COMMODORE
OFF GRID & SOLAR PUMPING SPECIALISTS

DC Series Solar Pump Owners Manual

TO ENSURE YOUR PERSONAL AND PROPERTY SAFETY, PLEASE READ THE MANUAL CAREFULLY BEFORE USE OF YOUR SOLAR PUMP

STOP

Test run submersible pump motors before installing them in your water source to ensure they run in the correct direction.

Component List

Submersible Pump

Controller

Surface Pump

Water Level Sensor

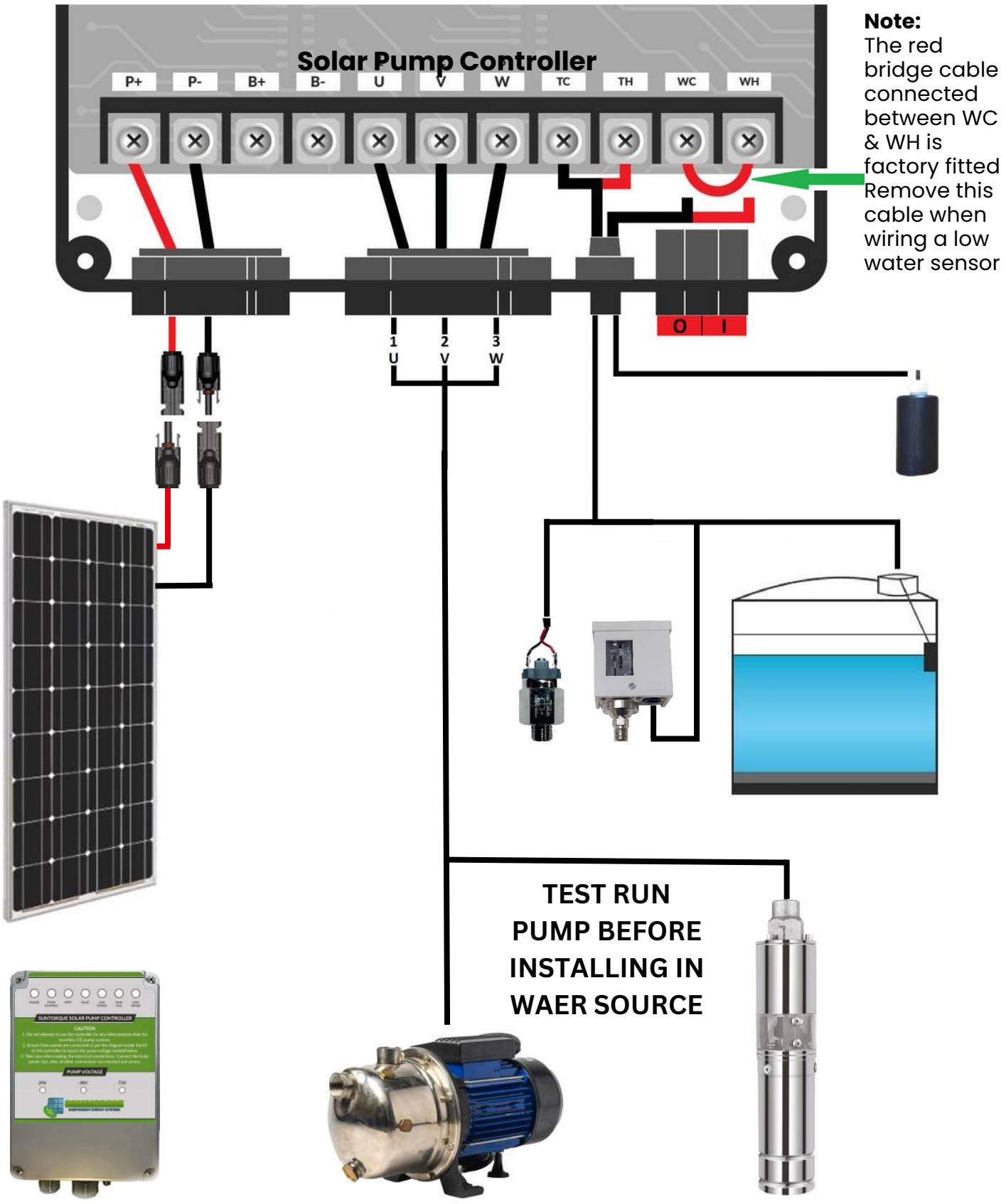
Pool Pump

Spare Impellor/Stator With Screw Pumps

Pressure Switch

1000V 32A Solar Isolator For Solar Panels

DC Solar Pump Wiring Diagram



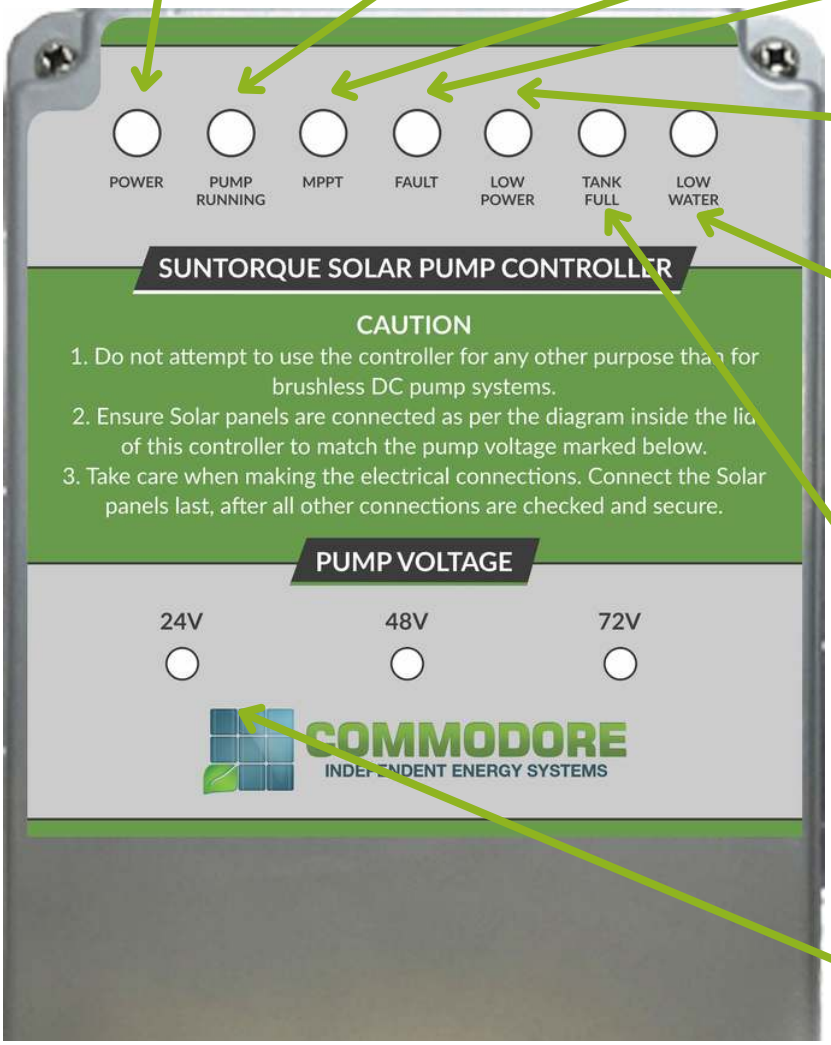
U1= _____ V2= _____ W3= _____

DC Solar Pump Wiring Diagram

Power - indicating pump controller has power

Pump Running - indicates the unit is attempting to run the pump

MPPT - flashing indicates normal operation and the adjustment of power to the pump



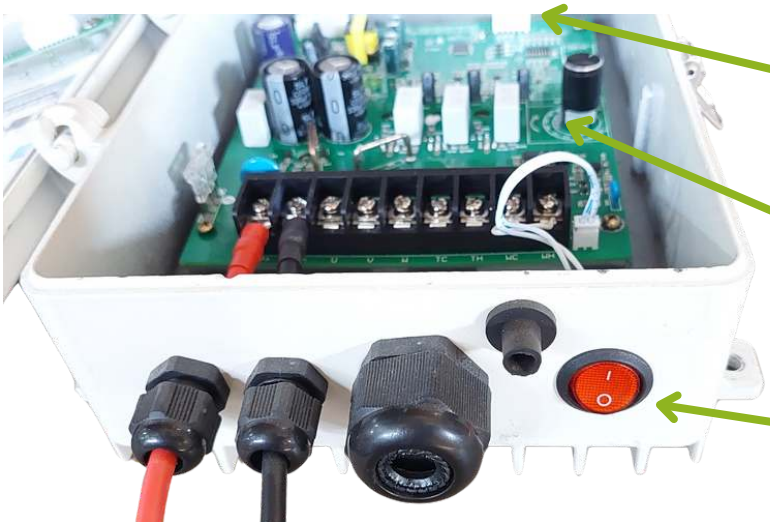
Fault - indicates a problem with the operation of the pump (see troubleshooting section)

Low Power - indicates the pump is not getting enough power to run correctly (see troubleshooting section)

Low Water - indicates the pump is stopped because the low water sensor is not submerged. Flashing indicates 30min restart delay is active

Tank Full - indicates the pump is stopped due to one of the following conditions:
- the tank full sensor is active to show the tank is full (if installed)
- the pressure switch is active to show the cut off pressure has been reached (if installed)
- the external switch on the bottom of the pump controller is in the O position

Pump Voltage - marked on case indicates the voltage of the pump and controller (see installation, troubleshooting)



Solar/Battery Switch - leave switched to solar unless instructed otherwise (24V and 48V models only)

Speed Control - can be turned to increase or decrease pumping speed (eg: to not outrun bore replenishment rate)

External Switch - this DOES NOT turn the power to the controller off. When turned off, this switch activates the 'Tank Full' circuit and stops the pump

Step By Step Connection Guide

Step 1 - Connect the pump's power cable to the UVW terminals in the pump controller. Do not reference the colour of the wires or previous pump installations, instead please reference the labels on the individual wires of the power cable.

Step 2 - If you are using a water level sensor or a pressure switch for automatic on/off functions, these will connect to TC and TH terminals. For a water level sensor supplied by us there will be no polarity to the sensor, so either wire can go on the TC or TH terminals.

For a pressure switch supplied by us, connect the wires to the TC and TH terminals in the pump controller and the terminals of the pressure switch as shown on pages 13 or 14. If you are using your own sensor type, please contact our Commodore Australia support for advice on how to connect it to the pump controller.

