

WATERGUARD

Operation and Installation



Applications

The WATERGUARD control relay detects the presence of a conductive liquid and provides a voltage-free contact output. When used with conventional stainless steel probe (electrode) assemblies, or with floats, it can regulate the operation of a pump or valve or provide alarm monitoring. Its simple yet versatile operation makes it adaptable to many applications both as retro-fit into existing installations or as an independent system of liquid presence detection and control.

Operation

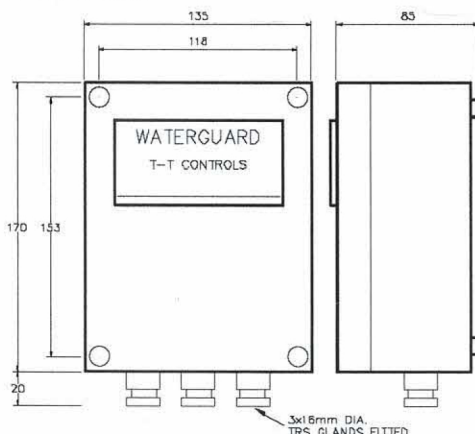
A liquid sensing circuit with a close switching differential, variable sensitivity and time delayed operation ensures reliable switching which ignores substantial electrode tracking, changing matter and foam. The operation of the output relay can be set for different operations by switches. An LED (light emitting diode) makes sensitivity adjustment a simple operation. When set, liquid between the probes G (or metallic casing) and P2 will light the LED and operate the output relay; the LED will remain lit until P1, if used, or P2 is uncovered. The output relay operation is then delayed by the timer to prevent hunting or to provide a run-on time.

The relay contact can be used to switch a single-phase motor directly (up to 1 kW), or a three-phase motor indirectly via a starter, or provide alarm monitoring. Any motor will require separate overload and short-circuit protection; this is not provided by the WATERGUARD.

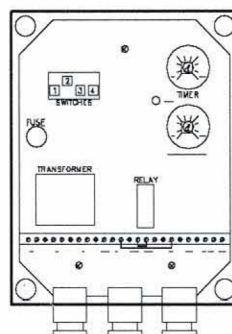
A two pole output relay is available, to replace the single pole relay fitted. The WATERGUARD requires a 230V 50 Hz supply (110 V, 50 Hz version is available) and is internally fused; the sensing circuit is transformer isolated from the supply and operates at < 24V AC.

The WATERGUARD can be configured for particular applications; contact SALES for advice.

Dimensions



Internal Layout



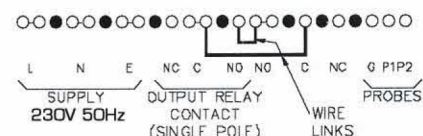
Technical Specification

Supply voltage :	230V + 10% - 20% 50 Hz 3 VA (optional 110V)
Internal fuse :	20 x 5 mm, 100mA, 230V Anti Surge (250 mA, 110V)
Electrode voltage :	20 V AC, max. Transformer isolated from mains supply.
Electrode Current :	3 mA max. short circuit.
Sensitivity Range :	10K to 100K Ohms.
Timer Range :	2 to 60 seconds.
Output 1-Pole Relay Contact Rating :	16A resistive, 8 A inductive at 230V Isolation (coil to contact) 4 kV AC
(Optional 2-Pole Relay Contact Rating :	5 A resistive at 230V Isolation (pole to pole) 2 kV AC
Terminal Capacity :	2.5 mm. ² max.
Ambient Temp. :	-10 to 50°C
Enclosure :	PVC light grey to RAL 7035, IP 555
Dimensions :	170 mm H x 135 mm W x 85 mm D
Fixings :	153 mm x 118 mm centres, M4 holes (Optional external fixing brackets available).
Weight :	0.7 Kg

Installation

The WATERGUARD should be positioned to avoid very damp atmospheres. It is essential to have a low resistance earth return path for the G terminal. A metal tank or pipe can be connected to this terminal, but if the efficiency of this earth is in doubt a separate ground probe should be installed. The probes should be cleaned periodically to avoid becoming coated in grease or carbonised oil, causing insulation from the conducting liquid, and requiring adjustment of the sensitivity control to maintain operation. Once installed the WATERGUARD should be maintenance-free; however the output relay is plug-in and can be easily changed if its contact deteriorates.

