Flow Sensor
for continuous flow measurement

Type 8020

Advantages / Benefits

- **Easy System integration by Easy LINK provides low cost of ownership**
- **Fluid-contacting parts of PVDF/ceramic with FPM/ EPDM gaskets**
- **2-wire system with paddle-wheel and coil, no external power**
- **3-wire system with paddle-wheel and Hall sensor for small flow rates**
- **"Low power" version for connection to separate versions of 8025**
- **Adjustable frequency output**
- **4...20 mA output**
- **Connection to batch controller 8600**

Design

The paddle-wheel flow sensor type 8020 is specially designed for use in aggressive and solid-free liquids.

The sensor produces a frequency signal proportional to the flow which can easily be transmitted and processed.

A specially designed fitting system ensures simple installation of the devices into all pipes.

- For aggressive and solid-free liquids
- Paddlewheel-Hall-sensor, 1:30 measurement dynamic (max. 10 m/s)
- 4...20 mA output signal with transmitter module (type 8023)
- Adjustable frequency output signal with pulse divider module (type 8021)
- Direct connection to batch controller type 8600 mounted on valve
- Connection to separate versions of flow transmitter type 8025:
  • Panel version
  • Wall-mount version

Applications

Flow Measurement

Industrial waste water treatment

Water treatment and process technology

Cooling water monitoring

Swimming-pool

Batch-Control

Chemical dosing

Ideal system solutions for filling systems

bürkert
Easy Fluid Control Systems

Design

The flow sensor consists of a transducer and an open-cell paddle wheel.
When immersed in the flow, the rotating paddle-wheel produces a frequency modulated measuring signal proportional to the flow.

In a 2- or 3-wire system, the signal can be displayed or processed directly. The output signal is provided via a 4-pole cable plug according to DIN 43650.

In the versions with 4...20 mA/ adjustable frequency output, an additional IP65 housing is pluged on the sensor instead of the cable plug. The output signals are available on a terminal strip inside the enclosure via a PG 9 cable gland.

All parts in contact with fluid are in PVDF or ceramic enabling use in aggressive fluids.

Principle of operation

When liquid flows through the pipe, the paddle-wheel is set in rotation producing a measuring signal in the transducer (coil or Hall Sensor). The induced voltage is AC. The frequency and amplitude are proportional to the flow.

The version 8020 "low power" flow sensor can only be operated with a flow transmitter 8025 in panel or wall-mount version. It can measure flow as from 0.3 m/s (1.0 ft/s) flow velocity.

The flow sensor 8020 with coil requires no external power supply and measures flow as from 0.5 m/s (1.6 ft/s) flow velocity. This flow sensor can also be operated with a flow transmitter 8025 in panel or wall-mount version.

The flow sensor 8020 with Hall Sensor requires an external power of 12...30 VDC and measures flow as from 0.3 m/s (1.0 ft/s) flow velocity.

The flow transmitter 8020 with 4...20 mA output requires an external power of 12...24 VDC and measures flow as from 0.3 m/s (1.0 ft/s) flow velocity.

The flow sensor 8020 with adjustable frequency output requires an external power of 12...30 VDC and measures flow as from 0.3 m/s (1.0 ft/s) flow velocity.

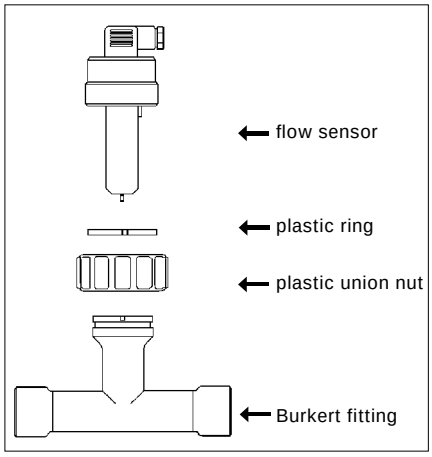
Installation

The recommended In- and Outflow straight pipe length should respect 10xD in and 3xD out.
According to pipe's design, necessary distances can be bigger or use a flow conditioner to obtain the best accuracy.
For more informations, please refer to EN ISO 5167-1.

The flow sensor can be installed in either horizontal or vertical pipes.

The suitable pipe size is selected using the diagram on the next page.
Pressure and temperature ratings must be respected according to the selected fitting material (see next page).

The flow sensor is not designed for gas flow measurement.



Examples of fitting selection

The suitable pipe size is selected using the diagram below.

Example 1:
Specification of nominal flow: 10 m³/h

Ideal flow velocity: 2...3 m/s

For these specifications, the diagram indicates a pipe size of DN 40.

Example 2:
Specification of nominal flow: 50 gpm

Ideal flow velocity: 8 fps

For these specifications, the diagram indicates a pipe size of 1 1/2".