Step 3 - If your system comes with a solar isolator, connect the solar to the isolator first and then connect the isolator to the P+ and P- terminals in the pump controller.

If you don't have an isolator, please proceed to Step 5.

Step 4 - Inside the pump controller, in the top right-hand corner of the circuit board there is a switch (not available on 72V controllers) that can change the input source from the P (solar) terminals to the B (battery) terminals. Please check that this switch is in the solar (up) position.

Step 5 - Make sure that the external switch is in the "I" position. If the switch is in the "O" position, the Tank Full light may be on when you power up the pump controller. Change it to the "I" position if this occurs.

Step 6 - For surface mount pumps, prime your pump and proceed to Step 7.

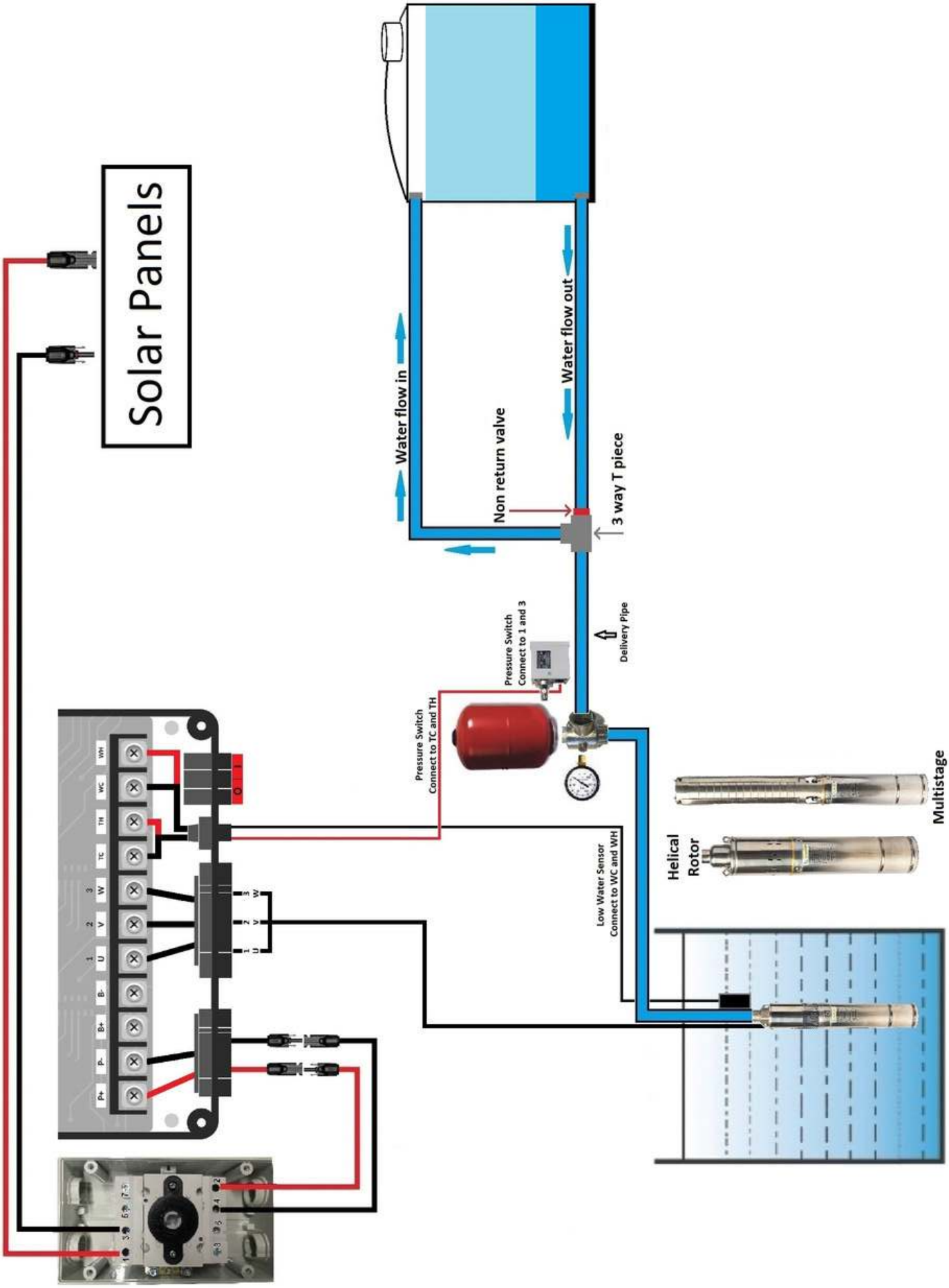
For submersible pumps, test run the pump before installing it in your water source or connecting any pipes. Place the pump in a bucket or appropriately sized container of water and turn the isolator to the on position. The controller should light up and begin running the pump.

Step 7 - Install the pump in your water source and turn the isolator (if included) to the on position.

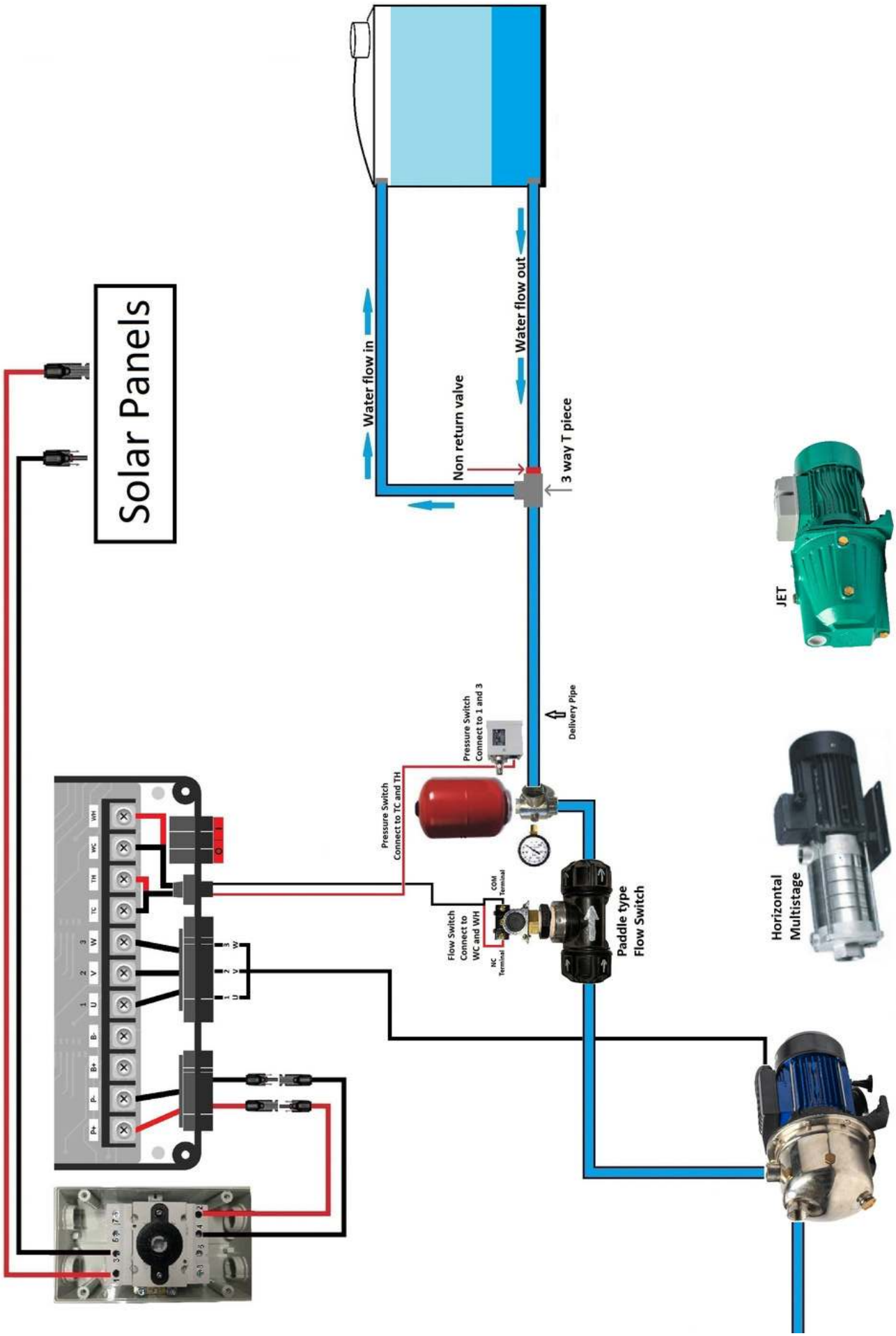
Step 8 - If you have a pressure switch supplied by Commodore Australia, reference pages 11-15 on how to install and set your pressure switch. For water level sensors, see pages 16 and 17.

Step 9 - Your pump should now be fully operational. If it is not, please reference the troubleshooting guide on pages 25-29 before contacting Commodore Australia support for assistance.

