

# SeaSide Automation

# PoolWARDEN

## Installation Manual

**SeaSide Automation**

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## IMPORTANT WARNING AND SAFETY INSTRUCTIONS

- 1 READ AND FOLLOW ALL INSTRUCTIONS
- 2 SAVE THESE INSTRUCTIONS
- 3 **WARNING** – To reduce the risk of injury, do not permit children to use this product
- 4 **DANGER** – Risk of injury
  - 4.1 Replace damaged cord immediately.
  - 4.2 Do not bury cord.
  - 4.3 Connect to a grounded, grounding type receptacle only.
  - 4.4 Do not use an extension cord.
- 5 **WARNING** – This product is provided with a ground-fault circuit-interrupter at the end of the power cord. The GFCI must be tested before each use. Turn the PoolWarden off by placing the ON/OFF switch to the OFF position. Next, push the test button on the GFCI and place the ON/OFF switch to the ON position. The PoolWarden should not operate. Now push the reset button on the GFCI and the PoolWarden should now operate normally. When the product fails to operate in this manner, there is a ground current flowing indicating the possibility of an electric shock. Disconnect the power until the fault has been identified and corrected.
- 6 It is very important to follow the safety guidelines in this manual to ensure safe installation and programming. Upon installation, it is important to properly train all personnel basic water quality management techniques, proper operation and programming to anyone who operates or services PoolWarden.
- 7 All applicable local installation codes and ordinances must also be adhered to. Improper installation will create an electrical hazard which could result in death or serious injury to pool users, installers or others due to electrical shock, and may also cause damage to property. The PoolWarden must be installed by a licensed or certified electrician or a qualified pool professional:
  - 7.1 United States: National Electrical Code (NEC), NFPA 70
  - 7.2 Canada: Canadian Electrical Code (CEC), CSA C22.1.
- 8 **WARNING** – *Disconnect all power to PoolWarden prior to any service including the main AC power and any other AC sources that may be connected to the AUX relays. Never apply power when PoolWarden*

*service door is unlocked or in the open position. Only qualified and licensed technicians should perform any service or repair.*

- 9 **WARNING** – *Always mount PoolWarden in safe and dry area. Never mount PoolWarden above any other electrical equipment.*
- 10 **WARNING** – *Install PoolWarden in a location that is not accessible to the public.*
- 11 **WARNING** – *Pool and Spa Chemical Safety*
  - 11.1 *Never mix sodium hypochlorite and muratic acid!*
  - 11.2 *When mixing acid and water, always add acid to the water, never add water to the acid.*
- 12 **CAUTION** – **TEST THE GROUND FAULT CIRCUIT INTERRUPTER BEFORE EACH USE OF THE POOL/SPA**
- 13 **CAUTION** – **CONNECT ONLY TO A CIRCUIT PROTECTED BY A CLASS A GROUND FAULT CIRCUIT INTERRUPTER**

- 1 **ATTENTION:** **TOUJOURS VÉRIFIER L'EFFICACITÉ DU DISJONCTEUR DIFFÉRENTIEL AVANT D'UTILISER LE BAIN**
- 2 **ATTENTION:** **LIRE LA NOTICE TECHNIQUE**
- 3 **AVERTISSEMENT:** **DÉCONNECTER DU CIRCUIT D'ALIMENTATION ÉLECTRIQUE AVANT L'ENTRETIEN**
- 4 **ATTENTION:** **CONNECTER UNIQUEMENT À UN CIRCUIT PROTÉGÉ PAR UN DISJONCTEUR DIFFÉRENTIEL DE CLASSE A**

# POLWARDEN OVERVIEW

SeaSide Automation, with over 20 years of technological leadership in Pool & Spa Chemical Control Systems, congratulates you on your selection of the PoolWarden Chemical Controller. PoolWarden measures pH, sanitizer and temperature on up to two bodies of water and will control the appropriate feed equipment to keep the measurements within a preprogrammed range. Using ORP (oxidation reduction potential) technology the control of sanitizer takes into account the effects of pH, and a pH lockout feature is also included for high pH values. Supporting both 110 and 220 VAC, the PoolWarden will control chemical feed equipment using relays to keep the pool or spa water in balance. Water measurements are taken continuously while PoolWarden's internal relay programming determines if chemical adjustments are needed. PoolWarden then communicates the adjustment signals through relays which control the chemical feed equipment. PoolWarden also contains additional dry-contact auxiliary relays that can be used to control heaters, pumps, chlorine backup and external alarm notifications.