Pressure-Temperature-Diagram for plastics

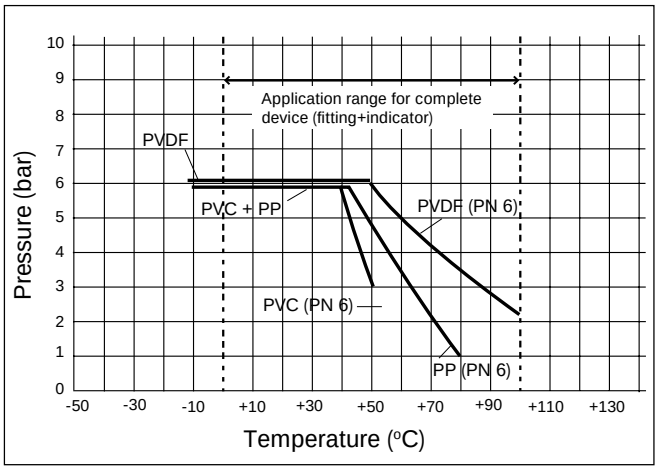
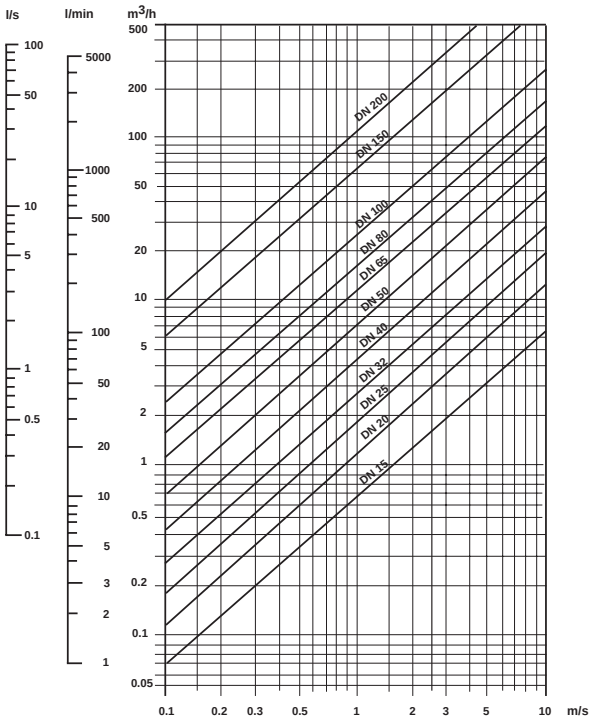


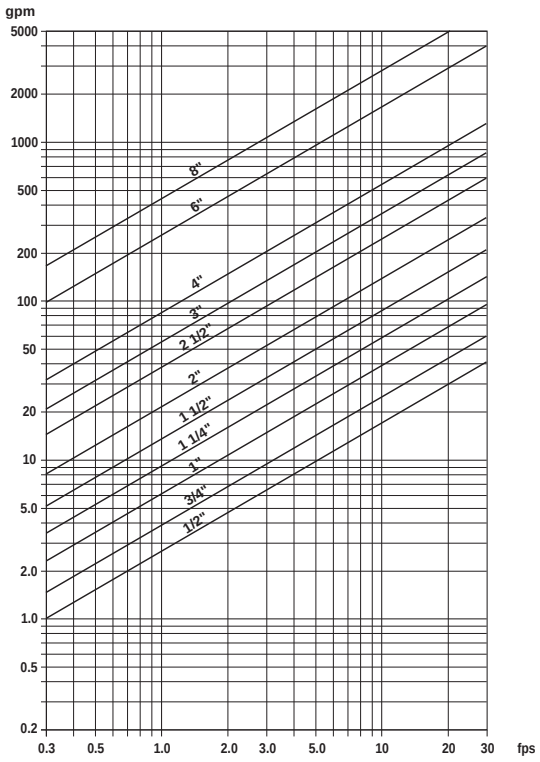
Diagram Flow-Pipe Size-Velocity

Flow



Flow velocity

Flow

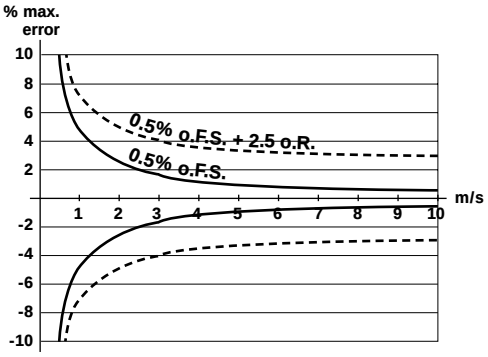


Flow velocity

Technical data

General Data

Pipe diameter	as from DN 15 (for more detailed information, please see chapter fittings)
Measuring range	0.3 m/s to 10 m/s (1.0 fps to 33 fps) as from 3 l/min (DN 15 pipe 0.3 m/s flow velocity) as from 0.9 gpm (1/2" pipe, 1.0 fps flow velocity)
Measuring error	1. With individual works calibration(on request): ≤ ±0.5% o.F.S. (at 10 m/s) * 2. With standard mean K-factor: ≤ ± (0.5% o.F.S. +2.5% o.R.) *
Linearity	≤ ±0.5% o.F.S. (at 10 m/s) *
Repeatability	0.4% o.R. *
Pressure class plastic and metal fitting	PN 6
Ambient temperature	0 to 60°C (32 to 140°F)
Storage temperature	0 to 60°C (32 to 140°F)
Enclosure	IP 65. (Relative humidity max. 80%)
Pulses/rotation	2
Sensor housing	PVDF
Paddle-wheel	PVDF
Axis and bearing	Ceramic
Housing	PE
Union nut	PC
O-rings	FPM/EPDM



Specific Data 8020 with Coil

Fluid temperature max.	PVC: 50°C (122°F); PP: 80°C (176°F); PVDF:100°C (212°F); Stainless steel and brass: 100°C (212°F)
Measuring range	0.5 to 10 m/s (1.6 to 32.8 ft/s)
Supply voltage	none
Output signal	AC: approx. 0...10 V, frequency: 0...200 Hz
Cable length	10 m (use shielded cable of max. 1.5 mm² wire cross section)

Specific Data 8020 with Hall Effect

Fluid temperature max.	PVC: 50°C (122°F); PP: 80°C (176°F); PVDF:80°C (176°F); Stainless steel and brass: 80°C (176°F)
Measuring range	0.3 to 10 m/s (1.0 to 32.8 ft/s)
Supply voltage	12...30 VDC
Output signal	transistor PNP, NPN open collector max. 100 mA; frequency: 0...200 Hz
Cable length	50 m (use shielded cable of max. 1.5 mm² wire cross section)

Specific Data 8020 with Hall Effect "low power"

