Electromagnetic flow sensor with hygienic process connections

- For connection to a Type SE58 transmitter (with or without display, in compact or remote variant) for flow measurement
- Hygenic variant, 3 A certification
- For food, beverage or pharmaceutical applications
- Flow measurement 0.2...approx. 4.500 l/min for DN 03...DN 100

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

Type SE58 ▸
L variant of the transmitter for electromagnetic inductive flow sensors

Type SE58 ▸
M variant of the transmitter for electromagnetic-inductive flow sensors

Type SE58 ▸
S variant of the transmitter for electromagnetic-inductive flow sensors

Type description

The electromagnetic flow sensor Type S056 (compact or remote variant) is suitable for applications with low flow rates and liquids with minimum conductivity.

Combining it with the corresponding transmitter Type SE58 S (required minimum conductivity: 20 µS/cm) or Type SE58 M or Type SE58 L transmitters (required minimum conductivity: 5 µS/cm) results in a flowmeter with varying performance, functions, materials, and approvals, suitable for specific applications as per the respective requirements.

Compact devices are built with Type SE58 S, while with Type SE58 M or Type SE58 L, both compact devices and remote variants are available, where the transmitter and sensor are connected with 2 cables up to a maximum distance. Standard process connections for Type S056 are available as clamp and threaded (dairy thread) connections.

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1. General technical data

Note:
Empty pipe functionality is not available for sensors with connections of DN 03...DN 20.

The electromagnetic flow sensor Type S056 in a compact or remote variant is intended for use with transmitter Type SE58, which is available in three variants L, M or S.

SE58 L or SE58 M	SE58 S
	

Further information can be found in the data sheet of the transmitter, see **data sheet Type SE58** ▶.

Product properties	
Material	
Non-wetted parts	
Sensor housing	Stainless steel 304/1.4301
Junction box	Only for remote sensor: stainless steel 304 (1.4301) polished
Wetted parts	
Clamp	Stainless steel 316L
Lining	PTFE (conform to FDA)
Electrode	Stainless steel 316L
Seal	FKM (conform to FDA), EPDM (on request, conform to FDA)
Pipe diameter	DN 03...DN 100
Dimensions	Further information can be found in chapter "4. Dimensions" on page 6.
Measurement principle	Electromagnetic induction Further information can be found in chapter "6.1. Measurement principle" on page 11.
Measuring range	0...10 l/h to 0...280 m^3/h Further information can be found in chapter "7.4. Ordering chart" on page 13.
Performance data	
At reference conditions and according to internal test procedures: • At room temperature • Constant flow rate during the test, liquid speed > 1 m/s • Pressure: > 30 Kpa • Flow condition: observed inlet and outlet conditions • Zero point stability: ± 0.005 %	
Measurement deviation	If used with Type SE58 transmitter: • in compact or remote L variant: ≤ ± 0.2 % of the measured value for flow velocity > 0.5 m/s • in compact or remote M variant: ≤ ± 0.8 % of the measured value for flow velocity > 0.5 m/s • in compact S variant: ≤ ± 0.5 % of the measured value for flow velocity > 0.5 m/s See **data sheet Type SE58** ▶
Repeatability	If used with Type SE58 transmitter: • in compact or remote L variant: ≤ ± 0.1 % of the measured value for flow velocity > 0.5 m/s • in compact or remote M variant: ≤ ± 0.4 % of the measured value for flow velocity > 0.5 m/s • in compact S variant: ≤ ± 0.25 % of the measured value for flow velocity > 0.5 m/s See **data sheet Type SE58** ▶
Vacuum resistance	200 mbar (2.9 PSI) absolute at 100 °C (212 °F)