## SYSTEM COMPONENTS

- **CONTROLLER:** PoolWarden is a microprocessor based, modular automation system that is capable of continuous monitoring locally onsite or remotely offsite.
- **INTERFACE:** PoolWarden uses a 16-button built in keypad, and an easy to read 80 character liquid crystal display. The display's internal back-light provides controller viewing in pool rooms with low light conditions. Back-light illumination time can be adjusted to suit the operator.
- **MEMORY:** PoolWarden is designed with nonvolatile memory which preserves all internal programming in case of power loss. Internal memory is preserved for up to 10 years without having power applied.
- **RELAYS:** PoolWarden S (single pool) includes 4 relays (2 of which are dry contact relays). PoolWarden D (two pools) includes 8 relays. Four of the 8 relays are dry contact relays (2 for each body of water).
- **SENSORS:** ORP Sensor, pH Sensor, Temperature Sensor and Flow Sensor.
- **VOLTAGE:** PoolWarden is designed with an ON/OFF switch and requires 120 VAC Input Voltage to operate.
- **SECURITY:** PoolWarden is designed with a lockable enclosure and provides up to four levels of password security protection (Admin, Tech, Service and Guest) for both local onsite and remote offsite interaction with the controller.
- **COMMUNICATION:** PoolWarden can connect to the Internet for direct monitoring, setup, and data interface via a WIFI or Ethernet option.
- **DATA:** PoolWarden will record up to 8192 lines of data with the built in internal memory.
- **HEATERS:** Auxiliary relays can control pool heaters with up to two set-points for each day to facilitate energy management.
- **PUMP CONTROL:** Auxiliary relays can be setup as a simple timer for controlling the on/off state of main pumps.
- **OVERFEED PROTECTION:** PoolWarden is designed with overfeed protection. Standard Overfeed limits the amount of time a relay can turn on feed equipment in a 24-Hour period.
- **PROPORTIONAL FEED:** Proportionally reduces the on-time as the measurement gets closer to the set-point to prevent overshoot.
- **E-MAIL ALERTS:** PoolWarden provides support for 4 email addresses. Alarm alerts can be sent directly from the controller for real-time management.
- **DIGITAL FLOW SENSORS:** PoolWarden can track flow rate and flow volume.
- **AUXILIARY RELAYS:** Auxiliary relays can control additional / backup sanitizer or acid feed pumps.

## Maximum Electrical Specifications

ITEM	DESCRIPTION	LIMIT
Input Voltage	Maximum input AC voltage	220 VAC, 50-60 Hz
Input Current	Maximum input current	10 A
Relay Voltage	Maximum relay voltage	220 VAC
Relay Current	Maximum Relay Current	2.5 A
Temperature	Minimum/Maximum Operating Temperature	30/110 °F
Standby Current	Maximum operating current	0.1 A Max
pH	Measurement of pH	4.22 to 9.98
ORP	Oxidation Reduction Potential	0 to 999 mV
Temperature	Water temperature measurement.	32 to 122 °F

## Models and Options

ITEM	DESCRIPTION
PW-XFC	PoolWarden controller with flow cell and sensors
PW-XFC-P	Add 2 pigtails per pool for easy connection of external feeders
PW-XFC-PE	Add 2 pigtails per pool and Ethernet communication
PW-XFC-E	Add Ethernet communication
PW-XMTD	PoolWarden controller with flow cell and sensors pre mounted on white back panel
PW-XMTD-P	Add 2 pigtails per pool for easy connection of external feeders
PW-XMTD-PE	Add 2 pigtails per pool and Ethernet communication
PW-XMTD-E	Add Ethernet communication
TrueDPD	Adds free chlorine measurement using the DPD colorimetric method. This is available as a single and dual sensor.
X	In the above model numbers, replace the x for S (Single pool) or D (Dual Pool)

## Certifications



Certified to  
NSF/ANSI Standard 50

**NSF/ANSI 50** - Equipment for  
Swimming Pools, Spas, Hot  
Tubs and Other Recreational  
Water Facilities

<http://info.nsf.org/Certified/Pools/Listings.asp?Company=C0214550&Standard=050&>

# POOLWARDEN INSTALLATION

## Mounting PoolWarden

Turn off any heaters, pool or spa circulation systems, chemical feed pumps or any related shut-off valves or equipment and relieve pressure from the filtration system. Find a suitable mounting location near a 120/220 VAC power source that meets the following criteria:

- Facilitates a combined (influent & effluent) maximum tubing run of 30'.
- Do not mount controller above electrical sources or electrical equipment.
- At least 10' away from any pool, spa or body of water and not accessible to the public.
- Away from corrosive materials and physical hazards.
- Not in direct sunlight or directly above or near any heat source.
- For 220 VAC, ability to hard wire with GFCI (ground fault circuit interrupter) protection.

Securely mount controller, or the optional controller backboard, vertically on the wall using supplied screws or appropriate fasteners for the wall construction. Never mount MiniWarden horizontally.

## Flow Cell To Circulation Plumbing

There are many ways to connect the flow cell tubing to the circulation plumbing. Always make sure the input source to the flow cell is well upstream from any chemical injection points. Successful flow cell installation requires a pressure differential, or there will be no water flowing through the cell. The Flow cell input should be filtered water and therefore after the filter. Never install the input to the flow cell between the main circulation pump and filter as that will be very high pressure which may damage the pump and provide the most debris to the flow cell. PoolWarden is equipped with a strainer to filter out any debris that does get past the filter. Periodically check and clean the strainer. Install the flow cell return after the heater, there will be a pressure drop across that should be sufficient to provide flow through the flow cell. If there is no heater, the next choice is the suction plug in the pumps strainer, make sure to adjust the return valve on the flow cell to keep the pressure in the flow cell positive.

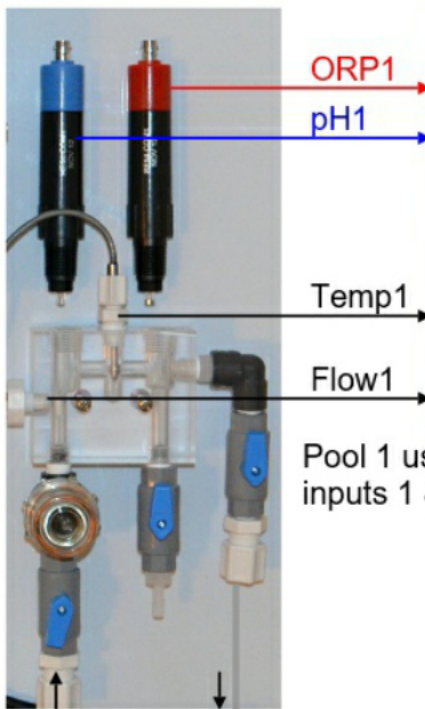
- Flow Cell Input: Drill & tap a connection point in the circulation system at a location just after the filter. The best location is where there is a pipe fitting as that will provide the most threads. Install a tube connector and run tubing to the input side of the flow cell.
- Flow Cell Output: Drill & tap a connection point in the circulation system at a location with reduced pressure just after the heater. Install a tube connector and run tubing to the return side of the flow cell.

