LEVEL MASTER WIND & WATER

Installation and User Manual

Sapphire®

TABLE OF CONTENTS

LEVEL MASTER CONTROLLER WARNING

The Level Master Controller is designed for use in connection with residential and commercial water features. Proper installation, use, and maintenance are essential for optimal performance and to reduce the risk of accident or injury. Follow the installation instructions carefully.

IMPORTANT

Before beginning installation, read all of the warnings and instructions below, and identify components using the figures and diagrams listed in this document. It is critical that all parts be carefully inspected by the installer prior to installation to ensure that no damage occurred in transit and that a damaged component is not used. Proper installation cannot be overstressed, as improper installation voids any warranty by Sapphire Fountains and may affect the safety of the water feature and its users. Failure to read and follow the instructions may result in damage to the Controller.

This Controller has been evaluated for use with water features only and has not been approved for use in aquariums or other marine areas.

Sapphire Fountains is not responsible for losses, injury, or death resulting from failure to observe safety precautions, failure to follow the instructions, or any misuse or abuse of the Controller or equipment.

WARNINGS

This unit must be hardwired and connected only to a supply circuit that is protected by a ground fault circuit interrupter (GFCI). A GFCI is generally a minimum requirement by most building codes and should be provided by the installer, and must be tested before each use. Consult the GFCI manufacturers' instructions for correct installation, testing, and operation.

All electrical connections must comply with the National Electric Code, as well as any applicable state and local codes and standards. A qualified, licensed electrician must be used for all electrical connections. DO NOT attempt to install the Level Master Controller unless you are an experienced, licensed electrician.

DANGER – RISK OF ELECTRICAL SHOCK. Special care should be taken since water is employed in the use of this product and equipment. Electrical components for the Level Master Controller should be installed at least 10 feet (3 meters) away from any body of water. All electrical components should be properly bonded per national, state, and local codes. DO NOT permit any electrical apparatuses (i.e. a light, telephone, radio, television, etc.) within 10 feet (3 meters) of a body of water.

Ensure that the Controller power source is OFF prior to connecting to the Controller. Prior to beginning the Controller installation, and anytime you connect or disconnect components, and before any other maintenance or cleaning, make sure the Controller is not plugged into any outlets and has been disconnected from all electrical connections. The controller must be installed in a

shaded area and out of direct sun light. Do not let the Controller become iced up. Do not make any contact with any components inside the Controller other than as provided in the installation instructions.

Inspect the power cable before using. The power cable should be protected at all times. Never cut the cord. Never handle the power cord with wet hands. Do not use the power cable to lift Controller. Grasp the plug and pull to disconnect. Never yank the cable. Do not operate if the power cord is damaged or if it is malfunctioning.

If replacement of any part of the Controller is required, including fuses, replace only with the same type of part and rating. Installation of a higher amperage fuse is a fire hazard and can lead to serious injury, equipment damage, or death.

The Level Master Controller has been tested before leaving the manufacturing plant. A blown circuit board is not covered under any warranty of this product. It is important that a licensed electrician installs the Level Master Controller and that they read the instructions provided and examine the diagrams to ensure that the circuit board is not damaged during installation.

PRODUCT FEATURES/OVERVIEW OF PARTS

1. **Power Switch:** Will turn on the controller. Leave the switch in the off position (bottom pushed in) when unplugged. While the controller is on, a blue light will be powered.

2. **Fuse:** Protects the controller from excessive current draw. It is a 3.15A, 20mm glass fuse.

3. **Wiring Terminals:** This is where all field devices will be wired.

4. **Strain Relief:** route all cables and wires through the strain relief to keep the controller watertight, and cables secure.

5. **Basic Terminal Pinout:** This label shows what terminals each feature is associated with.

6. **HMI Touch Screen:** This touchscreen will be the main point of control for the device.

7. **Serial Number:** this Label shows the serial number of the controller (on inside of lid).

DEVICE INTRODUCTION AND DIMENSIONS

The Level Master Wind and Water is the perfect controller for managing the water level of a fountain or pool, controlling a circulation or feature pump, and preventing splashing and water loss due to high winds.

