

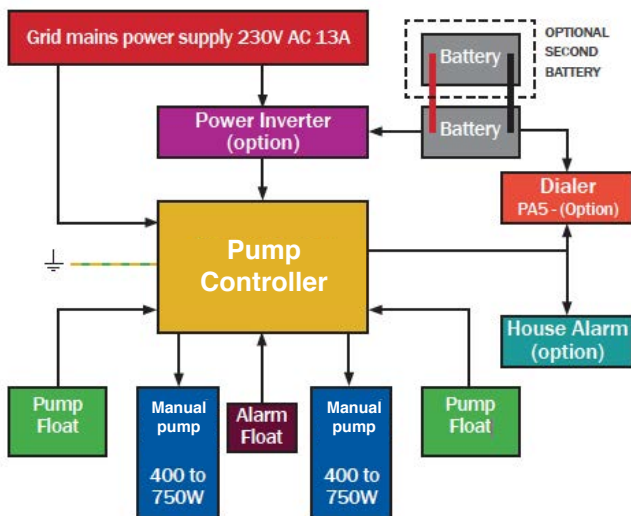
**PUMP CONTROLLER - TWIN PUMP CONTROLLER WITH ALARM**

**Dimensions**

300mm wide x 132mm high x 78mm deep. Weight - 1.94kg

The Pump Controller is designed to be used with matched pairs of manual versions of MacLennan pumps and provides a sophisticated, yet simple to install, twin pump control system which offers some of the features of the MacLennan Control Panel-Pro, but at a much lower cost.

The controller has a mains powered alarm with battery back-up alarm and features interfaces for use with MacLennan battery back-up and telemetry systems, as well as connections to whole house alarm and monitoring systems. The major feature of the control system is the self diagnostic program that operates both pumps on a weekly basis to ensure that they are not stood idle for extended periods so as to prevent seizure and premature pump failure. Each pump will operate for 5 seconds, (one after the other) once per week. Each pump is operated by its own vertical type float switch with a single reed type switch supplied for the alarm system which incorporates the same PCB as the MacLennan Alarm unit. The panel is designed to be used with an optional Victron Power Inverter, sized to suit the pumps installed and a minimum of one 12VDC standby battery of at least 110A/H.

**A typical system is shown below:**

**Panel Highlights**

1. Two independent power supply inputs - Each pump is separately and independently powered from the other. The operation of the pumps is not at all dependent on the operation of the Pump Controller. If the Pump Controller should fail, the float switches will still have the ability to switch on the pumps as if they were automatic pumps.

2. Automatic pump duty assist - If one pump cannot cope with the volume of water entering the sump, the water level will rise to the switch of the second pump which will automatically start to increase the pumping capability. Please be aware that separate discharge lines maximises the volume of water removed when this feature is utilised.

3. Automatic alarm float checking - An alarm checking signal is continually monitored to confirm the alarm float cables have been fitted correctly, not been tampered with or have been disconnected.

4. Automatic testing of each pump every 7 days - Test ensures the pumps are used each week. Each control circuit has its own independent timer to ensure that each pump is tested at different times. The SET button starts the 7-day cycle.

5. Test Button - Both pumps can be started from the panel for testing.

6. Alarm Power - The Alarm is powered under normal circumstances by 230V mains and by internal 9V battery during power outage.

7. Alarm Sounder mute - If the sounder is beeping to warn of high water level, you can mute the sounder by pressing the mute button once. The LED will still flash until re-set (in Alarm Mode 1).

8. Pump Counter - An internal, 6 digit counter is included that counts the number of times Pump 1 operates (Not pump 2). This count includes the weekly pump test and pump operations activated by the float switch.

9. Choice of pumps - A choice of MacLennan manual pumps of 400 and 750 watts.

10. Battery Back-up - Optional Victron Power Inverter can be connected to the unit to provide continuation of pumping (Pump 2) during power outage.

11. Fail-Safe - Telemetry - Pump controller can be connected to the MacLennan Dialer or to home alarm system

**Electrical connection**

INSTALLATION WARNINGS:  
THIS CONTROL PANEL MUST ONLY BE INSTALLED BY TRAINED ENGINEERS. BEFORE COMMENCING INSTALLATION, ISOLATE YOUR MAINS ELECTRIC SUPPLY.

This product should be installed in accordance with the relevant sections of the building regulations code and the current edition of the IEE Wiring Regulations (BS 7671: Requirements for electrical installations) and appropriate statutory regulations.

As of April 2004, new installations in the UK should be wired using the EU harmonised colours for the supply conductors. NEW COLOURS: BROWN = Live. BLUE = Neutral. YELLOW / GREEN = Earth. This installation MUST be earthed.

