

VFS Flowmeter



Fig. 1 VFS 2-40 Flowmeter

Technical Description

Grundfos Direct Sensors™, type VFS, are based on the principle of vortex. Fluid flows past a bluff body in the flowmeter tube and vortices are formed. A sensor evaluates the frequency of vortices. It is manufactured using the MEMS technology which is a sophisticated layout of electronic and micro-mechanical elements on a silicone base using advanced manufacturing methods.

Its inner surface is treated with a coating that resists aggressive fluids. The flowmeter features a sturdy design.

VFS sensors are available for flow ranges of 1-12, 1-20, 2-40, 5-100, 10-200 and 20-400 l/min.

Beside a flow sensor, the flowmeter is fitted also with a temperature sensor.

Applications

- flow and temperature sensing in solar thermal systems
- industrial process flow control
- monitoring of pumps, valves and filters
- cooling and temperature control
- domestic hot-water systems
- heat metering (solar system, heat pumps).

Features

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

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

Průtok

Measuring range	2 to 40 l/min
Accuracy 0 to 100 °C	± 1,5%
Response time (63,2%)	<1 s
Resolution	0.2 l / min

Temperature

Measuring range	0 to 100 °C
Accuracy 25 to 80 °C	± 1 °C
Accuracy 0 to 100°C	± 2 °C
Response time (63.2% at 50% flow)	<1 s
Resolution	0.5 °C

Fluid 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
Relative humidity	0 - 95%, non-condensing

Electrical data

Power supply	5 V DC (± 5%).
Grounding of the sensor supply is required (PELV)	
Output signal	Ratiometric
Flow signal	0.5 - 3.5 V (Zero at 0.35 V)
Temperature signal	0,5 to 3,5 V
Power consumption	<50 mW
Load impedance	> 10 kOhm

Sensor

Sensing element	Silicon-based MEMS sensor
Gasket	EPDM rubber
Housing	Composites (PPS, PA66)
Flow pipe	PPA 40-GF
Wetted materials	Corrosion-resistant coating EPDM, PPS, PPA 40-GF
IP rating	IP44 (Non overmolded IP20)
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20 - 2000 Hz, 10G, 4h
Electromagnetic compatibility	EN 61326-1
Sensing element	47 x 40 x 20 mm, see drawing
Flow pipe	88 x 39 x 25 mm

Dimensions [mm]

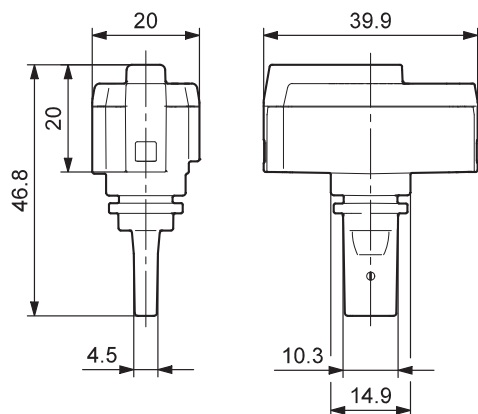


Fig. 2 Dimensional sketches of sensor element

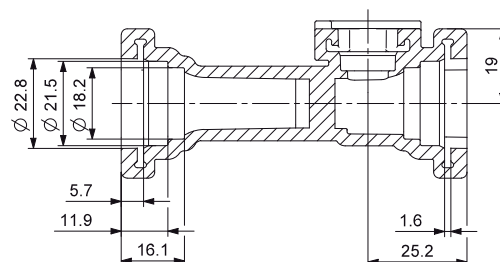


Fig. 3 Dimensional sketch of flow pipe

Electrical wiring

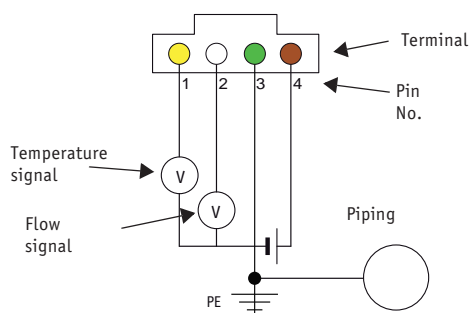


Fig. 4 Electrical connections

Pin configuration		Color
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 V DC), PELV	Brown

Power supply requirements

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

Sensor output signals

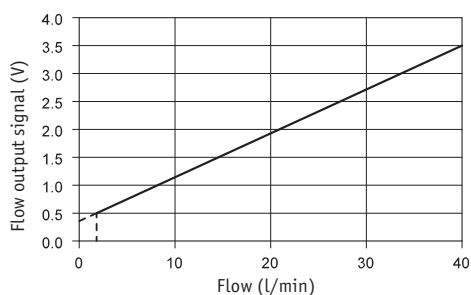


Fig. 5 Flow response

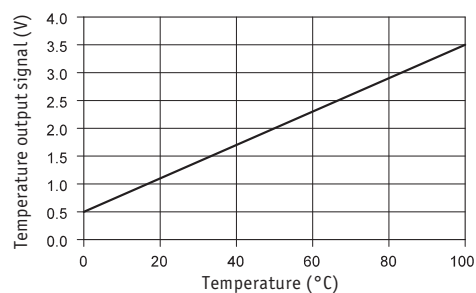


Fig. 6 Temperature response