

P25 SERIES CORROSION RESISTANT HEAVY DUTY INLINE FLOW SWITCHES



FEATURES

- DIRECTLY SWITCH PUMP MOTORS TO 1.5kW 2HP
- NO METAL PARTS IN CONTACT WITH LIQUIDS
- SUITS PIPES 15mm to 40mm (1/2" to 1 1/2") DIA.
- 100 LITRES PER MINUTE FLOW RATING
- VERSATILE ALL POSITION MOUNTING
- 18 BAR (260 PSI) PRESSURE RATING
- IP67 WEATHERPROOF HOUSING
- DETECTS VERY LOW FLOWS
- MANUAL OVERRIDE BUILT IN
- ADJUSTABLE SWITCH POINT

APPLICATIONS

- LOSS OF PRIME PROTECTION FOR PUMPS
- CONSTANT PRESSURE PUMP CONTROL
- CONTROL OF TANK FILLING SYSTEMS
- LOW YIELD BORE PUMP PROTECTION
- WATER TREATMENT MONITORING
- INDUSTRIAL PROCESS CONTROL
- METERING PUMP CONTROL
- MECHANICAL SERVICES
- IRRIGATION CONTROL



AUSTRALIAN MADE

DESCRIPTION

The P25 Inline flow switch is a rugged flow actuated sensor that can detect the flow of liquids in 15mm (1/2") to 40mm (1 1/2") diameter pipes. The switch can detect very low flows yet has a low head loss high flow through rating. It can be used to sense either continuous or pulsed flows. The P25 finds a myriad of applications in industrial, rural and domestic piping systems. It is particularly well suited to pressure boosting applications and in the control of constant pressure pumps, due to its ability to detect and switch at extremely low flows. In addition the P25 finds application in the protection of low yield bore pumps, and in remote tank filling systems. There are no metal parts in contact with liquids within the switch, so it is ideal for use in aggressive liquids such as groundwater, seawater, acids and in many chemical solutions.

The standard switch is supplied complete with pipe sockets and unions, for direct fitting into PVC, ABS or Poly pipework. The heart of the P25 flow switch is a 500Volt 20Amp single pole double throw switch with Tungsten contacts capable of directly controlling single-phase pump motors up to 2 Horse Power 1.5kW. A manual override switch is built into the body of every P25 flow switch. This feature allows pumping systems to be manually activated at any time for normal starting or for priming testing or commissioning.

OPERATING PRINCIPLE

The body of the P25 flow switch houses a free fitting piston. Any flow, either pulsed or continuous, causes the piston to be pushed back within the switch body to a point where liquid can pass around it and out of the switch. When pushed back by flow, the piston actuates a magnetically linked switch. When flow stops, the piston is pushed back to the off position by magnetic repulsion. There are no springs or metal parts in contact with the process liquid, and the magnetically isolated piston provides an exceptionally reliable corrosion proof mechanism. The sensitivity and set point of the P25 flow switch is adjustable over two overlapping flow ranges, by interchanging the inlet and outlet fittings on the switch. For fine tuning the switching point, a set screw located in the switch housing is provided.

TECHNICAL DATA

CONSTRUCTION

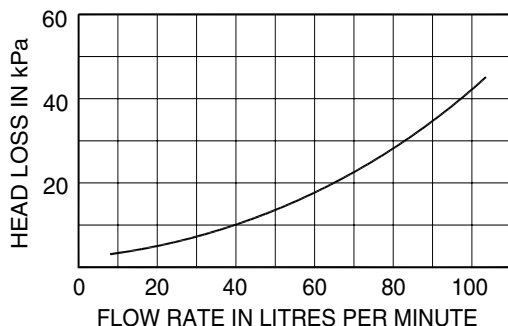
The standard P25 flow switch is made from glass reinforced polypropylene and ABS, with neoprene o-ring seals. The piston return mechanism and the electrical switching action within the sensor are achieved using high power magnets operating through the solid body of the switch. The electrical housing is hoseproof & weatherproof to IP67, and is supplied with a 20mm cable gland, for conduit or cable entry. All of the parts of the P25 flow switch are available as spare parts.

