



FL-01

Diaphragm Flow Meter

Description:

The FL-01's body contains a thin, elastic diaphragm, made of stainless steel, which covers the entire flow cross-section. It is bent through the flowing liquid, until it touches a bow-shaped stopper. The magnetic field of a plastic-encapsulated magnet, sitting right on the diaphragm, is detected by an external sensor. The optional available measuring-transducer, installed on the outside of the housing, owns a back-lit, well-readable LCD-Display, which shows measured values and parameters in a clear and easy to understand way. The FL-01 has either a 0...10 VDC- or 4...20 mA-output-signal and two switching outputs which can be used as PNP- or NPN-transistor-outputs, if needed. The device can be controlled and programmed with a magnet ring. By turning the ring left or right, parameters, such as hysteresis or switching points, can easily be changed.

A further option, the electronic unit can be ordered as a counter, with external reset, antivalent switching-outputs and current-value display, or, as a current-value display with analogue output, volume-pulse-output and counter.

Features

- / Analogue output
- / 2 switching outputs
- / Well-readable, back-lit display
- / Changeable dimensions
- / For industrial applications
- / Small and compact in size
- / Easy installation

Application:

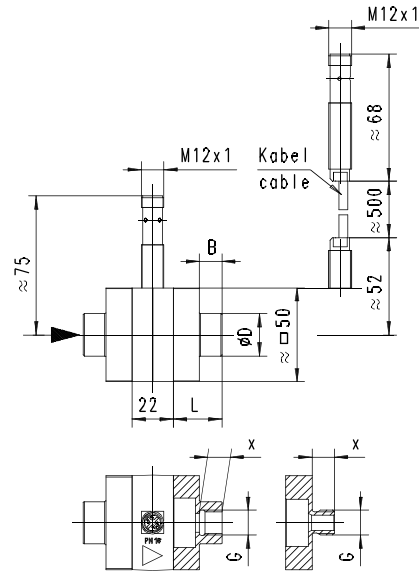
The new developed measuring-system of the FL-01 offers, by the fact, that it manages without any bearing a very good reproducibility and is practically free of hysteresis. In addition, the response time of the measurement is extremely small, due to the small mass of the spring diaphragm and the nearly complete coverage of the flow cross section. Therefore the instruments allows the detection of even the smallest starting values and a large measuring range of up to 1:100. Compared to some other principles of flow measurement, e.g. the calorimetric or the impeller system, the dynamics of the entire flow cross-section are detected in the FL-01 and not just a supposedly representative point in the center or at the edge of the flow profile. Straight inlet and outlet sections have a considerably less influence on the measurement result. The FL-01 connectors on the input and output sides are flanged to the measuring system at the factory, so if the device needs to be serviced, the connecting screws can be removed easily from the flange and the measuring-unit removed, without removing the connectors from the pipe. This flowmeter is a universally applicable, robust instrument, which is used in the entire industry. The excellent price-performance ratio and its multitude of technical advantages make it economically viable at many measuring points to replace old technologies, such as impeller or turbine flowmeters, with the FL-01.



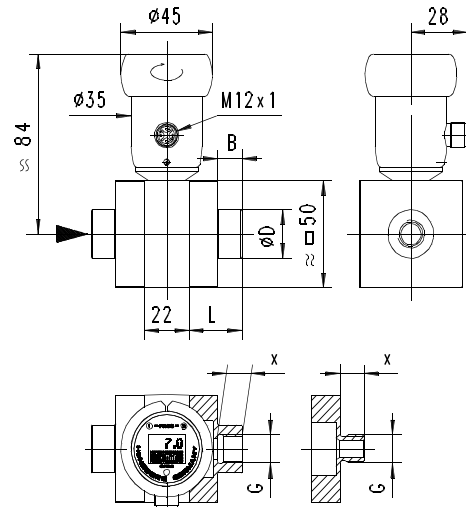
Technical Specifications:

Pressure resistance /	plastic: PN 16 metal: PN 100
Pressure drop /	max. 0.5 bar at scale-end
max. Mediatemp. /	0. . +70 °C with opt. high-temp. 0. . 150 °C
max. Ambient-temp. /	0. . +70 °C
Storage temp. /	-20. . +80 °C
Sensor /	flow-dependent diaphragm
Pipe diameter /	DN 8. . 25
Connection Type /	female thread G¼ to G1, optional male thread or tube, NPT-thread and customer specific connectors on request
Switching range /	1. . 100 l/min (water)
Measuring range (water) /	1. . 100 l/min; small-volume-range 0.4. . 6 l/min on request
Measurement uncertainty /	Standard range: ±3 % from measured value, at least 0.25 l/min Small-volume-range: ±3 % from measured range, at least 0.1 l/min
Display /	graphic LCD-Display extended temperature range -20. . +70°C, 32 x 16 pixels, back-lit, shows value and dimension, LED-signal blinking + message
Materials, wetted /	
Body:	PPS, brass nickel-coated CW614N or stainless steel 1.4404
Connections:	POM, brass nickel-coated CW614N or stainless steel 1.4404
Seals:	FKM
Diaphragm:	stainless steel 1.4031k
Magnetic holder:	PPS
Glue:	epoxy
Materials, not wetted /	
Sensorpipe:	brass nickel coated CW614N
Flange screws:	stainless steel or steel
with Display /	
Body:	stainless steel 1.4305
Glas:	hardened mineral glass
Magnet:	samarium-cobalt
Ring:	POM