DEVICE FEATURE SUMMARY

Pump Relay: This relay can be used to activate a motor starter or input on another device.

Fill Relay: This relay is used to power a fill solenoid. It activates when the high water level sensor is off.

Level Sensors Inputs: The high water level sensor will control where the target water level is, and the low water level sensor (if used) will act as the cutoff for the pump relay in case water runs low.

Wind Sensor Input: This sensor will determine windspeed and shut off the pump relay if it goes pass the max wind speed setting.

ELECTRICAL SPECIFICATIONS

ATTRIBUTE	VALUES	
Controller Voltage	120VAC	
Controller Max Amperage	3.15A	
Operating Amperage	200 mA	
Number of Sensors	3	
Wire Gauge Range	24AWG...16AWG	
Strain Relief Diameter	.475"	
Sensor Specifications	**TYPE**	**OPERATING VOLTAGE**
	Wind Sensor Anemometer	5V DC
	High Water Level Sensor	24V DC
	Low Water Level Sensor	24V DC
Number of Relays	2	
Relay Specifications	**TYPE**	**RANGE**
	Voltage	0...30V DC
		0...250V AC
	Amperage	0...10A

Warning: Do not exceed the rated voltage or amperage of the sensors or relays. Doing so will damage them, and void the warranty.

MOUNTING INSTRUCTIONS

Mount the controller within 5 feet of an electrical outlet, or an extension cord will be required.

MOUNTING WITHOUT FEET

Mount the controller with a screw in each corner. Each screw should be drilled into a stud or drywall anchor to be properly secured.

Use hardware size #8

MOUNTING WITH FEET

Note: mounting feet are included

Secure the slotted hole of each foot from the back with the hardware provided.

Mount the controller with a screw in each foot. Each screw should be drilled into a stud or drywall anchor to be properly secured.

Use hardware size #8, counter sunk

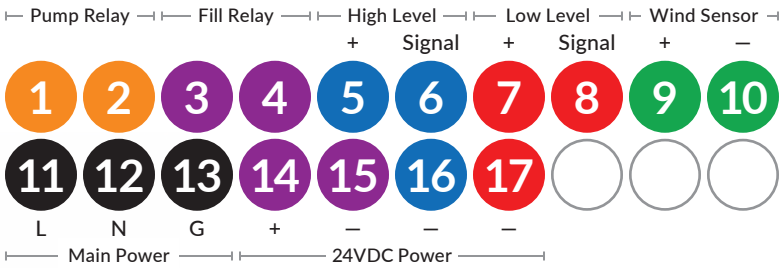
WIRING INTRODUCTION

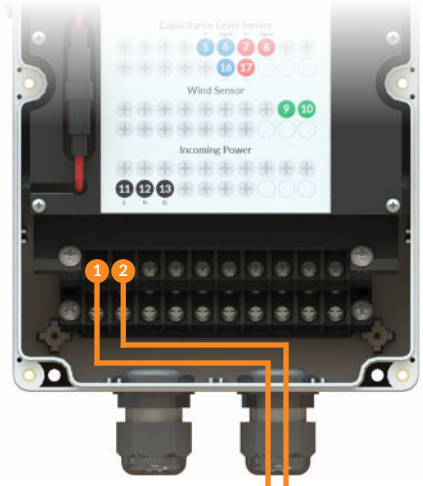
Warning: Disconnect power to all devices before wiring.

Warning: Line colors are for reference only. They do not represent wire colors.

