



FPC-8XX4X

QUICK START GUIDE

HydroSTART Pump Controllers

V1.3

MATElec Australia's HydroSTART Controller brings the features of the standard single and dual pump controllers into a new age with a redesigned capacitive touch keypad and control module with pump current sensing, providing wide range electronic overload protection which now functions with both single and three phase pumps. Additional control inputs and functionality has been incorporated into the new design to enhance the controller's flexibility and cover an even wider range of pumping applications. **The HydroSTART is the new standard for pump controls.**

SAFETY

This control panel has been designed and built for applications that are Commercial and/or Industrial in nature, operation, function and location. If the control panel is to be used in Domestic/Residential applications, where specific Wiring Rules in respect of 'electrical supply' protection may apply, it is the responsibility of the installing electrician to ensure compliance with relevant standards.

- Prior to installation, ensure power supply is isolated.
- Power supply must be circuit breaker protected (qualified electrician to determine appropriate amp rating).
- Electrical connection to the panel must be carried out in accordance with the following pages.
- Additions or modifications to the control panel are not permitted and will void warranty.
- The controller is not intended for use by children or infirm persons without supervision.
- Repairs to the controller must only be carried out by a suitably qualified electrician.



This quick start guide makes use of the following symbols to indicate warnings that must be paid specific attention to:



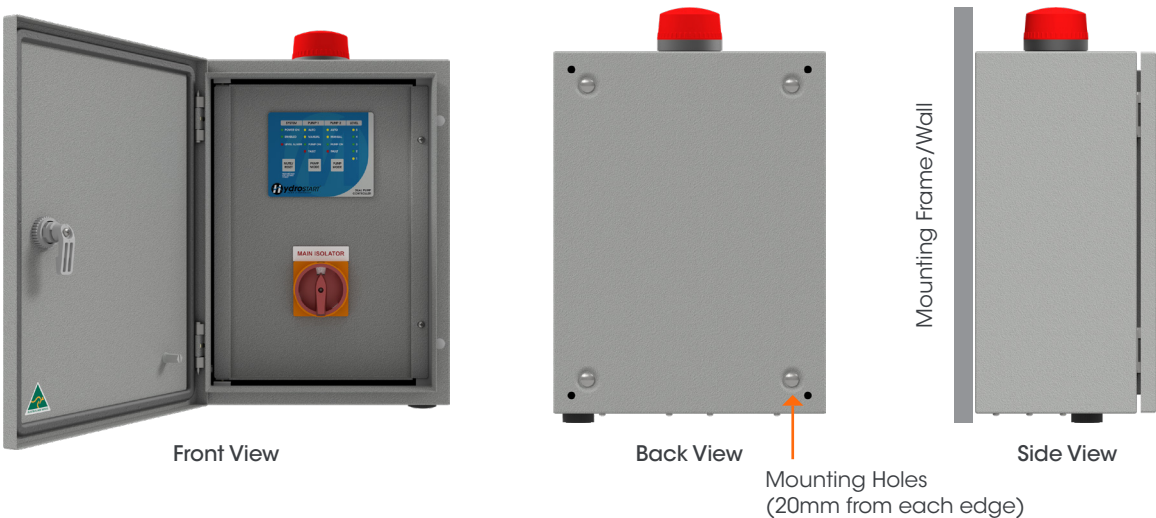
Damage to equipment or personal harm may occur if this instruction is not followed



Electrical risk (electrocution hazard) may occur if this instruction is not followed

