DATA SHEET

Type S051

Magnetic-inductive flow sensor for low flow rates

- For connection to a transmitter Type SE58 (with display, in compact or remote version) for flow measurement
- Clean in place (CIP)
- Flow rate measurements 0.2…approx. 200 l/min for DN 03…DN 20

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

Can be combined with

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

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

Type description

The magnetic inductive flow sensor Type S051 (compact or separated version) is recommended for applications with low flow rate and liquids with a minimal conductivity.

When combined with the SE58 M or SE58 L transmitters (minimum required conductivity: 5 µS/cm) it builds a flow measurement device with different performance, functions, materials and approvals with an appropriate suitability for the respective application depending on the individual requirements.

With the SE58 M and SE58 L compact devices or remote versions are created for which the transmitter and sensor are connected by 2 cables up to a maximum length.
Standard process connections available for the S051 are thread connections in G or NPT.

When connected to an actuator such as a valve, the S051 sensor in combination with the SE58 L transmitter can also be used to control high-precision filling operations.

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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 S051 electromagnetic flow sensor in a compact or remote version is intended for use with transmitter Type SE58, which is available in two versions L or M.

SE58 L or SE58 M

Detailed 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 version (process connection included)
Electrode	• Stainless steel 316L • Alloy C, Titanium, Tantalum, Platinum-rhodium on request
Lining	PTFE
Seal	FKM (EPDM or FFKM on request)
Dimensions	Detailed information can be found in chapter “2. Dimensions” on page 5.
Pipe diameter	DN 03…DN 20
Measuring principle	Electromagnetic induction Detailed information can be found in chapter “4.1. Measuring principle” on page 7.
Measuring range	0…10 l/h to 0…12500 l/h Detailed information can be found in chapter “5.4. Ordering chart sensor Type S051” on page 8.
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 SE58 transmitter: • in compact or remote L version: ≤ ± 0.2 % of the measured value for flow velocity > 0.5 m/s • in compact or remote M version: ≤ ± 0.8 % of the measured value for flow velocity > 0.5 m/s See **data sheet Type SE58** ▶
Repeatability	If used with SE58 transmitter: • in compact or remote L version: ≤ ± 0.1 % of the measured value for flow velocity > 0.5 m/s • in compact or remote M version: ≤ ± 0.4 % 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	• Compact version: -20…+100 °C (-4…+212 °F) • Remote version: -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)
Process/Port connection & communication	
Process 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 version of the sensor)
Approvals and certificates	
Standards	
Degree of protection according to IEC/EN 60529	If use with SE58 transmitter: • in compact L and M version: IP67 (IP68 optional) • in remote L and M version: IP68 See **data sheet Type SE58** ▶
Directives	
CE directives	The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of conformity (if applicable).
Pressure equipment directives	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 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 conditions	Continuous
Equipment mobility	Fixed device
Application range	Indoor and outdoor (protect the device against electromagnetic interference, ultraviolet rays and against the effects of climatic conditions)
Installation category	Category II according to UL/EN 61010-1
Pollution degree	Degree 2 according to UL/EN 61010-1