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Medium data	
Fluid temperature	If used with transmitter Type SE58: • in compact variant: - 20...+ 110 °C (- 4...+ 230 °F) (130 °C (+ 266 °F) allowed for 60 min for steam/hot water cleaning) • in remote variant: - 20...+ 130 °C (- 4...+ 266 °F)
Fluid pressure	PN 16
Minimum conductivity	5 µS/cm (or 20 µS/cm with demineralised water)
Product connections	
Pipe connection	DIN 11851, clamp ISO 2852 or clamp BS 4825 (SMS 1146 (from DN 10) on request)
Electrical connection	2 cable glands PG9 (for remote variant of the sensor)
Approvals and conformities	
Directives	
CE directive	Further information on the CE directive can be found in chapter "2.3. Standards" on page 5.
Pressure equipment directive	The device is subject to the requirements of the Pressure Equipment Directive 2014/68/EU. Category II device for group 1 and 2 fluids under the following conditions: • maximum allowable pressure (PS) ≤ 40 bar • minimum/maximum temperature (TS): - 10/+ 130 °C • within the following limits for liquids of group 2: – PN 40 for DN 40...DN 250 • within the following limits for liquids of group 1 with a vapour pressure at the maximum allowable temperature not exceeding 0.5 bar (g): for diameters above DN 25 and PS x DN > 2000
Foods and beverages/Hygiene	• 3-A (28-06) Sanitary Standards Inc. • FDA declaration of conformity • EC 1935/2004 declaration
Environment and installation	
Ambient temperature	According to the used version of SE58 transmitter and its material Detailed information can be found in the data sheet of the transmitter, see **data sheet Type SE58** ▶.
Relative air humidity	≤ 90 %, without condensation
Height above sea level	Max. 2000 m
Operating condition	Continuous
Equipment mobility	Fixed
Application range	Indoor and outdoor Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions.
Degree of protection according to IEC/EN 60529	If use with SE58 transmitter: • in compact L and M variant: IP65, IP67 (IP68 option) or IP65 only (depending on the housing material) • in compact S variant: IP65, IP67 (IP68 optional) • in remote L and M variant: IP68 Detailed information can be found in the data sheet of the transmitter, see **data sheet Type SE58** ▶.
Installation category	Category II according to UL/EN 61010-1
Pollution degree	Degree 2 according to UL/EN 61010-1

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2. Approvals and conformities

2.1. General notes

- The approvals and conformities listed below must be stated when making enquiries. This is the only way to ensure that the product complies with all required specifications.
- Not all available variants of the device can be supplied with the below mentioned approvals or conformities.

2.2. Conformity

In accordance with the Declaration of Conformity, the product is compliant with the EU Directives.

2.3. Standards

The applied standards which are used to demonstrate compliance with the EU Directives are listed in the EU-Type Examination Certificate and/or the EU Declaration of Conformity.

2.4. Foods and beverages/Hygiene

Approval	Description
	3-A Sanitary Standards Inc. The products comply with 3-A Sanitary Standards Inc (3-A SSI) as per certificate. Certificate authorization number: 1178

Conformity	Description
FDA	**FDA – Code of Federal Regulations** The devices are compliant in their composition with the Code of Federal Regulations published by the FDA (Food and Drug Administration, USA) according to the manufacturer's declaration.
	EC Regulation 1935/2004 of the European Parliament and of the Council All wetted materials are compliant with EC Regulation 1935/2004 according to the manufacturer's declaration.

3. Materials

3.1. Bürkert resistApp

Bürkert resistApp – Chemical resistance chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start chemical resistance check

