

DUAL, RECIRCULATING PUMP CONTROLLER INSTALLATION & OPERATION GUIDE

Model SM268v1 Document revision 2 July 2011



General description

The **SM268** pump controller is a compact wall mounted unit which will manage the operation of a **Single** or **Dual** (Duty & Standby) pump applications appropriate for **recirculating pumping systems** such as those used in Hydroponics or Aquaculture.

A backlit Liquid Crystal display provides extensive pump status information.

An external flow sensor input can be used to confirm pump operation or signal alarm conditions.

An additional input may be connected to a float or level probe to generate a triple-beep warning to say that a low or high water level has been detected in a holding tank or channel.

METHOD OF OPERATION

When power is applied to a controller unit, it will activate Pump 1 and begin to circulate water. Input is then expected from a flow sensor contact positioned in line with the water flow. This contact is expected to inform the controller unit that valid pump flow has been achieved within 10 seconds of pump activation. At preset intervals (typically 4 hours) the pump will halt and the alternate pump will commence operation, ensuring that the workload is divided evenly between two pumps. If at any time the flow sensor fails to detect water flow while a pump is supposed to be active, it will trigger an alert condition.

- The present pump will stop
- The alternate pump will be activated
- The large LED indicator will commence a slow flash to indicate a fault
- The electronic beeper will commence a slow pulsing alert tone
- The Aux Alarm relay will operate so that external alarms may be triggered.

If the second pump failed to produce valid flow then a second, more urgent alarm of a double-flash and double-beep will be generated and all pump drive will be shut down. (as a pipe may be broken or gate valve closed, and pumps may be running dry.)

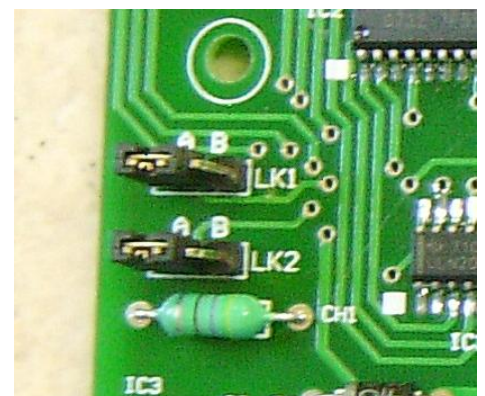
After the preset auto-changeover interval of successful operation of the alternate pump, the previous (possibly defective) pump will be tried again. If flow is successful, the alarm will self extinguish and normal operation will resume. If flow fails, the alternate pump will again be activated and the alarm event would continue. Pressing the **Motor Jog** button at any time will extinguish all alarms and force operation of the alternate pump.

OPTIONS LINKS

There are two option links designated **LK1** and **LK2**

With **LK1** in Position (A) the pump duty cycle operates normally. With **LK1** in Position (B) the **Auto-changeover** timer and **Alarm Mute** timer are reduced from the preset times down to 20 seconds. This is a test mode to allow maintenance and installation staff to observe the integrity of the system by witnessing successful auto-changeover events.

With **LK2** in position (A) the controller will expect two pumps to be in service. With **LK2** in Position (B) the operation of Pump 2



will be suppressed and auto-changeover at time intervals will be suppressed. No-flow events will immediately trigger the double-beep urgency alarm. This mode is intended where one of the two pumps has been deliberately removed from service for maintenance and forces the controller to adopt the operation of a single pump system.

SENSOR INPUTS

A four way screw terminal block provides for up to three external contacts labelled **PR1**, **PR2** and **PR3** relative to the common terminal labelled **COM**. These are low, voltage, low current inputs that may be extended for some distance from the controller. (control signals are 4.5V D.C. at less than 10 milliamps)

PR1, STOP/START control

Where this input is off or unconnected, the controller will assume that the pump must attempt to run the moment power is applied to the controller. Where this input is Closed (switched to **COM**), the pump operation will halt and the controller will effectively be placed upon standby.

