KELCO

F26 SERIES CORROSION RESISTANT HEAVY DUTY FLOW SWITCHES

FEATURES

- 0 TO 500VAC 15AMP S.P.D.T SWITCH
- 15 OR 20AMP MODELS AVAILABLE
- 1" BSP OR 1" NPT PROCESS CONNECTION
- STAINLESS, BRASS & POLYPROPYLENE MODELS
- SUITS PIPE SIZES 25mm (1") AND ABOVE
- 18 TO 200 BAR PRESSURE RATING
- MANUAL OVERRIDE BUILT IN
- SUBMERSIBLE IP67 HOUSING
- SEAL-LESS MAGNETIC DRIVE
- DIESELINE MODEL AVAILABLE
- EASILY SERVICEABLE

The F26 heavy-duty flow switch is a tough but highly sensitive paddle flow switch suitable for a wide range of flow control applications in cold to warm liquids. The switch is designed to integrate into modern piping systems and to compliment the inherent advantages of such systems.

The F26 flow switch is available in two basic forms, a general-purpose model designated F26-S, which is suitable for most control circuit applications and for the direct control of low wattage pump motors. The second version, model F26-H is supplied with a 20Amp 500Volt switch suitable for directly controlling heaters, fans or pump motors up to 1.5kW 2HP. Both versions of the switch are available in either glass-reinforced Polypropylene, or in a combination of DR brass, 316 stainless and Nylon or Polypropylene. All F26 flow switches are supplied with an extra long polypropylene paddle designed to be cut to any required length or width.

A unique feature of all the F26 flow switches is a built in manual override switch which allows the flow switch to be turned on, regardless of lack of flow. This feature allows pumps to be manually started, or primed and also facilitates the testing and commissioning of pumping systems.

Our well tried and proven magnetic repulsion system is built into each F26 flow switch and couples paddle movement to the high compliance switch through a wall of solid material. The result is a flow switch with no seals or bellows or other points of potential failure. Where required, the F26 flow switch can be supplied with no metal parts in contact with the process liquid. The F26 flow switch can be used reliably in a huge variety of liquids including seawater, bore water, acids and alkalis and in many chemical solutions.

MODELS AVAILABLE

F26-S	Standard all Polypropylene switch with 15Amp 500V SPDT switch
F26-SS	316 stainless & Polypropylene model with 15Amp 500V SPDT switch
F26-H	All Polypropylene heavy duty model with 20Amp 500V SPDT switch
F26-HS	316 stainless & Polypropylene model with 20Amp 500V SPDT switch
F26-SB	DR Brass & Polypropylene model with 15Amp 500Volt SPDT switch
F26-HB	DR Brass & Polypropylene heavy duty model with 20Amp 500V SPDT switch
F26-D	DR Brass & Nylon 15Amp 500V SPDT for use in Dieseline applications

Note: DR Brass is Dezincification Resistant Brass

ORDERING

F26 - S - BSP

- S: SEE TABLE OF MODELS AVAILABLE
- BSP: PROCESS CONNECTION — BSP = 1" BSPT, NPT = 1" NPT

AUSTRALIAN MADE

INSTALLATION AND OPERATING INSTRUCTIONS FOR F26 SERIES HEAVY DUTY FLOW SWITCHES

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

INTRODUCTION

The F26 series flow switch is a versatile heavy-duty paddle flow switch suitable for detecting flow or no flow conditions in liquids flowing in pipes of any diameter from 25mm upward. The switch is available in two versions, a polypropylene model designated F26-S, and a stainless body version designated F26-SS. Both switches are identical with the exception of the stainless body. The standard polypropylene switch is suitable for most applications where static or dynamic pressures are less than 18 Bars. The stainless version can safely tolerate pressures to 100 Bars. The F26-SS has the advantage of higher mechanical strength and finds application in fire prone or vandal prone areas and is also suitable for marine use. Both of the standard models are available with a high Amperage switch capable of directly controlling single phase pump or fan motors, to 1.5kW 2HP. These switches are designated F26-H (polypropylene version) and F26-HS (316 stainless version).

OPERATING ENVIRONMENT

Maximum operating pressure (static or dynamic) at ambient temperature.	18 Bars (260 PSI) polypropylene model 100 Bars (1450 PSI) Stainless model
Minimum burst pressure at ambient temperature.	80 Bars (1160 PSI) polypropylene model 400 Bars (5800 PSI) Stainless model
Maximum operating temperature (Liquid)	80 Degrees C at a pressure 1 bar absolute, see note below
Minimum operating temperature (Liquid)	-30˚C
Process liquid Ph range	1 to 14
Ingress protection rating (Housing)	IP67

