

## Q SERIES HEAVY DUTY FLOAT SWITCH

### FEATURES

- Extra strong polypropylene float
- S.P.D.T three wire switch
- No mercury or lead components
- High quality rubber cable
- No corrodible metal parts
- Sealed tamperproof design
- Highly chemical resistant
- Wide range of cable lengths available

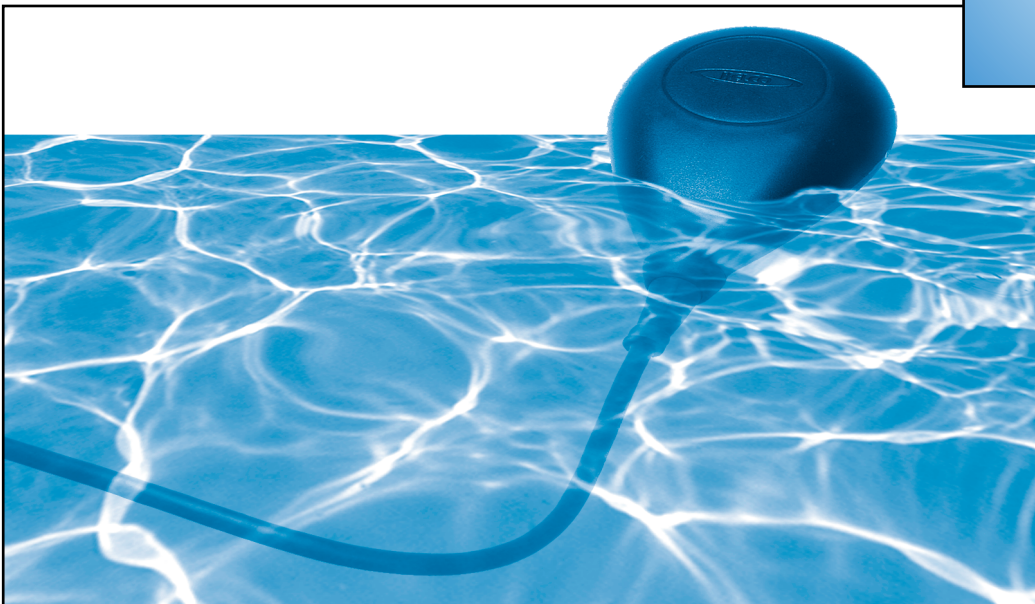
### APPLICATIONS

- High and low level control in tanks, pits and dams
- Loss of prime protection for pumps
- Automatic control of sump pumps
- Control of tank filling and draining valves
- Control of levels in effluent and separation pits
- Level control in bulk liquid tanks
- Control of level warning equipment

### CABLE DATA

The switch is made of high grade polypropylene. Our high tech manufacturing process produces a sealed, seamless and glandless float that is totally tamperproof and extremely tough.

The heavy duty cable fitted to the Q series switch is constructed from Hypalon Rubber, which is specifically designed for permanent immersion in water. The switch and cable are also resistant to oil, grease, fat, sewerage and a variety of chemicals.



*The Q Series Float Switch consists of a heavy duty polypropylene float double moulded onto a high quality three core cable. The float contains a single pole double throw switch, which can be used to give adjustable control over the level of liquid in tanks, pits and dams. By careful tethering of the cable the switch can be set to give an ON or Off action at any desired position. The heavy duty switch can directly control small pump motors, and is also ideal for instrument or PLC signalling.*



# TECHNICAL DATA

## OPERATING ENVIRONMENT

Maximum submergence	30metres,300kPa 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	600mm
Liquid level change for the switch to operate	300mm (approx)
Smallest opening through which the switch will fit	108mm
Minimum distance between float and closest tethering point/cable weight	100mm
Suitability for use in diesel fuel	Can be used, but some softening and swelling of the cable and boot may occur
Suitability for use in sodium hypochlorite	Fully Compatible
Suitability for use in sea water	Fully compatible
Suitability for use in octane (petrol)	Not suitable
Suitability for use in potable water	Fully compatible