MODELS AVAILABLE

Mode	Description
P25-15	Switch supplied with 25mm Unions and 15NB PVC pipe sockets
P25-20	Switch supplied with 32mm Unions and 20NB PVC pipe sockets
P25-25	Switch supplied with 40mm Unions and 25NB PVC pipe sockets
P25-32	Switch supplied with 40mm Unions and 32NB PVC pipe spigots
P25-40	Switch supplied with 40mm Unions and 40NB PVC pipe spigots

Please Note: The standard P25 switches are available with either PVC or ABS pipe sockets or spigots. PVC is supplied as standard unless otherwise specified. In addition to the standard models, the P25 flow switch can be ordered with any combination of the available inlet and outlet fittings, for example with a 20mm inlet and a 25mm outlet. Additional pipe fittings in various materials are also available to suit the P25 flow switch, including male tapered pipe threads in a variety of sizes. The outlet union assembly of the P25 flow switch can be unscrewed and removed and the 25mm, (1" B.S.P.) parallel female thread in the switch body utilized directly as a pipe socket. This in effect converts the P25 flow switch from Male to Male, to Male to Female.

Flow rate versus differential head loss for the P25 flow switch.



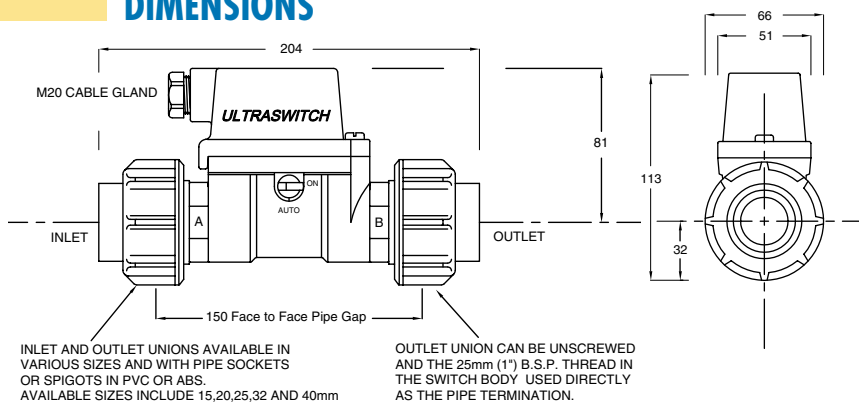
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DIMENSIONS



OPERATING PARAMETERS

Switching Point on a Slowly Rising Flow +/- 15%.	A Range Adjustable from 0.8 Litres per Minute to 5.3 L/min. B Range Adjustable from 2.2L/min. to 10L/min.
Switching Point on a Slowly Falling Flow +/-15%.	Approximately 20% less than the rising flow switching rate in both the A and B ranges..
Minimum Gravity Head Required to Actuate the P25 Switch	A or B Range at Maximum Sensitivity, 1.4 Metres,
Maximum Recommended Continuous Flow Rate	100 Litres per Minute (Head loss across the switch<50kPa at 100 L/min.)
Maximum Recommended Operating Pressure (Static or Dynamic) at Ambient Temperature	1800 kPa (260 P.S.I.)
Minimum Burst Pressure at Ambient Temperature	6000 kPa (865 P.S.I.)
Maximum Liquid Temperature (Standard P25 Switch)	80°C
Minimum Liquid Temperature (Standard P25 Switch)	-30°C
Liquid Ph range	1 to14
Ingress Protection Rating (Weatherproof Rating)	IP67

Note: Switching point flow rate date given in the table above refers to water at 15°C as the process fluid. Maximum operating pressure given in the table must be de-rated, in the interest of safety, in proportion to temperature increase and in consideration of any chemical solutions being processed.

ELECTRICAL DATA

The P25 flow switch houses a high capacity single pole double throw microswitch suitable for most general control applications and for the direct control of pump motors up to 1.5kW 2HP.

