



TYPE P4 & P5 CONDUCTIVITY LEVEL CONTROLLER

Installation and Setting up Instructions

General

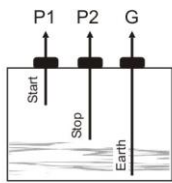
Principle of Operation: The P4 & P5 controller relies on the conducting properties of liquids to complete an electrical circuit between an electrode and earth. The earth is either the walls of a metal vessel, pipe work or another electrode which must extend below the lowest active electrode. A low voltage A.C. signal is used on the electrodes to prevent electrolysis.

Sensitivity: The sensitivity adjustment should be set to suit the application. This allows the level controller to ignore electrode bridging/foam layers and tracking, and only operate when the liquid touches or leaves the probe tip. To gain maximum benefit from the adjustment sensitivity and close switching differential, always use an earth electrode.

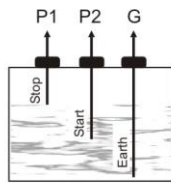
Fail Safe: For P4 the fail to safe switch is located on the front panel of the unit. In general, for emptying applications, use fail to safe low (FSL) and for filling applications use fail to safe high (FSH). Two green L.E.D.'s on the front panel indicate the fail to safe status. Use the end of a paperclip, or similar to change the fail to safe. Switch 'OUT' for FSL. For P5 the switch is internally located.

Operation and Applications

Control Use

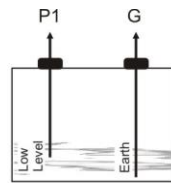


Pumping out between two levels use controller in FSL

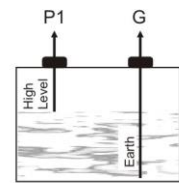


Pumping in between two levels use controller in FSH

Single Point Alarm/Cut-out



Low level alarm use controller in FSL



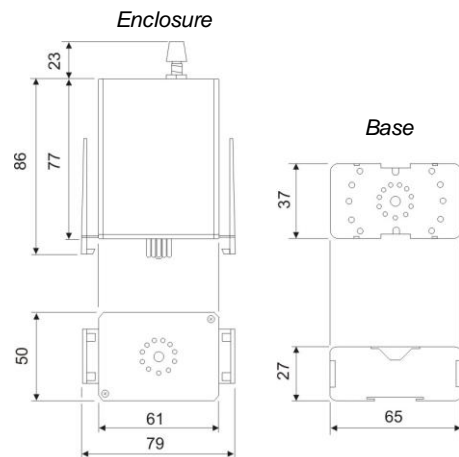
High level alarm use controller in FSH

In fail safe high mode (FSH) the controller relay de-energises when the liquid touches the shortest electrode. (e.g. pumping or high level alarm). In fail safe low mode (FSL) the controller relay energises when the liquid touches the shortest electrode. (e.g. pumping out or low level alarm). For control, two active electrodes are used. The controllers internal relay energises at the tip of one electrode and de-energises at the tip of the other to provide the interlock shown in the diagram.

Technical Specifications

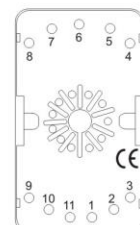
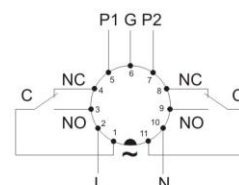
Supply voltage:	Stated on instrument plate 110V or 230VAC 50/60Hz
Supply tolerance:	+10% to -20%
Power consumption:	5VA
Ambient temperature:	-10°C to +60°C
Sensitivity P4:	Adjustable 100ohms to approx. 18,000ohms (approx. 0 to 10 on dial) higher values up to 5000,000 ohms are available for higher purity Water (ref Hi-Sen).
P5:	300 to 25,000 ohms adjustable.
Switching differential P4/P5	Better than 5% of sensitivity setting (e.g. less than 50ohms at 1000ohms sensitivity)
Relay output:	Dual pole changeover voltage free contacts Rated 4A @ 250VAC resistive.
Indication P4	RED LED showing relay contacts energised GREEN LED's (2) failsafe mode and power status
P5	RED LED showing relay contacts energised.
Connection:	11-pin DIN rail/surface mounting base.
Distance of controller to electrodes:	Nominally 100m greater distance using standard cable is possible in liquids of high conductivity Such as acids, sewage, sea water, etc
Response time: P4	0.5 seconds
P5	2 seconds
Probe voltage: P4	24V AC
P5	5V AC

Dimensions



Connection Details

11 Pin base, 2 C/O Contacts



Installation

Wiring Instructions

1. Ensure load to be switched does not exceed contacts rating.
2. When two active electrodes are in use P1 is always the shortest.
3. Avoid mineral insulated cable for probe connections, as this can absorb moisture giving a false signal.
4. Keep electrode cabling away from conductors carrying high voltage and or current.