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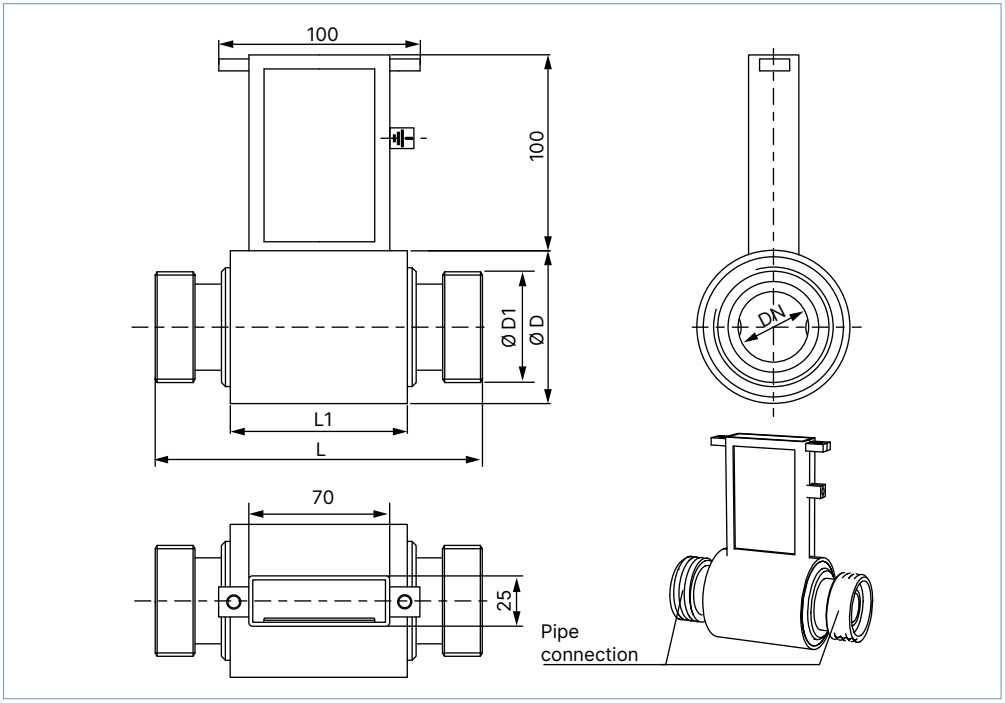
4. Dimensions

4.1. Compact variant

Pipe connection according to DIN 11851

Note:

- Further information on the dimensions of the Type SE58 transmitter can be found in **data sheet Type SE58** ▶.
- Dimensions in mm, unless otherwise stated



DN	Pipe connection	L	L1	Ø D	Ø D1
03	DN 10	128	77	76	RD28 x 1/8
06					RD28 x 1/8
10					RD28 x 1/8
15	DN 15				RD34 x 1/8
20	DN 20				RD44 x 1/6
25	DN 25	180	100		RD52 x 1/6
32	DN 32			89	RD58 x 1/6
40	DN 40				RD65 x 1/6
50	DN 50			114	RD78 x 1/6
65	DN 65			140	RD95 x 1/6
80	DN 80	200			RD110 x 1/4
100	DN 100			168	RD130 x 1/4

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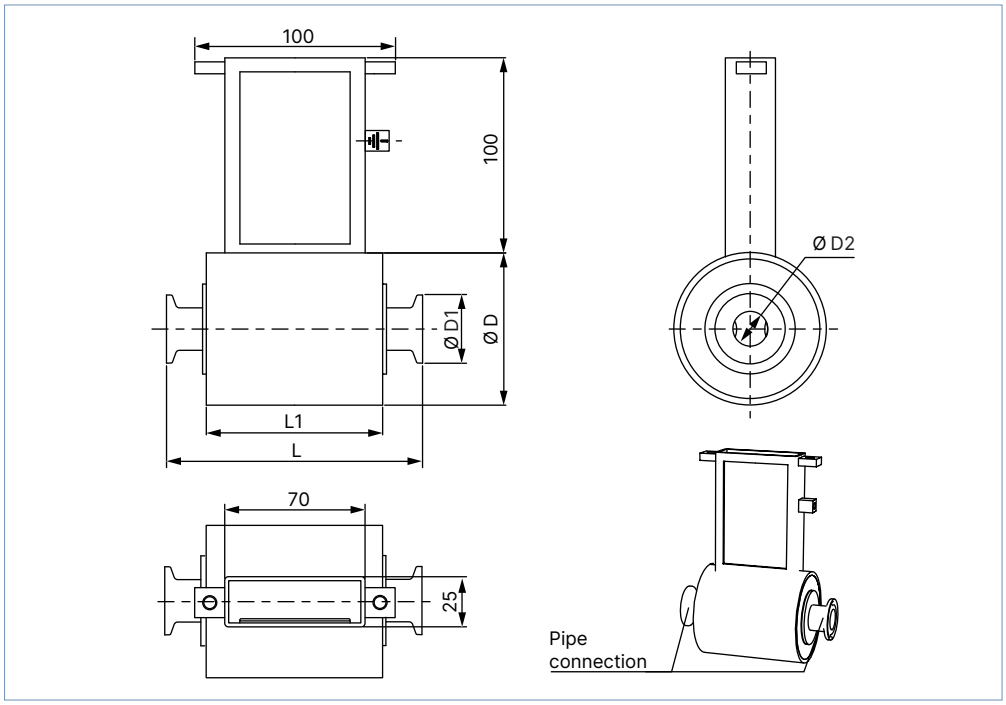
Pipe connection according to clamp ISO 2852 or BS 4825