WIRING DIAGRAMS

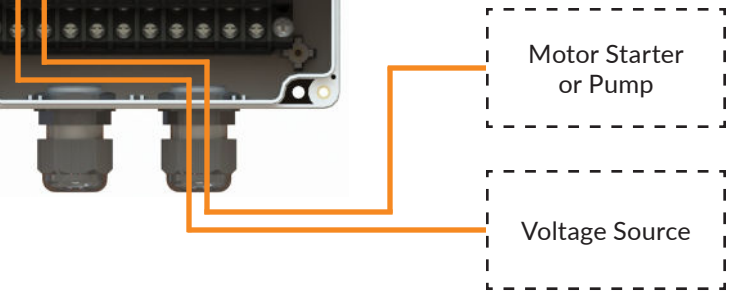
Use the following diagrams and information to wire field devices to the Level Master. Double check that wiring is done correctly before applying power to prevent accidental damage to the devices.

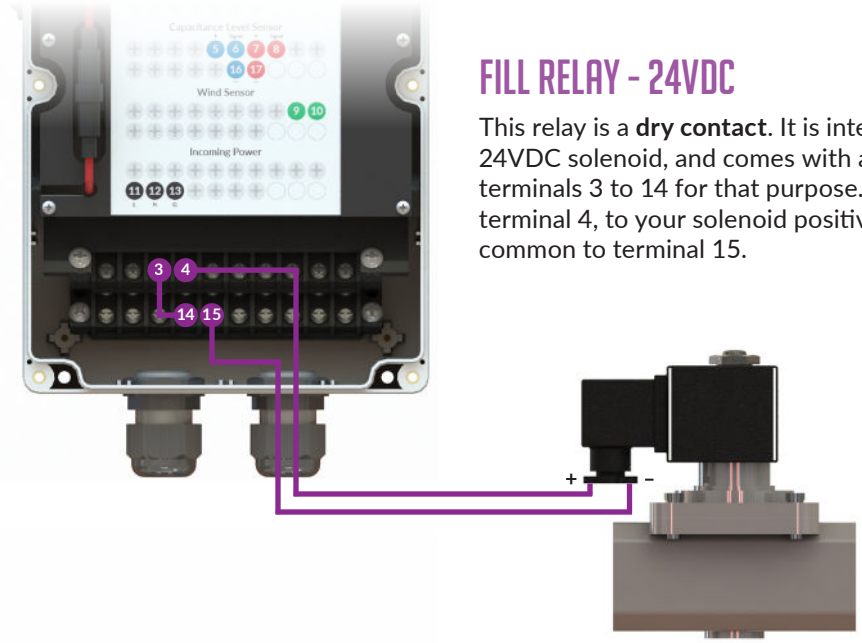




PUMP RELAY

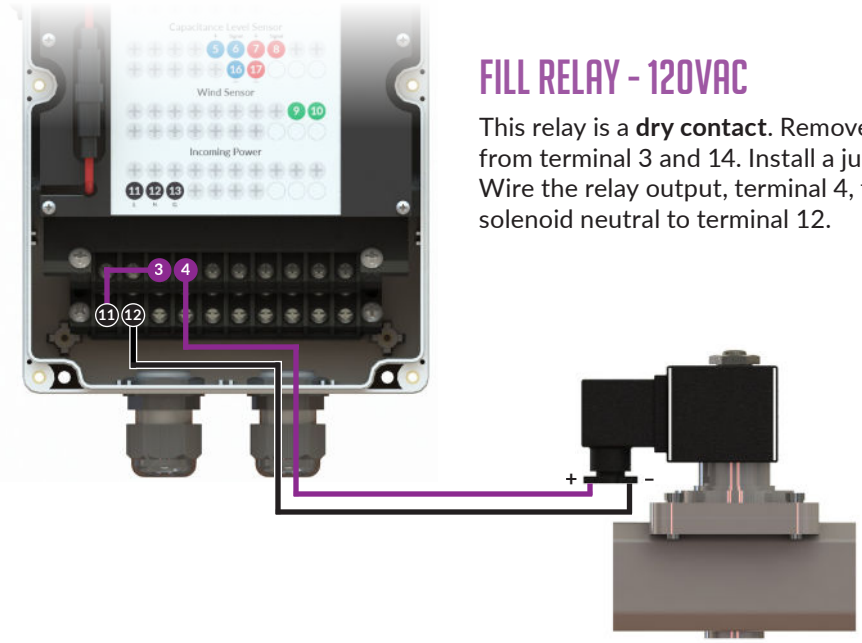
This relay is a **dry contact**. It is recommended that this relay be used control a motor starter, or be wired to another input device.





