SD-04

Impeller Flowmeter with Dosing or Switching Electronics

Features

/ Nominal diameters DN06 to DN50

/ Pressure-proof up to 16 bar

/ DC- or AC power supply

/ Variety of materials

/ Flanges and connections for food-processing applications

/ Available as NAMUR transmitter for ATEX zone 0 or 20 on request

Description:

An impeller made of PVDF is set into motion by a flowing medium. It generates through completely compound-filled magnets an impulse signal in the transmitter electronics proportional to the flow. Depending on the version the measuring transmitter, this signal is converted into different functions. In the simplest version, the complete unit is battery powered and displays the current flow rate and additionally two reset-table counters. The next level has a 4. . .20 mA signal and a pulse output, which is designed as a transistoroutput, and, in addition, two resettable totalizers that can be used as the main and day counters. Naturally, also the current flow rate can be displayed and furthermore two addi-tional relay outputs are available, if switchpoints are necessary. The full version of SD-04 includes a dosing device with 2 totalizers, 2 relays and 3 dosing modes. The dosing volume can be set through a keypad, binary inputs or pulse-modulated through a PLC. The dosing device is capable of determining the K factor of other flow sensors by means of „Teach-in“ or, in the same way, to enhance (litre-wise) the accuracy of the inbuilt own sensor. Moreover, for testing the system a flow can be simulated in a „dry“ run, thereby meeting the highest requirements of modern dosing technology. The sensor and electronics are connected to each other through a simple bayonet lock; therefore, the electronics are easily interchangeable. Pick-up sensors and transmitter variants can be interchanged in any manner.

Application:

Thanks to the variety of materials and connectivity in the flow pick-up sensor in the SD-04, the user has immense possibilities of application. Polypropylenes, PVDF and PVC offer a choice of synthetic materials that are resistant to nearly all hostile media and, materials such as brass and stainless steel logically supplement the choice favoring metals. All com-monly used thread variants, DIN and ANSI flanges in stainless steel and Tri-Clamp supports and welded ends are available as connectors and thus enable coupling the SD-04 to nearly any process. The nominal diameter ranges from DN06 to DN50 and covers, therefore, a wide range of flows.

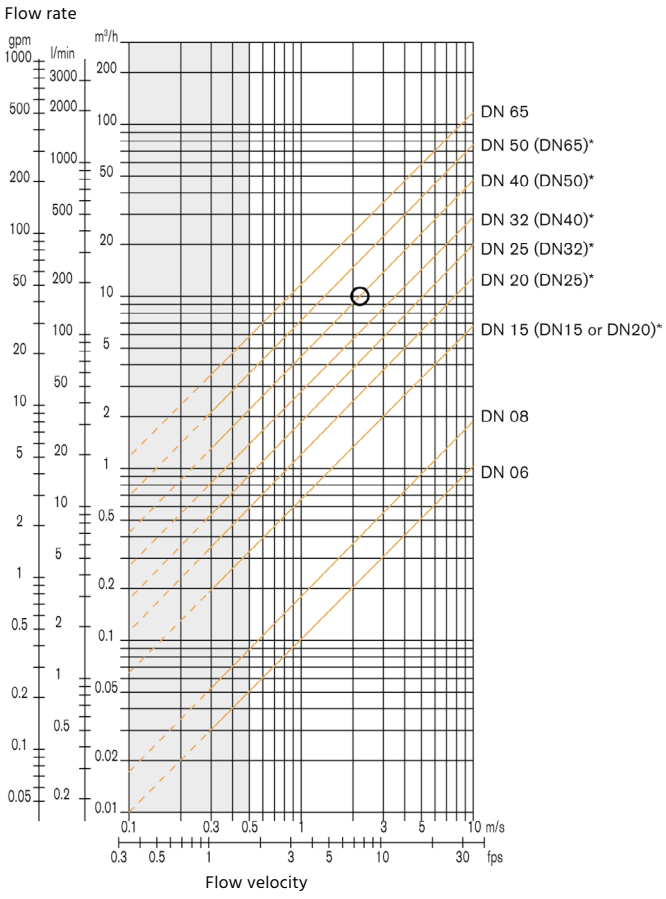
Technical Specifications:

