BFS

CORIOLIS BASED FLOW SENSOR

ELVEFLOW.COM/MICROFLUIDIC-FLOW-CONTROL-PRODUCTS/MICROFLUIDIC-FLOW-CONTROL-MODULE/MICROFLUIDIC-FLOW-SENSOR-CORIOLIS/

COMPATIBLE WITH ALL LIQUIDS: WATER, OIL, ALCOHOL, MIXTURE... WITH NO CALIBRATION REQUIRED

In partnership with **Bronkhorst**, we have developed a unique Coriolis flow sensor suited to microfluidics. It offers various benefits: **precision, wide range, straightforward compatibility with all liquids** (no calibration needed).

- ✓ **COMPATIBLE WITH ALL LIQUIDS & GAS**
- ✓ **NO CALIBRATION NEEDED**

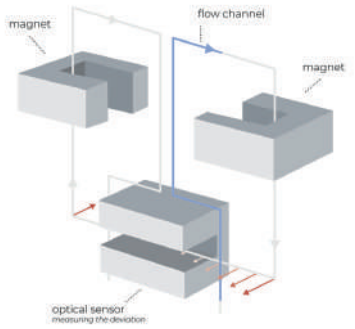
UNIQUE PERFORMANCES

- Large flow range **from 1.6 µL/min to 500 mL/min** (for water)
- Maximum flow rate: **500 mL/min** (for water)
- Sensor response time: **35 ms**
- Mass flow accuracy: **down to 2 %** of measured value (down to 0.2 % of mv on request)

APPLICATIONS

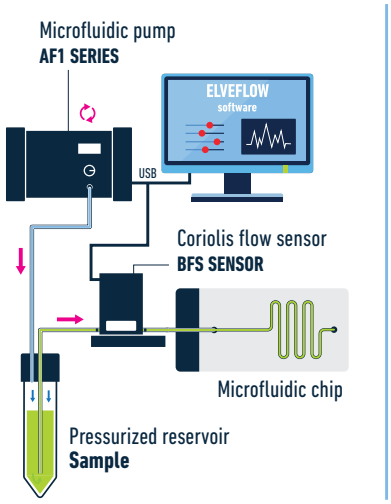
- Coumpound semiconductor processing
- Solar cell and FDP technology
- Food and pharmaceutical industries
- Medical microchemical or analytical installations
- Calibration laboratories