**CAUTION:** Maximum pressure across the sensors should be 10 PSI (pressure gauge may be required). Always expose the sensors to positive pressure. Prevent exposing the sensors to suction or a vacuum by connecting the flow cell output tubing to the suction side of the pump as the vacuum may suck the sensor gel from the sensors rendering the sensors inoperable in a very short period of time.

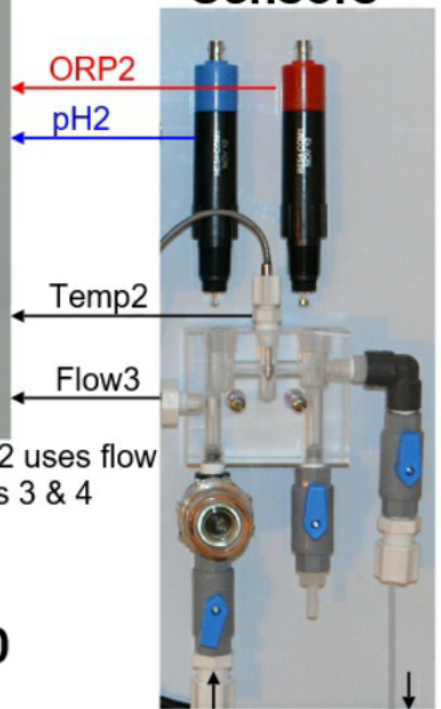
- If not pre-mounted, find a suitable location to mount the acrylic flow cell within 3 feet of the controller. Mount and assemble flow cell parts according to Picture 2.
- Remove pH (Blue) and ORP (Red) sensors from the boxes. Use Teflon tape on sensor threads and all other flow cell parts to ensure water tight connection and fasten accordingly.
- Install the appropriate 1/2" or 3/8" hard vinyl input and output tubing from the pools circulation system connection points to the "In" and "Out" connection points on the flow cell according to Picture 2.
- Once connected, turn circulating pump back on, test for leaks at all connection points, and make sure all air evacuates form the tubing.
- There is a small magnet in the flow cell that is held in place with a piece of tape. Remove the tape and make sure the magnet remains in the hole above the filter / strainer.