Nominal diameter /	DN06 to DN50
Operating range /	0.5. . .1200 l/min
Flow velocity /	0,3. . .10 m/s (hall transducer version) 0,5. . .10 m/s (batterie version - coil transducer)
Accuracy /	
Teach-In:	± 1% of measured value
Standard K-Factor:	+ 2.5% of measured value (at 10 m/s)
Linearity /	± 0.5% of F.S. (at 10 m/s)
Repeatability /	± 0.4% MW
Viscosity & Pollution /	clean, neutral or aggressive fluids max. 300 cSt / 1% max. (particle size: 0.5 mm max.)
Media temperature /	
PVC:	0. . .+50°C
PP:	0. . .+80°C
PVDF, brass, st. steel:	-15. . .+100°C (high temperature on request)
Operating and storage temperature of sensor housing /	
PVC:	-15. . .+60°C
PP:	-15. . .+80°C
VA, Ms, PVDF:	-15. . .+100°C
Rel. humidity /	≤ 80%, non-condensed
max. Pressure Fitting /	
Plastic:	10 bar up to 20°C (see P-T diagram)
Metal:	16 bar (40 bar on request)
Materials Fitting /	
Seal:	FKM (EPDM)
Housing:	PVC, PP, PVDF, brass ($CuZn_{39}Pb_2$) stainless steel (316L - 1.4404)
Screws:	stainless steel (316L - 1.4404)
Impeller:	PVDF (PP or stainless steel on request)
Axis and bearing:	ceramics (Al_2O_3)
Materials Electronics /	
Housing, cover, lid, nut:	PC
Front film:	polyester
Screws:	stainless steel
Cable, plug or glands:	PA

Wetted parts /	fitting, impeller, axis, bearing and seal
Display /	15 x 60 mm, 8-digit LCD, alpha-numeric, 15 segments, 9 mm high
Norm /	2014/68/EU
Certificate /	EN-ISO 10204 DIN 4762 DIN 4768 ISO/4287/1

Impeller sensors ensure reliable operation in the range of 0.3 to 10 m/s flow velocity which means that their accuracy of 0.5% from one end of the range plus 2.5% of the measured volume is available for a range of 1:33.
In dosing technology, especially the SD-04 has hardly any match, considering its variety in respect to volume specifi-cations, resistance to different media and, not the least, its excellent price to performance ratio.

Nominal Diameter Options:



--- not recommended
* choose a pipe size DN40 [or DN50 for any * marked fitting] for the following fittings with process connector:
External Thread SMS 1145
Weld-on end SMS 3008, BS4825-1/ASME BPE/DIN 11866 Line C or DIN 11850 Line 2/DIN 11866 Line A/DIN EN 10357 Line A
Clamp SMS 3017, BS 4825-3/ASME BPE or DIN 32676 Line A

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Electrical Specifications:

Dosing unit /

Supply voltage:	12. . .36 VDC ± 10%, filtered and controlled, SELV circuit with non-dangerous energy-level, or 115 / 230 VAC 50/60 Hz
Cable:	50 m max., shielded, 1.5 mm² max.
Cable gland:	M20 x 1.5 or plug EN 175301-803
Reverse polarity protection DC:	yes
Current consumption:	≤ 100 mA at 12 VDC - with relay ≤ 50 mA at 36 VDC - with relay ≤ 55 mA at 115/230 VAC - with relay (without consumption of digital input and pulse output)
4 digital inputs:	switching threshold Von: 5 to 36 VDC switching threshold Voff: 2 VDC max. input impedance: 9.4 kΩ galvanic insulation, protected against polarity reversals and voltage spikes functions selections of dosing volume and Start/Stop actuation

Transistor output / 2x NPN or PNP, potential free;

default for output 1: pulse output

default for output 2: batch state

configurable and parameterizable 0.6-2200 Hz, 5-36 VDC, 100 mA max. line drop 2.7 VDC at 100 mA

duty cycle:
> 0.45 if 0.6 < frequency < 300 Hz
> 0.4 if 300 < frequency < 1500 Hz
< 0.4 if 1500 < frequency < 2200 Hz
galvanic insulation, protected against overvoltage, polarity reversals and short circuits

Relay output / 2 relays (currentless open), parameterizable

Switching load:	230 VAC, 3 A, or 40 VDC, 3 A (ohmic load) max. switching capacity 750 VA (ohmic load)

