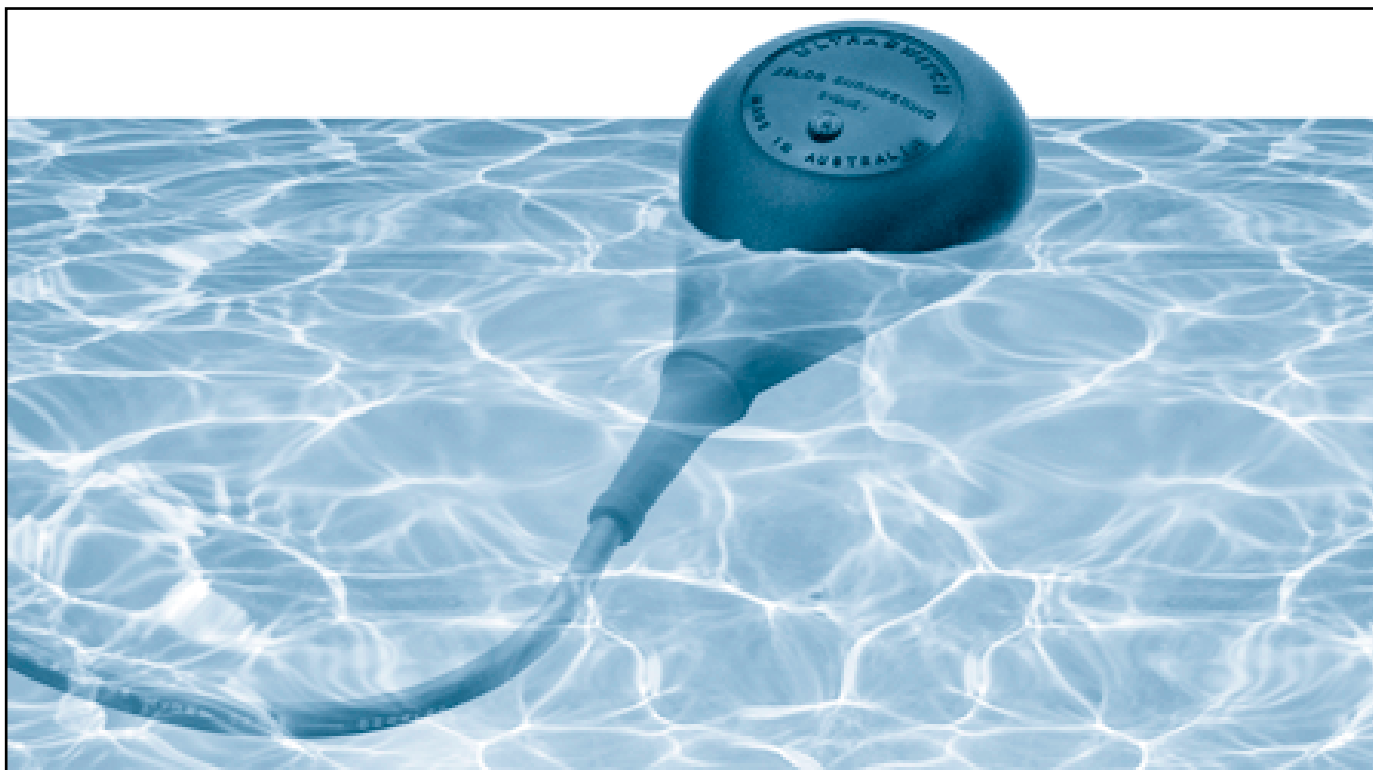


## Q SERIES HEAVY DUTY FLOAT SWITCHES

The Q series float switches consist of a heavy duty polypropylene float moulded directly onto a high quality three core cable. The float contains a single pole double throw switch, which can be used to give an adjustable control over the level of liquid in tanks, pits and dams.

By careful tethering of the cable the switch can be set to float up and down in rising and falling liquid levels, giving an ON or an 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



### FEATURES

- Extra strong polypropylene float
- Heavy duty 21 amp 250 volt switch
- High quality high amperage cable
- No metal parts to corrode
- Sealed tamper proof design
- Resistant to any chemical solutions
- Wide range of cable lengths available
- Simple to install
- Energy Authority Approved

