INSTALLATION & OPERATING INSTRUCTIONS

INSTALLING THE KELCO Q SERIES HEAVY DUTY FLOAT SWITCH

WARNING

Please read these installation and operating instructions fully and carefully before installing or servicing this float switch. The Q 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 Q Series heavy duty float switch is a two position level regulator, capable of giving an on or off switch action at two distinct levels in a pit or tank containing liquid. The difference in height between the on and the off point which can be attained with this switch is 300 mm (approximately), in water.

For applications where the level change is greater than 300 mm, two switches should be used, one to actuate at high level and one at low level.

This switch is suitable for use in clean water as well as in waste and effluents. There is no mercury used in this switch, so it is environmentally safe.

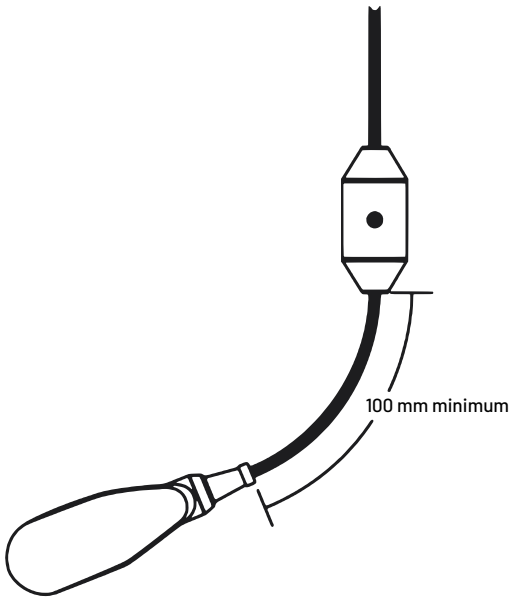


FIG. 1 Minimum distance from float to tethering point or cable weight

ENVIRONMENT

This switch is a fully overmoulded polypropylene float with an EPR/CPE cable. There are no metal parts in contact with the process liquid. The switch can therefore be used in water, seawater, acids, alkalis, and a great variety of chemical solutions, including oil, oily waste, fats and effluent of many types.

This float switch should not be used at greater than 30 metres submergence in water, or in closed vessels at greater than 300 kPa pressure. Do not expose this switch to liquid temperatures less than –20 °C or greater than 60 °C. Liquids in which this switch operates should have a specific gravity greater than 0.82. In liquids of low specific gravity, the buoyancy of the switch is reduced and a proportionally lower operating differential results.

Chemical Compatibility Checker ›

MECHANICAL INSTALLATION

A little care taken when installing this float switch will greatly influence and prolong its service life. Select the installation site carefully. Avoid installing this switch in any area where there is excessive turbulence, or in situations where the switch will rub or foul against any object. Any abrasion between the switch cable and any adjacent surfaces will greatly reduce the life of the switch and may cause premature or unpredictable failure. In areas where several float switches are to be installed, it is essential to ensure the cables from adjoining switches do not become tangled or abrade against each other.

Optional standard cable weights (Kelco part number QCW) are available to suit the Q Series float switch. The weight is constructed from a heavy grade of polypropylene. If a standard weight was supplied with this switch, unscrew the halves, place the wire in the channel, reassemble, position the weight on the cable where desired and tighten the halves. Position the weight at least 100 mm away from the float. See Fig. 1 for details.

Where possible tether the switch cable to a suitable standpipe. This will limit its movement to within its operating range and avoid unnecessary cable freedom and potential for abrasion or tangling. Do not tether the cable closer than 100 mm from the end of the cable boot. To do so greatly increases the severity of the flexing arc through which the cable must move, as the float rises and falls. This contributes to premature work hardening of the copper strands in the cable and may eventually contribute to failure of the switch.

Where possible keep the exposed rubber cable out of direct sunlight. For example, at the top of a tank, terminate the float switch in a suitable junction box; do not simply drape the cable over the tank rim or across exposed ground. Prolonged exposure to sunlight will perish and crack the cable.