# POOL1 = SPA Sensors



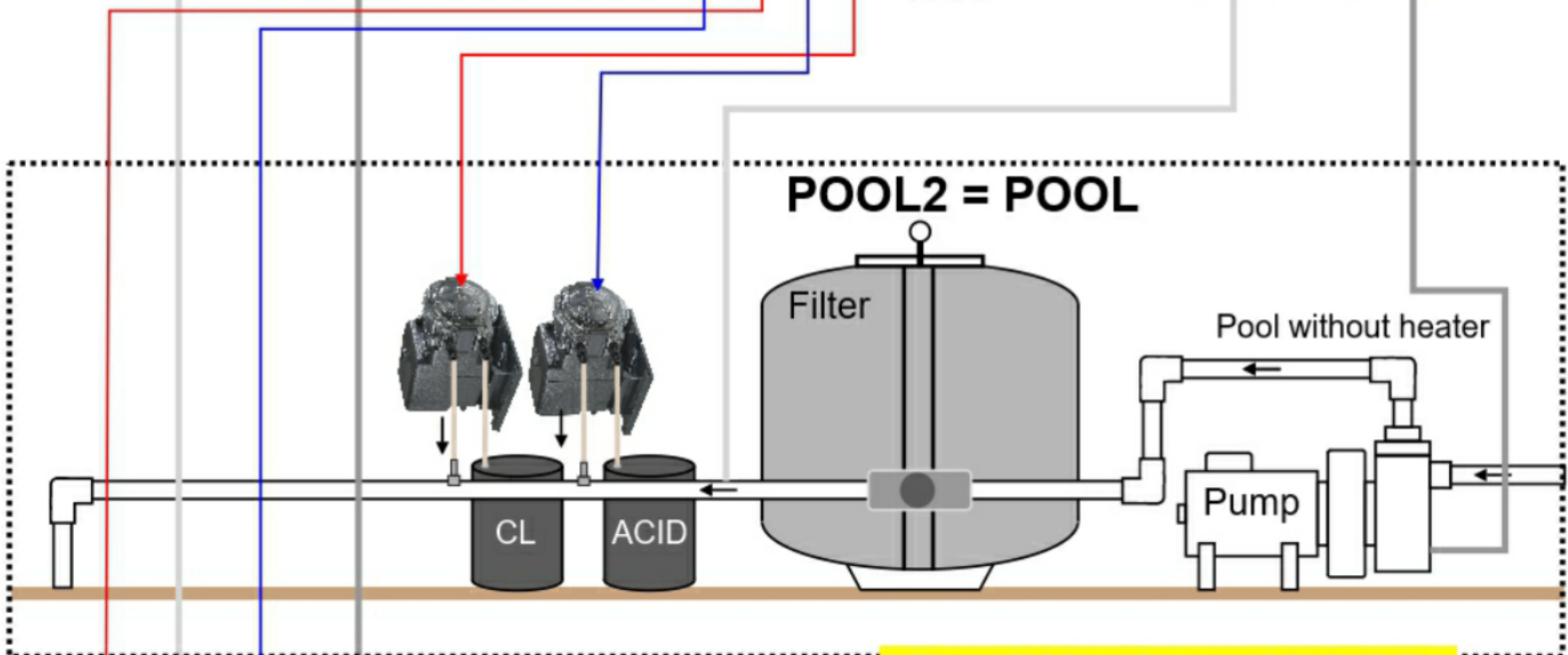
# POOL2 = POOL Sensors



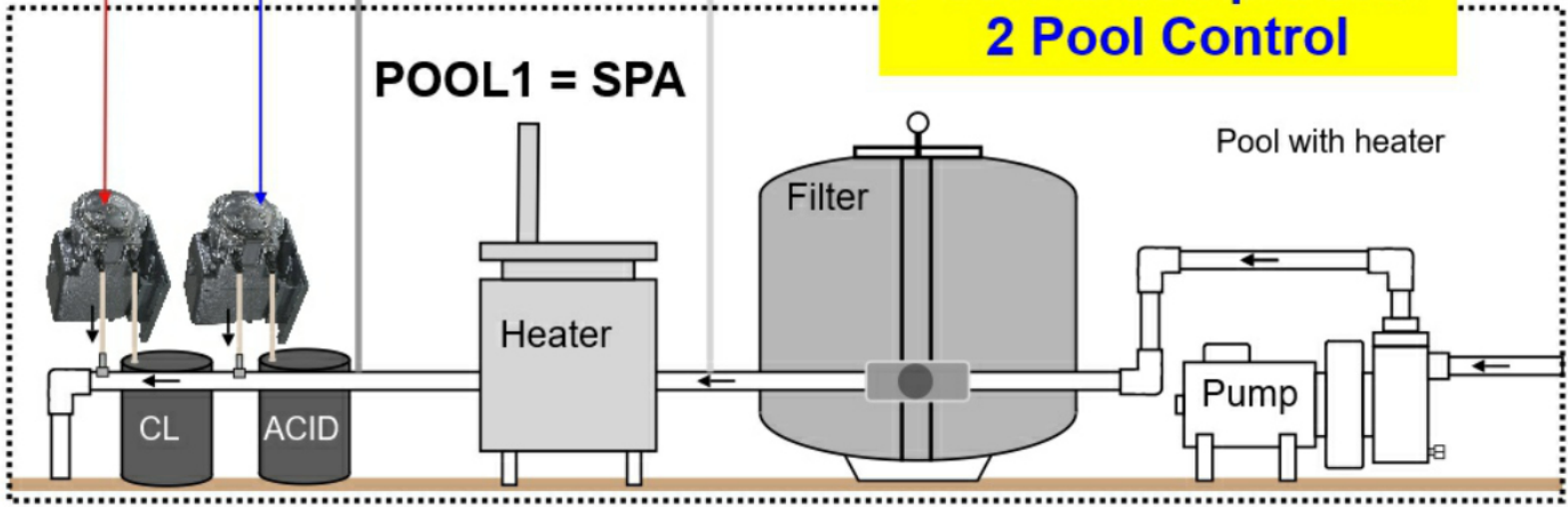
Pool 1 uses flow inputs 1 & 2

Pool 2 uses flow inputs 3 & 4

110/220 VAC



**PoolWarden pH/ORP  
2 Pool Control**

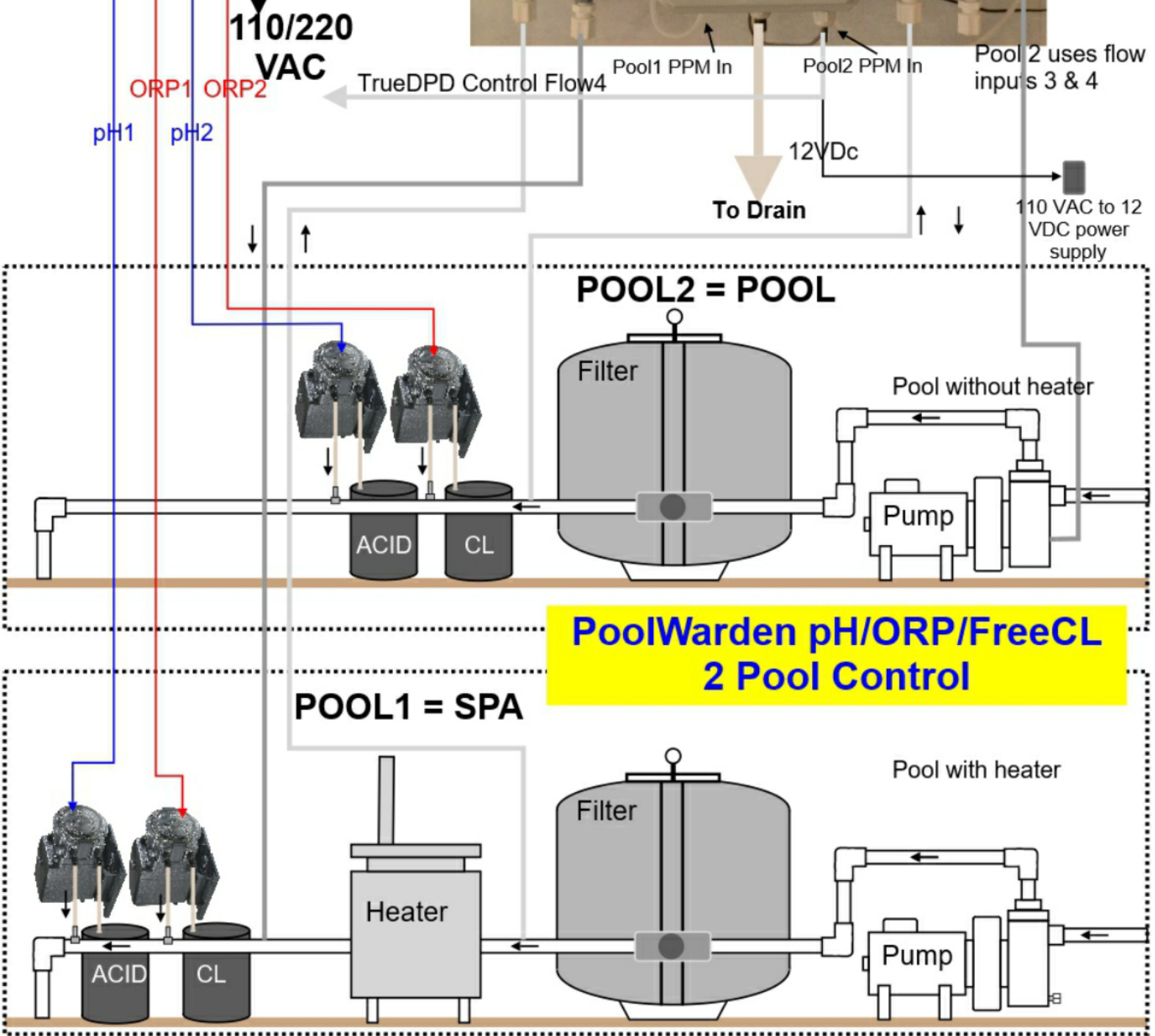
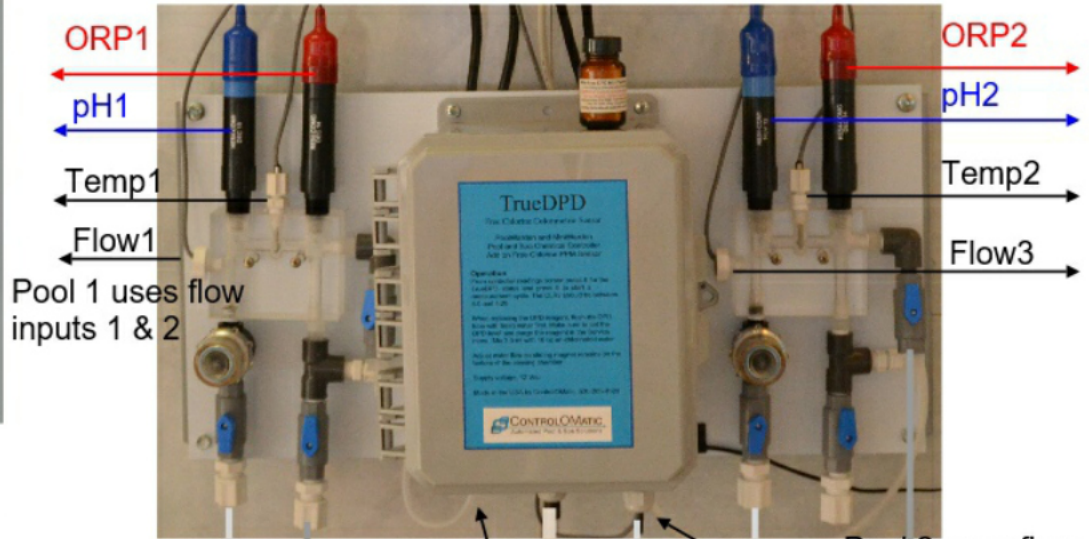






**POOL1 = SPA  
Sensors**

**POOL2 = POOL  
Sensors**



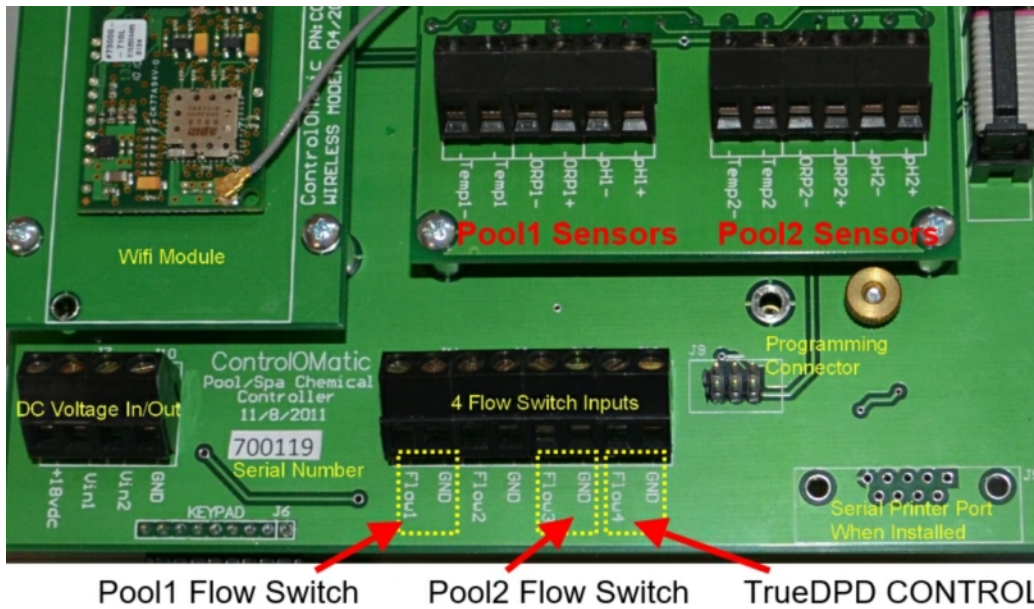
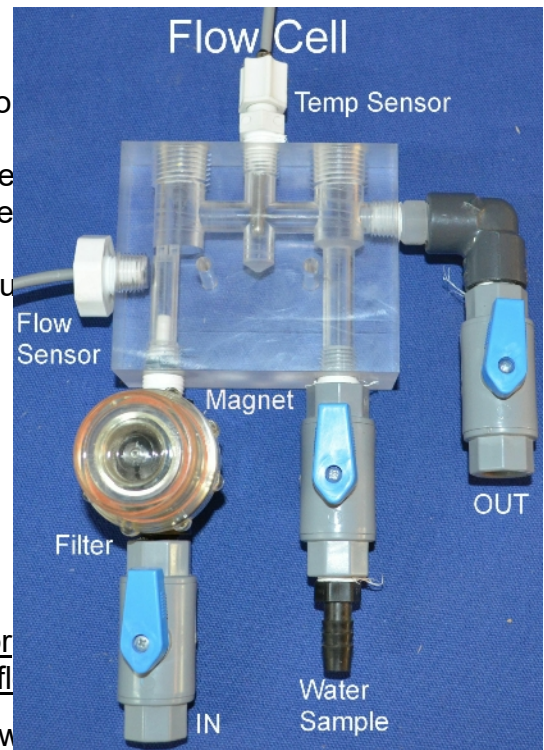
**IMPORTANT NOTE:** There needs to be just enough flow (0.5 gpm) through the flow cell to raise the flow magnet inside the flow cell to make contact with the flow sensor. To test this, turn the “input” shut-off valve to the off position and watch the flow magnet drop from the flow sensor. Next, turn the input shut-off valve back on and watch the flow magnet rise to the flow sensor. If the flow magnet rises abruptly and pings/knocks the flow cell acrylic then the flow is too high. To reduce flow, perform the same exercise, but now open the shut-off valve slowly and stop when you see the magnet “slowly” rise to make connection with the flow sensor. Leave the shut-off valve in that position.