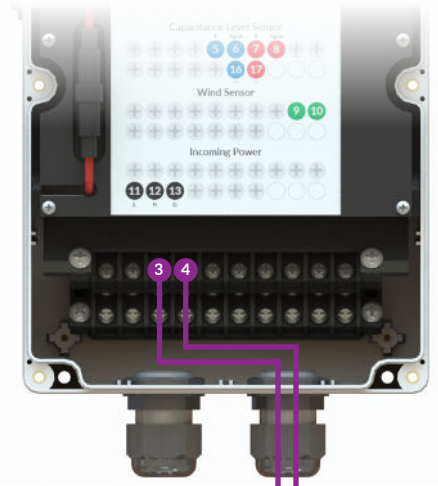
FILL RELAY - 24VDC

This relay is a **dry contact**. It is intended to be used with a 24VDC solenoid, and comes with a pre-installed jumper from terminals 3 to 14 for that purpose. Wire the relay output, terminal 4, to your solenoid positive, and your solenoid common to terminal 15.



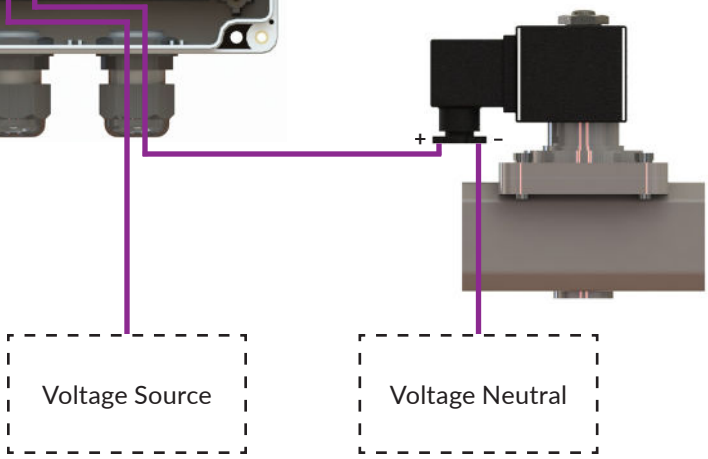
FILL RELAY - 120VAC

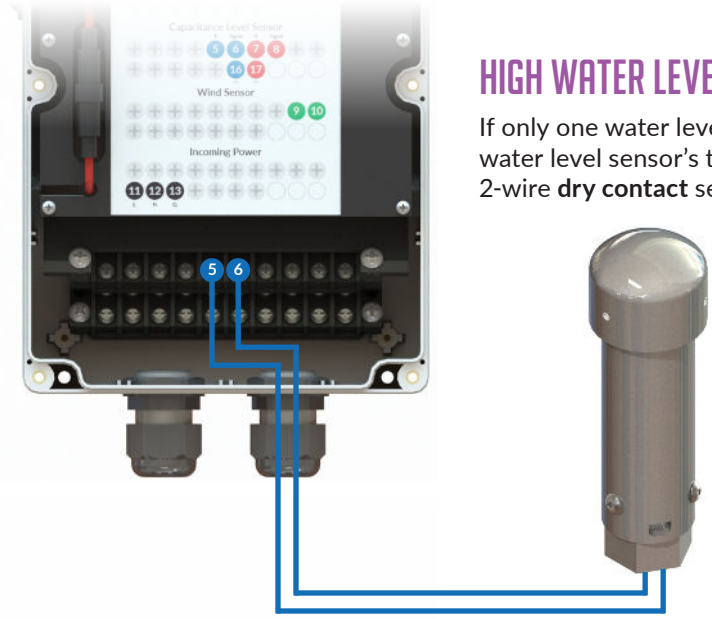
This relay is a **dry contact**. Remove the pre-installed jumper from terminal 3 and 14. Install a jumper from terminal 3 to 11. Wire the relay output, terminal 4, to your solenoid, and your solenoid neutral to terminal 12.



