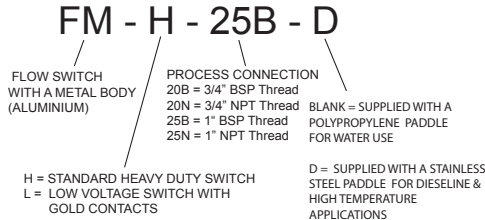


INSTALLING AND OPERATING THE KELCO FM FLOW SWITCH



Please read these installation and operating instructions fully and carefully before installing or servicing this Flow Switch. The FM flow switch is a mains voltage device. Death or serious injury may result if this switch is not correctly installed and operated. All electrical work on this switch must be performed by a fully qualified and licenced electrician.

CHECK THE SWITCH MODEL NUMBER



MECHANICAL INSTALLATION

1) Before installing check the part number of the switch to ensure it is suitable for the application in terms of pressure, temperature and electrical load. The part number can be found on a label on the inside of the lid of the switch. Check the suitability against the tables of data on this sheet.

2) Cut the paddle of the switch using a hacksaw or tin snips so that when installed in the pipe the paddle clears the inside of the pipe at all points.

Paddle length can be found using our online paddle trimming calculator.

<http://www.kelco.com.au/paddle-trimming-calculator-2>.

If you are unsure of the flow rate, cut the paddle so it intrudes 3/4 of the way across the pipe. If you think the flow rate will be low, cut the paddle so it just clears the bottom of the pipe. If you think the flow rate may be high, cut the paddle so it intrudes 1/4 to 1/2 way across the pipe. If you cut too much off the paddle and the switch fails to detect flow note that spare paddles are available from your supplier.

3) Select a suitable location for the switch in the pipework. Allow at least 5 diameters of straight pipe before and after the switch. This switch can be installed in either the suction or delivery pipework of a pump. The flow switch can be installed in either horizontal or vertically running pipework.

Note: When used in vertical pipework flow must be upward, not downward. Do not install this switch on the underside of horizontal pipework.

4) The switch can be installed in a pipe tee, a tapping saddle or a pipe socket welded to the pipe. The flow switch must be mounted square to the line of flow so flow impacts on the flat face of the paddle. The direction of flow arrow on the switch must point in the direction of flow.

5) Use Teflon tape or a suitable thread sealing compound and screw the switch into the socket allowing at least 4mm of thread between the top of the socket and the top end of the thread on the switch. Use a spanner and the spanner flats on the switch to screw the switch in. Never twist the switch body or use it to screw the switch into the pipework.

6) As supplied, the FM flow switch is set to its maximum sensitivity. That means it will detect the lowest possible flow. If you need to reduce its sensitivity to flow, remove the red dust cap and adjust the sensitivity screw on the switch. Use a wide straight bladed screwdriver for this. Wind the sensitivity screw out (anti clockwise). This reduces the sensitivity to flow. It will require a higher flow to actuate the switch the further out the

MAINTENANCE

The FM flow switch is a low maintenance device. Provided it is correctly installed it should function properly for many years. Factors that may reduce its useful life are pressures and temperatures in excess of its rating and electrical loads greater than the limits of its built in microswitch.

Should maintenance be required, spare parts including spare paddles are available from your supplier.

ELECTRICAL INSTALLATION

1) This FM flow switch may have been supplied with one of two microswitches fitted. The standard microswitch is suitable for the general purpose control circuit applications from 5 to 500VAC. An optional low voltage microswitch designated "L" is also available for low voltage signalling applications. Check the part number on the label inside the lid of the switch against the part number reference on this sheet before using this flow switch.

Note: The low voltage "L" microswitch is easily damaged if overloaded.

2) Check the electrical data tables on this sheet and ensure the switch is suitable for the application before wiring the switch up.

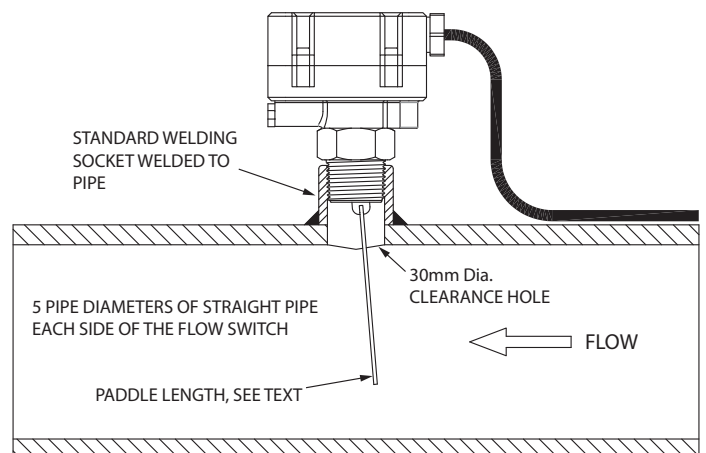
3) The terminals on both the standard and "L" microswitches are marked "C" for the common terminal, "NO" for the normally open terminal and "NC" for the normally closed terminal. In a two wire installation one wire will always be connected to the common terminal and the switch wire will be connected to either the normally open or normally closed terminal, depending on the application.

