INSTALLATION & OPERATING INSTRUCTIONS

INSTALLING THE KELCO F SERIES FLOW SWITCH

FOR F-L MODELS · LOW VOLTAGE GOLD CONTACT MICROSWITCH

WARNING

Read these instructions fully before installing or servicing this flow switch. The F Series is a **mains voltage device** – incorrect installation can cause death or serious injury. All electrical work must be carried out by a licensed electrician.

1. CHECK THE MODEL NUMBER

Check the part number on the label inside the lid against the codes below – for example **F-L-25B-SS**.

F	–	L	–	25B	–	SS

SERIES

F Series flow switch

SWITCH

- **L** Low voltage switch with gold contacts

PROCESS CONNECTION

- **20B** ¾" BSP (stainless only)
- **20N** ¾" NPT (stainless only)
- **25B** 1" BSP thread
- **25N** 1" NPT thread

WETTED MATERIALS

- **Blank** All polypropylene wetted parts
- **SS** High pressure 316 stainless steel process connection and polypropylene paddle

2. MECHANICAL INSTALLATION

1. Check the part number (label inside the lid) against the tables in this sheet for pressure, temperature and electrical load.

2. Trim the paddle with a hacksaw or tin snips so it clears the pipe wall by at least 4 mm all round. To find the paddle length, use the Paddle Trimming Calculator. As a guide:

LOW FLOW	Paddle just clears the bottom of the pipe
UNKNOWN FLOW	¾ of the way across the pipe
HIGH FLOW	¼ to ½ of the way across the pipe

Spare paddles are available if too much is cut off.

Paddle Trimming Calculator ›

Not sure how much to trim? Go to **www.kelco.com.au/en/tools/paddle-calculator** and use the calculator – enter your pipe inside diameter, flow rate and liquid to check the switch will operate reliably before you cut the paddle.

3. The switch can go in suction or delivery pipework, horizontal or vertical. In vertical pipe, flow must be upward. Do not mount on the underside of horizontal pipe.

   Where possible, mount the switch away from pumps, valves and bends. A fitting directly upstream makes the flow uneven and turbulent at the paddle, which can shift the switching point slightly or make the paddle flutter near the switching point. Downstream fittings have little effect. If the switch has to go close to a fitting, enter the upstream straight length in the Paddle Trimming Calculator and check operation on commissioning.

4. Mount in a pipe tee, tapping saddle or weld-on socket, square to the flow so liquid hits the flat face of the paddle. The arrow on the switch must point in the direction of flow.

5. Seal the thread with PTFE tape or thread sealant, leaving at least 4 mm of thread above the socket. Tighten with a spanner on the spanner flats only – never twist the switch body.

6. Switches are supplied at maximum sensitivity (adjuster wound fully in). To decrease sensitivity, remove the red dust cap and wind the adjusting screw out (anti-clockwise) with a wide flat screwdriver. The further out, the more flow is needed to operate the switch. Refit the dust cap.

TYPICAL MOUNTING

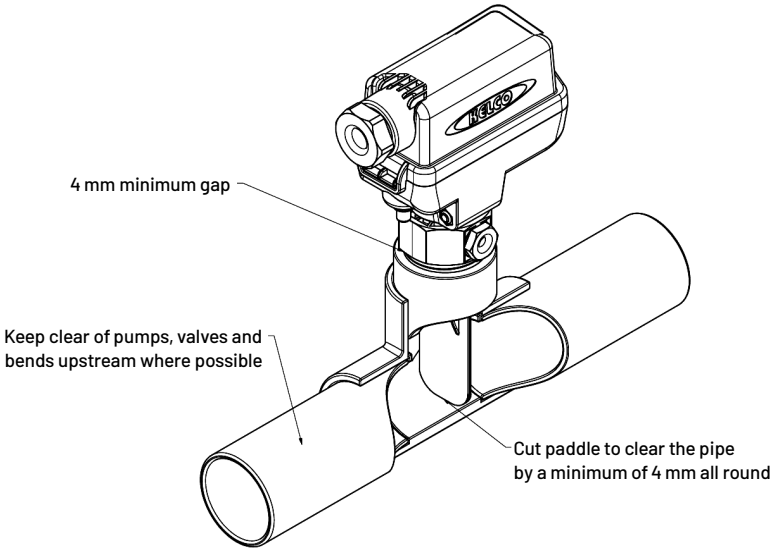


FIG. 1 F Series mounted in a standard pipe tee

3. ELECTRICAL INSTALLATION

1. This sheet covers the **F-L** models: an S.P.D.T. gold contact microswitch for low voltage, low current signalling (PLC inputs, telemetry, hazardous areas via a certified IS barrier or isolator). Check the part number on the lid label before wiring – F-H models have their own installation sheet.
2. Confirm the load is within the electrical ratings on page 3. The 'L' switch is easily damaged by overload.
3. The switch has terminals marked C (common), NO (normally open) and NC (normally closed). For a two-wire connection use C plus either NO or NC to suit the application.
4. Fully tighten the cable gland nut, check the lid gasket is in place and tighten the lid down.
5. Test: press the red manual override button under the cable gland. The switch changes state as if liquid were pushing the paddle.

