



CONTROL EQUIPMENT

DIGITAL STARTER
PROTECTOR 3 PHASE 380V



DIGITAL STARTER PROTECTOR 3 PHASE, 380V GEN1

General description

The 3 phase pump controller is an electronic control/protector for most pump motors and its operation and installation will be explained in the following pages:

1. Over current/under voltage protection is performed automatically by switching the main supply to the pump motor off.
2. In the event of a power failure or input voltage lower than 160V, the controller will switch off the power to the pump motor in 4 seconds.
3. The unit can also determine water levels in tanks or reservoirs and control the pump according to demand.

Technical features

Rated Voltage:	380V ± 15%
Output Power:	4kW (8 amp)
Operating Temperature:	-10 to 40°C
Control Distance:	1km
Humidity:	≤ 90%
Height above Sea Level:	2000m
Protection function:	Time extension feature

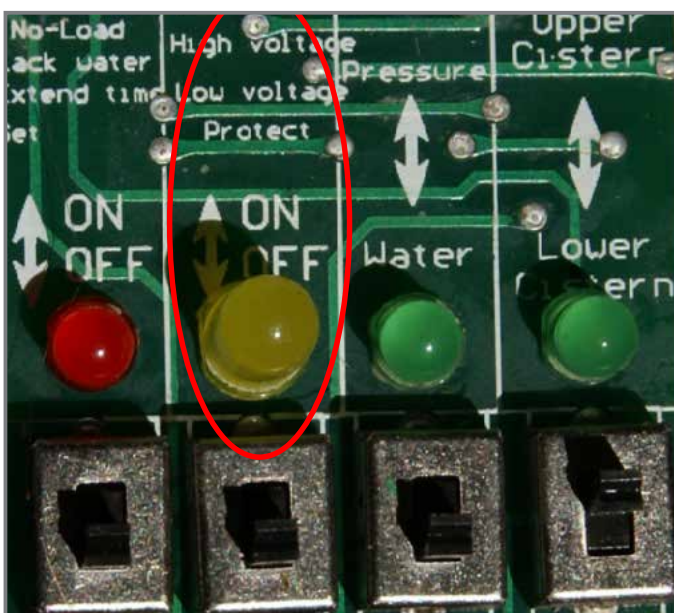


OVERLOAD (TIMES)	PROTECTION TIME (SECONDS)
1.3	50
1.5	30
2	15
3	6
5	1



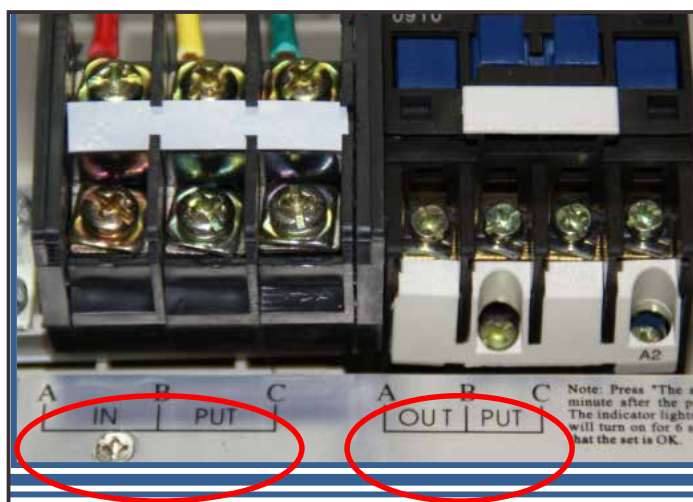
Operation

- 1. Water level control:** one reservoir/ water tank can be controlled via the wiring connection at the bottom of the controller.
- 2. Over load protection:** At the loss of any one phase, the phase detection CCT will signal the power contactor to drop out and switch the power supply to the pump motor off. Should for any reason the motor draw too much (high) current (see current setting) the over current protection CCT will signal the power contactor to drop out and switch of the power to the motor. This is done automatically in the time set by the installer, see Setting and Adjustments for high current and fast switch off times (anti-time overload protection). The overload LED / light will light up (blink) in the event of a power failure. Also refer to the failure enquiry feature.
- 3. Short CCT protection:** The controller will react the same as in the case of an overload, high current condition occurring and power to the pump motor will be switched off within the same time limit as set by the installer.
- 4. Over/under Voltage protection:** The small LED on the PCB will blink if this function is switched on. The voltage may vary as specified - $380V \pm 15\%$. The controller will self protect within 20 seconds when the voltage drops below 280V.