4) For all applications, the FM flow switch should be properly earthed. A dedicated earth terminal is provided inside the switch housing for this purpose.

Note: This flow switch must be earthed when operated at mains voltage.

5) After wiring the switch, ensure the cable gland is correctly assembled and the cable gland nut is fully tightened. Also make sure the lid gasket is in place and the lid is fully tightened down.

6) Once the flow switch is wired up it can be functionally tested using the red manual override button located on the body of the switch directly under the cable gland. Pressing the red override button causes the switch to change state and simulates liquid pushing the paddle.



TYPICAL STEEL PIPE INSTALLATION



WARNING

After installing or servicing this flow switch always replace its lid and fully tighten its lid screws. Also ensure the cable gland is fully tightened. Never leave the lid off the switch for extended periods. Without its lid in place this flow switch is not water resistant and presents a potential shock hazard. Take great care not to splash water onto the inside of the flow switch's electrical housing when the lid is not in place. Without its lid the flow switch is not weather or insect proof and presents a potential shock hazard that may result in death or serious injury.

ENVIRONMENTAL LIMITATIONS

Parameter	Standard FM Switch with a Polypropylene Paddle	FM-D Switch with a Stainless Steel Paddle
Maximum operating pressure (Static or Dynamic) at ambient temperature	400 Bars (5800 psi)	400 Bars (5800 psi)
Minimum burst pressure at ambient temperature	800 Bars (11600 psi)	800 Bars (11600 psi)
Maximum operating temperature	80°C (176°F)	100°C (212°F)
Minimum operating temperature	-60°C (-76°F)	-60°C (-76°F)
Ingress protection rating	IP67	IP67

ELECTRICAL DATA FOR THE L MICROSWITCH

The model "L" microswitch is a Single Pole Double Throw low voltage low wetting current switch with gold contacts, it is suitable for low voltage signalling applications up to 30VDC.

Maximum Switched Voltage	30VDC
Maximum Switched Current	26mA
Minimum Switched Voltage	5VDC
Minimum Switched Current	1mA

Note: Do not apply loads in excess of the limits in the table above. Do not apply inductive or capacitive loads to the L microswitch. The L microswitch will be damaged by loads in excess of the limits in the table.

HAZARDOUS APPLICATIONS

The FM-L flow switch can be used in hazardous areas. The flow switch is classed as a simple device and does not contain components capable of storing or producing an electric charge. As a simple device the FM-L can be used in hazardous applications provided it is isolated via an intrinsically safe barrier (a Zener barrier).

ELECTRICAL DATA FOR THE STANDARD H SWITCH

The standard microswitch fitted to the FM is a Single Pole Double Throw high voltage switch suitable for general purpose control circuit applications up to 500VAC. It can also be used in low voltage AC and DC application, for example at 12 or 24VAC or DC.

IMPORTANT

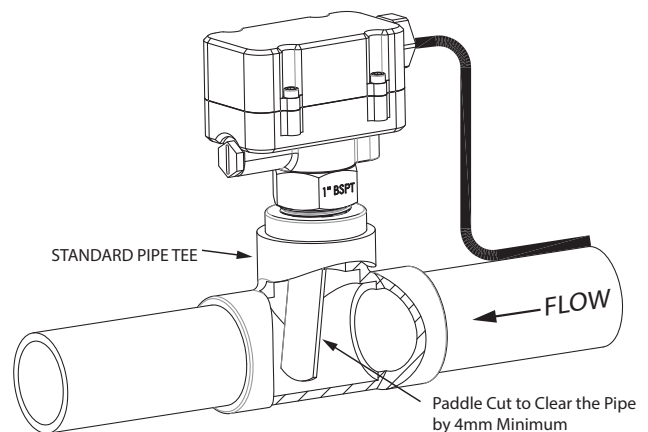
The standard H switch can operate at ANY voltage from 5 to 500VAC. It can be used to directly control pump motors up to 375 Watts (0.5HP) at 240VAC. For larger motors always use an interposing contactor or relay between the flow switch and the motor.

RATED VOLTAGE	NON INDUCTIVE LOADS				INDUCTIVE LOADS			
	RESISTIVE LOAD		LAMP LOAD		INDUCTIVE LOAD		MOTOR LOAD	
	NO	NC	NO	NC	NO	NC	NO	NC
125 VAC	15A		3A	1.5A	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	0.75
8 VDC	15A		3A	1.5A	15A		5A	2.5A
14 VDC	15A		3A	1.5A	10A		5A	2.5A
30 VDC	6A		3A	1.5A	5A		5A	2.5A
125 VDC	0.5A		0.5A	0.25A	0.05A		0.05A	0.05A
250 VDC	0.5A		0.5A	0.25A	0.03A		0.03A	0.03A

Maximum Switched Voltage	500VAC
Maximum Switched Current	15A
Minimum Switched Voltage	5VDC
Minimum Switched Current	160mA

Note: Do not apply maximum voltage at maximum current across the switch contacts. See main data table for current limits at specific voltages and for specific loads.

TYPICAL PIPE INSTALLATION



TYPICAL SMALL PIPE INSTALLATION

KELCO Engineering Pty Ltd

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