FVone-dbEX-NP-CA…00/22… (Push-in type)

Recommended for:
DN 65 and bigger

Required accessory:
Threaded installation bush

Optional accessory:
PTFE sealing ring
Locking set

FVone-dbEX-NP-CA…01/02… (Screw-in type)

Recommended for:
DN 20 – DN 80

Required accessory:
–

FVone-dbEX-NP-CA…11… (Plug-in type)

Recommended for:
DN 15 – DN 50

Required accessory:
Sensor adapter TP or
Ball valve BV

Features

- Compact flow meter for air, compressed air, nitrogen, oxygen, argon, carbon dioxide, methane and hydrogen
- Measured values: standard volume flow/mass flow, standard flow speed, totalizer/consumption, temperature
- Wear-resistant compact design, with stainless steel monitoring head and housing
- USB interface enables configuration, display of measured values and data logging by PC Software
  Download: www.flowvision-gmbh.de/fvone-software_e
- 4...20 mA outputs for flow and temperature
- Pulse output
- Error indication output
- Two galvanically isolated relay outputs
- Totalizer power fail-safe
- 12-core PUR cable (12 x 0,14 mm², conductor resistance 138 Ω/km)

ATEX certification

EU-type examination certificate to EN IEC 60079-0:2018, EN 60079-1:2014 and EN 60079-31:2014

II 2G Ex db IIC T4 Gb
II 2D Ex tb IIIC T75°C...T105°C Db

ATEX ranges of application

	gases		dust	
category 1	zone 0		zone 20	
category 2	zone 1	✔	zone 21	✔
category 3	zone 2	✔	zone 22	✔

Ordering information

Flow meter (calorimetric)

FVone-dbEX FlowVision one ATEX version

Housing

NP Compact housing

Firmware

CA Flow measurement of gases

Power supply

U1 DC 24 V

Process connection

00 Push-in type, L=300 mm, threaded installation bush as accessory
22 Push-in type, L=200 mm, threaded installation bush as accessory
01 Screw-in type, thread G1/2A (to DIN 3852-A), L =36 mm
02 Screw-in type, thread NPT1/2"-14, L=36 mm
11 Plug-in type (following DIN ISO 6149), L = 18,2 mm, for TP or BV adapters

Material (wetted parts)