Protection class / IP65

EMC / EN 61000-6-2, EN 61000-6-3

Security / EN 61010-1

Vibration / EN 60068-2-6

Shock / EN 60068-2-27

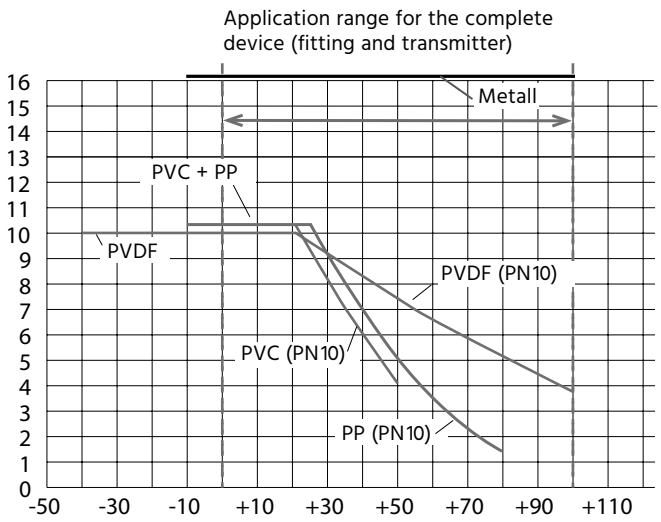
Approvals / CE; UL-Recognised for US & Canada

Flow transmitter /

Supply voltage:	12. . .36 VDC ± 10%, filtered and controlled, SELV circuit with non-dangerous energy-level, or 115 / 230 VAC 50/60 Hz
Cable:	50 m max., shielded, 1.5 mm² max.
Cable gland:	M20 x 1.5 or plug EN 175301-803
Reverse polarity protection DC:	yes
Current consumption:	≤ 70 mA at 12 VDC - with relay ≤ 25 mA at 12 VDC - without relay
Output signal:	4. . .20 mA, 3-wire - with relay 4. . .20 mA, 2-wire - without relay
Load:	max. 50 Ω at 12 VDC max. 600 Ω at 24 VDC max. 800 Ω at 115 / 230 VAC max. 900 Ω at 30 VDC
Pulse output:	polarized, potential free, 5 to 36 VDC, 100 mA, protected, line drop at 100 mA: 2.5 VDC
Relay:	2 relays freely configurable, 3 A, 230 VAC or 3A, 40 VDC
Protection class:	IP65
EMC:	EN 61000-6-2, EN 61000-6-3
Security:	EN 61010-1
Vibration:	EN 60068-2-6
Shock:	EN 60068-2-27

Battery power / batteries 4 x 1.5 VDC AA
lifespan min. 4 years at 20°C

P-T Diagram:



Ordering Codes:

Order number	SD-04.	2.	2.	2.	2.	0

SD-04 Flowmeter with Dosing or Switching Electronics

Sensor housing material /

1 = polypropylene with weld-on ends
1a = polypropylene with swivel nut and weld-on bushings
2 = PVDF with weld-on ends
2a = PVDF with swivel nut and weld-on bushings
2b = PVDF with male thread as per ISO 10931
3 = PVC with adhesive ends DIN 8063
3a = PVC with swivel nut and adhesive bushings DIN 8063
3b = PVC with BSPP-male thread DIN 8063
4 = brass with BSPP-female thread
4a = brass with BSPT-female thread
5 = brass with BSPP-male thread
5a = brass with BSPT-male thread
6 = brass with NPT-female thread
6a = brass with NPT-male thread
7 = stainless steel with BSPP-female thread
7a = stainless steel with BSPT-female thread
8 = stainless steel with BSPP-male thread
8a = stainless steel with BSPT-male thread
9 = stainless steel with NPT-female thread
9a = stainless steel with NPT-male thread
10 = stainless steel with welding studs EN ISO 1127 ISO 4200
11 = stainless steel with Tri-Clamp EN ISO 1127 ISO 4200
12 = stainless steel with flanges as per EN 1092-1
13 = stainless steel with flanges as per ANSI B16-5-1988

Nominal diameter /

0 = 06 mm
0a = 08 mm
1 = 15 mm
2 = 20 mm
3 = 25 mm
4 = 32 mm
5 = 40 mm
6 = 50 mm

Transmitter /

0 = battery operated measuring device, without outputs, with display for current flow and 2 resettable counters
1 = measuring device with 4 to 20 mA and pulse output (PNP and NPN), 2 totalizers and interchangeable flow display
2 = measuring device with 4 to 20 mA and pulse output (NPN and PNP), 2 additional relays, 2 totalizers and interchangeable flow display
5 = dosing device with 2 totalizers, dosing flow display and 2 relays

