

Flow Measurement using the digital FD38/39 pressure transmitter / switch

Importance of flow measurement:

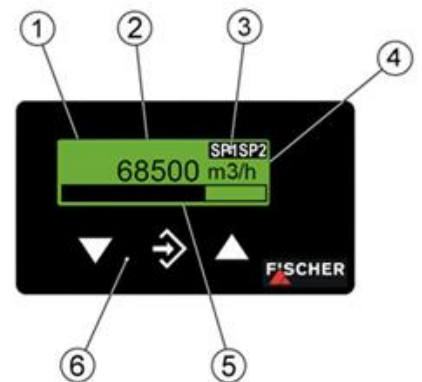
Flow measuring instruments are used in the fields of water and waste water, the chemical / petrochemical sectors, oil and gas industries, energy and steam generation, pharmaceutical, paper and pulp production as well as in the food and luxury food industries. Those instruments serve to cover numerous sector specific applications.

In the majority of cases, the flow volume is the decisive factor for the efficiency of the plant performance. In order to control its output as accurately as possible and to achieve a high degree of efficiency, the determination of the flow volume is of utmost importance.

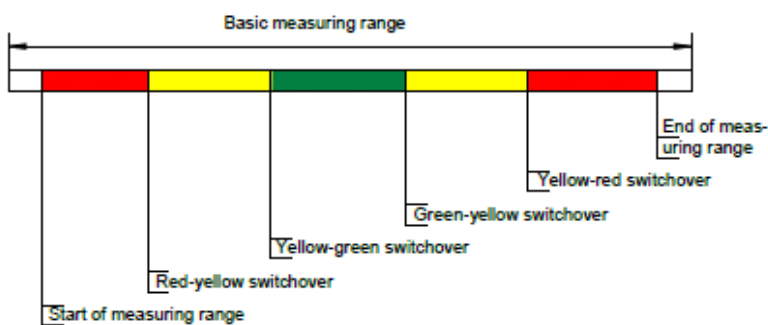
The compact design of the FD38/39 is an obvious advantage. There is no additional tubing necessary. The use of capillaries enables to cover various temperature ranges which may also exceed the admissible medium temperature of the measuring cell. In addition, the capillaries also serve to balance machine vibrations and potential pressure shocks caused by pulsating media.

Advantages of the LC display:

- switch contacts available as standard, NC / NO contacts (selectable)
- color change with freely adjustable measuring values and adjustable hysteresis up to 1800s
- easy parameterization by means of keypad
- storage of tables for value pairs
- square rooting of the output signal
- password-protection
- display of the differential pressure or flow volume (m³/h or l/min) including bar graph
- adjustment of contrast value



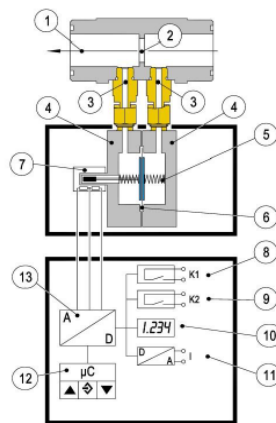
- 1 LC display with back lighting
- 2 Measurement display 4...6 digits
- 3 Status display of the switch points
- 4 Unit
- 5 Bar chart display
- 6 Keyboard



Advantages of restrictor measuring:

- allows high accuracy
- no electrical conductivity of the process medium required
- covers various temperature ranges
- maintenance free – no moving parts
- robust stainless steel design for effective media resistance

Functional Schematic



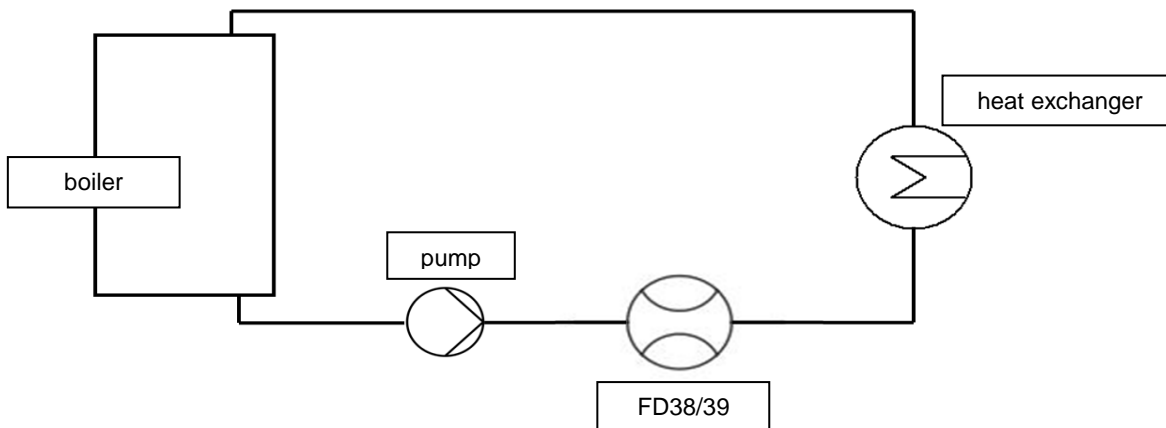
A Measuring path	
1	Flow direction
2	Measuring orifice
3	Differential pressure removal borehole

B Membrane measuring system	
4	Pressure chamber
5	Measuring springs
6	Measuring membrane
7	Inductive displacement transducer

C Electronics	
8	Switch output 1
9	Switch output 2
10	LC display
11	Analogue output
12	Microcontroller
13	Signal preparation

Simplified application example:

A pump is used to transfer the medium from a boiler to a heat exchanger. The intervening FD38/39 serves to precisely determine the flow volume and to regulate the pump.



	FD38	FD39
Nominal widths	DN 15 up to DN 63	DN 15 up to DN 63
Material: seal	FKM	EPDM, NBR, Viton, Kalrez®
Measuring principle	1 measuring diaphragm with inductive displacement sensor	2 ceramic pressure transmitters calculation of differential pressure
Material: measuring orifice	PP, 1.4404, PVDF	PP, 1.4404, PVDF
Output signal	0-20 mA, 4-20 mA, 0-10 V	0-20 mA, 4-20 mA, 0-10 V
Operating voltage	24 V AC/DC (12-32 V AC/DC)	24 V AC/DC (12-32 V AC/DC)
Display	LCD with color change	LCD with color change
Field of application	Flow measurement of gases and fluids with non-aggressive media	*) see remarks below

*) The FD39 is actually intended as a flow guard. With its two pressure sensors and its LC display is able to simultaneously show inlet, outlet, differential pressure and volume flow. Owing to its high media resistance, it can also be used for aggressive media as an alternative to the FD38.