



Digital Out of Liquid Module

Thermal Mass Flow Sensor

Optimal for flow applications in aggressive liquids

Characteristics & Applications

Characteristics:

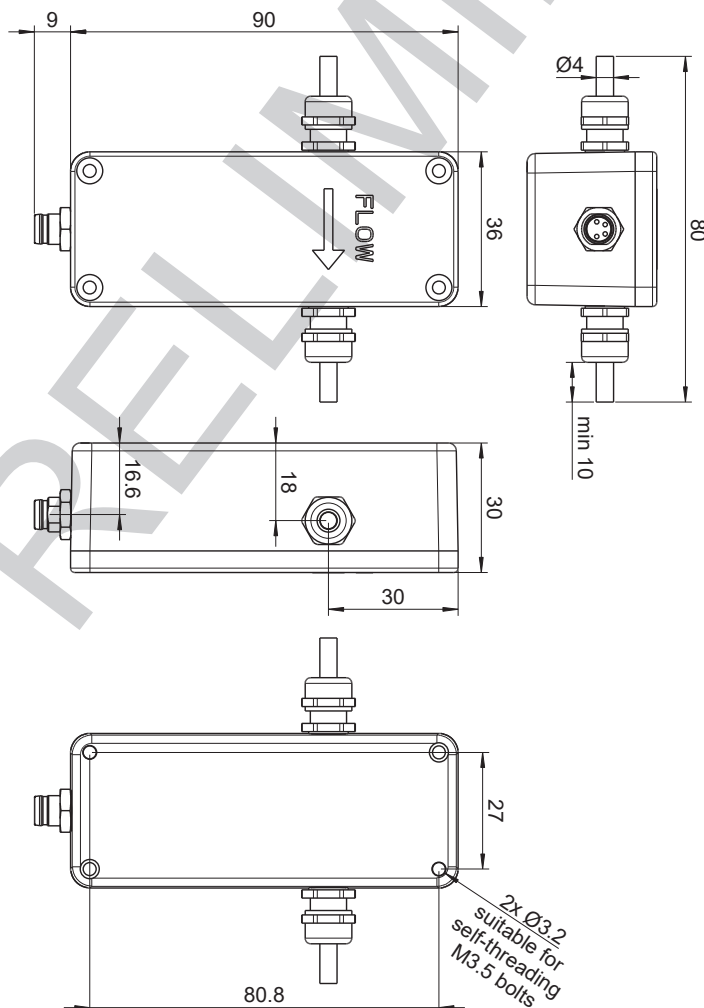
- Suitable for aggressive liquids
- High chemical resistance
- Very good repeatability
- High accuracy between 0 and 20 kg/h
- Temperature compensation already implemented

Applications:

- Water flow meter
- Process control
- Leak detection

Illustration

Dimensions in mm





Output signal of module

Output signal over I²C protocol:

- Calibrated flow signal in kg/h
- Electrical power of heater in mW (not linearized signal)
- Temperature of media in °C
- Temperature of microcontroller

Performance

Operating Parameters

Flow range:	1 to 20 kg/h (calibration media: deionized water (DI-H ₂ O))
Temperature range:	+5 to +50 °C
Max. operating pressure:	70 bar (calculated value)
Heating-up time:	5 min

Flow parameters

Accuracy:	< 3 % F.S. (value for DI-H ₂ O)
Repeatability:	< 0.3 % F.S. (value for DI-H ₂ O)
Response time t_{63} :	500 ms* (assumed value, value for DI-H ₂ O)
Temperature sensitivity:	< 0.3 %/K F.S. (value for DI-H ₂ O in temperature range +5 to +50 °C)

Temperature parameters

Accuracy:	< 0.2 K (value for DI-H ₂ O)
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General

Pressure loss:	0 to 1 mbar (based on H ₂ O for 1 to 20 kg/h, calculated value for +25 °C)
Dependency of orientation:	< 1 % F.S. (assumed by experiment)
Media compatibility:	Deionized water, oil, other liquids
Storage temperature range:	0 to +60 °C

* To achieve the cited performance, the sensor needs 3 to 5 minutes stabilization time because thermal equilibrium has to be reached.

Mechanical parameters

Process connection:	4.0 mm (flow channel open ended)
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Flow channel

Media wetted material:	Stainless steel 1.4301 (other materials on request)
Length:	80.0 mm
Outer diameter:	4.0 mm
Inner diameter:	3.7 mm



Housing

Material:	Aluminum
Width:	30.0 mm
Length:	89.7 mm
Height:	35.8 mm

General

Protection class:	IP65
Weight:	136.85 g

Electrical Parameters

Supply voltage:	10 to 26 V (DC)
Power consumption:	1 W (Max. value)
Electrical connection:	M8 4-pin; Connector compatible with Phoenix SACC-DSI-M8MS-4CON-L90 SH / Binder 09-3421-82-04 Pin 1: GND Pin 2: SCL Pin 3: Supply voltage Pin 4: SDA

Output signal over I²C

Power of heater:	mW, not linearized
Temperature of media:	°C
Mass flow:	kg/h, linearized
Temperature of microcontroller:	°C

Calibration

Reference:	Coriolismeter; mini CORI-FLOW Coriolis Mass Flow Meter model M15, Bronkhorst
Media:	Deionized water

I²C Protocol

Description of I²C protocol: see separate document

Connection Tool

Recommended tooling for a tube with an outer diameter of 6.0 mm and a wall thickness of 1.0 mm.

- Ear clamps with insert ring:
 - Oetiker 1-Ohr clamp with insert ring 5.6- 6.5
 - Art. 839925.0900 from Brüttsch & Rüeegger
- Installation tool:
 - Hand Installation Pincers HIP 2000 386 or HIP 2000 387
 - Art. 14100386 or 14100387 from Oetiker
- Removal tool:
 - Hand Clamp Cutter HCC 2000 407
 - Art. 14100407 from Oetiker



Product image



Order Information

Order code	Product code
former order code	150935
	160.00041

PRELIMINARY



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