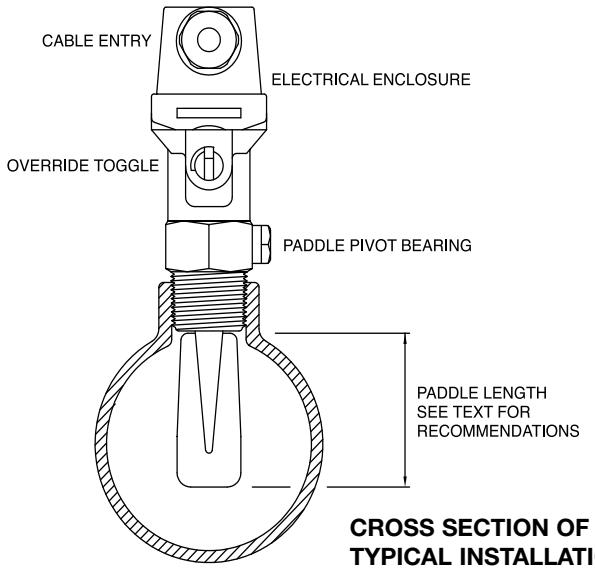
Note: temperature for the maximum operating pressure shown in the above operating environment table is 15°C, In the interest of safety, when using the polypropylene version of the F26 series, maximum operating pressure must be de-rated linearly in direct proportion to temperature increase, to a maximum pressure of 1 bar absolute at 80 degrees Centigrade. In other words only use this switch at elevated temperatures in non pressurised systems that are totally open to atmosphere in all circumstances and under all conditions.

INSTALLATION

Select a location for the flow switch in a straight run of pipe ideally with five pipe diameters of straight pipe either side of the switch. This will ensure a linear non turbulent flow acts against the paddle of the switch. Do not install the flow switch in any location likely to expose it to excessive turbulence, such as directly adjacent to valves or pumps, pipe bends or elbows. The object is to achieve a smooth flow against the paddle of the switch and thus obtain a stable non-chattering response from the flow switch. The F26 flow switch can be mounted in either the suction or discharge pipe of a pump, the switch will respond equally well in a negative pressure situation as well as in a positive pressure application.

The F26 flow switch is supplied with an extra long paddle suitable for flow sensing in large diameter pipes. The paddle will require trimming to allow installation in smaller diameter pipes. The paddle can be cut and shaped as required using tin snips or similar tools. See the accompanying table for recommendations on paddle lengths. Note that the paddle can be cut both in length and if required, in width. Many installers maintain a more stable flow response can be obtained by narrowing down the paddle, and thus avoiding turbulence close to the walls of the pipe.

The F26 flow switch can be installed in either horizontal or vertical piping, at right angles to the pipe, or at any angle up to 45˚ off the vertical axis. Do not install the flow switch on the underside of horizontal pipes, or in any orientation where debris may accumulate in the pocket in the switch body and ultimately prevent the switch from operating.



CROSS SECTION OF TYPICAL INSTALLATION

A suitable 25mm (1") B.S.P. female thread socket must be provided to fit the flow switch. This may be a tapping saddle or a pipe tee, or a socket welded directly to the piping. Ensure that whatever fitting is used, sufficient clearance is allowed for the free movement of the paddle. Normally a clearance to the full inside diameter of the 1" B.S.P. thread (28mm) will be required. The F26 flow switch can be installed in a one inch B.S.P. socket attached to a short stand off pipe, at 90˚ to the main pipe. This method increases the sensitivity of the switch to low flows due to the extra leverage against the tip of a longer paddle. If it is implemented, please ensure extra clearance is allowed for the free radial movement of the longer paddle.

Use thread tape or sealant and tighten the switch into the socket using the spanner flats provided on the switch body. Do not tighten the switch into its socket by twisting the switch body, as damage to the flow switch may result. Align the flow switch squarely to the axis of the pipe, with the direction of flow arrow on the switch body pointing correctly and aligned along the pipe. This flow switch will not function correctly unless the alignment is correct.

When installing the flow switch in vertically running pipework, note that the sensitivity of the switch will be slightly increased, it will detect lower flows when flow is downward and will be slightly decreased when flow is upward. This is due to the effect of gravity and the dead weight of the paddle itself. This effect is more noticeable in larger pipes and low flows where long paddles may be used.