## SWITCH DATA

Switch type	Single Pole Double Throw
Contact gap	1mm
Contact material	Silver Alloy
Contact resistance	15mΩ max
Rated voltage AC	0 - 240V AC
Rated voltage DC	0 - 250V DC
Current rating resistive AC	21 A at 250V
Motor load current rating AC	4 A at 250V
Current rating resistive DC	0.3 A at 250V
Motor load current rating DC	0.05 A at 250V
Maximum lamp load AC	3 A at 250V
Maximum lamp load DC	0.05 A at 250V
Maximum operating frequency, electrical	60 operations per/min
Insulation resistive	100MΩ min (at 500VDC)
Dielectric strength between contacts	2000 VAC, 50/60Hz for 1 minute
Life expectancy mechanical	50,000,000 operations min
Life expectancy electrical	100,000 operations min
Approved standards	UL508 E41515 CSA C22.2 No.55 (File No LR21642)

## IMPORTANT SAFETY NOTE

The Q Series Switches have been designed and built to be as tough as possible, and can withstand harsh environments. Great care should be taken to ensure the switch is only installed in positions where it will not be subjected to entanglement, severe agitation and abrasion against tank walls or moving equipment. If the application requires control of mains voltage, local electrical codes may require the switch to be isolated to a low voltage supply. This may be required, regardless of the high voltage rating of the float switch. Please check with your local electrical authority before connecting a Q Series Float Switch to a mains voltage supply.

**NSW DEPARTMENT OF MINERALS AND ENERGY  
APPROVAL NUMBER CS4937N**



Unit 3, 8 Hayden Court, Myaree WA 6154  
Phone (08) 9317 4322, Fax (08) 9317 4465  
[www.powercontrol.com.au](http://www.powercontrol.com.au)

## KELCO Engineering Pty Ltd

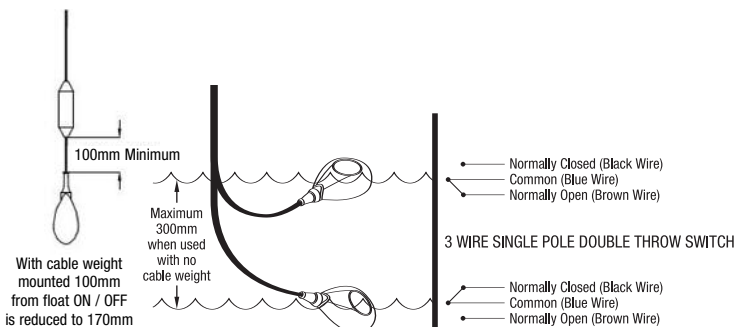
ABN 20 002 834 844  
Head office and factory  
9/9 Powells Road Brookvale 2100 NSW Australia  
Phone: +61 2 9905 6425 Fax: +61 2 9905 6420  
Email: [sales@kelco.com.au](mailto:sales@kelco.com.au) Web: [www.kelco.com.au](http://www.kelco.com.au)  
©2008 Kelco Engineering Pty Ltd

