



# Installation and Operation Manual

## Jandy® AquaPure™ Electronic Chlorine Generator

APURE700 and APURE1400

Patent Pending



### **WARNING**

**FOR YOUR SAFETY - This product must be installed and serviced by a professional pool/spa service technician. The procedures in this manual must be followed exactly. Failure to follow warning notices and instructions may result in property damage, serious injury, or death.**



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## Section 1. Safety Information

### IMPORTANT SAFETY INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS READ AND FOLLOW ALL INSTRUCTIONS

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

 **WARNING**

To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

 **WARNING**

When mixing acid with water, **ALWAYS ADD ACID TO WATER. NEVER ADD WATER TO ACID.**

 **WARNING**

To reduce the risk of electric shock, fire or injury, service should only be attempted by a qualified Pool Service Professional.

 **WARNING**

Do not operate electrolytic cell without proper flow or water circulation. A buildup of flammable gases would result in hazardous conditions.

 **WARNING**

Installation must be done in accordance with the National Electric Code (NEC, NFPA-70) and/or any other applicable local and national installation codes.

**RISK OF ELECTRIC SHOCK, FIRE, PERSONAL INJURY, OR DEATH.** Connect only to a circuit that is protected by a ground-fault circuit-interrupter (GFCI). Such a GFCI should be provided by the installer and should be tested on a routine basis. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, there is ground current flowing, indicating the possibility of an electric shock. Do not use this unit. Disconnect this unit and contact a qualified service representative before using.

A green colored terminal (or a wire connector marked "G", "GR", "Ground" or "Grounding") is provided within the terminal compartment. To reduce risk of electric shock, connect this terminal or connector to the grounding terminal of your electric service or supply panel with a conductor equivalent in size to the circuit conductors supplying this equipment.

Power supply must be interconnected with Pool Pump motor power source. This ensures the chlorinator and pool pump will turn on and off together.

Use of chemicals other than those recommended may be hazardous. Follow the Chemical Manufacturers Instructions.

It is recommended that the water Flow/Temp/Salinity Sensor is installed in the same piping as the electrolytic cell, without any valves or diverters between them. (See page 5 Figure 1).

The Flow/Temp/Salinity Sensor must be mounted as shown on page 12 Figure 8.

**⚠ CAUTION**

It is important to note that certain materials used in and around swimming pools and spas may not be compatible with chemicals commonly used to purify pool and spa water (e.g. acids, chlorine, salt, stabilizers, etc.).

As such, Jandy Pool Products, Inc. does not warrant or guarantee that the chlorinated water generated by the AquaPure will not damage or destroy certain types of plants, decking, coping and other materials in and around your pool and/or spa. Before selecting materials to be used in and around your pool and/or spa, please discuss all options with your contractor to assess the compatibility of such materials and chemicals.

Some helpful considerations may include:

- Choosing plants that can withstand splash out of pool water containing chlorine and/or salt and other water purification chemicals.
- All metal components used in and around a pool should be of a high grade, quality stainless steel.
- Careful selection of masonry products. The porosity and hardness of natural stones varies greatly. Therefore we recommend you consult with your builder or stone contractor on the best choice for stone materials around your pool or spa.
- Sealing all masonry products. Professionals in the stone industry specify that even natural stone, especially when used outdoors, be sealed to prevent weathering, staining, and premature degradation. Consult with your stone or deck contractor for the proper sealer for the masonry products you have selected to use around your pool or spa.
- For the optimal results, sealers should be reapplied on a regular basis. Reapply the protective sealer on a schedule per the manufacturer's instructions.

**SAVE THESE INSTRUCTIONS**

## Section 2. System Description

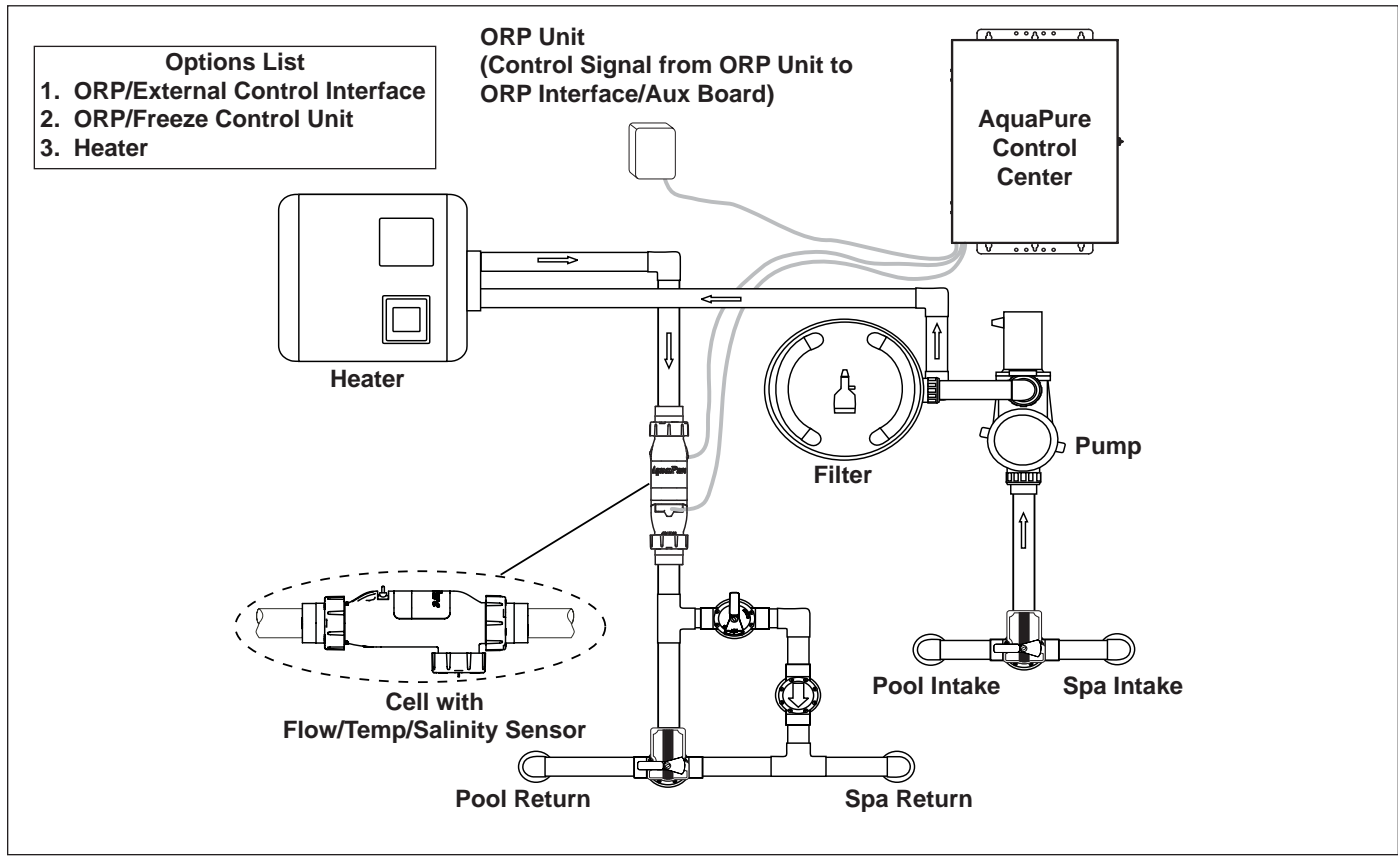


Figure 1. Typical AquaPure Installation With Options



**ATTENTION INSTALLER:** Various application notes (more detailed instructions) are available from the Dealer covering installation, operation, maintenance, and plumbing of the chlorinator system.

The AquaPure uses a process known as electrolysis to produce sodium hypochlorite (liquid chlorine) from a low concentration of salt added to the pool water. Hypochlorite kills bacteria, oxidizes organic material, and kills algae then reverts back to salt. The AquaPure then reuses the salt and the process starts over again. The AquaPure system is comprised of the following three component parts and an optional pool pump timer.

### Control Center

The control center converts AC electrical current to a low voltage DC current which is required by the cell to perform the electrolysis. The control center is connected with the pool circulation pump electrical source so that the electrolytic cell only operates when the pool pump is on. The flow portion of the **Flow/Temp/Salinity Sensor** is a backup device only.

### Electrolytic Cell

The AquaPure electrolytic cell contains bipolar electrodes which perform the electrolysis and produce chlorine when energized with DC current. Chlorine is generated as pool water containing salt passes through the cell. The chlorine production can be varied by either adjusting the Chlorine Production Level on the power center or by varying the number of hours the AquaPure is on each day. ***The AquaPure automatically cleans the Cell electrodes once every 3 hours by reversing polarity. This does not interrupt the production of Chlorine.***

**Flow/Temperature/Salinity Sensor** The Flow/Temp/Salinity Sensor only allows the Cell to operate if there is adequate water flow through the Cell. The salinity portion of the Flow/Temp/Salinity Sensor detects the level of salt in the pool water. This salt level is displayed in grams per liter (gpl) on the Liquid Crystal Display (LCD) whenever the salinity button is pressed. This eliminates the need for manual pool water salinity testing. Pool Temperature is now available on all models by pressing the **Temperature** button.

**Pool Pump Timer** A Pool Pump Timer is not included as part of your AquaPure. It is recommended that a timer or an AquaLink RS control system be used to save on energy and prolong the service life of your pool pump and the AquaPure.

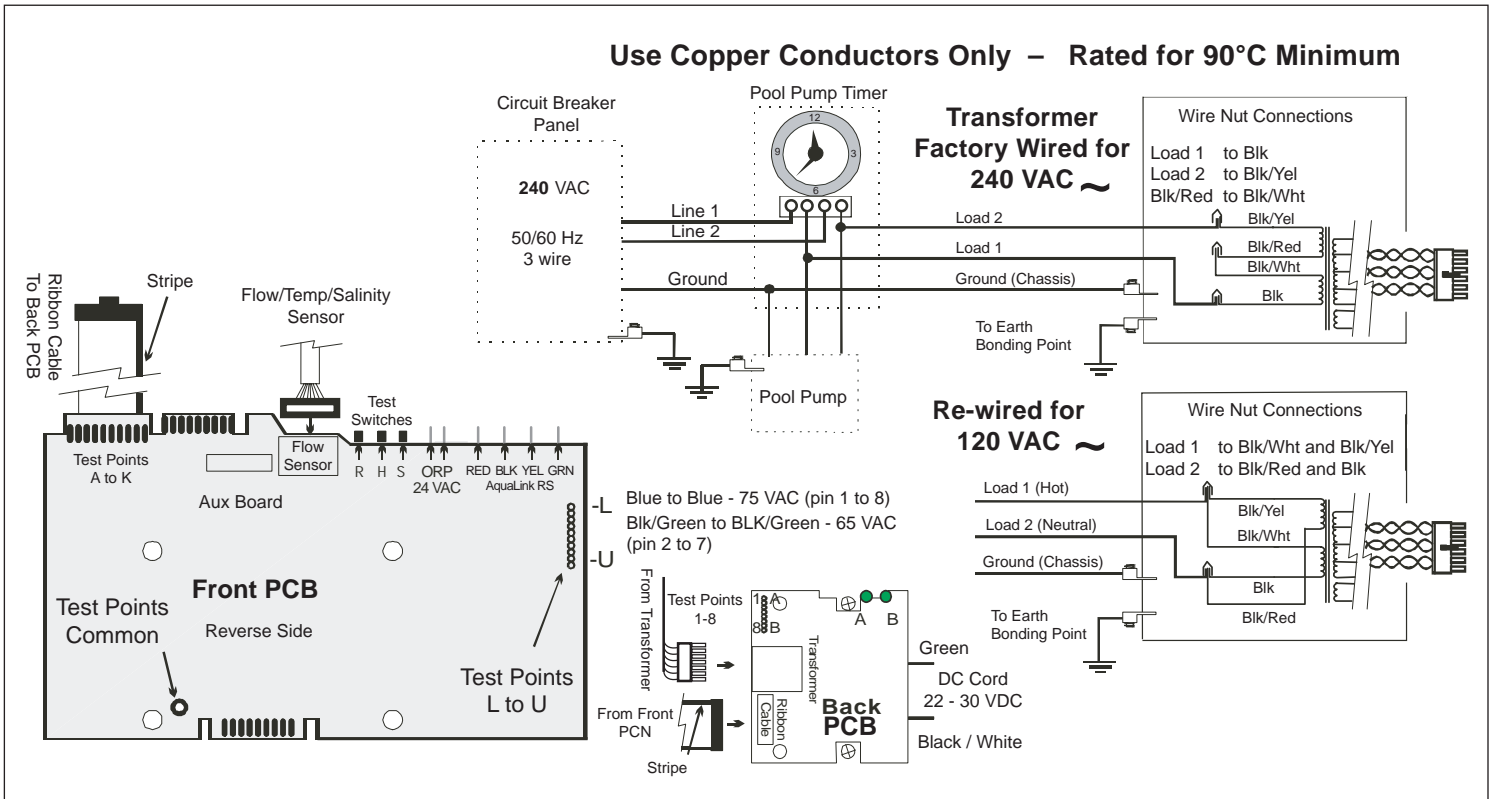
**2.1 Electrical Specifications**

**Circuit Protection** 2 pole 20 AMP device at the Electrical Panel.

	<u>Model APURE700</u>	<u>Model APURE1400</u>
<b>Input:</b>	<b>120 VAC, 50/60 Hz, 1.5 AMPS</b> <b>240 VAC, 50/60 Hz, 0.75 AMPS</b>	<b>Input: 120 VAC, 50/60 Hz, 2.5 AMPS</b> <b>240 VAC, 50/60 Hz, 1.25 AMPS</b>
<b>Output:</b>	<b>22-30 VDC @ 3 AMPS maximum</b>	<b>Output: 22-30 VDC @ 6 AMPS maximum</b>
<b>Chlorine:</b>	<b>0.625 lb. / 24 Hr. (283 gm / 24 Hr.)</b>	<b>Chlorine: 1.25 lb. / 24 Hr. (567 gm / 24 Hr.)</b>
<b>External Control:</b>	<b>ORP/External Control Connector</b> <b>AquaLink® RS485 Connector</b>	<b>External Control: ORP/External Control Connector</b> <b>AquaLink® RS485 Connector</b>

**⚠ CAUTION**

**Factory wired for 240 VAC service.** If available electrical service is 120 VAC, the power supply wiring must be changed to operate on 120 VAC as shown in the wiring diagram below. (Figure 2.)



