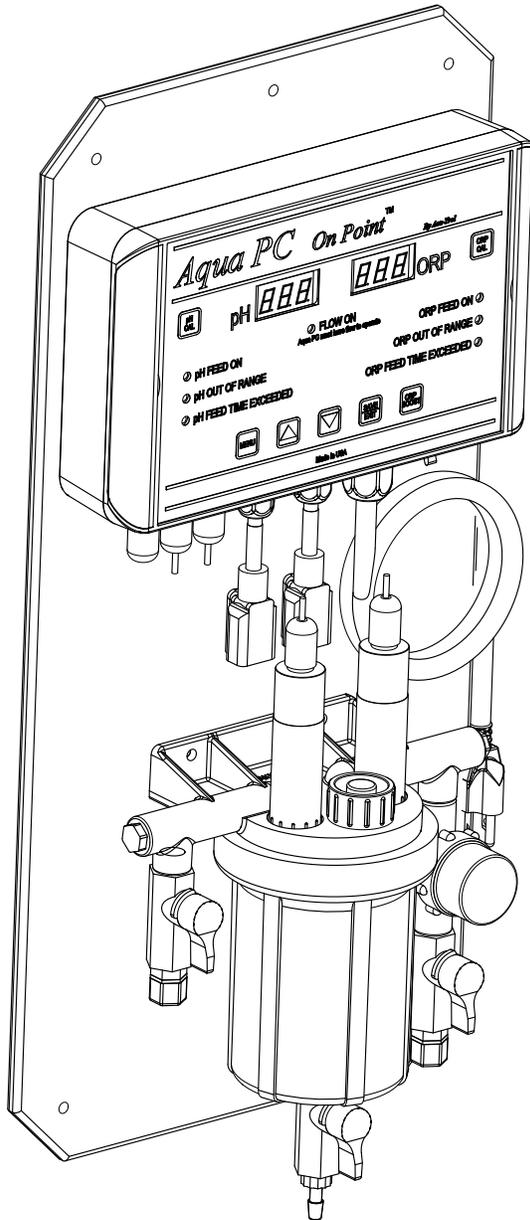




**Pentair Water**  
Pool and Spa™



# Aqua PC On Point™

## INSTALLATION GUIDE

11830 Kemper Road  
Auburn, CA 95603  
1-800-273-4667  
530-823-9898  
Fax: 530-823-9899  
[www.acu-trol.com](http://www.acu-trol.com)





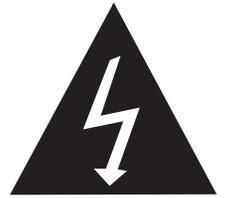


# CHAPTER 1

## INFORMATION

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

- **READ AND FOLLOW ALL INSTRUCTIONS.**
- **WARNING - DO NOT PERMIT CHILDREN TO OPERATE THIS EQUIPMENT!**
- **WARNING** - Risk of electrical shock. Connect only to a grounding type receptacle protected by a ground-fault interrupter-circuit (GFCI). Contact a qualified electrician if you cannot verify that the receptacle is protected by a GFCI.
- **WARNING** - Do not bury power cord. Locate power cord to minimize abuse from lawn mowers, hedge trimmers, and other yard maintenance equipment.
- **WARNING** - To reduce the risk of electric shock, replace damaged power cord immediately.
- **WARNING** - To reduce the risk of electrical shock, do not use an extension cord to connect unit to the electric supply; provide a properly located outlet.
- **WARNING** When adding any chemical to the pool/spa, be sure to follow the manufacturer's instructions thoroughly.
- **SAVE THESE INSTRUCTIONS**



 **WARNING**  
**CHEMICAL BURN HAZARD**

Make sure all pumps are off before drilling into any pipes.  
Securely fasten all electrical, water and chemical lines.  
Locate chemical feed pumps and chemical storage tanks in a  
safe and secure area.



## 1.2 Warranty

Acu-Trol, Inc. warrants the *AQUA PC On Point* to be free from defects in manufacturing and workmanship for a period of ONE (1) YEAR from the date of manufacture for the electronic module. All sensors and flow cells have a warranty of ONE (1) YEAR from the date of manufacture. Other equipment is covered by manufacturer's own warranty. During the warranty period, any defective parts will be repaired or replaced when necessary by Acu-Trol, Inc.

This warranty does not cover: (a) the buyers' labor or any servicing fees related to replacement of the Product; (b) damage resulting from the use of this Product in other than its normal manner; (c) damage from misuse, accident or neglect; (d) damage from improper testing, operation, or installation; (e) not operating the Product on a dedicated (separate) circuit or under conditions other than those recommended or at voltages or amperages other than the voltage or amperage indicated on the Product; and (f) acts of Mother Nature (i.e. lightning, electrical storms, floods, etc.). In addition, attempting to service or modify the Product will render this Warranty Void. Defective parts should be returned immediately to the local Acu-Trol dealer, any parts returned to the factory require a return of material authorization code to subsequently generate an RMA (Return Material Authorization form). An Acu-Trol Technician will analyze the returned part and determine the cause of failure and process accordingly.

**WARRANTY CARD MUST BE DETACHED FROM THIS SHEET, COMPLETED AND RETURNED AT ONCE TO BE KEPT ON FILE**



### Aqua PC On Point Warranty Registration Form

|                  |  |
|------------------|--|
| Facility Name    |  |
| Address          |  |
| City             |  |
| State            |  |
| Zip Code         |  |
| Phone            |  |
| E-Mail           |  |
| Contact          |  |
| Date of Purchase |  |
| Serial Number    |  |
| Purchased From   |  |
| Comments         |  |
|                  |  |

All information is held confidential for Acu-Trol warranty purposes only.  
Failure to submit registration may void warranty.  
Acu-Trol, Inc. 800-273-4667



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Place  
Stamp  
Here



**ATTN: Warranty Registration**  
**11830 Kemper Road**  
**Auburn, CA 95603**



## 1.3 Aqua PC On Point OVERVIEW

---

Acu-Trol, a technological leader in swimming pool automation, congratulates you on your selection of the *AQUA PC On Point* swimming pool controller. The *AQUA PC On Point* is an automation system capable of continuous monitoring and control of water chemistry. The *AQUA PC On Point* is specifically designed to be easy to use and install. The *AQUA PC On Point* includes the following features:

- ☞ **PROGRAMMABLE FEATURES:** Programmable chemical feed cycle on and off times; pH and ORP set points; selection of pH acid or base feed; proportional feed; off at set point; and a password.
- ☞ **DISPLAY:** The *AQUA PC On Point* includes two (2) digital displays with three (3) decimal points each. These displays are visible from a distance of over twenty (20) feet and are visible at night.
- ☞ **LED:** The *AQUA PC On Point* uses seven (7) indicator LED's including Flow, ORP Feed, ORP Out of Range, ORP Feed Time Exceeded, pH Feed, pH Out of Range, and pH Feed Time Exceeded.
- ☞ **BUTTONS:** The *AQUA PC On Point* includes seven (7) buttons for accessing and changing all parameters.
- ☞ **MEMORY:** In case of power loss the *AQUA PC On Point* shall retain all programmed values. The values are protected for at least ten (10) years without having power applied.
- ☞ **SECURITY:** The *AQUA PC On Point* has a password feature to disable the buttons on site.
- ☞ **ALARMS:** pH set point  $\pm 0.5$ , pH overfeed and ORP set point  $\pm 50$  mV, ORP overfeed.
- ☞ **RELAYS:** Two selectable (115/230VAC, 24V, or Dry Contact) relays.
- ☞ **SENSORS:** The *AQUA PC On Point* measures two sensors, the pH and ORP.
- ☞ **VOLTAGE:** The *AQUA PC On Point* includes switches to select the input voltage of 115 or 230 VAC (single or two phase). The input voltage is fused at 10A; each relay has its own 5A fuse.
- ☞ **DIMENSIONS & WEIGHT:** The controller box dimensions are 11 x 6.75 x 2.5 inches and the weight is ten (10) lbs mounted on a 1' x 2' backboard.



## 1.4 Receiving and Inspection

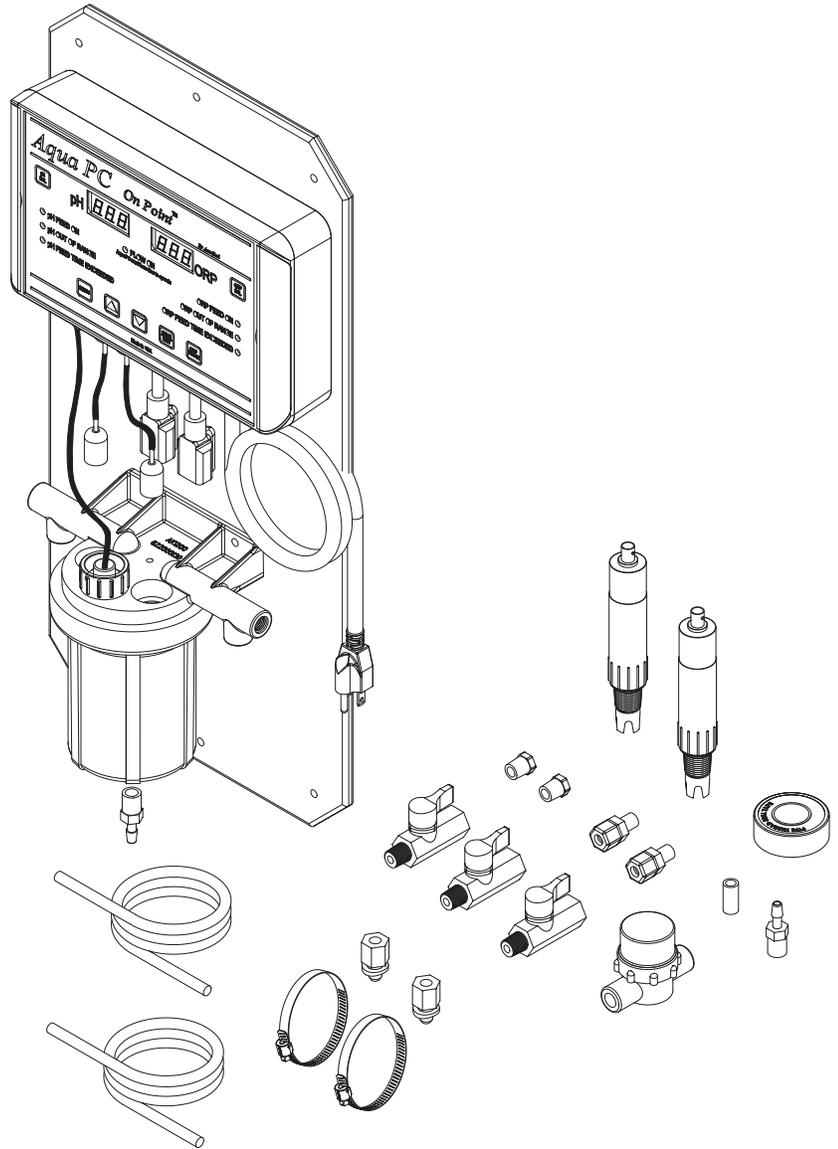
### Package Contents

As soon as the controller is received, check the shipping carton carefully and report any damage directly to the shipping company. Use care when unpacking equipment to avoid damage or loss of small parts. Verify packaged contents using the included packing list. Should any of the components be missing please contact Acu-Trol, Inc. at 530-823-9898 with missing parts information and we will replace any missing parts.