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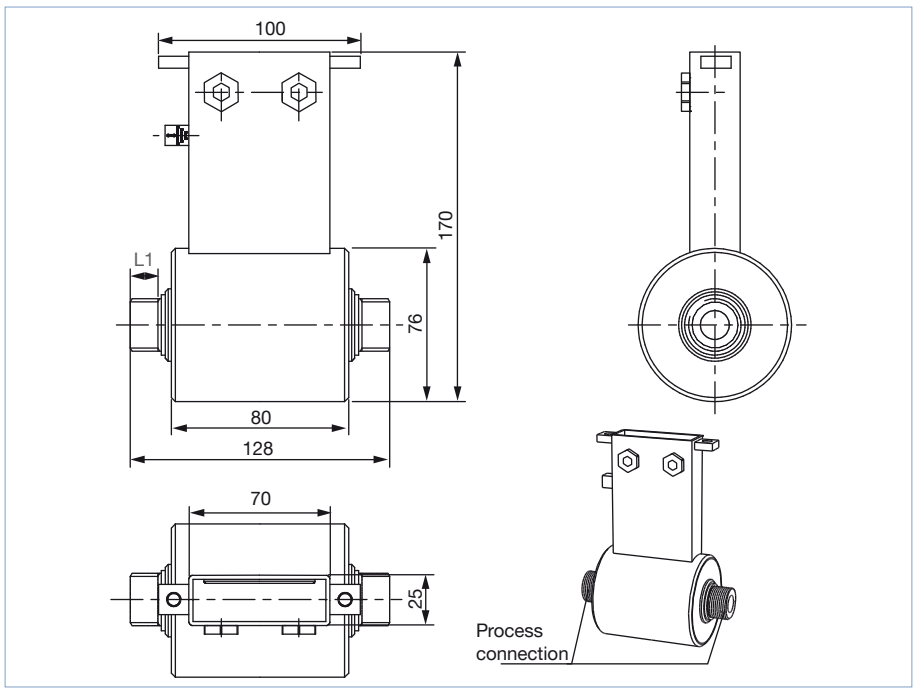
2. Dimensions

2.1. Compact version

Note:

- Detailed information on the dimensions of the SE58 transmitter can be found in **data sheet Type SE58** ▸.
- Dimensions in mm (unless specified differently)

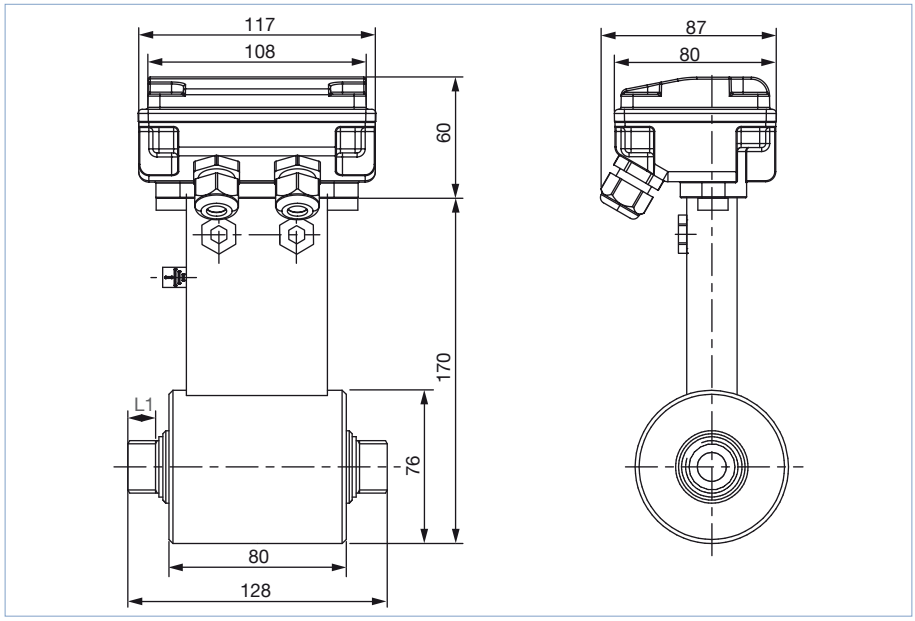


DN	Thread [Inch]	L1
03	G or NPT ¼"	16.4
06	G or NPT ⅜"	16.4
10	G or NPT ½"	17.4
15	G or NPT ¾"	20.0
20	G or NPT 1"	20.0

2.2. Remote version with junction box

Note:

- Detailed information on the dimensions of the SE58 transmitter can be found in **data sheet Type SE58** ▸.
- Dimensions in mm (unless specified differently)