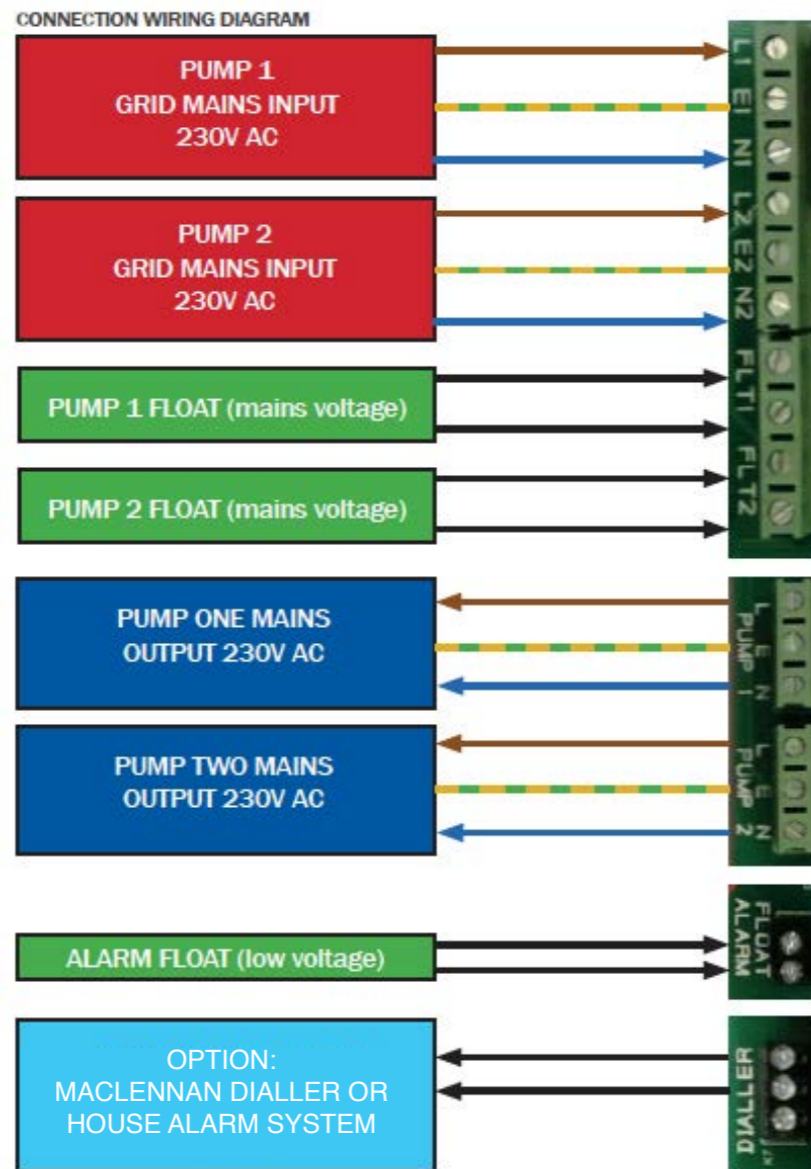
This control panel is not waterproof, is of metal construction and must be installed in a dry, well ventilated area.

Warning: it is important to read and understand the Pump Controller instructions This Pump Controller has been designed to be wall mounted or recessed within the wall. When the unit is recessed into the wall, the routing of all cables is also within the wall, making a neater installation than if the unit is wall mounted. Cable entry is via the knock-outs to the bottom and side of the panel and glands are supplied for recessed mounting. For ease of maintenance in changing pumps, it is recommended to always use 1 x 32mm conduit for the two pumps and 1 x 32mm conduit for the two float cables and 1 x 25mm conduit for the Alarm Float Cable. For surface mounting, the panel looks neater if the 32mm and 25mm conduits are fitted directly to the unit.

**Electrical connection**

**NOTES:**

Low voltage rated cables cannot be run in the same conduit as mains (230V AC) cables. Panel must be earthed. If the sump chamber is full of water on first powering up the panel, the alarm may sound and both pumps may start together. When the water level is below the alarm float, the alarm sounder will cease and the remainder of the water will be removed by Pump 1.



**Connections**

Mains 1 - 230V AC supply suitably rated to operate Pump 1 from a locally fused spur, preferably from its own feed off the consumer board.

Mains 2 - 230V AC supply suitably rated to operate Pump 2 from a locally fused spur, preferably from its own feed off the consumer board OR 230V AC power supply from correctly sized Victron Power Inverter (see page 10 for information on Power Inverter sizing).

Float 1 - Connections to 230V AC vertical type float switch.

