

VFS 2-40 QT

Vortex Flowsensor Standard, 2-40 l/min



TM03 8211 0808

Fig. 1 VFS 2-40 QT sensor

Technical overview

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. QT™ is a special version of the VFS sensors where a composite insert for the flow ranges of 1-12 and 2-40 l/min creates a compact and cost-effective flow and temperature measuring system, which can be integrated closely into the customer's own pipework.

Applications

- thermal management in solar heating systems
- cooling and temperature control (ex. manifold systems within machine tools)
- floor heating/radiant and valvesystems
- monitoring of pumps, valves and filters
- flow rate detection for pump controls
- industrial process flow control
- heat metering (solar - heat pumps).

Features

- flow range: 1-12 and 2-40 l/min in 42 % glykole mixture
- designed for harsh environments
- based on vortex shedding
- voltage output (ratiometric, ideal for use with microprocessor and PLC)
- compact and well-proven design
- MEMS sensing technology
- approved for potable water: WRAS, KTW, W270, ACS.

Benefits

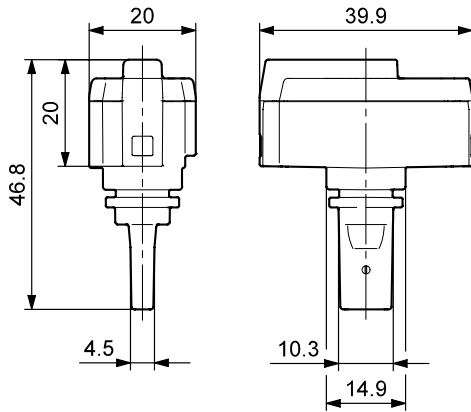
- no moving parts
- flow and temperature sensor in one package (two in-one sensor)
- fast temperature response (direct media contact)
- compatible with wet, aggressive media
- cost-effective and robust construction.

Specifications

Flow	
In water/tyfocur LS (30 - 100 °C)	2 to 40 l/min
Measuring range	
Accuracy ($\pm 1\sigma$), (0 to 100 °C)	1.5 % / 5 % FS (typical 3 %)
Response time (63.2 %)	< 1 sec.
Resolution	0.2 l/min
Temperature	
Measuring range	0 to 100 °C
Accuracy ($\pm 1\sigma$), 25 to 80 °C	± 1 °C
Accuracy ($\pm 1\sigma$), 0 to 100 °C	± 2 °C
Response time (63.2 % at 50 % FS flow)	appr. 1/4 sec.
Resolution	0.4 °C
Media and environment	
Media types	The sensor is compatible with liquids (kinematic viscosity ≤ 4 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 % (relative), non-condensing
System burst pressure	> 16 bar
Electrical data	
Power supply	5 V DC (± 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 k Ω
Sensor materials	
Sensing element	Silicon-based MEMS sensor
Seal (sensor to housing)	EPDM rubber
Housing	Composites (PPS, PA66)
Vortex tube	1.4408
Insert	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 drawing
Vortex tube	110 x 29.8 x 31.5 mm
Insert	63.9 x 16 x 15.4 mm

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

Dimensions (in mm)



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Fig. 2 Dimensional sketches of sensing element



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Fig. 3 VFS 2-40 sensor components

Type key

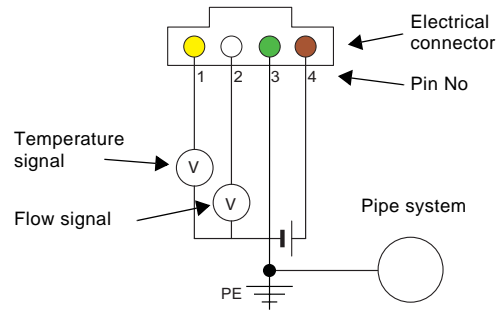
The sensor is labelled with a type designation.

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

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

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Electrical connections



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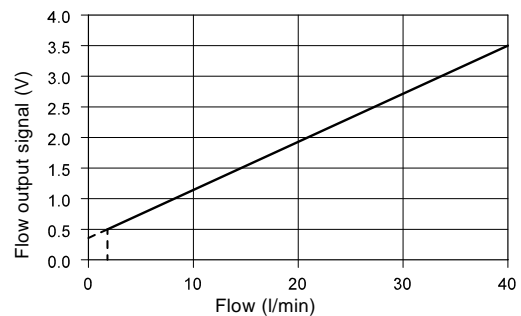
Fig. 4 Electrical connections

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.

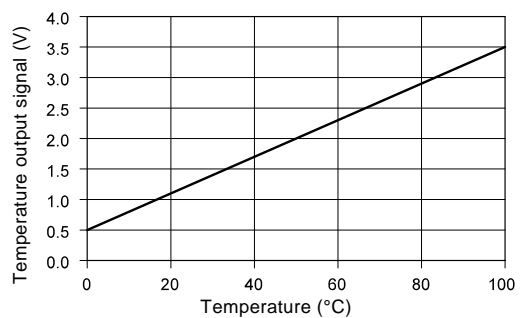
- 5 VDC
- separated from hazardous live circuitry by double or reinforced insulation
- power limitation: 150 VA; current limitation: 8 A.

Sensor output signals



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Fig. 5 Flow response



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Fig. 6 Temperature response

Subject to alterations.