

Description

Compact single point flow monitor for use in zone 2 (gases) and zones 21, 22 (dust), MIN or MAX monitoring options, suitable for air, gases, water, aqueous liquids, oil.
 With screw-in or plug-in type monitoring head for ease of installation and correct positioning.

If the flow rate falls below (MIN-function) or exceeds (MAX-function) the value adjusted by means of potentiometer, the signal output switches to 0 V-level and the yellow LED (Q) lights.



FS10-EX...

EC-type-examination certificate to EN 60079-0:2012, EN 60079-15:2010 and EN 60079-31:2014

II 3G Ex nA IIC T4 Gc
 II 2D Ex tb IIIC T120°C Db

Ranges of application

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

Features

- wear-resistant compact design, with stainless steel 1.4571 monitoring head and housing
- switch point steplessly adjustable by means of potentiometer
- status indication by green LED
- media temperature range -10 ... +100 °C/+14 ... +212 °F
- 3-core PVC cable, 3 x 0.22 mm² (AWG 24), conductor resistance 90 Ω/km
- fault indication by yellow LED
- signal output with HighSide-FET
- protected against short circuits and overloads

Ordering information

Flow monitor (calorimetric)

FS10-EX flow monitor and integral compact housing

Power supply

U1 DC 24 V (± 20 %)

Flow switch point

MIN

MAX

Process connection

01 G1/2A (to DIN 3852-A), length = 36 mm

02 NPT1/2"-14, length = 36 mm

11 plug-in type (following DIN ISO 6149), length = 18,2 mm for TP or BV adapters

Media

A air, gases

W water, aqueous liquids, oil

fitting material

M1 stainless steel 1.4571

M2 Hastelloy C4 2.4610

Cable length

Z02 2 m cable (standard)

Z05 5 m cable

Z10 10 m cable

Z20 20 m cable

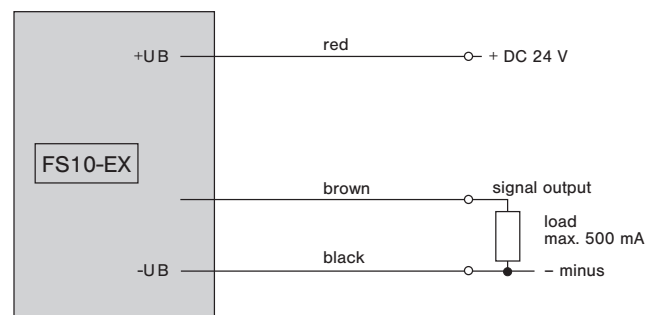
Certification

T5 approval to EC directive 94/9/EG (ATEX)*

FS10-EX - U1 MAX 01 W - M1 Z02 T5 ordering example

* please see also section 0.