Note:

- Further information on the dimensions of the Type SE58 transmitter can be found in **data sheet Type SE58** ▶.
- Dimensions in mm, unless otherwise stated



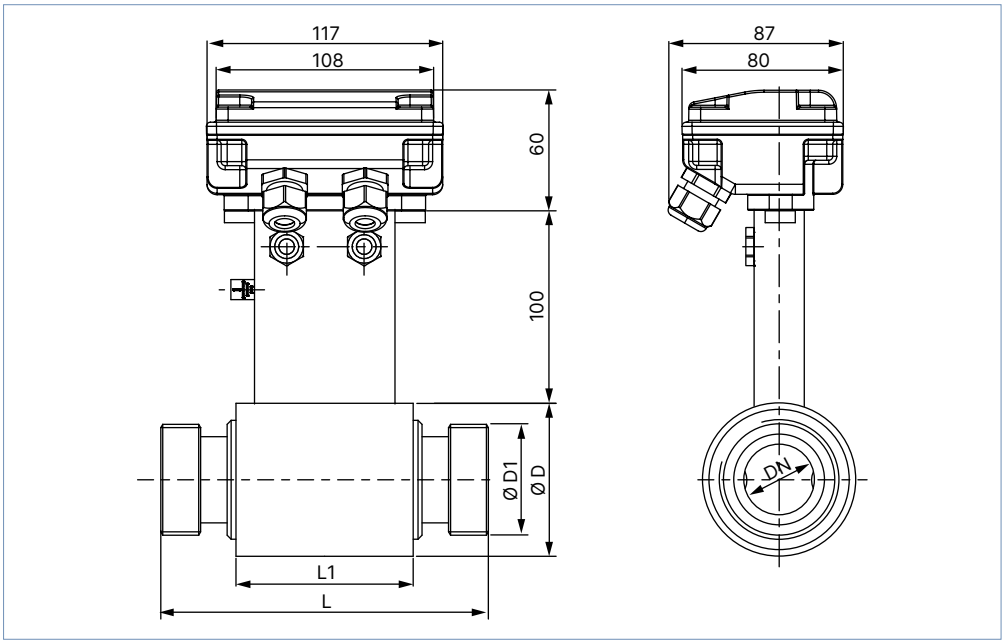
DN	Standard	L	L1	ØD	ØD1	ØD2
03	Clamp ISO 2852	128	77	76	34	12.7
	Clamp BS 4825				25.4	9.5
06	Clamp ISO 2852				34	12.7
	Clamp BS 4825				25.4	9.5
10	Clamp ISO 2852				34	12.7
	Clamp BS 4825				25.4	9.5
15	Clamp ISO 2852				34	17.2
	Clamp BS 4825				25.4	15.85
20	Clamp ISO 2852				34	21.3
	Clamp BS 4825				50.5	22.2
25	Clamp ISO 2852	180	100		50.5	22.6
	Clamp BS 4825				50.5	22.2
40	Clamp ISO 2852			89	50.5	35.6
	Clamp BS 4825				50.5	34.9
50	Clamp ISO 2852			114	64	48.6
	Clamp BS 4825				64	47.6
65	Clamp ISO 2852			140	77.5	60.3
	Clamp BS 4825				77.5	60.3
80	Clamp ISO 2852	200			91	72.9
	Clamp BS 4825				91	72.9
100	Clamp ISO 2852			180	119	97.6
	Clamp BS 4825				119	97.6

4.2. Remote variant with junction box

Pipe connection according to DIN 11851

Note:

- Further information on the dimensions of the Type SE58 transmitter can be found in **data sheet Type SE58** ▶.
- Dimensions in mm, unless otherwise stated