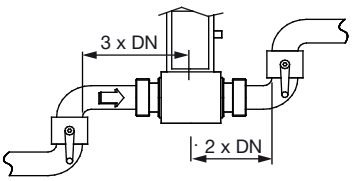
DN	Thread [Inch]	L1
03	G or NPT ¼"	16.4
06	G or NPT ⅜"	16.4
10	G or NPT ½"	17.4
15	G or NPT ¾"	20.0
20	G or NPT 1"	20.0

3. Product installation

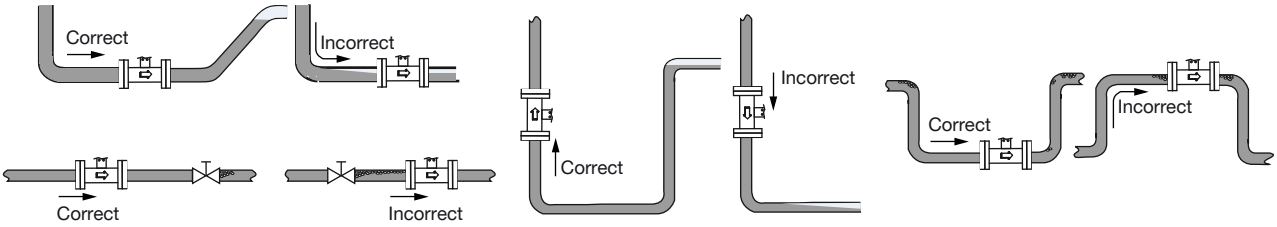
3.1. Installation notes

Note:
The flow sensor is not designed for gas and steam flow measurement.

- During flowmeter operation the pipe must be completely full.
- Observe the upstream and downstream distances.



The sensor can be installed into either horizontal or vertical pipes. Mount the sensor in the indicated positions shown below to obtain an accurate flow measurement.



The suitable pipe size can be selected using the nominal pipe size selection chart. See chapter **"3.2. Selection of the nominal diameter" on page 7**.

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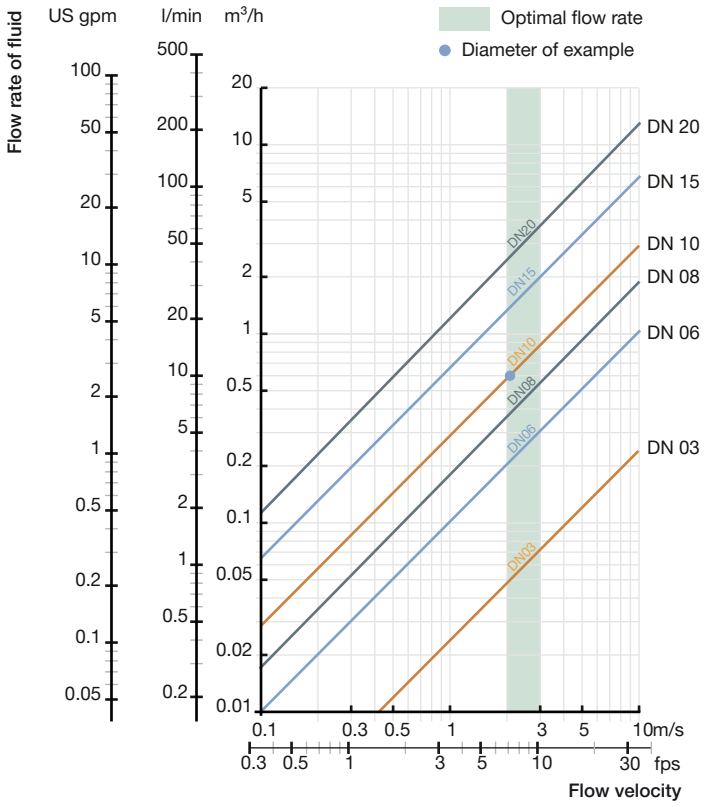
3.2. Selection of the nominal diameter

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

Example:

- Flow: 10 l/min
- Optimal flow rate: 2…3 m/s

Result: Select a pipe size of DN 10



4. Product operation

4.1. Measuring 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 S051 must be amplified and processed by transmitter SE58.