### 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



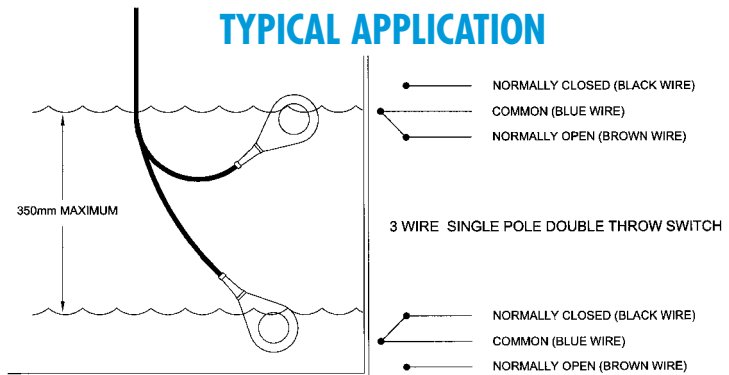
AUSTRALIAN MADE

# TECHNICAL DATA

The switch body is made from 30% glass reinforced polypropylene. Our high tech manufacturing process produces a sealed, seamless and glandless float that is totally tamper proof and extremely tough.

The heavy duty cable fitted to the Q series switch has outer sheathing made 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.

## TYPICAL APPLICATION



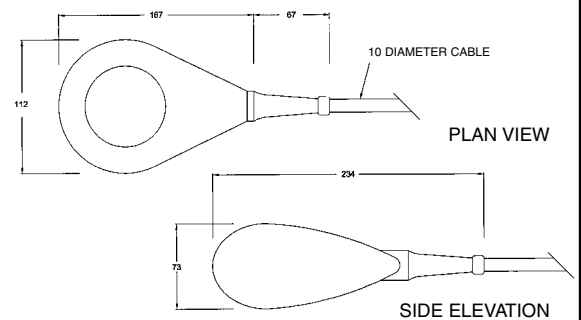
Switching range adjustable up to a maximum of 350mm depending on tethering point.

## CABLE DATA

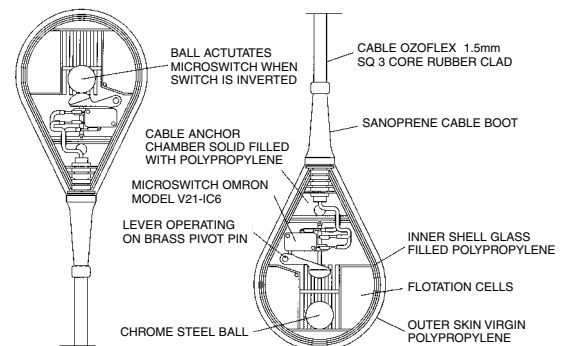
|   |  |        |                       |
|---|--|--------|-----------------------|
| <b>Cable Type</b>                                       | Ozoflex  |        |                       |
| <b>Outer Sheathing</b>                                  | CSP Elastomer Sheath (Hypalon) Oil & Flame Resistant |        |                       |
| <b>Inner Insulation</b>                                 | Core Insulation R-EP-90 Elastomer                    |        |                       |
| <b>Cores</b>  | 3 Cores each 30 Strands of 0.026mm Tinned Copper     |        |                       |
| <b>Core Colours</b>                                     | Common = Blue  |        |                       |
|   | Normally Closed = Black                              |        |                       |
|   | Normally Open = Brown                                |        |                       |
| <b>Rated Voltage</b>                                    | 250 Volts AC or DC                                   |        |                       |
| <b>Current</b>  | 24 Amps in Free Air                                  |        |                       |
| <b>Carrying Capacity</b>                                | 23 Amps Touching a Surface                           |        |                       |
| <b>Operating Temperature</b>                            | Minimum -40°C  |        |                       |
|   | Maximum Short Circuit Temperature 250°C              |        |                       |
| <b>Minimum Bending Radii for Reliable Operation</b>     | 100mm  |        |                       |
| <b>Minimum Ambient Temperature for Full Flexibility</b> | -25°C  |        |                       |
| <b>Cable Lengths</b>                                    | Standard 0.5 to 50 Metres                            |        |                       |
|   | Special Order 55 to 1000 Metres                      |        |                       |
| <b>Cable Construction</b>                               | AS1125   | AS3191 | AS3116 DIN / VDE 0282 |
| <b>Conformity</b>                                       | Prescribed Items Act Approval Cert No. 11551         |        |                       |