Terminal Functions

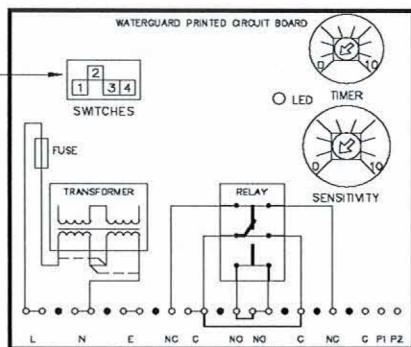


Do NOT overtighten terminals
The output relay CANNOT be used as a two pole relay by removing the wire links alone. The relay must also be replaced by the optional two pole relay.

Setting Instructions:

Switches

1. OUTPUT RELAY FUNCTION (SEE BELOW FIGS. 1 TO 4)
2. $\uparrow$ NORMAL
 $\downarrow$ OUTPUT RELAY OFF
3. NOT USED
4. DRY RUNNING PROTECTION (SEE BELOW FIG 9)



Connections:

Procedure

1. INITIAL SETTINGS: SENSITIVITY 0, TIMER 0
2. IMMERSE THE G AND P2 PROBES IN THE LIQUID
3. TURN THE SENSITIVITY CONTROL CLOCKWISE, SLOWLY, UNTIL THE LED LIGHTS THEN ADVANCE THE CONTROL BY ONE DIVISION. THE SENSITIVITY IS NOW SET. WITH SWITCH 1 $\downarrow$, THE OUTPUT RELAY WILL ENERGISE WHEN THE LED IS LIT, WITH SWITCH 1 $\uparrow$, THE RELAY WILL DEENERGISE WHEN THE LED IS LIT.
4. IF THE LED LIGHTS IMMEDIATELY THE PROBES ARE IMMERSED IN THE LIQUID, ADVANCE THE SENSITIVITY CONTROL TO THE FIRST DIVISION TO ENSURE CONSISTENT OPERATION.
5. REMOVE THE P2 PROBE FROM THE LIQUID, THE LED WILL REMAIN LIT UNTIL THE P1 PROBE, IF USED, OR P2 PROBE IS UNCOVERED, CHECK THAT THE LED EXTINGUISHES. THE RELAY WILL OPERATE 2 SECONDS LATER.
6. THE RUN ON TIME CAN BE INCREASED, IF REQUIRED, UPTO 60 SECONDS BY ADVANCING THE TIMER CONTROL (6 SECONDS PER DIVISION)

Probe Connections:

CONTROL
SWITCH 1 $\uparrow$ = FILLING SWITCH 1 $\downarrow$ = EMPTYING

FIG.1 DIRECT SWITCHING OF A SINGLE-PHASE MOTOR

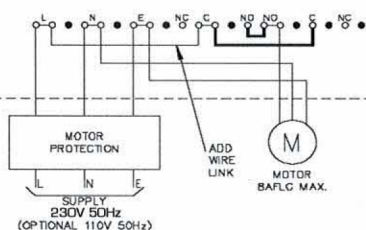


FIG.2 INDIRECT SWITCHING OF SINGLE OR THREE PHASE MOTOR

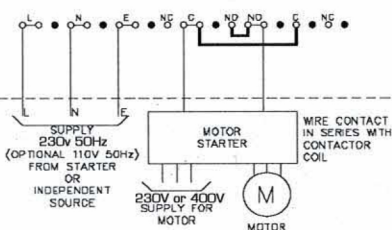


FIG.5 CONTROL

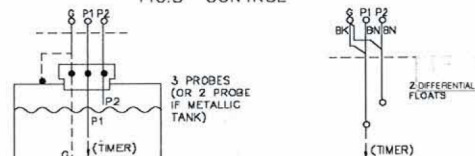
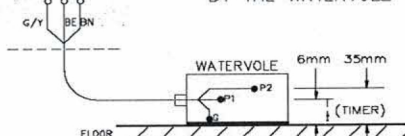