**Figure 2. APURE700 and APURE1400 Wiring Diagram**

## Section 3. Installation Instructions Model APURE700 and APURE1400

### 3.1 Materials and Tools

**NOTE** Salt not included. See pages 17 - 20.

Installation Materials Furnished	Tools Needed for Installation
(1 ea.) Electrolytic Cell with 2"-2.5" Universal Unions	Tape Measure
(1 ea.) Port Plug with 16 ft (4.88 m) Sensor and O-Ring	Phillips & Flathead Screwdrivers
(3 ea.) Universal Union Nut	Pliers
(1 ea.) 16 ft (4.88 m) DC Power Cord	Hacksaw
(1 ea.) Power Supply/Control Center	Voltmeter to determine line voltage of AC wiring to power supply
(4 ea.) Anchors and Screws	Electric Drill Motor and 1/4 " masonry drill bit for mounting power supply on block or stucco wall
(2 ea.) Wire Nuts	An NSF® approved All Purpose Cleaner Primer
(1 ea.) Owner's Manual - Warranty Information	An NSF® approved All Purpose Cement (such as Weld-On 794, 793)

### 3.2 Plumbing Configurations

#### **WARNING**

When using electrical products, basic precautions should always be followed, including the following:

- **DANGER: RISK OF ELECTRIC SHOCK WHICH CAN RESULT IN SERIOUS INJURY OR DEATH.** Before attempting installation or service, ensure that all power to the device is disconnected/turned off at the circuit breaker. Connect only to a circuit protected by a ground-fault circuit-interrupter (GFCI).
- Grounding is required. The unit should be installed by a qualified service representative and should be properly grounded. (See Earth Bonding, page 11).
- Install to permit access for servicing.
- Read Cautions and Important Instructions on page 4. **Before attempting any electrical wiring, be sure to read and follow Safety Instructions. Wiring should only be attempted by a qualified professional.**



### 3.2.1 Recommended Cell and Sensor Orientation

Shown below are four different cell and sensor orientations. The third port on the cell is designed for installation of the sensors and for quick viewing of the cell plates. The Minimum Flow Rate is 30 GPM (114 LPM).

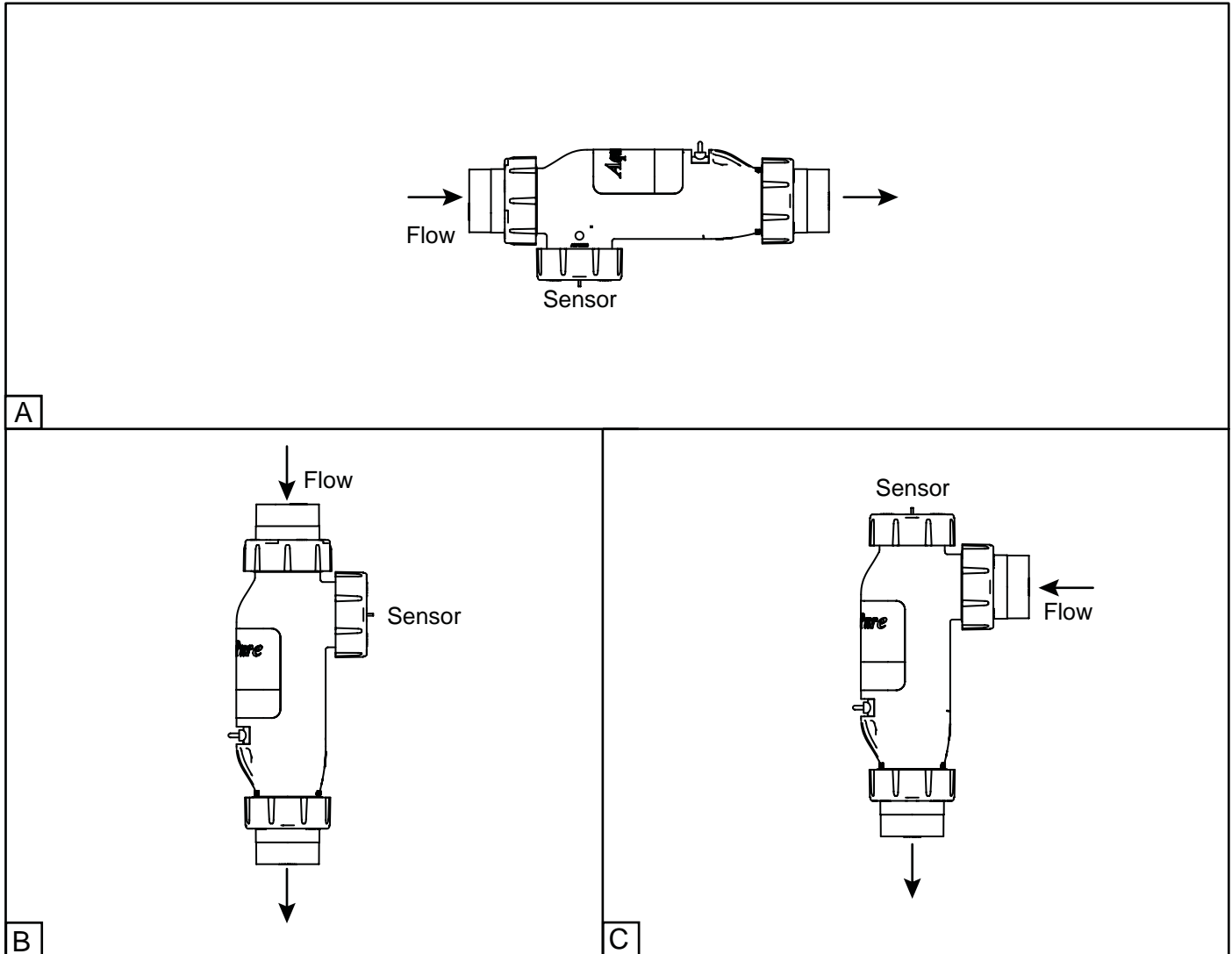


Figure 3. Chlorine Generator Cell and Sensor Orientation with Flow Direction

### 3.2.2 Recommended Plumbing Configuration

The preferred installation is that the Cell and Sensors are plumbed in the return line to the pool after (downstream of) all the pool equipment (filter, heater, solar, etc.). The Cell and Sensor fitting are designed to be plumbed into 2" PVC pipe. Adapters can be used for systems with 1½" plumbing. Figure 3 shows cell and sensor configuration with flow direction. Figures 4 and 5 illustrates the recommended plumbing configurations, which result in the most reliable operation.

**Note** The AquaPure is powered from the LOAD SIDE of the pool circulation pump relay or the time clock. This ensures that the Cell only operates when the pool pump is ON. The Flow Sensor serves as a protection device to ensure there is sufficient flow for the Cell to operate.

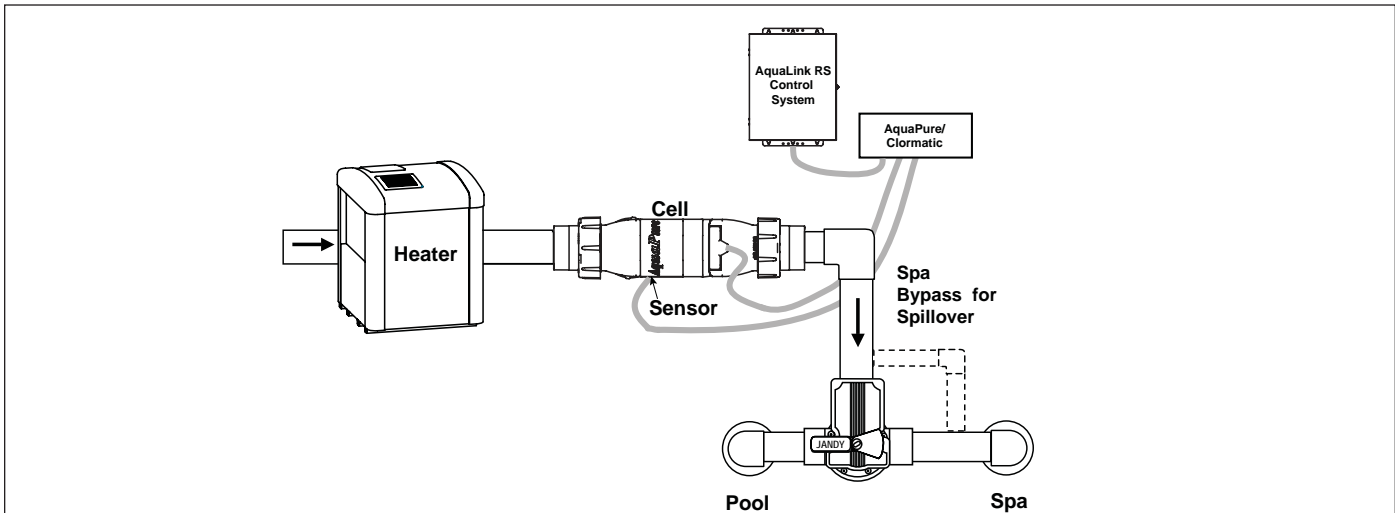


Figure 4. Recommended Plumbing Configuration for Pool/Spa Combination Systems

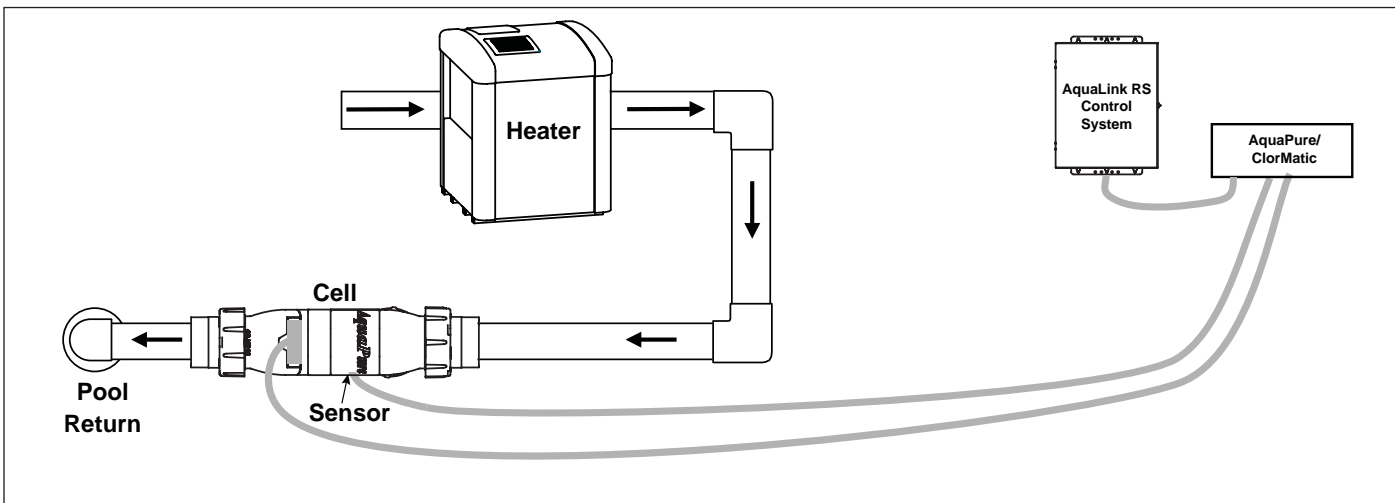


Figure 5. Alternate Plumbing Configuration for Pool or Dual Equipment Systems

**Note** The AquaPure is powered from the LOAD SIDE of the pool circulation pump relay or the time clock. This ensures that the Cell only operates when the pool pump is ON. The Flow Sensor serves as a protection device to ensure there is sufficient flow for the Cell to operate.

### 3.3 Installing APURE700 and APURE1400 Control Center

1. Locate the control center as close to the pump and filtration system as possible. Make sure that the DC power cord and the Flow/Temp/Salinity Sensor cable can reach that section of pipe selected for the Cell and Flow/Temp/Salinity Sensor installation. **Do not install the Control Center within 10 ft (3 m) of the pool edges.**
2. Use hardware provided and mount the control center at eye level. Leave sufficient clearance on all sides of the chassis backplate. If possible, leave a minimum of 9½ inch (241 mm) on the left side. Position the backplate on the mounting surface. Mark screw centers and drill four ¼ inch (6.35 mm) holes spaced 10 ⅜ inches (264 mm) on the horizontal center and 6 ⅜ inches (162 mm) on the vertical center. Install the anchors (provided) into the mounting surface. See Figure 6.
3. Install the screws (provided) into the anchors, leaving approximately ¼” of the screw shaft exposed. Position the backplate keyhole slots over the four mounting screws. Press the control center chassis down firmly so that the screws are secure in the keyhole slots. Tighten the screws until snug.
4. Remove the four screws that secure the control center front cover. Remove the front cover.

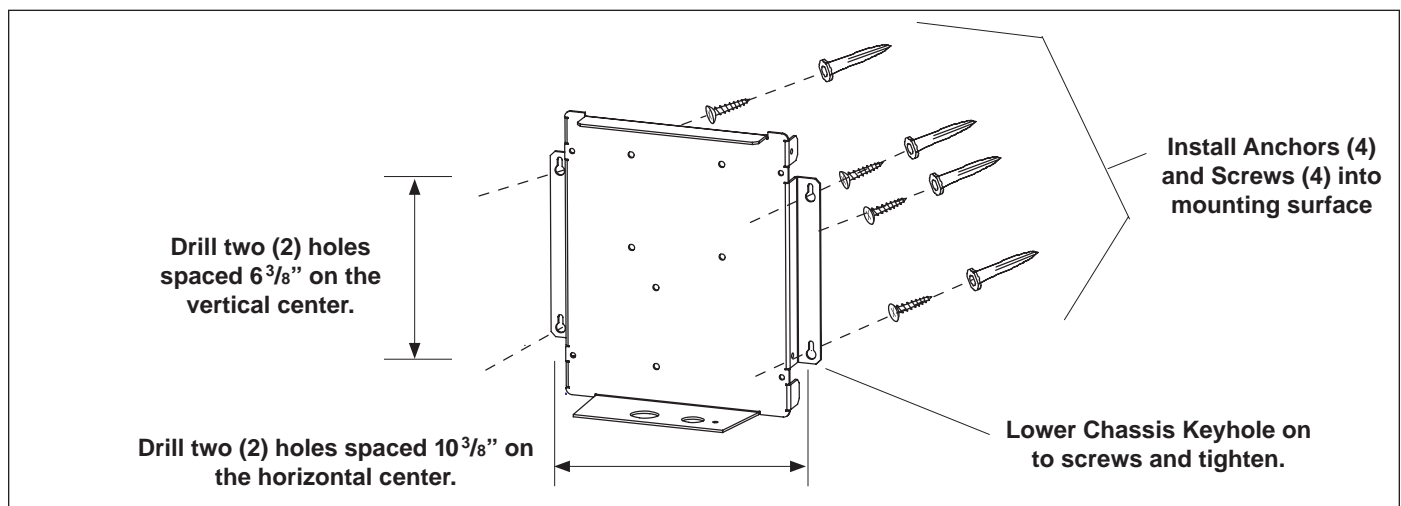


Figure 6. Mounting the Control Center Chassis Backplate

5. Using two of the four front cover screws, attach the cover to the chassis backplate. Please note that the chassis backplate has side mounting holes on both sides that allow you to secure the cover to either side of the backplate while you make all wire connections (see Figure 7).

