Electromagnetic flow sensor, low flow rates

- For connection to a Type SE58 transmitter (with or without display, in compact or remote variant) for flow measurement
- Clean in place (CIP) compatible
- Flow measurement 0.2 to approx. 200 l/min for DN 03 to DN 20

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 S051 (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 S051 are available in G and NPT threads.

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Visit product website ▸

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1. General technical data

Note:
Empty pipe functionality is not available for this sensor type.

The electromagnetic flow sensor Type S051 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) raw (on request: stainless steel 304 (1.4301) polished or painted aluminium)
Wetted parts	
Process connection	• Stainless steel 316L (1.4404) • Stainless steel 304 (1.4301) with full lining variant (process connection included)
Lining	PTFE
Electrode	• Stainless steel 316L • Alloy C276, Titanium, Tantalum, Platinum-rhodium on request
Seal	FKM (EPDM or FFKM on request)
Pipe diameter	DN 03...DN 20
Dimensions	Further information can be found in chapter "4. Dimensions" on page 5.
Measurement principle	Electromagnetic induction Further information can be found in chapter "6.1. Measurement principle" on page 7.
Measuring range	0...10 l/h to 0...12500 l/h Further information can be found in chapter "7.5. Ordering chart accessories" on page 9.
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 transmitter Type SE58: • 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 transmitter Type SE58: • 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...+ 100 °C (- 4...+ 212 °F) • In remote variant: - 20...+ 130 °C (- 4...+ 266 °F)
Fluid pressure	PN 16 (PN 40 on request)
Minimum conductivity	5 µS/cm (or 20 µS/cm with demineralised water)
Product connections	
Pipe connection	• External thread G ISO 228-1 • NPT • DIN 11851, SMS 1145, clamp, ISO 2852 or BS 4825, flange DIN 2501, ANSI 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 "2.2. Standards" on page 5.
Pressure equipment directive	The device is not subject to the requirements of the Pressure Equipment Directive 2014/68/EU, as the nominal flowmeter diameters are smaller than DN 25.
Environment and installation	
Ambient temperature	According to the used version of transmitter Type SE58 and its material Further 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 Further 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. Conformity

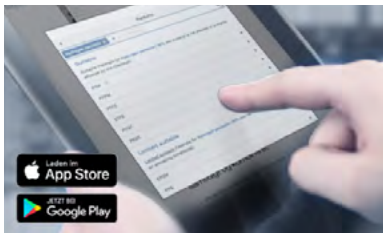
In accordance with the Declaration of Conformity, the product is compliant with the EU Directives.

2.2. 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.

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.