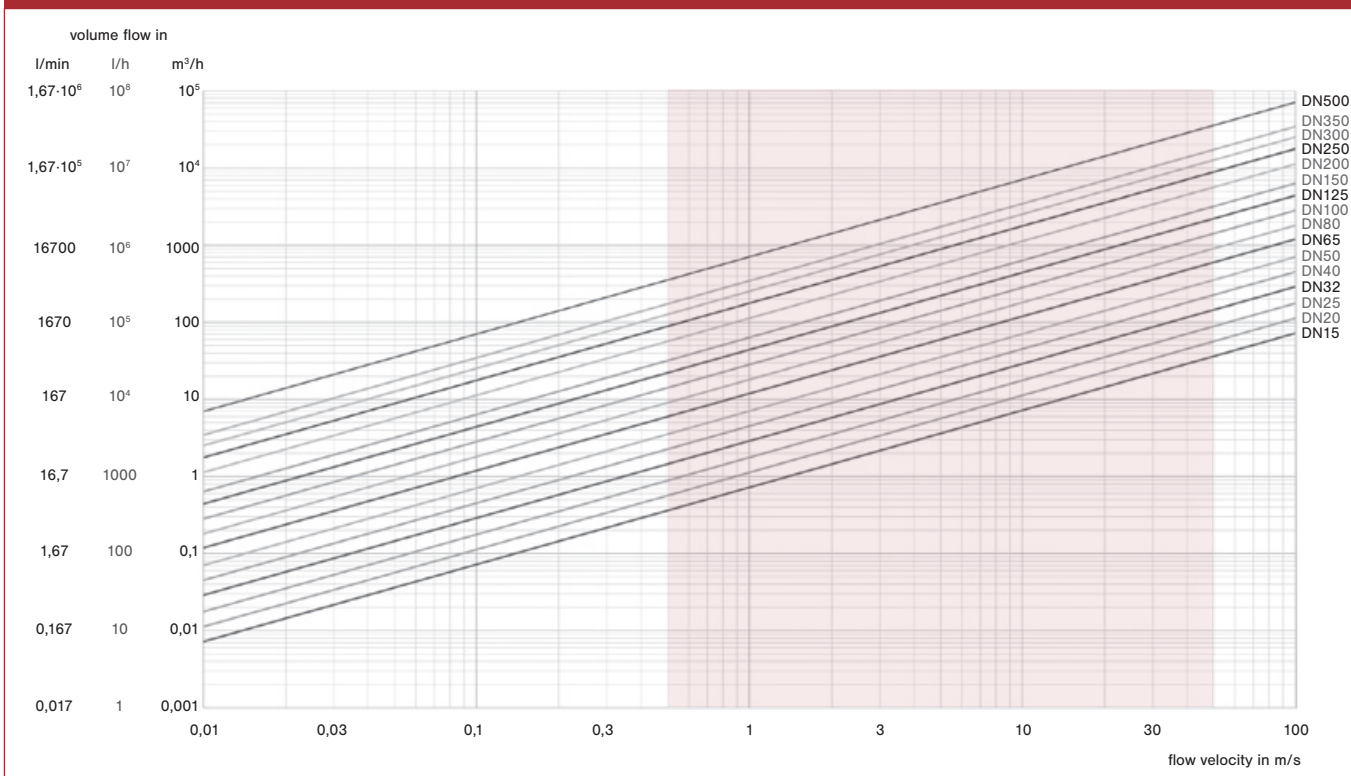
Connection diagram FS10-EX



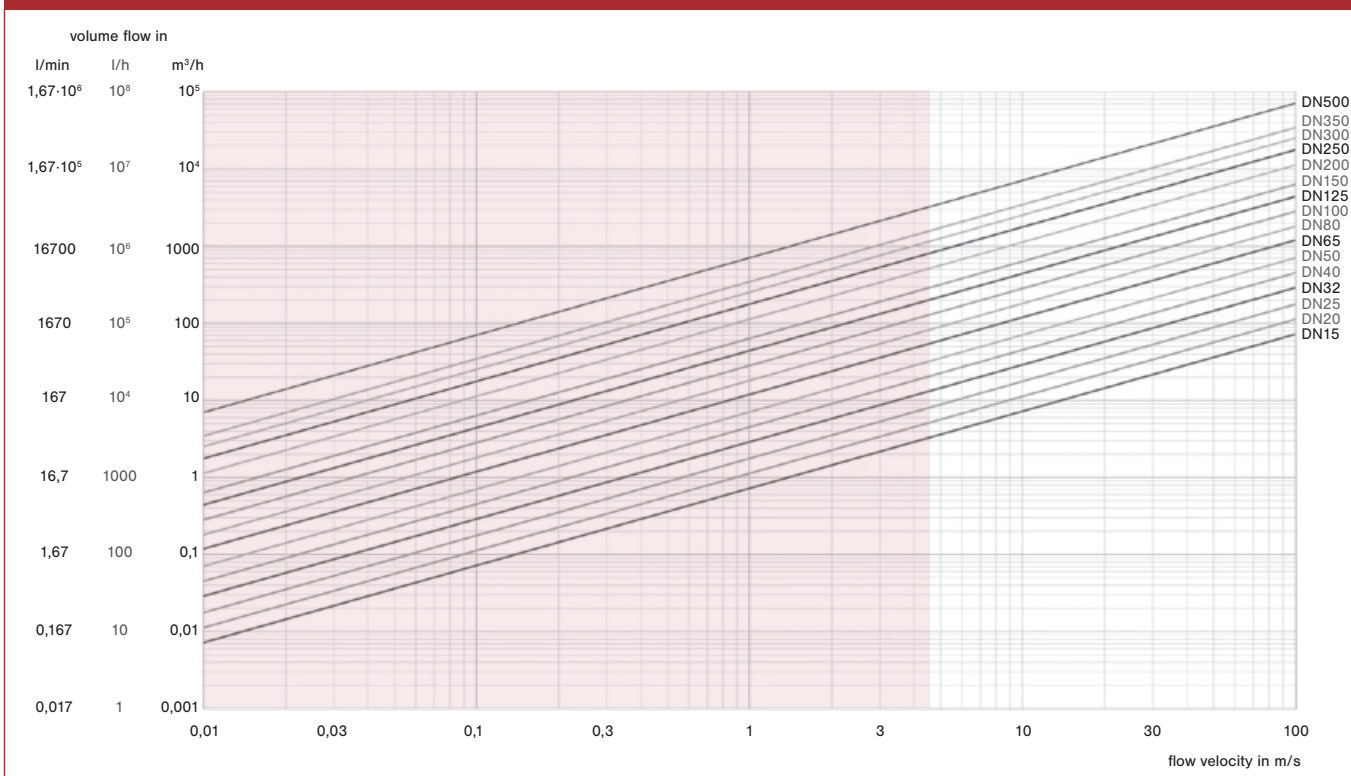
TECHNICAL DATA (ambient temperature $T_u = 25\text{ °C}$, operating voltage $U_B = \text{DC } 24\text{ V}$)