Basic System Setup Examples

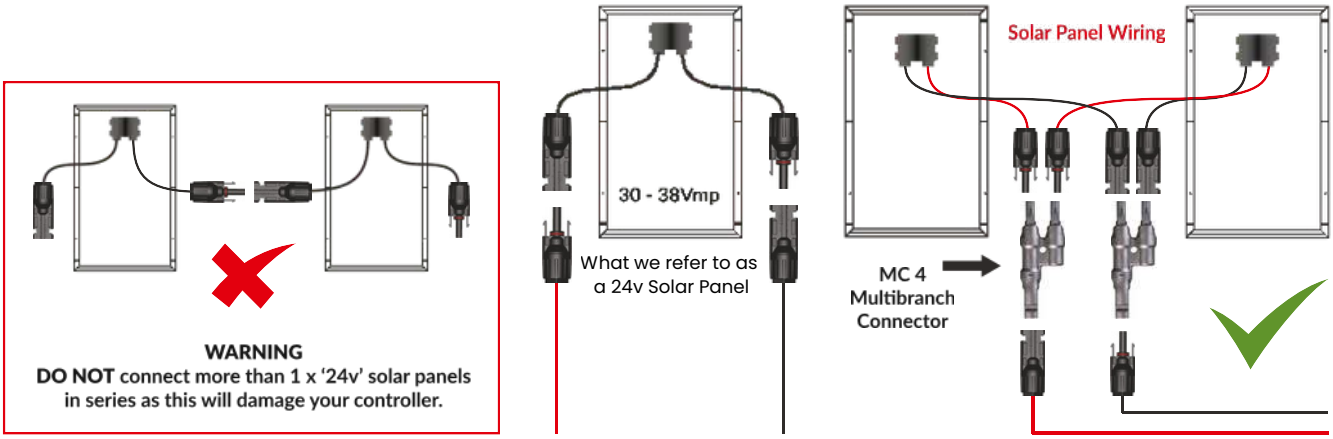


Basic System Setup Examples



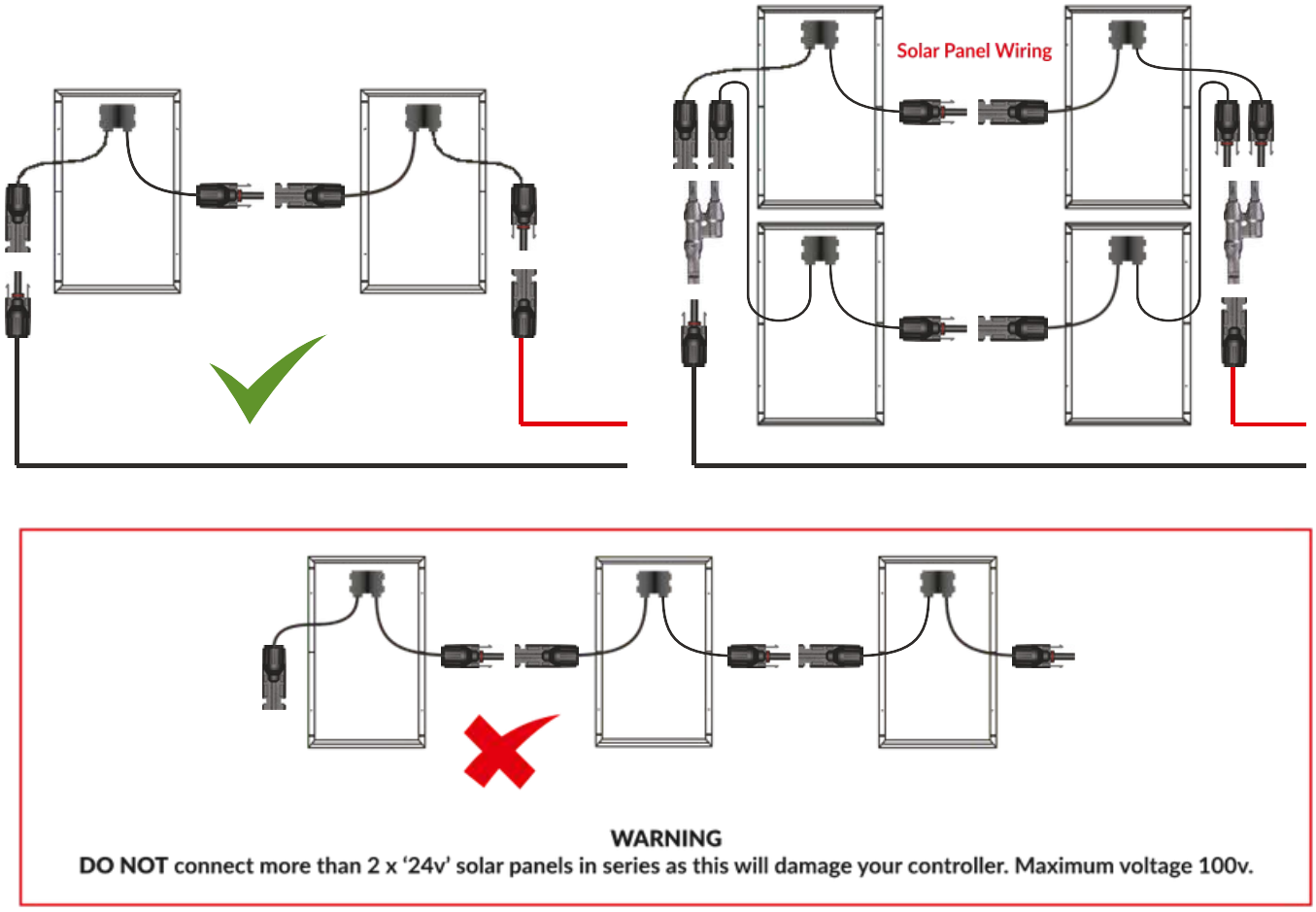
24V & 48V Solar Panel Wiring Diagrams

24v



24v pump systems: 1 x Solar panel in series with any additional panels connected in parallel as shown above. Recommended input voltage range 35Vmp - 55Voc

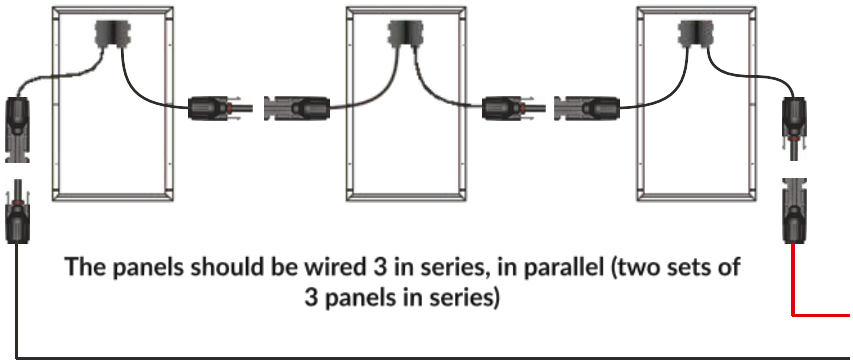
48v



48V pump systems: 2 x Solar panel in series with any additional panels connected in parallel sets of 2, as shown above. A solar isolator is required to be installed between the solar panels and the pump controller. Recommended input voltage range 65Vmp - 109Voc

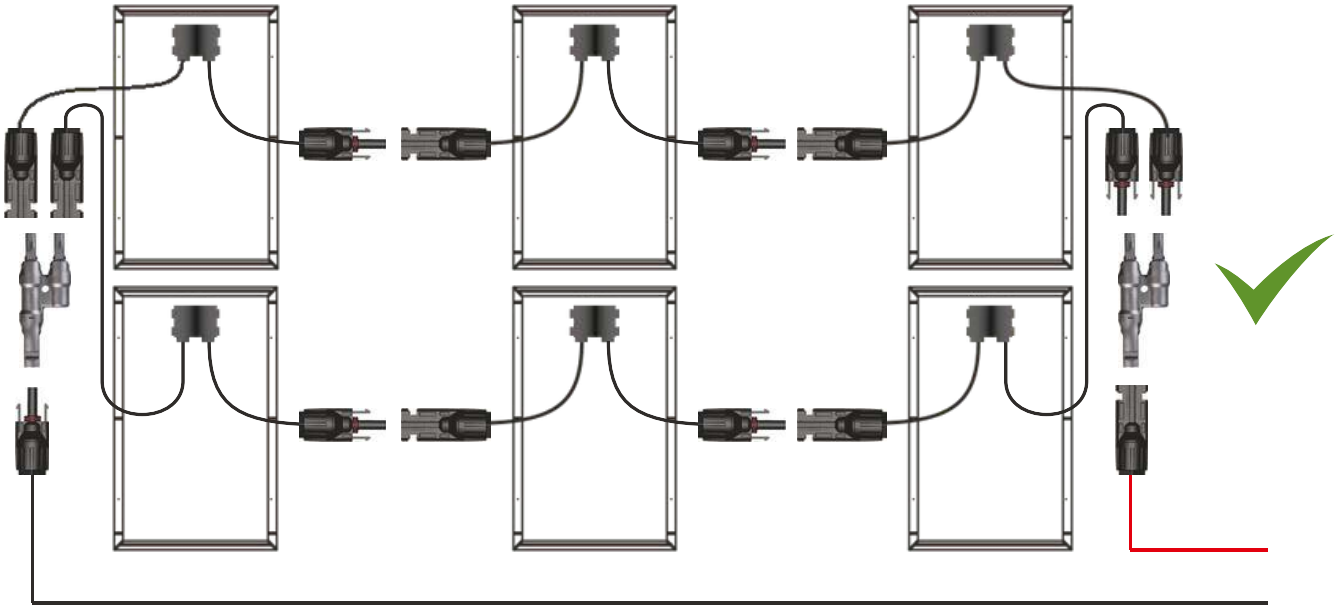
72V Solar Panel Wiring Diagrams

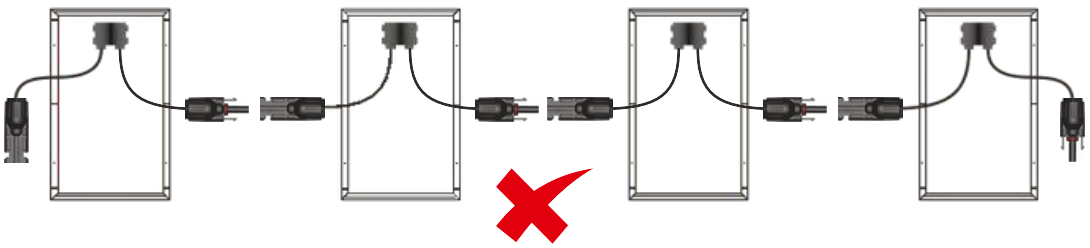
72v



The panels should be wired 3 in series, in parallel (two sets of 3 panels in series)

Isolator between Solar and controller





WARNING
DO NOT connect more than 3 x '24v' solar panels in series as this will increase the voltage output to over 150Voc and damage your controller!

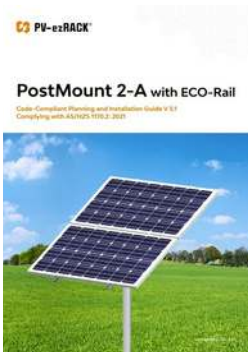
72V pump systems: 3 x Solar panel in series with any additional panels connected in parallel sets of 3, as shown above. A solar isolator is required to be installed between the solar panels and the pump controller. Recommended input voltage range 80Vmp - 136Voc

Solar Panel Stands and Racking

We have partnered with Clenergy to supply all of your solar panel stand and racking requirements.

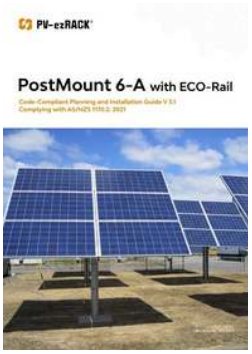
For detailed assembly instructions, please scan the QR code with your phone or smart device's camera, or click the image below. This will take you to a PDF of the installation guide for your specific racking system, which you can download.