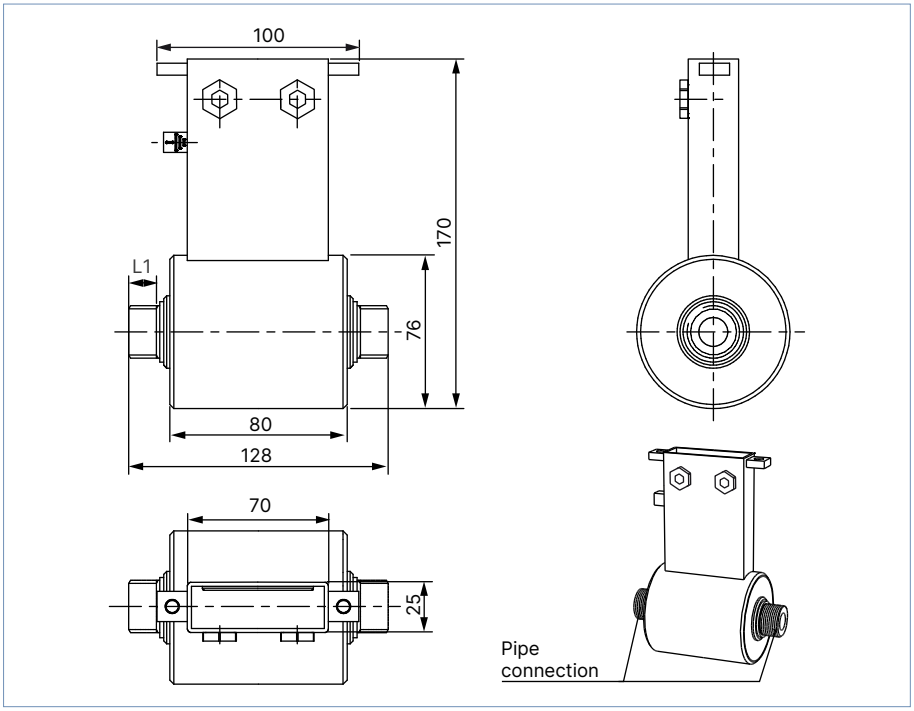
Start chemical resistance check

4. Dimensions

4.1. Compact variant

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

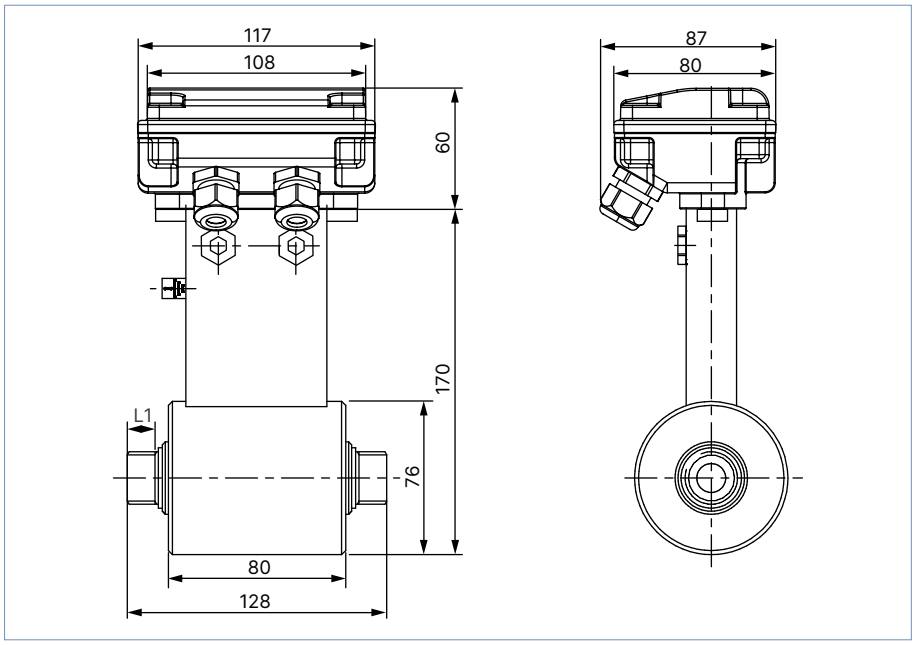


DN	Thread [Inch]	L1
03	G or NPT ¼	16.4
06	G or NPT ⅜	16.4
10	G or NPT ½	17.4
15	G or NPT ¾	20.0
20	G or NPT 1	20.0

4.2. Remote variant with junction box

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	Thread [Inch]	L1
03	G or NPT ¼	16.4
06	G or NPT ⅜	16.4
10	G or NPT ½	17.4
15	G or NPT ¾	20.0
20	G or NPT 1	20.0

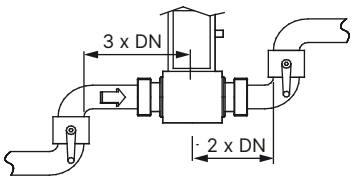
5. Product installation

5.1. Installation notes

Flow measurement

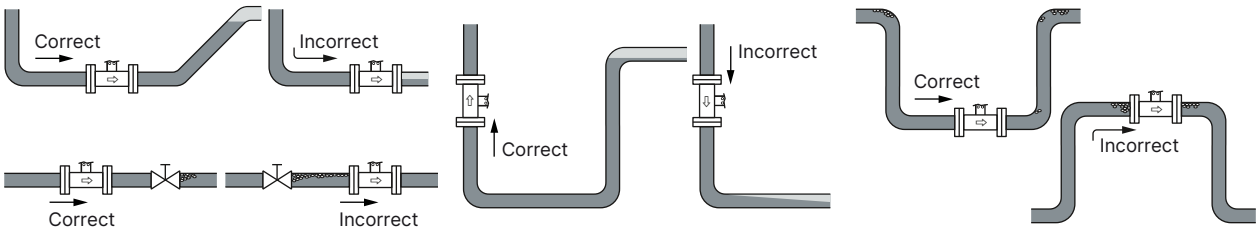
Note:
The device is not suitable for use in gaseous media and steam.

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 7.