Dimensions w/o Display:



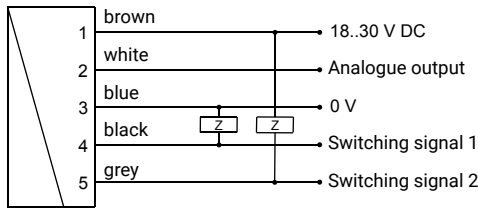
Dimensions with Display:



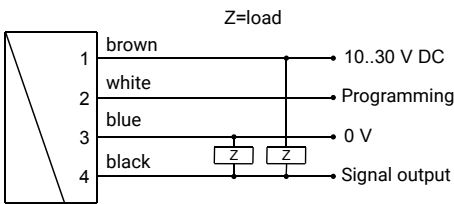
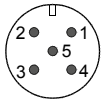
Range:

Pipe diameter	Switching range (l/min H ₂ O)
DN 8. . 25	0.4. . 6.0
DN 8. . 25	1.0. . 15.0
DN 10. . 25	1.0. . 25.0
DN 15. . 25	1.0. . 50.0
DN 20. . 25	1.0. . 80.0
DN 25	1.0. . 100.0

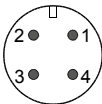
Elect. Connection:



Connection examples: PNP NPN



Connection examples: PNP NPN



Electrical Specifications:

Power supply /	10...30 VDC; 18...30 V DC with display: 15...30 V DC
Current output /	4...20 mA (0...20 mA on request max. 500 Ohm (only with display))
Voltage output /	0...10 V (2...10 V on request) current output max. 20 mA
Switching output /	transistor output „Push-Pull“ $I_{out} = 100 \text{ mA max.}$
Frequency output /	output frequency in relation to the range, standard 500 pulse/l (corresponds to 833,3 Hz at 100 l/min) 5000 pulse/l (corresponds to 500 Hz at 6 l/min) (other frequencies on request)
Pulse output /	transistor output „Push-Pull“ $I_{out} = 100 \text{ mA max.}$ pulse-width 50 ms pulse/quantity, please specify when ordering
Power consumption /	< 1 W (for unloaded outputs)
Connection /	for round connectors M12x1, 4-pin
Protection class /	IP 67 (IP 68 with oil filling)
Conformity /	CE

Ordering Codes:

Order number **FL-01.** **1.** **3.** **1.** **1.** **08.** **2.** **3.** **2.** **1**

FL-01 Diaphragm Flow Meter

Housing material /

- 1 = PPS
- 2 = brass, nickel plated(CW614N)
- 3 = stainless steel

Process connection material /

- 1 = POM
- 2 = brass nickel plated (CW614N)
- 3 = stainless steel

Seal material /

- 1 = FKM
- 2 = EPDM
- 3 = NBR

Process connection thread /

- 1 = female
- 2 = male
- 3 = hose fitting

Nominal diameter / (see table)

- 08 = ¼"
- 10 = 3/8"
- 15 = ½"
- 20 = ¾"
- 25 = 1"

Measuring range /

- 1 = 0.4...6 l/min (on request)
- 2 = 1.0...15 l/min
- 3 = 1.0...25 l/min
- 4 = 1.0...50 l/min
- 5 = 1.0...80 l/min
- 6 = 1.0...100 l/min

Output configuration /

- 1 = switching output pushpull (PNP and NPN)
- 2 = power output 4...20 mA
- 3 = current output 0...10 V
- 4 = frequency output (500 pulse/l)
- 5 = pulse output (please specify pulse/volume)
- 6 = digital on-site display with 2 transistor switching-outputs, display and analogue output 4...20 mA
- 7 = digital on-site display with 2 transistor switching-outputs, display and analogue output 0...10 V

Options /

- 1 = none
- 2 = with backflow resistance
- 3 = high-temperatures up to 150°C¹
- 4 = counter with external reset, antivalent switching-outputs and current-value display²
- 5 = current-value display with analogue output, volume-pulse-output and sum-counter²

Accessories /

- 0 = none
- 1 = counter plug M12x1, 4-pol.

¹ only with metal housing (with 300 mm cable separation)

² only with digital on-site indication