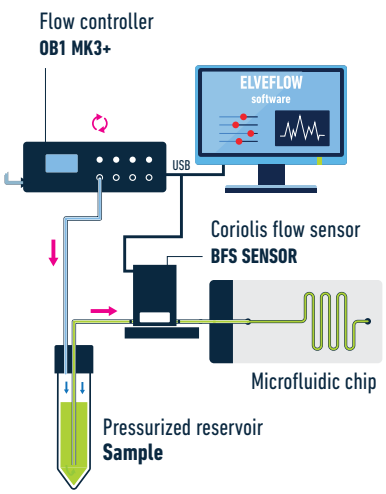
PRINCIPLE



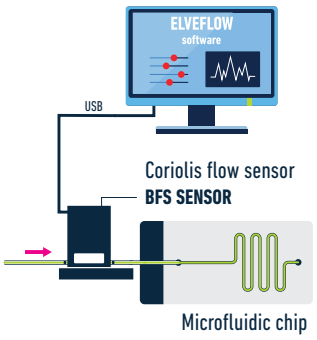
HOW IT WORKS

WITH ELVEFLOW FLOW CONTROLLERS: MONITORING + CONTROL





WITH EXTERNAL EQUIPMENT: MONITORING



TECHNICAL SPECIFICATIONS

CORIOLIS FLOW SENSOR	BFS 1	BFS 1+	BFS 2	BFS 3
Flow range	0.1 g/h to 200 g/h		1 g/h to 2000 g/h	30 g/h to 30000 g/h
Minimum flow rate (water)	1.6 µL/min		16.6 µL/min	500 µL/min
Maximum flow rate (water)	3.3 mL/min		33.3 mL/min	500 mL/min
PERFORMANCE				
Mass flow accuracy liquids	down to ± 2 % of measured value	down to ± 0.2 % of measured value		
Mass flow accuracy gases	up to ± 0.5 % o measured value			
Repeatability	± 0.05 % of rate ± 1/2 (ZS* x 100/flow) % based on digital output			
Zero stability (ZS) (1)	< ± 0.01 g/h		< ± 0.2 g/h	< ± 6 g/h
Density accuracy	< ± 5 kg/m³			
Temperature accuracy	± 0.5 °C			
Temperature effect (2)	Zero drift: ± 0.01 g/h/°C		Zero drift: ± 0.02 g/h/°C	Zero drift: ± 0.5 g/h/°C
Mounting (3)	Any position, attitude sensitivity negligible			
Device temperature	0...70 °C			
Response time (t 98 %)	0.2 s to fill the tubing then 35 ms			
MECHANICAL PARTS				
Wetted material	Stainless steel 316 L or comparable		Stainless steel 316 L or comparable	
			Optional: Hastelloy-C22	Optional: Hastelloy-C23
Pressure rating	200 bar		200 bar; higher on request	
Sensor inner diameter	250 µm		0.5 mm	1.3 mm
Microfluidic fitting type	1/4-28"		SwageLok	
Internal volume	13 µL		0.45 mL	0.82 mL
Calibration	/	Individual calibration certificate		

FLOW SENSOR SIZE (length x width x height): 65 x 32 x 144 mm **WEIGHT:** 3 kg

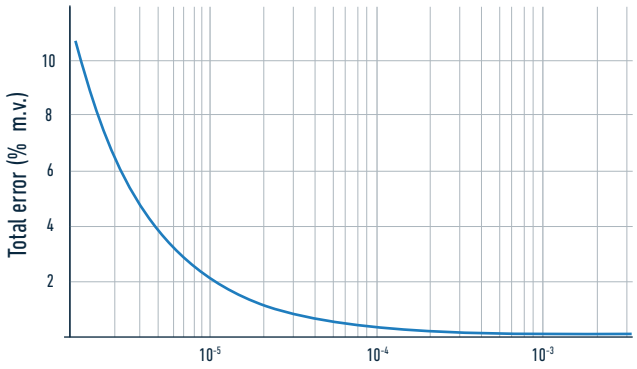
Non-contractual information, may be changed without notice.

(1) Guaranteed at constant temperature and for unchanging process and environment conditions. (2) Depends on flow rate, heat capacity fluid, T amb., T fluid and cooling capacity.
(3) To be rigidly bolted to a stiff and heavy mass or construction for guaranteed stability. External shocks or vibrations should be avoided.

TOTAL ERROR (% m.v.)

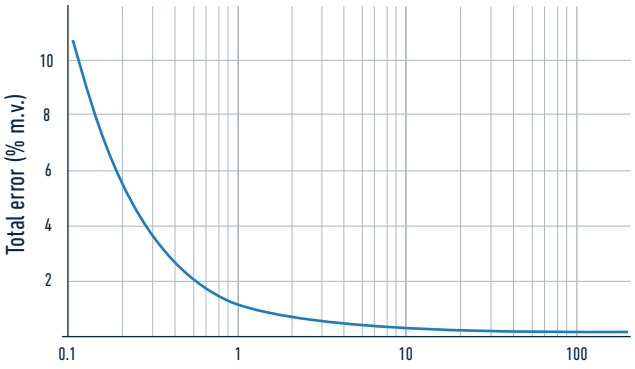
TOTAL ERROR = ACCURACY READING ± [(ZERO STABILITY / FLOW) X 100] [% READING]
m.v. - measured value