Installation

1. Fit the controller vertically to the appropriate area. Avoid dust, sun light and rain.
2. Connect the input power to the 3 phase input terminal market A,B and C.
3. Connect the pump motor cable wiring to the output terminals also marked A, B and C. They are to the right of the input connections.



4. Connect the water reservoir/tank probe cables to the terminals marked high, med and low at the right bottom of the PC board. Also note the small switch below the green LED, on far right-hand side just above the tank terminals. A selection can be made for the upper or lower tank.

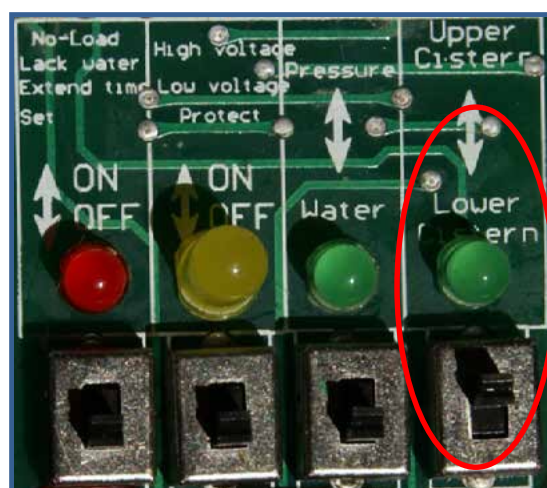


Lower Tank/Cistern:

Max water level: Power on
Min water level: Power off

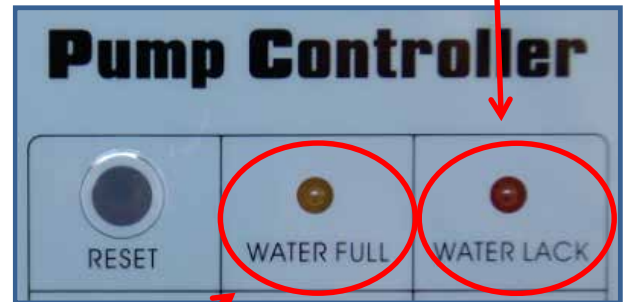
Upper Tank / Cistern:

Min water level: Power on
Max water level: Power off



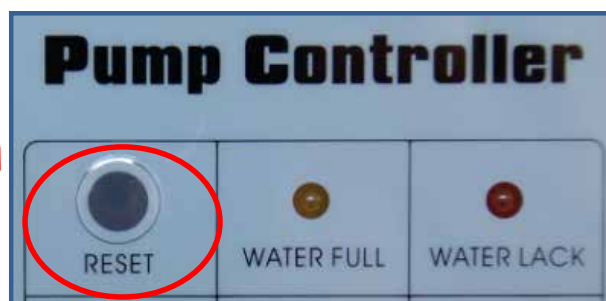
5. **Lack of water:** Switch to lower cistern. Should the lower tank lack water, whilst the pump is still running, the pump motor current will be low and the controller will sense this low current or no-load situation as there is no water in the tank and will therefore switch power to the motor off within 10 seconds.

6. Should the pump be in power-on mode but it has been switched off for a no-load fault and the tanks are now full of water, the probes in the tank will signal that the tank is full and the contactor will supply power to the motor. The unit will also do a self test every 30 minutes (adjustable), provided that no-load switch is on.