Rated Voltage	NON INDUCTIVE LOADS				INDUCTIVE LOADS			
	Resistive Load		Lamp Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	20A		7.5A		20A		12.5A	
250 VAC	20A		7.5A		20A		8.3A	
500 VAC	15 A		4A		10A		2A	
8 VDC	20A		3 A	1.5 A	20A		12.5A	
14 VDC	20A		3 A	1.5 A	15 A		12.5A	
30 VDC	6 A		3 A	1.5 A	5 A		5 A	
125 VDC	0.5 A		0.5 A		0.05 A		0.05 A	
250 VDC	0.25 A		0.25 A		0.03 A		0.03 A	

INSTALLATION AND OPERATING SHEET FOR P25 SERIES INLINE FLOW SWITCHES

PLEASE READ THIS INSTALLATION SHEET CAREFULLY AND FULLY BEFORE INSTALLING OR SERVICING THIS FLOW SWITCH.

INTRODUCTION

The P25 flow switch is a magnetically operated sensor that will turn on or off in response to liquid flow. The body of the switch contains a piston that partly obstructs the line of flow. To pass through the switch, the process liquid must push the piston back and flow over it and out through the outlet of the switch. When flowing liquid pushes the piston back, a magnet inside the piston actuates a powerful switch in the electrical housing. This provides a set of closed, (or open) electrical contacts that can be used in control circuits to indicate flow, or to directly actuate pump motors. The body of the P25 switch contains a second magnet that opposes the magnet in the piston. The repulsive force generated between the piston and the switch magnets constantly pushes the piston back to the off position, against the incoming flow. This unique magnet system negates the need for metal springs and provides the switch with exceptional reliability.

OPERATING ENVIRONMENT

The P25 flow switch has no metal parts in contact with the process fluid. Inert thermoplastics are all that come in contact with the liquid passing through the switch. This means the P25 can be used in aggressive chemical solutions, seawater, and bore water and in many fluids that would attack metal parts. The P25 flow switch contains a close fitting piston, and should only be used in applications where the process fluid is reasonably clean and free of entrained or suspended material. Fluids containing large particulate matter, ferrous materials or fibrous matter should not be used in this switch. If the degree of contamination of the process fluid can't be guaranteed, then suitable line filtration should be fitted to the system.

The standard P25 flow switch is constructed from glass reinforced polypropylene, with neoprene o-rings, and an ABS electrical housing. The P25 flow switch is weatherproof to IP67, that is it is suitable for all outdoor exposed applications. The switch should be protected from freezing, or from exposure to liquid temperatures in excess of 80°C. The P25 flow switch should not be used in applications where the line pressure exceeds 18 bars, in the interest of safety, the switch has a burst pressure rating of >60 bars. Care should be taken not to expose the P25 flow switch to excessive pressures such as may be generated by water hammer.

The environmental limitations and the main performance parameters of the standard P25 flow switch are set out in the table below.

OPERATING LIMITATIONS

Maximum Recommended Continuous Flow Rate	100 Litres per Minute (Head loss across the switch < 50kPa at 100 L/min.)
Maximum Recommended Operating Pressure (Static or Dynamic) at Ambient Temperature	1800 kPa (260 P.S.I.)
Minimum Burst Pressure at Ambient Temperature	6000 kPa (865 P.S.I.)
Maximum Liquid Temperature (Standard P25 Switch)	80°C
Minimum Liquid Temperature (Standard P25 Switch)	-30°C
Liquid Ph range	1 to 14
Ingress Protection Rating (Weatherproof Rating)	IP67

Please note: Maximum operating pressure given in the table must be de-rated, in the interest of safety, in proportion to temperature increase, and in consideration of any chemical solutions being processed.

INSTALLATION

The P25 flow switch can be mounted in any orientation in the pipework, including upside down. There is a direction of flow arrow on the switch body. This directionality must be adhered to, as the switch will not operate against a reversed flow. Pipework can be used to support the switch, or the switch can be connected directly into valve manifolds or pump ports. Do not use this flow switch as a non-return valve.

