, see ordering information standard flow speed referred to 20 °C and 1,01325 bar
	air, operating range FB2	0 ... 20 m/s (0 ... 100 m/s) – FB2, see ordering information standard flow speed referred to 20 °C and 1,01325 bar
	water, operating range FB1	0 ... 1 m/s (0 ... 1 m/s) – FB1, see ordering information
	water, operating range FB2	0 ... 3 m/s (0 ... 4 m/s) – FB2, see ordering information
Accuracy <sup>(4)</sup> (in measuring range)	air	± 2 % of measured value ± 2 % of measuring range final value
	water 0 ... 2 m/s	± 1 % of measured value ± 3 % of measuring range final value
	water 2 ... 3 m/s	± 8 % of measuring range final value
Reproducibility <sup>(1)</sup>		± 1 % of measured value ± 0,5 % of measuring range final value
Response time	air <sup>(3)</sup>	approx. 2 s
	water <sup>(2)</sup>	approx. 1 s
Temperature drift	air (+10 ... +70 °C)	± 0,5 % of measured value/°C
	water (+10 ... +70 °C)	± 1 % of measured value/°C
Mechanical data		
Type and size of monitoring head	plug-in type	following DIN ISO 6149
	screw-in type	G 1/2 A, NPT 1/2"
	push-in type	shank diameter 18 mm/0.709 in. without thread
Pressure resistance of monitoring head	plug-in type	100 bar
	screw-in type	100 bar
	push-in type	100 bar (observe pressure resistance of installation)
Degree of protection		IP65
Material	fitting	stainless steel 1.4571 (wetted)
	sensor	stainless steel 1.4571 (wetted)
	connection sensor/fitting	laser welded
	housing	stainless steel 1.4571
	cable	PVC
	cable gland	nickel-plated brass, Neoprene, O-ring NBR
	cap	stainless steel 1.4571
	O-ring	FKM (wetted, plug-in and push-in type)
Weight	plug-in type	approx. 330 g
	screw-in type	approx. 270 g
	push-in type	approx. 770 g

<sup>(1)</sup> at constant temperature and flow conditions, and stable thermal conductivity