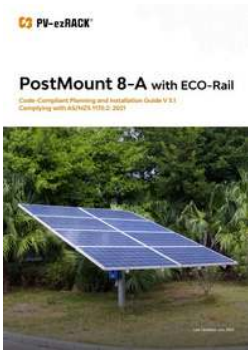
Clenergy Pole Mount Stands:



Solar Panel Stands and Racking

Clenergy Pole Mount Stands:





Note: All ground, pole and racking systems use the above grounding system for earthing

Ground Mount Stands:

Roof Mount Racking Systems:

Solar Isolator Wiring Diagram & Video

From String 1

From String 1

Terminal 1 joins to Terminal 2
Terminal 3 joins to Terminal 4

Video Walkthrough

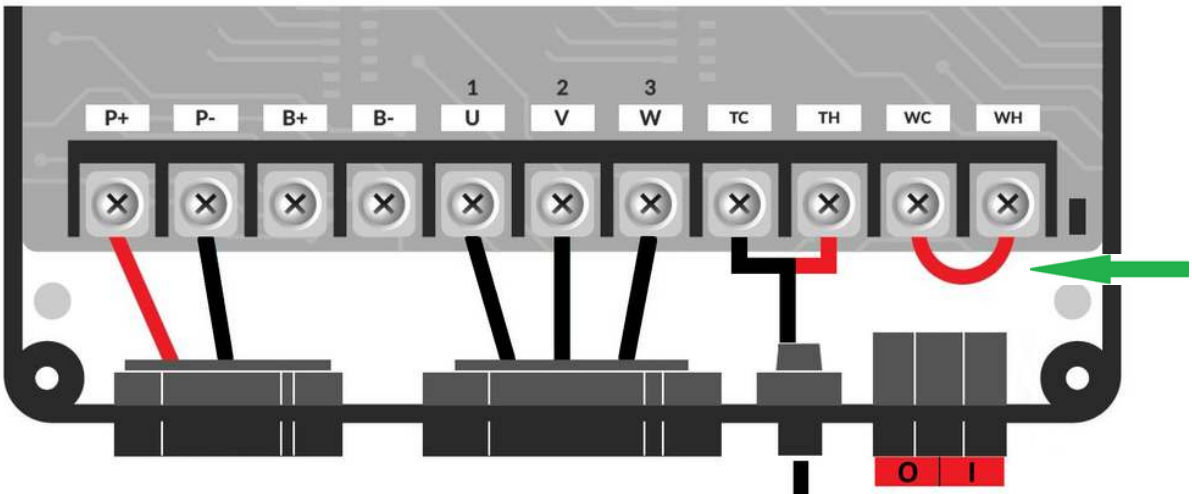
Please note that the solar isolator switch should only be turned off after using the on/off switch on the controller to stop the pump. Switching off the solar isolator while the pump is running may cause damage to the controller's input power circuits.

Excessive use of the isolator switch while the pump motor is running can cause the controller to short out as well as causing other failures.

The solar isolator MUST be turned off and then wait for the controller's lights to turn off before accessing any power cables for the solar panels or pump wiring. This also applies to any mains power pack (AC-DC converter) input wiring.

Pressure Switch Installation

Wiring to the controller



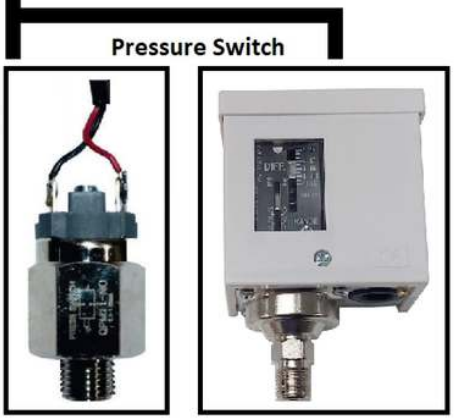
Note: The red bridge cable connected between WC & WH is factory fitted. Remove this cable when wiring a low water sensor

Optional Pressure Tank: Great if you require instant pressure for taps. If filling a tank, just the pressure kit without a pressure tank is required.

The air-charge for the pressure tank should be approximately 3PSI below the cut-in pressure. Unscrew the top cap to access the air filler valve, and use an air compressor to fill the tank to the required pressure.

This cap comes loosely screwed in, if you're using a pressure tank you don't need the cap and can screw the tank in instead. If you're not using a pressure tank, apply thread tape to the thread of the cap and tighten well to seal it.

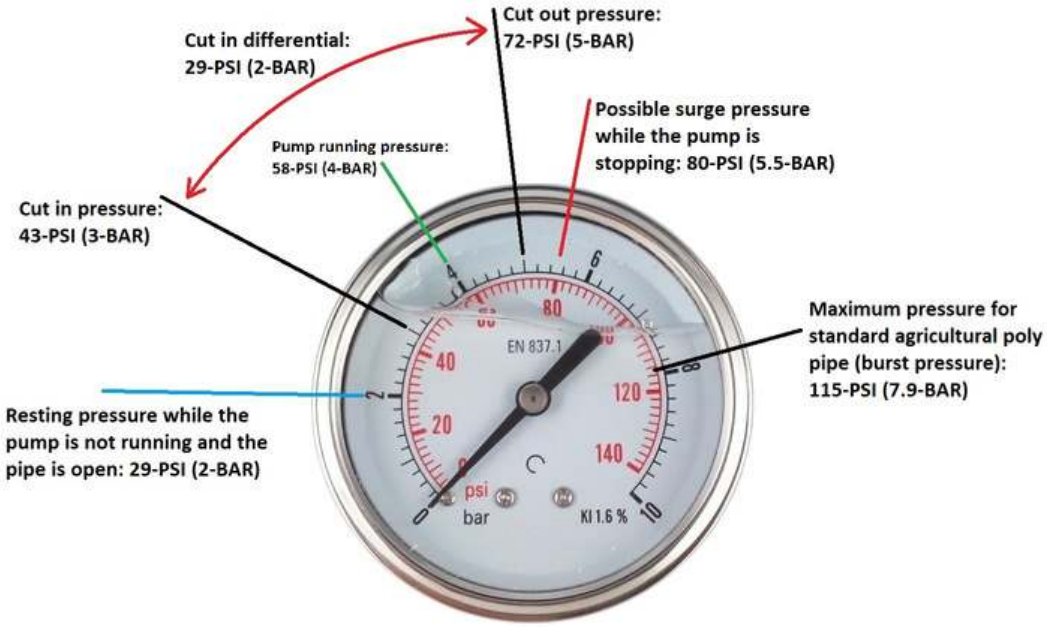
Pressure switch: Set pressure switch to cut out at least 15 PSI above the running pressure.



Pipe to pump

Pressure Switch Adjustment

Pressures gauge readings



Running Pressure - This is the pressure shown on the gauge when the pump is running efficiently and actively delivering water to its destination.

Resting Pressure - This is the pressure on the gauge when the pump is off, but valves at the destination (like troughs, tanks, sprinklers, or hoses) remain open. It commonly occurs at night or in low light when solar pumps stop running but the system is still open.

Cut-Out Pressure - This is the pressure at which the pressure switch tells the pump controller to stop the pump. It should be set higher than the running pressure but lower than the pipe's burst pressure. Be aware that the actual pressure may rise briefly (surge) after this point due to the delay between the switch activating and the pump stopping.

Cut-In Pressure - This is the pressure at which the pressure switch tells the pump controller to allow the pump to start again. Like with Cut-Out, there's usually a short delay, so the pressure can dip below this point before the pump restarts.

Cut-In Differential Pressure - This is the difference between the Cut-Out and Cut-In pressures. On some switches, such as the differential pressure switch, this can be adjusted manually. However, compact diaphragm switches usually have a fixed, factory-set differential and cannot be adjusted.

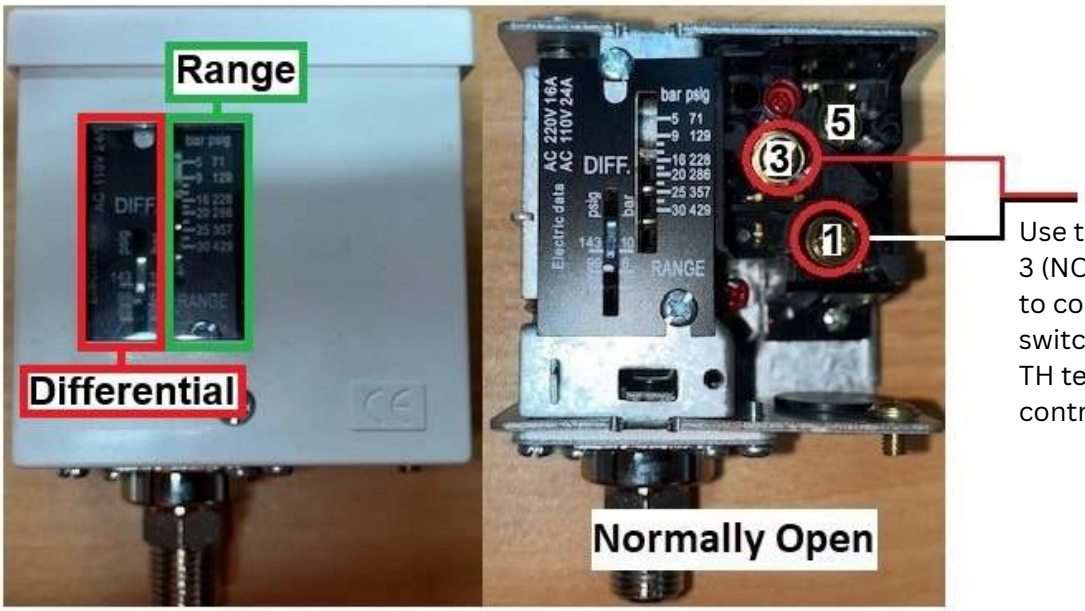
Surge Pressure - This is a pressure spike that can occur as the pump slows down and water flow stops while the pipes are closed. It is usually higher than the Cut-Out pressure and should remain below the pipe's burst rating. Surge pressure can fluctuate depending on power input (e.g. light conditions with solar systems).

Burst (Maximum) Pressure - This is the highest pressure your pipe can handle.
For example:

- Standard green line poly pipe: 115 PSI (7.9 BAR)
- Blue line poly pipe: Varies by wall thickness—check with your supplier for the exact rating.