DN	Pipe connection	L	L1	Ø D	Ø D1
03	DN 10	128	77	76	RD28 x 1/8
06					RD28 x 1/8
10					RD28 x 1/8
15	DN 15				RD34 x 1/8
20	DN 20				RD44 x 1/6
25	DN 25	180	100		RD52 x 1/6
32	DN 32			89	RD58 x 1/6
40	DN 40				RD65 x 1/6
50	DN 50			114	RD78 x 1/6
65	DN 65			140	RD95 x 1/6
80	DN 80	200			RD110 x 1/4
100	DN 100			168	RD130 x 1/4

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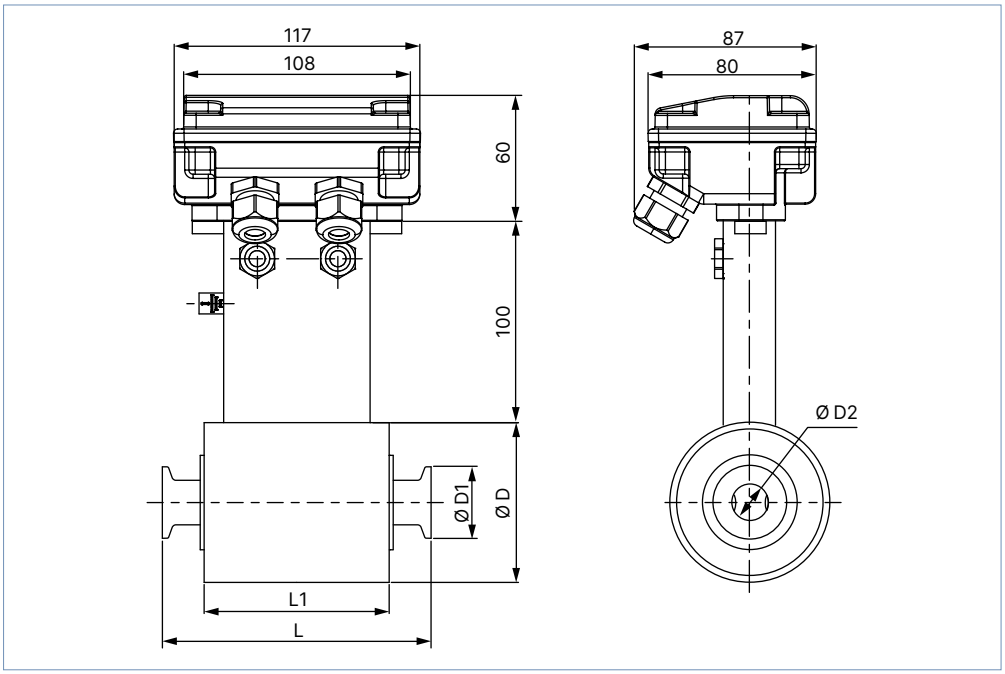
Pipe connection according to clamp ISO 2852 or BS 4825

Note:

- Further information on the dimensions of the Type SE58 transmitter can be found in **data sheet Type SE58** ▶.
- Dimensions in mm, unless otherwise stated



DN	Standard	L	L1	ØD	ØD1	ØD2
03	Clamp ISO 2852	128	77	76	34	12.7
	Clamp BS 4825				25.4	9.5
06	Clamp ISO 2852				34	12.7
	Clamp BS 4825				25.4	9.5
10	Clamp ISO 2852				34	12.7
	Clamp BS 4825				25.4	9.5
15	Clamp ISO 2852				34	17.2
	Clamp BS 4825				25.4	15.85
20	Clamp ISO 2852				34	21.3
	Clamp BS 4825				50.5	22.2
25	Clamp ISO 2852	180	100		50.5	22.6
	Clamp BS 4825				50.5	22.2
40	Clamp ISO 2852			89	50.5	35.6
	Clamp BS 4825				50.5	34.9
50	Clamp ISO 2852			114	64	48.6
	Clamp BS 4825				64	47.6
65	Clamp ISO 2852			140	77.5	60.3
	Clamp BS 4825				77.5	60.3
80	Clamp ISO 2852	200			91	72.9
	Clamp BS 4825				91	72.9
100	Clamp ISO 2852			180	119	97.6
	Clamp BS 4825				119	97.6

