

Datasheet

Thermal Flow Switch F20

Introduction

F20 is based on two temperature sensors which are positioned within the medium. The unheated sensor registers the liquid temperature, the other sensor is heated a few degrees above the medium. When medium flows, the heat generated in the sensor is conducted away by the medium. The temperature of the sensor is measured and compared to the temperature of the medium. The state of flow can be derived by the temperature difference.



Characteristics

- High turndown ratio
- 8 LEDs for flow and switch state
- Compact design - diameter 36mm
- Protection class IP67
- Optional relay output
- Touchless operating by magnetic pen

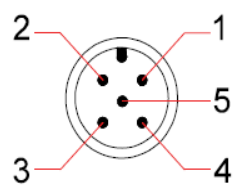
Applications

- Hydraulic and lubrication system
- Pump protection
- Cooling system
- Venting system
- Water treatment
- Leak monitoring

Specifications

Measuring range	Water: 1...150 cm/s (0.03...5 ft/s)
	Oil: 3...300 cm/s (0.1...10 ft/s)
	Gas: 20...2000 cm/s (0.65...65 ft/s)
Medium	Water / Oil / Gas
Repeatability	1% @ <0.6 m/s (2 ft/s)
	3% @ <1.5 m/s (5 ft/s)
	10% @ >1.5 m/s (5 ft/s)
Pressure rating	100 bar (1450 psi)
Initialization tme	1...8 s
Response time	1...13s adjustable
Power supply	18...30 VDC
Output	Relay (NC / NO programmable)
	Load: 200mA under 24VDC (NPN or PNP)
Wiring protection	Reverse polarity, Overvoltage and Short-circuit
Display	1 red LED (Flow velocity < switch point)
	1 yellow LED (Flow velocity = switch point)
	4 green LEDs (Flow velocity > switch point)
Ambient / Operating temperature	-40...85°C (-40...185°F)
Medium temperature	-20...85°C (-4...185°F)
Material	Housing: Aluminum
	Probe: stainless steel 304
Protection class	IP67
Electrical connection	M12 x 1

Wiring



Pin	Cable	Signal
1	Brown	Power +
2	White	NC
3	Blue	Power -
4	Black	NO
5	Gray	Relay terminal

PNP	NPN	RELAY
<p>PNP sensor wiring diagram: Pin 1 (brown) to L+, Pin 2 (white) to L+, Pin 3 (blue) to L-, Pin 4 (black) to L-.</p>	<p>NPN sensor wiring diagram: Pin 1 (brown) to L+, Pin 2 (white) to L+, Pin 3 (blue) to L-, Pin 4 (black) to L-.</p>	<p>RELAY sensor wiring diagram: Pin 1 (brown) to L+, Pin 2 (white) to NC, Pin 3 (blue) to L-, Pin 4 (black) to NO, Pin 5 (gray) to COM.</p>

LED function and Setup

	No flow or current flow is below set value, switch is off
	Current flow reaches set value, switch is on
	Current flow is higher than set value, switch keeps on. More green LEDs means higher flow rate.



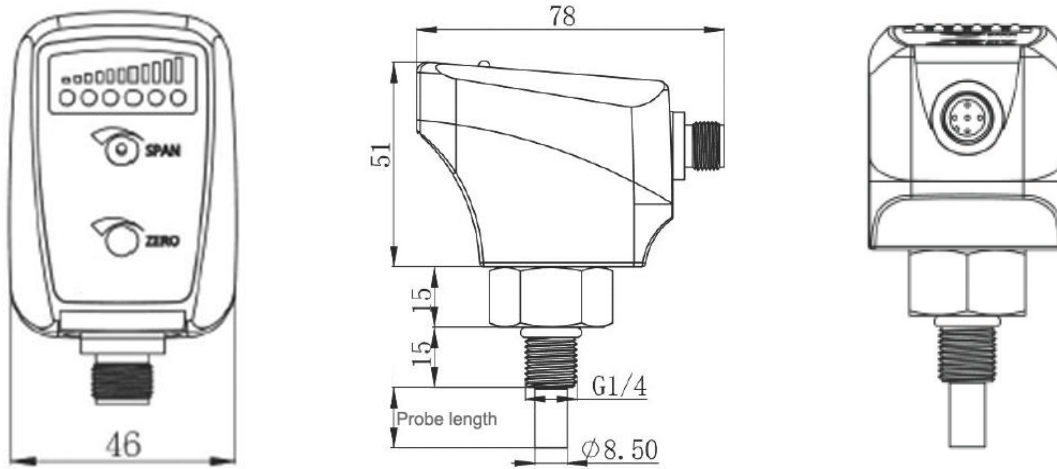
Response time adjustable: 1...13s

Mount the sensor and let the medium flows as desired monitoring value, adjust potentiometer till the first green LED turns on.