Pressure Switch Adjustment

Differential pressure switch

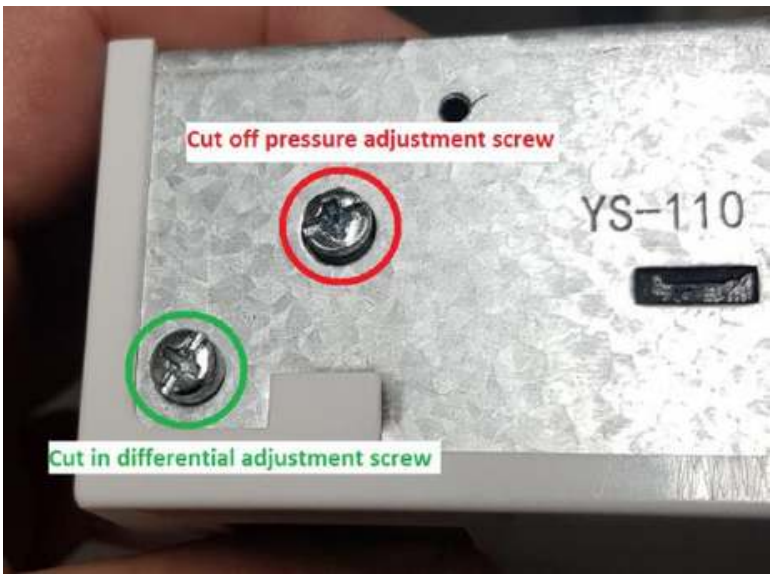


Use terminals 1 (COM) and 3 (NO) circled in the image to connect the pressure switch wires to the TC and TH terminals in the pump controller.

Setting cut off - Run your pump with the line open and wait for the gauge to reach its maximum running PSI or BAR. Take note of this pressure and then, using the screw circled in red, adjust the cut off pressure at least 15-PSI (1-BAR) higher than the running pressure.

Setting cut in - The cut in pressure differential often doesn't need to be modified from the factory setting of 15-PSI (1-BAR).

If the pump is not starting at this differential, you can adjust the screw circled in green to adjust the differential until your pump begins to run.



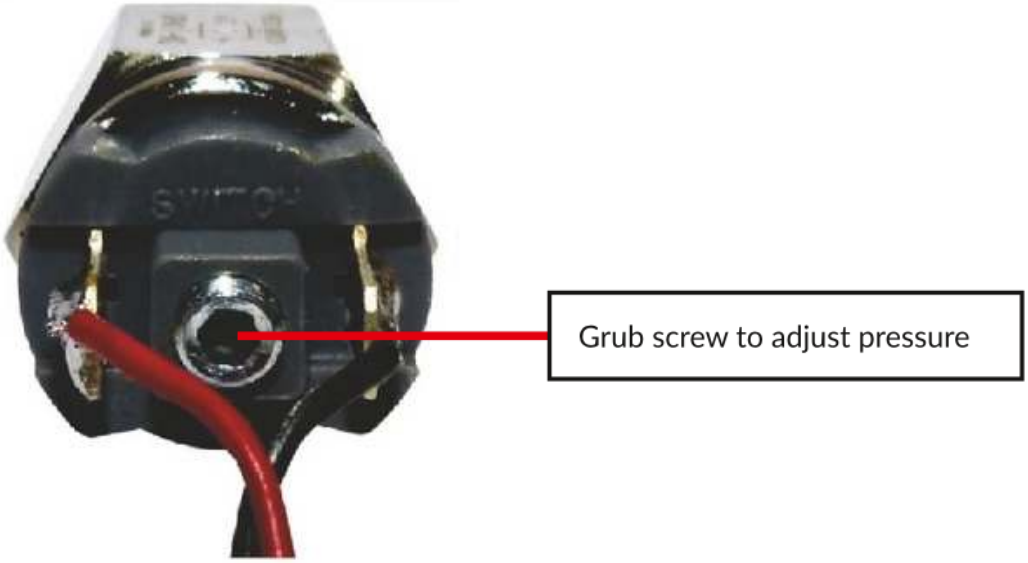
Note: *The cut off pressure must be lower than the maximum pressure the pipe system can withstand, otherwise you risk bursting pipes or fittings.*

For example - If the Cut-Out pressure is set to 72-PSI (5-BAR) and the differential is set for 29-PSI (2-BAR), this means that the pressure will drop to approximately 43-PSI (3-BAR) before the pressure switch tells the pump controller to allow the pump to start again.

Pressure Switch Adjustment

Compact diaphragm switch

There is no polarity to this wiring so the wires can be either way around. Run the wires through the cable entry gland and connect them to the TC and TH terminals in the solar pump controller.



Adjusting pressure cut in/out

- Remove the rubber cover from the pressure switch to access the adjustment screw.
- Use a 3mm Allen key for adjustments.
- Turn clockwise to increase the Cut-Out pressure.
- Turn counter clockwise to decrease the Cut-Out pressure.

Since there's no display showing the actual Cut-Out pressure setting, we recommend adjusting it while monitoring the pressure gauge. Set the Cut-Out pressure at least 15 PSI higher than the pump's running pressure as described on page 12.

Note: *The switch comes with a factory-set pressure differential of 7–10 PSI, which cannot be adjusted. This means the pressure must drop by around 10 PSI before the switch triggers the pump to restart (Cut-In).*

Pressure Switch Adjustment

Pressure Switch Adjustment Method

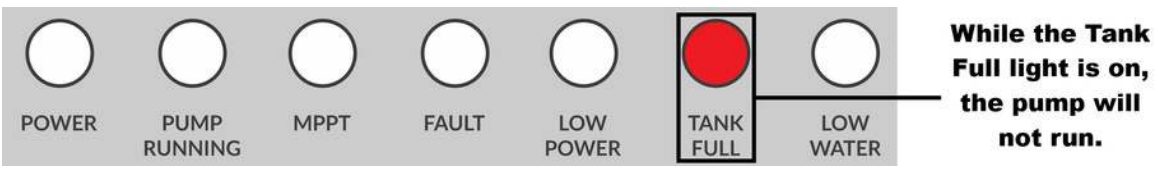
For best results, perform this setup during good weather when the pump is running at peak performance (e.g. full sunlight for solar systems).

1. **Start with Maximum Pressure -** Using a 3mm Allen key, turn the pressure switch adjustment screw all the way clockwise. This sets the cut-out pressure to its maximum, ensuring water reaches the intended destination without the pump stopping too early.
2. **Run the System -** With the pump and pressure switch properly installed and connected, let the pump run at full speed. Make sure there are no restrictions or closed valves—water should be flowing freely to the destination (tanks, sprinklers, etc.).
3. **Find the Cut-Out Point -** Slowly turn the adjustment screw counter clockwise until the Tank Full light on the pump controller turns red, and the pump shuts off.
4. **Trigger the Restart -** Turn the screw clockwise again, just until the Tank Full light turns off and the pump restarts.
5. **Fine-Tune the Pressure -** From this point, continue turning the screw clockwise about half a turn (180 degrees). This adds the recommended extra 15+ PSI to ensure your cut-out pressure is well above the running pressure.

Note: *If the pump is cycling on/off, the Cut-Out pressure may be set too low. Adjust the grub screw clockwise by a quarter turn (90 degrees) to slightly increase the Cut-Out pressure. If the problem continues, contact Commodore Australia Support for assistance.*

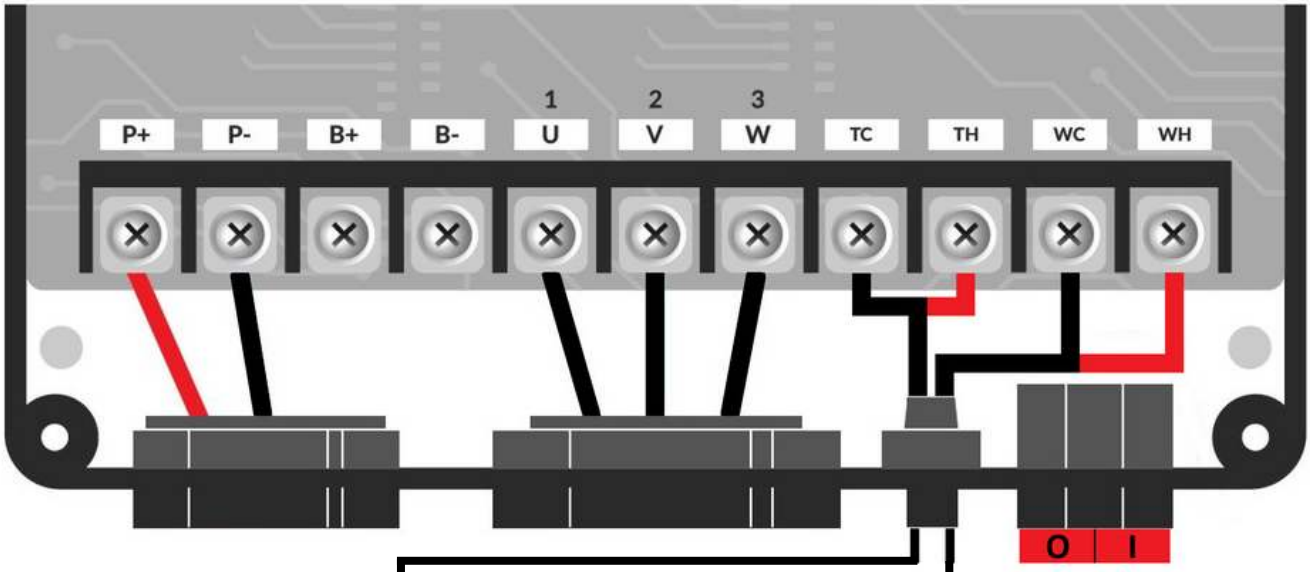
Confirming correct operation

1. **Start the pump -** Turn the system on and ensure water is flowing to the destination (tanks, sprinklers, etc.).
2. **Simulate a full tank or closed system -** This can be done manually by hold the float in the up position to closes the valve. If you don't have a float valve, we recommend installing a gate valve at least 5 meters down the pipe from the pressure switch. Close this valve to stop water flow and allow pressure to build.
3. **Observe the system -** As the pressure builds in the pipe, the Tank Full light should turn red, and the pump should then begin to slow down and stop.
4. **Troubleshooting -** If the Tank Full light does not turn red and the pump does not begin to slow, adjust the cut off pressure down to a lower setting and start again from step 1 of the adjustment method procedure.
5. **Restore flow -** Once the Tank Full light has turn red and the pump has stopped, release the float valve (or open the gate valve) to release the pressure that has built up in the pipe. Once the pressure drops, the Tank Full light will go out, the pump will restart, and the water should begin flowing again.