1. The *AQUA PC On Point* allows the connection and control of 5A maximum to either relay. Mapping out connections prior to installation is recommended due to variations in installation. It is highly recommended to use the configuration in Figure 4 on page 9 as a guide line.

2. Note the voltages that are required for the loads and determine what voltage will be used to supply power to the *AQUA PC On Point*. The *AQUA PC On Point* comes preset from the factory set for 115 VAC supply power and 115 VAC output on both relays.

3. In most cases, both loads will use the same voltage as the *AQUA PC On Point*. The *AQUA PC On Point* relays will switch the supply voltage to the load to turn it ON and disconnect the voltage from the load to turn it OFF. It is **NOT** possible to have the *AQUA PC On Point* powered with 115 VAC and control 230 VAC loads, without the use of external relays.





## CHAPTER 2 Installation

### 2.1 Aqua PC On Point Installation

Each electrical installation for the *AQUA PC On Point* may be different. This manual gives the basic principles to be applied for any specific installation as follows:

1. Identify the new and existing equipment to be connected.
2. Determine the supply voltage, 115 VAC or 230 VAC.
3. Determine if the control to the equipment uses the same voltage as the supply voltage.

#### 2.1.1 Select a Location for Mounting the Aqua PC On Point

- a. At least ten (10) feet from the pool or spa .
- b. Close enough for the supplied power cord (6') to reach the GFCI protected supply voltage. The controller will not operate properly without a solid earth ground connection.
- c. Supply power must be routed to the *AQUA PC On Point* in accordance with the applicable codes in the area; the supplied cord is not code in some areas.
- d. The installation surface must be solid and vertical. Do not mount the controller in a horizontal position.
- e. Maintain adequate clearance for opening the enclosure.
- f. The environment should be free of chemical fumes and excessive heat. The maximum room temperature is 110° F.
- g. Mount as far as possible from sources of electrical interference.
- h. Hold the mounting board with controller against the mounting surface and mark the selected holes located in the mounting board (see Fig. 1). Prepare holes as necessary and secure controller.
- i. Make sure the controller box is not distorted by an uneven mounting surface.

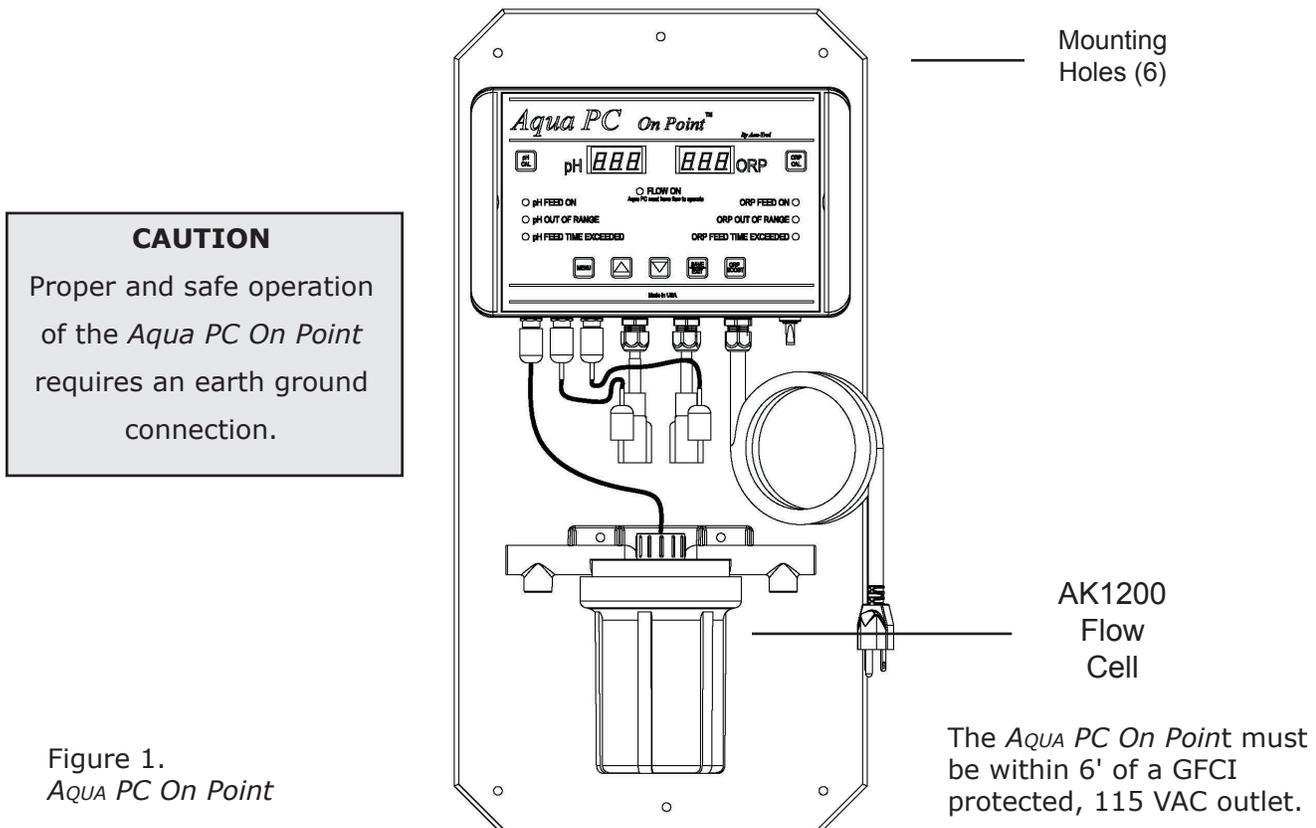


Figure 1.  
*AQUA PC On Point*



## 2.1.2 Connect the supply voltage

The *AQUA PC On Point* will operate on input voltages of 115 VAC or 230 VAC. The factory switch setting is for 115 VAC. The supply power is most commonly used to power the feed pumps and other external loads. If all the loads are 115 VAC then use 115 VAC setting and if the loads are 230 VAC then use 230 VAC setting for the input voltage.

1. The *AQUA PC On Point* comes with an electrical cord to plug directly into a GFCI protected 115VAC outlet.
2. If you do not have an GFCI outlet where the *AQUA PC On Point* is mounted, you will have to install one. Please call a licensed electrician to install a 115VAC, GFCI protected out let. If possible connect the *AQUA PC On Point* input voltage directly to the pump timer so that the *AQUA PC On Point* will only be ON when the pump is ON. This guarantees there will be no feeding of chemicals when there is no water flow in the system pipes and the flow cell. If this is not an option, the *Aqua PC On Point* has its own flow switch backup. See section 4.3.

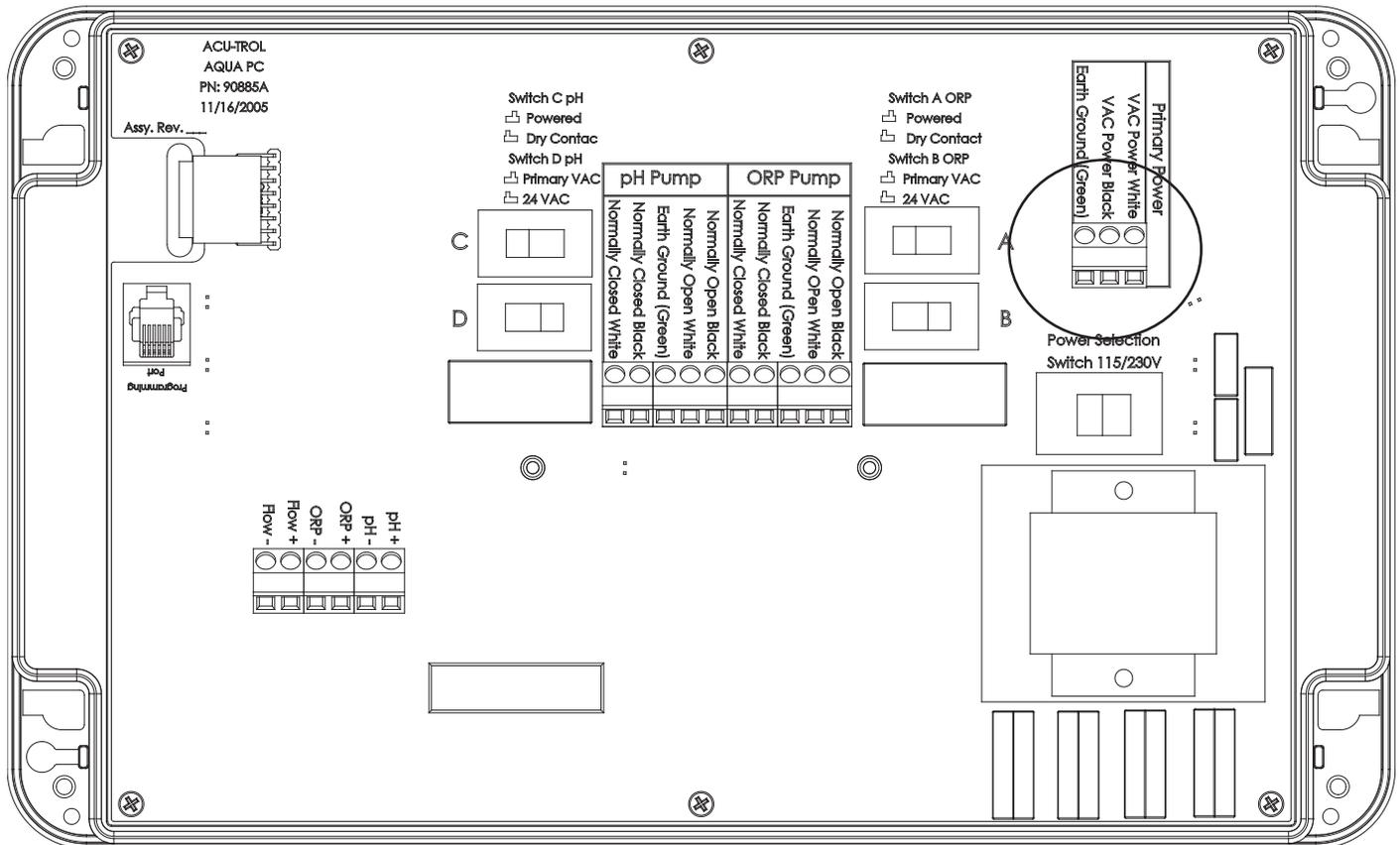


Figure 2. Voltage Selection Switch

### WARNING

If the *Aqua PC On Point* is connected to 220 VAC the voltage switches must be changed to the 220 VAC setting on the controller card before power is connected to the unit



**Using the existing timer.** When the *AQUA PC On Point* has been mounted cut the plug off the end of the supplied cord and strip the wires. Route the wires to the timer box and use an electrical strain relief connector to fasten the power cord to the box at the entry point. When using 115 VAC connect the hot and neutral to the corresponding hot and neutral on the switched side in the timer box. For 230 VAC connect the white and black wires to the two hot wires in the timer box. For 230 VAC the *AQUA PC On Point* will use both wires as hot for two (2) phase 230 VAC or one wire as hot for single phase 230 VAC.

## WARNING

Use only the proper wires and conduits.  
A licensed electrician should perform all electrical installations.