M1 Stainless steel 1.4571 (standard material)
M2 Hastelloy C4 2.4610

Cable length

Z05 5 m cable
Z10 10 m cable
Z20 20 m cable

Certification

T5 ATEX approval

FVone-dbEX- NP- CA- U1- 01- M1- Z05- T5 ordering example

TECHNICAL DATA (TU = 25 °C, UB = DC 24 V)			
General Data			
Suitable for			air, compressed air, nitrogen, oxygen, argon, carbon dioxide, methane, hydrogen, further gases upon request
Temperature range	fluid		-20 °C ... +80 °C
	ambience		-20 °C ... +50 °C
Configuration			via USB by PC software , runs on Windows® XP, Windows Vista®, Windows® 7, Windows® 8, Windows® 10 (4)
Electrical data			
Input voltage U_B			DC 24 V (± 20 %, at the device – please consider voltage drop)
Power consumption			max. 180 mA
2 Analogue outputs	flow and temperature		4...20 mA (12 bit)
2 Relay outputs	flow or temperature		galvanically isolated, AC/DC 24 V, max. 0,7 A
2 Transistor outputs	Pulse output (comsumption) and error indication output		Power Fet, high side switch, short circuit proof max. load 500 mA, inductive load max. 100 mA
Power indication			LED (green)
MTTF (SN 29500)			121 years
Flow measurement (8)			
Measuring range 0...68 Nm/s (operating range 0...100 Nm/s) (3) (7)	Volume flow depends on inner pipe diameter	16 mm, TP-01	0...50 Nm³/h (0...72 Nm³/h)
		20 mm, TP-02	0...77 Nm³/h (0...113 Nm³/h)
		25 mm, TP/BV-03	0...120 Nm³/h (0...177 Nm³/h)
		32 mm, TP/BV-04	0...197 Nm³/h (0...289 Nm³/h)
		40 mm, TP/BV-05	0...308 Nm³/h (0...452 Nm³/h)
		50 mm, TP/BV-06	0...481 Nm³/h (0...707 Nm³/h)
		60 mm	0...692 Nm³/h (0...1018 Nm³/h)
		70 mm	0...942 Nm³/h (0...1385 Nm³/h)
		80 mm	0...1231 Nm³/h (0...1810 Nm³/h)
		90 mm	0...1557 Nm³/h (0...2290 Nm³/h)
		100 mm	0...1923 Nm³/h (0...2827 Nm³/h)
		120 mm	0...2769 Nm³/h (0...4072 Nm³/h)
		140 mm	0...3768 Nm³/h (0...5542 Nm³/h)
		160 mm	0...4922 Nm³/h (0...7238 Nm³/h)
		180 mm	0...6229 Nm³/h (0...9161 Nm³/h)
		200 mm	0...7691 Nm³/h (0...11310 Nm³/h)
		250 mm	0...12017 Nm³/h (0...17672 Nm³/h)
		300 mm	0...17304 Nm³/h (0...25447 Nm³/h)
		400 mm	0...30763 Nm³/h (0...45239 Nm³/h)
		500 mm	0...48066 Nm³/h (0...70686 Nm³/h)
		600 mm	0...69216 Nm³/h (0...101788 Nm³/h)
		800 mm	0...123050 Nm³/h (0...180956 Nm³/h)
		1000 mm	0...192266 Nm³/h (0...282744 Nm³/h)
		1200 mm	0...276863 Nm³/h (0...407151 Nm³/h)
		1600 mm	0...492201 Nm³/h (0...723825 Nm³/h)
		2000 mm	0...769064 Nm³/h (0...1130976 Nm³/h)
Accuracy (2)	plug-in type	3 ... 50 % of measuring range	± 2,5 % of measured value ± 0,3 % of measuring range final value
		50 ... 100 % of measuring range	± 5 % of measured value ± 1 % of measuring range final value
	screw-in type/ push-in type	3 ... 50 % of measuring range	± 3 % of measured value ± 0,75 % of measuring range final value
		50 ... 100 % of measuring range	± 7 % of measured value ± 1 % of measuring range final value
Repeatability (1)			± 1 % of measured value ± 0,5 % of measuring range final value
Response time T_{63}			5 s (6)
Response time T_{90}			8 s (6)
Temperature drift (+10 ... +70 °C)			± 0,04 % of measuring range final value/°C
Pressure drift			approx. ± 0,5 % of measured value/bar

TECHNICAL DATA (TU = 25 °C, UB = DC 24 V)		
Temperature Measurement		
Measuring range		-20 °C ... +80 °C
Accuracy		± 1 % of measuring range [5]
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, length 200 mm/300 mm
Pressure resistance of monitoring head		100 bar, higher pressures with Inspection Certificate 3.1, observe pressure resistance of installation
Degree of protection		IP67
Materials	fitting, sensor (wetted)	stainless steel 1.4571 (standard)
	connection sensor/fitting	laser welded
	housing	stainless steel 1.4571
	cable	PUR
	cable gland	nickel-plated brass, EPDM
	cap	stainless steel 1.4571
	o-rings	EPDM (wetted, plug-in type)
Weight	plug-in type	ca. 900 g
	screw-in type	ca. 810 g
	push-in type 200 mm	ca. 1020 g
	push-in type 300 mm	ca. 1130 g

[1] At constant temperature and flow conditions, and stable thermal conductivity.

[2] The accuracy values were determined under ideal conditions: Symmetrical complete flow profile, correct mounting in the pipe, inlets and outlets according to manual.