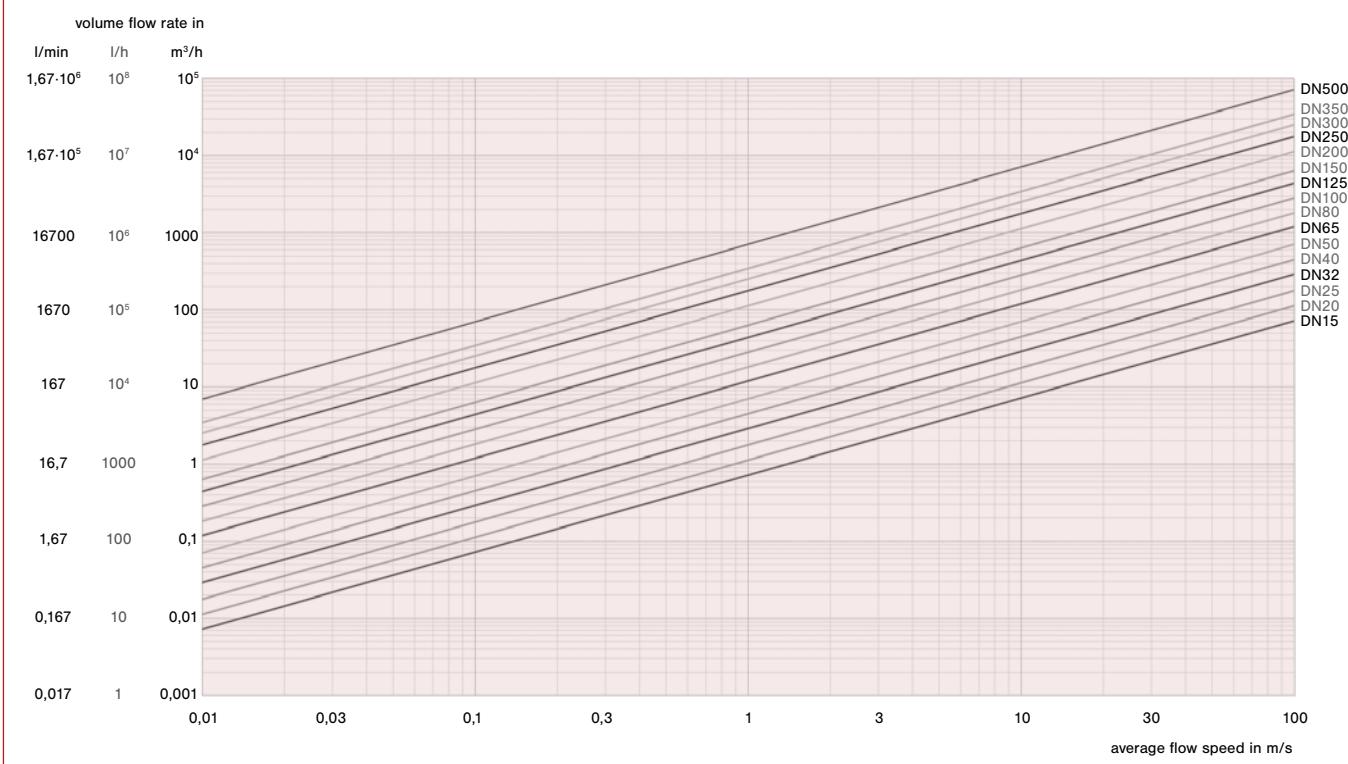
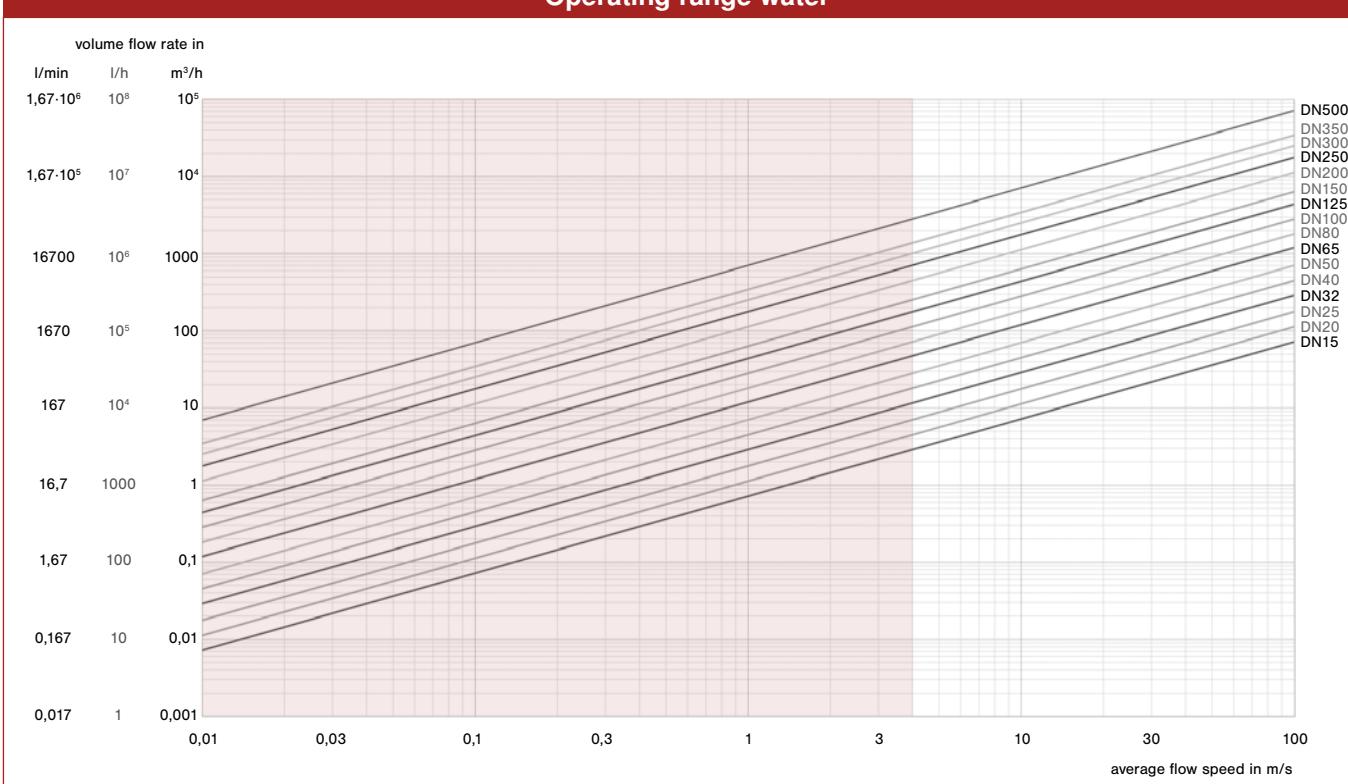
<sup>(2)</sup> delay with the switch point set to 1,8 m/s and the flow at 2 m/s, after a sudden complete stop

