

VFS 10-200

Vortex Flowsensor Standard, 10-200 l/min



TM03 8209 0807

Fig. 1 VFS 10-200 sensor

Technical overview

Grundfos Direct Sensors™, type VFS, is a series of combined flow- and temperature sensors (two-in-one) based on the principle of vortex shedding behind a bluff body. The VFS sensors are designed for high-volume production and are fully compatible with wet, aggressive media. The VFS sensor utilises MEMS sensing technology in combination with a novel packaging concept using corrosion-resistant coating on the MEMS sensor element. This makes the VFS sensor very robust and ideal for high-volume OEM applications. VFS sensors are available for flow ranges of 1-12, 1-20, 2-40, 5-100, 10-200 and 20-400 l/min.

The trademark Grundfos Direct Sensors™ is owned and controlled by the Grundfos group.

Applications

- thermal management in solar heating systems
- industrial process flow control
- flow rate detection for pump controls
- monitoring of pumps, valves and filters
- cooling and temperature control
- domestic hot-water systems
- heat metering (solar - heat pumps).

Features

- flow ranges: 1-12, 1-20, 2-40, 5-100, 10-200 and 20-400 l/min.
- based on vortex shedding
- voltage output (ratiometric, ideal for use with microprocessor and PLC)
- compact and robust design
- approved for potable water: WRAS, KTW, W270, ACS.

Benefits

- no moving parts
- flow and temperature sensor in one package (two-in-one sensor)
- fast temperature response (direct media contact)
- compatible with wet, aggressive media
- cost-effective and robust construction.

Specifications

| Flow | |
|--|--|
| Measuring range | 10 to 200 l/min |
| Accuracy (±1σ), 0 to 100 °C | ± 1.5 % FS |
| Response time Start up flow / no flow (90 %) | < 1.0 s |
| Resolution | 1.0 l/min |
| Temperature | |
| Measuring range | 0 to 100 °C |
| Accuracy (± 1σ), 25 to 80 °C | ± 1 °C |
| Accuracy (± 1σ), 0 to 100 °C | ± 2 °C |
| Response time (63.2 % at 50 % FS flow) | < 1.0 s |
| Resolution | 0.5 °C |
| Media and environment | |
| Media types | The sensor is compatible with liquids (kinematic viscosity ≤ 2 mm ² /s) |
| Media temperature (operation) | 0 to 100 °C |
| Media temperature (peak) | -25 to 120 °C, non-freezing |
| Ambient air temp. (operation) | -25 to 60 °C |
| Ambient air temp. (peak) | -55 to 90 °C |
| Humidity | 0 - 95 % RH, non-condensing |
| System burst pressure | > 16 bar |
| Electrical data | |
| Power supply | 5 VDC (± 5 %). Grounding of the sensor supply is required (PELV) |
| Output signals | Ratiometric |
| Flow signal | 0.5 - 3.5 V (Zero at 0.35 V) |
| Temperature signal | 0.5 - 3.5 V |
| Power consumption | < 50 mW |
| Load impedance | > 10 kΩ |
| Sensor materials | |
| Sensing element | Silicon-based MEMS sensor |
| Seal (sensor to housing) | EPDM rubber |
| Housing | Composites (PPS, PA66) |
| Flow pipe | PPA 40-GF |
| Wetted materials | Corrosion-resistant coating EPDM, PPS, PPA 40-GF |
| Environmental standards | |
| Enclosure class | IP44 (Non overmolded IP20) |
| Temperature cycling | IEC 68-2-14 |
| Vibration (non-destructive) | 20 - 2000 Hz, 10G, 4h |
| Electromagnetic compatibility | EN 61326-1 |
| Dimensions | |
| Sensing element | 47 x 40 x 20 mm, see drawings |
| Flow pipe | 137 x 45 x 41 mm |

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Dimensions (mm)

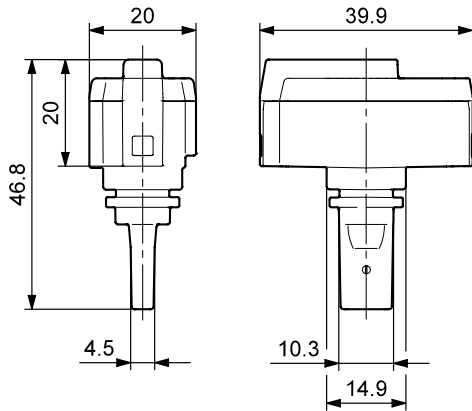


Fig. 2 Dimensional sketches of sensing element

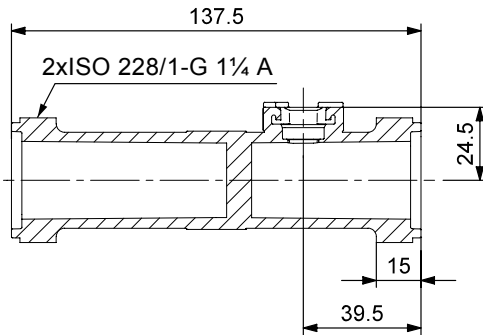


Fig. 3 Dimensional sketch of flow pipe

Type key

The sensor is labelled with a type designation.

| | | | |
|--------------------------|------|-------|-------|
| 96 | - XX | - XXX | XXXXX |
| Product number | | | |
| Revision | | | |
| Production year and week | | | |
| Consecutive number | | | |

For more information, see
<http://www.grundfos.com/directsensors>.

| | |
|----------------------|-----------|
| 96702086 1008 | GB |
| Repl. 96702086 0108 | |

Electrical connections

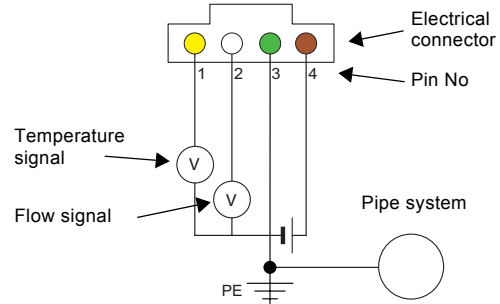


Fig. 4 Electrical connections

| Pin configuration | Colour |
|---|--------|
| 1 Temperature signal (0.5 to 3.5 V relative to pin 3) | Yellow |
| 2 Flow signal (0.5 to 3.5 V relative to pin 3) | White |
| 3 GND (0 V) | Green |
| 4 Power supply (+5 VDC), PELV | Brown |

Power supply requirements

- 5 VDC
- separated from hazardous live circuitry by double or reinforced insulation
- power limitation: 150 VA; current limitation: 8 A.

Sensor output signals

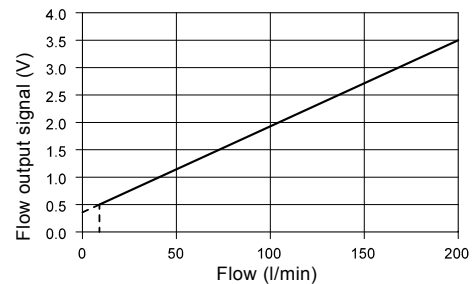


Fig. 5 Flow response

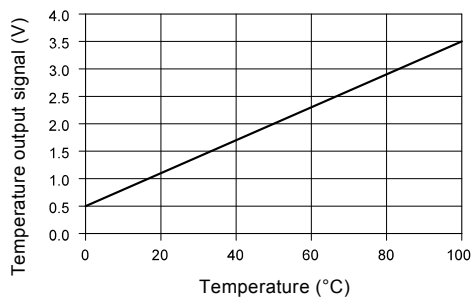


Fig. 6 Temperature response

Subject to alterations.