[3] Measuring range (operating range) for methane:
TP-01: 0...33 Nm³/h (0...72 Nm³/h)
TP-02: 0...51 Nm³/h (0...113 Nm³/h)
TP/BV-03: 0...80 Nm³/h (0...176 Nm³/h)
TP/BV-04: 0...132 Nm³/h (0...289 Nm³/h)
TP/BV-05: 0...206 Nm³/h (0...452 Nm³/h)
TP/BV-06: 0...322 Nm³/h (0...706 Nm³/h)
Screw-in/Push-in type: 0...46 Nm/s (0...100 Nm/s) - Nm³/h depends on pipe diameter, see table
Measuring range (operating range) for hydrogen:
TP-01: 0...29 Nm³/h (0...62,3 Nm³/h)
TP-02: 0...45,2 Nm³/h (0...97,3 Nm³/h)
TP/BV-03: 0...70,7 Nm³/h (0...152 Nm³/h)
TP/BV-04: 0...116 Nm³/h (0...249 Nm³/h)
TP/BV-05: 0...181 Nm³/h (0...389 Nm³/h)
TP/BV-06: 0...283 Nm³/h (0...608 Nm³/h)
Screw-in/Push-in type: 0...40 Nm/s (0...86 Nm/s) - Nm³/h depends on pipe diameter, see table

[4] Requires .NET Framework 4 (is provided for free by Microsoft®, usually already installed) and Windows® with current updates

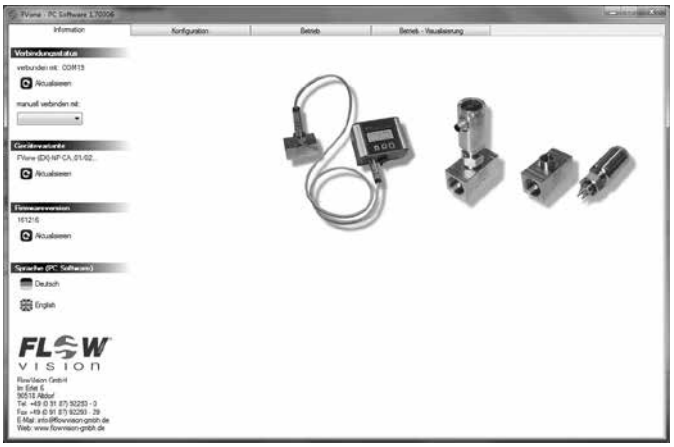
[5] At constant flow rate; fast changes of flow rate may temporarily cause greater deviation than stated.

[6] Measured at a flow of 20 Nm/s after a sudden complete stop.

[7] Valid up to 12 bar abs., > 12 bar abs. upon request.

[8] Specifications in Nm³/h and Nm/s refer to 1013 mbar, 0°C. Sensor calibration is performed at approx. 25 °C and approx. 970 mbar abs. in TP-03, inside pipe diameter 29,7 mm (screw-in type) and inside pipe diameter 79,2 mm (push-in type) respectively.

PC Software



Information/General settings:

- Information about the connected device (type, firmware)
- Connection status
- Selection of application language

Configuration:

- Basic settings (fluid, standard conditions, inside pipe diameter, averaging...)
- Selection of units for volume flow, speed, totalizer, temperature
- Configuration of analogue outputs, switching outputs, pulse output and error indication output
- Loading and saving the configuration to the hard disk
- Plausibility check
- Call up factory settings

Operation:

- Recording of measured values – export to Microsoft® Excel®
- Setting of the readout interval, 2 s up to 100000 s (= approx. 27 hours)
- Shows the actual measured values (volume flow, speed, totalizer, temperature)
- Shows the maximum and minimum values
- Shows the state of the switching and the error indication output
- Setting of the low flow suppression and execution of the zero point adjustment
- Shows which error occurred last
- Resetting of the totalizer value, the minimum and maximum values and the last error

Visualisation:

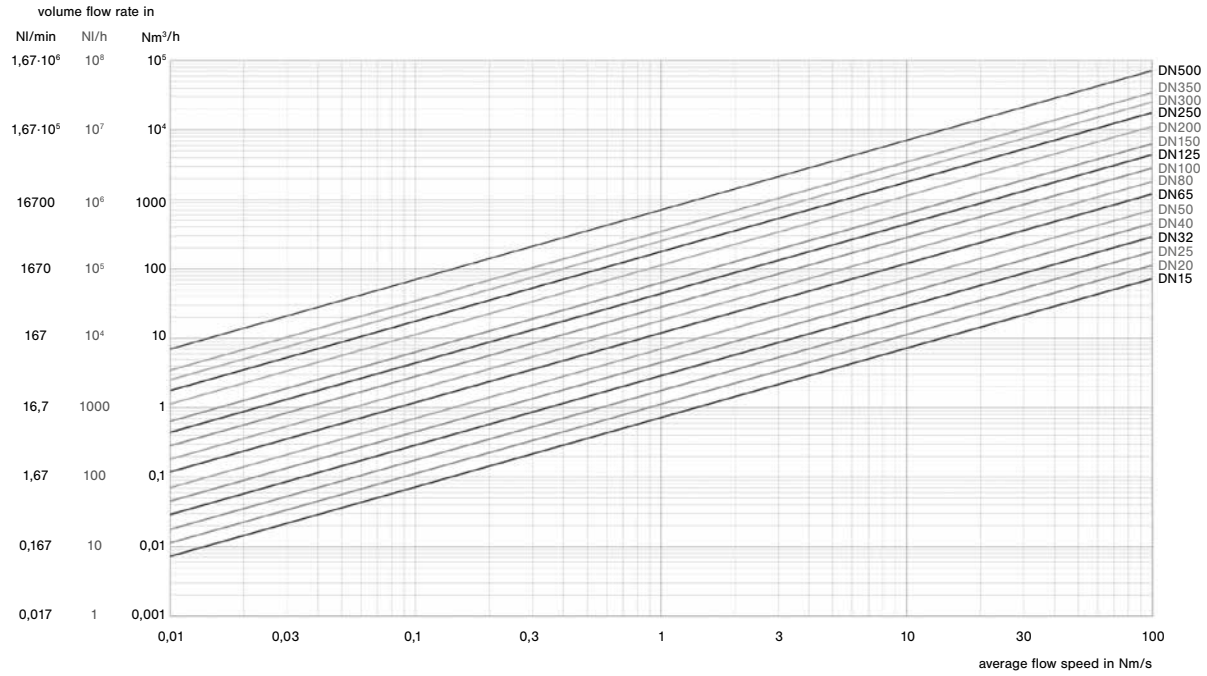
- Chart of the measured values volume flow, speed and temperature (maximum two simultaneously)