7. The **water full** LED will come on as the tank probes signal that the water is at a high level.

8. **Reset** on the front panel should only be used to get the pump's motor running again, in the event of the controller switching off, after the installation has gone through a fault finding test.



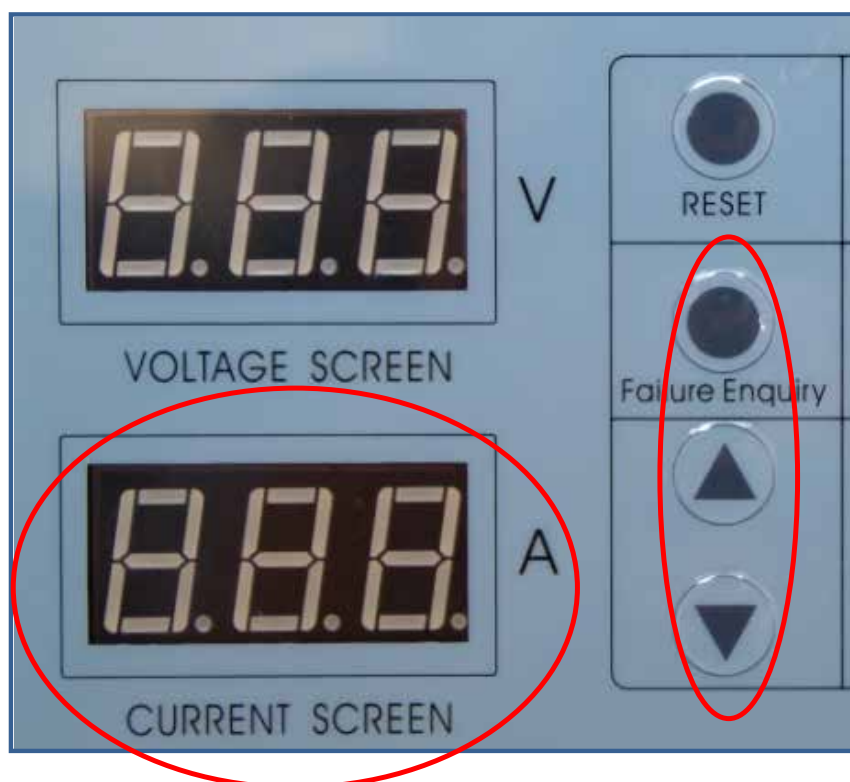
9. The user may also select water level or pressure control by switching to either function on the small PCB's second last switch, marked "pressure" and "water".

10. Switch to upper cistern, pump will not run. Lack of water will send a signal to switch on the power to pump motor.



Settings and adjustments

1. This unit has 10 failure data reports and by pressing the failure enquiry button on the front panel the user can select, with the arrows, any report that will be displayed on the digital current indicator A.



Should a failure light blink, pressing the failure enquiry button will result in the current indicator showing that particular fault condition. Overload will show overload current.

2. Should a phase loss be indicated on the front panel, the user will see the following on the current indicator when pressing the failure enquiry button:

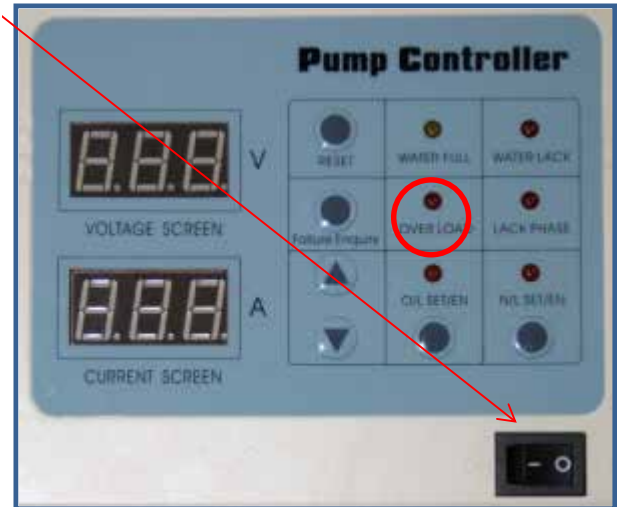
- 011 - phase A loss
- 101 - phase B loss
- 110 - phase C loss
- 111 - this code with the light on means that the input connections are not wired properly or the pressure mode senses low pressure which causes switch off condition and one has to re-set continuously until the fault has been fixed.



