INSTALLATION & OPERATING INSTRUCTIONS

INSTALLING THE KELCO L SERIES LEVEL SWITCH

FOR L-L MODELS · LOW VOLTAGE GOLD CONTACT MICROSWITCH

WARNING

Please read these installation and operating instructions fully and carefully before installing or servicing this level switch. The L Series level 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 licensed electrician.

CHECK THE SWITCH MODEL NUMBER

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

L	–	L	–	25B	–	SS

SERIES

L Series level switch

SWITCH

L Low voltage gold contact switch

PROCESS CONNECTION

25B 1" BSP thread

25N 1" NPT thread

WETTED MATERIALS

Blank All polypropylene wetted parts

SS Supplied with a high pressure 316 stainless steel process connection and polypropylene paddle

OUTLINE

The L Series level switch is a side entry tank level switch that provides a single switch point level reference when installed in the side wall of a tank or vessel. This document sets out in detail the installation and functions of the level switch and some of the main ways in which it can be used.

APPLICATION

The L Series level switch has been specifically designed to be used in both water and aggressive chemical solutions. The process connection on the switch is available in either polypropylene or 316 stainless steel. The float and all other wetted parts of the switch are made from polypropylene and glass reinforced polypropylene.

The all-polypropylene models are suitable for use in a wide range of liquids including potable water, sea water, acids, bases, ground water and many chemical solutions containing dissolved mineral salts. The switches should not be used in organic solvents. If there is any doubt about the suitability of this switch for a specific application, please contact the manufacturer before installing the switch.

Chemical Compatibility Checker ›

WARNING

Without its lid in place the L Series level switch is not water resistant and presents a potential **shock hazard**. Take great care not to splash water onto the switch when the lid is not in place. Always replace the lid and fully tighten its securing screw after wiring or servicing this switch.

MECHANICAL INSTALLATION

This level switch should be installed in a tank socket on the side wall of a tank. The switch requires a minimum of 25 mm of clearance above and below its centre line axis to facilitate the free movement of its float (see Fig. 1).

Do not install this switch where the pressure or liquid temperature is greater than the ratings in the Environmental Limitations table on page 3. Safety should always be considered when installing this switch, particularly where aggressive or dangerous process liquids are involved.

This level switch is intended to be installed in the horizontal plane in the side of a tank or riser pipe. A suitable female threaded tank socket should be installed at a level where the switch point is required. The level switch is supplied with a float designed to pass through the inside diameter of a standard pipe thread socket. This allows the switch to be installed from the outside of the tank.

Apply thread tape or sealant to the thread on the switch and screw the switch into the tank socket using the spanner flats on the process adaptor of the switch. Do not screw the switch into the tank socket by twisting the electrical housing; always use the spanner flats provided. Do not wind the switch all the way into the tank socket – leave a gap of approximately 4 mm between the end of the thread on the switch and the face of the tank socket. Orient the switch so the float arm rises and falls vertically. The cable entry on the switch must be on the underside of the switch and pointing straight down.

1. Do not expose this level switch to freezing. If the level switch is to be used in areas where low temperatures will be encountered, always lag the tank and switch to prevent the unit from freezing.
2. Do not use this level switch in hot liquid applications. Do not exceed the maximum operating temperature in the table on page 3: 60 °C for the all-polypropylene model, 80 °C for the stainless model.
3. Do not exceed the recommended pressure limitations outlined in this document (page 3).

TYPICAL INSTALLATION

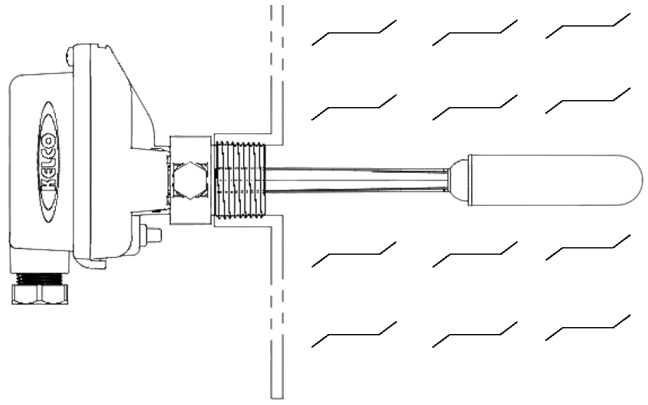


FIG. 1 L Series installed in a tank socket on the side wall of a tank

ELECTRICAL INSTALLATION

1. This sheet covers the **L-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 – L-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' 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.

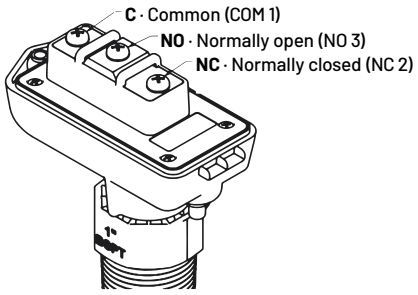


FIG. 2 Switch terminals

'L' SWITCH ELECTRICAL DATA

The 'L-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 (contactors, 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**

ENVIRONMENTAL LIMITATIONS

PARAMETER	ALL POLYPROPYLENE MODEL	WITH STAINLESS STEEL PROCESS CONNECTION
Maximum operating pressure (static or dynamic) at ambient temperature	**18 bar** 261 psi	**400 bar** 5800 psi
Minimum burst pressure at ambient temperature	**45 bar** 652 psi	**500 bar** 7215 psi
Maximum operating temperature	**60 °C** see note *	**80 °C** 176 °F
Minimum operating temperature	**–20 °C** –4 °F	**–20 °C** –4 °F
Ingress protection rating	**IP67**	**IP67**

> *** PLEASE NOTE** Maximum operating pressure of the all-polypropylene L Series switch must be linearly de-rated as operating temperature is increased, so that at 60 °C (140 °F) the maximum permissible operating pressure for the switch does not exceed one bar (15 psi) absolute.

HAZARDOUS AREAS

The L-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 L-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 (Uo ≤ 30 V, Io ≤ 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 L-L is not suitable for use in a hazardous area outside an intrinsically safe circuit.

MAINTENANCE

The L Series switches are low maintenance devices. 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 replacement floats are available from your supplier.

WARNING

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

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