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## DIMENSIONS



## MECHANICAL DETAILS



## SWITCH DATA

| Rated Voltage                | Non Inductive Load Amps                   |           | Inductive Load Amps |            | Inrush Current |
|------------------------------|---|-----------|---------------------|------------|----------------|
|                              | Resistive Load                            | Lamp Load | Inductive Load      | Motor Load |                |
|                              | NC  | NC        | NC                  | NC         |                |
| 250 VAC                      | 21  | 3         | 12                  | 4          | 50 A max       |
| 8 VDC                        | 21  | 5         | 12                  | 7          |                |
| 30 VDC                       | 14  | 5         | 12                  | 5          |                |
| 125 VDC                      | 0.6                                       | 0.1       | 0.6                 | 0.1        |                |
| 250 VDC                      | 0.3                                       | 0.05      | 0.3                 | 0.05       |                |
| <b>Contact Resistance</b>    | 15 Meg $\Omega$ maximum initial value     |           |                     |            |                |
| <b>Insulation Resistance</b> | 100 Meg $\Omega$ minimum at 500 VDC       |           |                     |            |                |
| <b>Dielectric Strength</b>   | 1000 VAC between Conductors               |           |                     |            |                |
|                              | 2000 VAC to Ground                        |           |                     |            |                |
| <b>Life Expectancy</b>       | Mechanical 50 Million Operations Minimum  |           |                     |            |                |
|                              | Electrical 100 Million Operations Minimum |           |                     |            |                |
| <b>Maximum Pressure</b>      | 300 kPa (30 Meters Submergence in Water)  |           |                     |            |                |

## 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 abrasion against tank walls, moving equipment, entanglement or severe agitation. 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.

**NEW SOUTH WALES DEPARTMENT OF MINERALS AND ENERGY APPROVAL No. CS4937N**

MADE IN AUSTRALIA BY

## KELCO ENGINEERING

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# 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 150 and 350mm, in water. For applications where the level change is greater than 350mm, 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. These may be supplied in brass or 316 stainless steel. If a standard cable weight was supplied with this switch, simply thread the switch cable through one of the holes in the weight and back through the second hole. Position the weight at least 150mm away from the float. See Fig1 for details.

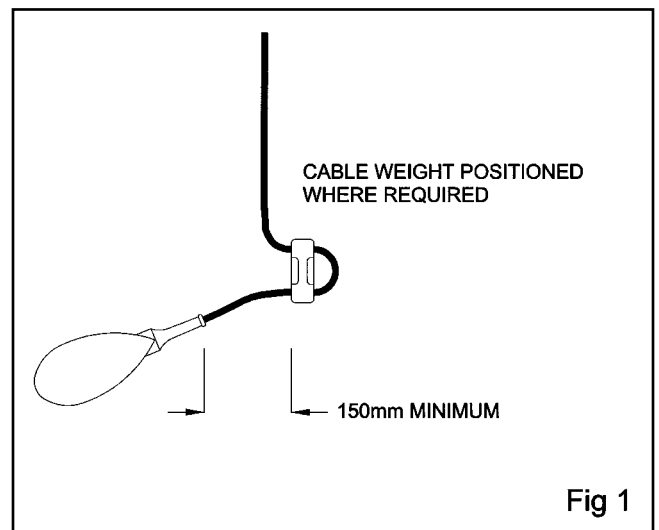
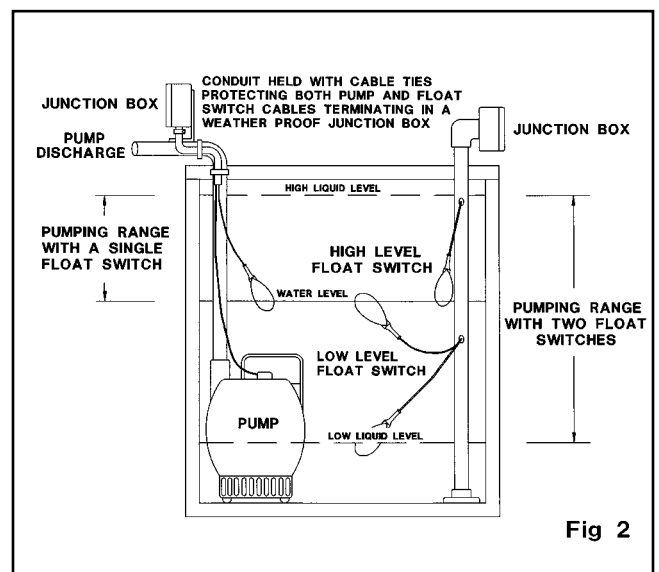


Fig 2 depicts a tidy method of installing multiple Float Switches, using a length of PVC pipe as a central cable conduit. Alternatively the Float Switch may be simply strapped to a pump discharge pipe, using cable ties.



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 150mm 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.