STEP 1 - INSTALLATION

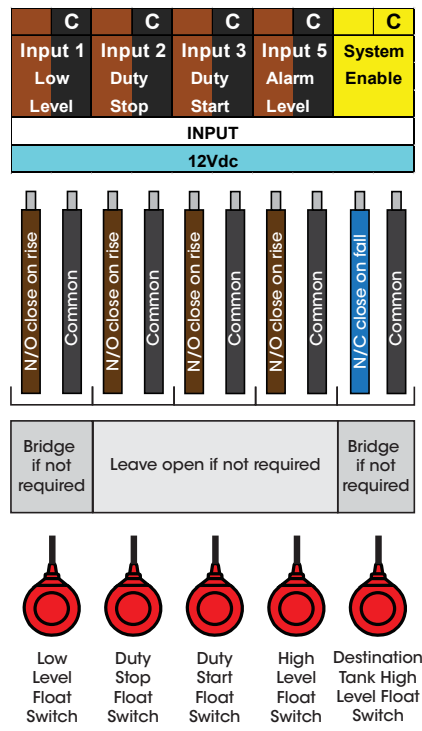
- Controller enclosure must be mounted in a vertical position.
- Ensure mounting method does not compromise enclosure weatherproof rating.
- IP54 single door controllers are only suitable for mounting indoors, while IP56 controllers with inner door can be mounted outside.
- Ensure access to main isolator is not restricted.
- Ensure cables/conduits entering the panel have mechanical protection and that the penetrations are sealed and do not compromise the weatherproof rating of the enclosure.
- If required, install buzzer through hole on underside of enclosure and tighten lock ring.



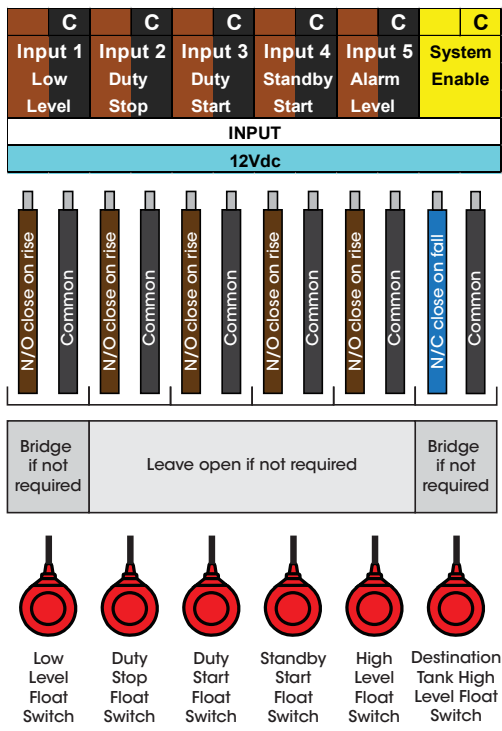
STEP 2 - CONNECTIONS

Warning: All electrical connections must be carried out by a suitably qualified and registered electrician