FILL RELAY - OTHER VOLTAGE

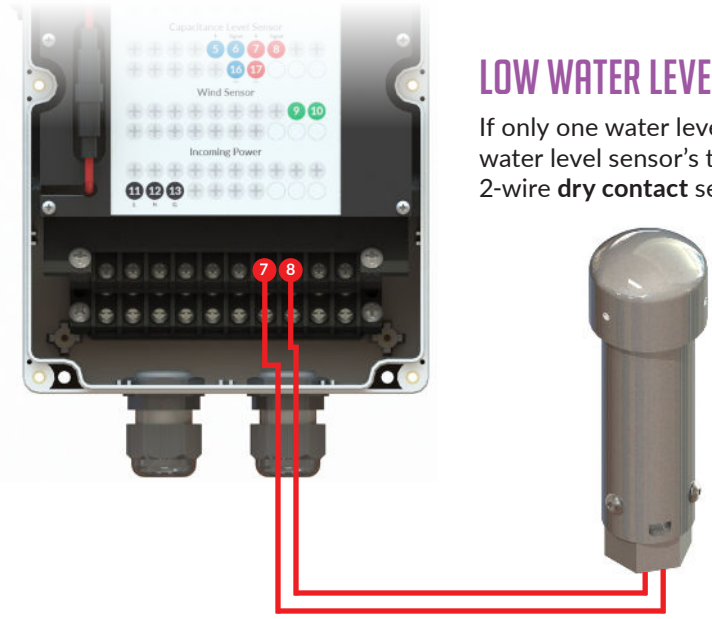
This relay is a **dry contact**. Remove the pre-installed jumper from terminal 3 and 14. Ensure that the chosen voltage matches the selected solenoid's electrical specifications. Wire the source voltage to terminal 3, then wire the relay output, terminal 4, to your solenoid, and your solenoid neutral to your voltage neutral.





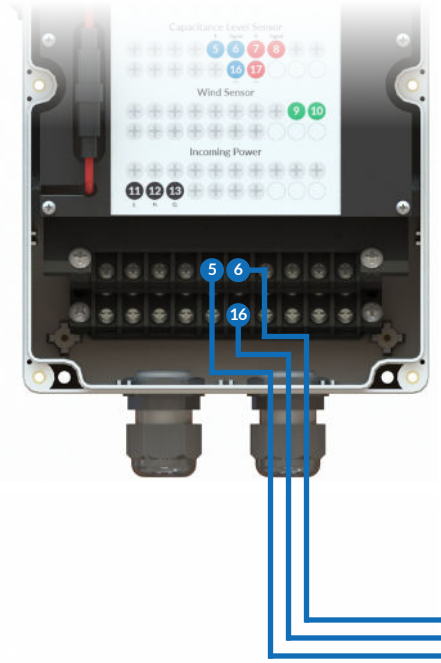
HIGH WATER LEVEL SENSOR - DRY CONTACT

If only one water level sensor will be used, wire it to the high water level sensor's terminals. Wire terminal 5 to one of the 2-wire **dry contact** sensor's wires. Wire the other to terminal 6.



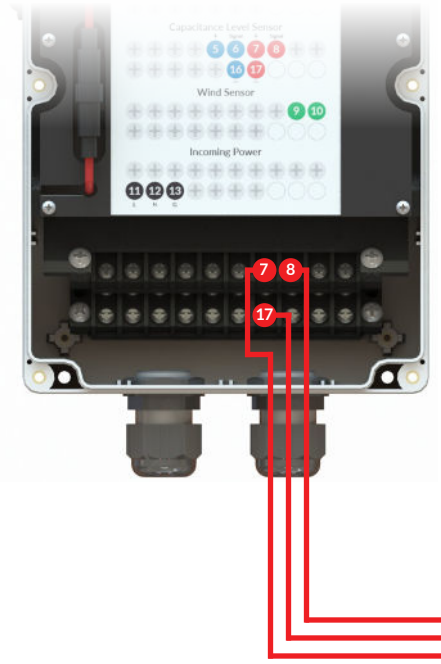
LOW WATER LEVEL SENSOR - DRY CONTACT

If only one water level sensor will be used, wire it to the high water level sensor's terminals. Wire terminal 7 to one of the 2-wire **dry contact** sensor's wires. Wire the other to terminal 8.