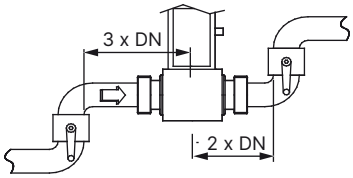
5. Product installation

5.1. Installation notes

Flow measurement

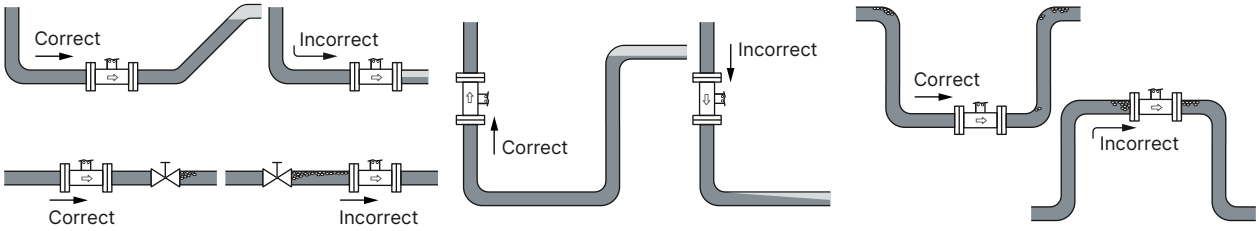
Note:
The device is not suitable for use in gaseous media and steam.

Minimum straight distances upstream and downstream of the sensor must be observed.



The device can be installed in either horizontal or vertical pipes, but following additional conditions should be respected:

- The pipe always must be filled with fluid at all times near the device, when it is in operation.
- Mount the sensor in the indicated positions shown below to obtain an accurate flow measurement.



The suitable pipe size is selected using the diagram in the chapter "5.2. Selection of the nominal diameter" on page 11.

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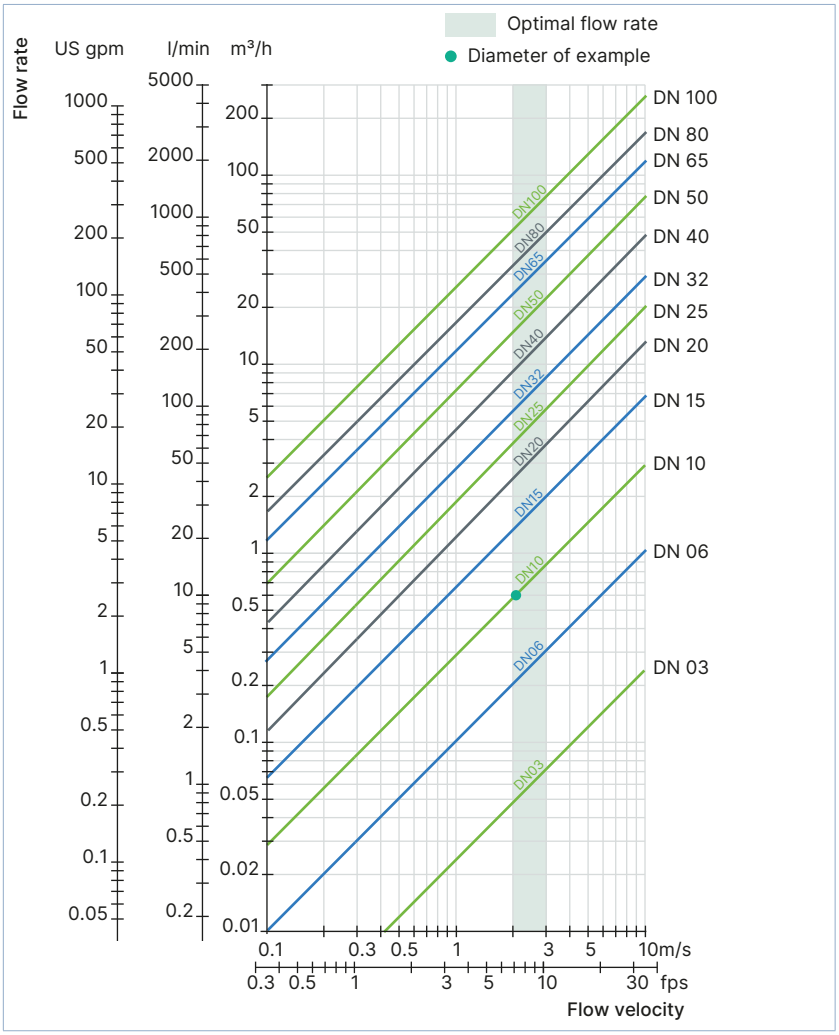
5.2. Selection of the nominal diameter