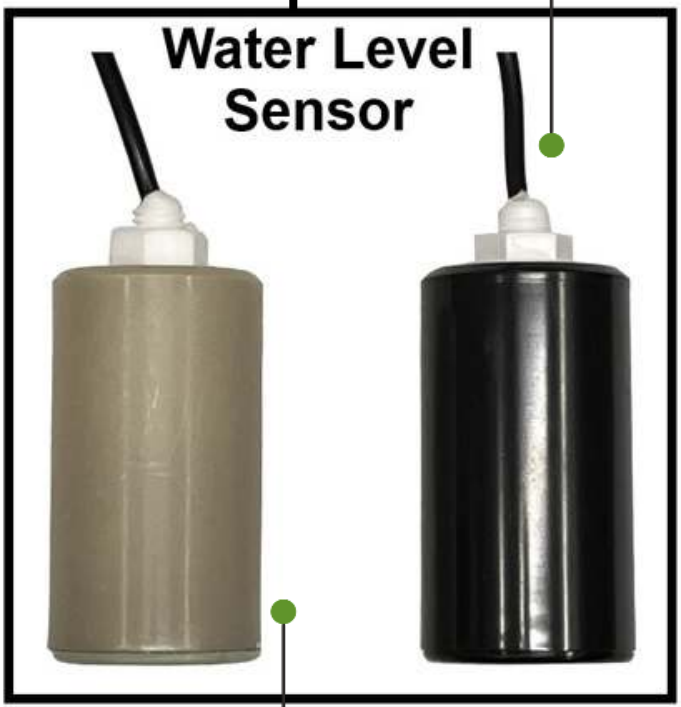


Water Level Sensor Installation

Wiring to the controller



There is no polarity to the wiring, so either wire can go on the WC and WH terminals.



The Counter Weight must be installed on cable before wiring into the pump controller.

There is no polarity to the wiring, so either wire can go on the TC and TH terminals.

Fix sensors vertically with the wires coming from the top of the sensor. DO NOT allow the sensor to float freely in the water. We recommend fixing it to the water delivery pipe using zip ties.

Water Level Sensor Installation

Mercury water level sensor

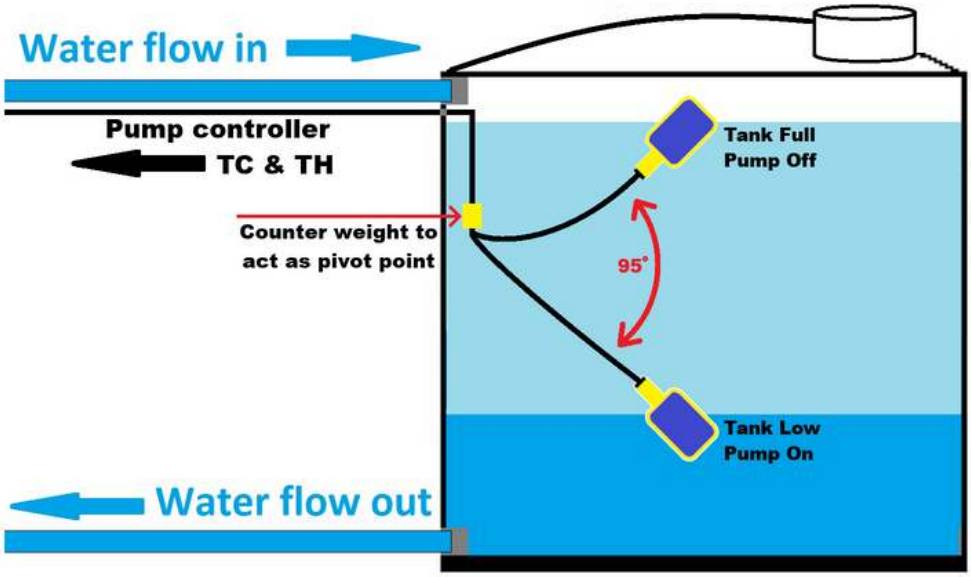
This sensor is used for Tank Full when a tank is located relatively close to the water source. For 1mm² gauge wire, we recommend limiting the maximum length of the cable to 150m.

Installation:

1. Install the counter weight onto the cable. If the cable was extended by Commodore, the counter weight will already be on the cable.
2. Fix the counter weight in a position that will allow it to act as a pivot point between the pump start/stop positions.
3. Connect the Black and Brown wires to the TC and TH terminals in the pump controller. There is no polarity to the wiring, so either wire can go on either terminal.

Confirming correct operation

1. **Start the pump -** Turn the system on and ensure water is flowing to the tank.
2. **Simulate a full tank -** This can be done manually by hold the float in the up position.
3. **Observe the system -** With the sensor raised, the Tank Full light should turn red, and the pump should then begin to slow down and stop.
4. **Troubleshooting -** If the Tank Full light does not turn red and the pump does not begin to slow, make sure that the Black and Brown wires are on the TC and TH terminals.
5. **Restore flow -** Once the Tank Full light has turn red and the pump has stopped, lower the sensor towards the ground so the Tank Full light turns off. The pump will then restart, and the water should begin flowing again.



Water Level Sensor Installation

Water level float switch

This sensor is used for Low Water detection to protect the pump from running dry.

Installation:

1. Fit the low water sensor at least 1 metre above the outlet of the pump. Use zip ties to secure the body of the sensor vertically to the delivery pipe. It can be secured to the pump body if the pipe is not possible.
2. Run the sensor cable along the pipe with the pump's power cable, fixing it to the pipe in intervals.
3. Remove the factory installed bridging wire from the WC and WH terminals.
4. Connect the Black and Red wires into the WC and WH terminals. There is no polarity to the wiring, so either wire can go on either terminal.

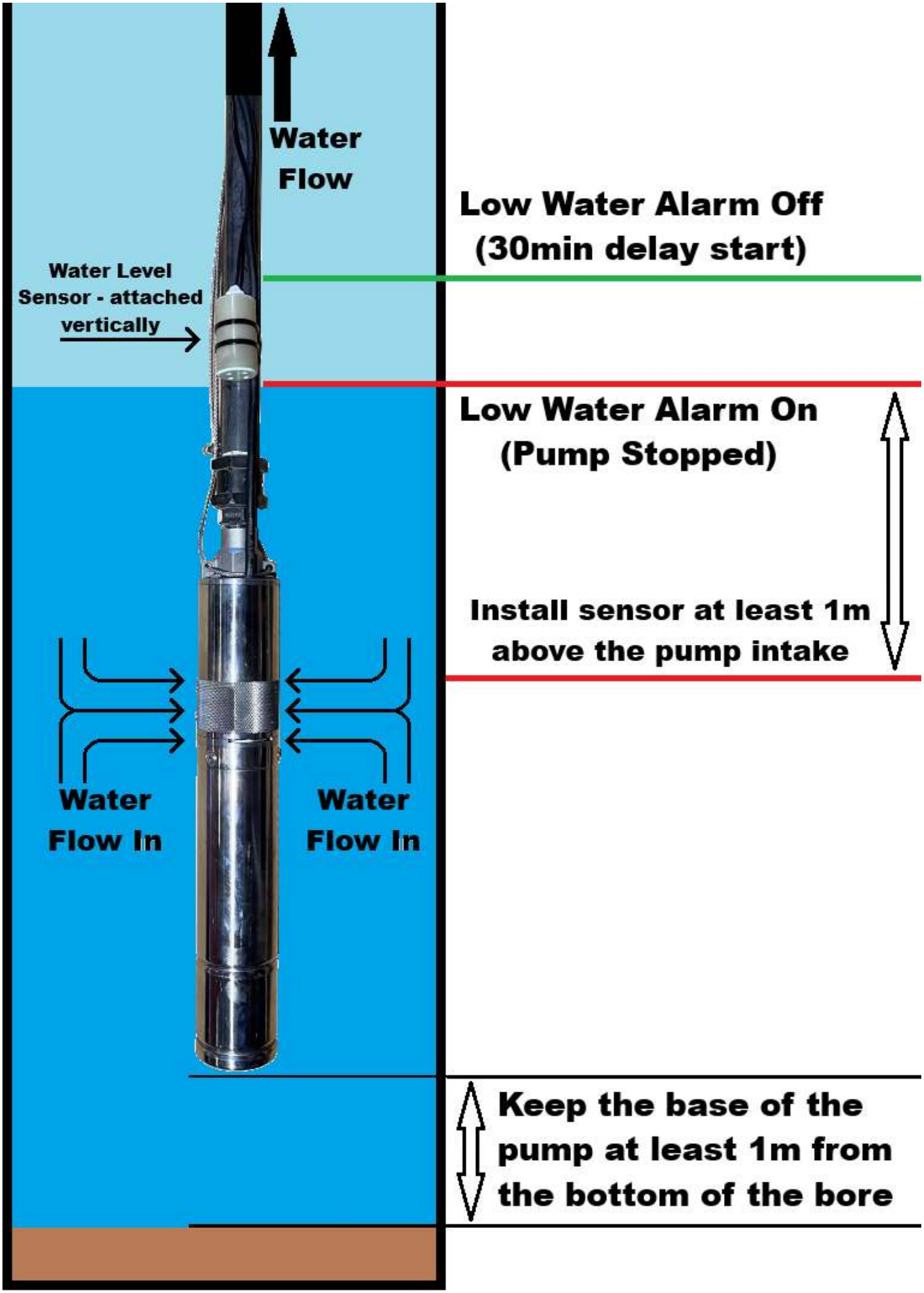
Note: *DO NOT leave the sensor to float freely as this can cause false signals that will stop the pump from operating. Ensure the sensor is fixed vertically with the wire is coming from the top sensor and there are no obstructions to water entering the holes at the top and bottom of the sensor body.*