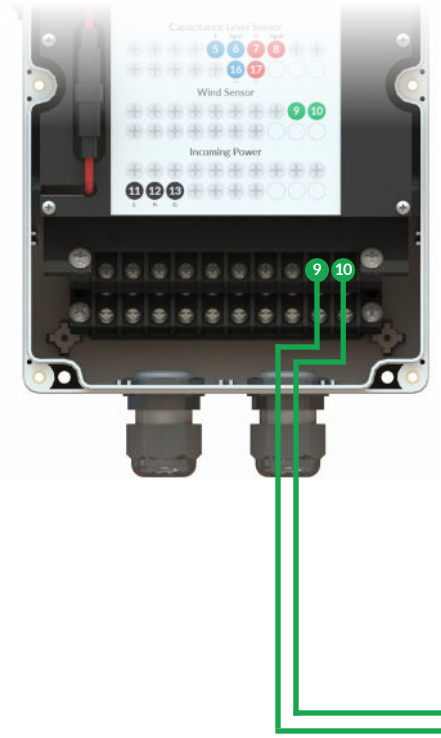
HIGH WATER LEVEL SENSOR - CAPACITANCE

If only one water level sensor will be used, wire it to the high water level sensor's terminals. Wire terminal 5 to the 3-wire **Capacitance** sensor's positive wire, the signal (output) wire to terminal 6, and the common wire to terminal 16.



LOW WATER LEVEL SENSOR - CAPACITANCE

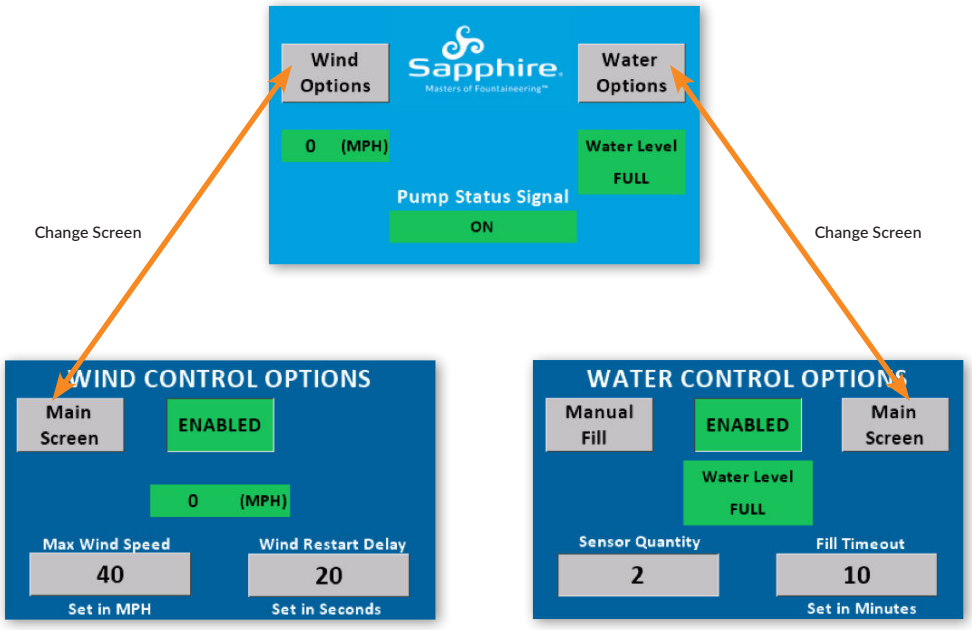
If only one water level sensor will be used, wire it to the high water level sensor's terminals. Wire terminal 7 to the 3-wire **Capacitance** sensor's positive wire, the signal (output) wire to terminal 8, and the common wire to terminal 17.