### 2.1.3 Connect the Feed Devices

Follow the instructions included with the chemical feed pump for installation if it is not already installed. Follow the list below for location recommendations and always follow local electrical codes:

- At least ten (10) feet from the pool or spa.
- Close enough to the *AQUA PC On Point* for the feed pump power cords to reach.
- Plug the feed pumps cords into the external plugs on the *AQUA PC On Point*.
- If the feed pumps do not have plugs, hard wire the pumps into the *AQUA PC On Point*.
- When installing metal conduit into the controller, a ground LUG should be used to connect the conduit to the circuit cards ground.

**A solenoid will be required to control the flow through a sanitizer erosion feeder.** The ORP control relay can supply a variety of output voltages: supply, 24 VAC or switch only. The default jumper setting from the factory is the supply voltage, 115 VAC. Remember to always follow local electrical codes.

***Damage that occurs from improper voltage switch settings is not covered in the controller warranty.***

## CAUTION

When sourcing 24VAC only 100mA is available for an output current.



## WARNING

Locate chemical feed pumps and chemical storage tanks in a safe and secure area. Never turn the chemical feed pumps on when both flow cell valves are closed. Increased pressure may cause the feed lines to blow off and spray full strength chemicals on anyone or anything near the equipment.  
Securely fasten all electrical, water, and chemical lines.



## 2.1.4 Setting the Relay Voltage

The *AQUA PC On Point* includes two adjustable output voltage relays. Four switches on the controller card will allow you to select whether these relays function as primary power, dry contact, or 24 VAC relays. Normally open and normally closed relays are selected by choosing the corresponding terminal block.

Please note the Relay Board Diagram below. The three configuration possibilities are as follows:

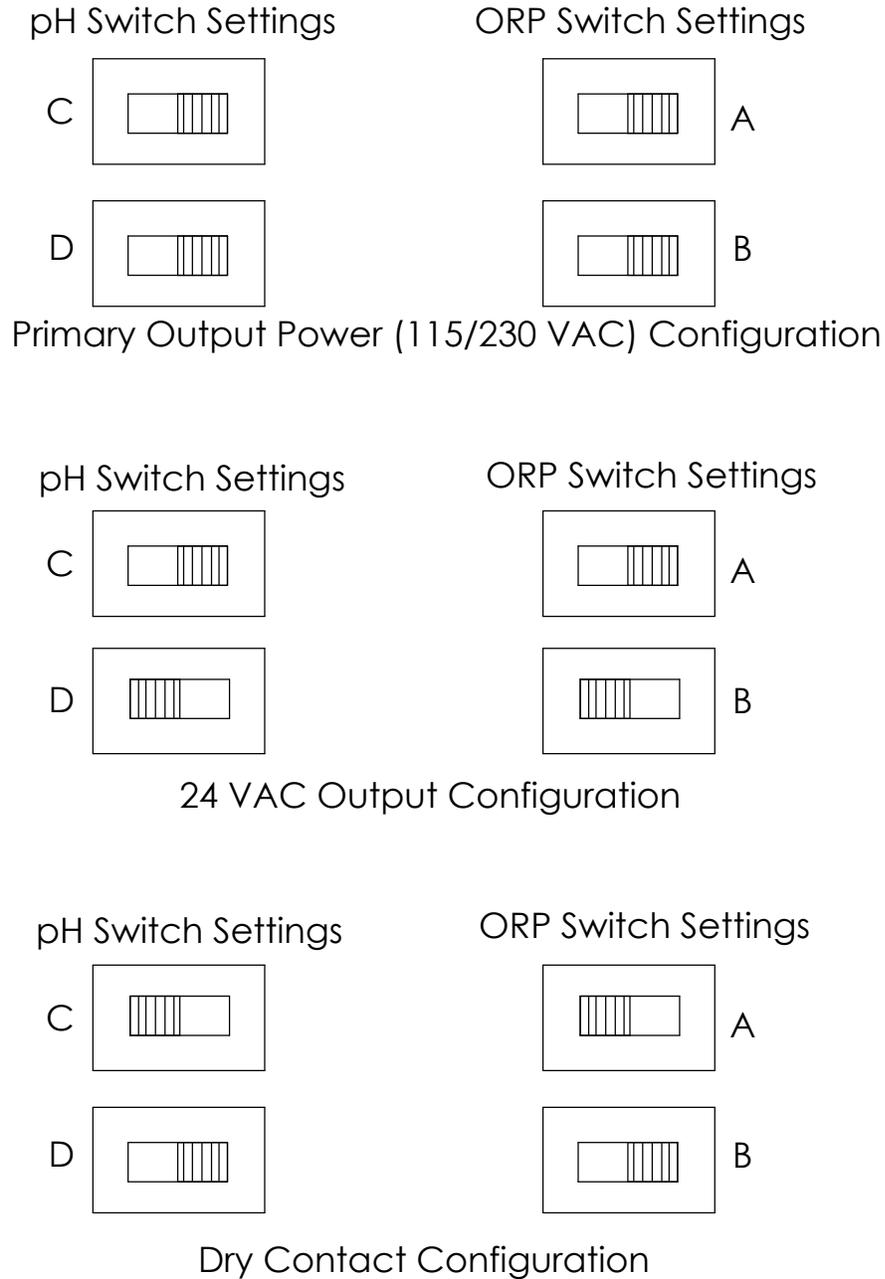


Figure 3. Output Voltage Switch Settings



## CHAPTER 3 AK1200 FLOW CELL

### 3.1 AK1200 Flow Cell

Remove flow cell from shipping carton and make sure all parts are included with AK1200 flow cell.

- 1 - AK1200 Lid
- 1 - Flow switch magnet
- 1 - Sample barb fitting
- 1 - Filter assembly with O-Ring
- 1 - Flow switch with O-Ring, 2' and 10' wire lengths available.
- 1 - AK1200 Jar with O-Ring
- 3 - ¼" Valves.
- 2 - ¼" NPT by ¾" flex fittings.
- 2 - ¼" Plugs.
- 1 - ¼" Close Nipple
- 1 - Teflon Tape

Note: The ¾" flexible tubing that is required to connect the flow cell to the rest of the system is included with the *Aqua PC On Point*.

#### 3.1.1 Flow Cell Assembly

The *Aqua PC On Point* comes partially assembled from the factory. Use the following steps to complete assembly of the Flow Cell. **Hand tighten the fittings only. Over tightening will cause damage to the parts.**

- Remove the protective cap from the pH & ORP sensors.
- Remove the Teflon tape.  
These sensors are equipped with O-Rings to ensure a waterproof seal.
- Install the blue pH sensor into the left hole in the Flow Cell top.
- Hand tighten the pH sensor.
- Install the red ORP sensor into the right hole in the Flow Cell top.
- Hand tighten the ORP sensor.
- Push the blue BNC connector over the top of the pH sensor and twist to lock in place. Do not cut the cable. Coil the excess wire up outside the *AQUA PC On Point*.
- Push the red BNC connector over the top of the ORP sensor and twist to lock in place. Do not cut the cable. Coil the excess wire up outside the *AQUA PC On Point*.
- Wrap Teflon tape around the threads of the other parts and assemble according to the diagram in Figure 3.

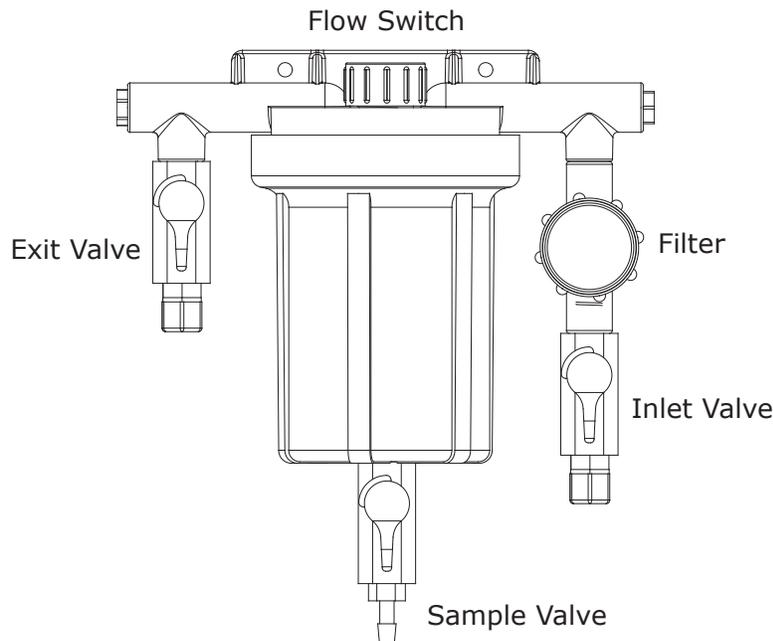
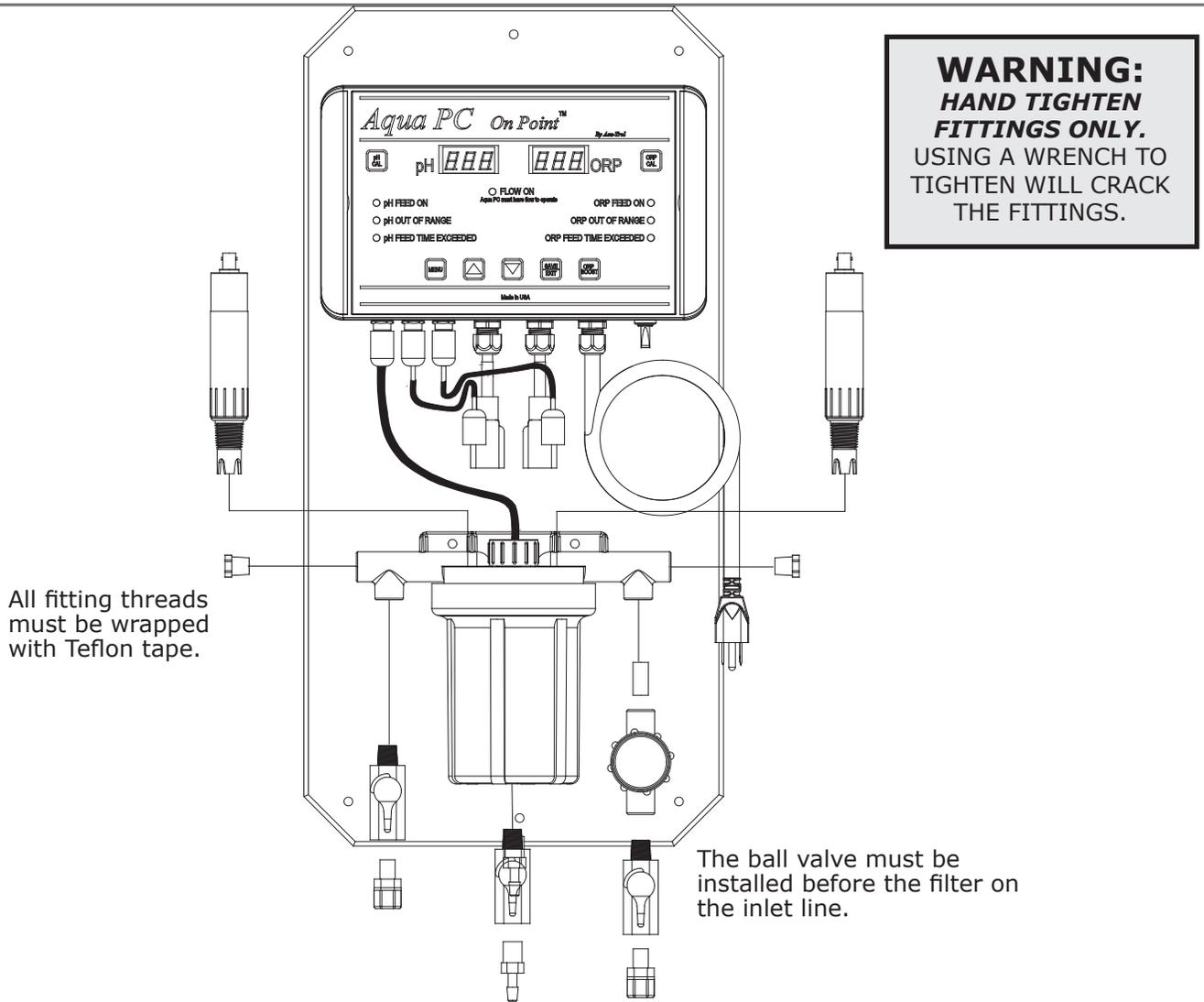