General data		FS10-EX
Media		air, gases, water, aqueous liquids, oil
Monitoring function	flow speed	switch point (min/max)
	fault indication	LED (yellow)
	signal output	Power FET, high side switch, short circuit proof max. load 500 mA, inductive load max. 100 mA
Temperature range	liquid/gas	-10 ... +100 °C/+14 ... +212 °F
	ambient	-10 ... + 65 °C/+14 ... +149 °F
Electrical data		
Operating voltage U_B		DC 24 V ($\pm 20\%$, at the device – please consider voltage drop)
Power consumption (without load)	gases	28 mA $\pm 5\%$
	liquids	57 mA $\pm 3\%$
Status indication		LED (green)
MTTF (SN 29500)		519 years
Flow monitoring		
Flow response level adjustment	air	0,5 ... 50 m/s / 1.64 ... 164 fps with atmospheric pressure (see diagram „adjustment range air“)
	water, oil	0,01 ... 4,5 m/s / 0.0328 ... 14.8 fps (see diagram „adjustment range water/oil“)
Repeatability ⁽¹⁾		$\leq \pm 3\%$ of the set value
Response delay	water	typ. 1 sec ⁽²⁾
	air	typ. 2 sec ⁽³⁾
	oil	typ. 1,5 sec ⁽²⁾
Switch point drift because of temperature change of the medium		approx. $\pm 1.0\%$ of the set value/°C / 1.8 % of the set value/°F
Mechanical data		
Type and size of monitoring head	plug-in	following DIN ISO 6149
	screw-in	G 1/2 A, NPT 1/2"
Pressure resistance of monitoring head	plug-in	100 bar
	screw-in	100 bar
Degree of protection		IP65
Materials	fitting (wetted)	stainless steel 1.4571/Hastelloy C4 2.4610
	sensor (wetted)	stainless steel 1.4571/Hastelloy C4 2.4610
	connection sensor/fitting	laser welded
	housing	stainless steel 1.4571
	cable	PVC
	cable gland	nickel plated brass, TPE
	cap	stainless steel 1.4571
o-ring	FKM	
Weight		approx. 270 g/0.595 lb
⁽¹⁾ of the set value, at constant temperature and flow conditions, and stable thermal conductivity ⁽²⁾ delay with the switch point set to 1,8 m/s and the flow at 2 m/s, after a sudden complete stop ⁽³⁾ delay with the switch point set to 18 m/s and the flow at 20 m/s, after a sudden complete stop		

Adjustment range air (with atmospheric pressure)