WIND SENSOR

Terminal 9 supplies 5VDC, and is intended for a **reed switch anemometer**. The sensor is reliable up to 500ft from the controller. Wire terminal 9 to one of the 2-wire anemometer's wires, and the other wire to terminal 10.

HMI TOUCH SCREEN



Enable Buttons: pressing these buttons will toggle between enabled and disabled for each control option. Enabled is the default mode.

If wind control is disabled, windspeed will be ignored.

If water control is disabled, water level will be ignored; the fill valve will stay off, and the cutoff sensor will not affect the pump relay.

Manual Fill: toggling this button will manually activate the fill valve, even if water control is disabled. This button will stay toggled until pressed again.

SETTINGS

Settings will be remembered in the event of a power outage.

Max Wind Speed Setting: If the wind speed is greater than this value for 10 seconds, the pump relay will turn off.

Wind Restart Delay Setting: If the wind speed is lower than the max wind speed setting for seconds equal to this value, the pump relay will turn on. Use this setting to keep the pump from turning on and off frequently due to fluctuating wind speeds.

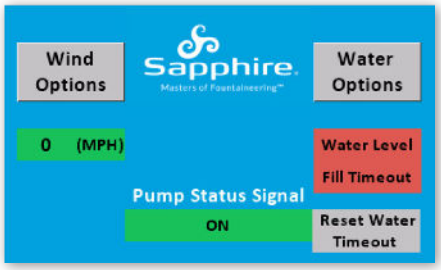
Sensor Quantity Setting: This setting indicates the number of level sensors wired to the controller. It can be either 1 or 2.

If set to 1, the controller will only read the high level sensor and use it as the cutoff sensor

as well as the high level. With this setting, the pump relay will be turned off if a fill timeout occurs.

If set to 2, the controller will read the high level and the low level sensors, using the low level sensor as the cutoff. In this mode, the pump relay will be turned off if the low level sensor is off for 10 seconds.

Fill Timeout Setting: If the fill valve is on for longer than this setting, a fill timeout will occur, requiring a reset on the main screen.



TROUBLESHOOTING GUIDE

My controller won't turn on:

If the controller is plugged into an outlet, the power button is turned on, but the power light and HMI screen are off; Ensure that the outlet the controller is plugged into is supplying power, that it is not tripped (if GFCI), and that the circuit breaker that controls the outlet is on.

If issue persists, unplug the device, remove the cover and check the fuse. If it is blown, replace it with a new 3.15A 20mm glass fuse.

My touch screen says "HMI offline", or is completely off:

Remove the cover, and check that the HMI's ribbon is plugged in. if it is, look for damage on the cable; a replacement may be required.

My fill valve won't turn on:

Turn on the manual fill button. If the fill valve works, there may be a sensor issue, proceed to the next section. If the fill valve does not turn on, double check the electrical specifications of the valve, and ensure that it is wired to the controller correctly. Use an electrical tester to verify what voltage is making it to the fill valve.

My sensors aren't being read correctly:

If the controller isn't showing the correct state 10 seconds after a change, double check the electrical specifications of the sensor and the wiring. Use an electrical tester to verify that the sensors are closing contacts correctly, and that the correct voltage is making it back to the controller.

My pump won't turn on at all:

If the touchscreen main screen says, pump status signal "Off" it is probably due to either low water or high wind. Adjust settings to allows for the pump to be on, or disable both wind and water control.

If the touchscreen main screen says: pump status signal "On", but your pump is still off, remove the cover and use an electrical tester to confirm that the pump relay is closed. Double check the electrical specifications of the pump and any control devices that are connected to the pump relay, and ensure the wiring is correct.

I've had a fill timeout, but it won't reset:

If pressing the "reset water timeout" button on the main screen does not reset the controller, or only resets in for a few seconds, go to the water options screen and ensure the "fill timeout" setting is set to something higher than 0. If the issue persists, power cycle the controller.