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more than dosing!

Quickstart guide

Conitnuous Flow Sensor

differential pressure flow sensor

Version 2.0

Thank you for choosing the Continuous Flow Sensor. The CFS is an easy to set up volume flow sensor for liquids, based on the differential pressure principle. The present sensor version is an OEM version, designed for integration into a system.

This document helps you getting started with the functionality of the sensor. For further documentation and safety information read the user manual.

Functionality

The volume flow is calculated from the pressure drop across a restriction in the fluid channel. The diameter of the restrictor depends on the flow range of the sensor.

Due to the restrictor, the sensor is not suited for fluids containing particles bigger as 50 µm.
Using a filter is highly recommended.
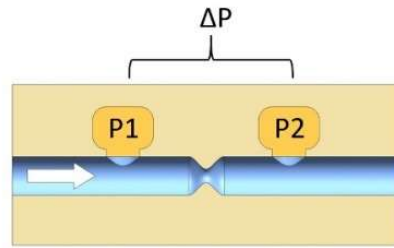
Fluidical installation

Inlet and outlet can be connected by ¼-28 UNF flat bottom connectors.

The CFS has a given flow direction, indicated by the arrow on the label. Backflow results in a negative flow signal.
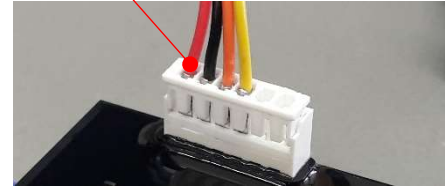
inlet   outlet

Note that due to its small orifice the CFS should always be used with a prefilter 43 µm (B1 / B2) mesh size.

Electrical installation

Pin1

Connector/ Pin	Description/Function
1	VIN + (5 VDC)
2	VIN – (GND)
3	RS232 RX
4	RS232 TX
5	GND
6	DOUT

RS-232 interface

The CFS comes with an RS-232 interface. For an easy startup a RS-232 to USB cable can be provided by ReseaTech.
The communication chip uses the standard Windows VCP driver for virtual COM Ports.

If you encounter a problem with the standard driver, you can also find the latest version of the driver on the manufacturer's homepage:

http://www.ftdichip.com/Drivers/VCP.htm

RS-232 communication

Port settings:

- Baud: 115200, Data: 8, Stop: 1, Parity: None, Handshake: off
- All commands are transmitted in ASCII characters
- Each command is terminated with LF (Hex 0x0A)
- Commands and parameters are separated by a space (Hex 0x20)

For the first tests we recommend using a simple serial terminal program such as HTerm or Termite.

HTerm: http://www.der-hammer.info

RS-232 interface

Connect both communication lines (RX, TX) and the Ground connection to your RS-232 Interface. Make sure both lines are crossed.

RX Sensor ------- TX Customer
TX Sensor ------- RX Customer

The Communication lines are ±15kV ESD-protected.

Mating connector:
Molex Micro-Latch, 51065-0600

Serial commands

Command	Description
M_Cont n	Continuous flow value output n = 1 -> start n = 0 -> stop
M_Single	Single flow measurement
M_Press	Single pressure measurement
M_Temp	Single temperature measurement
S_SetZero	Set the delta pressure to zero
S_GetZero	Returns the pressure zero point
S_ClearZero	Clears the zero point
S_GetFluidCal	Load current fluid calibration data

| Command	Description
S_SetFluidCal a b	Write new fluid calibration data a=fluid density [mPas] b=fluid viscosity [kg/m3]
S_GetFlowCorr	Load current correction factor
S_SetFlowCorr a	Set correction factor a = Multiplier for flow rate value
S_GetInterval S_SetInterval n	Read current interval Setting the readout interval for continuous output in ms: 10 – 100000 ms -> 100 – 0.01 Hz **Only adjustable in 10 ms steps!**
S_GetSerial	Read serial Number
S_SetThreshold	Set minimum flow rate [ul/s]
S_GetThreshold	Read minimum flow rate setting [ul/s]
Everything else	Wrong command

Application examples

Continuous measurement

To monitor a continuous flow, you can select a longer interval time for the measurement.

SetupCommand: **S_SetInterval 1000**

The following measurement shows a 10 ml syringe, which was squeezed by hand at varying flow rates. By integrating the flowrate over time, you get the total volume of 9898.1 µl.


Volume Flow OEM-C 10ml
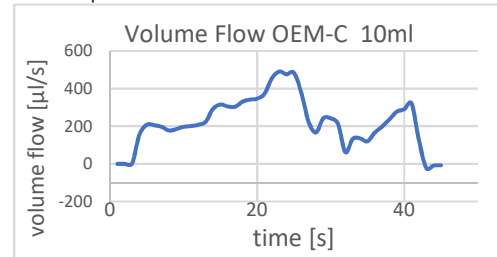
Dosing pulse measurement

To capture a short event, such as a short valve dosing pulse, it is recommended to set the shortest interval time for maximal visibility of what is going on.

Setup Command: **S_SetInterval 10**

The following measurement shows a dosing pulse of 100 ms at 0.5 bar (absolute) pressure. The medium is water. The sensor reports the flowrate every 10 ms. By integrating the flowrate over time, you get the total volume of 15.16 µl.

Valve opening time: 100 ms,
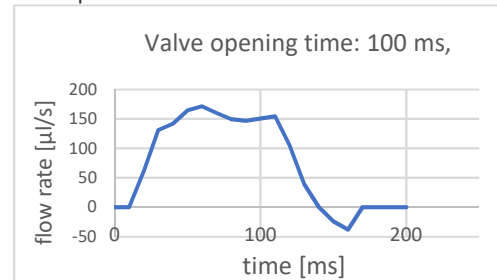
Limitations

Property	Value	Unit
Maximum supply pressure	1800 (absolute)	mbar
Temperature range	10 .. 50	°C
Viscosity range	1 .. 100	mPas
Flow range	B0: 1-15 B1: 3-30 B2: 10-100	ml/min
Sampling rate	100 (fixed)	Hz
Readout interval	0.001-100 (0.01 steps)	s

Technical data

Ordering Nr.	CFS-B1/B2
Connectors	¼-28 UNF flat bottom
Materials in contact with media	PEEK, FPM, silicone stainless steel
Dimensions	40x22x18 mm
Weight	15 g
Supply voltage	5 VDC
Supply current	< 20 mA
Accuracy of volume flow	± 2 % full scale
Com-interface	RS-232
Conformity	CE RoHS 2011/65/EU

Contact information

In case of difficulties with the CFS or if you have any questions, do not hesitate to contact us:

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