3. The **on/off switch** on the front panel may also be used to stop the function of the controller or switch the pump motor back on again.

4. The **“all complete / enter” button**: after running the pump motor normally for 60 seconds the user may press the “enter” button mentioned above. This is found on the PCB above the level connectors. Note that the overload LED on the front panel will flicker for 6 seconds and then turn off.

This means that the running and overload current settings with other functions has been memorized and the controller is in the ready state.



5. By selecting “lower or upper tank/cistern,” “pressure or water” the installer/user will notice that the LED corresponding to that switch will be on if the switch is in the lower position. The LED will go off in the upper position. Also note that the factory default signal to the controller is set on the “upper cistern”.

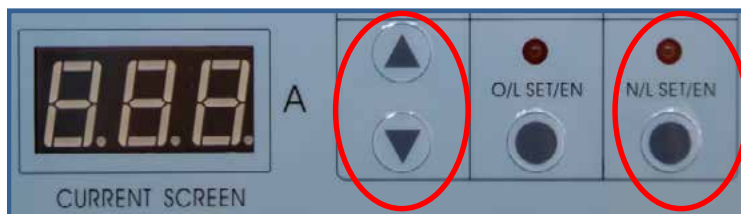


6. **Over-load setting:** Switch the controller on and take note of the running current, then press the overload set/confirm (O/L SET/EN) with the LED now ON. Press the up/down arrow button to select or adjust the digital indicator to the value recorded and a bit more, then press the O/L SET/EN button with the LED now off.



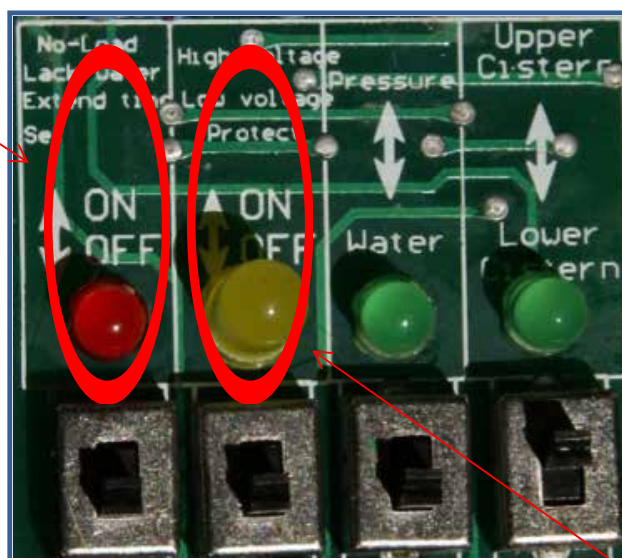
7. **No-load setting.** Start the pump motor and run for 60 seconds with “no load” . The current should be low. Record this value and press the set/confirm (N/L SET/EN) button on the front panel. With the LED above now “on,” select and adjust with the up/down arrow buttons the current setting as displayed on the digital display.

Press the N/L SET/EN button again with the LED off. The value has been recorded and memorized. The no-load current can be set directly as 0.85 times that of the normal operating/running current. The factory default no-load setting is 0.1 amp.



8. **No-load reset time.** After running the pump motor, switch the “no-load lack water extended set to “on,” located below the red LED. The current digital indicator now shows the no-load reset time in minutes. By adjusting with the “up/down” arrows, select the time required. Then switch to “off.” The time has now been recorded and memorized. Suggested time is 20 minutes as the factory default time is 30 minutes.