<sup>(3)</sup> delay with the switch point set to 18 m/s and the flow at 20 m/s, after a sudden complete stop

<sup>(4)</sup> the accuracy values were determined under ideal conditions:

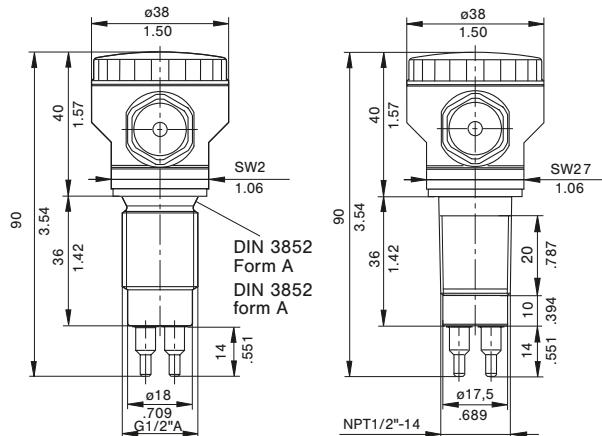
- symmetrical complete flow profile
- correct mounting in the pipe
- inlets and outlets according to EN ISO 5167-1

<sup>(6)</sup> sensor calibration is performed at approx. 25 °C and approx. 970 mbar abs. (punctual measurement)

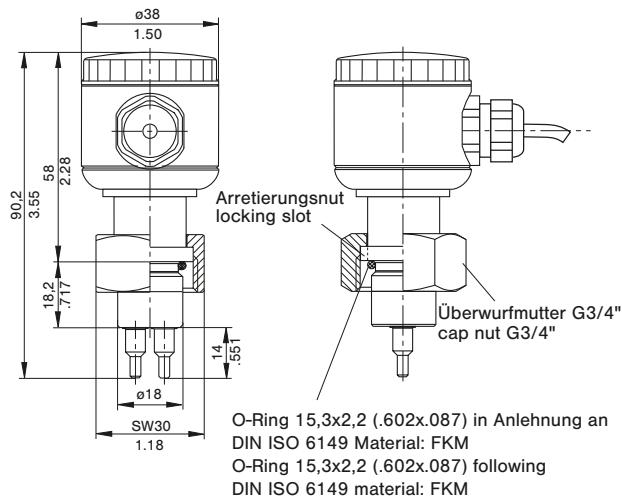
**Operating range FB2 air**

**Operating range water**


## Dimensions

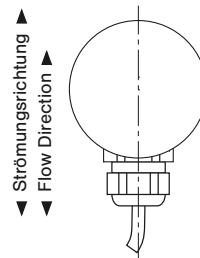
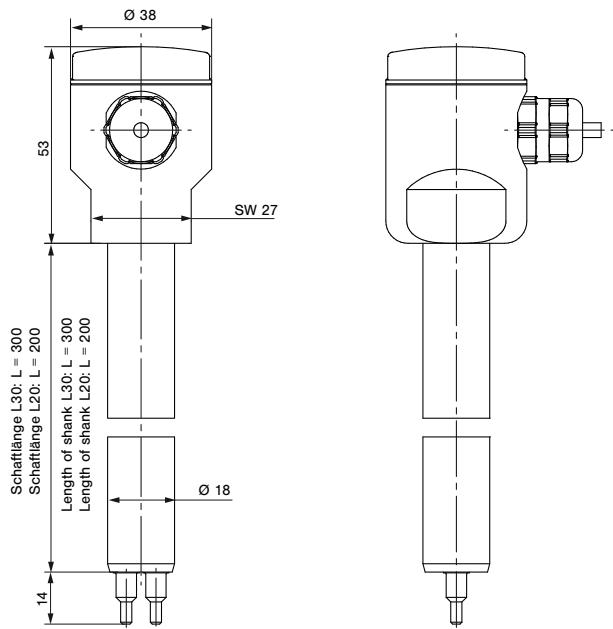
### Gewindeanschluss Screw-in type process connection



### Einsteckanschluss Plug-in type process connection



### Einschiebeanschluss Push-in type process connection



All dimensions in mm

### Sensoradapter TP/Ball valve BV


**TP-...**
**BV-...**

### Description

Sensor adapters TP and BV facilitate correct positioning and exchange of FC50-EX...11... (plug-in type connection) in pipes with process connection DN 15...DN 50.