PIPE TERMINATIONS & SPIGOTS

There are a number of optional piping terminations available that may have been supplied with the P25 flow switch. These include tapered or parallel BSP male fittings, in 15mm (1/2") through to 40mm (1 1/2") sizes. The parallel thread fittings are supplied with suitable union nuts O-rings and pipe sockets or spigots. The taper thread adaptors are not supplied with unions, as they are intended to be screwed directly into pipework. The outlet union assembly of the P25 switch can be unscrewed and any standard 25mm pipefitting can be screwed directly into the 25mm (1" B.S.P.) female (parallel) thread in the switch body.

SENSITIVITY AND SWITCHING POINT

There are two methods of adjusting the switching point of the P25 flow switch in relation to flow.

1. The inlet and outlet adaptors, (items 18 in the parts list) are marked on their octagonal faces, **A** and **B**. As supplied by the factory, the **A** adaptor is fitted to the inlet of the switch, and the **B** adaptor to the outlet of the switch. The **A** adaptor has a slightly different internal shape to the **B** adaptor and when fitted to the inlet of the switch requires the lowest flow rate to actuate the switch. By substituting the **B** adaptor for the **A** adaptor in the inlet of the switch a second and higher range of switching points is available to the installer. The exact flow rates required to actuate the P25 flow switch in both the **A** and **B** configuration are given in the accompanying tables.
2. For fine adjustment of the switch point, an adjusting screw is provided inside the electrical housing of the switch, as indicated in the accompanying sketch. As supplied, the adjusting screw is wound fully in, that is the switch is set to its least sensitive. To increase the sensitivity, and thereby reduce the flow rate required to actuate the switch simply wind the adjusting screw anti-clockwise, or outward. The maximum sensitivity is reached at a point where the head of the screw is flush with the top of the angled cowling that surrounds the head of the screw.

SWITCHING POINT, A RANGE

Switching Point on a Slowly Rising Flow.	Adjustable from 0.8 Litres per Minute to 5.3 Litres per Minute
Switching Point on a Slowly Falling Flow	Approximately 20% less than the rates given above.
Minimum Gravity Flow Head Required to Actuate Switch	1.4 Metres Head at Maximum Sensitivity.

SWITCHING POINT, B RANGE

Switching Point on a Slowly Rising Flow.	Adjustable from 2.2 Litres per Minute to 10 Litres per Minute
Switching Point on a Slowly Falling Flow	Approximately 20% less than the rates given above.
Minimum Gravity Flow Head Required to Actuate Switch	1.4 Metres Head at Maximum Sensitivity.

Please Note: Switching point flow rate data given in the tables above refers to water at 15°C as the process fluid and is accurate to +/-15%

ELECTRICAL

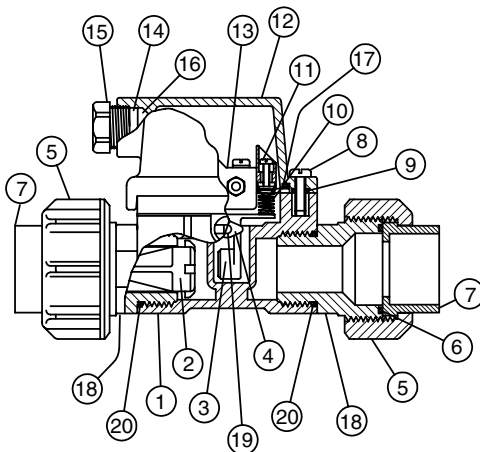
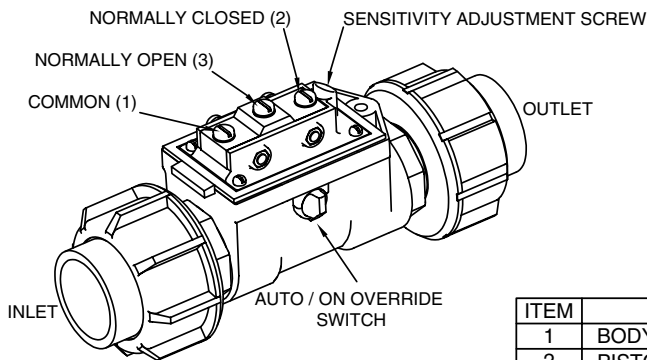
All electrical work associated with the P25 flow switch must be carried out by qualified persons only and must conform to the relevant local codes.