Fluid temperature max.	PVC: 50°C (122°F); PP: 80°C (176°F); PVDF:80°C (176°F); Stainless steel and brass: 80°C (176°F)
Measuring range	0.3 to 10 m/s (1.0 to 32.8 ft/s)
Cable length	50 m (use shielded cable of max. 1.5 mm² wire cross section)

(Can only be connected to seperate versions of flow transmitter/indicator type 8025, 8023, 8021, SE34

Specific Data 8020 with 4...20 mA output (8023)

Associated flow sensor	coil and Hall low power version
Supply voltage	12...24 VDC
Output signal	4...20 mA
Load	max. 500Ω at 12 V max. 1000Ω at 24 V
Accuracy	≤ 2%
Material of additional housing	PA

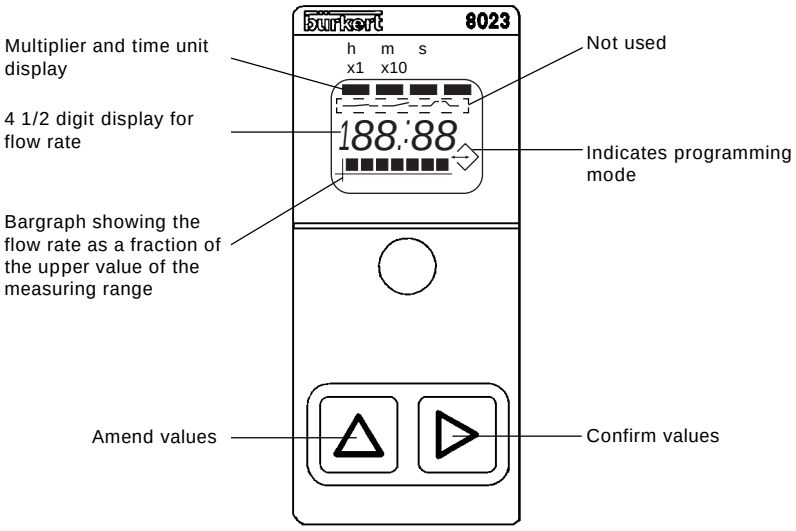
Specific Data 8020 with calibrated frequency output (8021)

Associated flow sensor	Hall sensor versions
Supply voltage	12...30 VDC
Output signal	transistor PNP, NPN open collector max. 100 mA
Accuracy	0,1%
Material of additional housing	PA

* Under reference conditions, i.e. measuring fluid = water, ambient and water temperature = 20 °C, applying the minimum inlet and outlet pipe straights, matched inside pipe dimensions
o.R. = of reading
o.F.S. = of full scale (10 m/s)

Operation and display

Type 8023, 4...20 mA output module



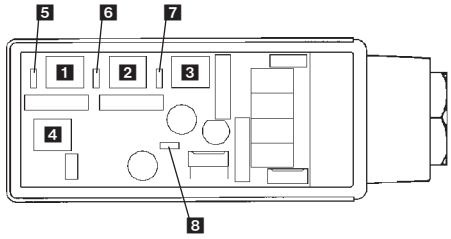
The operation is specified according to two levels:

▶ **Indication in operating mode**
- Flow (digits and bargraph)

▶ **Parameter definition**
- K-factor
- Time unit
- 4...20 mA measuring range

The device works without the control unit. The control unit enables only to perform parameter definition.

Type 8021 adjustable frequency output module



1, **2**, **3** rotary switches for factor K programming.

5, **6**, **7** jumpers for decimal position of factor K.

4 rotary switch for multiplicator D programming.

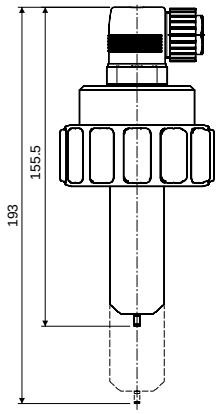
8 reset jumper.

The operation is specified according to the following level:

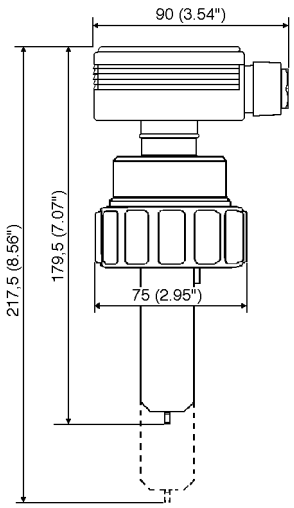
▶ **Parameter definition**
- K-factor
- Multiplicator D

Dimensions

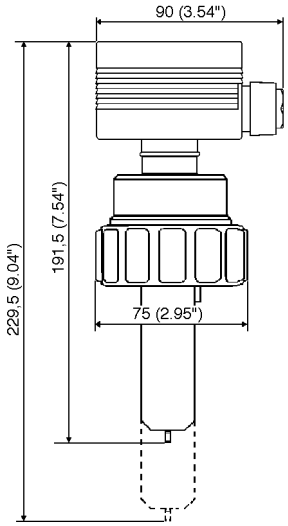
Type 8020 standard



Type 8020 with 4...20 mA or adjustable frequency output (8021)

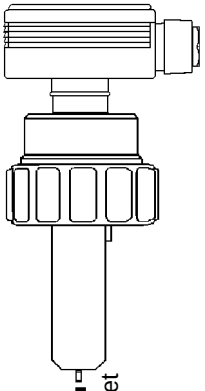


Type 8020 with 4...20 mA output including control unit (8023)



