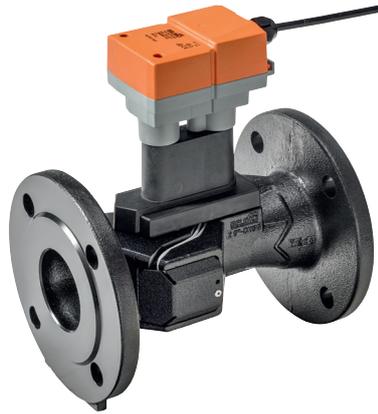


Flow sensor

- Nominal voltage AC/DC 24 V
- Output voltage DC 0.5...10 V
- For closed cold and warm water systems
- Robust against dirt and magnetite
- Low pressure drop across the sensor
- Calibrated ultrasonic flow sensor, temperature and glycol compensated


Type overview

Type	DN []	DN ["]	FS [l/s]	Δp [kPa]	PN []
FM065F-SZ	65	2 1/2	9.6	12	16
FM080F-SZ	80	3	13.6	13	16
FM100F-SZ	100	4	24.0	12	16
FM125F-SZ	125	5	37.5	13	16
FM150F-SZ	150	6	54.0	15	16

FS: Full scale, maximum measurable flow

 Δp : Pressure drop at FS

Technical data

Electrical data	Nominal voltage	AC/DC 24 V	
	Nominal voltage frequency	50/60 Hz	
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V	
	Power consumption in operation	0.5 W	
	Power consumption for wire sizing	1 VA	
	Connection supply	Cable 1 m, 3 x 0.75 mm ²	
Functional data	Output voltage range	DC 0.5...10 V	
	Output voltage note	DC 0 V = Sensor has no power supply DC 0.3 V = Sensor error DC 0.5 V = 0% of FS DC 10 V = 100% of FS max. load 1 mA	
	Media	Cold and warm water, water with glycol up to max. 50% vol.	
	Medium temperature	-20...120 °C	
	Permissible pressure ps	1600 kPa	
	Pipe connectors	Flange PN 16 according to EN 1092-2	
	Installation position	Upright to horizontal	
	Maintenance	Maintenance-free	
	Flow measurement	Measuring principle	Ultrasonic volumetric flow measurement
		Measuring accuracy flow	±6% of the measured value (20...100% FS) ±1.2% of FS (0...20% FS)
Measuring accuracy flow note		±2% of the measured value (20...100% FS) @ 20 °C / Glycol 0% vol. ±0.4% of FS (0...20% FS) @ 20 °C / Glycol 0% vol.	
Min. flow measurement		1% of FS	
Safety	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)	
	Protection class UL	UL Class 2 Supply	
	Degree of protection IEC/EN	IP54	
	Degree of protection NEMA/UL	NEMA 2	
	Enclosure	UL Enclosure Type 2	
	EMC	CE according to 2014/30/EU	
	Certification IEC/EN	IEC/EN 60730-1:11 and IEC/EN 60730-2-15:10	
	Mode of operation	Type 1	
Rated impulse voltage supply	0.8 kV		

Technical data

Safety	Control pollution degree	3
	Ambient temperature	-30...50 °C
	Non-operating temperature	-40...80 °C
	Ambient humidity	Max. 95% r.H., non-condensing
Materials	Measuring pipe	EN-GJS-500-7U (GGG50 with protective paint)

Safety notes



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Outdoor applications: Only possible where (sea)water, snow, ice, sunlight or aggressive gases cannot interfere directly with the sensor and it can be guaranteed that the ambient conditions remain at all times within the thresholds according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Mode of operation The ultrasonic flow sensor is equipped with a flow tube, four flow transmitters and an electronic circuit. A temperature sensor is mounted in the flow tube to compensate the temperature effects.

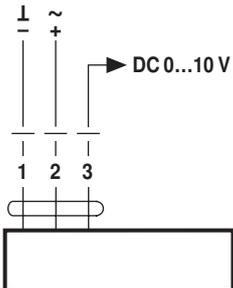
Electrical installation



Notes • Connection via safety isolating transformer.