Adjustment range water/oil



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11a

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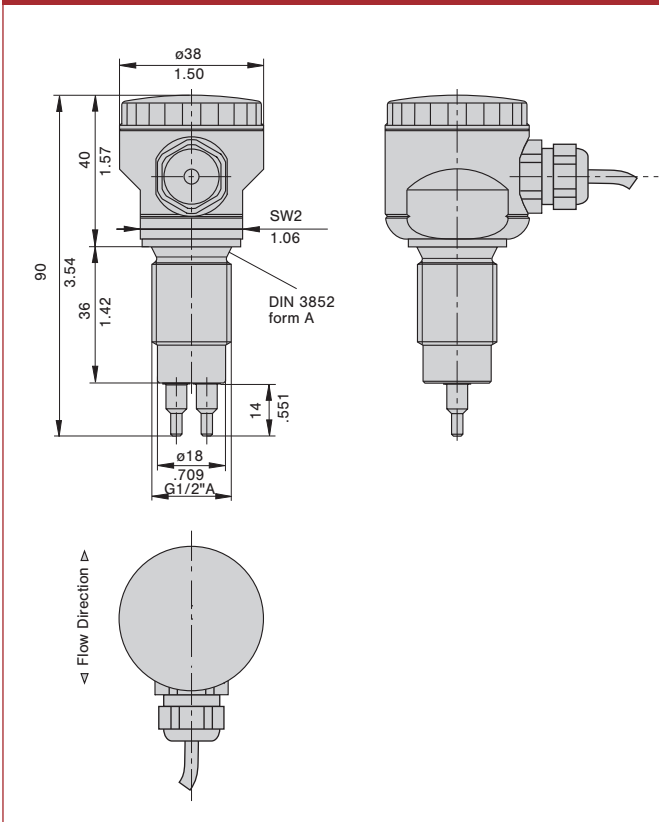
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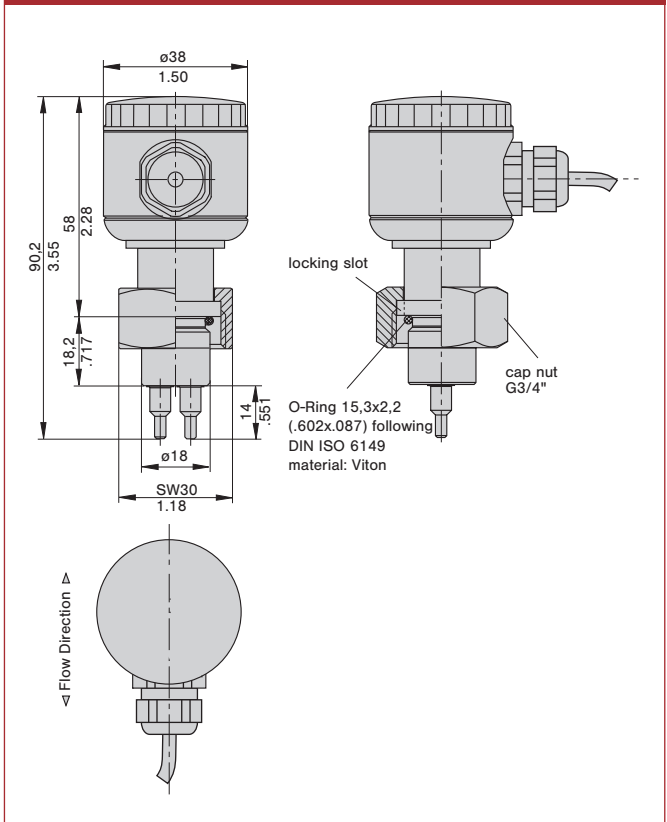
B

A

Dimensions of screw-in type process connection (FS10-EX-U1...01)



Dimensions of plug-in type process connection (FS10-EX-U1...11)



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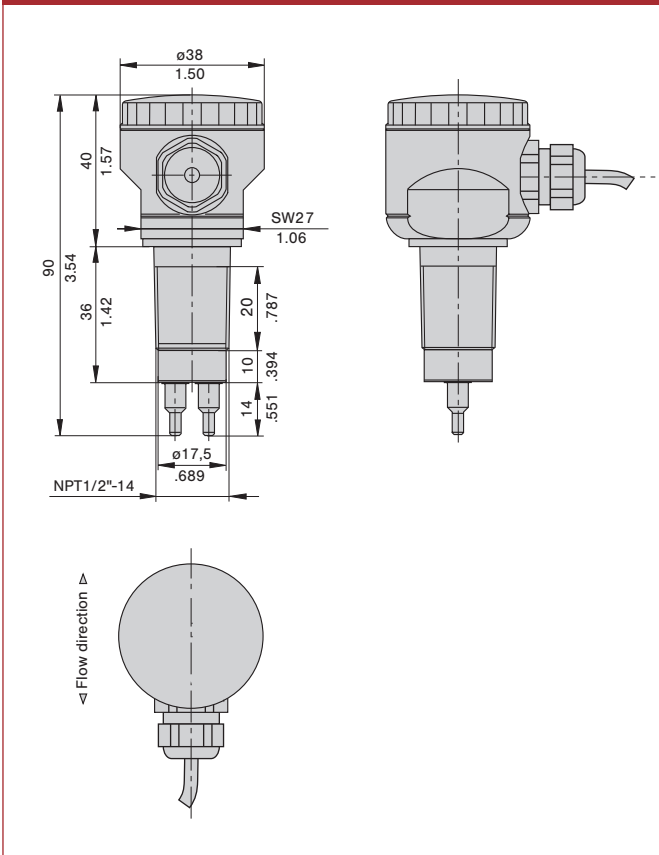
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Dimensions NPT thread (FS10-EX-U1...02)