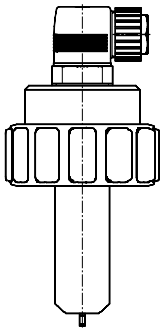
Connection to other Burkert devices

Type 8020 flow sensor with adjustable frequency output open collector NPN or PNP



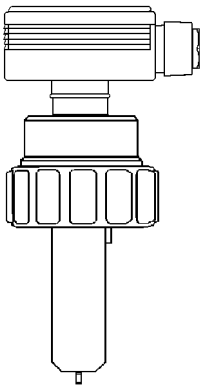
Via cable plug socket

Type 8020 flow sensor with frequency output:
- from coil
- open collector NPN or PNP

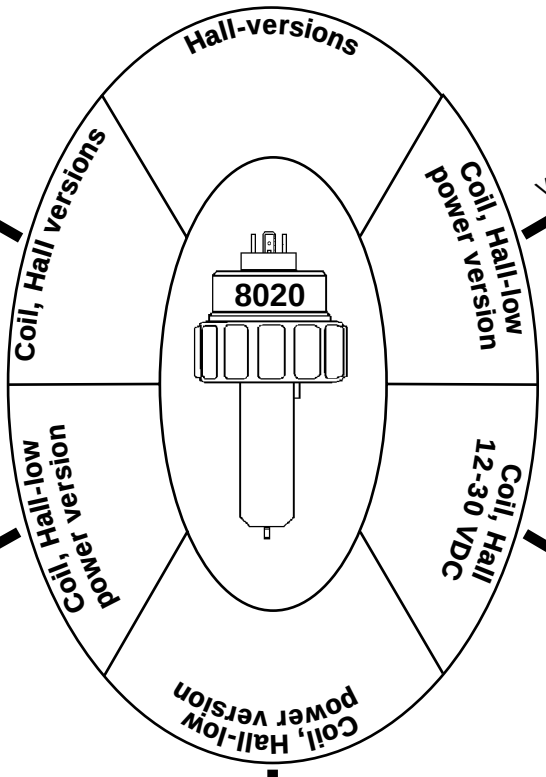


Via cable plug socket

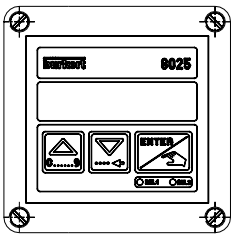
Type 8020 flow sensor with 4...20 mA current output



Via cable plug socket

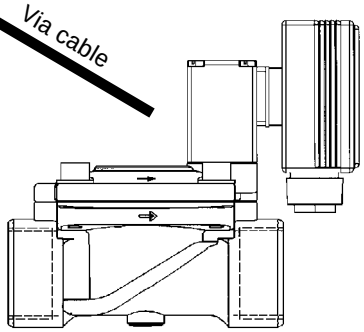


Via cable



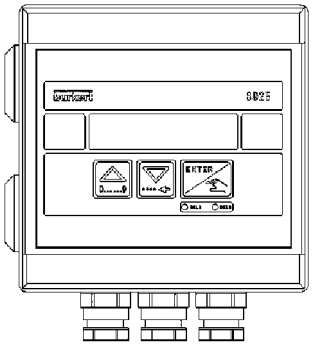
Type 8025 flow transmitter in panel version (see separate data sheet for more details)

Via cable



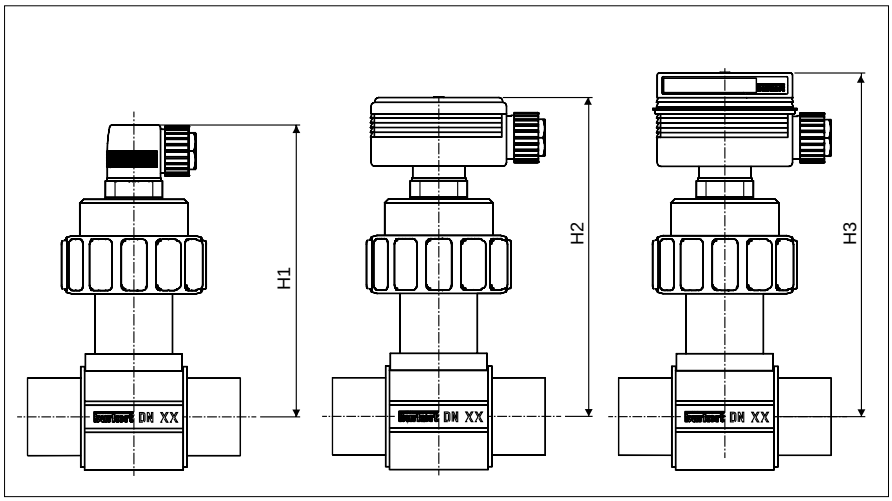
Type 8600 batch controller mounted on valve (see separate data sheet for more details)

Via cable



Type 8025 flow transmitter in wall-mount version (see separate data sheet for more details)

Dimensions [mm] - Fittings S020, DN 15 - 50

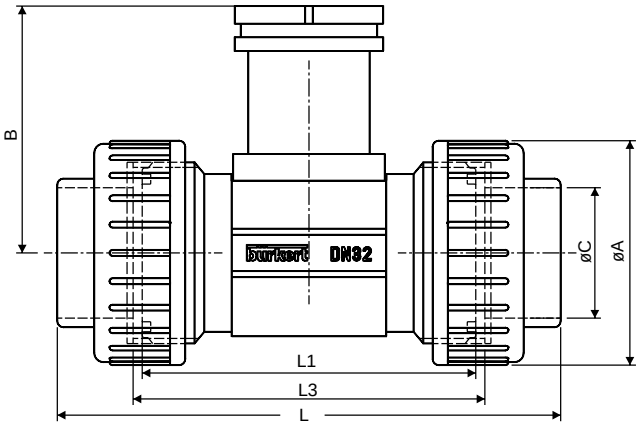


Variable Dimensions [mm]

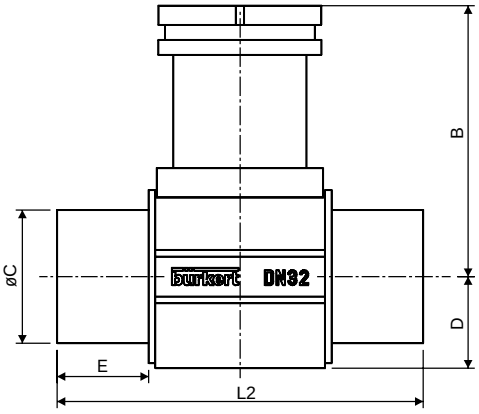
DN	H 1	H2	H3
15	159	173	186
20	157	171	184
25	157	171	184
32	163	177	190
40	164	178	191
50	170	184	197

Applicable for all fitting materials DN 15 ...50 sizes and process connections.