**PLEASE NOTE:** Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.

## CABLE DATA

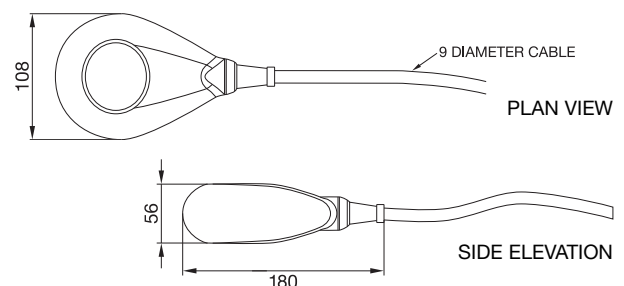
Cable type	Heavy Duty EPR/CSP Flexible Hypalon Rubber
Outer sheathing	CSP Hypalon, Oil Resistant & Flame Retarded to VDO 0472
Inner sheathing	R-EP-90 Special Elastomer Insulation
Cores	3 Cores, Each 1mm Diameter
Cable diameter	9mm Nominal
Core colours	Blue (Common) Black (Normally Closed) Brown (Normally Open)
Cable voltage rating Uo/U	600V / 1kV
AC test voltage	2.5kV
Cable current carrying capacity	18 Amps Continuous at a temperature of 30.5°C
Cable maximum tensile strength	15N/mm <sup>2</sup>
Minimum bending radii	50mm
Maximum ambient operating temperature	80°C
Minimum permissible ambient temperature	-40°C
Minimum permissible ambient temperature for fully flexible operation	-25°C
Cable maximum permissible short circuit temperature	250°C
Standards of cable construction	Meets or exceeds AS1125, AS3191, AS3116 and DIN/VDE0282
Cable lengths available	1, 3, 4, 6, 10, 15, 20, 30, 50 Metres standard. Against special order switches to 1000 Metres can be supplied

## TYPICAL APPLICATION



Switching range adjustable up to a maximum of 300mm depending on tethering point.

## DIMENSIONS



# INSTALLATION AND OPERATING SHEET FOR KELCO Q SERIES HEAVY DUTY FLOAT SWITCH

**PLEASE READ THIS INSTALLATION SHEET CAREFULLY AND FULLY BEFORE INSTALLING THIS FLOAT SWITCH**

## 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 between 170 and 300mm, in water. For applications where the level change is greater than 300mm, two switches should be used, one to actuate at high level and one at low level. This switch is suitable for use in potable water as well as in waste and effluents. There is no mercury used in this switch, so it is environmentally safe.

## ENVIRONMENT

This switch is constructed from polypropylene with hypalon rubber shielded 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  $-20^{\circ}\text{C}$  or greater than  $+80^{\circ}\text{C}$ . The switch will withstand temperatures outside these limits but the life of the unit may be reduced. This effect will be aggravated if various chemicals are also present. Liquids in which this switch operates should have a specific gravity greater than 0.6. In liquids of low specific gravity, the buoyancy of the switch is reduced and a proportionally lower operating differential results.

## 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.

Standard cable weights 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 100mm away from the float. See Fig 1 for details.

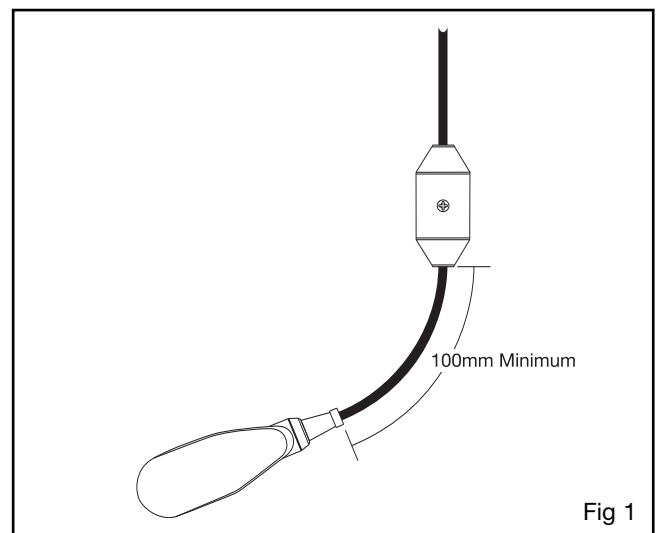
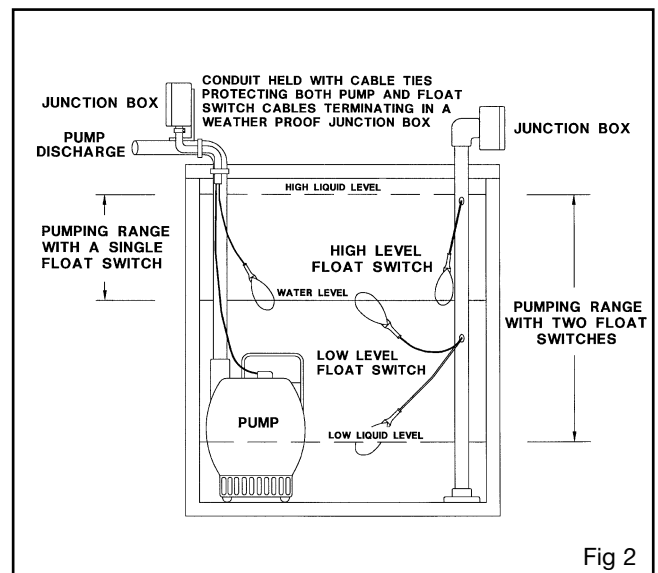