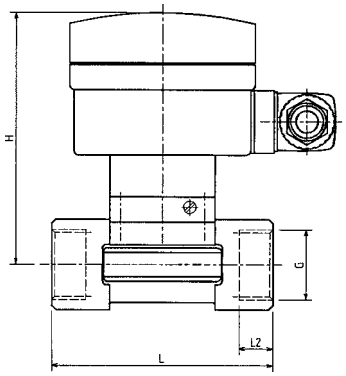
Supply voltage /

0 = battery 2 x 9 VDC (transmitter version 0 only)
1 = 12. . .36 VDC
2 = 115. . .230 VAC

Options /

0 = none
1 = measuring transmitter separately for panel-mounting
2 = measuring transmitter separately for wall-mounting

Dimensions MS and SS:



Brass and st. steel housing with f-thread G

ND [mm]	Thread	L [mm]	L2 [mm]	H [mm]
15	G ½"	84	16.00	139
20	G ¾"	94	17.00	137
25	G 1"	104	23.50	137
32	G 1 ¼"	119	23.50	140
40	G 1 ½"	129	23.50	144
50	G 2"	148.5	27.50	151

Brass and st. steel housing with NPT-f

ND [mm]	Thread	L [mm]	L2 [mm]	H [mm]
15	NPT ½"	84	17.00	139
20	NPT ¾"	94	18.30	137
25	NPT 1"	104	18.00	137
32	NPT 1 ¼"	119	21.00	140
40	NPT 1 ½"	129	20.00	144
50	NPT 2"	148.5	24.00	151

Brass and st. steel housing with BSPT-f

ND [mm]	Thread	L [mm]	L2 [mm]	H [mm]
15	Rc ½"	84	15.00	139
20	Rc ¾"	94	16.30	137
25	Rc 1"	104	18.00	137
32	Rc 1 ¼"	119	21.00	140
40	Rc 1 ½"	129	19.00	144
50	Rc 2"	148.5	24.00	151

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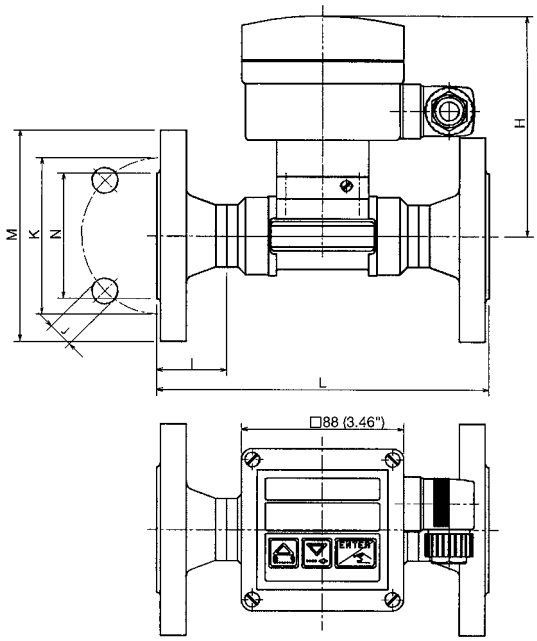
Dimensions MS and SS:

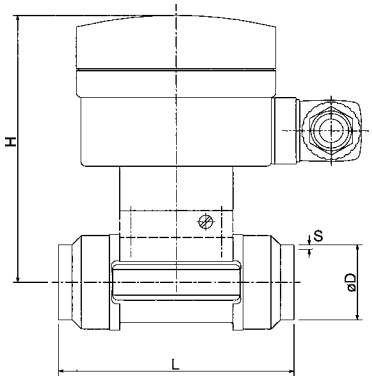


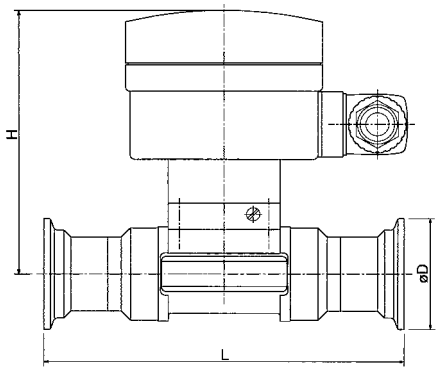
St. steel housing with flange as per EN 1092-1

