INSTALLATION & OPERATING INSTRUCTIONS

INSTALLING AND OPERATING THE KELCO KU SERIES HEAVY DUTY LEVEL REGULATOR

This product is not suitable for water or sewage applications

WARNING

Please read these installation and operating instructions fully and carefully before installing or servicing this switch. All electrical work on this switch must be performed by a fully qualified and licensed electrician.

APPLICATION

The KU 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 75 mm. If the level then falls by 75 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 75 mm is needed, multiple float switches should be used.

OPERATING ENVIRONMENT

This switch is constructed from polypropylene and orange polyurethane sheathed (H05BQ-F) cable. This switch is intended for use in oil and diesel applications only.

This float switch 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. The switch and cable will withstand temperatures outside these limits but the service life may be reduced. Liquids in which this switch is to operate must have a specific gravity of greater than 0.8. 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 KU 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). Its suitability for diesel and oil refers only to the chemical resistance of its materials and does not make it suitable for flammable or hazardous atmospheres. 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

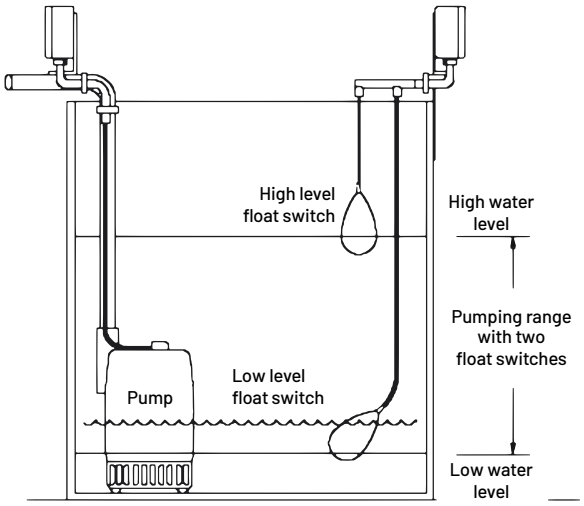


FIG. 1 Two float switches controlling a pump

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 stainless screw provided.

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 may 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.

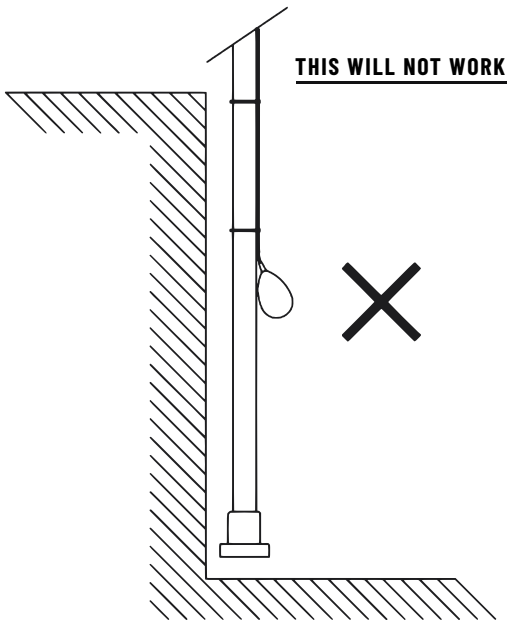


FIG. 2 Incorrect – tied to a pipe

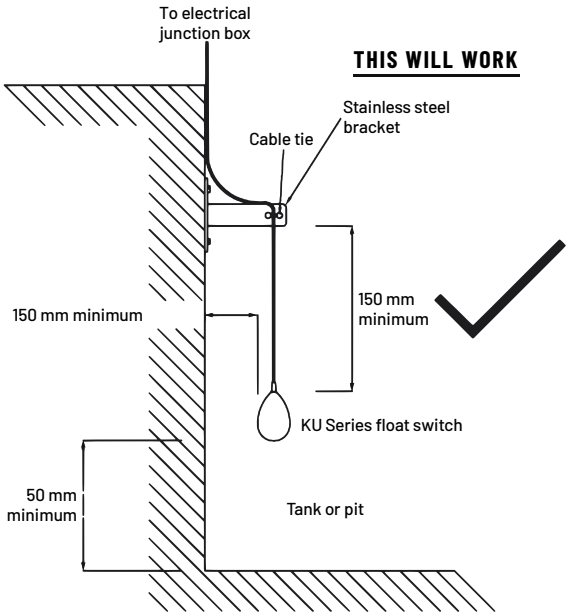


FIG. 3 Correct – free to tilt

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 KU 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

The KU Series heavy duty level regulator is rated at 5 to 500 VAC. However, in the interests of safety the KU Series level regulator should only ever be used with control voltages in the range of 12 to 48 volts AC or DC.