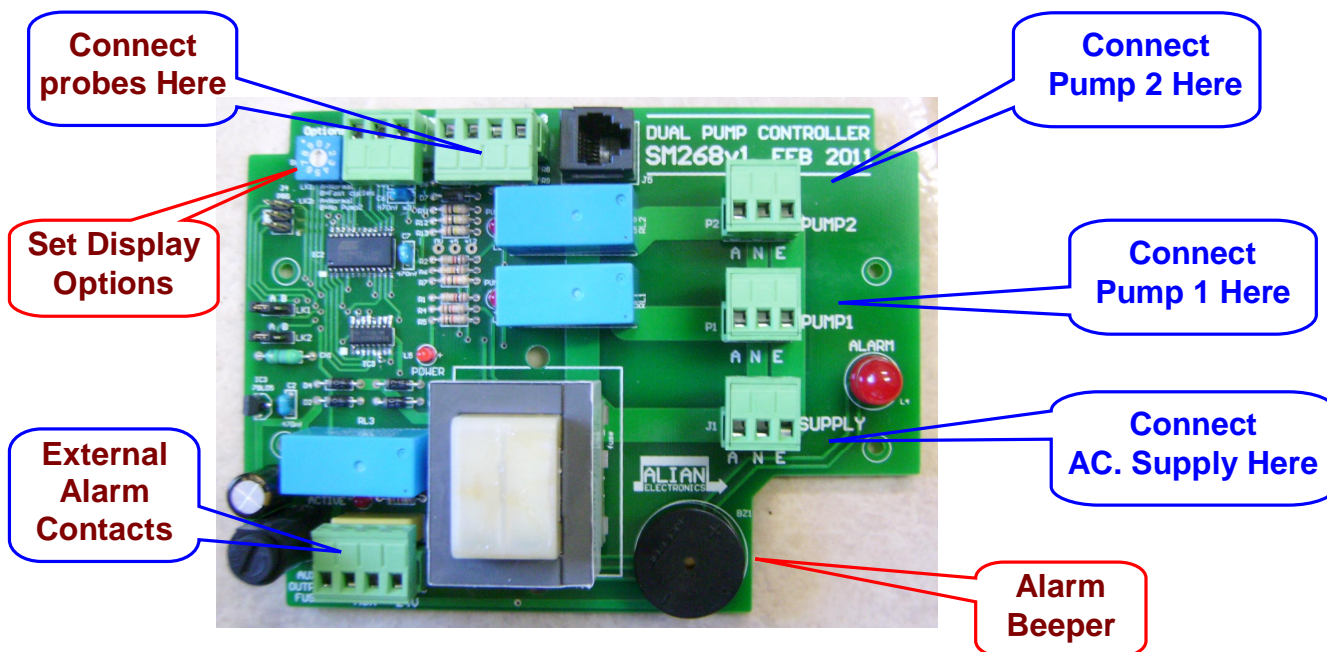
The message **MANUAL STOP** will slowly flash on the screen. This input can be wired to an external switch to effectively become an external **ON/OFF** switch to the pump control system. It uses inverted logic control so that where a control line is broken or unplugged, the pump controller will default to an active state and attempt to pump water.

PR2, FLOW control

This input connects to the flow switch sensor in series with the pump line to inform the controller that pump flow is successful. The flow contact should **CLOSE** when water flow is detected. There is a 10 second settling time from the start of a pump to the checking for valid flow. The flow sensor should be located within 20 metres of the controller and pumps.

PR3, OVERFLOW sensor

A float switch may be established at a nominal high-water mark in a tank or trough to indicate that there is too much water present. When this input is **CLOSED** it will cause the controller to generate a triple-beep, triple-flash alarm event to alert maintenance staff that an overflow is imminent or in progress. It does not halt or affect pump operation. This input may not be need where other safeguards exist against overflow events.



CONTROL INPUTS

A three way screw terminal block on the controller is labelled **COM**, **MUTE** and **JOG**

Two (low-voltage, low-current) momentary action push-button switches may be connected between the **MUTE** and **JOG** inputs and the **COM** terminal. (Note that the **JOG** input is designated as **PUMP SWAP** on the front panel of the controller unit)

Alarm Mute

Where an audible alarm has been triggered, pressing the MUTE button will suppress the alarm beeper operation for **6 hours**. The AUX relay and alarm LED is unaffected. This permits maintenance staff to quell the sound of an annoying alarm condition if they are expected to work close to the controller during known alarm events. This 6 hour period is reduced to 20 seconds if link **LK1** is in **Position B**

PUMP SWAP Button (labelled as 'Jog' on the controller terminal strip)

Pressing the Pump Swap button will reset any pump flow alarms. If two pumps are available, it will fast-forward the pump timer and manually force a changeover to the alternate pump.