Measuring and operating ranges

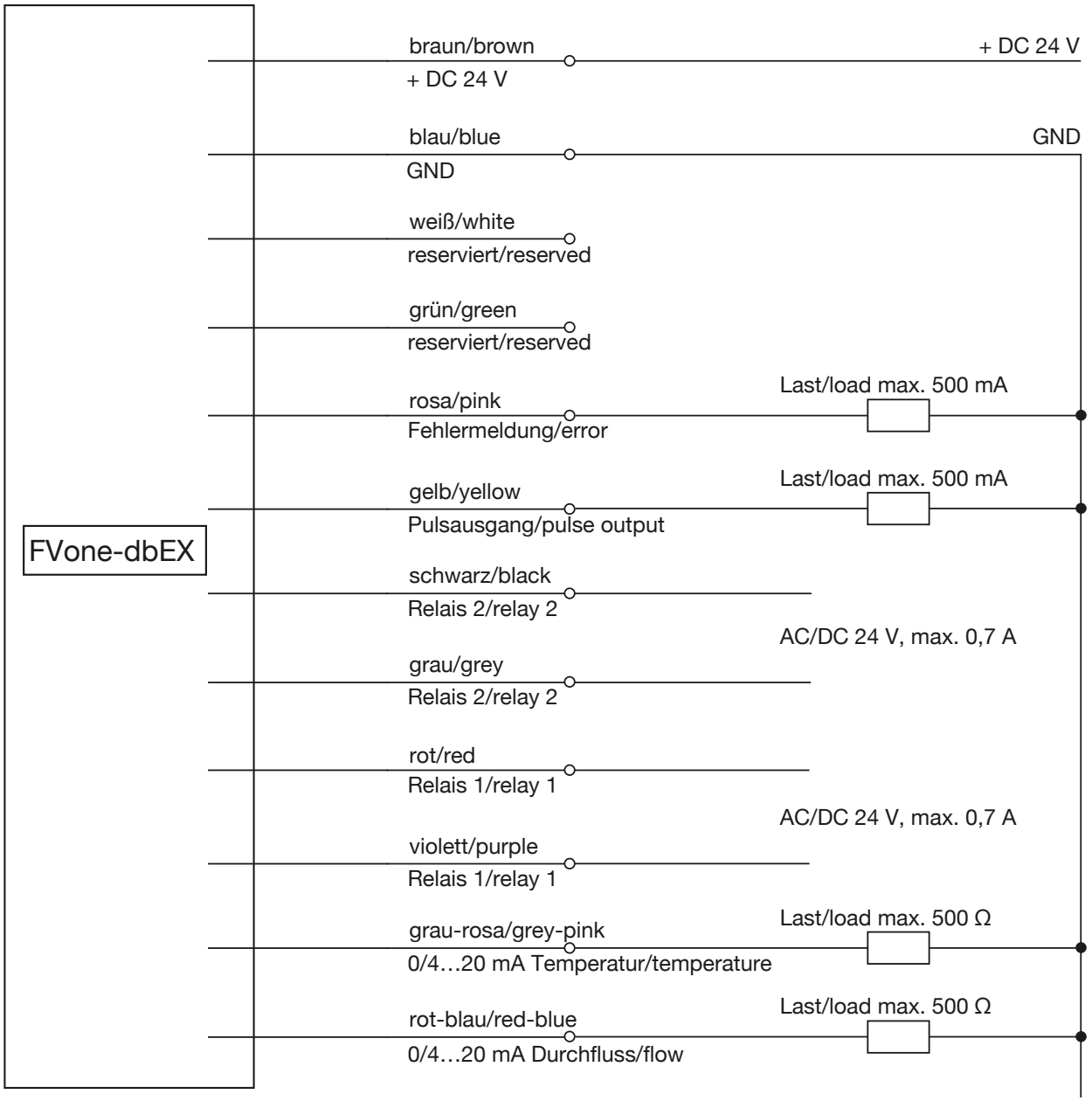
The measuring/operating ranges are determined by the inner pipe diameter.
They can be calculated with the following equation:

$Q = V_N \times A_R$
Q (Nm^3/h) - flow quantity
V_N (Nm/h) - average standard velocity
A_R (m^2) - inner pipe cross section

Standard velocity measuring range (air, nitrogen, oxygen, argon, carbon dioxide):	0 ... 68 Nm/s
Standard velocity measuring range (methane):	0 ... 46 Nm/s
Standard velocity measuring range (hydrogen):	0 ... 40 Nm/s
Standard velocity operating range (air, nitrogen, oxygen, argon, carbon dioxide, methane):	0 ... 100 Nm/s
Standard velocity operating range (hydrogen):	0 ... 86 Nm/s