True union - PVC, PP, PVDF



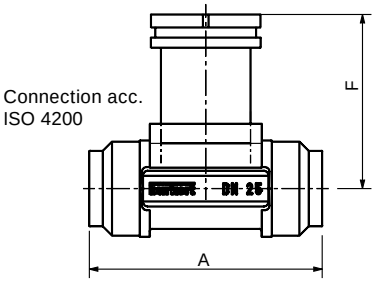
Solvent spigot - PVC, PP, PVDF



True union										Solvent spigot					
B	øA	L			øC			L1	L3	**DN**	D	L2		E	
		DIN	ANSI	JIS	(DIN)	(ANSI)*	(JIS)*					PVC	PP/PVDF	PVC	PP/PVDF
80.4	43	128	130.0	129	20	21.3	18.40	90	96	**15**	17.5	90	85	16.5	14
77.8	53	144	145.6	145	25	26.7	26.45	100	106	**20**	17.5	100	92	20.0	16
78.0	60	160	161.4	161	32	33.4	32.55	110	116	**25**	21.5	110	95	23.0	18
81.4	74	168	170.0	169	40	42.2	38.60	110	116	**32**	27.5	110	100	27.5	20
85.2	83	188	190.2	190	50	48.3	48.70	120	127	**40**	31.5	120	106	30.0	23
91.5	103	212	213.6	213	63	60.3	60.80	130	136	**50**	39.5	130	110	37.0	27

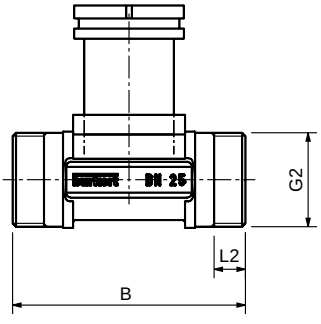
* only for PVC with true union

Weld ends - Stainless steel



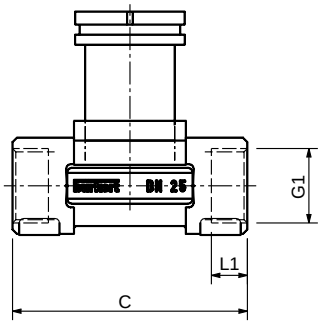
Material Stainless steel:
DIN 1.4404; BS 316L

Male threaded port - Stainless steel / Brass



Material Stainless steel:
DIN 1.4404; BS 316L

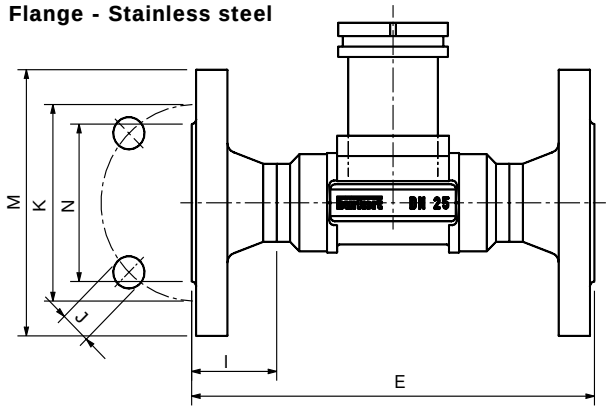
Female threaded port Stainless steel / Brass -



Material Stainless steel:
DIN 1.4404; BS 316L

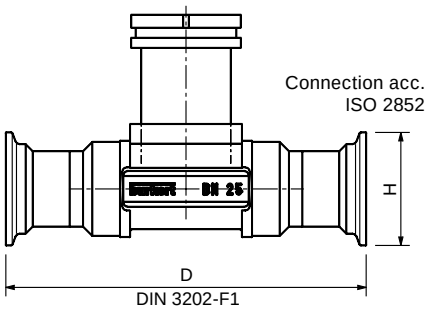
Dimensions [mm] - Fittings S020, DN 15 - 50

Flange - Stainless steel



Material:
DIN 1.4404; B.S. 316 L

Tri-Clamp



Material:
DIN 1.4404; B.S. 316 L

Variable dimensions [mm] for Weld ends, Male threaded port, Female threaded port, Flange, Tri-Clamp