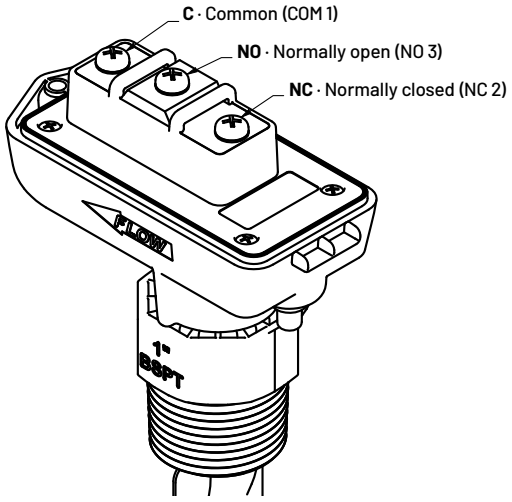


FIG. 2 Switch terminals

WARNING

Always refit the lid and fully tighten the lid screw and cable gland after installing or servicing. Without its lid the switch is not water, weather or insect proof and presents a **shock hazard that may cause death or serious injury**. Never splash water into the open housing or leave the lid off for extended periods.

'L' SWITCH ELECTRICAL DATA

The 'F-L' models use an S.P.D.T. gold contact microswitch rated down to 1 mA at 5 VDC, so they switch reliably at the low wetting currents of PLC inputs, telemetry and relay logic.

> **PLEASE NOTE**
> Not suitable for inductive or capacitive loads such as contactors and relays. Loads above the rating will damage the switch.

Switch type	**Gold contact microswitch**
Contact configuration	**S.P.D.T.**
Contact material	**Gold alloy**
Rated current (resistive)	**0.1 A at 125 VAC** **0.1 A at 8, 14 and 30 VDC**
Inrush current	**0.1 A maximum (NC and NO)**
Minimum applicable load	**1 mA at 5 VDC**
Operating range (micro load)	**5 to 30 V, 5 to 800 mW** **(26 mA maximum at 30 V)**
Contact resistance	**50 mΩ maximum (initial)**
Typical applications	**PLC, telemetry and low voltage control**

HAZARDOUS AREAS

The F-L is a passive switch that meets the definition of simple apparatus under AS/NZS 60079.11. It is not Ex certified in its own right. It may be used in a hazardous area only as part of an intrinsically safe circuit, connected through suitably certified associated apparatus such as a Zener barrier or galvanic isolator. The design of the intrinsically safe system and its installation are the responsibility of the system designer and installer, in accordance with AS/NZS 60079.14 and AS/NZS 60079.25. The F-L uses gold alloy contacts, which switch reliably at intrinsically safe signal levels. Contact rating: minimum load 1 mA at 5 VDC; maximum 0.1 A resistive at up to 30 VDC. The associated apparatus must not exceed these limits ($U_o \leq 30$ V, $I_o \leq 100$ mA). Where the associated apparatus monitors for line faults, end-of-line resistors must be fitted as specified by its manufacturer. The electrical housing is non-metallic; the installer must assess electrostatic charging risk under AS/NZS 60079.0 for the zone and gas group. Stainless steel process connections (-SS models) must be bonded to the plant earth. The F-L is not suitable for use in a hazardous area outside an intrinsically safe circuit.

MAINTENANCE

The F Series is low maintenance and should give years of service when correctly installed. Its life is shortened by pressures, temperatures or electrical loads beyond its ratings.

Spare parts, including paddles, are available from your supplier.

ENVIRONMENTAL LIMITATIONS

PARAMETER	F (POLYPROPYLENE)	F-SS (316 STAINLESS)
Maximum operating pressure *	**18 bar** 261 psi	**400 bar** 5800 psi
Minimum burst pressure *	**45 bar** 652 psi	**500 bar** 7215 psi
Maximum operating temperature	**60 °C** 140 °F	**80 °C** 176 °F
Minimum operating temperature	**–20 °C** –4 °F	**–20 °C** –4 °F
Ingress protection	**IP67**	**IP67**

*** NOTE** Pressures are at ambient temperature, static or dynamic. The all-polypropylene model must be de-rated linearly with temperature, down to a maximum of 1 bar (15 psi) absolute at 60 °C (140 °F).

Check that the switch materials suit the liquid being monitored:

Chemical Compatibility Checker ›

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