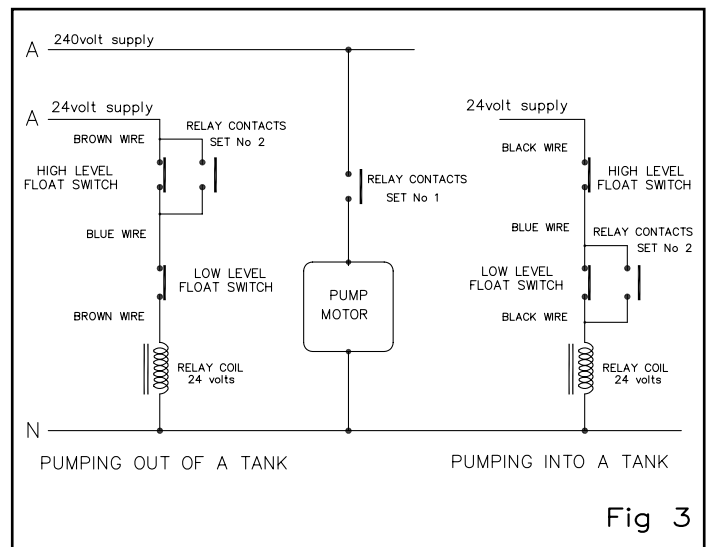
This switch is rated to control 240 volt circuits. In the interest of safety, lower voltages, such as 24 or 48 volts should be used wherever possible. If the switch is used in a 240 volt control circuit, it must always be isolated via an earth leakage circuit breaker.

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.



## 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.

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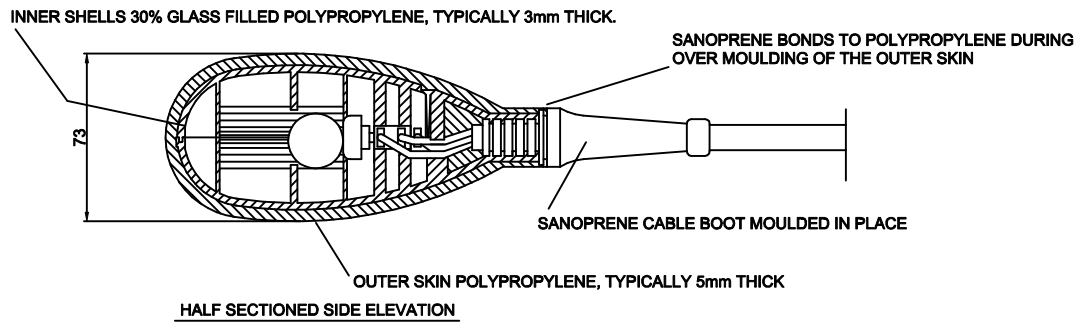
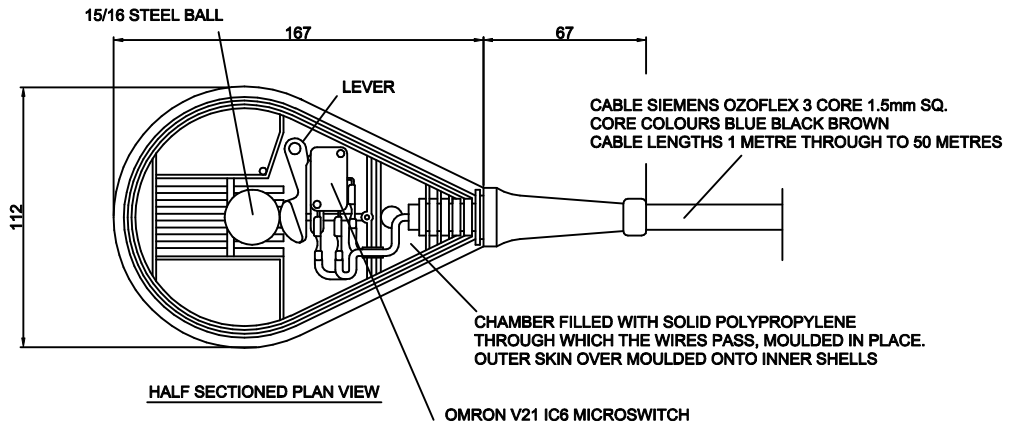
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|                                    |                 |   |                         |
|------------------------------------|-----------------|---|-------------------------|
| TITLE                              |                 |   |                         |
| Q SERIES HEAVY DUTY FLOAT SWITCH   |                 |   |                         |
| KELCO ENGINEERING SYDNEY AUSTRALIA |                 | PHONE 95055425<br>FAX 95055425<br>FACTORY<br>288 POWELLS ROAD BROOKVALE<br>NEW 2150 AUSTRALIA |                         |
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