Confirming correct operation

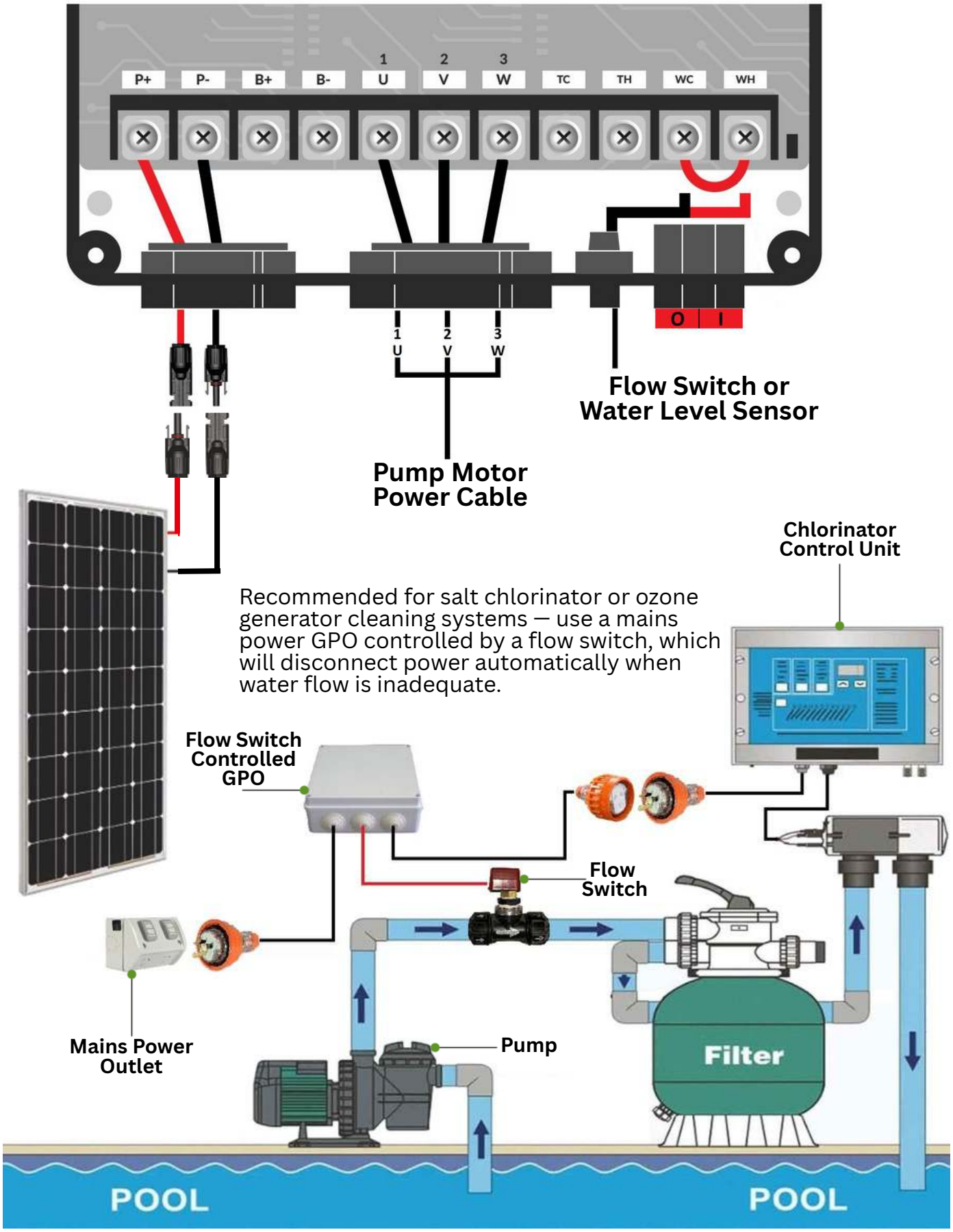
1. **Start the pump -** Turn the system on and ensure water is flowing to the destination.
2. **Simulate low water level -** This can be done by removing the wire from the WH terminal.
3. **Observe the system -** With the wire disconnected, the Low Water light should turn red, and the pump should then begin to slow down and stop.
4. **Restart delay -** Reinstall the wire to the WH terminal. The Low Water light will begin flashing which indicates that the 30-minute restart delay is counting down.
5. **Restore flow -** At the end of the restart delay, the Low Water light will stop flashing red and turn off. The pump will then restart, and the water should begin flowing again.

Note: The restart delay can be ended by turning the incoming power off and then on again. DO NOT reset power if the pump is running

Water Level Sensor Installation



Pool Pump Quick Connect Guide



Motor Wire Colours and Labels. Please not the label of each wire colour before extending the main power cable

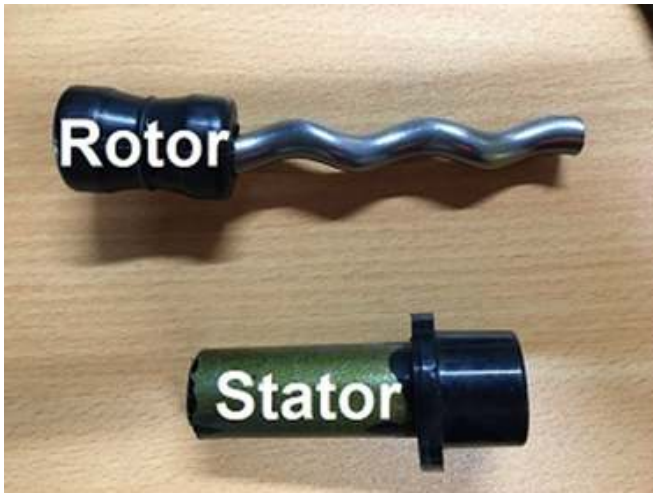
U1= _____ V2= _____ W3= _____

Helical Rotor Pump & Motor Check

Checking The Impeller

Pull the pump out of the water, disconnect the pipe from the pump, unbolt the outlet from the rest of the pump.

1. Turn off all incoming power.
2. Pull the pump from the bore.
3. Disassemble the pump (wet end) section by:
    a. Disconnecting the pipe from the pump.
    b. Undoing the bolts holding the outlet to the impeller housing and sliding it up the power cable.
4. While the stator is still on the rotor turn it by hand.



It should move easily but have a firm feel to it. If it is loose or feels like it is grabbing on the rotor, it will need to be replaced.

Please refer to the next page which illustrates how to change your impeller.

Checking The Motor

While checking the impeller, it is also worth checking that the motor is still in good condition.

- Continue dismantling the wet end by:
    a. Removing the stator from the impeller housing.
    b. Undoing the screws that hold the inlet screen onto the impeller housing.
    c. Undoing the bolts behind the inlet screen that holds the impeller housing to the motor body and sliding it up the power cable.

With the pump is disassembled, try turning the motor shaft by hand or by placing an open ended spanner on the 2 flat sections at the top of the motor shaft.

- A working motor shaft should turn freely with a clunking sensation as it is turned. The clunking sensation is the motor shaft's magnets moving between the motor's windings and is normal.
    - Normal movement:
        - The shaft should turn freely with a clunking sensation as it is turned. The clunking sensation is the motor shaft's magnets moving between the motor's windings and is normal.
    - Abnormal movement:
        - The shaft is difficult to turn.
        - Has a grinding or scraping noise/feel to it.
        - Grabs while turning.
        - Is jammed and cannot move.
        - Side to side movement.

Other worthwhile checks:

- The seal where the motor shaft comes out of the motor is clean and in good condition.
- The base of the motor is clean and in good condition.
- The power cable is not damaged where it enters the impeller housing.
- The power cable is not damaged along the length that runs through the impeller housing.
- The power cable is not damaged where it enters the motor.

How to Replace an Impeller

This guide provides step-by-step instructions for dismantling a helical rotor pump head to inspect and replace the impeller. The procedure is based on the Commodore 1.8-80 pump model. For additional assistance, please contact Commodore Australia support.

Required tools:

Multigrips
Philips head screw driver (P2)
10mm open end spanner
12mm open end spanner
13mm open end spanner

1. Begin by removing the 3 x 10mm bolts from the pump's outlet. Lift the outlet away and up the power cable. This will allow for the removal of the stator.

2. Remove the stator for inspection. Look for small stones and sticks as these can prevent the rotor and stator from working. Also look for deposits of calcium, lime, iron, and general shale. These can harden the rubber of the stator, effecting the pumps ability to move water. They can also cause excess wear on the impeller, hindering both free movement and water flow.

It is also important to look for signs of sand, dirt/mud. These can cause the rotor and stator to wear rapidly, causing them to become loose which greatly effect water flow.

3. Remove the inlet filter screen by removing the 2 x Phillips head screws. Take care as the edges of the screen can be sharp.

4. Remove the 3 x 10mm bolts holding the impeller housing to the pump's motor body. Lift the housing away and up the power cable to allow access to the rotor.

5. Push down the rubber collar beneath the rotor's base to expose two flat sections on the motor shaft. Place the 12mm (or 13mm) spanner on these flat sections to hold the shaft in place and turn the rotor clockwise to remove it. Install the replacement rotor by turning it counterclockwise on the motor shaft.

While the rotor is removed, inspect it and motor shaft for signs of wear. Use a spare impeller set as a comparison when checking the condition of the removed set. These sets are not expensive, so we recommend always keeping at least 1 spare set.

These images show impeller sets that have been in water with high mineral and iron content. These minerals have become stuck and formed thick layers on the stator over time. This has caused the rubber to become dry and tight which has led to the rotor not being able to spin freely and reducing water flow.

These minerals and iron are mainly in bores, but can be found in dams at lower concentrations. Algae and other slime like materials can form in dams over time. These can harden and have similar effects as the minerals, however they are typically more damaging to the pump's power cable than the rotor and stator

Multistage Motor Check

Step 1:
To check if the motor or impeller shafts are jammed, you will need to separate them.

Pull the pump out of the water and remove the power cables cover. This is done by undoing the 2 screws that hold it to the pump body and then lifting the cover away.

Using a 13mm ring/open end spanner, undo the 4 bolts holding the pump to the motor. Be sure to not loose any bolt or washers.

Once removed, lift the pump away from the motor.

Step 2:
Once they are separated use plyers to turn the impeller shaft in the pump. It should turn freely in either direction. There will be some up/down movement, but this is normal and no need for concern. If the shaft is jammed, difficult to turn or there is grinding/scraping sounds coming from the pump, it is likely that it needs to be replaced or repaired. Please contact our support department for advice.

Step 3:
You can also check that the motor shaft turns by using your hand or plyers. It should turn freely with only moderate effort and have a smooth feel to the turn. There will be a clunking sensation to it as it turns because of the shaft moving between the magnets.

If the shaft is very difficult to turn, feels like it is grinding through sand as it turns, or there is side to side movement, then the bearings or motor shaft may need replacing. Please contact our support department for advice.

