CALORIMETRIC FLOW SWITCHES FOR EX ENVIRONMENT FS Ex 10/11/15/20

218.01en

DESCRIPTION AND APPLICATION

It is a device that monitors the flow of fluid based on calorimetry principle. If the flow rate drops below a limit set by user, the status output is changed. The flow rate is displayed by ten LEDs and it is possible to select a boundary for contact making/breaking in the same graduation. The measuring cycle takes from 4 sec to 8 sec with the recommended measurement range 4 to 150 cm/sec. In case of an empty pipeline, the sensor behaves in the same way as with zero flow.

These calorimetric flow switches are available in four versions:

- FS 10Ex – 1 × status output (depending on flow velocity)
- FS 11Ex – 2 × status output (depending on flow velocity)
- FS 15Ex – 2 × status output (1 × depending on flow velocity and 1 × on temperature)
- FS 20Ex – 1 × status output and 1 × current output (depending on flow velocity

Meter states displayed

The flow switch point on LED scale can be implemented using two colours (red LED or amber LED), indicating at the same time which contact is normally closed or normally, open. In case of FS 15Ex, the temperature switch point is indicated by the LED located between the control push buttons. If the temperature of media is above/below the set-point, the LED is red, indicating that PIN2 is open at the same time (the sensor supplied as standard is configured open at a temperature above the set limit with the LED turned ON). If the logic of the normally open/normally closed point is changed by the user, the logic of both outputs is changed at the same time (applicable to FS 11Ex and FS 15Ex versions).

The flow switch has two flush-type control buttons, making it possible:

- the switching point/points for flow velocity (temperature in some case)
- to change the logic of the N.O./N.C. output
- to calibrate the minimum and maximum flow values of the monitoring device
- to reset the original parameters from factory

I M1 Ex ia I Ma
II 1G Ex ia IIC T6 Ga
II 1D Ex ia III T85°C Da

ACCESSORIES

- FS adapter block

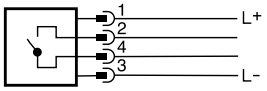
SPECIFICATIONS

Sensor type	FS 10Ex/11Ex/15Ex/20Ex
Power supply	24 V ± 10 % DV with polarity reversal protection
Input power	1.5 / 4 VA
Electrical connection	connector M12x1 (4 PIN)
Process connection	according to DIN 2353 with the M16 x 1.5 union nut through the 24° ring into the direct socket with pipe thread (G1/2"; G1/4"; M14 x 1.5; NPT1/4")
Sensor design	compact, separed (standard 3 m cable)
Display	10 x three-colour LED (flow velocity) 1 x LED (temperature – for FS 15Ex version only)
Output types	relay (for FS 10Ex version only), PNP, NPN, 4 to 20 mA (for FS 20Ex version only)
Contact rating	130 mA / 60 V / 500 mW
Time response *	1 to 6 s
Velocity flow range	4 to 400 cm/s
Accuracy	± 2 to ± 8 cm/s
Hysteresis	2 to 8 cm/s
Control	2 x flush-mounted buttom
Temperature of liquid	-10 to 80 °C
Ambient temperature	-20 to 55 °C
Material in contact with medium	stainless steel DIN 1.4404
Maximum pressure	64 bar
Ingress protection	IP 67 in accordance with 60529, as amended
Ambient humidity	max. 90 %
Status contact	SSR, passive, potential free, max. 350 V AC/DC, 150 mA, 400 mW
Weight	290 g
Dimensions (h x w x d)	91 x 74 x 60 mm (in case of the longer version, the height is 151 mm)

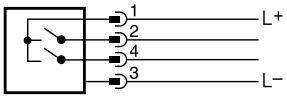
*) for water (25 °C)

WIRING DIAGRAM

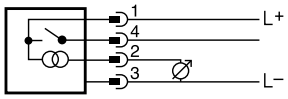
FS 10 – RELAY



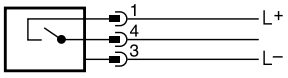
FS 11 / FS 15 – PNP



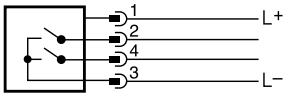
FS 20 – PNP



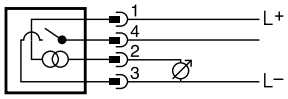
FS 10 – PNP



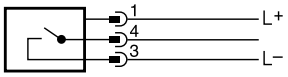
FS 11 / FS 15 – NPN



FS 20 – NPN



FS 10 – NPN



FS 10
RELAY

PIN 1 – Supply voltage +24 V
PIN 2 – Relay contact switch point
PIN 3 – Supply voltage GND
PIN 4 – Relay contact switch point

FS 10/FS 11/FS 15
PNP/NPN

PIN 1 – Supply voltage +24 V
PIN 2 – PNP/NPN contact of the flow switch point (FS 11 only) / / temp. (FS 15 only)
PIN 3 – supply voltage GND
PIN 4 – PNP/NPN contact of the flow switch point

FS 20
PNP/NPN

PIN 1 – Supply voltage +24 V
PIN 2 – 4–20 mA output
PIN 3 – Supply voltage GND
PIN 4 – PNP/NPN contact switch point

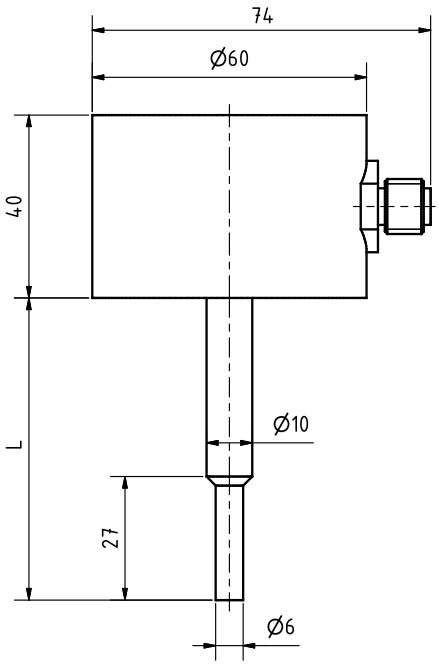
ELECTRICAL SAFETY PARAMETERS

The flow switch is normally delivered for 24 V DC ± 20% power supply. It must be fed from an intrinsically safe power supply with parameters compatible with our sensor and with regard to applicable classification according to the environment in which it will be used. Signal outputs of the flow switch can only be connected to devices with necessary protection degree for use in explosive atmospheres and their parameters correspond to applicable safety parameters for connection to our flow switch.

	Group devices I	Group IIC and IIIC devices
Power	Ui: 28.5 V Ci: 0 Li: 0	Ui: 28.5 V Ii: max. 115 mA Ci: 0 Li: 0
Relay output, passive	Ui: max. 28.5 V Ii: max. 115 mA Pi: max. 0.330 W Ci: 0 Li: 0	Ui: max. 28.5 V Ii: max. 115 mA Pi: max. 0.330 W Ci: 0 Li: 0
Realay output, active	Uo: max. Uo source Io: max. 115 mA Co: * LO: *	Uo: max. 115 mA Io: max. 115 mA Co: * LO: *
Current loop 4 to 20 mA active	Uo: max. 10.8 V Io: max. 196 mA Po: max. 0.529 W Co: < 10 mF LO: < 0.2 mH	Uo: max. 10.8 V Io: max. 196 mA Po: max. 0.529 W Co: < 1 mF LO: < 0.015 mH

** values are identical to those of the power supply*

DIMENSIONAL DRAFT



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