## Sensor Wire Connection

If not pre-mounted, route the pH (Blue Sensor Wires), ORP (Red Sensor Wires), flow sensor and temp sensor wires through the cable grips at the bottom of controller and connect as labeled inside or as indicated below in PICTURE 3. **Note: Black wires are always negative (-) and the Clear or Red wires are always positive (+).**

◆ **REQUIRED** Flow Sensor Connections: Connect flow sensor wires for pool #1 to flow switch 1 and connect flow sensor wires for pool #2 to fl

□ **Optional** Flow Sensor Connections: Flow switch 2 & 4 are auxiliary sw respectively. For powered 3 wire digital flow meters or water level indicators use the 18VDC connection on the left of the main board, note that it has a 1 amp fuse.

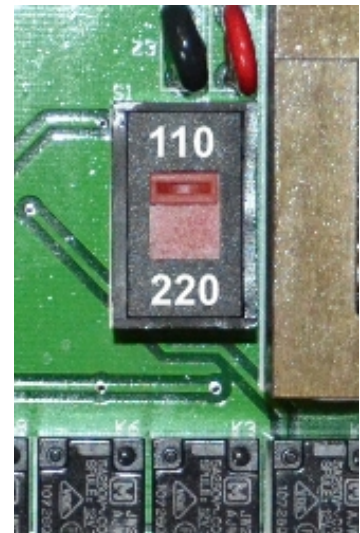


## Supply 110/220 Vac Input Selection

The PoolWarden supports both 110 VAC and 220 VAC. For 110 VAC the power cord includes a GFCI on the end of the cord that plugs in. For 220 VAC the cord should be removed and the PoolWarden should be hardwired to a circuit breaker with a GFCI by a licensed electrician. The cord can be returned to ControlOMatic for a credit.

□ **VAC Selector:** The red switch in the center of the bottom circuit board must have the switch notch up for 110 VAC, and down for 220 VAC. Incorrect selection will damage the PoolWarden.

□ A good solid earth ground is required for PoolWarden to work properly. Without a solid ground connection the sensors may drift.