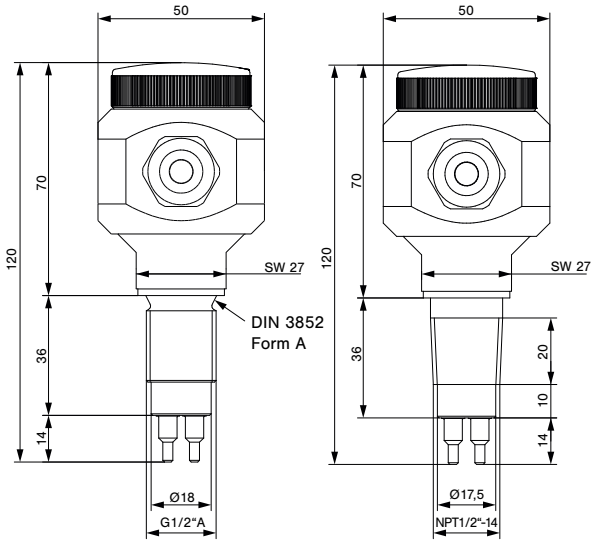


Electrical connection

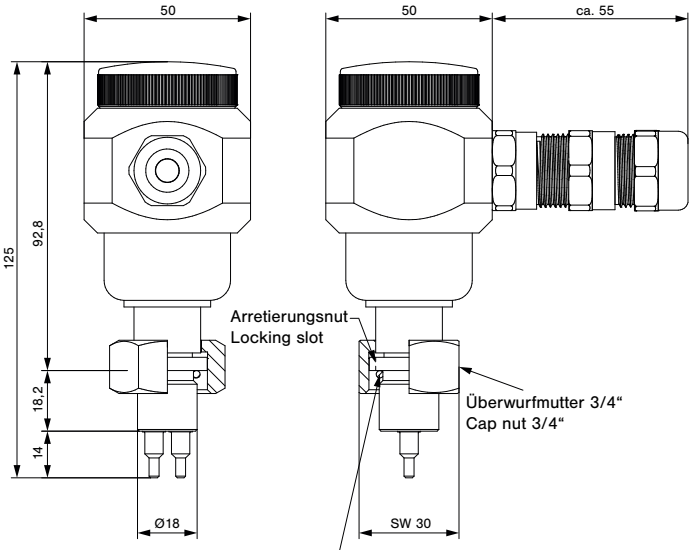


Dimensions

Gewindeanschluss
Screw-in type process connection

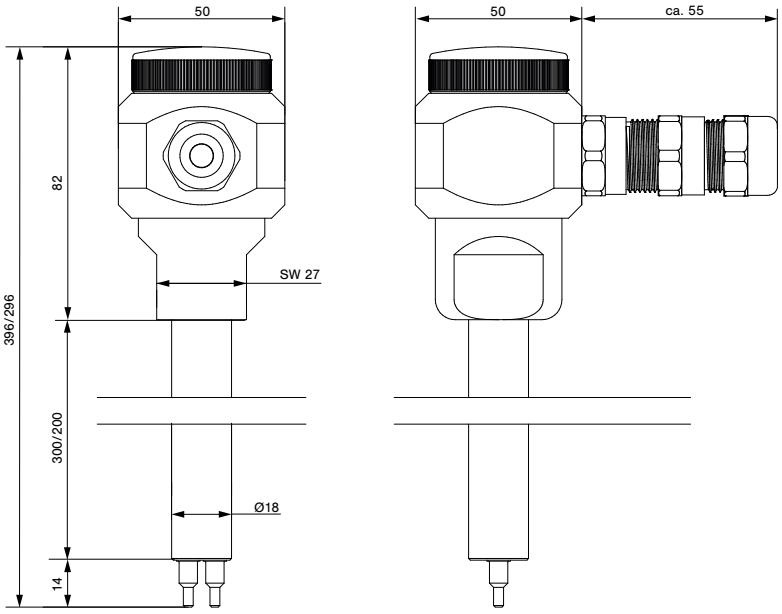


Einsteckanschluss
Plug-in type process connection



O-Ring 15,3x2,2 in Anlehnung an DIN ISO 6149, Material: FKM
O-Ring 15,3x2,2 following DIN ISO 6149, material: FKM

Einschiebeanschluss
Push-in type process connection



All dimensions in mm

All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.

Sensor adapter TP/Ball valve BV

TP-... BV-...

Description

Sensor adapters TP and BV facilitate correct positioning and exchange of FVone...11... (plug-in type connection) in pipes with process connection DN 15...DN 50.
Ball valve BV enables pressure-free installation or removal of FVone...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.