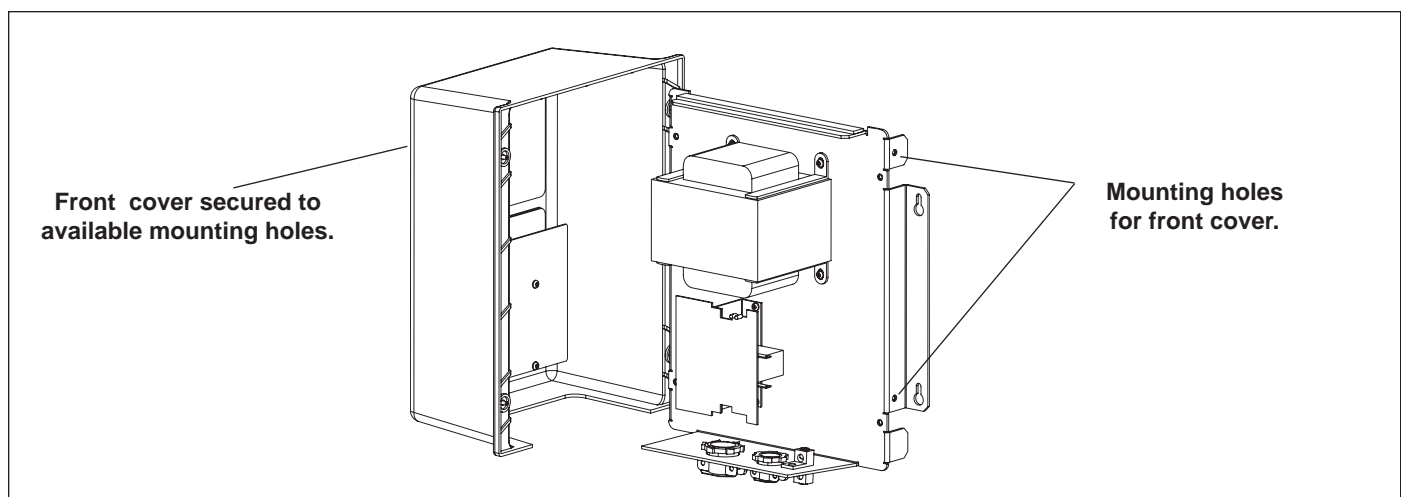


Figure 7. Securing the Control Center Front Cover to the Chassis Backplate

6. Check source voltage. (All units are factory wired for 240 VAC). ***In order to use on 120 VAC, the internal factory wiring of the control center must be changed. (See wiring diagram page 6 Figure 2).***
7. Use #12/3 insulated wire and conduit. Wire control center transformer to pool pump power source. The control center should be connected to the pump motor switch or automatic timer (Pool Pump Timer) as shown in the diagram on page 6 Figure 2. ***The flow portion of the Flow/Temp/Salinity Sensor is a backup device only.*** Attach the third wire (**Ground**) from the electrical panel to the ground point inside the Control Center. ***Earth bonding in Section 3.4 must also be accomplished to ensure personal safety and safety of equipment.***

### 3.4 Earth Bonding (Grounding)

A solid, copper # 8 AWG (8.4 mm<sup>2</sup>) wire is *recommended* for connecting the control center to a Permanent Earth Ground connection that is acceptable to the local inspection authority. Refer to your local codes for the acceptable grounding wire gauge. Attach the bonding point located on bottom of the chassis backplate to a Common Earth Bonding Point. Do not use the AquaPure as the Common Bonding Point. Each piece of non-AquaPure related pool equipment requiring a ground should be bonded to the Common, Approved Earth Bonding Point. ***Never ground pool pump to the chassis backplate.***

### 3.5 Installing the APURE700 and APURE1400 Cell and Flow/Temp/Salinity Sensor

**NOTE:** Maximum Operating Pressure is 345 kPa or 50 PSI - Minimum Flow Rate is 30 GPM (114 LPM).

1. Be sure pool pump is turned off.

#### **WARNING**

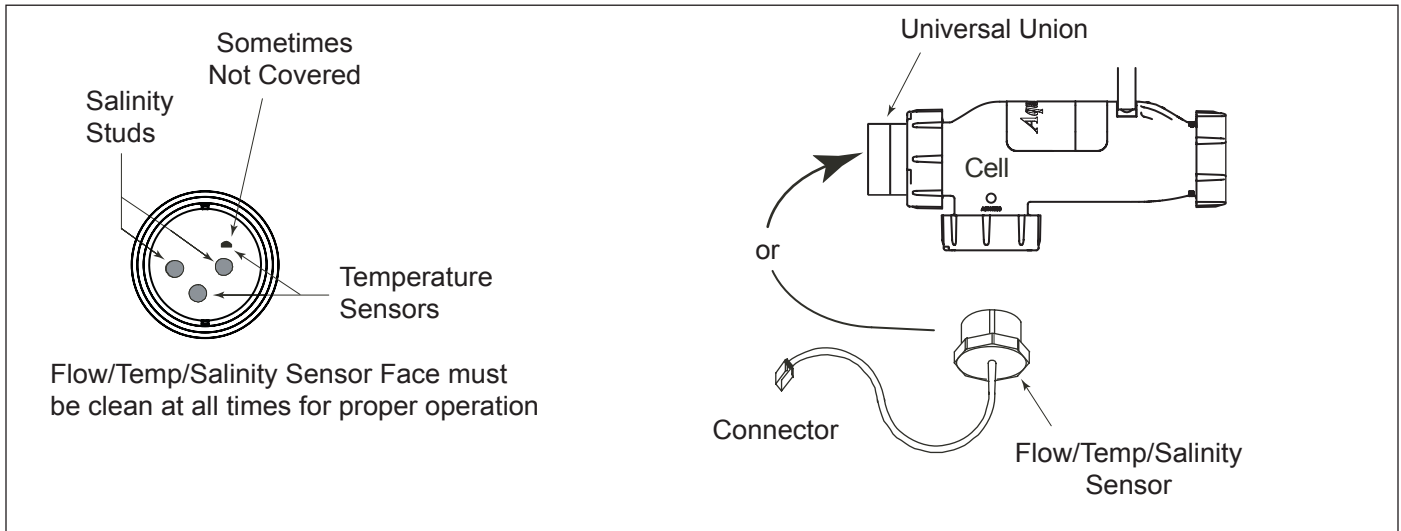
**ATTENTION INSTALLER:** If The Flow/Temp/Salinity Sensor is not installed properly, it may allow the Cell to operate without water flow. This would cause a buildup of flammable gases which can result in FIRE or EXPLOSION.

- Mount as shown in Figure 8. This will result in the most reliable operation.
- The Flow/Temp/Salinity Sensor must be mounted:
  - (1) in the same line as the Electrolytic Cell.
  - (2) with no valves or diverters between the Flow/Temp/Salinity Sensor and Cell.
- Anytime the Flow/Temp/Salinity Sensor is connected or disconnected and reconnected, the AC power to the unit must be turned off and back on (Cycle Power). If power is not cycled, unreliable operation of the Flow/Temp/Salinity Sensor will result.

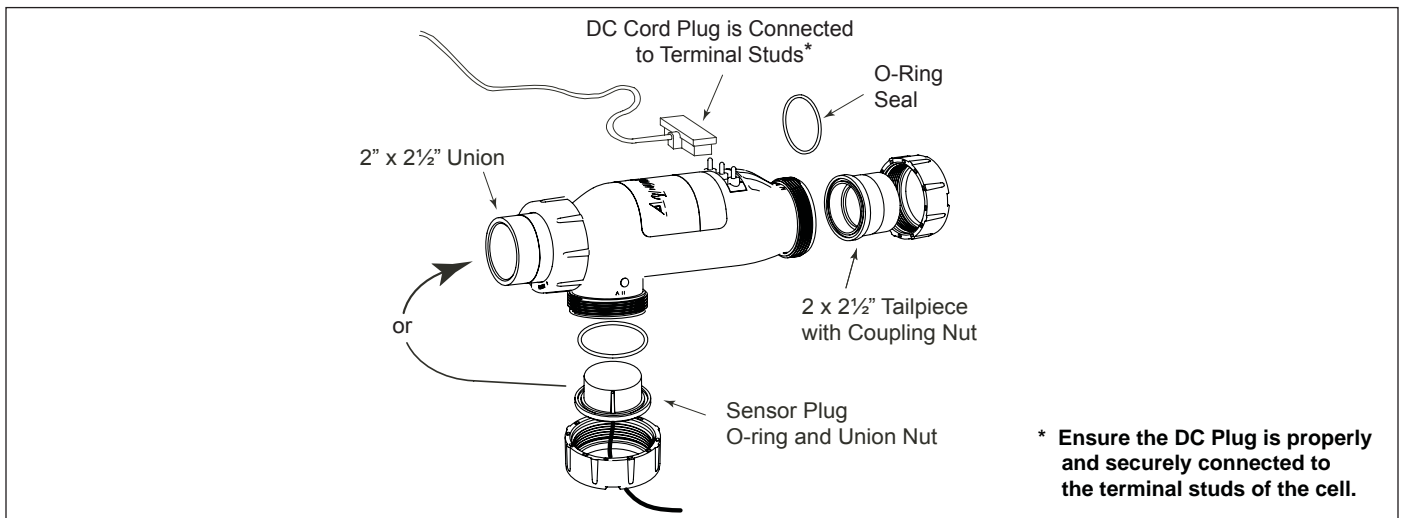
2. It is recommended that the Flow/Temp/Salinity Sensor and Electrolytic Cell be installed in the pool return line after the filter and heater. The Cell can be installed in either a horizontal (as shown in Figure 3) or a vertical position.
3. Position the Flow/Temp/Salinity Sensor and Cell in the recommended position (see page 8 Figure 3, page 9 Figures 4 and 5, and page 5 Figure 1).
4. Locate a suitable section of pipe, approximately 17 inches (432 mm) long or follow the recommended plumbing diagrams beginning on page 9, Figures 4 and 5. The Flow/Temp/Salinity Sensor cable and Cell DC cord ***must*** be able to reach from the control center to this section.

**⚠ WARNING**

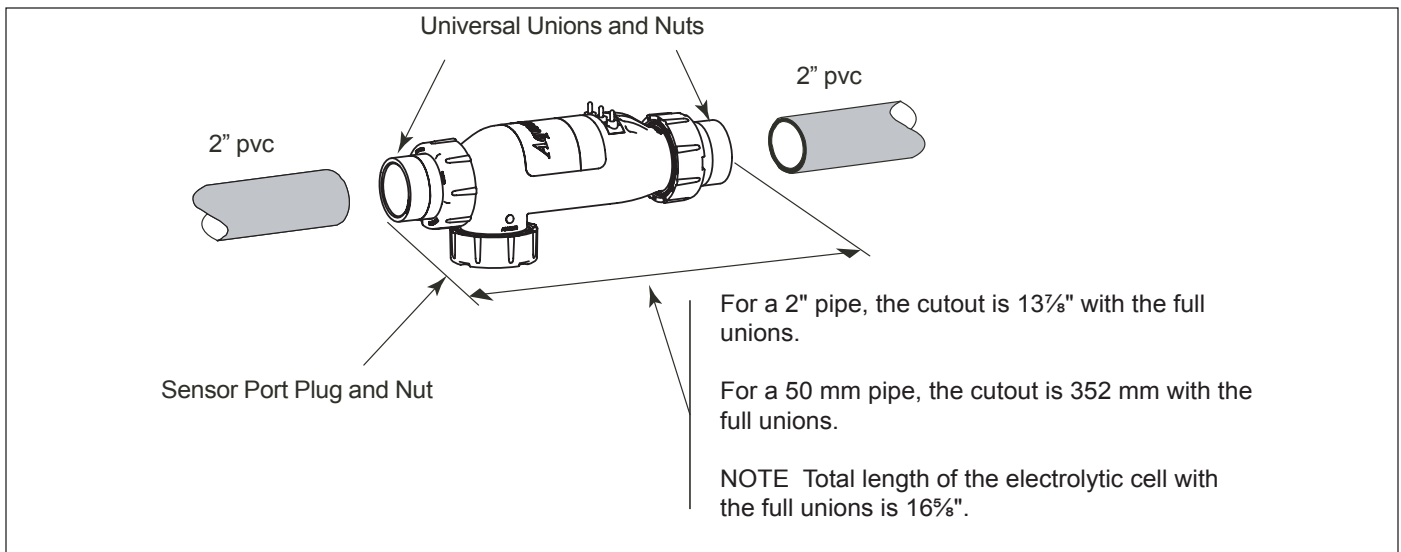
Do not operate the electrolytic cell without water circulation. A buildup of flammable gases can result in FIRE or EXPLOSION.



**Figure 8. Flow/Temp/Salinity Sensor**



**Figure 9. Cell Installation**



**Figure 10. Pipe Cutout**

5. Cut out a 13 $\frac{7}{8}$ " (352 mm) section of the 2" (50 mm) pipe to insert the Cell. See Figure 10.
6. Install the Flow/Temp/Salinity Sensor into the 3 -Port Cell.
7. Feed the connector end of the Flow/Temp/Salinity Sensor cable through the DC cord strain relief fitting located in the bottom of the control center chassis backplate. ***Be certain the connector is clean and dry***, then plug the cable into the connector on the control center Printed Circuit Board as shown on page 6 Figure 2. ***(Do not pull Flow/Temp/Salinity Sensor cable too tight, allow a little slack).***

 **CAUTION**

To avoid risk of damage to the equipment and possible injury, it is important to make sure the DC cable connector is fully seated on the cell stud terminals.

8. Plug the DC cord, in either direction, into the Cell stud terminals protruding from the Cell top. Make sure that the plug is fully inserted and bottomed out on the housing.
9. Connect the DC cord to the control center. Feed the DC cord through the same strain relief fitting as the Flow/Temp/Salinity Sensor. Plug the DC cord into the two push-on connectors located on the control center Printed Circuit Board as shown in Figure 2 on page 6.