Figure 3. Plumbing Installation Diagram



### 3.1.2 Plumbing

- At the equipment pad, turn off the filter pump and release the pressure from the system by opening the valve on top of the filter.
- Close all valves to prevent flooding.
- Attach the IN and OUT tubes to the Flow Cell Inlet and Outlet (see Figs. 4 & 5).
- Run the end of the IN tube (with the pipe clamp) to the chosen pressure line. Choose a location that provides enough space to drill and to tighten the clamp (must be after the filter, but before the heater). Be sure the tube is not pinched or kinked. Mark a spot on the pipe.
- Drill a 3/8" hole on the mark and immediately place the pipe clamp over the pipe. Align the fitting with the hole and tighten the pipe clamp.
- Run the end of the OUT tube (with the pipe clamp) to the chosen return line. Choose a location that provides enough space to drill and to tighten the clamp (must be after the heater). Be sure the tube is not pinched or kinked. Mark a spot on the return line pipe.
- Drill a 3/8" hole on the mark and immediately place the pipe clamp over the pipe. Align the fitting with the hole and tighten the pipe clamp.
- Open any closed system valves. Close the filter valve and turn on the circulation system. Check that the system is working properly.

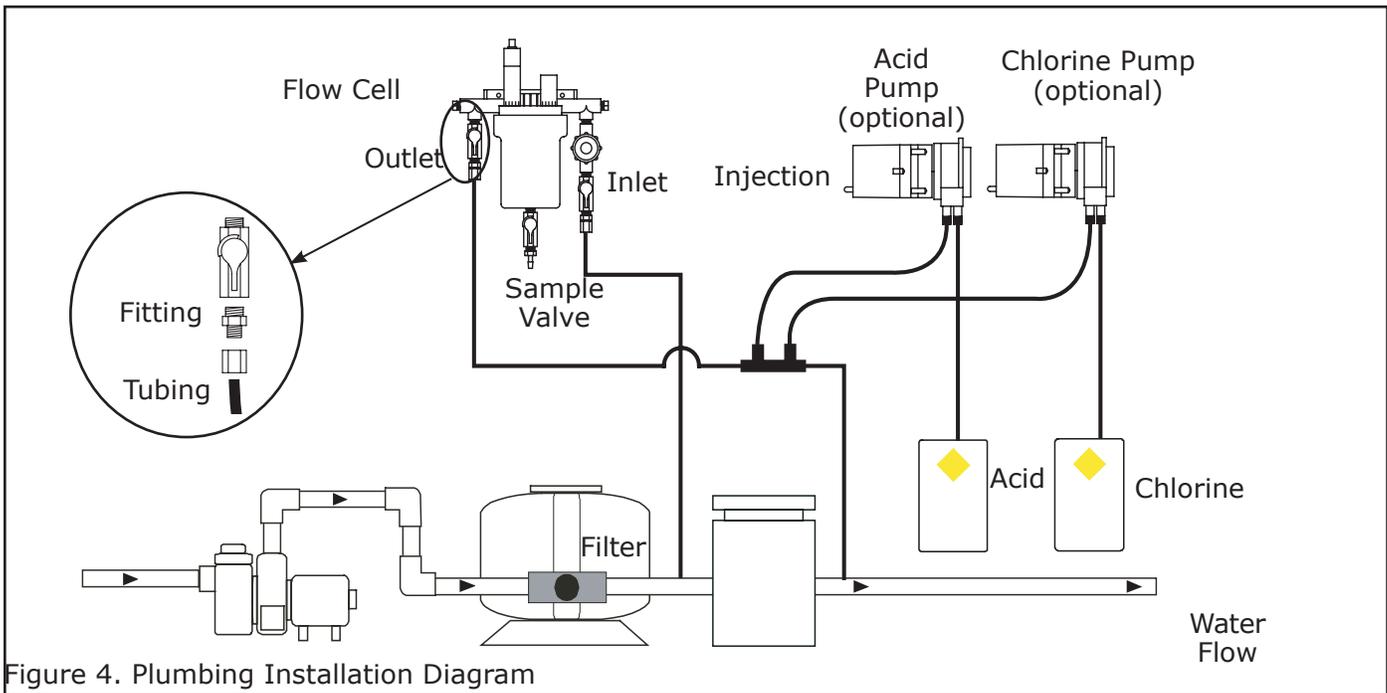


Figure 4. Plumbing Installation Diagram

See Fig. 5

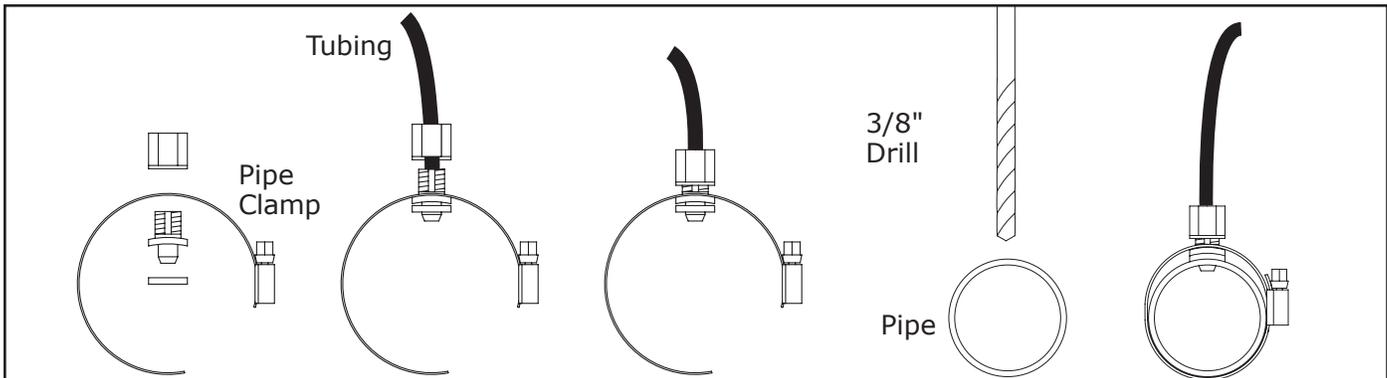


Figure 5. Tubing Installation

### 3.1.3 Sensor Installation

1. Keep pH and ORP sensors wet at all times, install the sensors into the flow cell. Hand-tighten only and save caps for future use, fill flow cell with water. The sensors have O-Rings and don't require Teflon tape.
2. Connect the pH and ORP sensors to the Aqua PC On Point using the BNC connections on the bottom of the controller.

**WARNING** ⚠

The Flow Switch is a Dry Contact Only. (No Current)  
Use of this flow switch with any other brand of controller will void

3. Turn the main pump on and open the valves to test for leaks and the free movement of magnet. Magnet must be all the way up in order to close the flow switch. 1/4 GPM will push the magnet all the way up.

**WARNING**

*Make sure that all pumps are off before drilling into any pipe.*

**WARNING**

*Never turn chemical feed pumps on when both flow cell valves are closed.*



## CHAPTER 4 Sensors

The *Aqua PC On Point* can accept readings from a wide variety of sensors. Each sensor has its own unique circuitry. Isolation of each sensor ensures more accurate measurements.

The *Aqua PC On Point* measures the following sensor measurements with the listed characteristics:

pH (Blue)

Range: 4.2 to 9.8.

ORP (Red)

Range: 400 to 900 mV,

Flow Switch

This input measures if a switch is open or closed.

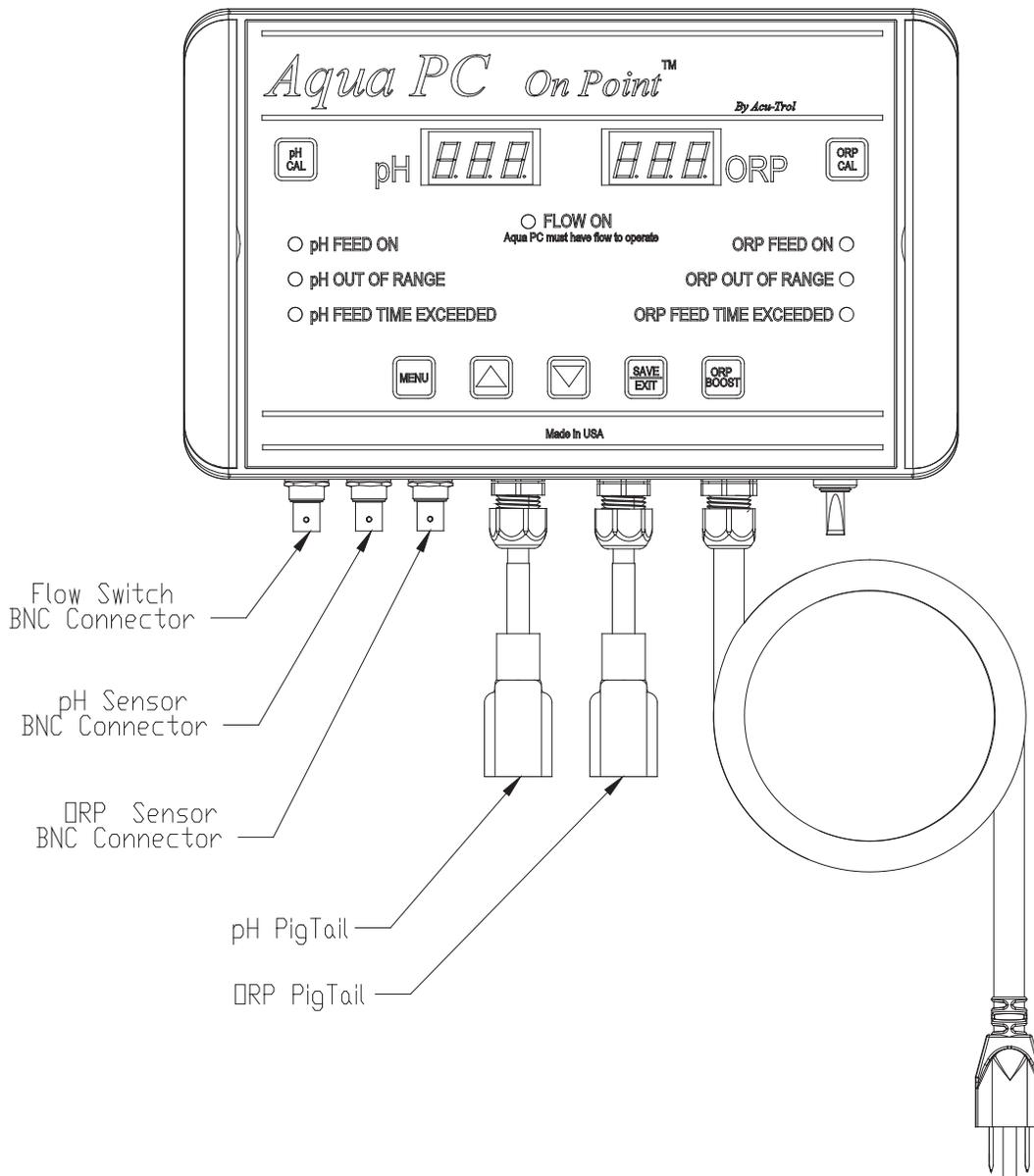


Figure 6. Sensor Installation



## **WARNING**

Sensors are shipped with a protective cap covering the electrode tip to protect the sensing element. Sensors should be kept in the protective cap until ready for installation, if the sponge in the cap becomes dry, wet it with tap water. During shipment, air bubbles may have entered the electrode, carefully shake the electrode downward (like a thermometer) to dispel the air from the sensing elements inside the electrode.