FIG.6 FIXED LOW LEVEL SWITCHING BY THE WATERVOLE



ALARM MONITORING

SWITCH 1 $\uparrow$ = HIGH LEVEL (NORMAL) OR LOW LEVEL (FAIL SAFE) OR NO FLOW (FAIL SAFE) OR FLOW (NORMAL)
SWITCH 1 $\downarrow$ = HIGH LEVEL (FAIL SAFE) OR LOW LEVEL (NORMAL) OR NO FLOW (NORMAL) OR FLOW (FAIL SAFE)

FIG.3 REMOTE INDICATION

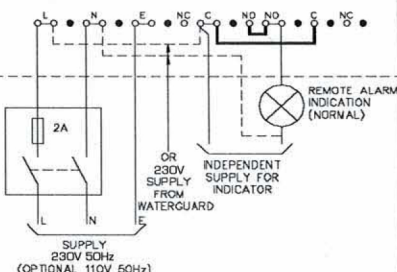


FIG.4 REMOTE SIGNALLING (VOLT FREE CONTACTS)

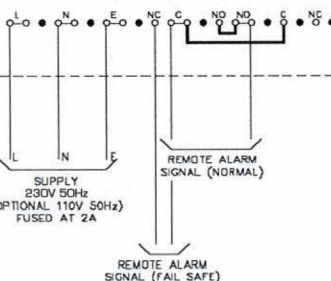


FIG.7 ALARM MONITORING OR CONTROL (SWITCH OFF BY TIMER)

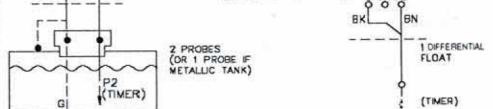


FIG.8 FLOW MONITORING

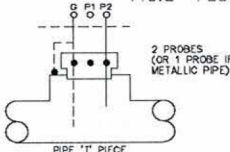


FIG.10 OPTIONAL 2 POLE RELAY

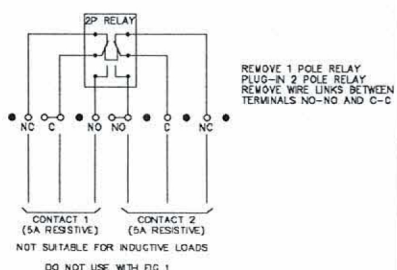
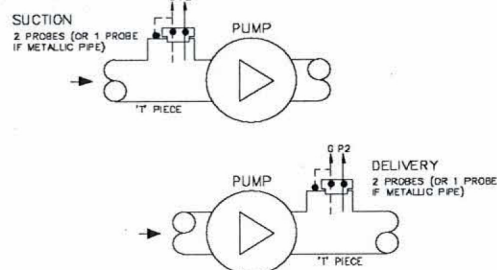


FIG 9 PUMP DRY RUNNING PROTECTION CONNECTIONS AND SWITCH 1 SETTING AS IN FIGS 1 OR 2 ABOVE

SWITCH 4 $\downarrow$ SUCTION (INLET) SIDE
AUTOMATIC RESTART WHEN LIQUID PRESENT.
SETTING UP PROCEDURE AS ABOVE
TIMER SET TO OVERCOME AERATION IN PIPE

SWITCH 4 $\uparrow$ DELIVERY (OUTLET) SIDE
RESTART BY SWITCHING OFF SUPPLY TO WATERGUARD FOR 2 SECONDS MINIMUM AND THEN ON AGAIN. TIMER ALLOWS PRIMING OF PUMP AND LIQUID TO REACH PROBE.
SETTING UP PROCEDURE:
SET SENSITIVITY TO 10, TIMER TO 10.
SWITCH ON SUPPLY TO WATERGUARD.
WHEN LED COMES ON TURN SENSITIVITY TOWARDS 0 UNTIL LED GOES OUT THEN TURN BACK 1 DIVISION.
TURN TIMER TO PUMP PRIMING TIME.
DISCONNECT PROBE P2 AND CHECK PUMP STOPS AFTER TIME, RECONNECT P2, SWITCH OFF WATERGUARD FOR 2 SECS AND ON AGAIN.



WARNING BEFORE CONNECTING OR DISCONNECTING ANY WIRING TO THE TERMINALS ENSURE THAT ALL ELECTRICAL SUPPLIES TO WATERGUARD ARE ISOLATED. CONNECTIONS SHOULD ONLY BE MADE BY QUALIFIED ELECTRICIANS.