P20 SERIES

CORROSION RESISTANT INLINE FLOW SWITCHES

For liquids or gases in tubes and small diameter pipes



FEATURES

- Detects very low flows
- No metal parts in contact with the liquid
- All position mounting
- Easy to install
- High flow through
- 18 bar pressure rating
- Very low head loss

0.14 L/min
Switch-on flow
(P20-B and P20-R)

18 bar
261 psi maximum
operating pressure

pH 1–14
No metal parts in
contact with the liquid

3 modules
Reed switch or solid
state relay outputs

OUTLINE

The P20 Series inline flow switches are simple and reliable flow switches that can detect the flow of liquids or gases in tubes and small diameter pipes. The P20 can detect either continuous or pulsed flows. Typical applications include monitoring flow in water treatment and irrigation systems, domestic constant pressure system control, gland cooling systems and a myriad of uses in industrial process control.

The P20 flow switches give a simple on or off response to liquid flow. With no metal wetted parts, the P20 is ideal for use in aggressive liquids such as seawater, groundwater, acids and many chemical solutions. The standard switch is supplied complete with pipe spigots and unions, for direct fitting into PVC or ABS pipework. In addition, three electrical modules are available that give a wide choice of control options.

APPLICATIONS

- Liquid or gas flow detection
- Constant pressure pump control
- Loss of prime pump protection
- Water treatment control
- Industrial process control
- Irrigation control
- Chemical dosing systems
- Chilled water control
- Vapour flow detection

OPERATING PRINCIPLE

The body of the P20 flow switch houses a fluted piston. Any flow, either pulsed or continuous, causes the piston to be pushed back within the switch body to a point where the liquid can pass over the piston and out of the switch. The piston contains a magnet that actuates a reed switch and this provides the switching output. When flow stops, the piston is pushed back to the off position by a second magnet built into the switch body.

The magnetically sprung piston provides an exceptionally reliable corrosion proof mechanism. The sensitivity of the flow switch and its switching point are determined by the viscosity of the fluid and by the clearance between the piston and the switch body. The P20 flow switch can be mounted in any orientation in pipework, including upside down, with no adverse effects.

CONSTRUCTION

The standard P20 flow switch is made entirely from glass reinforced polypropylene, with nitrile O-ring seals. The piston return mechanism and the electrical switching action within the switch are achieved using high power magnets operating through the solid body of the switch.

The electrical housing is hose-proof and weatherproof, and is supplied with a built-in 20 mm cable gland for conduit or flexible cable entry. The electrical circuit boards used in the switch are interchangeable and all of the parts of the P20 flow switch are available as spare parts.

ORDERING

Build your part number from the codes below – for example **P20-B-20**.

P20	–	B	–	20

SERIES

P20 Series inline flow switch

ELECTRICAL MODULE

B S.P.S.T. N.O. reed switch

C S.P.D.T. break before make reed switch

R S.P.S.T. N.O. solid state relay

PROCESS CONNECTION

20 20NB (suits PVC pipe)

HEAD LOSS VERSUS FLOW RATE

The graph sets out the dynamic head loss across the P20 flow switch. The graph data refers to water at 15 °C as a test medium.

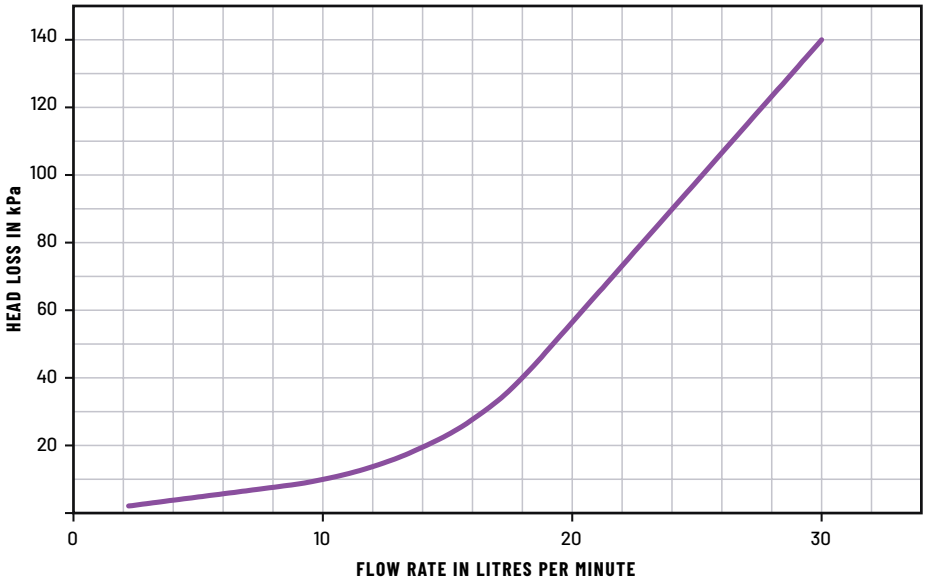


FIG. 1 Head loss versus flow rate

ELECTRICAL DATA

The P20 inline flow switch is available in a variety of electrical configurations to suit specific applications. The model numbers and details of these options are outlined in the table below.