The following graph is used to determine the appropriate DN of the pipe and fitting for the application, according to the fluid velocity and the flow rate. On the chart, the intersection of flow velocity and flow rate gives the appropriate diameter.

Example:

- Nominal flow: 10 l/min
- Optimal flow velocity: 2...3 m/s

Result: select a pipe size of DN 10



6. Product operation

6.1. Measurement principle

Faraday's law serves as the physical basis for magnetic flow measurement.
Magnetic coils are arranged around the pipeline to generate a magnetic field. Conductive liquids flowing through the magnetic field induce a voltage at two opposite metallic electrodes in contact with the medium. These electrodes are used to measure the induced electrical alternating voltage.
The signal of sensor Type S056 must be amplified and processed by transmitter Type SE58.

Detailed information on the dimensions of the SE58 transmitter can be found in **data sheet Type SE58 ▶**.

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7. Ordering information

7.1. Bürkert eShop

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7.2. Recommendation regarding product selection

A complete flowmeter consists of a Type S056 (compact or remote variant) and a Type SE58 transmitter (compact or remote variant).

See **data sheet Type SE58** ▶ for more information.

Two different components must be ordered to obtain a complete device. The following information is required:

- **Article no.** of the sensor **Type S056** (see "7.4. Ordering chart" on page 13)
- **Article no.** of the transmitter **Type SE58** (see **data sheet Type SE58** ▶ for more information)

7.3. Bürkert product filter

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7.4. Ordering chart

DN	Flow rate range		Pipe connection	Material				Article no.
[mm]	Min. 0...0.4 m/s	Max. 0...10 m/s		Housing	Electrode [1.)]	Seal	Lining	
Sensor Type S056, compact variant								
03	0...0.01 m³/h	0...0.25 m³/h	DIN 11851	Stainless steel 304	Stainless steel 316L	FKM	PTFE	555732
			Clamp ISO 2852					554004
			Clamp BS 4825					559786
06	0...0.04 m³/h	0...1 m³/h	DIN 11851					559430
			Clamp ISO 2852					559431
			Clamp BS 4825					553325
10	0...0.12 m³/h	0...3 m³/h	DIN 11851					559432
			Clamp ISO 2852					554904
			Clamp BS 4825					554350
15	0...0.24 m³/h	0...6 m³/h	DIN 11851					553527
			Clamp ISO 2852					553555
			Clamp BS 4825					553533
20	0...0.50 m³/h	0...12.5 m³/h	DIN 11851					553528
			Clamp ISO 2852					559433
			Clamp BS 4825					553534
25	0...0.72 m³/h	0...18 m³/h	DIN 11851					553486
			Clamp ISO 2852					554151
			Clamp BS 4825					553535
32	0...1.16 m³/h	0...29 m³/h	DIN 11851					553529
40	0...1.80 m³/h	0...45 m³/h	DIN 11851					553530
			Clamp ISO 2852					553741
			Clamp BS 4825					553536
50	0...2.88 m³/h	0...72 m³/h	DIN 11851					553531
			Clamp ISO 2852					555120
			Clamp BS 4825					553537
65	0...4.80 m³/h	0...120 m³/h	DIN 11851					553532
			Clamp ISO 2852					554116
			Clamp BS 4825					553538
80	0...7.20 m³/h	0...180 m³/h	DIN 11851					555089
			Clamp ISO 2852					559434
			Clamp BS 4825					559791
100	0...11.20 m³/h	0...280 m³/h	DIN 11851					On request
			Clamp ISO 2852					On request
			Clamp BS 4825					On request