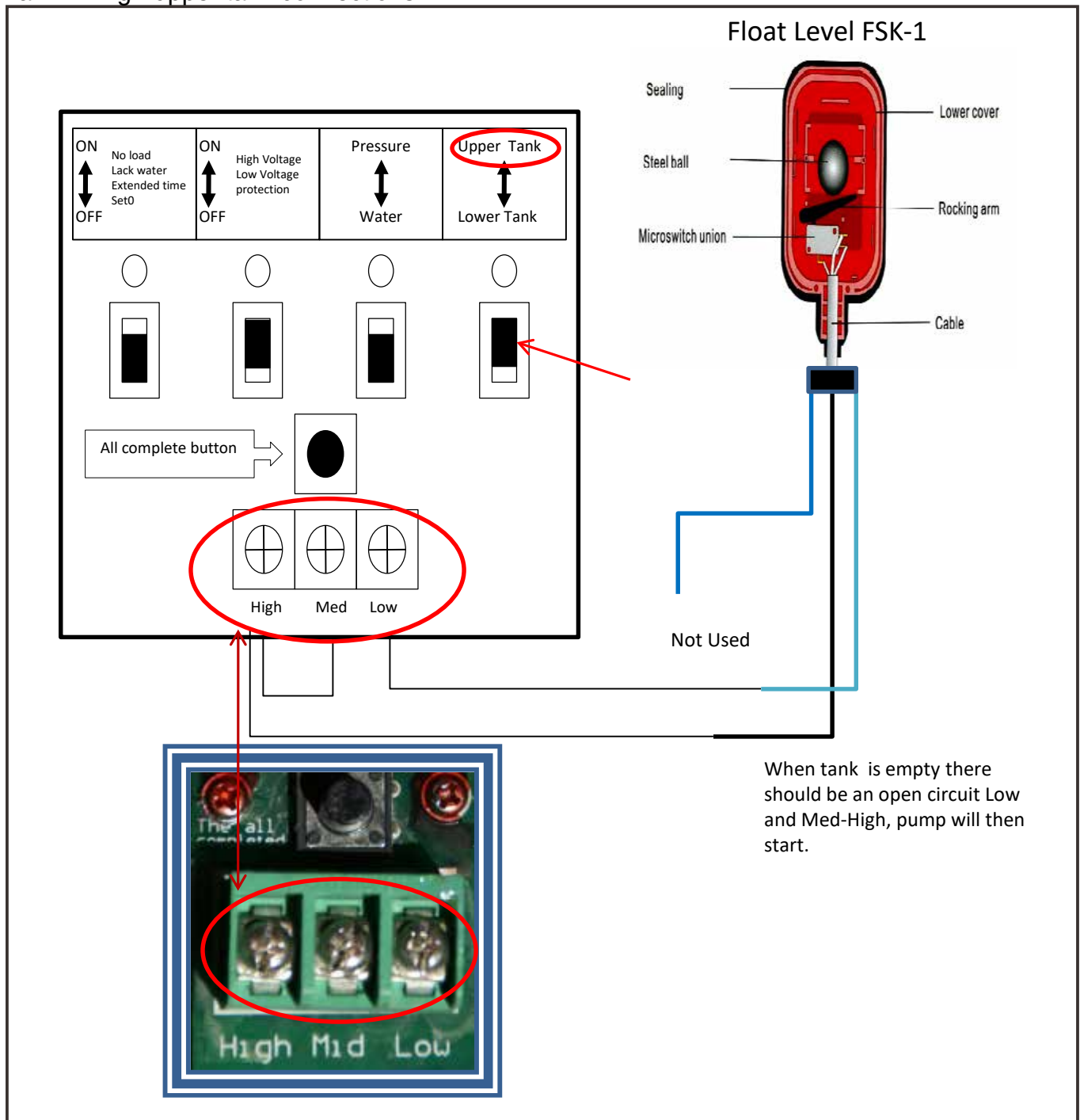
9. **Over/Under voltage.** After running the pump motor, switch the “high/low voltage” switch to “on” This is located under the yellow LED on the board and the light will be on. This will ensure that



the high/low voltage protection function/protector is ON and will protect as per the specification of 380V ± 15%.