Sensitivity Adjustment

General usage set at 5

In general, for clean water and dirty water not containing suspended matter such as paper, weed, rag etc., the sensitivity should be set at 5.

Risk of ragging set at between 0 & 2

Where there is the possibility of suspended matter, the unique circuitry of the Hawker series level controller enables a sensitivity setting to be found such that fouling and electrode bridging can be ignored. Here the sensitivity should be set as low as provides reliable operation. For sewage this can be as low as 2.1 or even 0 on the scale. Normally the setting is left ½ to 1 division above the switching point. (See below).

High purity water set between 5 & 10

Sensitivity settings higher than 5 may be required for boiler feed water, spring water etc., or when the level sensing electrodes are within plastic stilling tubes, e.g. in borehole. Again a point ½ to 1 division higher than the switching point should be chosen, or such as to give reliable operation.

Switching point

With both active electrodes covered, turn the sensitivity pot clockwise to '10' now slowly rotate anti clockwise until the relay changes state, (to de-energise, light OFF, in FSL, to energise, light ON, in FSH). This is the switching point. Advance 1 division for best sensitivity setting.

Fault Finding

Firstly, Check the obvious!

1. Correct Supply? And present at controller.
2. Connections all secure and correct.
3. Continuity of electrode cabling.

To check controller operation:

1. Disconnect electrodes
2. Short circuiting P1 to G should change relay state.

To check interlock function in two electrode systems:

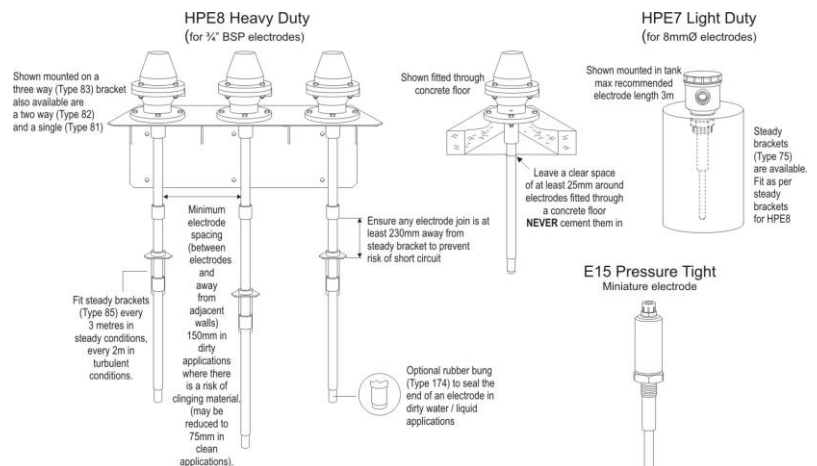
1. Short circuit P2 to earth and hold.
2. Short circuit P1 to earth, for FSH controller's relays Should be de-energised and LED 'OFF'. For FSL controllers, relay should be energised and LED 'ON'.
3. Remove P1 short, relay state should remain unchanged.
4. Remove P2 short, relay should change state.

Probe Problems

1. If probes are covered but controller will not switch check sensitivity setting and there is a good earth i.e. earth electrode has been sufficiently bared, and is close to active electrodes.
2. Hunting around upper electrode (P1) means lower electrode(P2) is disconnected. (or is not fitted)
3. Hunting around a lower probe often means (P1) and (P2) Connections have been reversed.
4. If controller runs on even when probes are uncovered, check for clinging debris, or other forms of short circuit. If necessary, adjust sensitivity.

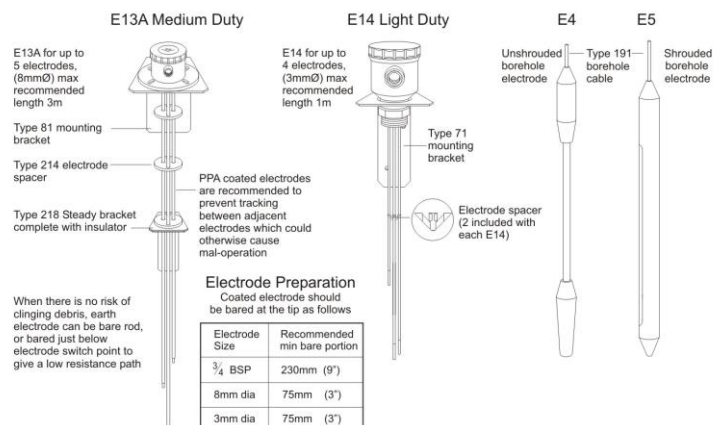
Electrode Installation

Electrode Holders



Multiprobe Electrode Holders

Borehole Electrodes



This product has been designed and complies to the relevant standards as listed in its certificate of conformity. The installer/user must ensure compliance. The crossed out bin symbol, placed on the product, reminds you of the need to dispose of the product correctly at the end of its life. Because of continuing development we reserve the right to change the specifications without notice

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