Ball valve BV enables pressure-free installation or removal of FC50-EX...11... (plug-in type connection) simply by closing the input and output pipe. The measuring points are suited to temporary measurements; after completion of the measuring cycle they can be closed by means of blanking plugs.

### Ordering information

#### Type

**BV** ball valve with internal thread

#### Process connection/Nominal size

<b>03</b>	<b>DN 25</b>	<b>G1</b>	internal thread	length: 88 mm/3.46 in.
<b>04</b>	<b>DN 32</b>	<b>G1 1/4</b>	internal thread	length: 100 mm/3.94 in.
<b>05</b>	<b>DN 40</b>	<b>G1 1/2</b>	internal thread	length: 110 mm/4.33 in.
<b>06</b>	<b>DN 50</b>	<b>G2</b>	internal thread	length: 131 mm/5.16 in.

#### Material of the area exposed to fluid

**M3** nickel plated brass, Delrin seal

**BV - 03 M3** ordering example

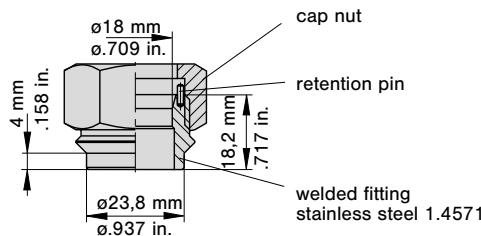
### Features

- Correct positioning of sensor
- Ease of sensor replacement
- Measuring point can be closed if not used
- Sensor adapter available as screw-in or welding type
- Ball valve also serves as a shutoff valve (both input and out output)

### Accessories

Description	Ref. No.
Blanking plug, brass, with O ring	0Z121Z000186
Union nut, brass	Y 306 901 01
Blanking plug, stainless steel 1.4571/AISI 316 Ti, with viton O ring	0Z121Z000187
Union nut, stainless steel	Y 306 901 03

#### Welding set 05

**0Z122Z000202**


### Ordering information

#### Type

**TP** Sensor adapter with internal thread

#### Process connection/Nominal size

<b>01</b>	<b>DN 15</b>	<b>G 1/2</b>	internal thread	length: 50 mm/1.97 in.
<b>02</b>	<b>DN 20</b>	<b>G 3/4</b>	internal thread	length: 64 mm/2.52 in.
<b>03</b>	<b>DN 25</b>	<b>G1</b>	internal thread	length: 78 mm/3.07 in.
<b>04</b>	<b>DN 32</b>	<b>G1 1/4</b>	internal thread	length: 94 mm/3.70 in.
<b>05</b>	<b>DN 40</b>	<b>G1 1/2</b>	internal thread	length: 110 mm/4.33 in.
<b>06</b>	<b>DN 50</b>	<b>G2</b>	internal thread	length: 138 mm/5.43 in.

#### Material of the area exposed to fluid

<b>M1</b>	stainless steel 1.4571/AISI 316Ti	PN 315 bar/4570 psi
<b>M3</b>	brass (not TP-03..)	PN 25 bar/363 psi
<b>M5</b>	red brass (only TP-03..)	PN 16 bar/232 psi

**TP - 01 M3** ordering example

### Ordering information

#### Type

**TP** Sensor adapter with welding nipples

#### Process connection/Nominal size

<b>01</b>	<b>DN 15</b>	<b>dia.d: 16 mm/.630 in.</b>	length: 80 mm/3.15 in.
<b>02</b>	<b>DN 20</b>	<b>dia.d: 20 mm/.787 in.</b>	length: 70 mm/2.76 in.
<b>03</b>	<b>DN 25</b>	<b>dia.d: 25 mm/.984 in.</b>	length: 80 mm/3.15 in.
<b>04</b>	<b>DN 32</b>	<b>dia.d: 32 mm/1.26 in.</b>	length: 100 mm/3.94 in.
<b>05</b>	<b>DN 40</b>	<b>dia.d: 40 mm/1.57 in.</b>	length: 110 mm/4.33 in.
<b>06</b>	<b>DN 50</b>	<b>dia.d: 50 mm/1.97 in.</b>	length: 140 mm/5.51 in.