Once above is done, the switch will release if the flow is below desired value.

To make switching point below current flow rate, adjust potentiometer to have more green LEDs on.

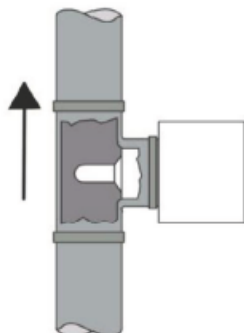
Dimensions Inch(mm)



Note:

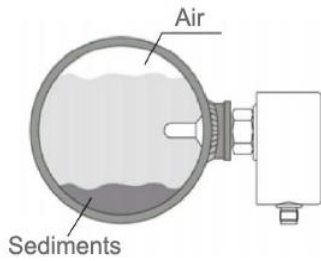
Above dimensions are for G1/4 thread connection, other thread on request.
Probe length L is 13mm by default, other length on request.

Mounting considerations

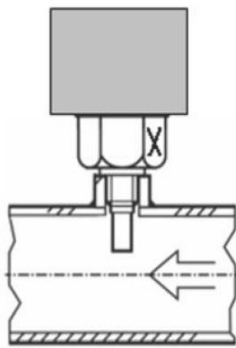


For vertical mount, make sure where medium flows upward.

At least half of probe should be immersed in the medium.



For horizontal mount, avoid probe touching air or sediments.
 At least half of probe should be immersed in the medium.



When mounting, the mark "X" should always face flow direction to have the best performance.

Order Code

Example: F20-G12HPRP

1. Model

F20- Thermal flow switch

2. Process connection

G12 G1/2 thread (probe length 27mm)
 G14 G1/4 thread (probe length 27mm)
 M18 M18 x 1.5 thread (probe length 60mm)

3. Thread

I Female thread (M18 x 1.5 only)
 H Male thread

4. Output

PR PNP (NC+NO SPDT)
 NR NPN (NC+NO SPDT)
 CR Relay (NC+NO SPDT)

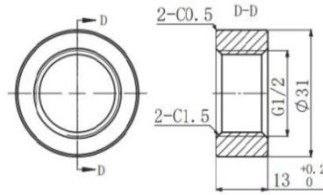
Accessory 1 - Cable

ST04-	PU	2	F	G	Description
ET04-					4-pin M12 x 1 cable
ET05-					5-pin M12 x 1 cable
ST04-					Self-lock 4-pin M12 x 1 cable
ST05-					Self-lock 5-pin M12 x 1 cable
	PU				Material: PUR
		02			Length: 2m / 6.5 ft (default)
		05			Length: 5m / 16 ft
		10			Length: 10m / 32 ft
			F		Female plug head
				G	Straight head
				W	Bend head

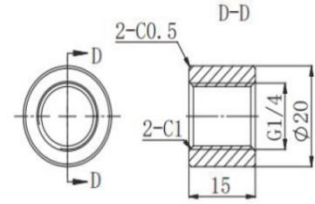


Accessory - Welding socket

TT01-	K	G14	Description
TT01-			Welding socket (For male thread)
	K		Material: stainless steel
		G14	Connection thread G1/4
		G12	Connection thread G1/2



G1/2



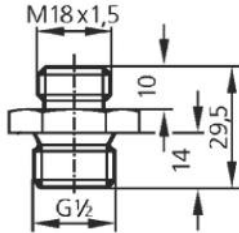
G1/4

Accessory - Adaptor for M18

TT02-	K	G14	Description
TT02-			Adaptor convert M18 to G12/G14 (For female thread)
	K		Material: stainless steel
		G14	Self-lock 4-pin M12 x 1 cable
		G12	Self-lock 5-pin M12 x 1 cable



G1/2



G1/4