Level Control Connections - Single Pump

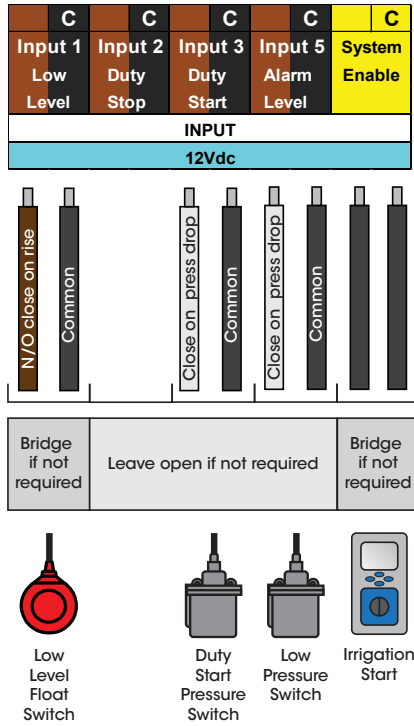


Level Control Connections - Dual Pump

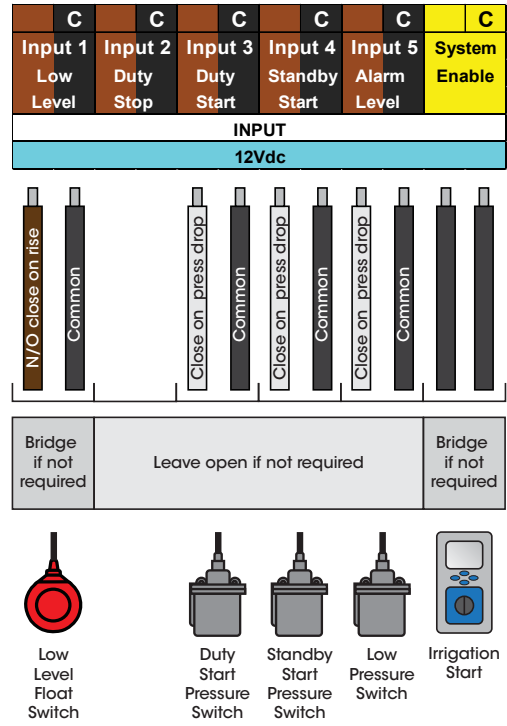


STEP 2 - CONNECTIONS

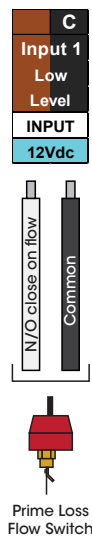
Pressure Control Connections - Single Pump



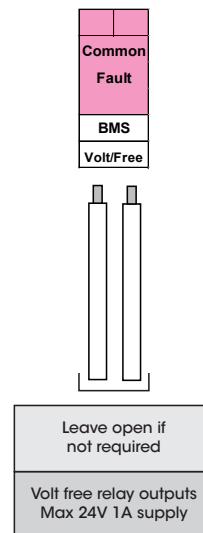
Pressure Control Connections - Dual Pump



Prime Loss Connection



VF Connections



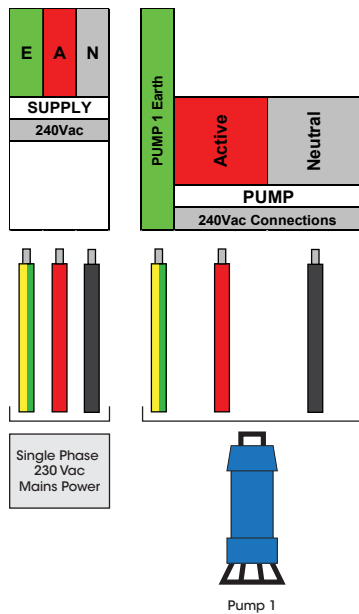
Note:

- The above shows the full range of connections available. Not all connections are necessary for operation.
- Modbus RTU Serial RS485 connections for SCADA are also available on the HydroSTART control module. Din rail terminals are not provided as standard for these connections, but they can be wired directly to the module. See the Operation Manual for further information.