 **CAUTION**

Do not bury the AquaPure DC cord or Sensor cable directly in the ground. Direct burial can cause damage to an electrical cord/cable.

10. Tighten strain relief fitting screws for the Flow/Temp/Salinity Sensor cable and the DC cord. ***Do not pull Flow/Temp/Salinity Sensor cable or DC Cord too tight. Allow a little cable slack inside of control center enclosure.***
11. Prior to reattaching front cover, check the wiring. Be sure the Flow/Temp/Salinity Sensor is plugged in. The DC cord should be plugged in. Also, check the AC wiring.

 **CAUTION**

Do not overtighten the strain relief fitting. Overtightening can cause damage to the Flow/Temp/Salinity Sensor cable.

12. If disconnected, plug the ribbon cable attached to the front cover PC board into Printed Circuit Board mounted on the backplate (See page 6 Figure 2). Now reattach the control center front cover to the backplate.

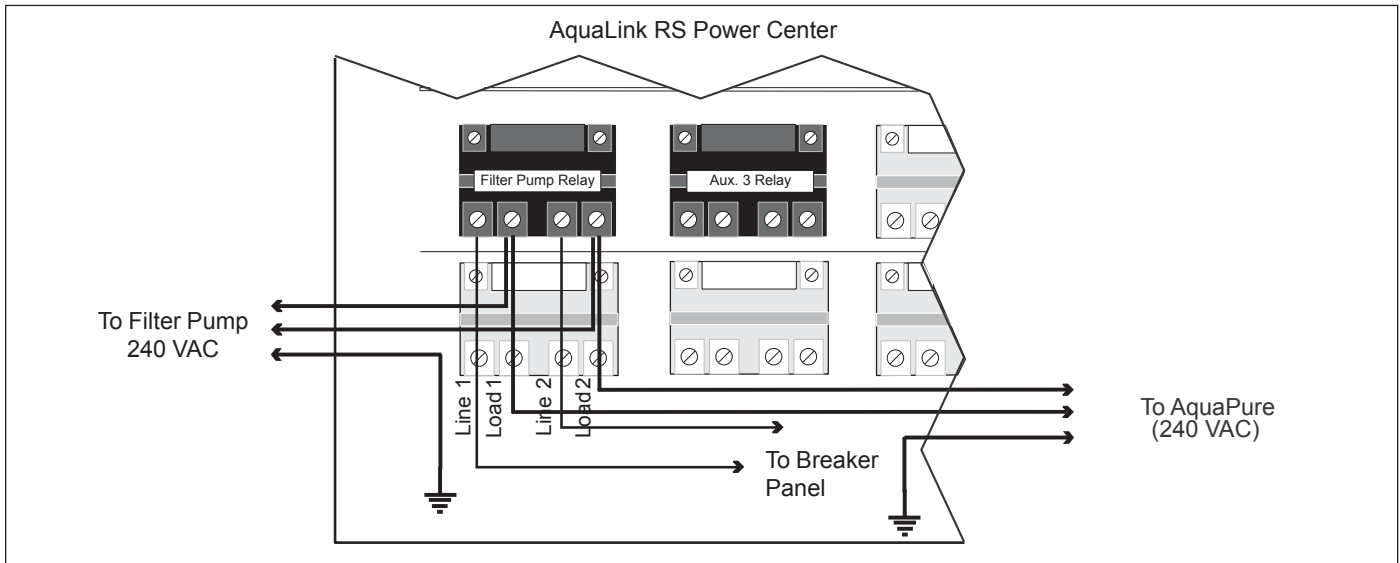
### 3.6 Connection to an AquaLink® RS Control System

The Jandy AquaLink RS is a multi-function pool controller and can fully control the function of the AquaPure chlorine generator. The AquaPure will display "JA" when a button is pressed at the AquaPure while the Jandy AquaLink RS is in control. Adjustment of the AquaPure chlorine production rate or Boost mode can be controlled from the main menu of the Jandy AquaLink RS or the AquaPure control box at the equipment. Boost mode may be activated from the AquaPure while the AquaLink RS is online. The AquaLink RS offers individual pool and spa settings for output %. Refer to the *AquaLink RS Owners Manual* for more information. The AquaPure temperature, salinity, service codes, and LED indicators operate as normal.

**NOTE** The AquaPure Chlorine Generator will communicate with AquaLink RS using firmware versions JJ or *later*.

### 3.6.1 Wiring to a Jandy AquaLink RS

In the AquaLink RS Power Center, wire the AquaPure power *directly* to the LOAD SIDE of the Filter Pump relay (see Figure 11).

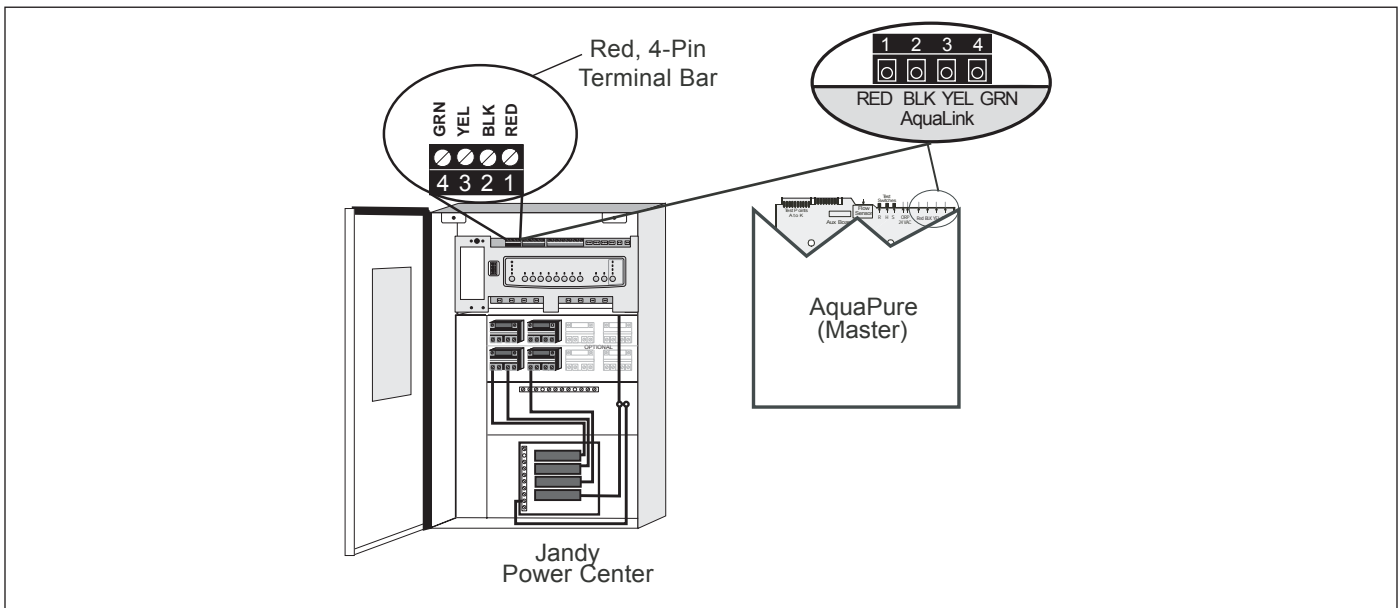


**Figure 11. Wiring AquaPure Power to an AquaLink RS Power Center**

The Jandy AquaLink RS and AquaPure use a four (4) wire connection to communicate and can be wired up to 500 feet apart. Any outdoor rated four (4) conductor cable, minimum 22 AWG, can be used. Locate the appropriate screw terminals on the circuit board according to Figure 12. Wire the AquaPure from the red 4-pin terminal bar to the AquaLink RS red 4-pin terminal bar (see Figure 12).

**NOTE** The screw terminals are removable to aid in installation.

**IMPORTANT** Attach the AquaPure wires to the like-numbered screw terminals on both the AquaPure and AquaLink RS as shown in Figure 12.



**Figure 12. Wiring an AquaPure to an AquaLink RS Control System Network**

### 3.6.2 Wiring Multiple AquaPure Units to a Jandy AquaLink RS

Only one AquaPure unit can be connected to the AquaLink RS network. Additional AquaPure units may be wired to the Filter Pump relay, but not to the AquaLink RS red, 4-pin terminal bar.

## Section 4. Pool Water Preparation

### 4.1 Determining Pool Size (m<sup>3</sup> of Water in Your Pool)

- **Rectangular Pools**

Average length (meters) x average width (meters) x average depth (meters) = m<sup>3</sup> capacity.

- **Circular Pools**

Diameter (meters) x diameter (meters) x average depth (meters) x 0.79 = m<sup>3</sup> capacity.

- **Oval Pools**

Long diameter (meters) x short diameter (meters) x average depth (meters) x 0.79 = m<sup>3</sup> capacity.

- **Sloping Sides**

Multiply total m<sup>3</sup> by 0.85 = m<sup>3</sup> capacity.

### 4.2 Determining Pool Size (Gallons of Water in Your Pool)

- **Rectangular Pools**

Average length (feet) x average width (feet) x average depth (feet) x 7.5 = gallon capacity.

- **Circular Pools**

Diameter (feet) x diameter (feet) x average depth (feet) x 5.9 = gallon capacity.

- **Oval Pools**

Long diameter (feet) x short diameter (feet) x average depth (feet) x 5.9 = gallon capacity.

- **Sloping Sides**

Multiply total gallons by 0.85 = gallon capacity.

 **CAUTION**

Never use dry acid to adjust pH in arid geographic areas with excessive evaporation and minimal dilution of pool water with fresh water. A buildup of by-products can damage the electrolytic cell.



### 4.3 Selecting Model Size

Model APURE700	Model APURE1400
<b>Chlorine Production</b> 283 gm (0.625 lbs) per 24 Hour period.	<b>Chlorine Production</b> 567 gm (1.25 lbs) per 24 Hour period.
<b>Residential Pools</b> One (1) unit per 45 m <sup>3</sup> (up to 12,000 gal) pool (See General Rule of Sizing notes below.).	<b>Residential Pools</b> One (1) unit per 151 m <sup>3</sup> (up to 40,000 gal) pool (See General Rule of Sizing notes below.).
<b>Commercial Pools</b> Check With Manufacturer. See Commercial Sizing Guide.	<b>Commercial Pools</b> Check With Manufacturer. See Commercial Sizing Guide.

**General Rule of Sizing:** In areas with year-round use and high water temperatures, such as Florida, Texas, Arizona, Las Vegas and Southern California, the following must be considered:

**Year Round Use:** Up-sizing the AquaPure or adding more than one AquaPure unit may be recommended for pools that are close to the maximum size and used year round. Please consult your pool professional.

**High Water Temperatures:** Because chlorine demand increases with the rise of water temperature, adjustments must be made in order to keep up with chlorine demand. In hot summer months, where the water temperature rises above 85°F, you must increase the pump run time, increase the AquaPure output %, increase the Stabilizer (cyanuric acid) to 75-85 PPM, and super chlorinate with other chlorine agents other than the AquaPure, to reach break-point chlorination.

### 4.4 Chemistry You Need to Know

1. **Chlorine Stabilizer** (cyanuric acid) is needed to maintain proper levels of chlorine. Most unstable chlorine is destroyed by the UV radiation from the sun within 2 hours. Chlorine stabilizer should be maintained between 50 - 75 PPM. See Table 2, page 20.
2. **Nitrates** can cause extremely high chlorine demands and will deplete chlorine from your swimming pool. In some cases Nitrates may even lower your chlorine levels to zero. Your local pool professional can test for Nitrates. Make sure Nitrates are not present in your pool.
3. **Metals** (some metals) can cause loss of chlorine. Also, metals can stain your pool. Have your local pool professional check for metals and recommend methods of removal.
4. **Chloramines** should not be present in pool water. When organic materials combine with Free Chlorine, Chloramines are formed. This ties up the Free Chlorine in your pool and does not allow the chlorine in your pool to disinfect. Chloramines also cloud pool water and burn the eyes. (Super Chlorinate (shock) to remove Chloramines at the initial startup of the pool).
5. **Super Chlorination** (Shocking) burns out the organic material that has combined with chlorine. This frees the chlorine for sanitizing. This is accomplished by raising the chlorine level quickly and dramatically. When the chlorine level is raised to 5 - 15 PPM the pool water is said to have been Super Chlorinated (shocked). As pool water is continuously passed through the AquaPure Electrolytic Cell, all pool water inside the cell is being Super Chlorinated. When the AquaPure is used on pools the pool water sparkles and does not burn the eyes because of the absence of Chloramines.

**NOTE** On initial startup of a pool, it is best to Super Chlorinate from an outside source, i.e., use a shock treatment available at your local pool supplier.

6. **pH** produced by the AquaPure is close to Neutral pH. However, other factors usually cause the pH of the pool water to rise. Therefore, the pH in a pool chlorinated by the AquaPure tends to stabilize at approximately 7.8. This is within Association of Pool and Spa Professionals (APSP) standards. If the pool pH rises above 7.8 have a pool professional test to see if other factors such as high Calcium Hardness or Total Alkalinity are the cause and then balance accordingly.
7. **Total Dissolved Solids (TDS)** Adding salt to pool water will raise the TDS level. While this does not adversely affect the pool water chemistry or clarity, the pool water professional testing for TDS must be made aware salt has been added for the AquaPure system. The individual performing the TDS test will then subtract the salinity level to arrive at the correct TDS level.

8. New Pool Water in a recently filled or newly refinished pool may contain undesirable matter. This undesirable matter could interfere with the AquaPure's ability to chlorinate properly. Make sure the water is tested by a pool professional and properly balanced before turning on the AquaPure.

#### 4.5 Optimum Pool Water Conditions

In accordance with Association of Pool & Spa Professionals (APSP) standards, we recommend the following water balance conditions be maintained on an on-going basis to protect the pool finish and equipment and ensure the pleasing appearance of the water. The AquaPure is warranted to operate properly only if these conditions are met.

<b>Free Chlorine</b>	1.0 - 3.0 PPM. Above 3.0 PPM may cause corrosion of pool metals.
<b>Combined Chlorine (Chloramines)</b>	None (Super Chlorinate to remove all Chloramines).
<b>pH</b>	7.2 - 7.8 (Use Muriatic Acid to lower pH and Soda Ash to raise pH).
<b>Chlorine Stabilizer (Cyanuric Acid)</b>	50 - 75 PPM
<b>Total Alkalinity</b>	80 - 120 PPM
<b>Calcium Hardness</b>	150 - 400 PPM
<b>Metals (Copper, Iron, Manganese)</b>	None
<b>Nitrates</b>	None

#### 4.6 Chlorine Testing

It is recommended that chlorine test samples be taken from two places. Compare the samples. A higher level should be found at the pool return line. The higher level at the pool return line indicates the AquaPure is producing chlorine.