The electrical enclosure on the P25 switch is accessible by removing one screw on the lid. The lid has an integral 20mm cable gland designed to accept flexible cable up to 10mm diameter. If the gland nut is removed the exposed female thread will then accept a 20mm conduit bush. The accompanying table sets out the electrical rating of the switch.

ELECTRICAL DATA

The P25 flow switch houses a high Amperage single pole double throw switch suitable for most general control applications and for the direct control of pump motors up to 1.5kW 2HP.

Rated Voltage	NON INDUCTIVE LOADS				INDUCTIVE LOADS			
	Resistive Load		Lamp Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	20A		7.5A		20A		12.5A	
250 VAC	20A		7.5A		20A		8.3A	
500 VAC	15 A		4A		10A		2A	
8 VDC	20A		3 A	1.5 A	20A		12.5A	
14 VDC	20A		3 A	1.5 A	15 A		12.5A	
30 VDC	6 A		3 A	1.5 A	5 A		5 A	
125 VDC	0.5 A		0.5 A		0.05 A		0.05 A	
250 VDC	0.25 A		0.25 A		0.03 A		0.03 A	



OVERRIDE SWITCH

The P25 flow switch incorporates a built in manual override that allows the flow switch to be operated even if no flow is present. Located on the side of the switch body, the override is operated by rotating its dial 90° between AUTO and ON. In the AUTO position the switch only responds to liquid flow. In the ON position the switch ignores liquid flow (or lack of it) and actuates the switch. Turning the switch dial to the on position allows the flow switch and its associated circuits to be tested and also allows pumps to be primed or pressure accumulators to be charged. In normal operation the override should be rotated fully into the auto position. Note that the P25 flow switch may not operate correctly if the dial is left part way between on and auto.

MAINTENANCE

If The P25 flow switch is correctly installed and if the process fluid is compatible with the materials of construction of this switch, then a very long maintenance free service life can be expected from this switch. Factors that may contribute to early failure of the P25 include excess temperature, excess pressure or electrical loads in excess of the microswitch's rating.

Please Note: All of the components of this switch are available as spare parts

ITEM	DESCRIPTION	QTY	MATERIAL
1	BODY	1	GLASS REINFORCED POLYPROPYLENE
2	PISTON	1	ABS
3	SWITCH ARM & MAGNET	1	ABS
4	TOGGLE ASSEMBLY	1	ABS
5	UNION NUT	2	GLASS REINFORCED POLYPROPYLENE
6	O-RING	2	NEOPRENE
7	PIPE SOCKET	2	PVC (STANDARD) ABS (OPTIONAL)
8	LID SCREW	1	M5 BY 16 STAINLESS PAN HEAD
9	RETAINER RING	1	NEOPRENE
10	SPRING	1	STAINLESS STEEL
11	SENSITIVITY ADJUSTMENT	1	M3.5 BY 14 STAINLESS PAN HEAD
12	LID	1	ABS
13	MICROSWITCH ASSEMBLY	1	A20 MICROSWITCH AND CARRIER
14	GLAND BACKING RING	1	ABS
15	GLAND NUT	1	ABS
16	CABLE GROMMET	1	SANOPRENE
17	LID GASKET	1	SANOPRENE
18	25 by 40 ADAPTOR A & B	2	GLASS REINFORCED POLYPROPYLENE
19	TOGGLE O-RING	1	NEOPRENE
20	BODY O-RING	2	NEOPRENE

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