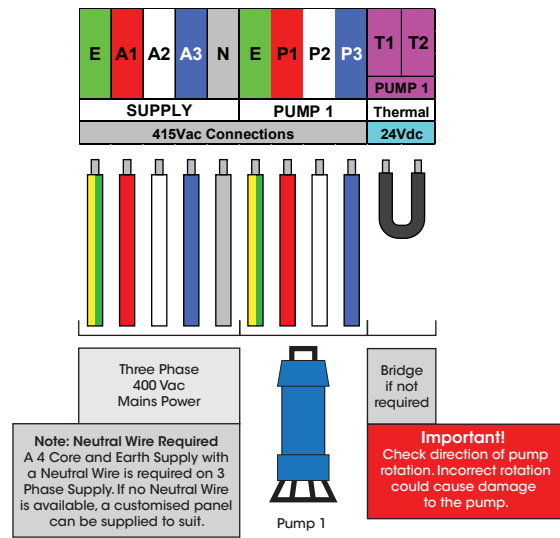
STEP 2 - CONNECTIONS

POWER SUPPLY & PUMP CONNECTIONS

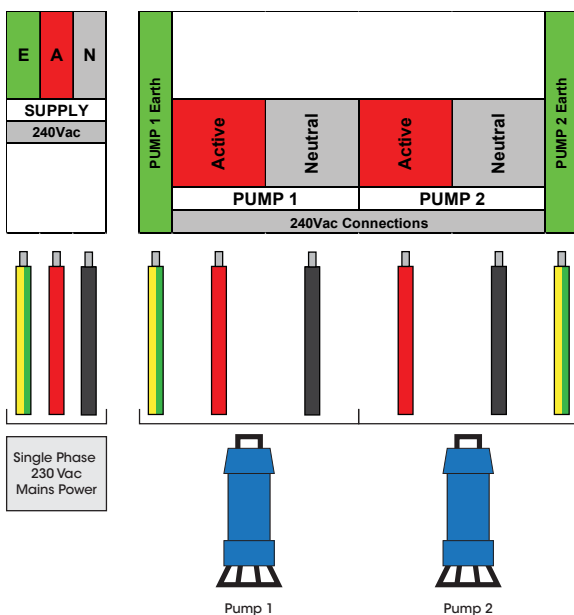
Single Pump, Single Phase



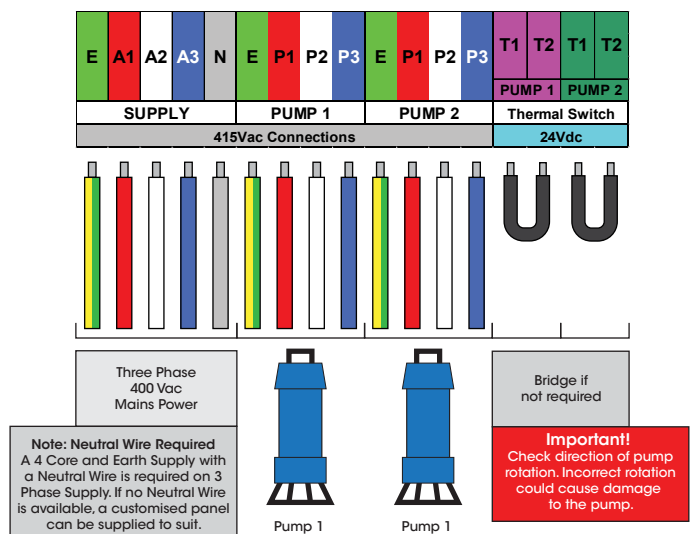
Single Pump, Three Phase



Dual Pump, Single Phase



Dual Pump, Three Phase

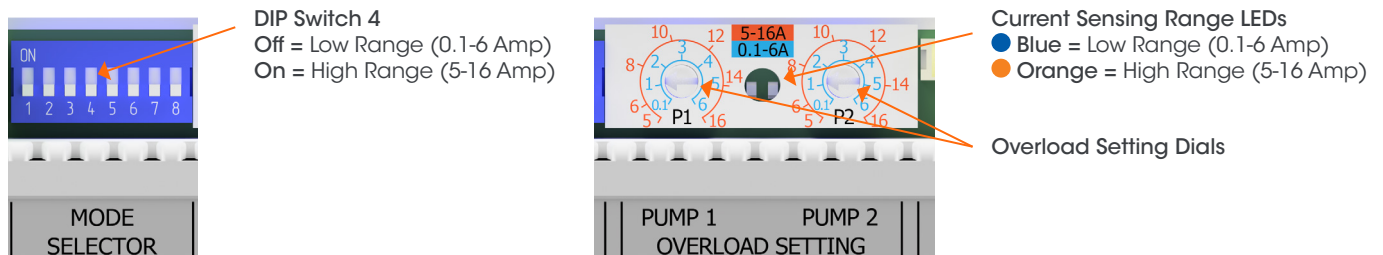


STEP 3A - CURRENT SENSING SETUP



Note - This step applies to HydroSTART controllers using the pump current sensing for pump protection. Skip to step 3B if the controller features external thermal overloads.