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B

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

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 CSP monitoring heads, FC03, FC04 or FS10-U1...11 (plug-in type connection) in pipes with process connection DN 8...DN 50. Ball valve BV enables pressure-free installation or removal of CSP monitoring heads and Flow Meter FC03, FC04 and FS10-U1...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			
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 medium			
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)

Ordering information

Type			
TP	Sensor adapter with internal thread		
Process connection/Nominal size			
00	DN 8	G1/4	internal thread length: 50 mm/1.97 in. *
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 medium			
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	

Ordering information

Type			
TP	Sensor adapter with welding nipples		
Process connection/Nominal size			
00	DN 8	dia.d: 8 mm/.315 in.	length: 80 mm/3.15 in. *
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 medium			
M1	stainless steel 1.4571/AISI 316Ti		
Process connection			
SA	welded connection		
TP - 01	M1	SA	ordering example

* tube/pipe inside diameter min. 8 mm

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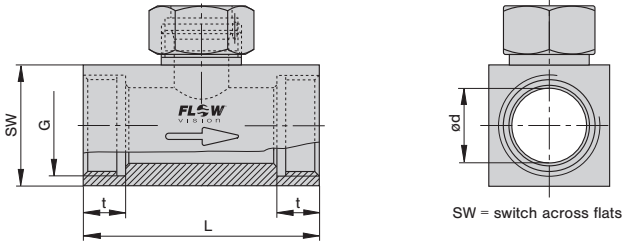
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B

Dimensions

TP-... sensor adapter with internal thread

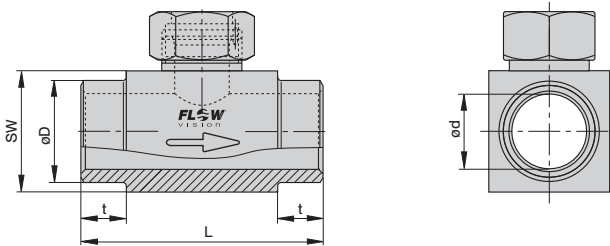


SW = switch across flats

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-00 ...	8	.315	8	.315	1/4"	10	.394	50	1.97	27	1.06
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

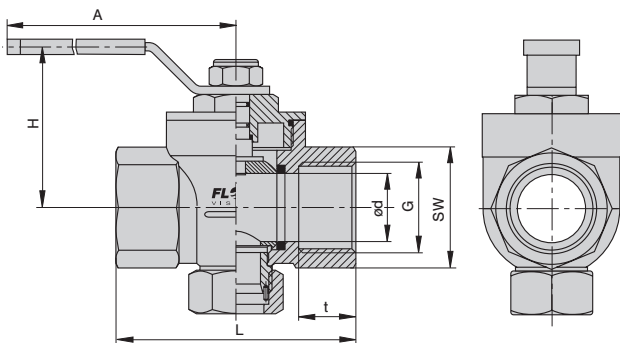
TP-... M1-SA sensor adapter with welding nipples



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-00M1-SA	8	.315	8	.315	13.5	.532	15	.591	80	3.15	27	1.06
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



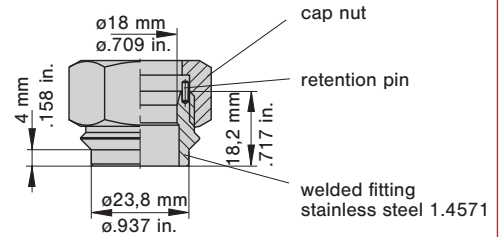
PN 25 bar / 363 psi

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

Accessories

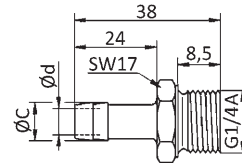
Description	Ref. No.
Blanking plug, brass, with O ring	OZ121Z000186
Union nut, brass	Y 306 901 01
Blanking plug, stainless steel 1.4571/AISI 316 Ti, with viton O ring	OZ121Z000187
Union nut, stainless steel	Y 306 901 03

**Welding set 05
OZ122Z000202**



Barbed tube fitting for TP-00... (DN 8) *

brass nickel-plated, seal face for seal ring DIN 7603, PN 25 bar



ordering number	for tube inside diameter	øC	Ød
Y50040002	8 mm	9 mm	6 mm
Y50040003	10 mm	11 mm	8 mm
Y50040004	12 mm	13 mm	8 mm

* tube/pipe inside diameter min. 8 mm