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

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5. Ordering information

5.1. Bürkert eShop – Easy ordering and quick delivery

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5.2. Recommendation regarding product selection

A complete flowmeter consists of a S051 flow sensor (compact or remote version) and a SE58 transmitter (compact or remote version).

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

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

- **Article no.** of the sensor **Type S051** (Detailed information can be found in chapter "5.4. Ordering chart sensor Type S051" on page 8)
- **Article no.** of the transmitter **Type SE58** (see **data sheet Type SE58** ▶ for more information)

5.3. 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

5.4. Ordering chart sensor Type S051

DN [mm]	Process connection	Flow rate range Min. 0…0.4 m/s	Flow rate range Max. 0…10 m/s	Housing material	Wetted parts materials Process connection /Electrode[1.)]	Wetted parts materials Seal	Wetted parts materials Lining	Article no.
Sensor Type S051, compact version								
03	G ¼" (ISO 228-1)	0…10 l/h	0…250 l/h	Stainless steel 304	Stainless steel 316L	FKM	PTFE	554321
	NPT ¼"							554213
06	G ⅜" (ISO 228-1)	0…40 l/h	0…1000 l/h					553065
	NPT ⅜"							555892
10	G ½" (ISO 228-1)	0…120 l/h	0…3000 l/h					553374
	NPT ½"							555111
15	G ¾" (ISO 228-1)	0…240 l/h	0…6000 l/h					553481
	NPT ¾"							557659
20	G 1" (ISO 228-1)	0…500 l/h	0…12500 l/h					553539
	NPT 1"							553663

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DN [mm]	Process connection	Flow rate range		Housing material	Wetted parts materials			Article no.
		Min. 0...0.4 m/s	Max. 0...10 m/s		Process connection /Electrode[1.]	Seal	Lining	
Sensor Type S051, remote version with junction box in stainless steel 304 (1.4301) raw and 10 m electrodes and coils cables (included)								
03	G ¼" (ISO 228-1)	0...10 l/h	0...250 l/h	Stainless steel 304	Stainless steel 316L	FKM	PTFE	448487
06	G ⅜" (ISO 228-1)	0...40 l/h	0...1000 l/h					448488
10	G ½" (ISO 228-1)	0...120 l/h	0...3000 l/h					448489
15	G ¾" (ISO 228-1)	0...240 l/h	0...6000 l/h					448490
20	G 1" (ISO 228-1)	0...500 l/h	0...12500 l/h					448491

1.) Two measuring electrodes

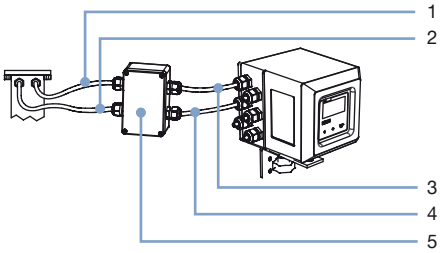
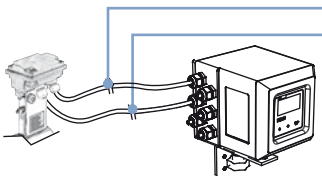
Further versions on request

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

Pressure
PN 40

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 C (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)

5.5. 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 (**version without junction box**) Type S051, S054, S055 or S056 to the connecting box of the cable extension kit.	448518
	2	10 m cable for coils[1.] For connecting the sensor (**version without junction box**) Type S051, S054, S055 or S056 to the connecting box of the cable extension kit.	448519
	3	10 m cable for electrodes[1.] For connecting • the connecting box of the cable extension kit to the transmitter Type SE58 • the sensor (**version 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 cable extension kit to the transmitter Type SE58 • the sensor (**version with junction box**) Type S051, S054, S055 or S056 to the transmitter Type SE58	562852
	5	Connecting box of the cable extension kit including No. 1+2+3+4 and resin	562853

1.) Other cables length than 10 m on request (for cables length > 20 m a preamplifier could be needed. **Caution, this will result in a price increase!**)

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