- Ensure power is isolated before opening the enclosure to access the HydroSTART control module.
- Check that the current sensing range is correct according to the controller's model number suffix of LR (low range, 0.1-6 Amp) or HR (high range, 5-16 Amp). The range in use is also indicated by the LEDs in between the overload dials, and is selected via DIP switch 4. Only the overload range that the panel is designed for should be used.
- Set the pump overload trip settings according to the full load current (FLC) shown on the pump nameplate, via the overload dials shown in the image below. The value set corresponds with either the blue or orange scale, depending on which current sensing range is selected. If the trip value is set too high there is potential that the pumps may be damaged if an issue occurs. If set too low the pumps will go into fault prematurely during normal operation.




STEP 3B - THERMAL OVERLOAD SETUP

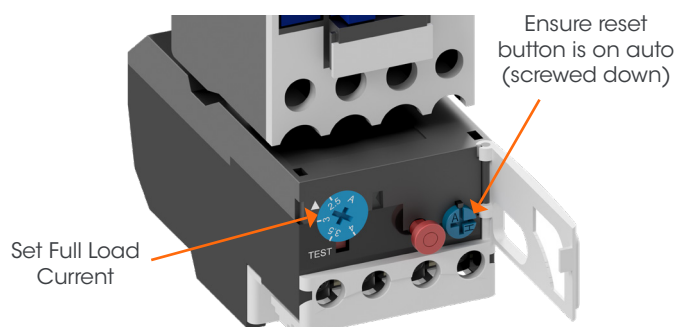


Note - This step applies to HydroSTART controllers using external thermal overloads for pump protection instead of the pump current sensing. These are used if an overload rating above 16 Amps is required.

- Ensure power is isolated before opening the enclosure to access the thermal overloads.
- Set the pump overload trip settings according to the full load current (FLC) shown on the pump nameplate, via the overload dial shown in the image below. If this value is set too high there is potential that the pumps may be damaged. If set too low the pump will go into fault prematurely during normal operation.
- The auto reset button should be left in auto (screwed down) so that the controller can latch and reset the faults from the keypad without the need to access the live parts.



		THREE PHASE		
CAT.NO.		JM3550		
SPEC.		35F84W7		
FRAME	56J	SER.	F1295	
H.P.	1 1/2T	E		
VOLTS	208-230/460			
AMPS	7.6/2.3			
HZ	50			



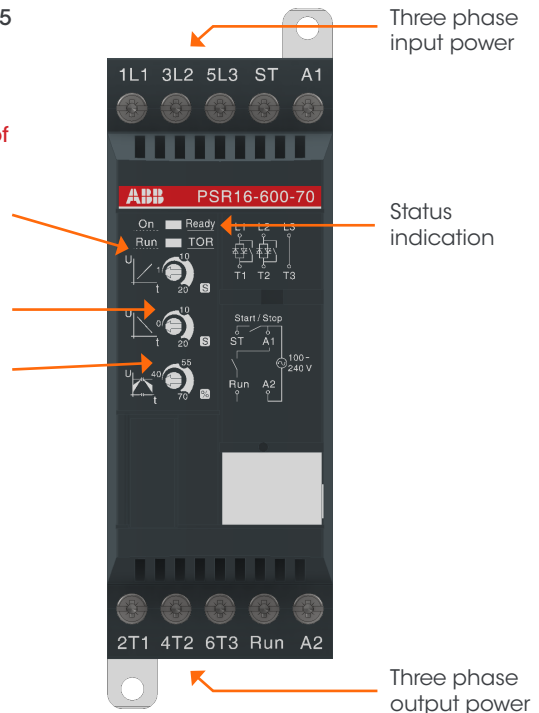
STEP 4 - SOFT STARTER SETUP (ABB PSR)



Note - This step applies to HydroSTART controllers with soft starters, skip to step 5 if soft starters are not in use.

The soft starter is rated for 10 starts per hour with 6s acceleration time, 4x FLC at 40°C. Care must be taken to limit pump starts to within the manufacturer's specification. Going beyond these limits will reduce the acceptable number of starts per hour.