This float switch houses a single pole double throw switch. The electrical rating of the switch is indicated on the outside face of the float. Connection is via 3-core 0.75 mm^2 H05BQ-F polyurethane 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.

OPERATING LIMITATIONS

PARAMETER	KU SERIES
Maximum submergence	**30 m, 300 kPa static pressure**
Maximum liquid temperature	**60 °C**
Minimum liquid temperature	**–20 °C**
Liquid specific gravity	**Greater than 0.8**
Liquid pH	**1 to 14**
Smallest diameter tank the switch can operate in	**300 mm inside diameter**
Liquid level change for switch to operate	**75 mm**
Closest switching point to tank floor	**100 mm**
Minimum distance between float and closest tethering point or cable weight	**200 mm**

WIRE COLOURS AND FUNCTIONS

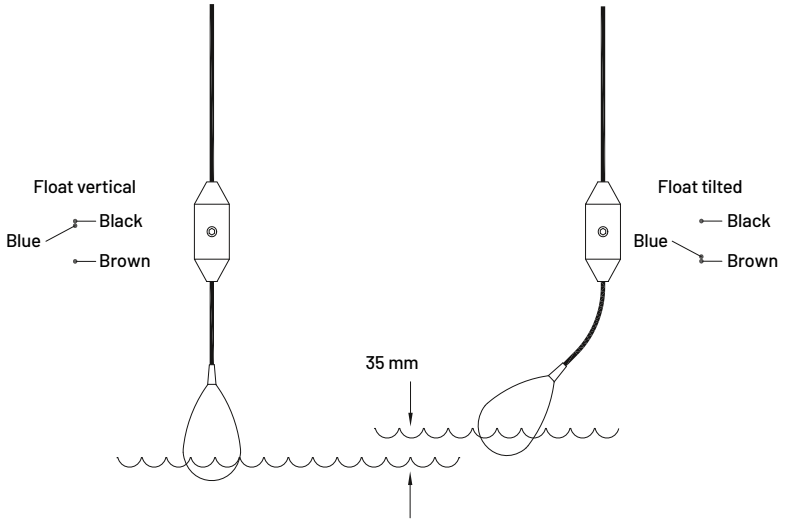


FIG. 4 Core connections with the float vertical and tilted

TWO LEVEL TANK CIRCUIT

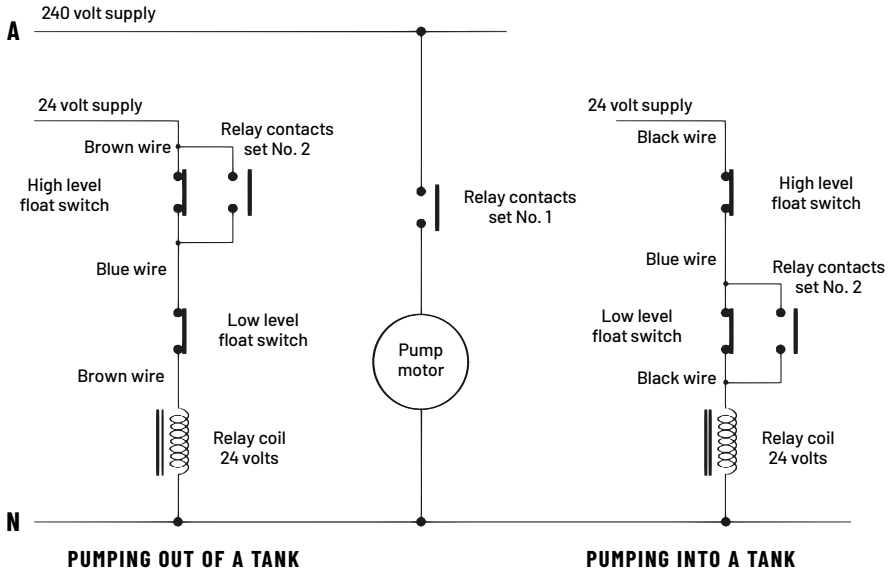


FIG. 5 Latching circuit for two float switches

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