FLOAT LEVEL CONNECTIONS

Tank Filling - upper tank connections:

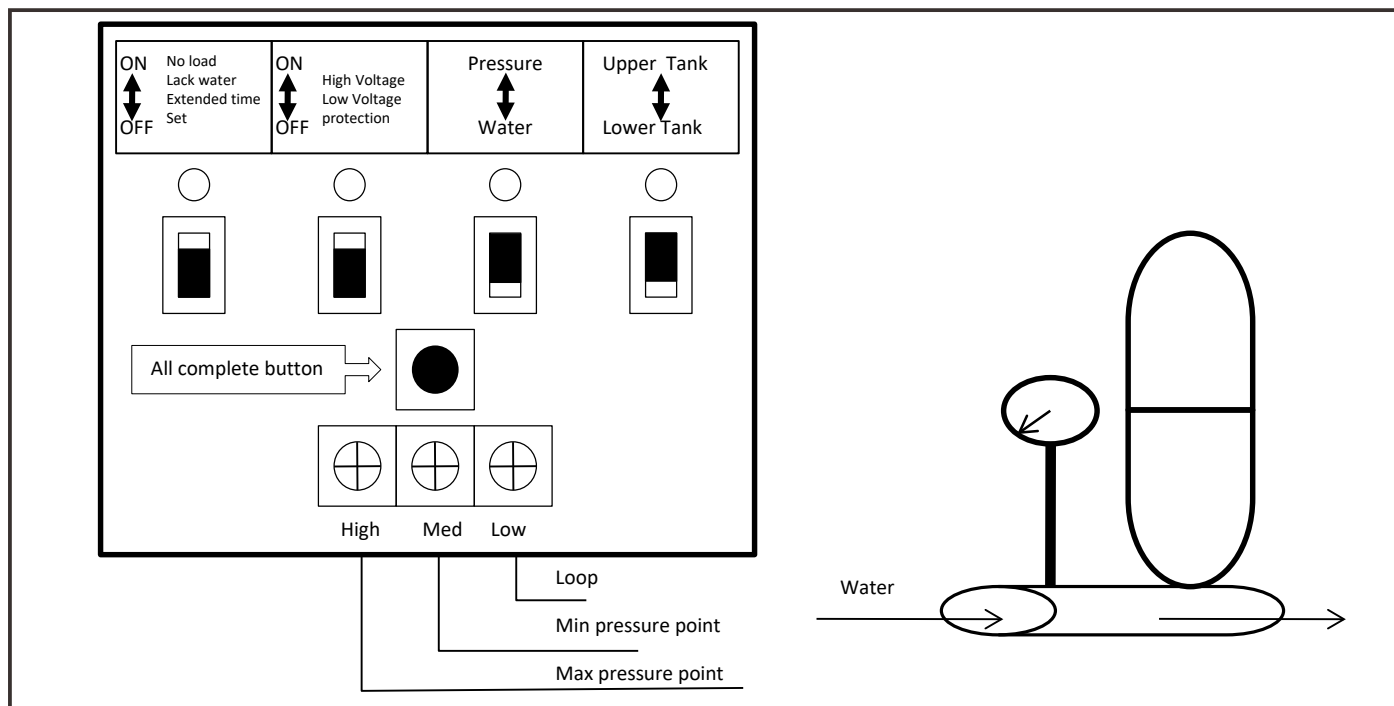


When tank is empty there should be an open circuit Low and Med-High, pump will then start.

Fault finding

If the control unit is connected to the water pressure system and the pump motor does not switch on at the minimum pressure, check the following:

1. Ensure that the wiring is done correctly, see diagram.



2. If the wiring is correct and the system still does not operate correctly, remove the wiring and short CCT the terminals H, M and L.
Start the pump motor.
If the motor runs, it is an indication that the wiring to the pressure system is faulty or the probes are defective.
Repeat by shorting and disconnecting to make sure the unit is fine.