- **Setting the Start Ramp Time** - Set the acceleration ramp time for the motor to reach full speed. Exceeding 6 seconds will reduce the acceptable number of starts per hour.
- **Setting the Stop Ramp Time** - If required, adjust deceleration to reduce water hammer. This will reduce the acceptable number of starts per hour.
- **Setting the Initial Voltage** - For high starting current motors, set the initial voltage high enough to get motor rotation started.

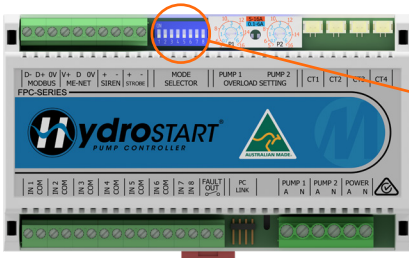


STEP 5 - POWERUP



When safe to do so, switch on electrical supply to panel. Check correct supply voltage before turning on the main isolator.

STEP 6 - DIP SWITCH CONFIGURATION

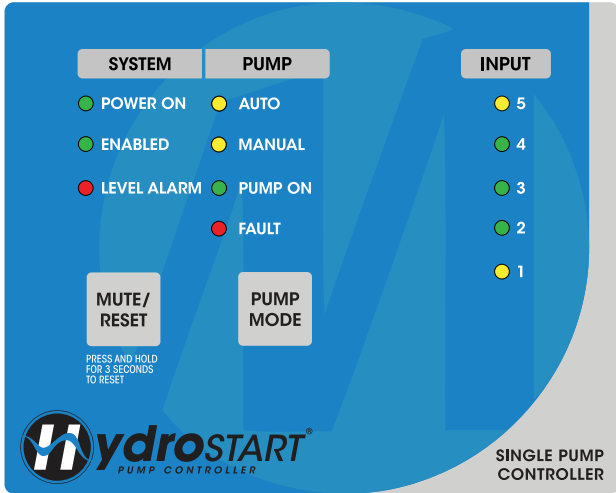


There are 8 DIP switches located on the upper side of the control module which are used to select the control mode and adjust the functions of the HydroSTART controller, as per the table below.

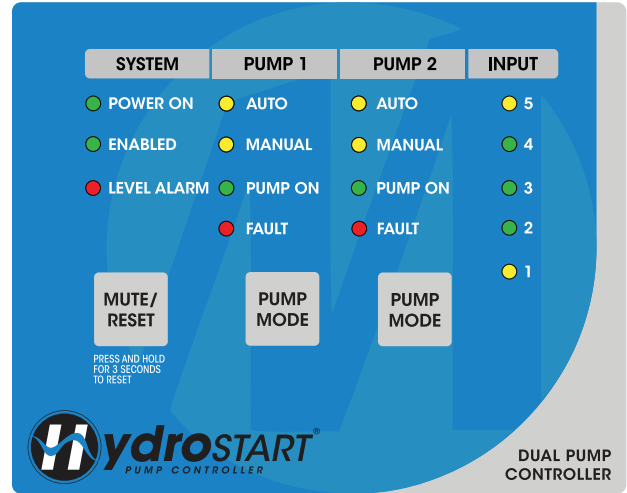
DIP SWITCH	POSITION	FUNCTION
1	Off	Level control mode The controller will operate in level empty control mode, controlled by up to 5 float switches. Input 1 = Low level/prime loss, Input 2 = Duty stop, Input 3 = Duty Start, Input 4 = Standby Start and Input 5 = High level.
	On	Pressure control mode The controller will operate in pressure boost control mode, controlled by up to 3 pressure switches. Input 1 = Low level/prime loss, Input 2 is unused, Input 3 = Duty start, Input 4 = Standby start and Input 5 = Low pressure.
2	Off	Prime loss protection Input 1 is configured for prime loss protection. If a pump is running and input 1 is open for 30 seconds and prime loss fault is activated for that pump, shutting it down and alternating duty. Manual reset via the mute/reset button on the keypad is required.
	On	Low level protection Input 1 is configured for low level protection. If input 1 opens for 1 second the low level fault will be activated and the pumps shut down. Manual reset via the mute/reset button on the keypad is required.
3	Off	Standard alternation mode Duty pump alternates on every start or after 30 minutes of continuous running.
	On	Recirculation alternation mode Duty pump alternates after an accumulated running time of 6 hours, irrespective of starting/stopping and the system being enabled/disabled.
4	Off	Low current range Pump current sensing is configured for low range 0.1 to 6 Amps. The overload setting dials and CT scaling will use this range.
	On	High current range Pump current sensing is configured for high range 5 to 16 Amps. The overload setting dials and CT scaling will use this range.
5	Off	Manual mode continuous If a pump is placed in manual mode it will remain running in manual indefinitely.
	On	Manual mode timeout If a pump is placed in manual mode it will revert to auto mode after 5 minutes of running in manual.
6	Off	High level stormwater The high level alarm will activate after the high level input (input 5) is closed for 15 minutes. The alarm will automatically reset once the high level input opens.
	On	High level sewage The high level alarm will activate after the high level input is closed for 1 minute. Manual reset via the mute/reset button on the keypad is required.
7	Off	Undercurrent and zero current protection off Undercurrent and zero current protections are disabled. Use for automatic pumps or pumps with low current.
	On	Undercurrent and zero current protection on Undercurrent and zero current protections are enabled. Undercurrent - If a pump is running the current being sensed is less than 50% of the value set on the pump overload dial for 10 seconds, an undercurrent fault will be activated. Zero current - If a pump is running and the current being sensed is less than 100mA or 10% of the value set on the pump overload dial (whichever is higher) for 10 seconds, a zero current fault will be activated.
8	Off	Alternate duty Duty alternation is enabled as configured by DIP switch 3.
	On	Static duty Duty alternation or fault alternation is disabled. Pump 1 will always be the duty pump that starts first and pump 2 will always be the standby pump.