Before using the sensor, remove the cap.

### **4.1 pH and ORP Sensors**

pH electrodes sense the acidity of the water and work with any acid or base. The blue bands on the cables and sensors identify the pH sensors. Each sensor is also identified on the sensor body. ORP electrodes are used to monitor the Oxidation-Reduction Potential (sanitization quality of the water). The sensing element of the ORP electrode is made of a precious metal such as platinum or gold. The red bands on the cables and sensors identify ORP sensors.

### **4.2 Flow Sensor**

The *Aqua PC On Point* uses a flow sensor to monitor the flow in the AK1200 flow cell. A green LED light on the front panel of the controller indicates whether the flow is on or off. The *Aqua PC On Point* will not feed chemicals or perform other programmed tasks if there is no flow in the system.

### **4.3 Sensor Care**

Contamination of the sensing elements often results in slow response and inaccurate readings. Clean the elements by the following procedures:

#### **pH and ORP sensors**

- Wash electrode tip in a liquid detergent and water. Carefully use a soft bristled toothbrush to wash the electrode tip and white sensing ring.
- Rinse after cleaning. To install, place in flow cell according to the diagram and hand tighten.
- Make sure the O-ring is installed on sensor.
- If the cable is longer than needed, it should be coiled neatly and attached under the cabinet.

#### **pH Sensors Only**

- Attempt to clean the sensor with liquid detergent first.
- If this is not successful, swirl the tip of the sensor in a 5 parts water 1 part muriatic acid solution for 10 - 20 seconds.
- Rinse again and reinstall.

## **WARNING**

- Do not rub hard on the glass element in the sensor or use sand paper or other polishing material to clean.
- Handle electrode carefully.
- Sensors contain external and internal glass elements.
- Do not drop or otherwise subject the sensor to vibration, physical impact, or freezing conditions.

Any type of physical damage is not covered under warranty.



## 4.4 Finishing and Testing the Installation

Once the controller system has been installed with applicable sensors and expansion modules, the following steps are required for final system finishing and testing.

1. Balance the chemicals in the pool or spa to the desired pH and ORP levels.
2. Plug in the Aqua PC On Point and turn on the main breaker. Switch the ON/Off switch to ON.
3. Verify that the display is active and displays various introduction/initialization screens. When the AQUA PC On Point is initially powered up, the software version B04 (right side) and the controller model # AOP (left side) will briefly be displayed.
4. SENSORS: The first screen displays the sensor readings. Verify that they are connected properly by checking the readings.  
Example: pH is within 0.5 of your hand measurement.  
*This is to verify that the pH is connected to the pH input and the ORP is connected to the ORP input.*
5. FLOW: Verify that the green flow LED is on.
6. PLUMBING: Check for air or water leaks in the Flow Cell and at the pipe connections.

## 4.5 Electrical Specifications

\* Selectable

The following electrical specifications must not be exceeded:

| ITEM          | DESCRIPTION                           | LIMIT   |
|---------------|---------------------------------------|---|
| Input Voltage | Maximum Input AC Voltage              | 250 VAC   |
| Input Current | Maximum Current                       | 10 Amps (AC)  |
| Temperature   | Minimum/Maximum Operating Temperature | 32° - 110° F  |
| Storage Temp  | Minimum/Maximum Storage Temperature   | 32° - 158° F  |
| Sensor Range  | pH<br>ORP                             | 4.2 - 9.8 pH units<br>400-900 mV                              |
| Relays        | pH<br>ORP                             | 110/220* VAC, DPDT, 5A<br>24VAC 100mA, 110/220* VAC, DPDT, 5A |



### CAUTION

Be sure to have a licensed electrician perform all electrical wiring. This is important, as they will be familiar with all the codes in the local area.

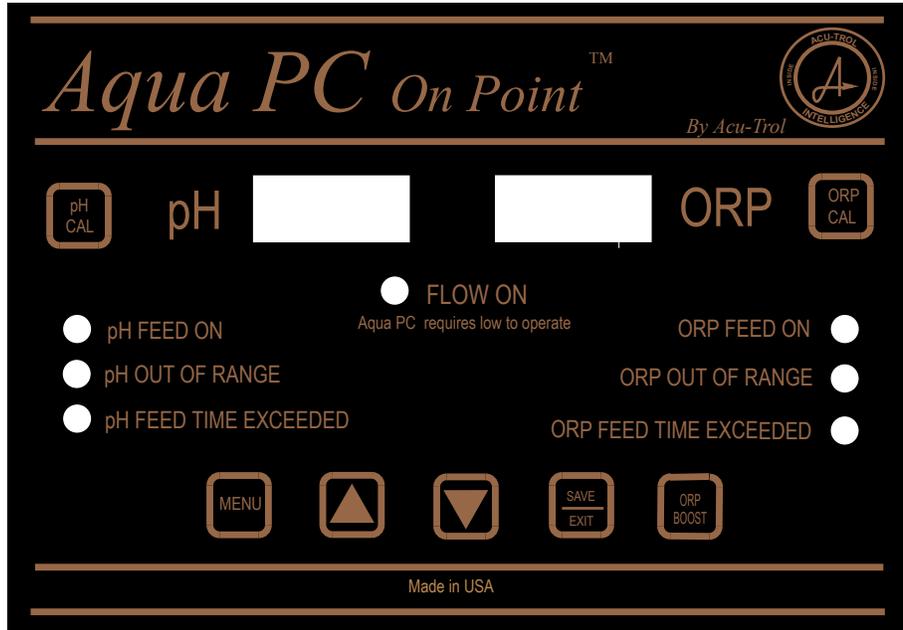


# CHAPTER 5      Operation and Programming

## 5.1    Operation of the Aqua PC On Point

This section covers the Menu item functions. There is one menu in the Aqua PC On Point. The items in that menu are accessed via the seven buttons on the controller faceplate.

Upon initial start-up, you will need to go through and program the menu items to setup the Aqua PC On Point.



### 5.1.1    Menu Buttons

**MENU:** Press this button to scroll through the menu. Note that the left display will show abbreviated text to indicate the current menu item and the right display will show a value or status.

**UP:** When in a menu that allows a value change, pressing this button will increase the number or change the selection.

**SAVE/EXIT:** This button saves any changes made to the Aqua PC On Point Setting and returns the controller to the main readings screen.

**CHLORINE BOOST:** Holding this button for three (3) seconds will start or stop a chlorine-boost cycle. Chlorine boost turns the chlorine feeder ON for ten (10) times the entered chlorine ON Time Two extra decimal points will appear in the ORP reading on the Readings screen when in Chlorine Boost.

**DOWN:** When in a menu that allows a value change, pressing this button will decrease the number or change the selection.

**ORP Cal:** Press this button to jump to the calibration menu function in the Aqua PC On Point used to calibrate your ORP value.

**pH CAL:** Press this button to jump to the calibration menu function in the Aqua PC On Point used to calibrate your pH value.



## 5.1.2 Indicator and Alarm Lights

☞ **FLOW ON:** This Green LED indicates whether or not there is flow in the system. The light will be on when flow is present. The light will be off when there is no flow. The *Aqua PC On Point* will not allow chemical feeding or other programmed actions if flow is not present.

☞ **pH FEED ON:** This green LED indicates whether the pH feed mechanism is on or off. The light will be lit when the pH feed mechanism is feeding. The light will be off when the pH feed mechanism is off.

☞ **pH OUT OF RANGE:** This red LED is used to alert users that the pH level in the system is out of the allowable setpoint range, which is  $\pm .5$  of the set point. When this light is lit, the pH in the system is either too high or too low.

☞ **pH FEED TIME EXCEEDED:** This red LED is used to alert users that the pH feed system has reached its maximum feed time. When this light is on, the pH feed system will not be allowed to feed until the feed timers are cleared manually or until the controller performs it's automatic reset, which it does once in a 24 hour period. The maximum feed time can be programmed by the user, for more information please see section 5.2.14

☞ **ORP FEED ON:** This green LED indicates whether the ORP feed mechanism is on or off. The light will be lit when the pH feed mechanism is feeding. The light will be off when the ORP feed mechanism is off.

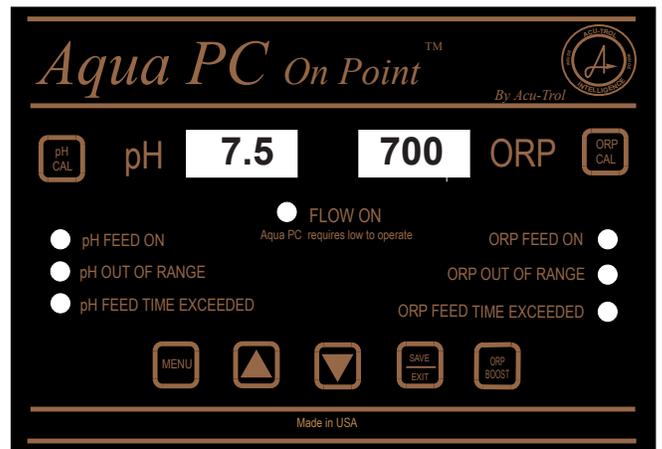
☞ **ORP OUT OF RANGE:** This red LED is used to alert users that the ORP level in the system is out of the allowable setpoint range, which is  $\pm 50$ mV. When this light is lit, the ORP in the system is either too high or too low.

☞ **ORP FEED TIME EXCEEDED:** This red LED is used to alert users that the ORP feed system has reached its maximum feed time. When this light is on, the ORP feed system will not be allowed to feed until the feed timers are cleared manually or until the controller performs it's automatic reset, which it does once in a 24 hour period. The maximum feed time can be programmed by the user, for more information please see section 5.2.13.

## 5.2 Menus

### 5.2.1 Readings Screen

The current measurements in the *Aqua PC On Point* are displayed in the Readings Screen. The pH reading will always be displayed in the left display window, and the ORP reading will always be displayed in the right display window. The Readings Screen is the default or at rest menu for the *Aqua PC On Point*. You will return to the Readings Screen after each change you make to the programming of the unit. The Menu Button is used to move from the Readings Screen to all other screens in the *Aqua PC On Point* menu.





### 5.2.2 Manual ORP Feed



This menu will allow the user to manually turn the ORP feed on and off, overriding the controller set point and other programming. The Manual ORP feed will turn the controller on for the length of the ORP On Time (OOn). The Manual ORP Feed Menu is always OFF unless the user turns it on.