Float 2 - Connections to 230V AC vertical type float switch.

Pump 1 - 230V AC output to Pump 1.

Pump 2 - 230V AC output to Pump 2.

Dialer - Volt free relay contact which operates upon alarm sending signal to ancillary alarm options such as the Dialer or BMS (Building Management System). Use NO (Normally Open) and C (Common).

Float Alarm - For connection of water alarm float.

**Connection Notes**

- Ensure that the grid mains connection is not connected until all connections are complete and the Pump Controller casing is fitted and locked closed.

- The Alarm Float is the smaller Reed Pivot Switch and the Pump Switches are the larger Vertical Action Float Switches. The Alarm Float should be installed so that the switch is always closed and only opens when lifted upwards by rising water.

- The three floats each have two wires. The connection of these wires is not dependent on polarity and can be fitted to either of the terminals for each connection.

- The three switches should be fitted to the two pump vertical discharge pipes so as to give a switching order of: PUMP 1; ALARM; PUMP 2

- Ensure that the switches are set at the correct levels so the pumps operate correctly: If the switch is too high, the switch may not operate until the water level in the sump is too high. If the switch is too low, it is possible that the pump removes all the water before the switch has turned off. It is vitally important to test the pump switching to ensure the pumps operate correctly.

**Display information**

The Pump Controller fascia is fitted with LED lights which indicate the following:

- OPERATING - Blue LED lit steadily with option to reduce brightness via "Set" button
- PUMP 1 - Green LED lit steadily while Pump 1 is running on test
- PUMP 2 - Green LED lit steadily while Pump 2 is running on test (Pump 1 will also be running indicating high water ingress). If Pump 1 is not running, this indicates that Pump 1 did not start. Contact service engineer. NOTE: Alarm should have sounded also
- WARNING - Blue LED shows fault on High Water Alarm unit
- WATER HIGH - Blue LED shows High Water Alarm

**Internal information**

COUNTER - A 6-digit counter will count the number of times the output to pump 1 operates. This count shall include pump operations by the weekly test cycle and pump operations. Counter can be reset by shorting jumper J2 on the PCB.

**CONTROLS**

Pump Controller - When the Pump Test Button is pressed for three seconds, initially Pump 1 will run for 5 seconds and then stop. After a 5 second delay Pump 2 will run for 5 seconds and then stop.

When the Set Button is pressed briefly, (for 1 second or less) the brightness of the "Operating" LED will be reduced to half normal brightness. Pressing briefly when at reduced brightness will return to default full brightness setting.

When the Set Button is pressed for more than 3 seconds, it will reset the weekly test operation timer so that the next test will be at the same time the following week from when the button was pressed. The "Operating" LED indicator will flash 3 times to confirm that the timer has been reset.

**High Water Alarm**

When the Alarm Test Button is pressed, both the alarm indicators will light and the internal buzzer will sound. When the Alarm Mute Button is pressed, the internal buzzer will be silenced.

**PUMP CONTROLLER - TWIN PUMP CONTROLLER WITH ALARM**

**Operation**

After installation and power up, the weekly timer will start and the blue Operating LED shall light at full brightness.

After one week from initial power up (or after a 3 second press of the Set Button as described above), a test will take place of the two pumps. During the test, both pumps will be separately tested with a 5 second period between the two pump starts. Pump LED lights will show the test occurring.

The test process will repeat each week.

**Performance examples**

The table below is test data from our pump testing rig and confirms the volumes of water that should be removed with the specified system. The test rig was set with a pumping head of 4m with 4 pump starts per hour, approximately 66 litres of water discharged at each start, water discharge temperature of 20°C and standard DC power cables. 400 watt pump flow rate was 137 litres per minute. 750 watt pump flow rate was 225 litres per minute, measured by flow per metre.

	400W Pumps				750W Pumps			
	Start Volts	Starts	Hours	Litres	Start Volts	Starts	Hours	Litres
1 x NorthStar NSB 60FT	12.84	56	14.2	3825	12.98	48	12.0	3154
2 x NorthStar NSB 60FT	12.71	104	26.6	7035	12.84	102	25.7	6879
1 x NorthStar NSB 100FT	12.98	106	27.1	7295	13.08	87	21.9	5803
2 x NorthStar NSB 100FT	12.85	212	54.0	14417	12.90	180	45.5	11992
1 x NorthStar NSB 190FT	12.80	182	46.7	12394	12.82	162	41.0	11002
2 x NorthStar NSB 190FT	12.84	395	101.5	26822	13.10	353	89.6	23936
1 x NorthStar NSB 190FT <sup>1</sup>	12.80	2568	642.0	282480	13.10	1632	408.0	244800