INSTALLATION & OPERATING INSTRUCTIONS

INSTALLING AND OPERATING THE KELCO K SERIES FLOAT SWITCH

WARNING

Please read these installation and operating instructions fully and carefully before installing or servicing this float switch. The K Series float 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.

APPLICATION

The K Series heavy duty level regulator is a low hysteresis tilting float switch capable of providing an on or off signal at a single fixed point in a tank or sump. The low differential switching means the regulator switches when the liquid level reaches it and rises by a further 35 mm. If the level then falls by 35 mm the switch de-actuates. These float switches are ideal for single point switching applications such as high and low level alarms. Where multiple switching points are required, or where a level difference of greater than 35 mm is needed, multiple float switches should be used.

ENVIRONMENT

This switch is constructed from polypropylene, with a fluorosilicone cable boot and CPE rubber sheathed cable. There are no metal parts in contact with the process liquid, and this switch can be used in water, sea water, acids, alkalis and a great variety of chemical solutions, including oil, oily waste, fats and effluents of many types.

K Series switches should not be used in closed vessels at greater than 300 kPa static pressure, or in submerged applications at greater than 30 metres.

Do not expose this switch to liquid temperatures of less than –20 °C or greater than +60 °C. Liquids in which this switch is to operate must have a specific gravity of greater than 0.82. In liquids of low specific gravity the buoyancy of the float is reduced and a proportionally higher operating differential results.

Chemical Compatibility Checker ›

HAZARDOUS AREAS

The K Series is not certified for use in hazardous areas and must not be installed in any area classified as hazardous under AS/NZS 60079.10 (Zone 0, 1, 2, 20, 21 or 22). It contains a silver-contact microswitch rated for mains voltage, has no recognised Ex protection concept, and is not suitable as simple apparatus in an intrinsically safe circuit because its contacts require a minimum load of 160 mA at 5 VDC.

TYPICAL INSTALLATION

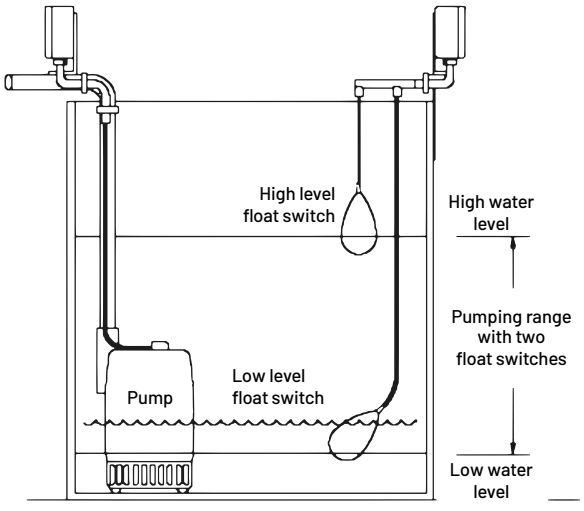


FIG. 1 Two K Series float switches controlling a pump

MECHANICAL INSTALLATION

A little care taken when installing this float switch will greatly prolong its service life. Select the installation site carefully. Avoid installing this switch in any area where there is likely to be turbulence or where the float or cable will abrade against tank walls, piping or pumps. Any abrasion between the switch cable and adjacent surfaces will greatly reduce the life of the switch and may cause premature failure. In areas where several float switches are to be installed it is essential to ensure the cables from adjoining switches do not rub or tangle.

Do not install this float switch hard against the side of a tank or pit; to do so limits the free movement of the float and will impede the switching action. Suspend the switch away from tank walls and stand pipes by at least 100 mm.

Heavy polypropylene cable weights are available to suit the float switches. If a cable weight was supplied, simply clamp the weight onto the cable using the provided screw.

Position the weight at least 150 mm above the float. Multiple weights can be installed spaced along the switch cable if required. When tethering the float switch, allow at least 150 mm of free cable between the float and the first tethering point. The free cable allows the float to swing and tilt in response to liquid level changes. Flexing of the cable should be distributed evenly along the cable and must not be confined to one point.

If the free movement of the cable is restricted it can cause work hardening of the copper strands within the cable and lead to premature failure of the switch. Where possible keep the exposed cable out of direct sunlight. For example, on top of a tank, terminate the cable in a suitable junction box or run the switch cable inside a length of conduit, and do not simply drape the cable over the exposed tank rim. Prolonged exposure to sunlight can perish and crack the cable, leading to premature switch failure.