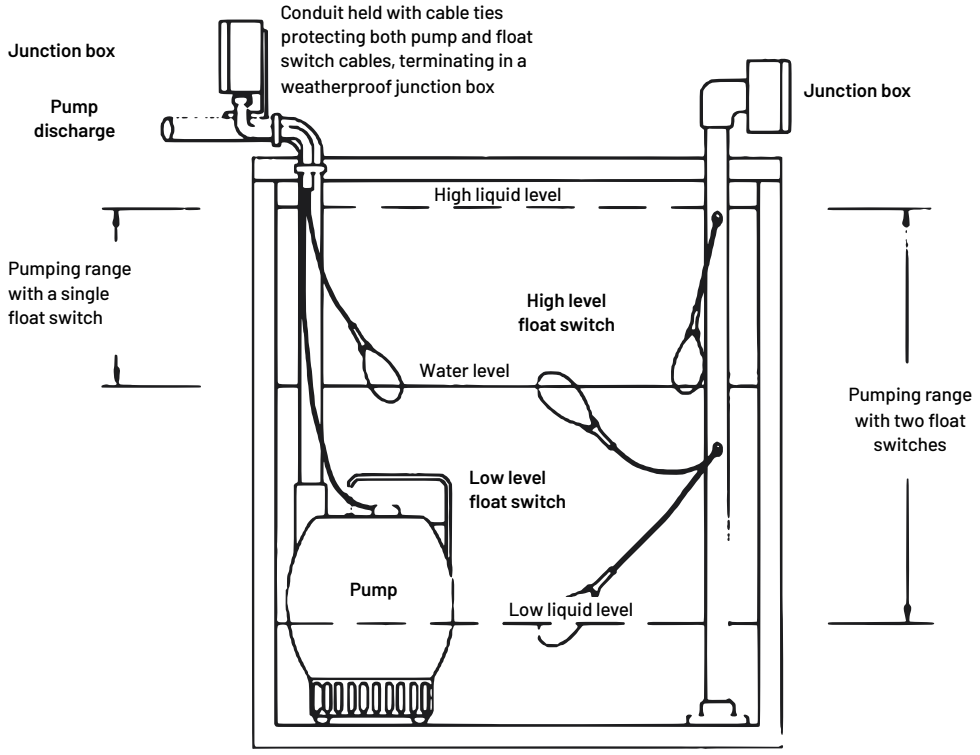


FIG. 2 Installing multiple float switches

Fig. 2 depicts a tidy method of installing multiple float switches, using a length of PVC pipe as a central cable conduit. Alternatively the float switch may be simply strapped to a pump discharge pipe, using cable ties.

WARNING

All electrical work associated with the Q Series float switch must be carried out by qualified electrical personnel and all electrical work must conform to AS/NZS 3000 (or equivalent) standards and to local wiring rules.

ELECTRICAL INSTALLATION

This switch is rated 250 VAC: 21 A resistive, 4 A motor. In the interest of safety, lower voltages, such as 24 or 48 volts, should be used wherever possible.

If the switch is used in a 240 volt control circuit, it must always be isolated via a residual current device (RCD). This float switch contains a single pole double throw (S.P.D.T.) microswitch. The electrical ratings are listed in the Q Series data sheet. Connection is via three core 1.0 mm^2 S07RN-F (EPR/CPE) cable. The cable cannot be replaced; if it is damaged, replace the complete switch.

Core colours are blue, black and brown. The blue wire is common. With the switch hanging vertically down, the black wire to blue is closed and the brown to blue, open.

If the switch is inverted, so the cable hangs vertically below the switch, the blue wire to black is open circuit and the blue to brown closed. As a general guide, terminate the float switch in a junction box as close as practical, and well above the liquid level in the tank or pit.

Where possible avoid running the float switch cable any appreciable distance through conduit, as this simply makes servicing, testing and eventual replacement more difficult. Most applications will only require the use of the common (blue) wire and either the black or brown wire. In all two-wire applications, insulate the end of the third, unused wire, as it will become live when the switch changes state.