To turn on the manual ORP feed, press the up arrow.



The ORP Feed Menu display should now read On. Press the Save/Exit button to turn on the ORP feed system and return to the readings screen. Do not manually feed pH and sanitizer at the same time. Manual ORP feed will not allow ORP chemicals to feed if there is no flow in the system

### 5.2.3 Manual pH Feed



This menu will allow the user to manually turn the pH feed on and off, overriding the controller set point and other programming. The Manual pH feed will turn the controller on for the length of the pH On Time (POn). The Manual pH Feed Menu is always OFF unless the user turns it on.

To turn on the manual pH feed, press the up arrow.



The pH Feed Menu display should now read On. Press the Save/Exit button to turn on the pH feed system and return to the readings screen. Do not manually feed pH and sanitizer at the same time. Manual pH feed will not allow chemicals to feed if there is no flow in the system.

### 5.2.4 Calibrate ORP



While all ORP sensors work in the same way, the exact reading each individual sensor gives can vary because of water makeup and variances in manufacturing. This menu will allow the user to calibrate or adjust the ORP sensor reading so that it is in line with the manual reading taken by your pool technician or local pool store.

The Calibrate ORP menu will initially display the current reading from the ORP sensor. To modify this reading so that it matches the manual reading, use the up or down arrow buttons.



The Calibrate ORP menu display should now be the same as the manual reading. Press the Save/Exit button to save your changes and return to the readings screen.

### 5.2.5 Calibrate pH



While all pH sensors work in the same way, the exact reading each individual sensor gives can vary because of water makeup and variances in manufacturing. This menu will allow the user to calibrate or adjust the pH sensor reading so that it is in line with the manual reading taken by your

The Calibrate pH menu will initially display the current reading from the pH sensor. To modify this reading so that it matches the manual reading, use the up or down arrow buttons.



The Calibrate pH menu display should now be the same as the manual reading. Press the Save/Exit button to save your changes and return to the readings screen.



### 5.2.6 Reset pH and ORP Calibrations



The Reset pH and ORP Calibrations menu is used to clear the current calibrations. This menu is always set to not reset the calibrations, unless the user chooses to reset them.

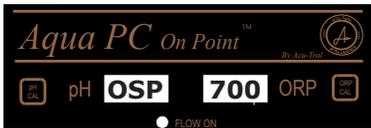


The Reset pH and ORP Calibrations menu will initially display nO. To Reset the pH and ORP calibrations, use the up arrow button to select YES.



The Reset pH and ORP Calibrations menu display should now display YES. Press the Save/Exit button to reset the calibration values and return to the readings screen.

### 5.2.7 ORP Set Point



This menu will allow the user to select the ORP set point that the Aqua PC On Point will use to control the pool or spa. A set point should be chosen to meet pool and spa chemistry standards. The default ORP set point is 700.



The ORP Set Point menu will initially display the current ORP set point. To change the setpoint, use the up or down arrow buttons.



The ORP Set Point menu should now display the desired setpoint. Press the Save/Exit button to save the changes and return to the readings screen.

### 5.2.8 pH Set Point



This menu will allow the user to select the pH set point that the Aqua PC On Point will use to control the pool or spa. A set point should be chosen to meet pool and spa chemistry standards. The default pH setpoint is 7.5.



The pH Set Point menu will initially display the current pH setpoint. To change the setpoint, use the up and down arrow buttons.



The pH Set Point menu should now display the desired setpoint. Press the Save/Exit button to save the changes and return to the readings screen.

### 5.2.9 ORP ON Time



This menu will allow the user to select the amount of time in seconds that the Aqua PC On Point will feed ORP sanitizer each time the controller calls for ORP chemicals. The default ORP On Time is 60 seconds.



The ORP On Time menu will initially display the current ORP on time. To change the on time, use the up and down arrow buttons.



The ORP On Time menu should now display the desired on time. Press the Save/Exit button to save the changes and return to the readings screen.



### 5.2.10 ORP OFF Time



This menu will allow the user to select the amount of time in minutes that the *Aqua PC On Point* will wait in between ORP/ sanitizer feeding. The default ORP Off Time is 6 minutes.



The ORP Off Time menu will initially display the current ORP off time. To change the on time, use the up and down arrow buttons.



The ORP Off Time menu should now display the desired on time. Press the Save/Exit button to save the changes and return to the readings screen.

### 5.2.11 pH ON Time



This menu will allow the user to manually select the amount of time in seconds that the *Aqua PC On Point* will feed pH each time the controller calls for pH chemicals. The default pH On Time is 30 seconds.



The pH On Time menu will initially display the current pH on time. To change the on time, use the up and down arrow buttons.



The pH On Time menu should now display the desired on time. Press the Save/Exit button to save the changes and return to the readings screen.

### 5.2.12 pH OFF Time



This menu will allow the user to select the amount of time in minutes that the *Aqua PC On Point* will wait in between pH feeding. The default pH Off Time is 5 minutes.



The pH Off Time menu will initially display the current pH off time. To change the on time, use the up and down arrow buttons.



The pH Off Time menu should now display the desired on time. Press the Save/Exit button to save the changes and return to the readings screen.

### 5.2.13 ORP Feed Time Exceeded



As a safety feature, the *Aqua PC On Point* will only allow a certain amount of ORP chemicals to feed into the system in a 24 hour period. This menu will allow the user to select the maximum amount of time in hours that the ORP will be allowed to feed. The controller tracks each feed time, and adds them together. When the maximum feed time is reached or exceeded, the ORP feed system is prevented from feeding until the next 24 hour period begins, or the feed timers are cleared manually by the user. The default ORP Feed Time Exceeded is 2 hours.



The ORP Feed Time Exceeded menu will initially display the current ORP maximum feed time. To change the maximum feed time, use the up and down arrow buttons.



The ORP Feed Time Exceeded menu should now display the desired on time. Press the Save/Exit button to save the changes and return to the readings screen.



### 5.2.14 pH Feed Time Exceeded

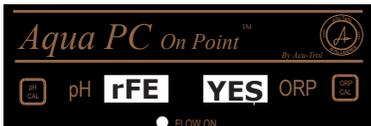


As a safety feature, the *Aqua PC On Point* will only allow a certain amount of pH chemicals to feed into the system in a 24 hour period. This menu will allow the user to select the maximum amount of time in hours that the pH will be allowed to feed. The controller tracks each feed time, and adds them together. When the maximum feed time is reached or exceeded, the ORP feed system is prevented from feeding until the next 24 hour period begins, or the feed timers are cleared manually by the user. The default pH Feed Time Exceeded is 1 hour.

The pH Feed Time Exceeded menu will initially display the current pH maximum feed time. To change the maximum feed time, use the up and down arrow buttons.

The pH Feed Time Exceeded menu should now display the desired maximum feed time. Press the Save/Exit button to save the changes and return to the readings screen.

### 5.2.15 Reset Feed Limit Timers



This menu will allow the user to manually clear the pH and ORP feed limit timers before they are automatically reset each 24 hour period of operation.

The Reset Feed Limit Timers menu will always be set to nO. To change the setting to YES , use the up arrow button.

The Reset Feed Limit Timers menu should now read YES. Press the Save/Exit button to clear the feed limit timers and return to the readings screen. You must be in this screen when the Save/Exit button is pressed in order to reset the feed limit timers.

### 5.2.16 Acid/Base Selection



The *Aqua PC On Point* can control pH levels using either Acid or Base. The user must select which chemical they are using in order to ensure proper pH control.

The Acid/Base Selection menu default pH control solution is Acid. To change the pH control solution to Base, use the down arrow.

The pH control solution should now be Base. Press the Save/Exit button to save your changes and return to the readings screen.

### 5.2.17 Proportional Feed



The *Aqua PC On Point* has the ability to adjust the feed times for pH and ORP depending on how close the current reading is to the set point. This helps to prevent overfeeding and makes it easier for the controller to reach the exact set point.

The Proportional Feed menu default setting has the proportional feed feature turned On. To turn the proportional feed feature off, use the down arrow button.

The proportional feed will now be turned off. Press the Save/Exit button to save your changes and return to the readings screen.



### 5.2.18 ORP Off at Set Point



The *Aqua PC On Point* has the ability to automatically turn off the ORP feed system once the current reading is equal to the set point. This helps to prevent overfeeding and makes it easier for the controller to reach the exact set point.

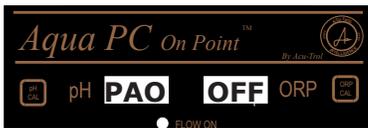


The ORP Off at Set Point menu default setting has the automatic turn off feature turned Off. To turn the automatic turn off feature On, use the up arrow button.



The controller will now automatically turn off the ORP feed system when set point has been reached. Press the Save/Exit button to save your changes and return to the readings screen.

### 5.2.19 Simultaneous Feed



The *Aqua PC On Point* will allow pH and sanitizer chemicals to feed at the same time. This feature should be used only if the feed injection points are significantly separated from each other, or if controlling a salt chlorine generator.

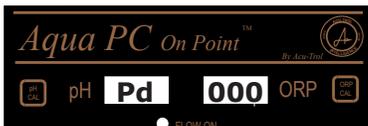


The Simultaneous Feed menu default setting has the simultaneous feed feature turned Off. To turn the simultaneous feed feature on, use the up arrow button.



The simultaneous feed will now be turned off. Press the Save/Exit button to save your changes and return to the readings screen.

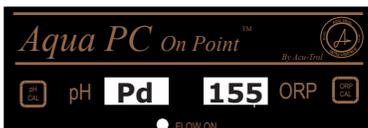
### 5.2.20 Password



The *Aqua PC On Point* can have one numeric password. Once a password has been set, the controller will not allow any changes to be made without the password. To disable the password, enter 000.



To set or enter a password, use the up and down arrow keys until you reach the number you have chosen as your password.



Press the Menu button to enter your password and return to the readings screen. If you forget this password, please call Acu-Trol Technical Support for assistance.

### 5.2.21 Salt System



The *Aqua PC On Point* contains pre-set programming for when it is used in conjunction with a chlorine salt generator. If you are using a chlorine salt generator, you may use this function to automatically set some of the *Aqua PC ON Point* settings and optimize the controller for use with a salt system..



To view the factory salt settings, please see section 6.1.2. To turn on the pre-set salt system programming, press the up arrow.



The Salt System menu should now display YES. Press the Save/Exit button to turn on the salt system programming and return to the readings screen. You must be in this screen when the Save/Exit button is pressed for this setting to be changed.



## 5.2.22 Reset Factory Defaults



The *Aqua PC On Point* allows the user to reset all settings back to their original factory configuration. To view the original factory default settings, please see section 6.1.1.



To reset the controller to the factory default settings, use the up arrow.



The Reset Factory Defaults screen should now read yes. Press the Save/Exit button to reset the controller to the factory default settings and return to the readings screen. You must be in this screen when the Save/Exit button is pressed in order for the current calibrated values to be cleared.

### IMPORTANT OPERATION GUIDELINES

You must press the Save/Exit button each time you make a change in one of the menu screens. Changes will not be saved if the Save/Exit button is not pressed.

If the Save/Exit button is not pressed, the settings will revert back to the last saved settings at the next power cycle.

If you have made a number of changes to the *Aqua PC On Point* settings and have not saved these changes, you can cycle the power to cancel the changes you have made.

Cycling the power will not cancel changes made in the Reset pH and ORP Calibrations, Reset Feed Limit Timers, Salt System and Reset Factory Default screens.