#### Material of the area exposed to fluid

**M1** stainless steel 1.4571/AISI 316Ti

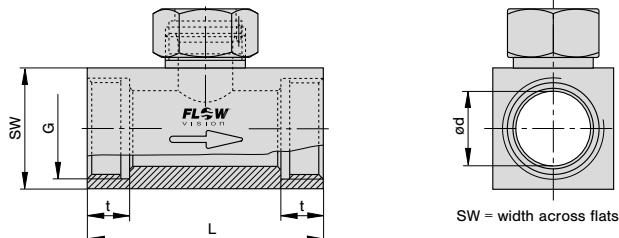
#### Process connection

**SA** welded connection

**TP - 01 M1 - SA** ordering example

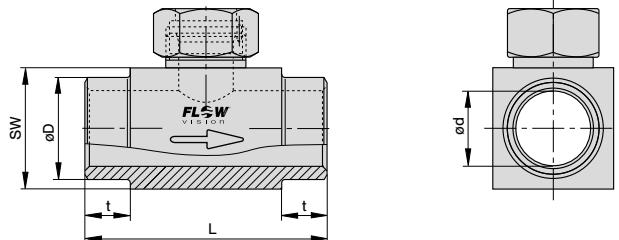
## Dimensions

### TP... sensor adapter with internal thread



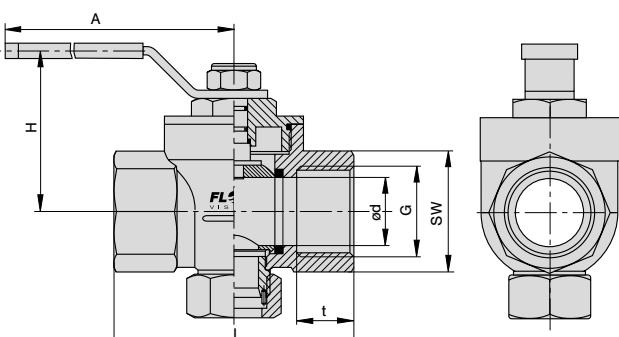
Type	DN	dia. d	G	t	L	SW
	mm	in.	mm	in.	mm	in.
TP-01 ...	15	.591	16	.630	11	.433
TP-02 ...	20	.787	20	.787	3/4"	12
TP-03 ...	25	.984	25	.984	1"	14
TP-04 ...	32	1.26	32	1.26	1 1/4"	15
TP-05 ...	40	1.57	40	1.57	1 1/2"	15
TP-06 ...	50	1.97	50	1.97	2"	19

### TP... M1-SA sensor adapter with welding nipples



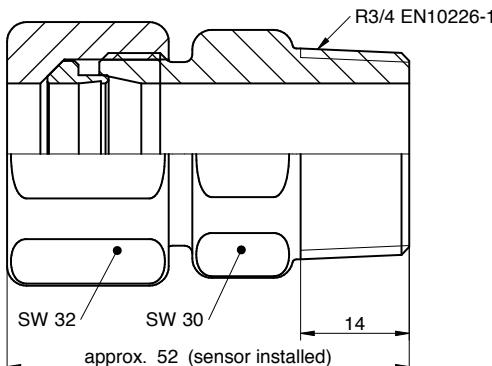
Type	DN	dia. d	dia. D	t	L	SW
	mm	in.	mm	in.	mm	in.
TP-01M1-SA	15	.591	16	.630	21.3	.839
TP-02M1-SA	20	.787	20	.787	26.9	1.06
TP-03M1-SA	25	.984	25	.984	33.7	1.33
TP-04M1-SA	32	1.26	32	1.26	42.4	1.67
TP-05M1-SA	40	1.57	40	1.57	48.3	1.90
TP-06M1-SA	50	1.97	50	1.97	60.3	2.37