In applications where two float switches are used in a control circuit, for example for the filling or pumping out of a deep tank, a relay must be used in the control circuit. A basic schematic diagram for this application is depicted in Fig. 3. In Fig. 3, a double pole relay is used to latch the circuit ON. The latch is broken by either the high level 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 the pump motor; however, it is preferable that the control circuit be operated at low voltage, and the relay contacts, set 1, used to control a suitable mains voltage contactor which in turn controls the pump motor.

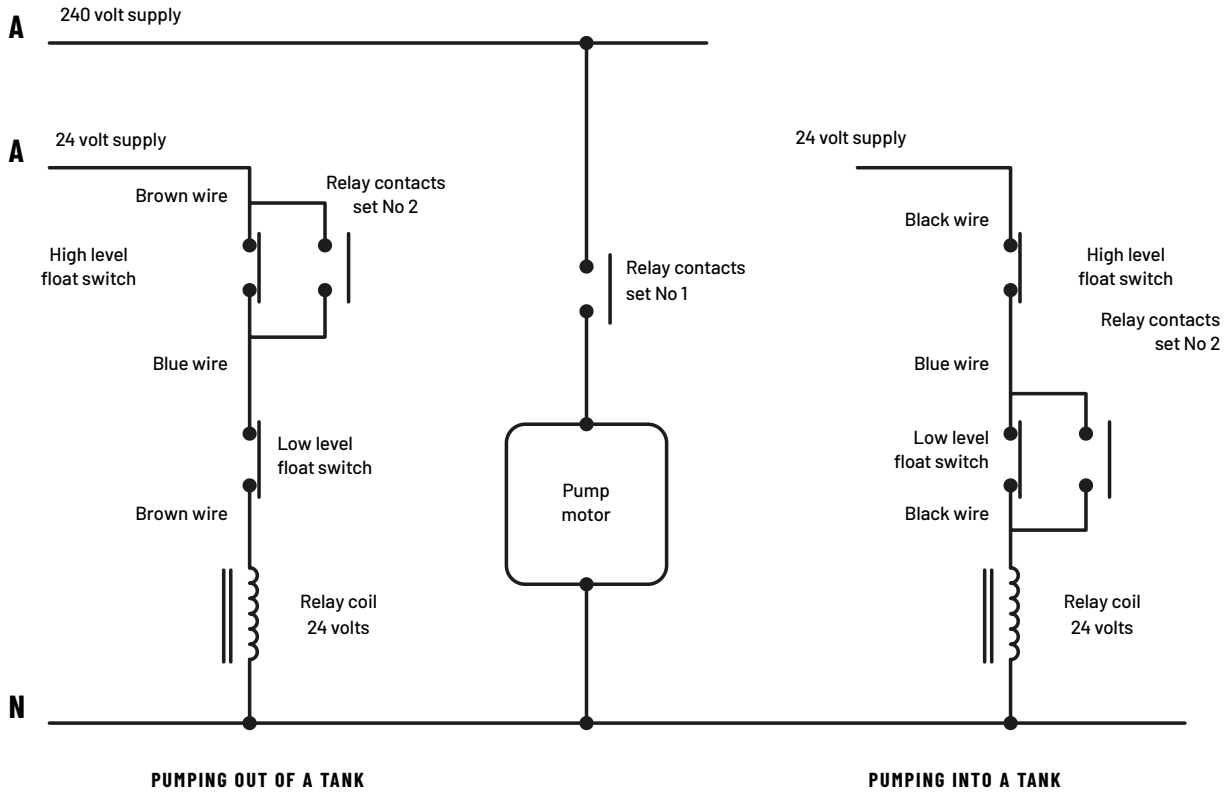


FIG. 3 Two float switches controlling a pump through a latching relay

ENVIRONMENTAL LIMITATIONS

Maximum submergence	**30 metres, 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	**600 mm**
Liquid level change for the switch to operate	**300 mm (approximately)**
Smallest opening through which the switch will fit	**108 mm**
Minimum distance between float and closest tethering point / cable weight	**100 mm (see Fig. 1)**
Suitability for use in sodium hypochlorite	**Fully compatible**
Suitability for use in sea water	**Fully compatible**
Suitability for use in potable water	**Not approved**

HAZARDOUS AREAS

The Q 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.

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