SWITCH MODEL	MODULE TYPE	CONTACT CONFIGURATION	SWITCHED POWER MAXIMUM	SWITCHED VOLTAGE MAXIMUM	SWITCHED CURRENT RESISTIVE AC (RMS) MAXIMUM	INDUCTIVE LOADS (POWER FACTOR 0.4)	TYPICAL APPLICATION
P20-B	Dry reed switch	S.P.S.T. N.O.	50 W/VA	250 VAC 200 VDC	1.5 A	Not suitable	PLC and general control circuits
P20-C	Dry reed switch	S.P.D.T. break before make	20 W/VA	140 VAC 150 VDC	1 A	Not suitable	PLC and general control circuits
P20-R	Solid state relay (triac)	S.P.S.T. N.O.	740 W	12 to 240 VAC	4 A continuous (spike to 15 A)	4 A at 240 VAC	AC control circuits and AC motor control

OPERATING LIMITATIONS

PARAMETER	P20 SERIES
Maximum operating pressure (static or dynamic) at ambient temperature	**1800 kPa** 261 psi
Minimum burst pressure at ambient temperature	**9700 kPa** 1406 psi
Maximum liquid temperature *	**80 °C** at a pressure of 1 bar absolute
Minimum liquid temperature	**–30 °C**
Maximum recommended continuous flow rate (water)	**25** litres per minute
Liquid pH range	**1 to 14**

*** WARNING** The maximum operating pressure for the P20 Series switches must be linearly de-rated as operating temperature is increased, so that at 80 °C the maximum permissible operating pressure for the switch is not more than 1 bar absolute.

HAZARDOUS AREAS

The P20-B and P20-C are simple apparatus under AS/NZS 60079.11 and may be used in a hazardous area only as part of an intrinsically safe circuit, connected through suitably certified associated apparatus. They are not Ex certified in their own right. The full conditions of use are given in the installation sheet.

The P20-R is not certified for use in hazardous areas and must not be installed in any area classified as hazardous under AS/NZS 60079.10 (Zone 0, 1, 2, 20, 21 or 22).

SWITCH POINT DATA

MODEL	SWITCHING POINT ON A SLOWLY RISING FLOW (LITRES PER MINUTE)	SWITCHING POINT ON A SLOWLY REDUCING FLOW (LITRES PER MINUTE)	ELECTRICAL RESPONSE TIME (SECONDS)
P20-B & P20-R	0.14	0.065	0.4
P20-C	< 0.50	0.30	0.4

DIMENSIONS

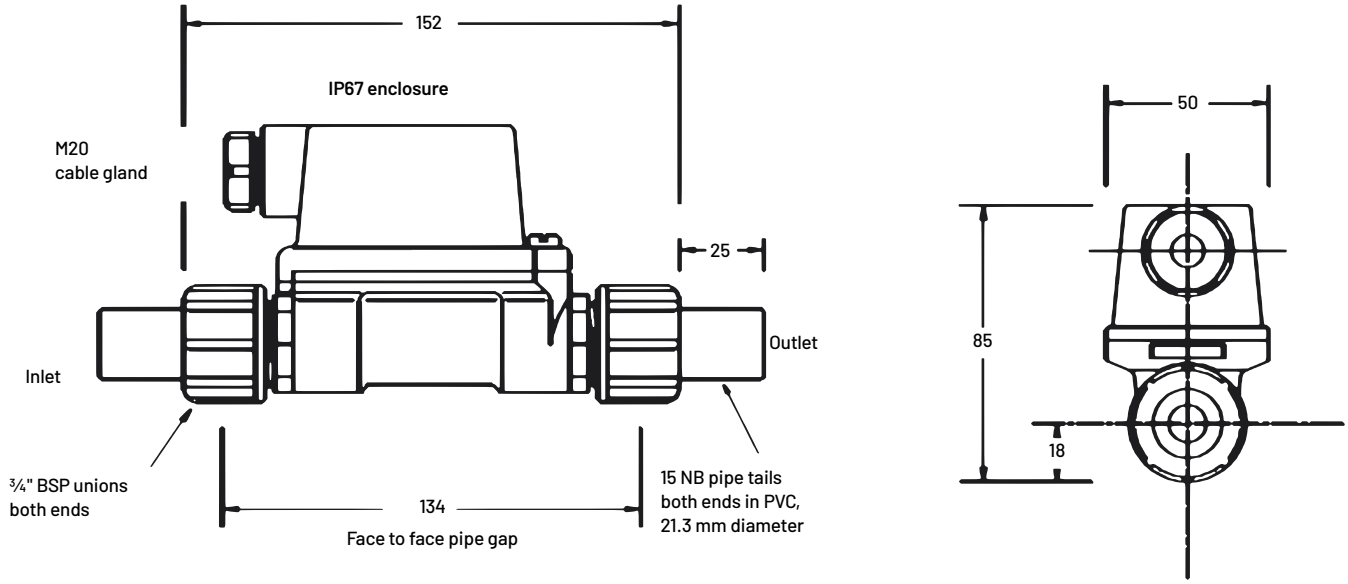


FIG. 2 Overall dimensions in millimetres – side and end views

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