ND [mm]	I [mm]	J amount x Ø	K [mm]	M [mm]	N [mm]	L [mm]	H [mm]
15	23.5	4 x 14 mm	65	95	45	130	139
20	28.5	4 x 14 mm	75	105	58	150	137
25	28.5	4 x 14 mm	85	115	68	160	137
32	31	4 x 18 mm	100	140	78	180	140
40	36	4 x 18 mm	110	150	88	200	144
50	41	4 x 18 mm	125	165	102	230	151

St. steel housing with flange as per ANSI B16-5

ND [mm]	I [mm]	J amount x Ø	K [mm]	M [mm]	N [mm]	L [mm]	H [mm]
15	23.5	4 x 15.8 mm	60.3	89.0	34.9	130	139
20	28.5	4 x 15.8 mm	69.8	99.0	42.9	150	137
25	28.5	4 x 15.8 mm	79.4	108.0	50.8	160	137
32	31	4 x 15.8 mm	88.9	117.0	63.5	180	140
40	36	4 x 15.8 mm	98.4	127.0	73.0	200	144
50	41	4 x 19.0 mm	120.6	152.0	92.1	230	151





Stainless steel housing with welding studs as per EN ISO 1127 ISO 400

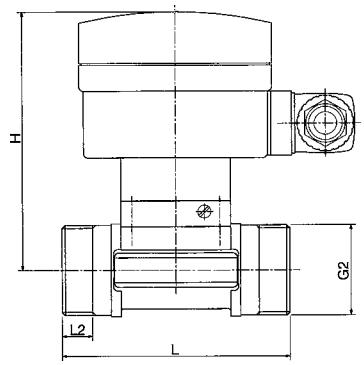
ND [mm]	D [mm]	L [mm]	S [mm]	H [mm]
08 DIN 11850	13	90	1.5	134
15	21.3	84	1.6	139
20	26.9	94	1.6	137
25	33.7	104	2.0	137
32	42.4	119	2.0	140
40	48.3	129	2.0	144
50	60.3	148.5	2.6	151

Stainless steel housing with Tri-Clamp connector as per EN ISO 1127/ISO 400

ND [mm]	D [mm]	L [mm]	H [mm]
08 DIN 32676	34.00	125	134
15	34.00	130	139
20	50.50	150	137
25	50.50	160	137
32	50.50	180	140
40	64.00	200	144
50	77.50	230	151

Other connections on request.

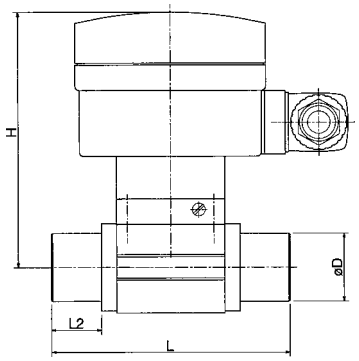
Dimensions MS and SS:



PVC, PVDF, Brass and stainless steel housing with male thread

PVC only available for DN6 and DN8, PVDF only available for DN8

ND [mm]	Thread	L [mm]	L2 [mm]	H [mm]
06	G ½"	90	14.00	134
08	G. NPT. R ½"	90	14.00	134
15	G ¾"	84	11.50	139
20	G 1"	94	13.50	137
25	G 1 ¼"	104	14.00	137
32	G 1 ½"	119	18.00	140
40	M 55 x 2	129	19.00	144
50	M64 x 2	148.5	20.00	151

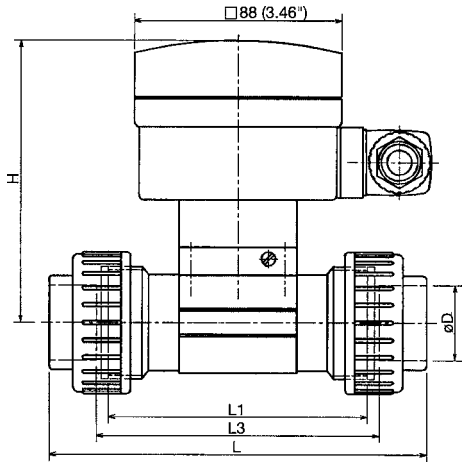


PP- and PVDF housing with weld-on ends ISO 10931 DIN 16962

ND [mm]	D [mm]	L [mm]	L2 [mm]	H [mm]
15	20	85	14	139
20	25	92	16	137
25	32	95	18	137
32	40	100	20	140
40	50	106	23	144
50	63	110	27	151