DC Pump Troubleshooting Guide

Problem	Solution
No lights on controller	1. 24V and 48V controllers have a small internal switch located in the top right-hand corner of the circuit board. If using the P+ and P- terminals, check that this switch is in the “Solar” position (switched up). If using the B+ and B- terminals, check that this switch is in the “Battery” position (switched down). 2. With the switch is in the correct position or if you do not have a switch, you will need to confirm that the polarity is not reversed by using a multimeter. If the solar panels or batteries are connected to controller in reverse, no lights will come on and there will be either a low voltage reading, or a negative voltage reading on the multimeter. In this case, you will need to swap the wires around. 3. If the polarity is correct and there are still no lights use the multimeter to check the voltage that is coming in from the solar panels or batteries. For 1 panel in series the voltage should be between 30V and 52V, for 2 panel in series the voltage should be between 60V and 96V and for 3 panel in series the voltage should be between 90V and 135V. If there is no voltage at all, confirm the multimeter is reading DC voltage and retest. If it is, check that all the connections between the solar panels and pump controller are firmly plugged in together and that all terminals are tightened properly. 4. If the problem persists, please contact our support department.
Tank full light on	1. Check that the external switch, which is located on the bottom right underneath side of the controller is the I position. If it is in the O position, changed it to the I position. 2. If the pump does not start, turn off all incoming power, open the pump controller and unplug the small white plug (from the external switch) from the bottom right corner of the circuit board. Turn the incoming power back on to test-run the pump. If the pump begins operating, it is likely that the external switch is faulty and needs replacing. To organise a replacement, please contact out sales or support departments. Next step on the next page.

DC Pump Troubleshooting Guide

Problem	Solution
Tank full light on (continued)	3. With the pump controller open, turn off all incoming power and remove one or both pressure switch/tank sensor wires from the TC and/or TH terminals. Turn the incoming power back on to test-run the pump. If the pump begins operating, it is possible that the pressure switch/tank sensor or its cable is faulty and need to be replaced. Please contact our support department if this is the case. 4. Turn off all incoming power and unplug the large white cable (light bar cable) from the top left corner of the circuit board. Turn the incoming power back on to test-run the pump. If the pump begins operating, it is likely that the light bar is faulty and needs replacing. To organise a replacement, please contact out sales or support departments. 5. If the pump continues to not operate after the external switch, the pressure switch/tank sensor cable and the light bar have been removed, the pump controller is likely faulty, and we recommend contacting our support department.
Low water light on solid	1. Check that the low water sensor is securely mounted in a vertical position using zip ties, or something similar, and that the cable is coming from the top of the sensor. 2. If the sensor is mounted correctly and is submerged below the water, the low water sensor circuit will need to be tested. Turn off all incoming power, remove the lower water sensor cable from the WC and WH terminals and install a loop wire connecting the terminals. If the pump runs when the power is turned back on the sensor cable and/or sensor will need to be replaced. Please note that if the Low Water light is flashing, this indicates that the controller's 30-minute restart delay has been activated. Wait at least 30 minutes to see if the pump begins to run. If the Low Water light is still on and solid, please contact our support department.
Low water light is flashing	1. This indicates that the low water sensor had recently stopped the pump because it was in danger of running dry. The flashing light indicates that the water has replenished to the point where the sensor is covered, and a 30-minute delay has been activated. Please wait 30 minutes to see if the pump restarts. Next step on the next page.

DC Pump Troubleshooting Guide

Problem	Solution
Low water flow when the pump has just been installed	1. Check that the solar panels are connected in the correct configuration to deliver the correct voltage to the pump controller. For example, 1 panel in series for 24V controllers, 2 panels in series for 48V controllers, or 3 panels in series for 72V controllers. 2. Check that the solar panels are clean with nothing covering any part of the panel's front, such as cardboard on the corners or shade on any section. Any coverage can significantly reduce the solar panels' performance. 3. Check that all connections between the solar panels, pump controller and pump are firm and correct. A bad or loose connection can allow the pass through of voltage but will not allow for the correct flow of current when trying to run the pump at full speed. 4. If the panels are clear and in good sunlight conditions, the pump motor may be running backwards. Most pumps can still deliver water when running backwards, but it will be a reduced flow rate with little pressure behind it. To reverse the direction of the pump motor, swap the positions of the wires from the V and W terminals. Please note that screw/helical rotor impeller pumps can unscrew the impeller if ran in the wrong direction. This means that if the pump ran backwards, it is possible that the impeller has unscrewed from the motor and reversing the direction may not deliver water. If reversing the direction does not deliver water, the pump will need to be pulled up and the impeller reinstalled on the motor. At this time, we recommend confirming the pump is running in the correct direction before placing the impeller back on the motor.
Low water flow when the pump has been in operation for some time	1. Check that the solar panels are clean from dust, bird droppings or other debris, and not covered by shade on any part of the panel's front. Any coverage can significantly reduce the solar panels' performance. 2a. For screw/helical rotor pumps, the impeller (rotor and stator) needs to be changed periodically. We generally recommend that they be replaced every 1 or 2 years, but this can be affected significantly by local conditions. Continued on the next page.

DC Pump Troubleshooting Guide

Problem	Solution
Low water flow when the pump has been in operation for some time (continued)	2a. We recommend pulling the pump out and checking that the stator can still turn freely on the rotor with little resistance, but without being too loose. If they have become overly loose or tight, we recommend replacing both rotor and stator. Please note that these are a matched pair and should always be swapped in/out together. To inspect or change the impeller, see the “how to change your impeller” page of this manual. 2b. For multistage impeller pumps, check that the inlet and impellers are not clogged. It they are then this can significantly reduce the flow rate of the pump. We recommend running the pump in reverse for 5 – 10 minutes before swapping back to forwards for 5 10 minutes, and then reversing the direction again for another 5 – 10 minutes. This should allow the pump to dislodge much of what is clogging the impellers. You can change the direction of the pump by cutting off all incoming power and then swapping the wires on the V and W terminals. Take note of their positions before swapping any wires. Multistage pumps can also be disassembled for cleaning. This needs to be done carefully as there are many parts that need to be kept in the correct order for reassembly. Contact our support department for instruction or further assistance. 3. For multistage impeller pumps it is also possible that the coupling between the motor and impeller shafts has become stripped. To check this, you will need to separate the 2 parts. Pull the pump out of the water, remove the power cable guard from the side of the pump, and remove the bolts holding the pump head to the motor. If the spline on the motor shaft or coupling on the impeller shaft are damaged, it can significantly reduce the pump’s water flow. To determine the best course of action please contact our support department.
Low power light on	1. Check that the solar panels are clean with nothing covering any part of the panel’s front, such as cardboard on the corners or shade on any section. Any coverage can significantly reduce the solar panels’ performance. Next step on the next page.

DC Pump Troubleshooting Guide

Problem	Solution
Low power light on (continued)	2. Check that all connections between the solar panels, pump controller and pump are firm and correct. A bad or loose connection can allow the pass through of voltage but will not allow for the correct flow of current when trying to run the pump at full speed. 3. Check that the intake has not become clogged and that the impeller and/or motor shaft's movement has not become tight or jammed. 4. Check the pump's power cable for damage. If the cable has been damaged it could be allowing water into the pump which can trigger the low power alarm. If the pump's power cable has been extended it is also a good idea to double check that the join point is in good condition. If the cable join is suspect, turn off all incoming power, and disconnect the power cable from the pump controller. Cut the power cable on the motor side of the join and check it for signs of water. If there are no signs of water, connect the power cable to the pump controller and test run the pump in a bucket or appropriately sized container of water. If the pump runs without any problems the power cable will need replacing. If the pump does not run or there are signs of water in the power cable, please contact our support department.
Fault light on	1. Check that the intake has not become clogged and that the impeller and/or motor shaft's movement has not become tight or jammed. 2. Check the pump's power cable for damage. If the cable has been damaged it could be allowing water into the pump which can trigger the Fault alarm. If the pump's power cable has been extended it is also a good idea to double check that the join point is in good condition. If the cable join is suspect, turn off all incoming power, and disconnect the power cable from the pump controller. Cut the power cable on the motor side of the join and check it for signs of water. If there are no signs of water, connect the power cable to the pump controller and test run the pump in a bucket or appropriately sized container of water. If the pump runs without any problems the power cable will need replacing. If the pump does not run or there are signs of water in the power cable, please contact our support department

Warranty Policy

1.. Damage to the pump or motor caused by abrasive or corrosive water is not covered by warranty. It is suggested that an analysis of bore water be carried out prior to installation to ensure pump suitability.

2. Pumps must be used with clean water. A submersible pump must not be used to bail a new bore. Guarantee does not cover failure or wear due to abrasives in the water.

3. Do not allow pumps to run dry, low water sensors must be installed to avoid dry running.

4. Know the depth of the bore and ensure that the pump does not rest in sand. Ensure 1.5 metres (5 feet) clear between the bottom of the pump and the bottom of the bore.

5. Never support the weight of the pump by the power cable, ensure it is held with appropriate steel hanging cable.

6. If a non-return valve (or check valve) is fitted at the top of the bore in a submersible pump installation, such as when using a pressure switch with non-return valve fitted into the T piece, it is also necessary to fit an additional non-return valve at no more than 7.5m above the pumping draw down water level in the bore. This helps to protect the pump from a less than zero head (vacuum) start up in the event of a leak in the pumps built-in non return valve. Generally speaking it is typically best to have just one non-return valve in a submersible pump installation. For multistage submersible pumps a valve is built into the pump head after the final impeller stage, a pressure switch system will require an additional check valve.

Commodore Pumps (motor and pump head) come with a 2 year warranty. New solar panels have a 25 year 80% output warranty. If your item is found to be defective within the warranty period we will replace the defective part free of charge. You are welcome to send any faulty goods back and our factory trained staff will carry out the repair for you free of charge within the warranty period. Repairs outside of the warranty period are available at a reasonable cost. Shipping is cost of buyer. Consumables (such as helical rotor pump impellers), cables, leads, etc are not covered by warranty. Negligence or misuse is a warranty exclusion. Commodore is not responsible for any direct or indirect expenses or losses related to warranty or non warranty.

For more information on returns, warranty and repairs you can view our terms and conditions online here - www.commodoreaustralia.com.au/terms-conditions/

How to Videos - Scan QR Code

How To Wire Solar Panels For A 24V Pump

How To Wire Solar Panels For A 48V Pump

How To Wire Solar Panels For A 72V Pump

How To Adjust A Pressure Switch

How To Replace A Pump Impeller

How To Wire Either A 24V, 48V or 72V Controller

We are here to help, if you require assistance with your Commodore Solar pump system, please don't hesitate to get in touch.

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