BFS 1+



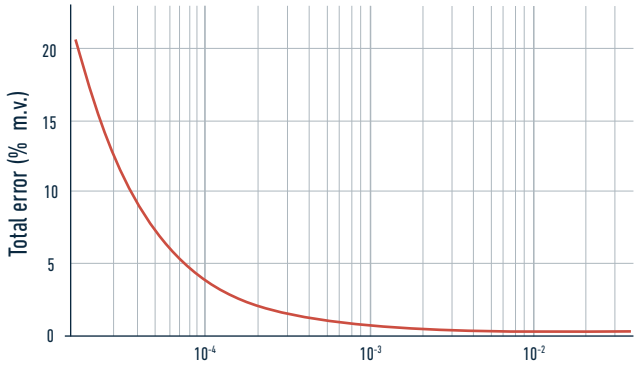
Volume flow rate (L/min) - log scale

water at 20 ° C



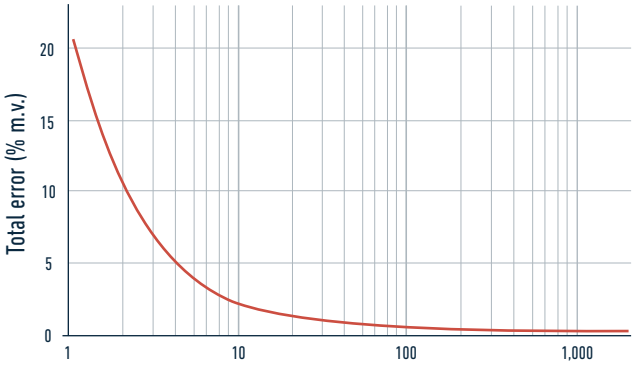
Mass flow rate (g/h) - log scale

BFS 2



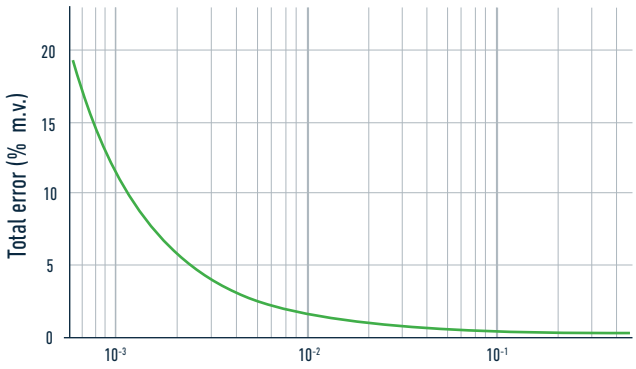
Volume flow rate (L/min) - log scale

water at 20 ° C



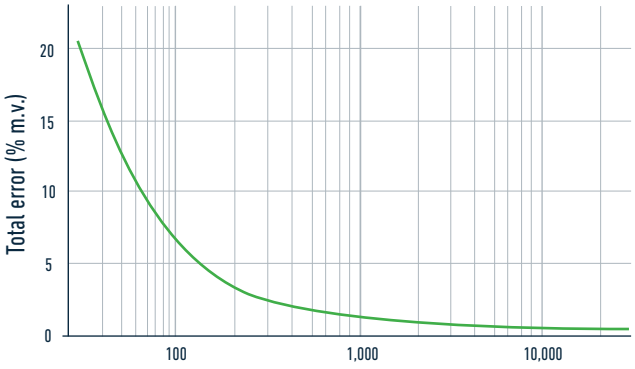
Mass flow rate (g/h) - log scale

BFS 3



Volume flow rate (L/min) - log scale

water at 20 ° C



Mass flow rate (g/h) - log scale

FLOW SENSORS COMPARISON MFS VS BFS

FLOW SENSORS COMPARISON	**BFS** (1 & 1+)	**MFS**
Accuracy	0.2 % of measured value [1]	5 % of measured value
Range	One sensor for 1.6 µL/min to 3 mL/min	Five sensors from 10 nL/min to 5 mL/min
Negative flow measurement	Yes	Yes
Supported fluid types	All without calibration	All with calibration
Response time	35 ms [2]	From 1 to 70 ms [3]
Flow sensor size	65 x 32 x 144 mm	58 x 53 x 23 mm
Internal diameter	250 µm	From 25 µm to 1.8 mm [4]
Weight	3 kg	100 g
Connectors	1/16" OD tubing	1/16" OD tubing
Internal volume	13 µL	From 1 µL to 80 µL[4]
Wetted material	Stainless steel 316L or comparable	Glass or Quartz
Principle	Coriolis	Thermal
Computer connection	Directly via USB to the computer	Directly on the OB1 and the AF1 or with the Sensor reader MSR
Additional features	Temperature and density measurement	

Non-contractual information, may be changed without notice.

(1) Available upon request. 2 % accuracy for the regular model
(2) 0.2 s at 98 % (spec) to fill the tubing then 35 ms with temperature measurement
(3) Depending on chosen digital resolution
(4) Depending of the sensor range