Fig 2 depicts a tidy method of installing multiple Float Switches, using a length of PVC pipe as a central cable conduit. Alternatively the Float Switch may be simply strapped to a pump discharge pipe, using cable ties.



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 100mm 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.

## ELECTRICAL INSTALLATION

All electrical work associated with this Float Switch must conform to the relevant local and national codes and must be carried out by qualified persons only.

This switch is rated to control 240 volt circuits. 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 an earth leakage circuit breaker.

This Float Switch contains a single pole double throw microswitch. The rating of the microswitch is indicated on the face of the switch. Connection is via three core 1.5mm rubber clad cable. 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.

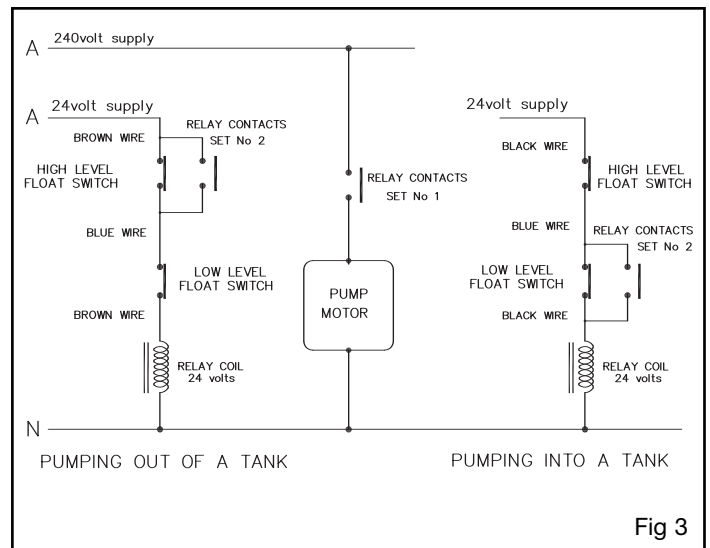


Fig 3

## HAZARDOUS APPLICATIONS

This Float Switch is classed as a simple device, it contains no mechanism for the production or storage of electricity. As such, it requires no separate certification to be used in hazardous environments. For such installations it is necessary to isolate the Float Switch via an intrinsically safe relay, a zener barrier.



Unit 3, 8 Hayden Court, Myaree WA 6154  
Phone (08) 9317 4322, Fax (08) 9317 4465  
[www.powercontrol.com.au](http://www.powercontrol.com.au)

## KELCO Engineering Pty Ltd

ABN 20 002 834 844

Head office and factory

9/9 Powells Road Brookvale 2100 NSW Australia

Phone: +61 2 9905 6425 Fax: +61 2 9905 6420

Email: [sales@kelco.com.au](mailto:sales@kelco.com.au) Web: [www.kelco.com.au](http://www.kelco.com.au)

©2008 Kelco Engineering Pty Ltd

**PLEASE NOTE:** Kelco Engineering Pty Ltd reserves the right to change the specification of this product without notice. Kelco Engineering Pty Ltd accepts no liability for personal injury or economic loss as a consequence of the use of this product. All rights reserved copyright Kelco Engineering Pty Ltd © 2008.