K AND KU SERIES MOUNTING DIAGRAM

To ensure correct and reliable operation, the float head must be free to move between a tilted position and vertical.

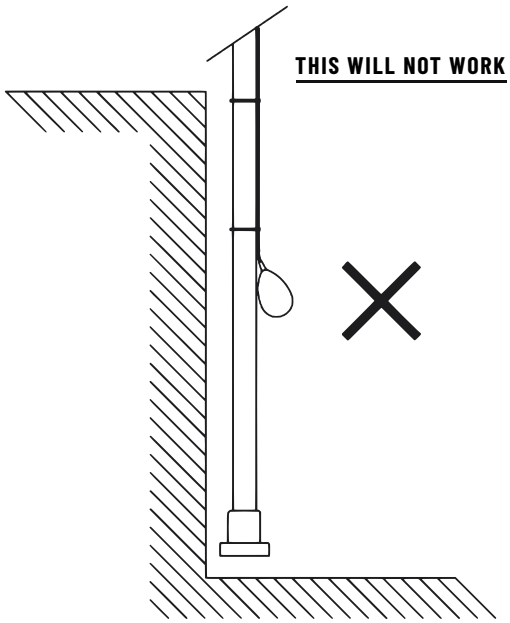


FIG. 2 Incorrect – tied to a pipe

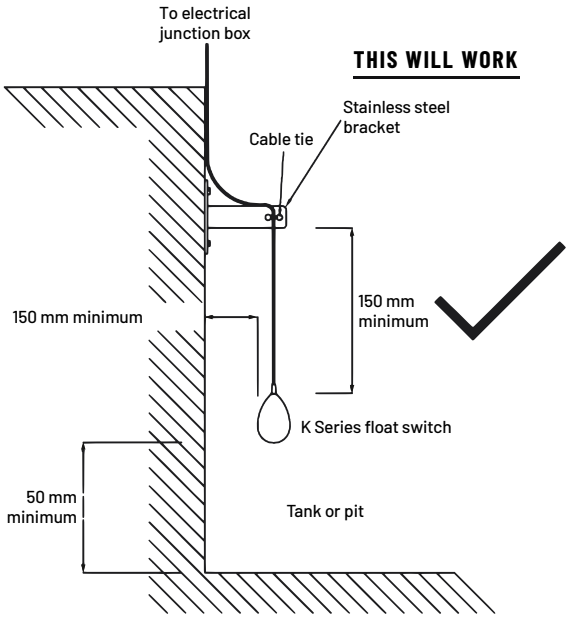


FIG. 3 Correct – free to tilt

NOTE Do not tie the float switch against pipes or against the side of the tank. The float must be allowed to return freely to a vertical position, as illustrated in Fig. 3.

WARNING

All electrical work associated with the K Series level regulator must be carried out by qualified electrical personnel, and all electrical work must conform to AS/NZS (or equivalent) standards and to local wiring rules.

ELECTRICAL INSTALLATION

This float switch is rated at 5 to 500 VAC; however, local regulations may require its use be confined to low voltage control circuits. In the interest of safety we recommend all installations be isolated by a low voltage transformer and operated at 24 to 48 VAC. Where it is impractical to use low voltage, all mains voltage installations must incorporate a suitable earth leakage relay.

This float switch houses a single pole double throw (S.P.D.T.) switch. The electrical rating of the switch is indicated on the outside face of the float. Connection is via a three core 0.75 mm^2 S05RN-F CPE sheathed cable. With the float hanging vertically the core colours are blue – common, black – normally closed and brown – normally open. When the liquid level rises and tilts the float 45°, blue to brown closes and blue to black opens (Fig. 4).

As a general guide, terminate the float switch well above the liquid high level in the tank or pit. Where possible avoid running the float switch cable any appreciable distance through conduit, as this makes servicing, testing or replacement more difficult. Most installations will only require the use of two of the three available wires. This will be the blue common and one of the other two wires. Be aware that when the float switch actuates the unused wire will be live, and it must therefore always be isolated.