### 5.3 Setting Ranges and Limits

| # of Times Menu Button Pressed | Menu Item | Description                              | Range              |
|--------------------------------|-----------|--|--------------------|
|                                | Boot      | Firmware Version Information             |                    |
|                                | Readings  | Displays the Current ORP and pH readings |                    |
| 1                              | OFd       | ORP Manual Feed                          | On/OFF             |
| 2                              | PFd       | pH Manual Feed                           | On/OFF             |
| 3                              | OCb       | ORP Calibration                          | +128/-127          |
| 4                              | PCb       | pH Calibration                           | +1.2/-1.2          |
| 5                              | rSC       | Reset pH and ORP Calibrations            | yES/nO             |
| 6                              | OSP       | ORP Set Point                            | 550-850            |
| 7                              | PSP       | pH Set Point                             | 6.8-8.2            |
| 8                              | OOn       | ORP Feed Pump ON time                    | 000-999            |
| 9                              | OOF       | ORP Feed Pump OFF time                   | 001-060            |
| 10                             | POn       | pH Feed Pump ON Time                     | 000-999            |
| 11                             | POF       | pH Feed Pump OFF Time                    | 001-060            |
| 12                             | OFE       | ORP Feed Time Exceeded                   | 001-018            |
| 13                             | PFE       | pH Feed Time Exceeded                    | 001-018            |
| 14                             | rFE       | Reset Feed Limit Timers                  | yES/nO             |
| 15                             | PH        | Acid or Base Feeding Setting             | ACd/bAS            |
| 16                             | PrF       | Proportional Feed                        | On/OFF             |
| 17                             | OSt       | Off at Setpoint Setting                  | On/OFF             |
| 18                             | PAO       | Simultaneous pH and ORP Feeding          | On/OFF             |
| 19                             | Pd        | Controller Security                      | (password) 000-255 |
| 20                             | SLt       | Salt system setting                      | yES/nO             |
| 21                             | rFd       | Factory Defaults Reset                   | yES/nO             |



## CHAPTER 6 Appendix

### Appendix A: Factory Default Settings

#### 6.1.1 Factory Default Settings

The factory default settings for the *AQUA PC On Point* are listed in the following table:

|                        |            |
|------------------------|------------|
| ORP Set Point          | 700        |
| ORP ON Time            | 60 Seconds |
| ORP OFF Time           | 6 Minutes  |
| pH Set Point           | 7.50       |
| pH Feed ON Time        | 30 Seconds |
| pH Feed OFF Time       | 5 Minutes  |
| ORP Feed Time Exceeded | 2 Hours    |
| pH Feed Time Exceeded  | 1 Hour     |

These default settings are based on a 15,000 to 25,000 gallon body of water.

**Tip:** If your pool has less than 15,000 gallons of water, you will need to lower the on/off times.

If your pool has over 25,000 gallons of water, you will need to increase the on/off times.

#### 6.1.2 Salt System Default Settings

The factory default settings for the *AQUA PC On Point* salt mode are listed in the following

|                        |             |
|------------------------|-------------|
| ORP ON Time            | 999 Seconds |
| ORP OFF Time           | 6 Minutes   |
| ORP Feed Time Exceeded | 23 Hours    |
| ORP Off at Set Point   | On          |
| Acid/Base Selection    | Acid        |
| Proportional Feed      | Off         |
| Simultaneous Feed      | On          |

These default settings are based on a 15,000 to 25,000 gallon body of water with a salt chlorine generator.

**Tip:** If your pool has less than 15,000 gallons of water, you will need to lower the on/off times.



## Appendix B: Troubleshooting

This section lists common problems with the likely solution:

| Failure Location              | Problem                              | Solution #1   | Solution #2   |
|-------------------------------|--------------------------------------|---|---|
| pH Feed Time Exceeded LED On  | High pH (acid feed)                  | Acid empty  | Increase ON time (POn)<br>May need to increase pH Feed Time Exceeded (PFE)      |
| pH Out Of Range LED On        | Low pH (acid feed)                   | Decrease ON time (POn)  | Test water, check and adjust calibration if necessary                           |
| pH Out Of Range LED On        | High pH (base feed)                  | Decrease ON time (POn)  | Test water, check and adjust calibration if necessary                           |
| pH Feed Time Exceeded LED On  | Low pH (base feed)                   | Base empty  | Increase ON time (POn)<br>May need to increase pH Feed Time Exceeded (PFE)      |
| ORP Out Of Range LED On       | ORP High                             | Decrease ON time (OOn)<br>May want to turn on function Off at Set Point | Test water, check calibration and adjust if necessary                           |
| ORP Feed Time Exceeded LED On | ORP Low                              | Chlorine empty  | Increase ON time (OOn)<br>May need to increase ORP Feed Time Exceeded (OFE)     |
| Flow Switch                   | Magnet will not go up or Not working | Verify that valves are turned on<br>Backwash main filter                | Clean filter, check for debris in flow switch tube<br>Check wiring for failures |
| pH Sensor                     | Readings bouncing                    | Clean sensor  | Check flow, slow flow down  |
| Not Feeding Chlorine          | ORP Relay not turning on             | Check flow switch   | Check for pH lockout when pH is over 7.8  |
| Readings                      | Readings not changing or wrong       | Clean sensors   | Check Aqua PC On Point and Sensors using the Duo-Check                          |



## Appendix C: Menu Items

All menu items start with either P or O, if the item starts with a P it is for pH, and O is for

| # of Times Menu Pressed | MENU ITEMS                    | DISPLAY | FUNCTION  |
|-------------------------|-------------------------------|---------|---|
|                         | Main                          |         | Displays the current measurements.  |
| 1                       | Manual ORP Feed               | OFd     | Manually turns ON or OFF the ORP relay.   |
| 2                       | Manual pH Feed                | PFd     | Manually turns ON or OFF the pH relay.  |
| 3                       | Calibrate ORP                 | OCb     | Calibrate the ORP sensor to match a manual measurement.   |
| 4                       | Calibrate pH                  | PCb     | Calibrate the pH sensor to match a manual measurement.  |
| 5                       | Reset pH and ORP Calibrations | rSC     | Reset pH and ORP calibrations or remove any user entered calibrations.  |
| 6                       | ORP Set Point                 | OSP     | Manage and view the selected ORP set point.   |
| 7                       | pH Set Point                  | PSP     | Manage and view the selected pH set point.  |
| 8                       | ORP ON Time                   | OOn     | Maximum length of time in seconds that the ORP relay can be ON each time the controller feeds sanitizer.  |
| 9                       | ORP OFF Time                  | OOFF    | Maximum length of time in minutes that the ORP relay will be OFF after each feed cycle before the unit will be allowed to feed sanitizer again. |
| 10                      | pH ON Time                    | POn     | Maximum length of time in seconds that the pH relay can be ON each time the controller feeds pH.  |
| 11                      | pH OFF Time                   | POFF    | Maximum length of time in minutes that the pH relay will be OFF after each feed cycle before the unit will be allowed to feed pH again.         |
| 12                      | ORP Feed Time Exceeded        | OFE     | Maximum length of time in hours that the ORP relay can be ON in one 24 hour period.   |
| 13                      | pH Feed Time Exceeded         | PFE     | Maximum length of time in hours that the pH relay can be ON in one 24 hour period.  |
| 14                      | Reset Feed Limit Timers       | rFE     | To clear the timers when the Feed Time of pH, ORP, or both is exceeded before the 24 hour period has passed.                                    |
| 15                      | Acid/Base Selection           | PH      | Select whether this unit will be controlling pH using Acid or Base.   |
| 16                      | Proportional Feed             | PrF     | Turn the proportional feed feature ON and OFF.  |
| 17                      | Off at Set Point              | OSt     | Determine whether the controller will automatically stop feeding chemical when it reaches the programmed set point.                             |
| 18                      | Simultaneous Feed             | PAO     | Allow the controller to feed both pH and Sanitizer chemicals simultaneously. For use with salt chlorine generators.                             |
| 19                      | Password                      | Pd      | Manage and view the selected password for this unit.  |
| 20                      | Salt System                   | SLt     | Set the Aqua PC On Point to monitor and feed ORP using a salt system.   |
| 21                      | Reset Factory Defaults        | rFd     | Reset all settings to the original factory configuration.   |



# Appendix D: Menu Tree

|                             |      |   |  |   |  |
|-----------------------------|------|---|--|---|--|
| Main Display                |      |   |  |   |  |
|                             | MENU |   |  |   |  |
| Manual Feed, ORP            |      | ▲ |  | ▲ | Use arrow keys to turn manual feed On and Off            |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |
| Manual Feed, pH             |      | ▲ |  | ▲ | Use arrow keys to turn manual feed On and Off            |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |
| Calibrate ORP               |      | ▲ |  | ▲ | Use arrow keys until calibrated reading = manual reading |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |
| Calibrate pH                |      | ▲ |  | ▲ | Use arrow keys until calibrated reading = manual reading |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |
| Reset pH & ORP Calibrations |      | ▲ |  | ▲ | Use arrow keys to reset both pH and ORP.                 |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |
| ORP Setpoint                |      | ▲ |  | ▲ | Use arrow keys until desired set point is reached        |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |
| pH Setpoint                 |      | ▲ |  | ▲ | Use arrow keys until desired set point is reached        |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |
| ORP ON Time                 |      | ▲ |  | ▲ | Use arrow keys until desired ORP on time is reached      |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |
| ORP OFF Time                |      | ▲ |  | ▲ | Use arrow keys until desired ORP off time is reached     |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |
| pH ON Time                  |      | ▲ |  | ▲ | Use arrow keys until desired pH on time is reached       |
|                             |      | ▼ |  | ▼ |  |
|                             | MENU |   |  |   | SAVE EXIT  |