STEP 7 - KEYPAD OPERATION

The status of the HydroSTART controller is displayed via the various indicator lights on the keypad interface. The keypad features capacitive touch buttons for muting or resetting faults, testing the keypad and alarm operation, and selecting the pump mode. The keypad connects to the HydroSTART module via a 3 wire connection (+12V, bus and ground) and communicates via the proprietary ME-NET protocol.



Single Pump Keypad



Dual Pump Keypad

The meaning of each LED status is explained below. Some LEDs have multiple functions with different flash rates corresponding with different faults or conditions. If multiple conditions are present at once, the On status will take priority, followed by 1 flash, 2 flashes and so on. For example, if there is a prime loss fault (1 flash) and an undercurrent fault (5 flashes) for pump 1, the pump 1 fault light will flash once as the prime loss fault takes precedence.

SYSTEM INDICATOR LIGHTS

- POWER ON**
Off - Power off
On - Power on
1 flash - Alarm fault
2 flash - Settings fail fault
3 flash - Contact fault
4 flash - Conductivity input fault
- ENABLED**
Off - System disabled
On - System enabled
- LEVEL ALARM**
Off - No faults active
On - High level fault
1 flash - Low level fault
2 flash - Low pressure fault

PUMP INDICATOR LIGHTS

- AUTO**
Off - Pump not in auto mode
On - Pump in auto mode
- MANUAL**
Off - Pump not in manual mode
On - Pump in manual mode

Note - If both the auto and manual lights are off, the pump is in off mode

- PUMP ON**
Off - Pump not running
On - Pump running
- FAULT**
Off - Pump healthy
On - Overload fault
1 flash - Input fault
2 flash - Prime loss fault
3 flash - Max run fault
4 flash - Zero current fault
5 flash - Undercurrent fault

LEVEL INDICATOR LIGHTS

- 5**
Off - Input 1 is open
On - Input 1 is closed
- 4**
Off - Input 2 is open
On - Input 2 is closed
- 3**
Off - Input 3 is open
On - Input 3 is closed
- 2**
Off - Input 4 is open
On - Input 4 is closed
- 1**
Off - Input 5 is open
On - Input 5 is closed

Note - In tank fill mode, indicator light 4 will correspond with input 2 (duty stop), while input 2 will correspond with input 4 (standby start), so that lights reflect the position of the float switches in the tank

BUTTONS

- MUTE/RESET**
Press for 1 sec - Mutes the audible alarm
Press for 3 sec - Resets active faults, or starts the alarm test in which all indicator lights will illuminate and alarms will activate. The alarm test will stop when the button is released or after 10 seconds.
- PUMP MODE**
Press for 1 sec - Changes the pump mode from auto to manual, manual to off or off to auto.