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)

Ordering information – sensor adapter TP/thread

Type				
TP	Sensor adapter with internal thread			
	Process connection/Nominal size			
	01	DN 15 G1/2	internal thread	length: 50 mm/1.97 in.
	02	DN 20 G3/4	internal thread	length: 64 mm/2.52 in.
	03	DN 25 G1	internal thread	length: 78 mm/3.07 in.
	04	DN 32 G1 1/4	internal thread	length: 94 mm/3.70 in.
	05	DN 40 G1 1/2	internal thread	length: 110 mm/4.33 in.
	06	DN 50 G2	internal thread	length: 138 mm/5.43 in.
		Material of the area exposed to fluid		
		M1	stainless steel 1.4571/AISI 316Ti	PN 315 bar/4570 psi
		M3	brass (not TP-03..)	PN 25 bar/363 psi
		M5	red brass (only TP-03..)	PN 16 bar/232 psi
TP -	**01**	**M3**	ordering example	

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

Ordering information – sensor adapter TP/welding

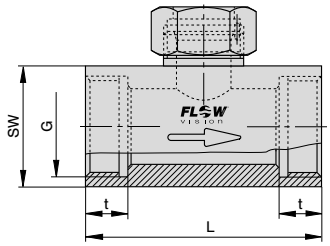
Type				
TP	Sensor adapter with welding nipples			
	Process connection/Nominal size			
	01	DN 15	dia.d: 16 mm/.630 in.	length: 80 mm/3.15 in.
	02	DN 20	dia.d: 20 mm/.787 in.	length: 70 mm/2.76 in.
	03	DN 25	dia.d: 25 mm/.984 in.	length: 80 mm/3.15 in.
	04	DN 32	dia.d: 32 mm/1.26 in.	length: 100 mm/3.94 in.
	05	DN 40	dia.d: 40 mm/1.57 in.	length: 110 mm/4.33 in.
	06	DN 50	dia.d: 50 mm/1.97 in.	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	

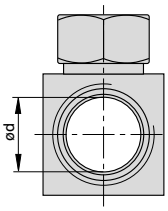
Ordering information – ball valve

Type				
BV	ball valve with internal thread			
	Process connection/Nominal size			
	03	DN 25 G1	internal thread	length: 88 mm/3.46 in.
	04	DN 32 G1 1/4	internal thread	length: 100 mm/3.94 in.
	05	DN 40 G1 1/2	internal thread	length: 110 mm/4.33 in.
	06	DN 50 G2	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	

Dimensions

TP-... sensor adapter with internal thread



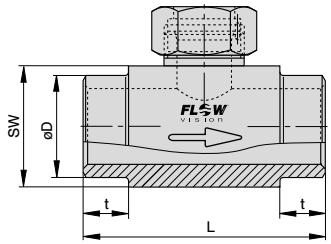


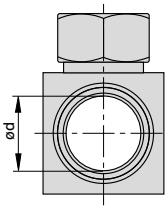
SW = width across flats

Material stainless steel (-M1): PN 315 bar / 4569 psi
Material brass (-M3): PN 25 bar / 363 psi
Material red brass (-M5): PN 16 bar / 232 psi

Type	DN		dia. d		G	t		L		SW	
	mm	in.	mm	in.	in.	mm	in.	mm	in.	mm	in.
TP-01 ...	15	.591	16	.630	1/2"	11	.433	50	1.97	27	1.06
TP-02 ...	20	.787	20	.787	3/4"	12	.472	64	2.52	32	1.26
TP-03 ...	25	.984	25	.984	1"	14	.551	78	3.07	40	1.57
TP-04 ...	32	1.26	32	1.26	1.1/4"	15	.591	94	3.70	50	1.97
TP-05 ...	40	1.57	40	1.57	1.1/2"	15	.591	110	4.33	55	2.16
TP-06 ...	50	1.97	50	1.97	2"	19	.748	138	5.43	70	2.76