1. At the pool return line.
2. 18 inches (457 mm) below the surface and well away from the pool return line.

#### 4.7 Salt (NaCl sodium chloride)

##### 4.7.1 When to Add Salt?

For a new pool or newly resurfaced pool it is recommended to wait 14 days (surface should be completely cured) before adding salt. Follow the pool surface Manufacturer's guidelines for your particular pool. For vinyl and fiberglass pools, salt can be added at start up.

##### 4.7.2 What Type of Salt to Use?

- The purer the salt the better the life and performance of the electrolytic cell. Use a salt that is at least 99.8% pure NaCl. The preferred salt is an evaporated, granulated, food quality, non-iodized salt. Consult your salt supplier.
- Avoid using salt with anti-caking agents (sodium ferrocyanide, also known as YPS or yellow prussiate of soda) that could cause some discoloration of fittings and surface finishes in pool.
- Water conditioning salt pellets are compressed forms of evaporated salt and may be used but will take longer to dissolve.
- **Do Not** use calcium chloride as a source of salt. (Use sodium chloride only).
- **Do Not** use Rock salt (insoluble impurities mixed with the rock salt can shorten the life of the unit).

### 4.7.3 How Much Salt to Use?

Use Table 1 to determine how much salt will be needed. Most pools contain some salt depending on the water source and chemicals used for sanitizing. If the AquaPure has not been wired and turned on yet, a hand held meter calibrated for NaCl (salt) can be used to determine the existing salt concentration of the water. If the AquaPure is wired in (connected), use it to determine the salinity.

Set Chlorine Production to 00%. Operating the unit above 00% production without salt will damage Cell. The **Salinity** button **C** on the AquaPure can be used to determine salinity in the case of a new pool installation, or a complete water change so long as the Chlorine Production is set to 00%. See *Section 5.4.2, step 2*.

- 3.0 to 3.5 gpl of salt is recommended for optimum water conditions.
- Low salt concentration below 2.0 gpl will cause premature cell failure.
- High salt concentration above 4.0 gpl may damage the power center.
- High salt concentration above 6.0 gpl may cause corrosion damage to pool fixtures.

**NOTE** Should too much salt be inadvertently added to the pool see *Section 7, Troubleshooting*.

**NOTE** To convert gpl (grams per liter) of a salt solution to PPM (Parts Per Million) of a salt solution multiply by 1000, i.e., 3.0 gpl salt X 1000 = 3000 PPM salt.

### 4.7.4 How to Add Salt to the Pool?

1. Turn on pump to circulate pool water.
2. **IMPORTANT - Turn the AquaPure off by pressing the arrow button A and setting CHLORINE PRODUCTION Rate to 00%.**
3. Determine amount of salt from the following charts.
4. Broadcast or spread the salt into the outer perimeter of the pool, or into the shallow end of the pool for quick and even distribution.
5. **To avoid clogging the filter or damaging control center and pump, do not add salt through the skimmer, main drain, or surge tank.**
6. Brush the pool bottom and allow water to circulate for 24 hours to dissolve completely and mix evenly with the pool water.
7. After 24 hours, verify correct salt reading.
8. Turn on the AquaPure and set to desired Production rate (Press arrow button **B** ).

**NOTE** For a new pool or newly resurfaced pool it is recommended to wait 14 days (surface should be completely cured) before adding salt. Follow the pool surface manufacturers guidelines for your particular pool. For vinyl and fiberglass pools, salt can be added at start up.

**⚠ CAUTION**

It is important to note that certain materials used in and around swimming pools and spas may not be compatible with chemicals commonly used to purify pool and spa water (e.g. acids, chlorine, salt, stabilizers, etc.).

As such, Jandy Pool Products, Inc. does not warrant or guarantee that the chlorinated water generated by the AquaPure will not damage or destroy certain types of plants, decking, coping and other materials in and around your pool and/or spa. Before selecting materials to be used in and around your pool and/or spa, please discuss all options with your contractor to assess the compatibility of such materials and chemicals.

Some helpful considerations may include:

- Choosing plants that can withstand splash out of pool water containing chlorine and/or salt and other water purification chemicals.
- All metal components used in and around a pool should be of a high grade, quality stainless steel.
- Careful selection of masonry products. The porosity and hardness of natural stones varies greatly. Therefore we recommend you consult with your builder or stone contractor on the best choice for stone materials around your pool or spa.
- Sealing all masonry products. Professionals in the stone industry specify that even natural stone, especially when used outdoors, be sealed to prevent weathering, staining, and premature degradation. Consult with your stone or deck contractor for the proper sealer for the masonry products you have selected to use around your pool or spa.
- For the optimal results, sealers should be reapplied on a regular basis. Reapply the protective sealer on a schedule per the manufacturer's instructions.

**Table 1. Approximate Kilograms (Pounds) of Salt Needed to Obtain 3.0 gpl (3,000 PPM) in Pool**

Salt Concn. Before Addition	Pool Size (US Gallons)															
	38m <sup>3</sup> (10,000)	45m <sup>3</sup> (12,000)	53m <sup>3</sup> (14,000)	60m <sup>3</sup> (16,000)	68m <sup>3</sup> (18,000)	76m <sup>3</sup> (20,000)	83m <sup>3</sup> (22,000)	91m <sup>3</sup> (24,000)	98m <sup>3</sup> (26,000)	106m <sup>3</sup> (28,000)	113m <sup>3</sup> (30,000)	121m <sup>3</sup> (32,000)	129m <sup>3</sup> (34,000)	136m <sup>3</sup> (36,000)	144m <sup>3</sup> (38,000)	151m <sup>3</sup> (40,000)
0.00 g/l	113 kg (250 lbs)	136 kg (300 lbs)	159 kg (350 lbs)	181 kg (400 lbs)	204 kg (450 lbs)	227 kg (500 lbs)	249 kg (550 lbs)	272 kg (600 lbs)	295 kg (650 lbs)	318 kg (700 lbs)	340 kg (750 lbs)	363 kg (800 lbs)	386 kg (850 lbs)	408 kg (900 lbs)	431 kg (950 lbs)	454 kg (1000 lbs)
0.25 g/l	104 kg (230 lbs)	127 kg (280 lbs)	145 kg (320 lbs)	168 kg (370 lbs)	188 kg (415 lbs)	209 kg (460 lbs)	231 kg (510 lbs)	249 kg (550 lbs)	272 kg (600 lbs)	293 kg (645 lbs)	313 kg (690 lbs)	334 kg (736 lbs)	355 kg (782 lbs)	376 kg (828 lbs)	396 kg (874 lbs)	417 kg (920 lbs)
0.50 g/l	95 kg (210 kg)	113 kg (250 lbs)	134 kg (295 lbs)	154 kg (340 lbs)	172 kg (380 lbs)	191 kg (420 lbs)	209 kg (460 lbs)	229 kg (505 lbs)	247 kg (545 lbs)	268 kg (590 lbs)	286 kg (630 lbs)	305 kg (672 lbs)	324 kg (714 lbs)	343 kg (756 lbs)	362 kg (796 lbs)	381 kg (840 lbs)
0.75 g/l	86 kg (190 lbs)	104 kg (230 lbs)	122 kg (270 lbs)	136 kg (300 lbs)	154 kg (340 lbs)	172 kg (380 lbs)	191 kg (420 lbs)	209 kg (460 lbs)	225 kg (495 lbs)	240 kg (530 lbs)	259 kg (570 lbs)	276 kg (608 lbs)	293 kg (646 lbs)	310 kg (684 lbs)	327 kg (722 lbs)	345 kg (760 lbs)
1.00 g/l	75 kg (165 lbs)	91 kg (200 lbs)	104 kg (230 lbs)	120 kg (265 lbs)	136 kg (300 lbs)	150 kg (330 lbs)	163 kg (360 lbs)	181 kg (400 lbs)	195 kg (430 lbs)	209 kg (460 lbs)	225 kg (495 lbs)	240 kg (528 lbs)	254 kg (561 lbs)	269 kg (594 lbs)	284 kg (627 lbs)	299 kg (660 lbs)
1.25 g/l	66 kg (145 lbs)	79 kg (175 lbs)	91 kg (200 lbs)	104 kg (230 lbs)	118 kg (260 lbs)	132 kg (290 lbs)	145 kg (320 lbs)	159 kg (350 lbs)	172 kg (380 lbs)	186 kg (410 lbs)	197 kg (435 lbs)	210 kg (464 lbs)	224 kg (493 lbs)	237 kg (522 lbs)	250 kg (551 lbs)	263 kg (580 lbs)
1.50 g/l	57 kg (125 lbs)	68 kg (150 kg)	79 kg (175 lbs)	91 kg (200 lbs)	102 kg (225 lbs)	113 kg (250 lbs)	125 kg (275 lbs)	136 kg (300 lbs)	147 kg (325 lbs)	159 kg (350 lbs)	170 kg (375 lbs)	181 kg (400 lbs)	193 kg (425 lbs)	204 kg (450 lbs)	215 kg (475 lbs)	227 kg (500 lbs)
1.75 g/l	48 kg (105 lbs)	59 kg (130 lbs)	68 kg (150 kg)	77 kg (170 lbs)	86 kg (190 lbs)	95 kg (210 kg)	104 kg (230 lbs)	113 kg (250 lbs)	125 kg (275 lbs)	134 kg (295 lbs)	143 kg (315 lbs)	152 kg (336 lbs)	162 kg (357 lbs)	171 kg (378 lbs)	181 kg (399 lbs)	191 kg (420 lbs)
2.00 g/l	39 kg (85 lbs)	45 kg (100 lbs)	54 kg (120 lbs)	63 kg (140 lbs)	68 kg (150 kg)	77 kg (170 lbs)	86 kg (190 lbs)	93 kg (205 lbs)	109 kg (240 lbs)	109 kg (240 lbs)	116 kg (255 lbs)	123 kg (272 lbs)	131 kg (289 lbs)	139 kg (306 lbs)	147 kg (323 lbs)	154 kg (340 lbs)
2.25 g/l	27 kg (60 lbs)	32 kg (70 lbs)	39 kg (85 lbs)	45 kg (100 lbs)	50 kg (110 lbs)	54 kg (120 lbs)	59 kg (130 lbs)	66 kg (145 lbs)	73 kg (160 lbs)	76 kg (168 lbs)	82 kg (180 lbs)	87 kg (192 lbs)	93 kg (204 lbs)	98 kg (216 lbs)	103 kg (228 lbs)	109 kg (240 lbs)
2.50 g/l	18 kg (40 lbs)	23 kg (50 lbs)	27 kg (60 lbs)	29 kg (65 lbs)	32 kg (70 lbs)	36 kg (80 lbs)	41 kg (90 lbs)	45 kg (100 lbs)	48 kg (105 lbs)	50 kg (110 lbs)	54 kg (120 lbs)	58 kg (128 lbs)	62 kg (136 lbs)	65 kg (144 lbs)	69 kg (152 lbs)	73 kg (160 lbs)
2.75 g/l	9 kg (20 lbs)	11 kg (25 lbs)	14 kg (30 lbs)	14 kg (30 lbs)	18 kg (40 lbs)	18 kg (40 lbs)	20 kg (45 lbs)	23 kg (50 lbs)	23 kg (50 lbs)	27 kg (60 lbs)	27 kg (60 lbs)	29 kg (64 lbs)	31 kg (68 lbs)	33 kg (72 lbs)	34 kg (76 lbs)	36 kg (80 lbs)

**NOTE** Add salt as required to maintain 3.0 gpl concentration

**IMPORTANT** Add 0.57 kg (1.25 lbs) of Stabilizer per 22.7 kg (50 lbs) of Salt.

**Table 2. Approximate Pounds (kg) of Salt Needed to Maintain 3.0 gpl (3,000 PPM)**

Salt Concentration. Before Addition	Salt Addition Required per 1000 gallon pool capacity	Salt Concentration Before Addition	Salt Addition Required per 1000 gallon pool capacity
0.0 gpl	25.6 lbs (11.6 kg)	1.5 gpl	12.8 lbs (5.8 kg)
0.3 gpl	23.5 lbs (10.7 kg)	1.8 gpl	10.7 lbs (4.8 kg)
0.5 gpl	21.4 lbs (9.7 kg)	2.0 gpl	8.5 lbs (3.9 kg)
0.8 gpl	19.2 lbs (8.7 kg)	2.3 gpl	6.4 lbs (2.9 kg)
1.0 gpl	17.1 lbs (7.8 kg)	2.5 gpl	4.2 lbs (1.9 kg)
1.3 gpl	15 lbs (6.8 kg)	2.8 gpl	2.2 lbs (1 kg)

## Section 5. Operating Instructions



Figure 13. Control Center Front Panel

### 5.1 Using the Front Panel Controls

**Chlorine Production Rate (more or less) Adjustment**

Pressing the arrow button **A** or arrow button **B** will change the **CHLORINE PRODUCTION** in 5% increments. Generally, adjustments to production should be made in 10% increments.

**Salinity**

Press the **Salinity** button **C** to check the salinity of the water in pool.

**Boost**

Press and hold the **Temperature** button **D** for 10 seconds to enter the **Boost** mode (Note 'bo' will flash intermittently). **Boost** can be used to set chlorine production to maximum (100%) for 24 hours of operation. After 24 hours of chlorinator run time, chlorine production will return to previous setting. To clear the **Boost** mode, press and hold the **Temperature** button again for 10 seconds.

**NOTE** The Chlorine Production Rate buttons can be used to adjust the output % when the AquaPure is controlled by the AquaLink RS only when the AquaLink RS is placed into Service Mode. (This feature is available with AquaPure front PCB firmware version 11230A05 or later. Your firmware revision number can be found on the back of the front AquaPure PCB.) If arrow button **A** or arrow button **B** is pressed, **JA** in the AquaPure display indicates that the AquaLink RS is controlling the AquaPure and desired output percentages. The Boost button at the AquaPure Control Panel will start Boost cycle when the AquaLink RS is online.

**Chlorine Production Rate (more or less) Adjustment with AquaLink RS Online**

The AquaLink RS Control System must be set to Service Mode before you can change the chlorine production levels from the AquaPure Service Panel.

**AquaLink RS Power Center**

Press the Mode Select button to move the AquaLink RS from Auto Mode into Service Mode. The indicator light located next to the Service will turn ON.

Press the Valve Select button to choose either Pool Mode to change pool chlorine production, or Spa Mode to change spa chlorine production.

Press the Filter Pump button to turn on the pump and apply power to the AquaPure system.