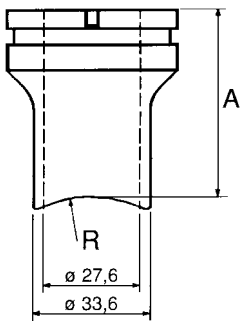
DN	Weld ends ø outside	Weld ends Wall-thickness	Length dimensions A	B	C	D	E (DIN) (ANSI)	E (JIS)	F	Thread G1	L1	G2	L2	Tri-Clamp H	Flange dimensions Norm*	I	J	K	M	N
										G 1/2	16.0				DIN	23.5	4x14.0	65.0	95	45.0
15	21.3	1.6	84	84	85	130	130	140	80.3	NPT 1/2	17.0	G3/4	11.5	34.0	ANSI	23.5	4x15.8	60.3	89	34.9
										Rc 1/2	15.0				JIS	23.5	4x15.0	70.0	95	51.0
										G 3/4	17.0				DIN	28.5	4x14.0	75.0	105	58.0
20	26.9	1.6	94	94	95	150	150	152	77.8	NPT 3/4	18.3	G 1	13.5	50.5	ANSI	28.5	4x15.8	69.8	99	42.9
										Rc 3/4	16.3				JIS	28.5	4x15.0	75.0	100	56.0
										G 1	23.5				DIN	28.5	4x14.0	85.0	115	68.0
25	33.7	2.0	104	104	105	160	160	165	78.0	NPT 1	18.0	G 1/14	14.0	50.5	ANSI	28.5	4x15.8	79.4	108	50.8
										Rc 1	18.0				JIS	28.5	4x19.0	90.0	125	67.0
										G 11/4	23.5				DIN	31.0	4x18.0	100.0	140	78.0
32	42.4	2.0	119	119	120	180	180	178	81.6	NPT 11/4	21.0	G 1/2	18.0	50.5	ANSI	31.0	4x15.8	88.9	117	63.5
										Rc	21.0				JIS	31.0	4x19.0	100.0	135	76.0
										G 11/2	23.5				DIN	36.0	4x18.0	110.0	150	88.0
40	48.3	2.0	129	129	130	200	200	190	85.4	NPT 11/2	20.0	M55x2	19.0	64.0	ANSI	36.0	4x15.8	98.4	127	73.0
										Rc 11/2	19.0				JIS	36.0	4x19.0	105.0	140	81.0
										G 2	27.5				DIN	41.0	4x18.0	125.0	165	102.0
50	60.3	2.6	149	149	150	230	230	216	91.5	NPT 2	24.0	M64x2	20.0	77.5	ANSI	41.0	4x19.0	120.6	152	92.1
										Rc 2	24.0				JIS	41.0	4x19.0	120.0	155	96.0

* Flange: DIN 2501/2633, length according to DIN 3201-F1;
ANSI B16-5-1988, length according to DIN 3201-F1
JIS 10K, length according to ANSI B16-10

Dimensions [mm] - Fittings DN 65 - 350

Weld-o-let fittings with radius - Stainless steel

Material: 1.4404 (DIN),
316L (B.S.)



Variable Dimensions [mm]

DN	A	R
65	54.52	36.65
80	53.07	44.45
100	50.71	57.15
125	48.24	70.65
150	45.73	84.15
200	41.01	109.55
250	73.64	136.55
350	63.94	177.80

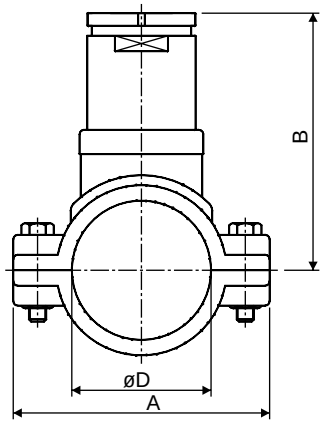
Note:
Short sensor version for: DN 65 - DN 200
Long sensor version for: DN 250 - DN 350

Dimensions [mm] - Fittings DN 65 - 400

Saddle - PP

Body material: PP/PVC
Seal material: EPDM

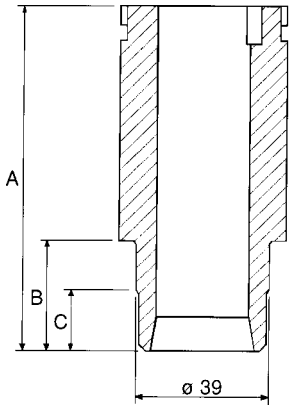
Note: These saddle fittings require the long sensor version of the flow indicator 8024 for all DN.



Variable Dimensions [mm]

DN	A	B	øD
50	116	111.1	63
65	129	110.0	75
80	144	113.9	90
100	166	118.7	110
110	181	115.5	125
125	196	121.5	140
150	216	131.5	160
200	290	174.0	225

Weld-o-let fittings - PE, PP, PVDF



Variable Dimensions [mm]

DN	A	PE		PP		PVDF	
		B	C	B	C	B	C
65	72.5	13	---	13	---	10.4	---
80	72.5	15.6	---	15.6	---	12.5	---
100	72.5	19	5	19	5	15.2	6
150	102	27.7	10	27.7	10	---	---
200	102	38.9	16	38.9	16	---	---
250	102	48.4	21	48.4	21	---	---
300	102	61.3	28	61.3	28	---	---
350	102	61.3	28	61.3	28	---	---
400	102	69.1	31,5	---	---	---	---

Note:
Short sensor version for: DN 65 - DN 100
Long sensor version for: DN 150 - DN 400