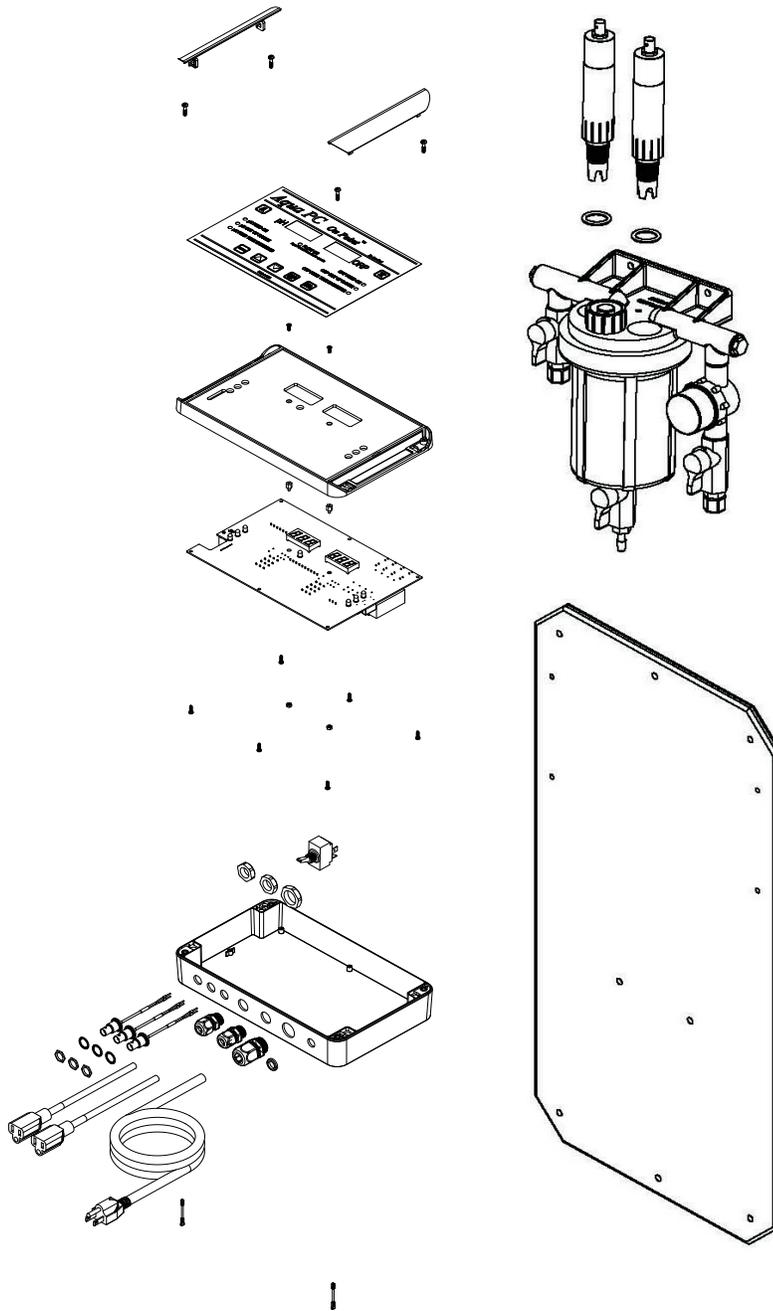
# Appendix D: Menu Tree

|                             |                   |        |                   |        |  |              |
|-----------------------------|-------------------|--------|-------------------|--------|--|--------------|
| pH Off Time                 | POF 060<br>pH ORP | ▲<br>▼ | POF 070<br>pH ORP | ▲<br>▼ | Use arrow keys until desired pH off time is reached            | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| ORP Feed Time Exceeded      | OFE 002<br>pH ORP | ▲<br>▼ | OFE 001<br>pH ORP | ▲<br>▼ | Use arrow keys until desired ORP feed time exceeded is reached | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| pH Feed Time Exceeded       | PFE 001<br>pH ORP | ▲<br>▼ | PFE 002<br>pH ORP | ▲<br>▼ | Use arrow keys until desired pH feed time exceeded is reached  | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| Reset Feed Limit Timers     | rFE YES<br>pH ORP | ▲<br>▼ | rFE nO<br>pH ORP  | ▲<br>▼ | Use arrow keys to toggle between YES and NO                    | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| Acid or Base Feed Selection | PH ACd<br>pH ORP  | ▲<br>▼ | PH bAS<br>pH ORP  | ▲<br>▼ | Use arrow keys to toggle between Acid and Base                 | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| Proportional Feed           | PrF On<br>pH ORP  | ▲<br>▼ | PrF OFF<br>pH ORP | ▲<br>▼ | Use arrow keys to toggle between ON and OFF                    | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| Off at Setpoint             | OSt On<br>pH ORP  | ▲<br>▼ | OSt OFF<br>pH ORP | ▲<br>▼ | Use arrow keys to toggle between ON and OFF                    | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| Simultaneous Feed           | PAO On<br>pH ORP  | ▲<br>▼ | PAO OFF<br>pH ORP | ▲<br>▼ | Use arrow keys to toggle between ON and OFF                    | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| Password                    | Pd 170<br>pH ORP  | ▲<br>▼ | Pd 180<br>pH ORP  | ▲<br>▼ | Use arrow keys until the password is reached                   | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| Salt System                 | SLt nO<br>pH ORP  | ▲<br>▼ | SLt YES<br>pH ORP | ▲<br>▼ | Use arrow keys to toggle between NO and YES                    | SAVE<br>EXIT |
|                             | MENU              |        |                   |        |  |              |
| Reset Factory Defaults      | rFd YES<br>pH ORP | ▲<br>▼ | rFd nO<br>pH ORP  | ▲<br>▼ | Use arrow keys to toggle between YES and NO                    | SAVE<br>EXIT |



# CHAPTER 7      DIAGRAMS

## 7.1    Aqua PC On Point EXPLODED VIEW

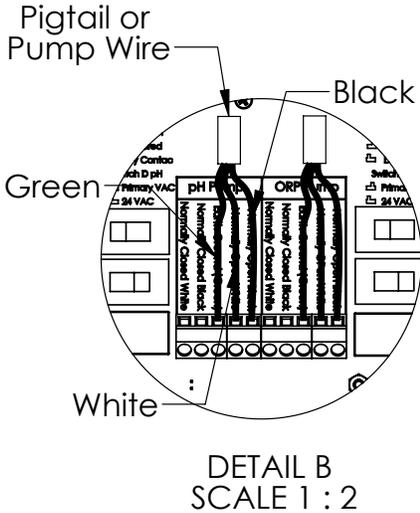
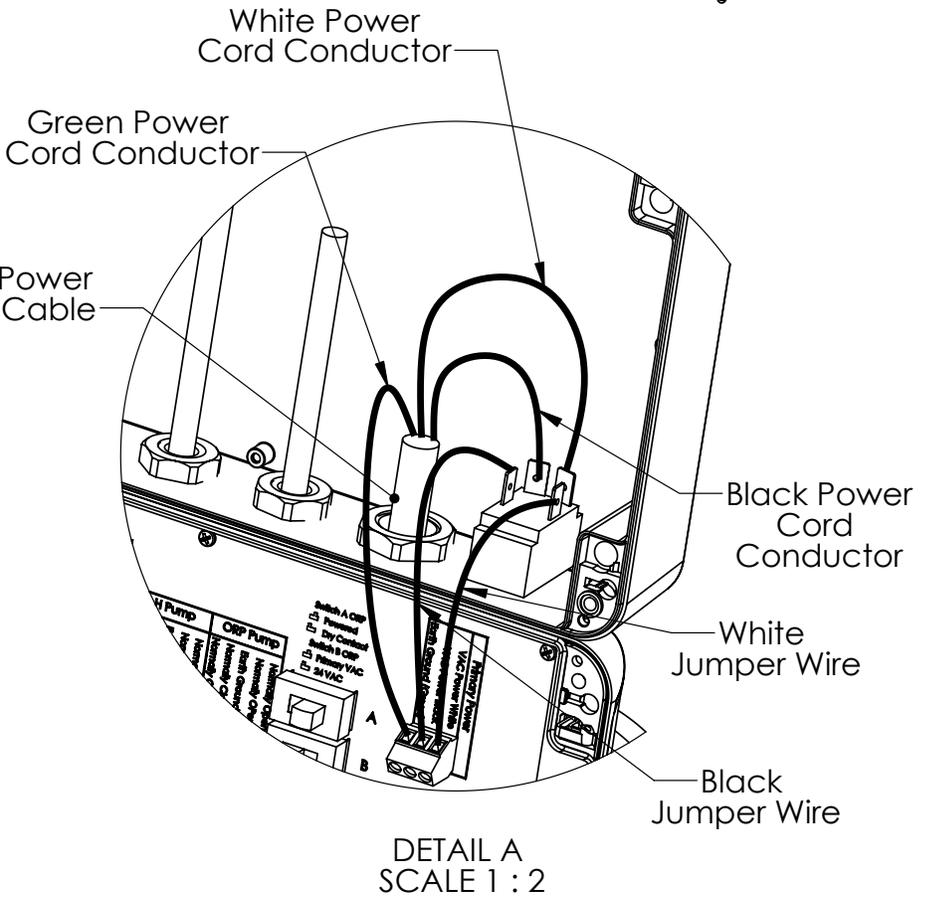
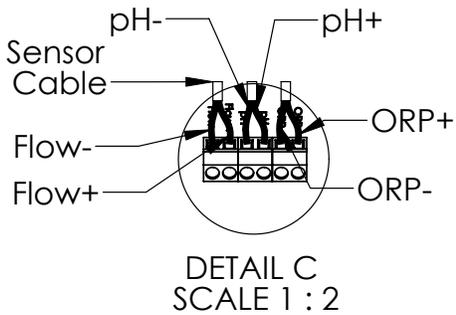
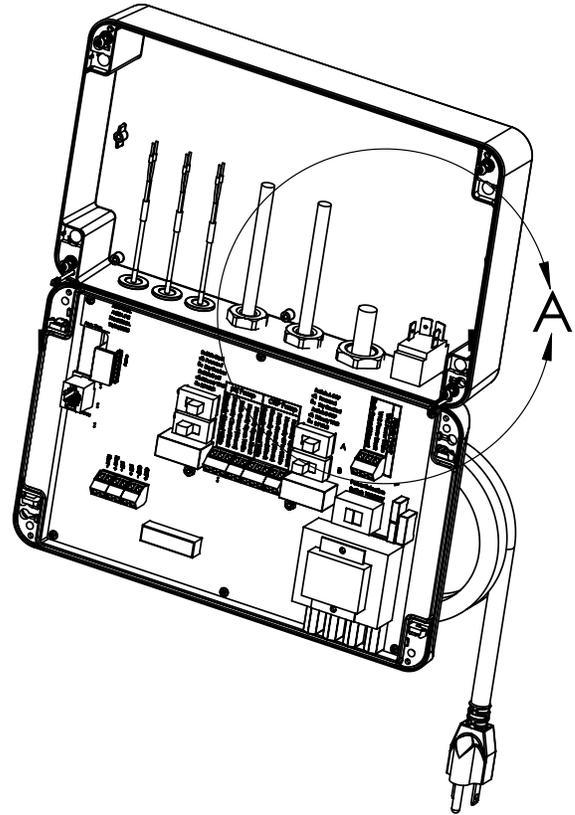
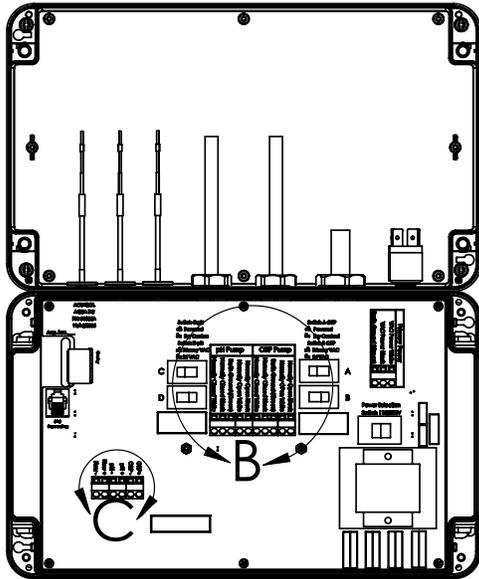


## 7.2    Aqua PC On Point PARTS LIST

| Dia. # | Description                               | Part #    |
|--------|---|-----------|
| 1      | Controller, AquaPC On Point.....          | 700000160 |
| 2      | Sensor, pH.....                           | 744000260 |
| 3      | Sensor, ORP .....                         | 744000330 |
| 4      | Flow Cell w/o Sensors.....                | 755000000 |
| 5      | 1' x 2' Poly Mounting Board (Smoke) ..... | 754000000 |



### 7.3 Aqua PC On Point SENSOR WIRING





For Technical Support Call: 800-273-4667

Pentair Water Commercial Pool and Spa™  
Acu-Trol, Inc.  
11830 Kemper Road  
Auburn, CA 95603