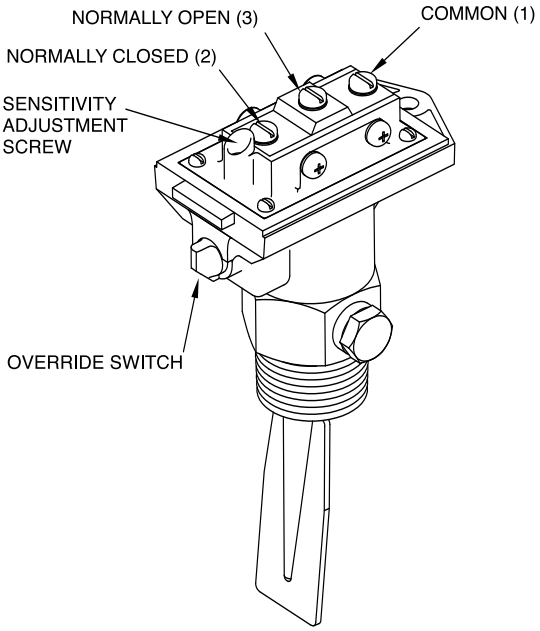
MANUAL OVERRIDE

The F26 flow switch has a built in manual override, located under the cable gland on the end face of the switch. The rotary toggle switch is marked AUTO and ON. In the AUTO position the flow switch responds solely to flow, and the toggle switch has no effect. In the ON position the flow switch is actuated regardless of the state of the actual flow, that is, the switch is turned on. The override feature is handy for testing new installations, commissioning systems and for manually priming pumps or starting diesel pump sets etc. In normal operation the override switch should be rotated fully into the AUTO position. Do not operate the flow switch with the override partly between auto and on, as it may not function correctly.

ELECTRICAL

All electrical work associated with this flow switch must be carried out by qualified persons only and must be in accordance with the relevant local codes.

The F26 flow switch houses a magnetically coupled high current high voltage single pole double throw microswitch. Two versions are available, the F26-S which is fitted with a 15Amp 500Volt switch suitable for most general control circuit applications, and the F26-H which is fitted with a 20Amp 500Volt switch capable of directly controlling motors up to 1.5kW 2HP. The accompanying table and sketch gives the electrical rating of the two models, and the terminal designations.



In exposed locations ensure the lid and cable gland are securely tightened and secondary precautions such as cable drip loops are employed to ensure the ingress protection rating of this switch is achieved.

PADDLE TRIMMING AND FLOW SENSITIVITY

There are two methods of setting the sensitivity of the F26 flow switch. By far the most effective method is by trimming the paddle. For fine tuning, a sensitivity adjustment screw is provided, as shown in the accompanying sketch. As supplied, the sensitivity screw is wound fully in and is set to minimum sensitivity. The adjusting screw can be wound out, and the sensitivity slightly increased. The maximum effect is achieved with the screw wound out to a point where the screw head is flush with the base of the angled cowling.

The best effect is achieved by paddle trimming and this is a compromise between sensitivity to the duty flow and stress on the intruding paddle. Fluid flow generates force, and a certain minimum amount of force is required by the flow switch in order to function. Excessive force however can bend or break paddles.

ELECTRICAL DATA

The F26-S and the F26-SS models are suitable for general control circuit applications

MODELS F26-S AND F26-SS								
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	15A		3 A	1.5 A	15A		5A	2.5A
250 VAC	15A		2.5A	1.25A	15A		3A	1.5A
500 VAC	10A		1.5A	0.75A	6A		1.5A	0.75A
8 VDC	15A		3 A	1.5 A	15A		5A	2.5A
14 VDC	15A		3 A	1.5 A	10A		5A	2.5A
30 VDC	6A		3 A	1.5 A	5A		5A	2.5A
125 VDC	0.5A		0.5 A	0.5 A	0.05A		0.05A	0.05A
250 VDC	0.25A		0.25 A	0.25 A	0.03A		0.03A	0.03A

The F26-H and the F26-HS models are suitable for the direct control of pump motors up to 1.5kW 2HP.

MODELS F26-H AND F26-HS								
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	

The accompanying table gives the flow in litres per minute required to actuate the F26 flow switch when installed in Schedule 40 Steel Pipe of various diameters. The flow rates given refer to water as the process liquid. In the case of 25NB and 32NB pipe, the paddles are trimmed to clear the inside wall of the pipe by 3mm. For all other pipe diameters the switch is fitted with a standard width paddle that has been trimmed to the centre line of the pipe. The data is accurate to +/-15% in a non-turbulent flow installation; with 5 diameters of straight pipe either side of the switch. **The accompanying table should be used as a general guide only.** Increasing the paddle length will proportionally increase the sensitivity of the switch. That is it will decrease the flow rate required to actuate the F26 flow switch. Inversely, decreasing the paddle length will reduce the sensitivity of the switch and increase the flow rate required to actuate the switch. Maximum recommended flow rates are determined by setting a safe limit to the flow induced forces acting on the paddle. Under the conditions described above the maximum flow rates should not exceed 5 times the switching point flow rates given in the table. Proportionally reducing the paddle length can substantially increase the safe maximum flow rate, but at a low flow will also increase the flow rate required to actuate the switch.

Pipe size	25NB	32NB	40NB	50NB	65NB	80NB	100NB	150NB	200NB
Switching point on a rising flow in L/Min	6	10	13	18	26	39	52	85	132

MAINTENANCE

If the F26 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. Factors that may contribute to early failure of the F26 flow switch include excess temperature, excessive pressure or electrical loads in excess of the switch's rating.

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