AUXILLIARY RELAY CONTACT

This relay contact is closed whenever an alarm condition exists. The circuit is fuse protected at 1 Amp by the M205 vertical fuse holder labelled AUX OUTPUT FUSE

AUXILLIARY AC OUTPUT

This is a low-power **24V AC** power source that may be used to operate an external strobe or visual indicator when wired in series with the **AUX** relay contact. Maximum normal current is **150ma**. Output terminals are labelled **AC - AC 24V**.

LCD DISPLAY

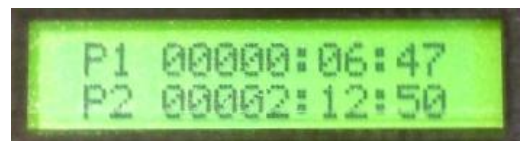
A Liquid Crystal display provides information to the operator about the system. Rotating the small, blue 10-position encoder labelled 'Options' will allow different items of information to be viewed by the operator.



Display option	Function
0	Display controller manufacturer name
1	Display Hours, Minutes, Seconds until the next pump changeover event.
2	Display present status of Pump1, Pump2, Flow Switch flow detection (Y/N) and the countdown delay until the next pump changeover event.
3	Display how many hours/minutes ago the Alarm Mute button was pressed in response to an alarm condition.
4	Show diagnostic voltage readings for switched inputs PR1, PR2, PR3
5	Show present Hourmeter count for Pump1 and Pump2 since the pumps were first installed.
6	unused
7	unused
8	Functional test level (see notes below)
9	unused

Hourmeter display

The optional LCD display can give some insight into the number of hours of operation of each pump has been in service within a dual-pump installation.



Display Option 8 – Functional test area

While the switch is in **Position 8** a quick functional test of the controller can be implemented by the installer.

In this level, briefly operating the **Alarm Mute** button will trigger a single test cycle which will operate **Pump 1** for 1 second, **Pump 2** for 1 second, **Aux Relay** for 1 second, **Flood Alarm led** for 1 second and **Piezo Beeper** for 1 second.

briefly closing the Flow Switch input (**PR2** to **COM**) will cause repeated beeps on the display.



Display options selector

SM268 SPECIFICATIONS

Cabinet Height/Width/Depth	126 x 165 x 78mm
Unit weight	650 g.
No. of pumps supported	2
Supply Voltage	240VAC, 50Hz
Supply Current	10A max
Pump Capacity	1500W (one pump at a time)
EMC (C-tick) compliance	N12656
Electrical Safety compliance	CS03057V (AS3100)

WARANTY INFORMATION

A warranty period of 12 months applies to the pump control system from the date of installation. This warranty becomes void where: (A) The unit has been damaged by excessive and unreasonable impacts, or (B) Water damage has resulted from an ingress of water caused a poor cable seal (fitted by an installer), or (C) Water damage has resulted by exposure to weather where a door has not been fully closed, or (D) The controller has been used for an application other than that specified in the installation document.

The warranty implies that a repair or replacement will be given when the defective unit is returned to the supplier. The warranty does not cover delivery and handling charges, compensation for time lost, damage caused by incorrect wiring during installation, or damage to other plant and equipment at the installation site.

Appendix 1 – Resetting the SM268 Hour Meter

This is a special sequence that will allow service personnel to erase the present hour meter values back to **00000:00:00**. Normally it is not desirable for the customer to have access to this feature so that a true reading of pump longevity can be measured.

It is intended to be used whenever a new pump is installed on a system.

Step 1 Set the **LK1** option link into Position '**B**'

Step 2 Set the **Display Option** switch to **Position 9**

Step 3 To reset the **Pump 1** hour meter to zero press the **Motor Jog** button.
or

Step 3 To reset the **Pump 2** hour meter to zero press the **Alarm Mute** button.

Step 4 Set the **Display Option** switch to '**5**' to confirm the hour meter has been reset

Step 5 Set the **LK1** option link into Position '**A**'

Step 6 Set the **Display Option** switch back to a normal viewing position

As the corresponding meter is cleared to zero and saved to permanent memory, a brief double-beep confirmation will be heard from the LCD display