**AquaPure Service Panel**

Press the arrow button **A** or arrow button **B** to change the **CHLORINE PRODUCTION** in 5% increments. Generally, adjustments to production should be made in 10% increments.

**AquaLink RS Power Center**

Press the Mode Select button to put the AquaLink RS in the Time Out mode.

Press the Mode Select button again to place it back into Auto mode.

**NOTE** The Power Center must be in pool mode to change the AquaPure pool setting; it must be in spa mode to change the AquaPure spa setting, use the valve select button to switch between the two modes. System must be cycled through SERVICE, TIME OUT, then back to AUTO to accept the Pool Setting versus the Spa Setting.

**NOTE** When a pool pump timer is used to limit chlorinator run time, the 24 hours will only count down when the chlorinator is on.

**Temperature**

Press the **Temperature** button **D** to check the pool water temperature. Temperature measurements can be displayed in either Fahrenheit or Celsius. For more information, see Section 8, *Temperature Conversion*.



## 5.2 Reading the Display

<b>Cell On</b>	The <b>CELL ON</b> indicator shows that the cell has been turned on by the control center. Some reasons for the <b>CELL ON</b> indicator not being on during normal operation, are: <b>CHLORINE PRODUCTION</b> set to 00%, <b>CHLORINE PRODUCTION</b> set to less than 100% and <b>Cell Resting</b> appears during cell rest period, <b>NO FLOW</b> condition, two minutes before automatic cleaning cycle, Low temperature cut off has been activated, or a service related problem such as a salinity level below 2.0 gpl or salinity level too high.
<b>Cell Resting</b>	During the Normal chlorine production cycle when the unit is set for less than 100% the cell will periodically rest, i.e., not make chlorine. The <b>CELL RESTING</b> indicator shows that the cell has been turned off by the control center. The reason for the <b>CELL RESTING</b> indicator, during normal operation, is <b>CHLORINE PRODUCTION</b> set to less than 100%.
<b>Flow or No Flow Indication</b>	When the control center determines that water is flowing past the Flow/Temp/Salinity Sensor, the <b>FLOW</b> indicator is displayed. When no flow is detected, the <b>NO FLOW</b> is displayed and the cell is turned off.
<b>Cell Reversing</b>	The automatic cleaning cycle of the AquaPure is in progress. The cleaning cycle is factory set and cannot be adjusted. Cell Reversing does not interrupt the production of Chlorine.
<b>Salinity</b>	Salinity is displayed along with the <b>gpl</b> (grams per liter) indicator, when the <b>Salinity</b> button is depressed. If a reading of HH appears, the salinity is above 4.5 to 6.5 gpl (depending on pool temperature) and is too high to measure correctly (at normal temperatures). Maintain Salinity between 3.0 and 3.5 gpl. See pages 17 through 20.
<b>Add Salt</b>	The <b>ADD SALT</b> indicator comes on when the Flow/Temp/Salinity Sensor determines that the salinity level of the pool water is too low. Maintain Salinity between 3.0 and 3.5 gpl.
<b>Service and Service Code</b>	The <b>SERVICE</b> indicator will turn on whenever the AquaPure detects a problem that requires attention. The <b>SERVICE</b> indicator is accompanied by a service code displayed on the front panel, displayed as a 3 digit code. The service code(s) are displayed twice per minute with an audible alarm.

**NOTE** See "Service Codes" page 33. Problems can range from insufficient salinity to the DC cord not connected. See troubleshooting.

<b>Audible Alarm</b>	An audible alarm (beep) sounds once per hour, and only for the first service code when a <b>Service</b> condition is detected. The Alarm can be cleared by pressing and holding the <b>Salinity</b> button <b>C</b> for 5 seconds. The audible alarm can be cleared for 24 hours or until the power to the unit is turned off and back on whichever comes first. However, the audible alarm will return if a new problem is detected.
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**NOTE** The audible alarm can be permanently disabled by removing the blue jumper from J10 on the control center front cover PCB.

**Beeper Control** Beeper operation and volume control can be adjusted.

To adjust volume control, press and hold the **TEMPERATURE** button for 15 seconds. The system will beep once when pressed, once after 10 seconds and once after 15 seconds. Release the key after the third beep.

Press the **Salinity** button within 5 seconds to enter the temperature change screen.

The system will display a '1' followed by 'F' or 'C'. Press the **TEMPERATURE** button to move to the second parameter screen. The screen will display a 0, and the beeper volume will be fully reduced. The system will occasionally show a '2' to display the screen number.

Press the arrow button B to increase the volume and the arrow button A to reduce the volume. The volume increments from 0 to 100 in 20 steps. After each press of the arrow buttons, the beeper will activate to demonstrate the current volume level.

When the beeper volume has been adjusted to the desired setting, press the **Salinity** button to confirm the new beeper volume setting. The change will be stored in permanent memory.

If you do not wish to keep the change, wait 5 seconds, and the change screen will 'time out' and return to normal operation without keeping any changes to the system. Any changes made to the beeper volume will NOT be saved if this occurs.

The **Boost** cycle is normally activated after 10 seconds. However, if the key is held down until after the third beep at 15 seconds, the **Boost** mode will not be changed.

### 5.3 Operation

#### CAUTION

Before attempting to operate refer to page 15 - Pool Water Preparation. Also, do not adjust Chlorine production above 00% until it is certain that salt has been dissolved in pool. Operating without salt will damage Electrolytic Cell.

**Use of an external Pool Pump Timer is not required.** The AquaPure is designed to supply a sufficient amount of chlorine to sanitize pool water on a daily basis. If the AquaPure is operated 24 hours a day at 100%, more chlorine would be generated than would be needed by most pools (1-3 PPM). The AquaPure has its own internal timer which cycles the electrolytic cell on and off depending on what percent the Chlorine Production is set. For instance, at 100% the cell works all the time. When set at 90%, the cell is allowed to rest 10% of the time prolonging cell life. In order to fine tune the AquaPure to any size pool just increase or decrease the Chlorine Production from 00% to 100%. (see "Apply Power" Section 5.4.2, page 25, steps 1-5 )

- Check Chlorine Level on a regular basis and adjust AquaPure accordingly.

**If you use a Pool Pump Timer.** The Association of Pool & Spa Professionals (APSP) recommends that all water in a residential pool pass through the filtration system at least once every 12 hours (referred to as pool water turnover). However, many factors have an effect on actual pump and filter system run times. Pool size, source of water, direct sun light, indoor/outdoor, screened/unscreened, filtration system, cold or hot weather, swimmer load, rain, organic debris, algae, etc., are all factors which contribute to either more or less pool pump and filter system run times. Because of these differences, it is extremely difficult to set an initial run time (starting point) for the pool pump and chlorinating system.

Try initially setting the Pool Pump Timer to 12 hours. It will take a few days to get just the right pool pump operating time. Adjust accordingly using the steps listed below ( Section 5.4.2, steps 1-5 ). When the AquaPure is wired with a Pool Pump Timer (See page 6 Figure 2) **results will vary greatly from one pool installation to the next, so this should be discussed with either the pool builder or the local pool professional. The key points are:**

- Operate pool pump at least the minimum time needed for good filtration.
- The Pool Pump Timer reduces energy consumption.

**NOTE** Exception - For Cold Weather Operation: If the AquaPure is run 24 hours a day through the winter, extremely cold water temperatures can affect Cell life. Sometimes it will be necessary to run the AquaPure at a very low production rate of 10% to 20% or to turn the unit off. See Winterizing on page 29.

**NOTE** The generator only operates when the pump is running. During hot weather months you may need to increase pump run time to allow sufficient chlorine production.

## 5.4 Startup

### 5.4.1 Shocking

**Shocking (Super Chlorination) is recommended before pool startup.** Start out with good pool water from the beginning. The AquaPure will build up a sufficient level of chlorine for sanitation in several hours. However, if pool water has a high demand from the startup the AquaPure will not be able to produce enough chlorine to reach break point chlorination. So, it is best to super chlorinate from an outside source at the time of pool startup. Then, wait until the chlorine level has returned to 1 to 3 PPM before turning on the AquaPure.

### 5.4.2 Apply Power

1. Turn on the pool pump switch or Pool Pump Timer. When the AquaPure is first turned on (cold), the unit will beep. Next it will self-calibrate the Flow/Temp/Salinity Sensor. After going through an internal test and calibration, the LCD will display the current setting for Chlorine Production (00% to 100%). During the calibration period “Wait” will appear. “Wait” means the unit is self calibrating and doing internal testing. This usually takes less than 6 minutes.
2. Check salinity level by pressing the **Salinity** button. It should read between 3.0 gpl and 3.5 gpl. If it does not then press the **Salinity** button two or three more times until the salinity reading stabilizes.

**NOTE** If still less than 3.0 gpl refer to pages 18 through 20 and adjust salt level. (Maintain the Recommended Salinity Level of 3.0 to 3.5 gpl). If salinity is below 2.0 gpl the AquaPure will automatically turn the cell off until the salinity is raised above 2.0 gpl, since operating with low salt will damage Cell. Likewise, if salinity is above the range of measurement the AquaPure will automatically turn the cell off until the salinity is lowered to a measurable level, since operating with high salt will damage the control center. If salinity is greater than 3.5 gpl, see Troubleshooting, page 30.

3. Adjust the Chlorine Production to 50% by pressing the arrow button **B**.

4. After 24 hours, use a reliable test kit to test the pool water for free active chlorine. The ideal range to maintain is 1-3 PPM. If the chlorine content of the pool water is *too low, increase chlorine production by pressing the arrow button B*. If the chlorine content of the water is *too high, decrease chlorine production by pressing the arrow button A*. Adjust in 10% increments initially then in smaller increments as the correct chlorine level is approached.
5. Due to a varying chlorine demand of pool water, it may take a few days to determine the correct pool pump operating time and chlorine production percentage setting for your pool. Continue adjusting as necessary, allowing 24 hours between adjustments until the chlorine content of the pool water has stabilized at 1-3 PPM.

## 5.5 Operating in Winter

See Winterizing on Page 29.

## 5.6 Recommendations

### DO List

- Read and keep your manual in a safe place.
- Increase Chlorine Production before party time and return to normal afterwards.
- Increase Chlorine Production when temperature goes up.
- Increase Chlorine Production when number of guests goes up.
- Use Stabilizer (Cyanuric Acid) to Stabilize Chlorine in Pool.
- Mount Control Center in shade or out of the direct sunlight whenever possible.
- Decrease Production when temperature goes down during Fall/winter etc.
- Take Pool water sample to Pool Professional once per month.

### DON'T List

- Do not get fertilizer in your pool. Fertilizers contain nitrates which cause a high chlorine demand on pool water.
- Never use dry acid to adjust pH in arid geographic areas with excessive evaporation and minimal dilution of pool water with fresh water. A build up of by products can damage the electrolytic cell.
- Do not add any pool water balancing chemicals (including salt) unless the AquaPure is turned off.
- Do not let Chlorine Stabilizer drop below 50 PPM.
- Do not add salt without first checking the pool salinity level. Too much salt can disable and possibly damage the chlorinator.

## Section 6. User Maintenance Instructions

The following information describe how to care for your AquaPure.

### 6.1 Daily

*None.*

### 6.2 Weekly

1. **Chlorine Test.** Test pool water chlorine level with a reliable test kit. Maintain ideal range by adjusting the AquaPure chlorine production rate as discussed on pages 25 through 26 steps 3, 4, and 5. Recommended Free Chlorine is 1-3 PPM.

**NOTE** It is recommended that chlorine test samples be taken from two places, one at the pool return line, the other well away from the pool return line. Compare the samples. A higher level should be found at the pool return line. The higher level at the pool return line indicates the AquaPure is producing chlorine.

2. **pH Level Test.** Test the pH level of your pool with a test kit. If necessary, adjust according to your pool professional's recommendations. APSP standard of 7.2 - 7.8 is recommended.

#### CAUTION

Never use dry acid to adjust pH in arid geographic areas with excessive evaporation and minimal dilution of pool water with fresh water. A build up of by products can damage the electrolytic cell.

### 6.3 Monthly

1. **Salt Level Test.** Test pool water salt level by depressing the **Salinity** button **C** and reading the LCD located on the front cover of the AquaPure control center. Maintain the ideal range of 3.0-3.5 gpl for optimum performance of the AquaPure. If additional salt is required, follow the procedures and charts described on pages 17 through 20. If salt level does not rise after 24 hours, see Troubleshooting on page 30.
2. **Pool Water Sample.** Take water sample to local pool store for testing.
3. **Total Alkalinity Test.** Test pool water for total alkalinity with a test kit. Adjust according to your pool professional's recommendations. 80-120 PPM is the APSP Standard.
4. **Stabilizer (Cyanuric Acid).** Test pool water stabilizer (*cyanuric acid*) level using a test kit or by having a water sample tested by a pool professional. Maintain ideal range of 50-75 PPM. Follow your pool professional's recommendations.
5. **Calcium Hardness.** Test pool water for calcium hardness level using test kit or by having a water sample tested by a pool professional. If necessary, adjust according to your pool professional's recommendations. APSP standard of 150-400 PPM is recommended.
6. **Metals Test.** It is recommended that the pool water be tested periodically for the presence of metals such as copper, iron, and manganese. These metals should not be present in the pool water. If those metals are present, contact the local pool professional.

### 6.4 Electrolytic Cell Cleaning - As Needed

1. **Automatic Cleaning.** The control center has an automatic cell cleaning feature (Cell Reversing) that removes scale deposits from the electrolytic cell.

**NOTE** Automatic Cleaning does not interrupt Chlorine Production.

“Scale” is a white crusty deposit that forms in excessively hard water or from pool water that is out of balance and in a scaling condition. Following the installation of the AquaPure, check the cell once a month for several months. If the cell is clean, replace and re-check at the end of each swimming season. If the cell shows excessive scaling, go on to Step 2, Acid Wash Cleaning.

2. **Acid Wash Cleaning.** If the electrolytic cell has a tendency to scale, it is recommended that every two months the cell be removed and inspected for scale formation and/or debris. Some filters allow debris to pass through to the cell which could lodge between the plates in the cell. A small amount of scale formation is normal. If by looking through the cell it is observed that there is excessive scale formation between the plates or debris is present, the cell must be cleaned as follows:
  - a. Use a high pressure jet of water from a garden hose. If the cell cannot be reasonably cleaned in this manner, acid cleaning is necessary.
  - b. Remove the cell from the plumbing. Replace the cell with the spool piece, if necessary. Remove the sensor from the port.
  - c. To acid clean the cell, plug the two adjacent ports. Mix one pint of muriatic acid with two quarts of tap water in a plastic bucket. **Use the appropriate port plugs on the ports. Do not use the sensor as damage can result.**

 **WARNING**

Inhalation of muriatic acid vapor or contact with skin or eyes can cause serious injury or death. Wear goggles and rubber gloves, and perform cleaning in a well-ventilated area. Add acid to the water, do not add water to the acid as splashing could result.