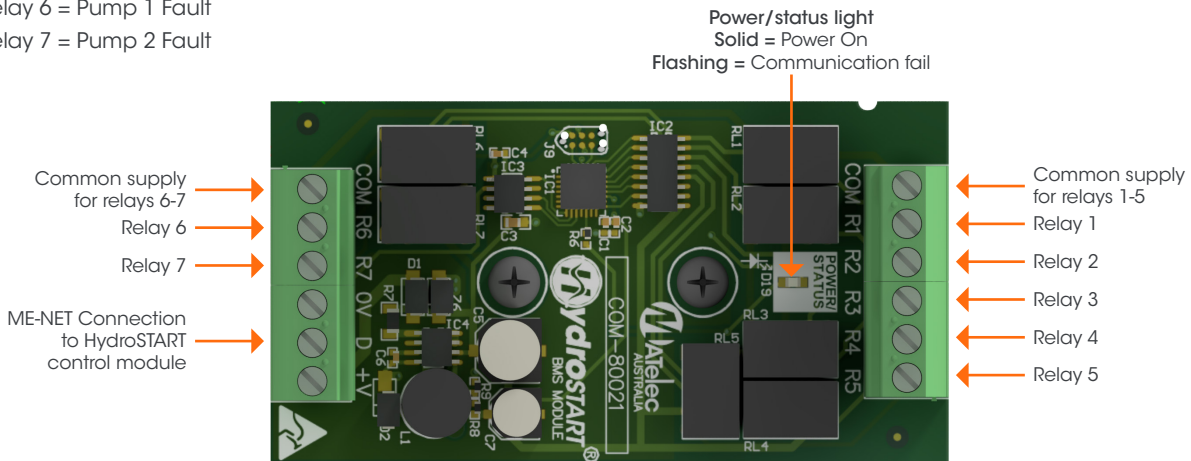
HydroSTART BMS VARIATION

The BMS variation of the HydroSTART features the HydroSTART BMS module, providing volt free outputs for power on, high and low level, individual pump run and fault as standard, in addition to the common fault output included on other variations.

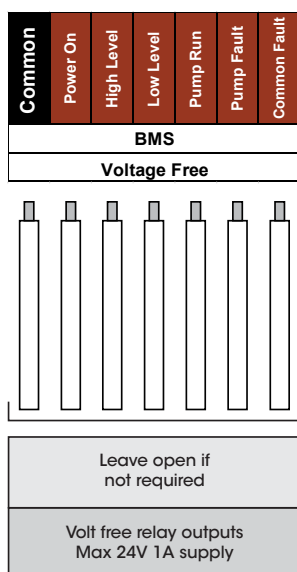
BMS MODULE

The HydroSTART BMS module features 7 volt free relay outputs providing status information to BMS systems from a HydroSTART control module. Similarly to the HydroSTART keypad, the BMS module connects to the HydroSTART control module via a 3 wire connection (+12V, bus and ground) and communicates via the proprietary ME-NET protocol. The BMS module also includes a power/status LED to indicate power and communication status. The default functions that these relays are assigned to is shown below:

- Relay 1 = Power On
- Relay 2 = Low Level
- Relay 3 = High Level
- Relay 4 = Pump 1 Run
- Relay 5 = Pump 2 Run
- Relay 6 = Pump 1 Fault
- Relay 7 = Pump 2 Fault



Volt Free Connections - Single Pump



Volt Free Connections - Dual Pump