Wiring diagrams

AC/DC 24 V, Output signal

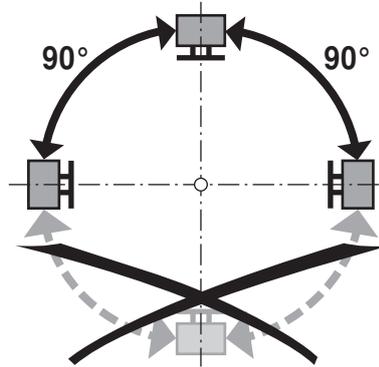


Cable colours:

1 = black
2 = red
3 = white

Installation notes

Recommended installation positions The sensor can be installed upright to horizontal. The sensor may not be installed in a hanging position.



Mounting position in the return Installation in the return is recommended.

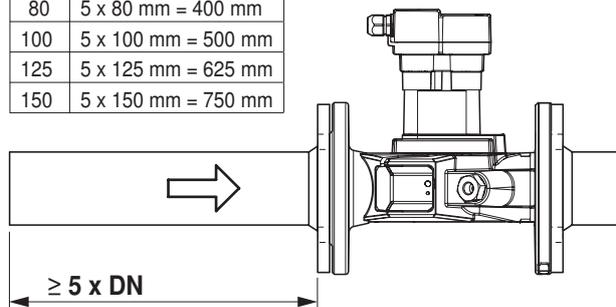
Water quality requirements The water quality requirements specified in VDI 2035 must be adhered to.

Maintenance Sensors are maintenance-free.
 Before any service work on the sensor is carried out, it is essential to isolate the sensor from the power supply (by unplugging the electrical cables if necessary). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow all components to cool down first if necessary and always reduce the system pressure to ambient pressure level).
 The system must not be returned to service until the sensor has been correctly reassembled in accordance with the instructions and the pipeline has been refilled by professionally trained personnel.

Flow direction The direction of flow, specified by an arrow on the housing, is to be complied with, since otherwise the flow rate will be measured incorrectly.

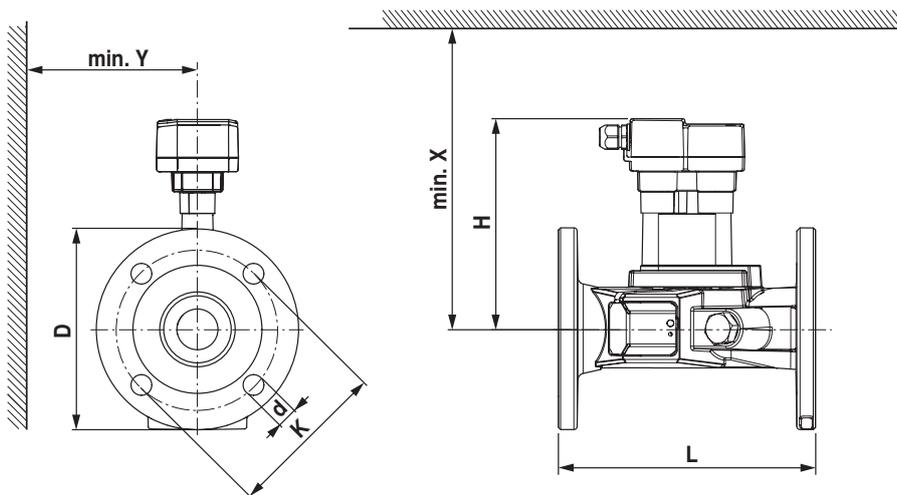
Inlet section In order to achieve the specified measuring accuracy, a flow-calming section or inflow section in the direction of the flow is to be provided upstream from the flow sensor. Its dimensions should be at least 5x DN.

DN	L min.
65	5 x 65 mm = 325 mm
80	5 x 80 mm = 400 mm
100	5 x 100 mm = 500 mm
125	5 x 125 mm = 625 mm
150	5 x 150 mm = 750 mm



Dimensions / Weight

Dimensional drawings



Type	DN []	L [mm]	H [mm]	D [mm]	d [mm]	K [mm]	X [mm]	Y [mm]	Weight
FM065F-SZ	65	240	193	185	4 x 19	145	263	132	12.6 kg
FM080F-SZ	80	260	200	200	8 x 19	160	270	140	14.6 kg
FM100F-SZ	100	262	202	230	8 x 19	180	272	155	18.4 kg
FM125F-SZ	125	314	209	255	8 x 19	210	279	167	24.4 kg
FM150F-SZ	150	334	219	285	8 x 23	240	289	182	30.2 kg