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

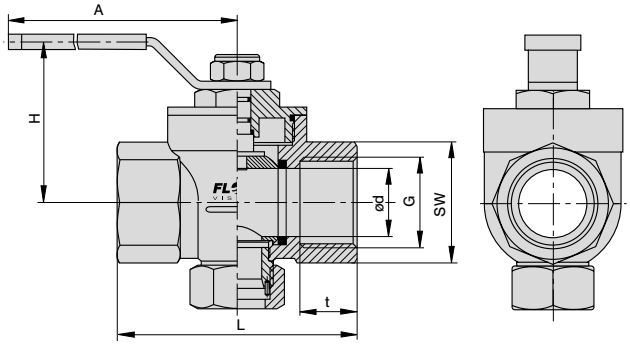




PN 315 bar / 4569 psi

Type	DN		dia. d		dia. D		t		L		SW	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
TP-01M1-SA	15	.591	16	.630	21.3	.839	15	.591	80	3.15	27	1.06
TP-02M1-SA	20	.787	20	.787	26.9	1.06	15	.591	70	2.76	32	1.26
TP-03M1-SA	25	.984	25	.984	33.7	1.33	15	.591	80	3.15	40	1.57
TP-04M1-SA	32	1.26	32	1.26	42.4	1.67	15	.591	100	3.94	50	1.97
TP-05M1-SA	40	1.57	40	1.57	48.3	1.90	15	.591	110	4.33	55	2.16
TP-06M1-SA	50	1.97	50	1.97	60.3	2.37	15	.591	140	5.51	70	2.76

BV-... M3 Ball valve with internal thread

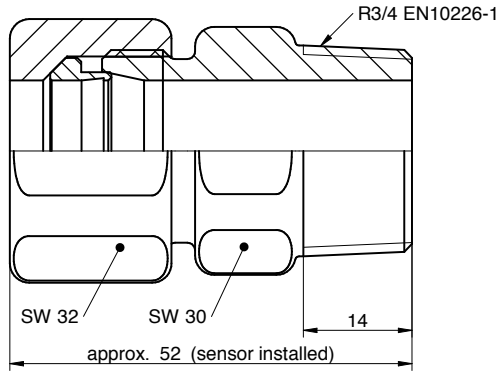


PN 25 bar / 363 psi

Type	DN		dia. d		G	t		L		SW		H		A	
	mm	in.	mm	in.	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
BV-03M3	25	.984	25	.984	1"	21	.827	88	3.47	41	1.61	59	2.32	115	4.53
BV-04M3	32	1.26	32	1.26	1.1/4"	24	.945	100	3.94	50	1.97	65	2.56	115	4.53
BV-05M3	40	1.57	40	1.57	1.1/2"	24	.945	110	4.33	54	2.13	77	3.03	150	5.91
BV-06M3	50	1.97	50	1.97	2"	28	1.10	131	5.16	70	2.76	85	3.35	150	5.91

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

Compression fitting

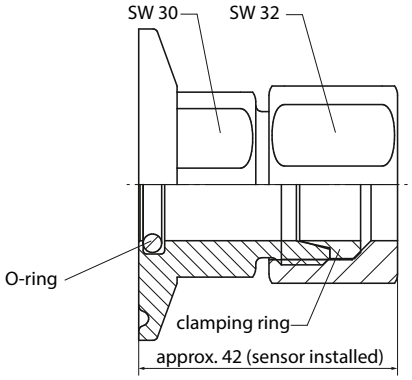


Description and ordering information

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

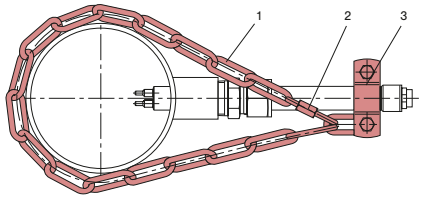


Description and ordering information

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



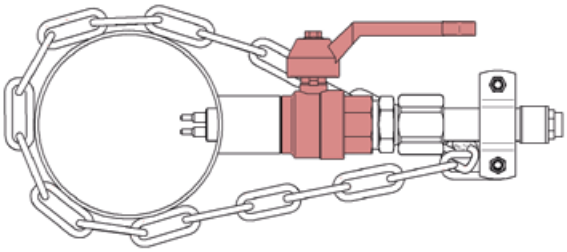
Description and ordering information

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