- d. Pour the acid/water mixture inside the cell. A foaming action will begin, which is caused by scale (calcium carbonate) being dissolved from the plates. If rigorous foaming action does not begin, the cell does not need to be cleaned (**STOP THE CLEANING PROCESS- go on to next step “e”**). Otherwise, allow the cell to remain in the solution until the foaming has stopped. **However, do not leave in acid for more than 1/2 hour. \*(Excessive Acid Washing will damage Electrolytic Cell).**
- e. Rinse the cell thoroughly with clean tap water and inspect. If deposits are still visible, repeat the cleaning procedure. Additional acid may need to be added to the solution.
- f. Rinse the cell again with clean tap water and inspect. If clean, replace the cell and resume normal operation.
- g. If the acid wash procedure is necessary, it is recommended that a sample of pool water be analyzed by an authorized AquaPure service representative for excessive hardness and/or improper water balance.
- h. If no scale or debris deposits are observed in the cell after two bimonthly inspections, it is not necessary to continue bimonthly inspections. However, due to possible changes in pool water chemistry and filtering effectiveness, it is recommended that the cell be removed for inspection at least twice a year.

## 6.5 Flow/Temp/Salinity Sensor Cleaning

**One time per year or as needed.** It is rare but scale formations on the Flow/Temp/Salinity Sensor sometimes occur and will affect the accuracy of the salinity test.

1. Remove Flow/Temp/Salinity Sensor from the threaded PVC Tee or 3-Port Cell by turning counterclockwise or removing the union nut.
2. Brush with a mildly abrasive green fiber household cleaning pad. Contacts should be clean and bright.



3. Thoroughly rinse the Flow/Temp/Salinity Sensor with clean tap water. Replace and resume normal operation.
4. **Turn power off and back on in order to recalibrate and reset Flow/Temp/Salinity Sensor. Reset anytime Flow/Temp/Salinity Sensor is unplugged.**

## 6.6 Winterizing

Very little chlorine is needed in cold water. Below 51 Degrees Fahrenheit chlorine production is not permitted, i.e., operating chlorinator in cold water might allow the pool water to become over chlorinated. If more chlorine should be needed, **activating the “Boost” mode will override this cold water feature allowing chlorine production for 24 hours of operation.** See page 21.

If preventative measures are not taken, freezing water may cause severe damage to the Cell and Flow/Temp/Salinity Sensor. Prevent freeze damage to the Cell and Flow/Temp/Salinity Sensor by running pump continuously or winterize pool by draining water from pump, filter, and all intake and return lines. Remove the cell, clean and store it. Disconnect the Flow/Temp/Salinity Sensor from the control center, then remove it from the threaded PVC Tee or 3-Port Cell. Wrap Flow/Temp/Salinity Sensor in a plastic bag or protective covering and coil Flow/Temp/Salinity Sensor and DC power cord cables around the control center for storage. Cap the third port of the cell with provided plug and cap.

An optional Spool Piece is available to replace the cell during winterizing or cell maintenance. This will enable the pool pump to circulate water with the cell out of the line. See Figure 14.

When a FREEZE CONTROLLER is used on pump equipment and the AquaPure is run through the winter, turn the AquaPure CHLORINE PRODUCTION down to 10 - 20%. Otherwise, chlorine production will exceed the recommended level of 1.0 - 3.0 PPM.

**NOTE** Above 3.0 PPM may cause corrosion of pool metals and possibly cause damage to associated pool equipment.

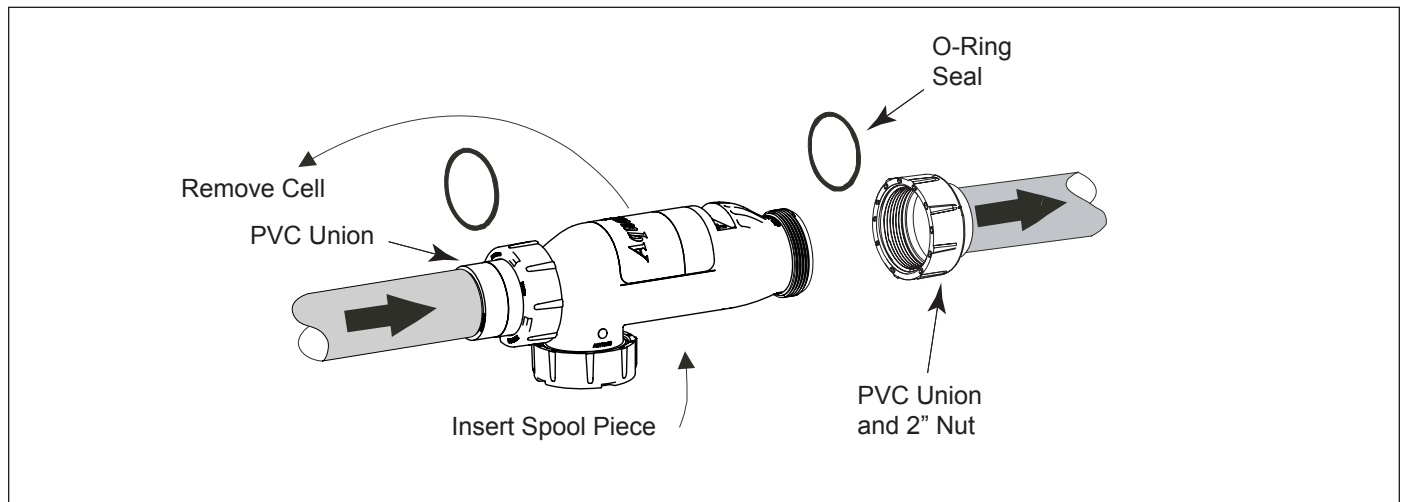


Figure 14. Spool Piece Location

## Section 7. Troubleshooting

**NOTE:** Turn off power to unit prior to attempting service or repair.

### 7.1 Problems and Corrective Action

Problem	Possible Cause	Corrective Action
Low or no chlorine.	Low <i>stabilizer</i> (cyanuric acid) level in pool water.	Add stabilizer to maintain 50 - 75 PPM per pool professional's recommendations..
	Insufficient operating hours of the pool filtration pump.	Increase the AquaPure operating time per day. See pages 22 through 24.
	CHLORINE PRODUCTION percentage set too low or off at 00%.	Increase chlorine production by pressing the Chlorine Production Rate Adjustment button (arrow button B). See page 21.
	Recent increases in weather temperature without increasing the chlorine production of your unit.	Increase chlorine production by pressing the Chlorine Production Rate Adjustment button (arrow button B). See page 21.
	Temporary loss of chlorine due to heavy organic load - rain, leaves, fertilizer or heavy bather load (Recent party!). Pets using pool.	Set "Boost" mode and allow to run for 24 hours. Recheck. If still too low, Super Chlorinate with outside source. (Take pool water sample to Pool Professional). See pages 22 and 25.
	Low (Less than 2.5) gpl salt level in pool water.	Test salinity by pressing the Test Salinity button. See Chart page 20.
	High nitrate level.	Contact Pool Professional.
	Metals present in pool water.	Contact Pool Professional.
	New pool water. Not shocked properly upon startup.	Super Chlorinate Pool. See page 25.
	Clogged or dirty cell.	Remove cell for inspection. Clean if necessary. See pages 27 and 28.

Problem	Possible Cause	Corrective Action
No display on LCD ( <i>Screen is blank</i> ).	No Power to Unit.	Check power. Turn on pump. 1. Defective automatic timer or pump switch. 2. Loose connection at automatic timer or pump switch.
	Loose ribbon cable between front and back PC board.	Check that ribbon cable is fully inserted into connector.
	Incorrectly wired. Unit not wired for 240 VAC.	Check that unit is correctly wired for 240 VAC and connected to 240 VAC.
	Loose or bad connection at white connector between transformer and back PC board.	Check connector at white plug to insure proper connection. If burnt connector contact authorized service representative.



Problem	Possible Cause	Corrective Action
"Cell On" indicator does not come on.	Chlorine Production set to 00%.	Adjust CHLORINE PRODUCTION to desired Percentage.
<i>If No Flow also....</i>	Insufficient water flow. Cell is plugged with debris, pump has lost prime.	Remove obstruction and/or clean cell. See Page 27. Prime pump if necessary.
<i>If No Flow also....</i>	Flow/Temp/Salinity Sensor not plugged in.	Plug in Flow/Temp/Salinity Sensor. See page 6 Figure 2.
	Salt level below 2.0 gpl.	Add salt as described on pages 17 through 20.

Problem	Possible Cause	Corrective Action
"No Flow" indicator stays on continuously.	Pump fails to provide sufficient water flow.	Check for correct operation of the pump, i.e., loss of pump prime or clogged strainer baskets.
	Closed valves.	Check and correct all valve alignments.
	Dirty filter.	Follow filter cleaning procedures.
	Obstruction in the AquaPure cell.	Remove cell for inspection. Follow cleaning procedures. See page 27.
	Flow/Temp/Salinity Sensor not installed properly.	Ensure that the Flow/Temp/Salinity Sensor is installed according to page 12 Figure 8. If not, contact a pool professional.
	Flow/Temp/Salinity Sensor not plugged in.	Plug Flow/Temp/Salinity Sensor into connector on control center printed circuit board. Turn power to unit off and back on (Cycle Power). See page 6 Figure 2. See also page 28, Section 6.5 step 4.
	Flow/Temp/Salinity Sensor elements covered with PVC glue, taped over, or covered with other debris.	Remove and clean Flow/Temp/Salinity Sensor, and reinstall. See pages 11 through 13, 27 and 28.
	Defective Flow/Temp/Salinity Sensor.	Contact your authorized service representative.

Problem	Possible Cause	Corrective Action
Salt level too high.	Too much salt has been added to pool.	Backwash or partially drain pool and dilute with fresh water until salinity returns to 3.0 gpl to 3.5 gpl.

Problem	Possible Cause	Corrective Action
"Service" Indicator On.	Low salt level in pool water.	Test salinity. Add salt as described on pages 17 through 20.
	Cell requires cleaning.	Refer to Maintenance Procedure for acid wash cleaning. See pages 27 and 28.
	Cell not working properly after cleaning	Contact your authorized service representative.
	DC power cord not properly connected to the cell.	Check connection. Check for dirt or corrosion around DC cord contacts at Cell. Check Cell studs for same.
	Flow/Temp/Salinity Sensor not plugged in.	Plug Flow/Temp/Salinity Sensor into connector on control center printed circuit board. (Cycle Power).
	Water temperature too low	Winterize your pool. See page 29.
	All the above have been checked and indicator light is still on.	Contact your authorized service representative.

Problem	Possible Cause	Corrective Action
Salt Level Too Low.	Not enough salt added on start up.	Add salt to pool, 3.0 gpl to 3.5 gpl. See pages 17 through 20.
	Heavy Rainfall.	Add salt to pool, 3.0 gpl to 3.5 gpl. See pages 17 through 20.
	Leak in pool.	Repair pool.
	Dirty Flow/Temp/Salinity Sensor contacts or faulty Flow Sensor.	Remove and clean Flow/Temp/Salinity Sensor contacts. Check Flow/Temp/Salinity Sensor cable for damage. See page 28. Verify salinity with Myron "L" meter calibrated for NaCl, titration test units, or other salt meters. Please be aware that salt test strips have a large variance in readings (400 - 800 ppm).

## 7.2 Service Codes






Code Number	Possible Cause	Corrective Action
120	Low current in forward direction to Cell	1. Clean cell if necessary (see pages 27 and 28) 2. Check DC Cord.
121	Low current in reverse direction to Cell	1. Clean cell if necessary (see pages 27 and 28) 2. Check DC Cord.
123	Extremely Low current to Cell	1. Clean or replace cell if necessary (see pages 27 and 28) 2. Check DC Cord.
124	Higher than normal Current to Cell	Contact a pool professional.
125	Cell needs to be cleaned	Clean cell if necessary (see pages 27 and 28).
126	Low current in forward direction and VAC input voltage below 100/200 VAC	Contact a pool professional.
127	Low current in reverse direction and VAC input voltage below 100/200 VAC	Contact a pool professional.
144	Low Salinity (below 2.0 gpl)	Add salt to pool to achieve 3.0 gpl (see pages 17 through 20).
145	High Salinity (above 4.0 gpl)	Backwash filter if a DE filter is installed. Partially drain pool and dilute with fresh water until salinity returns to 3.0 to 3.5 gpl.
170	Possible Front board service condition or unit not correctly wired to 120 VAC	Contact an authorized service representative.
171	Possible Backboard service condition	Contact an authorized service representative.
172	Flow Sensor service condition or flow sensor is unplugged	Contact an authorized service representative.
173	Low VAC input voltage and on board power supply is not regulated or unit not correctly wired.	Unit wired to improper AC voltage. Contact a pool professional.
174	Pool Temperature is too high for operation of AquaPure	Flow/ Salinity Sensor indicates water temperature at sensor above 108 F. Reduce water temperature.
175	Flow Sensor air lock condition or very low salinity	Verify proper Flow/Temp/Salinity Sensor installation (see page 12 Figure 8). Check salinity with Myron "L" meter calibrated for NaCl or test strips. Add salt as necessary (see pages 17 through 20).

## 7.3 Additional Letter Codes

Code	Condition	Reason
EC	External Control	ORP unit or external controller has shut off chlorine production.
Lo	Low Temperature Cutoff	Temperature of Pool is < 50 Deg. F. Chlorine production stopped.
bo	Boost	In "Boost" mode unit will operate at 100% production for 24 run time hours.
HH	High-High	Input has exceeded Maximum Range.
JA	AquaLink RS Online	AquaLink RS is controlling the AquaPure and desired output percentages.
Jb	Boost (AquaLink RS Interface)	AquaLink RS is controlling the AquaPure and "Boost" is active.

## Section 8. Temperature Conversion

To display Celsius or Fahrenheit on the digital display.

- 
- 
- 
- 
- 
1. Press and hold button **D** for 15 seconds (third beep).
  2. Within 5 seconds, momentarily press **C** to enter the Fahrenheit/Celsius change mode.
  3. To toggle between Celsius and Fahrenheit, press **A** or **B**.
  4. Confirm by momentarily pressing **C**. The change will be stored in permanent memory.