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DN	Flow rate range		Pipe connection	Material				Article no.
[mm]	Min. 0...0.4 m/s	Max. 0...10 m/s		Housing	Electrode 1.)	Seal	Lining	
Sensor Type S056, remote variant with junction box in stainless steel 304 (1.4301) polished and 10 m electrodes and coils cables (included)								
03	0...0.01 m³/h	0...0.25 m³/h	DIN 11851	Stainless steel 304	Stainless steel 316L	FKM	PTFE	551506
			Clamp ISO 2852					551501
			Clamp BS 4825					559787
06	0...0.04 m³/h	0...1 m³/h	DIN 11851					551507
			Clamp ISO 2852					551502
			Clamp BS 4825					559788
10	0...0.12 m³/h	0...3 m³/h	DIN 11851					551508
			Clamp ISO 2852					551503
			Clamp BS 4825					559759
15	0...0.24 m³/h	0...6 m³/h	DIN 11851					551509
			Clamp ISO 2852					551504
			Clamp BS 4825					554082
20	0...0.50 m³/h	0...12.5 m³/h	DIN 11851					551510
			Clamp ISO 2852					551505
			Clamp BS 4825					553925
25	0...0.72 m³/h	0...18 m³/h	DIN 11851					448480
			Clamp ISO 2852					448499
			Clamp BS 4825					559789
32	0...1.16 m³/h	0...29 m³/h	DIN 11851					448481
40	0...1.80 m³/h	0...45 m³/h	DIN 11851					448482
			Clamp ISO 2852					448501
			Clamp BS 4825					554147
50	0...2.88 m³/h	0...72 m³/h	DIN 11851					448483
			Clamp ISO 2852					448502
			Clamp BS 4825					554138
65	0...4.80 m³/h	0...120 m³/h	DIN 11851					448484
			Clamp ISO 2852					448503
			Clamp BS 4825					559790
80	0...7.20 m³/h	0...180 m³/h	DIN 11851					448485
			Clamp ISO 2852					448504
			Clamp BS 4825					558854
100	0...11.20 m³/h	0...280 m³/h	DIN 11851					448486
			Clamp ISO 2852					448505
			Clamp BS 4825					On request

1.) 2 measuring electrodes

Further variants on request

Process connection
SMS 1146 (from DN 10)

Material
Seal: EPDM

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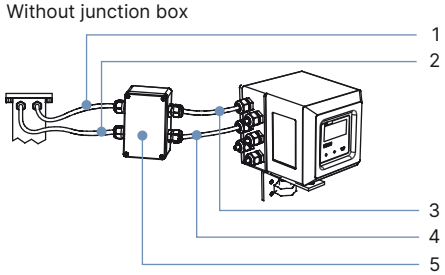
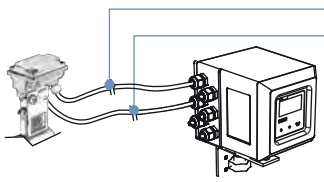
7.5. Ordering chart accessories

Accessories for remote sensor	No.	Description	Article no.
Without junction box  With junction box  	**1**	10 m cable for electrodes [1.] For connecting the sensor (**variant without junction box**) Type S051, S054, S055 or S056 to the connecting box of the extension cable set	448518
	2	10 m cable for coils [1.] For connecting the sensor (**variant without junction box**) Type S051, S054, S055 or S056 to the connecting box of the extension cable set	448519
	3	10 m cable for electrodes [1.] For connecting • the connecting box of the extension cable set to the transmitter Type SE58 • the sensor (**variant with junction box**) Type S051, S054, S055 or S056 to the transmitter Type SE58	562851
	4	10 m cable for coils [1.] For connecting • the connecting box of the extension cable set to the transmitter Type SE58 • the sensor (**variant with junction box**) Type S051, S054, S055 or S056 to the transmitter Type SE58	562852
	5	Connecting box of the extension cable set including resin	562853

1.) Cable lengths other than 10 m on request (for cables length > 20 m, a preamplifier is supplied for an additional charge).

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