Ordering Data for Flow Sensor Type 8020

Flow sensor	Power supply	Gasket	Sensor	Cable entry	Item-No.
FLOW SENSOR 8020 STANDARD TYPES					
8020 with coil	none	FPM	Coil short	DIN 43650 PG9	419583P
8020 with coil	none	EPDM	Coil short	DIN 43650 PG9	419584Q
8020 with coil	none	FPM	Coil long	DIN 43650 PG9	419585R
8020 with coil	none	EPDM	Coil long	DIN 43650 PG9	419586J
8020 with Hall sensor	12...30 VDC	FPM	Hall short	DIN 43650 PG9	419587K
8020 with Hall sensor	12...30 VDC	EPDM	Hall short	DIN 43650 PG9	419588U
8020 with Hall sensor	12...30 VDC	FPM	Hall long	DIN 43650 PG9	419589V
8020 with Hall sensor	12...30 VDC	EPDM	Hall long	DIN 43650 PG9	419590S
8020 with Hall sensor, only connectable to 8025/8021/8023/SE34		FPM	Hall short	DIN 43650 PG9	419591P
8020 with Hall sensor, only connectable to 8025/8021/8023/SE34		EPDM	Hall short	DIN 43650 PG9	419592Q
8020 with Hall sensor, only connectable to 8025/8021/8023/SE34		FPM	Hall long	DIN 43650 PG9	419593R
8020 with Hall sensor, only connectable to 8025/8021/8023/SE34		EPDM	Hall long	DIN 43650 PG9	419594J
FLOW SENSOR 8020 WITH PULSE DIVIDER TYPE 8021					
8020 with Hall sensor and adjustable pulse output NPN & PNP	12-30VDC	FPM	Hall short	DIN 43650 PG9	419595K
8020 with Hall sensor and adjustable pulse output NPN & PNP	12-30VDC	EPDM	Hall short	DIN 43650 PG9	419596L
8020 with Hall sensor and adjustable pulse output NPN & PNP	12-30VDC	FPM	Hall long	DIN 43650 PG9	419597M
8020 with Hall sensor and configurable pulse output NPN & PNP	12-30VDC	EPDM	Hall long	DIN 43650 PG9	419598W
FLOW SENSOR 8020 WITH FLOW TRANSMITTER TYPE 8023					
8020 with coil and adjustable 4...20 mA output	12-24VDC	FPM	Coil short	DIN 43650 PG9	419603B
8020 with coil and adjustable 4...20 mA output	12-24VDC	EPDM	Coil short	DIN 43650 PG9	419604C
8020 with coil and adjustable 4...20 mA output	12-24VDC	FPM	Coil long	DIN 43650 PG9	419605D
8020 with coil and adjustable 4...20 mA output	12-24VDC	EPDM	Coil long	DIN 43650 PG9	419606E
8020 Hall sensor and adjustable 4...20 mA output	12-24VDC	FPM	Hall short	DIN 43650 PG9	419738H
8020 Hall sensor and adjustable 4...20 mA output	12-24VDC	EPDM	Hall short	DIN 43650 PG9	419739A
8020 Hall sensor and adjustable 4...20 mA output	12-24VDC	FPM	Hall long	DIN 43650 PG9	419740P
8020 Hall sensor and adjustable 4...20 mA output	12-24VDC	EPDM	Hall long	DIN 43650 PG9	419741C
FLOW TRANSMITTER TYPE 8023 FOR FLOW SENSOR TYPE 8020					
8023 with adjustable 4...20 mA output	12-24VDC	none	none	1 X PG9	130428V
1077-3 control unit for flow transmitter type 8023	12-24VDC	none	none	none	130446X
PULSE DIVIDER TYPE 8021 FOR FLOW SENSOR TYPE 8020					
8021 with adjustable pulse output	12-30VDC	none	none	1 X PG9	418895P

Ordering Data of Stainless Steel Fittings Type S020

Diameters	Materials	Item-No.
SS - Female G-Threaded Ports		
DN 15	SS, FPM	428 736 Y
DN 20	SS, FPM	428 737 Z
DN 25	SS, FPM	428 738 A
DN 32	SS, FPM	428 739 B
DN 40	SS, FPM	428 740 Q
DN 50	SS, FPM	428 741 D
SS - Female NPT-Threaded Ports		
DN 15	SS, FPM	428 742 E
DN 20	SS, FPM	428 743 F
DN 25	SS, FPM	428 744 G
DN 32	SS, FPM	428 745 H
DN 40	SS, FPM	428 746 A
DN 50	SS, FPM	428 747 B
SS - Female ISO7 (JIS) Threaded Ports		
DN 15	SS, FPM	428 748 L
DN 20	SS, FPM	428 749 M
DN 25	SS, FPM	428 750 J
DN 32	SS, FPM	428 751 F
DN 40	SS, FPM	428 752 G
DN 50	SS, FPM	428 753 H
SS- Male G Threaded Ports		
DN 15	SS, FPM	428 754 A
DN 20	SS, FPM	428 755 B
DN 25	SS, FPM	428 756 C
DN 32	SS, FPM	428 757 D
DN 40	SS, FPM	428 758 N
DN 50	SS, FPM	428 759 P
SS - Weld Ends		
DN 15	SS, FPM	428 760 L
DN 20	SS, FPM	428 761 H
DN 25	SS, FPM	428 762 A
DN 32	SS, FPM	428 763 B
DN 40	SS, FPM	428 764 C
DN 50	SS, FPM	428 765 D
SS - Tri-Clamp (ISO 2852)		
DN 15	SS, FPM	428 766 E
DN 20	SS, FPM	428 767 F
DN 25	SS, FPM	428 768 Q
DN 32	SS, FPM	428 769 R
DN 40	SS, FPM	428 770 N
DN 50	SS, FPM	428 771 B
SS - DIN Flanges (DIN 2501)		
DN 15	SS, FPM	428 772 C
DN 20	SS, FPM	428 773 D
DN 25	SS, FPM	428 774 E
DN 32	SS, FPM	428 775 F
DN 40	SS, FPM	428 776 G
DN 50	SS, FPM	428 777 H
SS - Flanges (JIS 10K)		
DN 15	SS, FPM	431 053 J
DN 20	SS, FPM	431 054 K
DN 25	SS, FPM	431 055 L
DN 32	SS, FPM	431 056 M
DN 40	SS, FPM	431 057 N
DN 50	SS, FPM	431 058 X