### BV... M3 Ball valve with internal thread



Type	DN	dia. d	G	t	L	SW	H	A
	mm	in.	mm	in.	mm	in.	mm	in.
BV-03M3	25	.984	25	.984	1"	.287	88	3.47
BV-04M3	32	1.26	32	1.26	1 1/4"	.945	100	3.94
BV-05M3	40	1.57	40	1.57	1 1/2"	.945	110	4.33
BV-06M3	50	1.97	50	1.97	2"	1.10	131	5.16

This is a metric design and millimeter dimensions take precedence ( $\frac{\text{mm}}{\text{inch}}$ )

**Compression fitting****Description and ordering information**

Compression fitting for push-in sensors with R3/4 thread

**Compression fitting for push-in sensors**

**EEF** Compression fitting

**Process connection**

**04** Thread R3/4

**Material double nipple and cap nut**

**M1** Stainless steel 1.4571

**M2** Hastelloy C4 2.4610

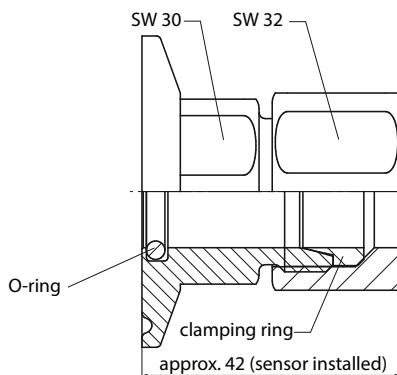
**Material clamping ring**

**CR1** Stainless steel 1.4571 PN 25 bar abs.

**CR2** PTFE PN 5 bar abs.

**CR3** Hastelloy C4 2.4610 PN 25 bar abs.

**EEF - 04 - M1 - CR1** ordering example

**Hygiene flange****Description and ordering information**

Hygiene flange for push-in sensors with front-flush o-ring with FDA approval

**Hygiene flange for push-in sensors**

**HEF** Hygiene flange

**Process connection**

**TF1** Triclamp DIN 32676

**Material flange and cap nut**

**M1** Stainless steel 1.4571

**M2** Hastelloy C4 2.4610

**O-ring**

**R1** VMQ (Silicone) blue FDA (standard)

**R2** VMQ (Silicone) white FDA

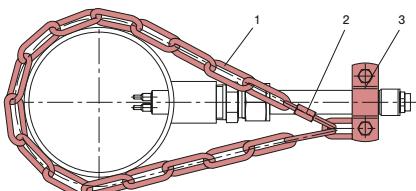
**Material clamping ring**

**CR1** Stainless steel 1.4571 PN 25 bar abs.

**CR2** PTFE PN 5 bar abs.

**CR3** Hastelloy C4 2.4610 PN 25 bar abs.

**HEF - TF1 - M1 - R1 - CR1** ordering example

**Locking set****Description and ordering information**

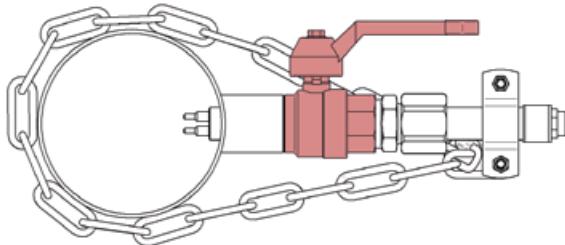
Locking set for push-in sensors.

1 Chain 4 x 32 DIN 5685 (approx. 1 m)

2 Catch for chain NG 5

3 Clip with screw and nuts DN15 to DIN 11850

**Ordering no.:** 0Z122Z000204

**Ball valve for installation under pressure****Description and ordering information****Material (body, ball):**

Brass nickel plated

**Material (ball seal):** PTFE

**Length:** 65 mm

**Outside thread:** G3/4", L = 13 mm

**Inside thread:** G3/4", L = 15 mm

**Fluid temperature:** -20...120 °C

**Ambient temperature:** 0...80 °C

**Pressure:** PN 25 bar (up to 80 °C)

**Ordering number:** BV-02M3-PI

**Material (body, ball):**

Stainless steel 1.4408, 1.4401

**Material (ball seal):** PTFE

**Length:** 78 mm

**Outside thread:** R3/4", L = 17 mm

**Inside thread:** Rp3/4", L = 13 mm

**Fluid temperature:** -30...180 °C

**Ambient temperature:** 0...80 °C

**Pressure:** PN 64 bar (up to 80 °C)

**Ordering number:** BV-02M15-PI