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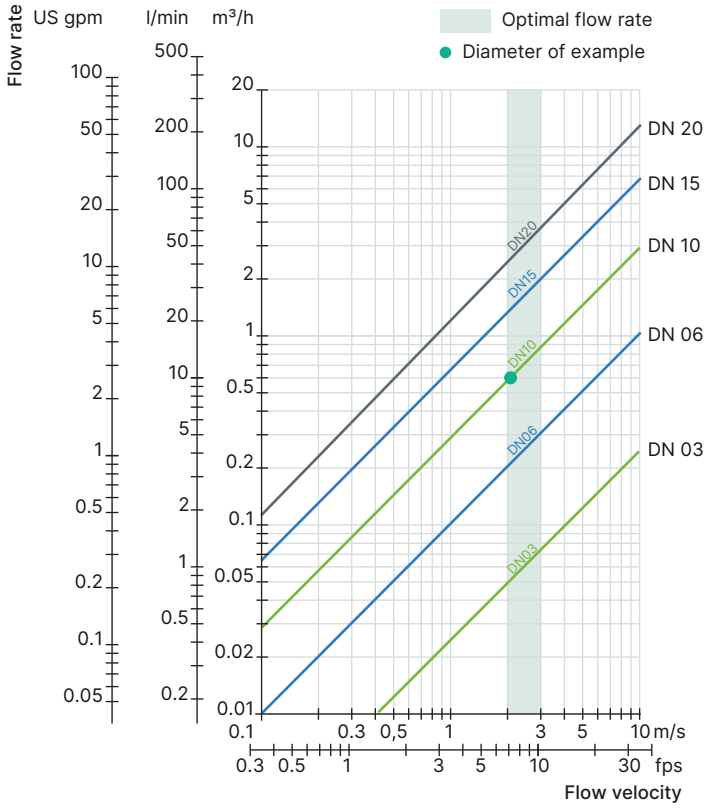
5.2. Selection of the nominal diameter

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 S051 must be amplified and processed by transmitter Type SE58.

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

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7. Ordering information

7.1. Bürkert eShop

Bürkert eShop – Easy ordering and quick delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

7.2. Recommendation regarding product selection

A complete flowmeter consists of a Type S051 flow sensor (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 S051** (see "7.4. Ordering chart" on page 8)
- **Article no.** of the transmitter **Type SE58** (see **data sheet Type SE58** ▶ for more information)

7.3. Bürkert product filter

Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements?
Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter

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	Pipe connection / Electrode [1.]	Seal	Lining	
Sensor Type S051, compact variant								
03	0...10 l/h	0...250 l/h	G ¼ (ISO 228-1)	Stainless steel 304	Stainless steel 316L	FKM	PTFE	554321
			NPT ¼					554213
06	0...40 l/h	0...1000 l/h	G ⅜ (ISO 228-1)					553065
			NPT ⅜					555892
10	0...120 l/h	0...3000 l/h	G ½ (ISO 228-1)					553374
			NPT ½					555111
15	0...240 l/h	0...6000 l/h	G ¾ (ISO 228-1)					553481
			NPT ¾					557659
20	0...500 l/h	0...12500 l/h	G 1 (ISO 228-1)					553539
			NPT 1					553663

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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	Pipe connection / Electrode [1.]	Seal	Lining	
Sensor Type S051, remote variant with junction box in stainless steel 304 (1.4301) raw and 10 m electrodes and coils cables (included)								
03	0...10 l/h	0...250 l/h	G ¼ (ISO 228-1)	Stainless steel 304	Stainless steel 316L	FKM	PTFE	448487
06	0...40 l/h	0...1000 l/h	G ⅜ (ISO 228-1)					448488
10	0...120 l/h	0...3000 l/h	G ½ (ISO 228-1)					448489
15	0...240 l/h	0...6000 l/h	G ¾ (ISO 228-1)					448490
20	0...500 l/h	0...12500 l/h	G 1 (ISO 228-1)					448491

1.) 2 measuring electrodes

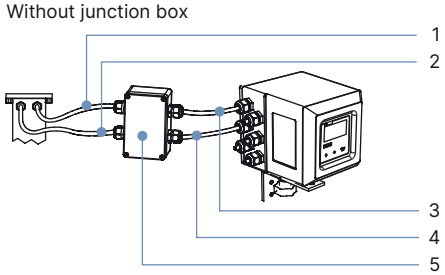
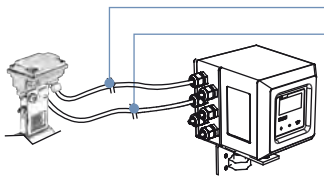
Further variants on request

Material
- Seal: EPDM, FFKM
- Junction box in painted aluminium or stainless steel 304 (1.4301) polished
- Wetted parts (connection): Stainless steel 304 (with full lining in PTFE)
- Electrodes:
  - Alloy C276 (2 measuring electrodes + 2 ground electrodes)
  - Titanium (2 measuring electrodes + 2 ground electrodes)
  - Tantalum (2 measuring electrodes + 2 ground electrodes)
  - Platinum-rhodium (2 measuring electrodes + 2 ground electrodes)

Process connection
- External thread: DIN 11851, SMS 1145
- Clamp: ISO2852, BS 4825
- Flange: DIN 2501, ANSI

Pressure
PN 40

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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