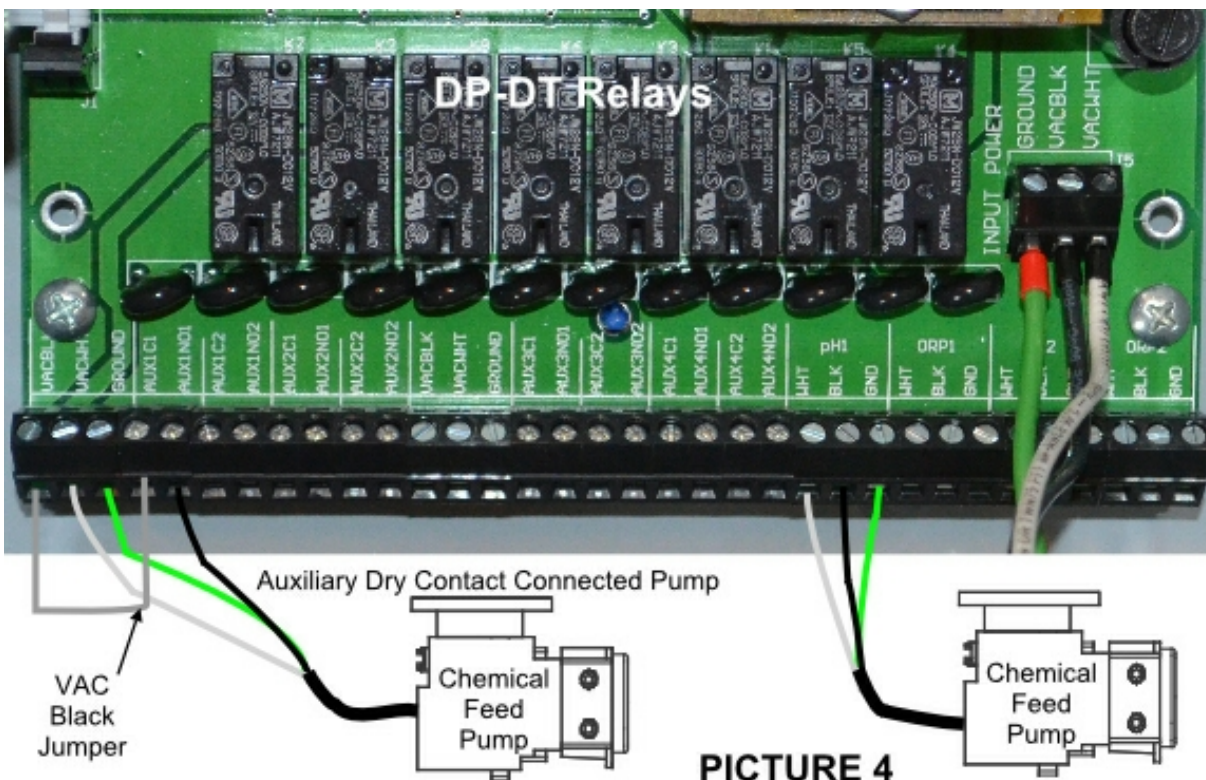




- The ORP and pH relay are directly connected to the input VAC. If you have the PoolWarden set for 220 VAC then the loads must also be 220 VAC.
- ◆ For 220 VAC operation, the neutral line will be connected to the Red 220 VAC wire and the Line connection will be to the Black 220 VAC wire. The Neutral connection for pH and ORP relays switches the Neutral input VAC wire. The relays are double pole double throw and break both lines.

## Load / Equipment Connection & Installation

**ORP & pH RELAYS:** The chemical feed relays for pH and ORP are internally connected to the input VAC main input which is located on the right side connector on the circuit board through 10 AMP fuses F1 and F2.



No voltage is being supplied to the load / equipment when the relay is off, hence, voltage is being supplied to the load / equipment when the relay is on. Any standard chemical feed pump or solenoid can be hard wired directly into the appropriate ORP and pH connection terminals as shown below in PICTURE 4 so long as their voltage matches the input VAC connected to the PoolWarden.

- VACBLK: Connection to the VAC black (Line) wire
- VACWHT: For 110 VAC connect to the input white neutral wire. For 220 VAC connect to the red VAC wire.
- PH / ORP WHT: For 110 connect to the white neutral wire on the load. For 220 connect to one of the Line connections.
- PH / ORP BLK: For 110 connect to the black line wire on the load. For 220 connect to the other Line connection.
- PH / ORP GND: Connect to the green ground wire on the load.

**DRY CONTACT RELAYS:** A dry contact relay is not connected to any voltage and acts as a switch. To supply power to a load / equipment (such as a chemical pump) through any of the auxiliary dry contact relays, the voltage must be supplied using a jumper to the main input voltage. To facilitate this jump, PoolWarden is equipped with terminals right next to the auxiliary dry contact relay terminals labeled VACBLK, VACWHT and GROUND. Please note that these VAC terminals are after the 10 AMP fuses F1 and F2.

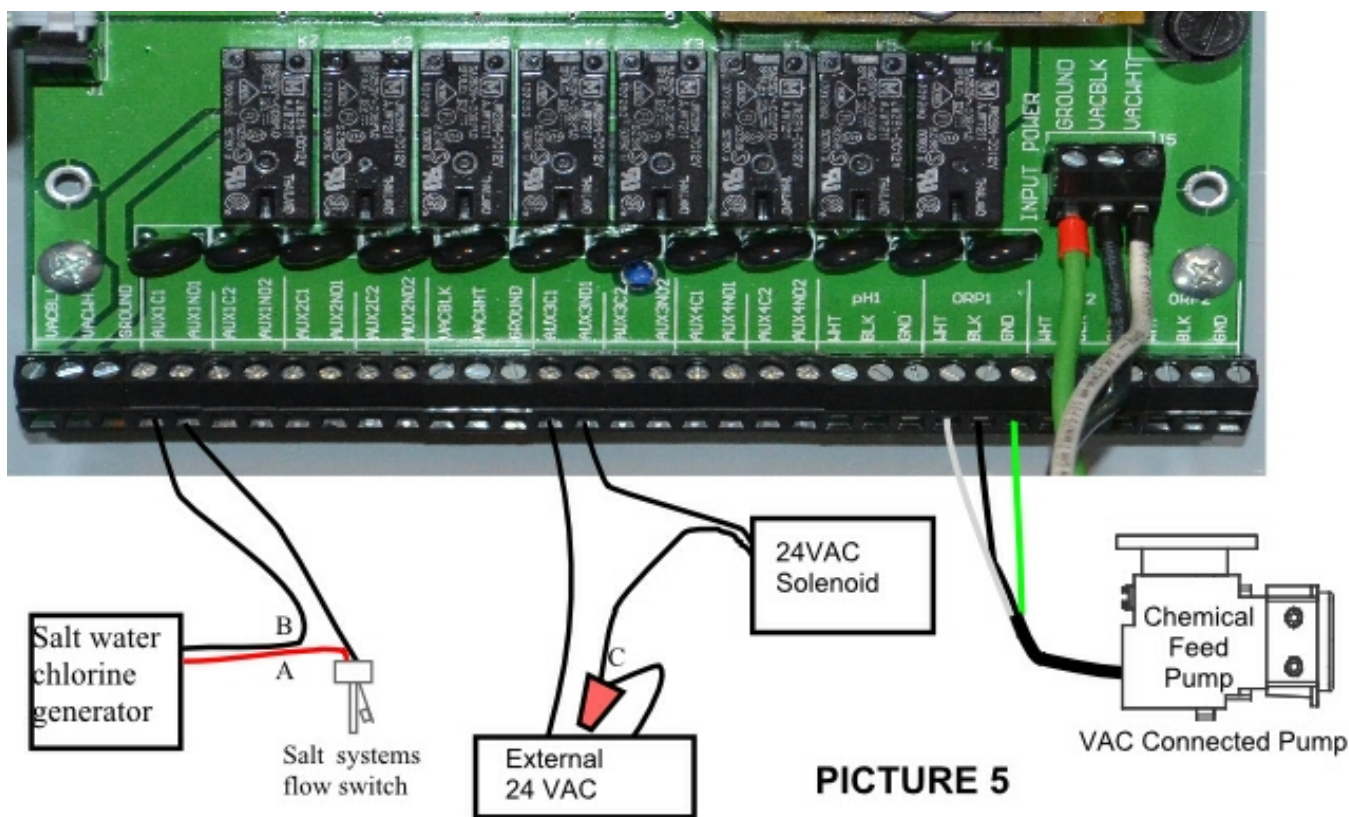
### Relay Board Acronyms for the Auxiliary Dry Contact Relays:

- AUX#NO1: Normally Open aux relay, side 1 of the relay
- AUX#NO2: Normally Open aux relay, side 2 of the relay

- AUX#C1: Common connection to relay # side 1. □ AUX#C2: Common connection to relay # side 2.
- GROUND: Connected to the GROUND connection on the input VAC terminal.
- VACBLK: A convenient connection to the input VAC black line wire.
- VACWHT: A convenient connection to the input VAC white neutral wire.
- GROUND: A convenient connection to the green ground wire.

**Supported Auxiliary Dry Contact Loads / Equipment:**

- Standard Chemical Feed Pumps: Any Chemical Feed Pump can be connected to an Auxiliary Dry Contact Relay as shown in PICTURE 4 on the previous page. This may be needed to set up a back up sanitizer to the main sanitation control. A black wire 110 VAC jumper is needed to energize the dry contact for 110 VAC operation and two jumpers for 220 VAC operation..
- Chlorine Generators: A high power chlorine generator should not be powered using PoolWarden’s internal power as it may exceed the input 2.5 AMP relay rating. Simply connect an auxiliary dry contact to control the on/off status of the generator. When PoolWarden’s relay turns on, while the flow switch is on, then the chlorine generator will turn on. When the relay is turned off it makes the chlorine generator think there is no flow, and the chlorine generator will turn off.
- Loads / Equipment Using External 24 VAC (Erosion Feeders & Suction Side Cal Hypo): Solenoids are used to control water flow through a chlorine erosion feeders and suction side cal hypo systems and most use 24 VAC. Install a 24 VAC Transformer external to the PoolWarden and connect one of the output leads to an AUX#C1 relay and connect the AUX DRY#NO1 to the solenoid as shown in PICTURE 5. Connect the other 24 VAC Transformer wire to the remaining solenoid wire (C). If the 24 VAC Transformer has a an output ground wire then connect it to one of the Ground terminals on the relay board.
- Circulation Pumps: Never connect a circulation pump directly to any of the relays inside PoolWarden. Always use an external High-Power Relay that the Auxiliary Dry Contact Relay inside PoolWarden can control. Please refer to the circulation pump’s manual for proper set-up and control of a variable speed pump.
- External Alarms (Light or Sound): If a more noticeable alarm notification is needed beyond the red LED on PoolWarden’s front panel, a relay can be set up to output the alarm status to an external buzzer or light.



## LIMITED WARRANTY

**Models:** This warranty applies to PoolWarden referenced here as “Controller”. SeaSide Automation LLC Warrants the controller to be free from defects in manufacturing and workmanship for a period of Five (5) Years from the date of manufacture for the electronic main circuit board. All sensors and flow cells have a One (1) Year warranty. All other supporting equipment to the controller are individually covered by the specific equipment manufacturers warranty. Liability under this warranty is limited to the repair or replacement of any device or component which is returned to SeaSide Automation within the warranty period by the original purchaser and found to be defective upon examination.

This warranty does not cover: (a) the purchaser’s labor or any servicing fees related to replacement of the defective product; (b) damage resulting from the use of this product in a manner inconsistent with normal use and the owners manual; (c) damage as a result of misuse, accident or neglect; (d) damage from improper testing, operation, or installation; (e) damage resulting from not operating the controller on a dedicated circuit or under conditions other than those recommended or at voltages or amperages other than those indicated on the controller and in the owners manual; (f) acts of mother nature (lightning, floods, earthquakes, etc); (g) modification of the controller in any way.

Defective parts should be returned to the local SeaSide Automation Dealer. Any parts returned directly to SeaSide Automation require a Return Material Authorization (RMA) code issued by a SeaSide Automation Technician.

SeaSide Automation makes no warranties, either expressed or implied, other than those stated above. No representative has the authority to change or modify this warranty in any way. Warranty Registration can be done by calling 530-487-5007 or by email to [orders@seasideautomation.com](mailto:orders@seasideautomation.com). Include your name, address, and serial number of the PoolWarden.

Any warranty claims should be directed to the following address:

SeaSide Automation  
12933 Drummer Way  
Grass Valley, CA 95949  
530-487-5007