PVC housing with adhesive ends DIN 8063

ND [mm]	D [mm]	L [mm]	L2 [mm]	H [mm]
15	20	90	16.50	139
20	25	100	20.00	137
25	32	110	23.00	137
32	40	110	27.50	140
40	50	120	30.00	144
50	63	130	37.00	151



PVC housing with swivel nut and adhesion bushings; PP and PVDF housing with swivel nut and weld-on bushings

ND [mm]	D [mm]	L [mm]	L1 [mm]	L3 [mm]	H [mm]
08 [PVC only]	12	122	90	92	134
15	20	128	90	96	139
20	25	144	100	106	137
25	32	160	110	116	137
32	40	168	110	116	140
40	50	188	120	127	144
50	63	212	130	136	151

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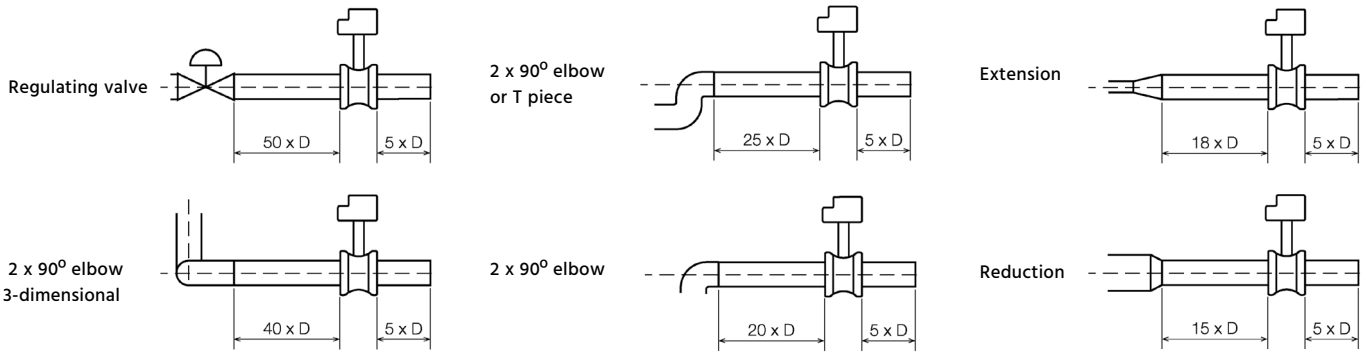
Inlet and Outlet sections:



Nominal Diameter	DN06-1/4"	DN06 - ½"	DN08 - ½"	DN15	DN20	DN25	DN32	DN40	DN50
brass fitting									
BSPP female thread	o	o	o	x	x	x	x	x	x
NPT female thread	o	o	o	x	x	x	x	x	x
BSPT female thread ISO7	o	o	o	x	x	x	x	x	x
BSPP male thread	x	x	x	x	x	x	x	x	x
NPT male thread	o	o	x	o	o	o	o	o	o
BSPT male thread ISO7	o	o	x	o	o	o	o	o	o
stainless steel fitting									
BSPP female thread	o	o	o	x	x	x	x	x	x
NPT female thread	o	o	o	x	x	x	x	x	x
BSPT female thread ISO7	o	o	o	x	x	x	x	x	x
BSPP male thread	x	x	x	x	x	x	x	x	x
NPT male thread	o	o	x	o	o	o	o	o	o
BSPT male thread ISO7	o	o	x	o	o	o	o	o	o
weld-on ends ENISO1127 / ISO4200	o	o	x[1)]	x	x	x	x	x	x
Tri-clamp for pipe ISO1127 / ISO4200	o	o	o	x	x	x	x	x	x
flange EN 1092-1	o	o	o	x	x	x	x	x	x
flange ANSI B16-5-1988	o	o	o	x	x	x	x	x	x
PVC fitting									
bushing DIN 8063	o	o	x	x	x	x	x	x	x
socket DIN 8063	o	o	o	x	x	x	x	x	x
BSPP mal thread	o	x	x	o	o	o	o	o	o
PP fitting									
bushing DIN 16962	o	o	o	x	x	x	x	x	x
socket DIN DIN 16962	o	o	o	x	x	x	x	x	x
PVDF fitting									
bushing ISO 10931	o	o	o	x	x	x	x	x	x
socket ISO 10931	o	o	o	x	x	x	x	x	x
male thread ISO 10931	o	o	x	o	o	o	o	o	o

1) with EPDM gasket o = not available, * = available in this combination

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