Diameters	Materials	Item-No.
SS - ANSI Flanges (ANSI B16-5-1988)		
DN 15	SS, FPM	428 778 J
DN 20	SS, FPM	428 779 K
DN 25	SS, FPM	428 780 H
DN 32	SS, FPM	428 781 W
DN 40	SS, FPM	428 782 X
DN 50	SS, FPM	428 783 Y
SS - Weld-o-let		
DN 65	SS	418 112 M
DN 80	SS	418 113 N
DN 100	SS	418 114 P
DN 125	SS	418 115 Q
DN 150	SS	418 116 R
DN 200	SS	418 117 J
DN 250	SS	418 756 A
DN 300	SS	420 070 G
DN 350	SS	416 637 R

Ordering Data of Brass Fittings Type S020

Diameters	Materials	Item-No.
Brass - Female G-Threaded Ports		
DN 15	Brass, FPM	428 712 Y
DN 20	Brass, FPM	428 713 Z
DN 25	Brass, FPM	428 714 S
DN 32	Brass, FPM	428 715 T
DN 40	Brass, FPM	428 716 U
DN 50	Brass, FPM	428 717 V
Brass - Female NPT-Threaded Ports		
DN 15	Brass, FPM	428 718 E
DN 20	Brass, FPM	428 719 F
DN 25	Brass, FPM	428 720 C
DN 32	Brass, FPM	428 721 Z
DN 40	Brass, FPM	428 722 S
DN 50	Brass, FPM	428 723 T
Brass - Female ISO7 (JIS) Threaded Ports		
DN 15	Brass, FPM	428 724 U
DN 20	Brass, FPM	428 725 V
DN 25	Brass, FPM	428 726 W
DN 32	Brass, FPM	428 727 X
DN 40	Brass, FPM	428 728 G
DN 50	Brass, FPM	428 729 H
Brass - Male G/metric Threaded Ports		
DN 15	Brass, FPM	428 730 E
DN 20	Brass, FPM	428 731 T
DN 25	Brass, FPM	428 732 U
DN 32	Brass, FPM	428 733 V
DN 40	Brass, FPM	428 734 W
DN 50	Brass, FPM	428 735 X

Ordering Data of Plastic Fittings Type S020

Diameters	Materials	Item-No.
PVC - True union ISO		
DN 15	PVC, FPM	428 670 J
DN 20	PVC, FPM	428 671 F
DN 25	PVC, FPM	428 672 G
DN 32	PVC, FPM	428 673 H
DN 40	PVC, FPM	428 674 A
DN 50	PVC, FPM	428 675 B
PVC - True union ASTM		
1/2"	PVC, FPM	428 682 T
3/4"	PVC, FPM	428 683 U
1"	PVC, FPM	428 684 V
1" 1/4"	PVC, FPM	428 685 W
1" 3/4"	PVC, FPM	428 686 X
2"	PVC, FPM	428 687 Y
PVC - True union JIS		
DN 15	PVC, FPM	429 078 H
DN 20	PVC, FPM	429 079 A
DN 25	PVC, FPM	429 080 Y
DN 32	PVC, FPM	429 081 M
DN 40	PVC, FPM	429 082 N
DN 50	PVC, FPM	429 083 P
PVC - Solvent Spigot		
DN 15	PVC, FPM	428 676 C
DN 20	PVC, FPM	428 677 D
DN 25	PVC, FPM	428 678 N
DN 32	PVC, FPM	428 679 P
DN 40	PVC, FPM	428 680 D
DN 50	PVC, FPM	428 681 S
PE - Weld-o-let		
DN 65	PE	418 642 G
DN 80	PE	418 643 H
DN 100	PE	418 644 A
DN 150	PE	418 645 B
DN 200	PE	418 646 C
DN 250	PE	418 647 D
DN 300	PE	418 648 N
DN 350	PE	418 649 P
DN 400	PE	418 598 V

Diameters	Materials	Item-No.
PP - True Union with Threaded Port		
DN 15	PP, FPM	428 688 H
DN 20	PP, FPM	428 689 A
DN 25	PP, FPM	428 690 F
DN 32	PP, FPM	428 691 U
DN 40	PP, FPM	428 692 V
DN 50	PP, FPM	428 693 W
PP - Weld Ends		
DN 15	PP, FPM	428 694 X
DN 20	PP, FPM	428 695 Y
DN 25	PP, FPM	428 696 Z
DN 32	PP, FPM	428 697 S
DN 40	PP, FPM	428 698 B
DN 50	PP, FPM	428 699 C
PP - Weld-o-let		
DN 65	PP	418 650 L
DN 80	PP	418 651 H
DN 100	PP	418 652 A
DN 150	PP	418 653 B
DN 200	PP	418 654 C
DN 250	PP	418 655 D
DN 300	PP	418 656 E
DN 350	PP	418 657 F
PP - Saddle		
DN 50	PP, PVC, FPM	425 138 N
DN 65	PP, PVC, FPM	425 139 P
DN 80	PP, PVC, FPM	425 140 U
DN 100	PP, PVC, FPM	425 141 R
DN 110	PP, PVC, FPM	425 142 J
DN 125	PP, PVC, FPM	425 143 K
DN 150	PP, PVC, FPM	425 144 L
DN 200	PP, PVC, FPM	425 416 D
PVDF - True Union with Threaded Port		
DN 15	PVDF, FPM	428 700 R
DN 20	PVDF, FPM	428 701 E
DN 25	PVDF, FPM	428 702 F
DN 32	PVDF, FPM	428 703 G
DN 40	PVDF, FPM	428 704 H
DN 50	PVDF, FPM	428 705 A
PVDF - Weld Ends		
DN 15	PVDF, FPM	428 706 B
DN 20	PVDF, FPM	428 707 C
DN 25	PVDF, FPM	428 708 M
DN 32	PVDF, FPM	428 709 N
DN 40	PVDF, FPM	428 710 A
DN 50	PVDF, FPM	428 711 X
PVDF - Weld-o-let		
DN 65	PVDF	418 658 Q
DN 80	PVDF	418 659 R
DN 100	PVDF	418 660 N