In installations where two float switches are to be used to control the high and low levels in a tank or pit, a latching circuit is normally used. A basic schematic for such a circuit is shown in Fig. 5. In the circuit drawing a double pole relay is used to latch the pump on. The latch is broken by either the high or low level float switch changing state, depending on whether the tank is to be emptied or filled. A suitable relay may be used to directly control a pump motor; however, it is preferable that the control circuit is operated at low voltage and the relay contacts, set 1, be used to control a contactor which in turn controls the pump motor.

ENVIRONMENTAL LIMITATIONS

PARAMETER	K SERIES
Maximum submergence	**30 m, 300 kPa static pressure**
Maximum liquid temperature	**60 °C**
Minimum liquid temperature	**–20 °C**
Liquid specific gravity	**>0.82**
Liquid pH	**1 to 14**
Smallest diameter well that the switch can operate in	**Within a 160 mm inside diameter vertically mounted pipe**
Liquid level change for the switch to operate	**35 mm**
Closest switching point to tank floor	**50 mm**
Smallest opening through which the switch will fit	**75 mm**
Minimum distance between float and closest tethering point / cable weight	**150 mm**
Suitability for use in sodium hypochlorite	**Fully compatible**
Suitability for use in sea water	**Fully compatible**
Suitability for use in potable water	**Fully compatible**

WIRE COLOURS AND FUNCTIONS

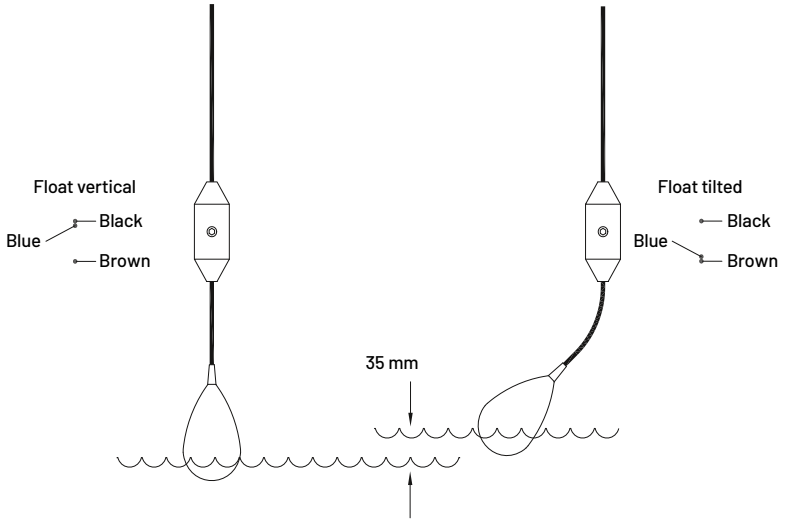


FIG. 4 Core connections with the float vertical and tilted

TWO LEVEL TANK CIRCUIT

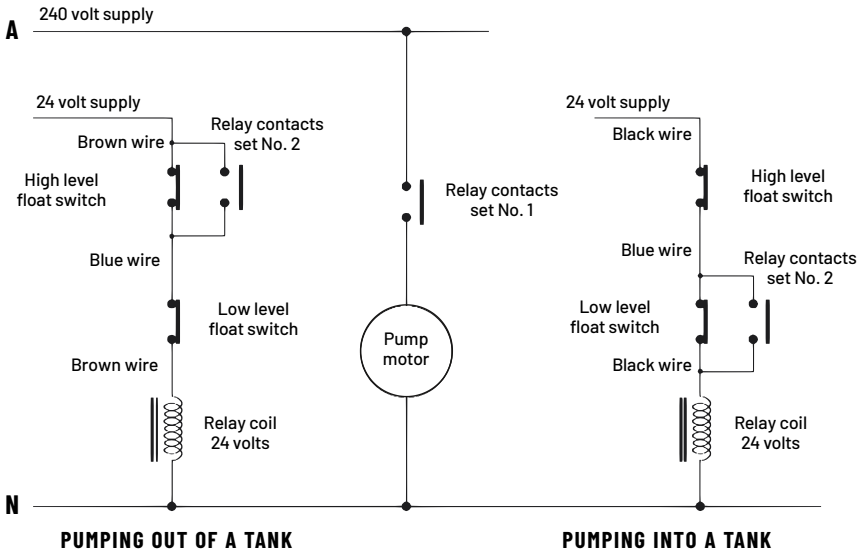


FIG. 5 Latching circuit for two float switches

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