**NOTE:** The Boost mode will normally be activated if the Boost button **D** is depressed for 10 seconds. However, if button **D** is held down an additional 5 seconds (for the third beep), the state of the Boost mode will not be changed. 1

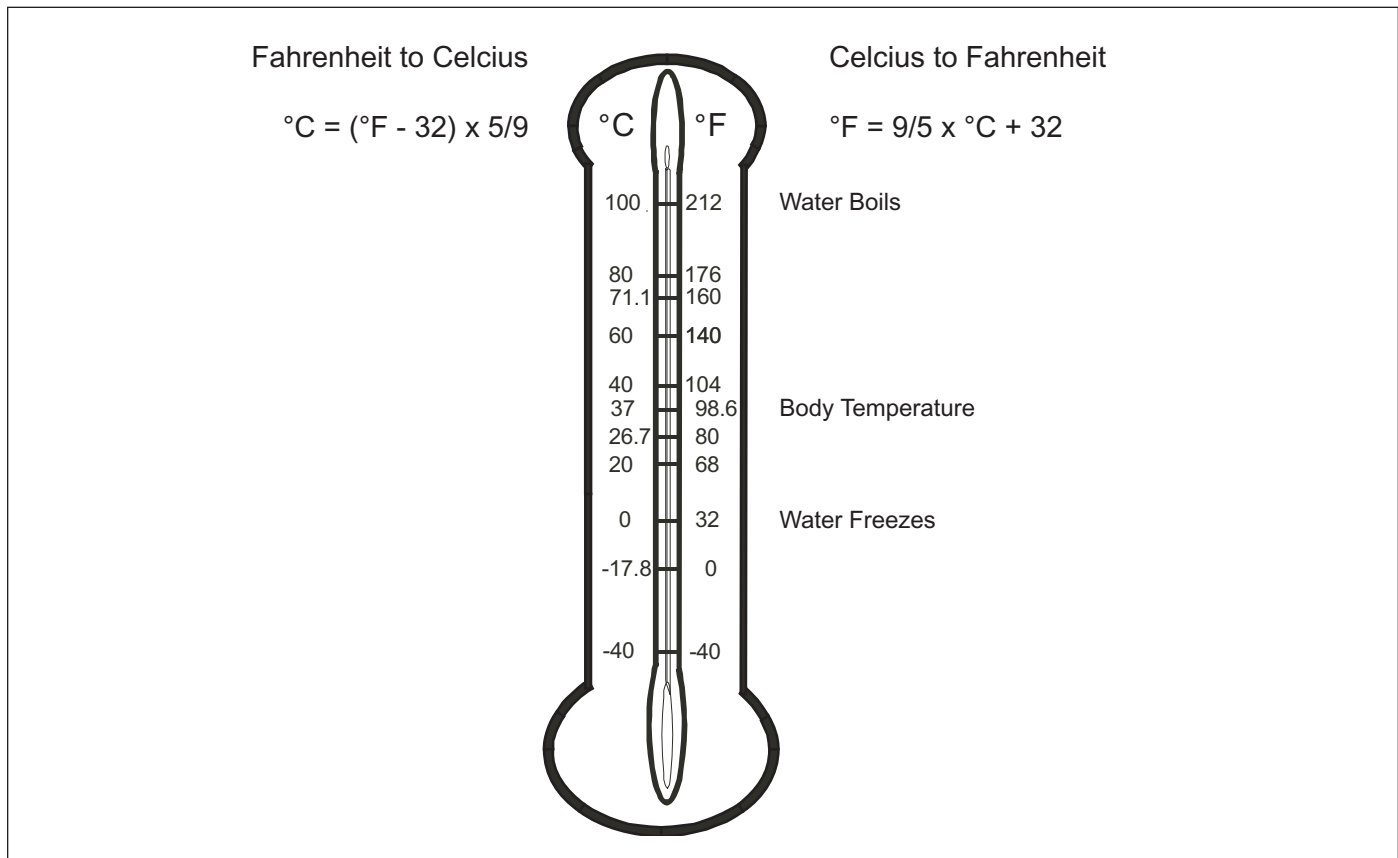


Figure 15. Temperature Conversion Chart

## Section 9. APURE700 and APURE1400 Exploded Views and Replacement Kits

### 9.1 Control Center Replacement Parts

Dwg. #	Kit #	Description	Qty.
1	R0402900	Control Box Complete, APURE700	1
	R0403000	Control Box Complete, APURE1400	1
2	R0403100	Control Box Cover, APURE700	1
	R0403200	Control Box Cover, APURE1400	1
3	R0404300	Control Box Decal, APURE, Top	1
4	R0404400	Control Box Decal, APURE Bottom	1
5	R0403900	PCB, Front LED, All Models, Rev. B10038-01	1
6	T1005	Transformer, 50/60Hz	1
7	R0404000	PCB, Back, APURE700	1
	R0404100	PCB, Back, APURE1400	1
8	M1033	Strain Relief, Power	1
9	M1034	Strain Relief, Data	1
10	R0412900	Mounting Hardware Kit (new style)	1
11	AZ008	Mounting Hardware Kit (old style)	1

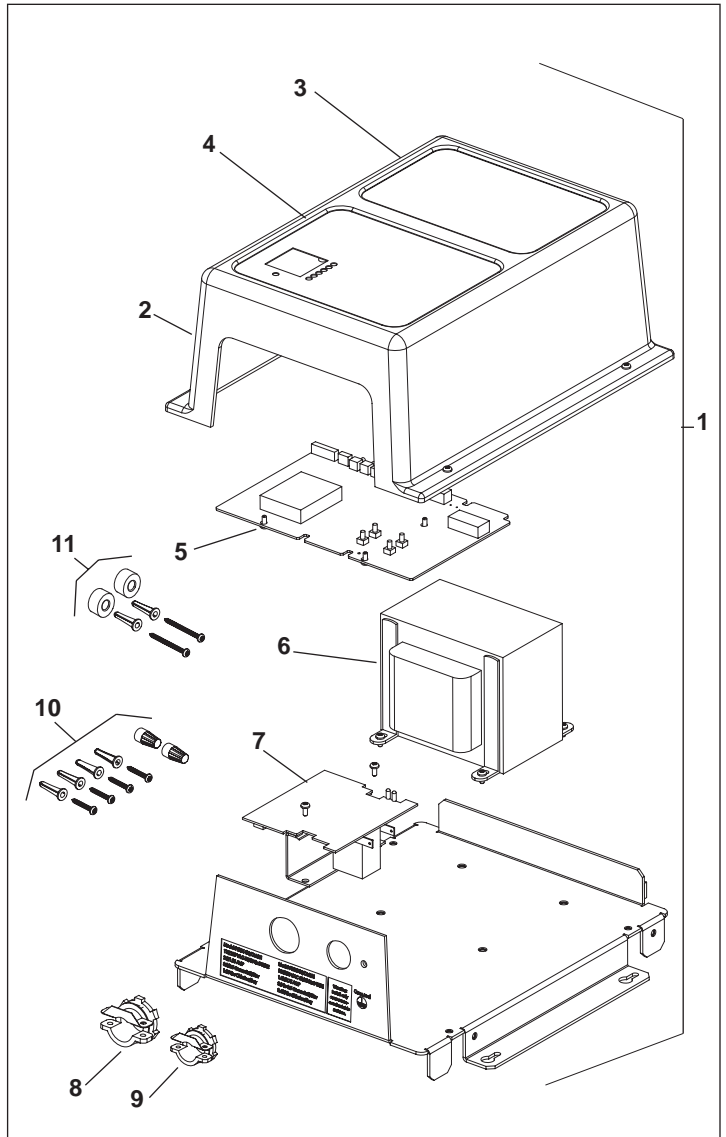


Figure 16. Control Center

## 9.2 3-Port Electrolytic Cell and Sensor Replacement Parts with Universal Unions (2"-2½")

Dwg. #	Kit #	Description	Qty.
12	R0452100	Universal Union/Tailpiece/ Plug, 3-Port Cell includes: Nut, Union Universal O-Ring, #2-231 Tailpiece, 2" X 2 ½" Plug, Port CG Cell	3 3 2 1
13	R0452200	O-Rings and Terminal Adapter, 3-Port Cell includes: O-Ring, #2-231 O-Ring, #2-106 Terminal Adapter Screw, #6 X 1/2"	3 6 1 2
14	R0452300 R0452400	7-Blade Cell, 3-Port Cell 14-Blade Cell, 3-Port Cell Includes: Cell Assy, APure O-Ring, #2-231 DC 16Ft Power Cord, Blk	1 3 1
16	R0452500	Port Sensor, 3-Port Cell includes: Sensor, Port CG Cell O-Ring, #2-231	1 1
17	SP3P	3-Port Spool includes: Spool, GC Cell, 3-Port O-Ring, #2-231 Nut, Union Universal Tailpiece, 2" X 2½" Plug, Port CG Cell	1 4 3 2 2
18	R0402800	16' Cable DC	1

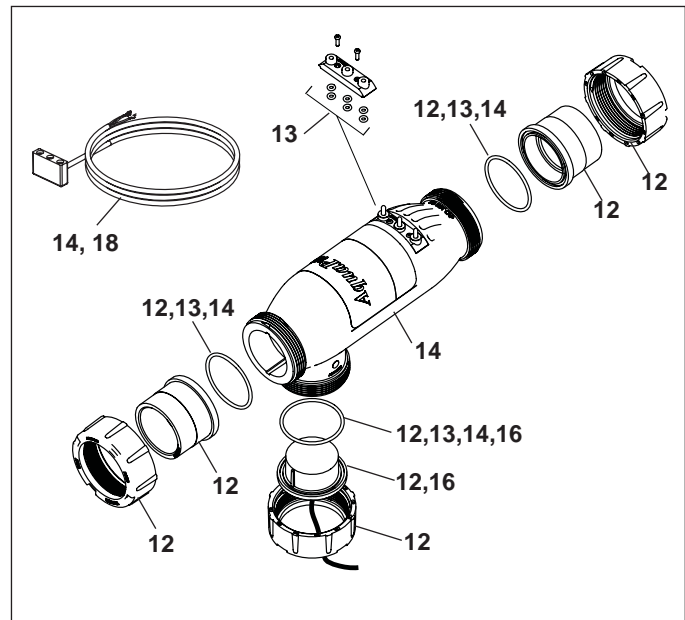


Figure 17. 3-Port Electrolytic Cell and Sensor Exploded View

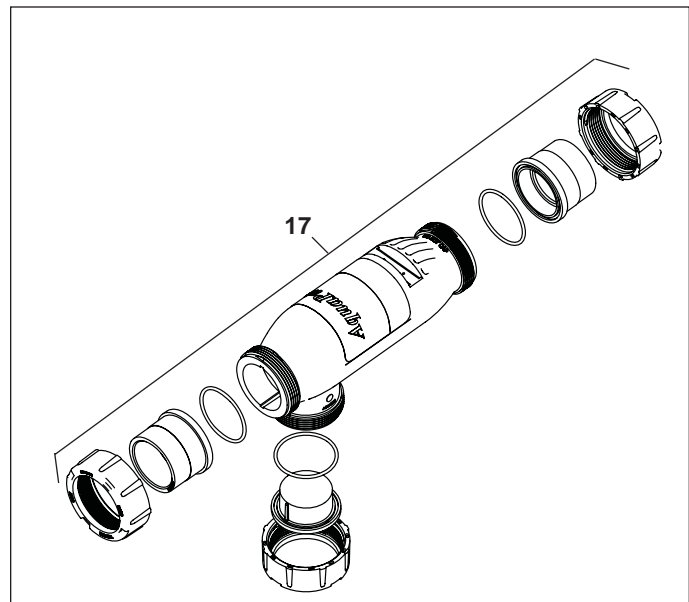


Figure 18. 3-Port Spool Exploded View

### 9.3 2-Port Electrolytic 2" Cell and Sensor Replacement Parts (PVC Black Unions)

Dwg. #	Kit #	Description	Qty.
1	R0412400	2-Port Cell, APURE700, w/ 16' DC Cable, 2" Threaded PVC Union	1
	R0412300	2-Port Cell, APURE1400, w/ 16' DC Cable, 2" Threaded PVC Union	1
2	R0402700	8' Cable, DC	1
	R0402800	16' Cable, DC	1
3	R0412500	Union Nut, 2" PVC	1
4	R0412600	Union Half, Unthreaded, 2" PVC	1
5	R0412700	Union O-ring, 2"	1
6	R0403800	Flow Sensor w/ 16' Cable	1

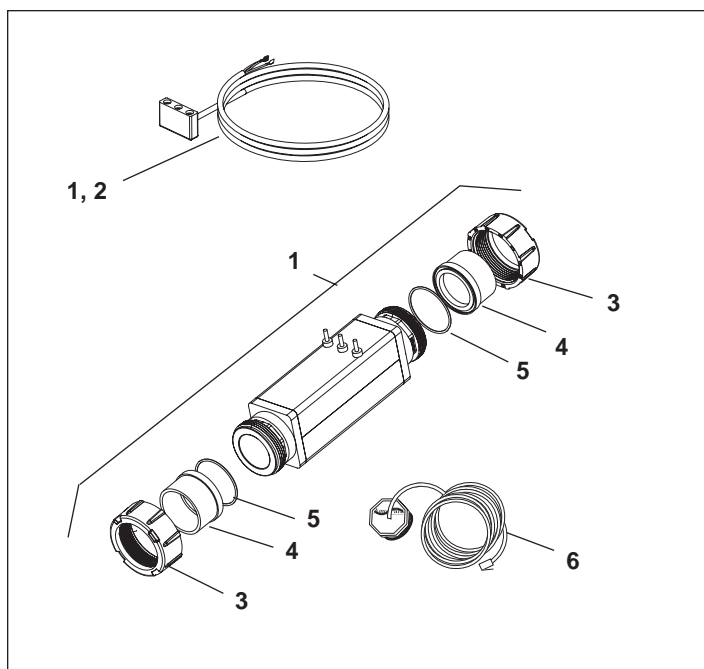


Figure 19. 2" PVC Union, Electrolytic Cell and DC Cable

### 9.4 2-Port Electrolytic 1½" Cell and Sensor Replacement Parts (ABS White Unions)

Dwg. #	Kit #	Description	Qty.
1	R0403400	2-Port Cell, PURE700 w/ 16' DC Cable	1
	R0403600	2-Port Cell, PURE1400 w/ 16' DC Cable	1
2	R0402700	8' Cable, DC	1
	R0402800	16' Cable, DC	1
3	AZ009	Tee, w/ 1½" ABS Union for Sensor	1
4	PI1019	Union Half, 1½" Threaded Socket, White	1
5	PI1024	Union O-ring, 1½"	1
6	AZ003	2-Port Spool Piece, 1½" ABS Unions (Optional)	1

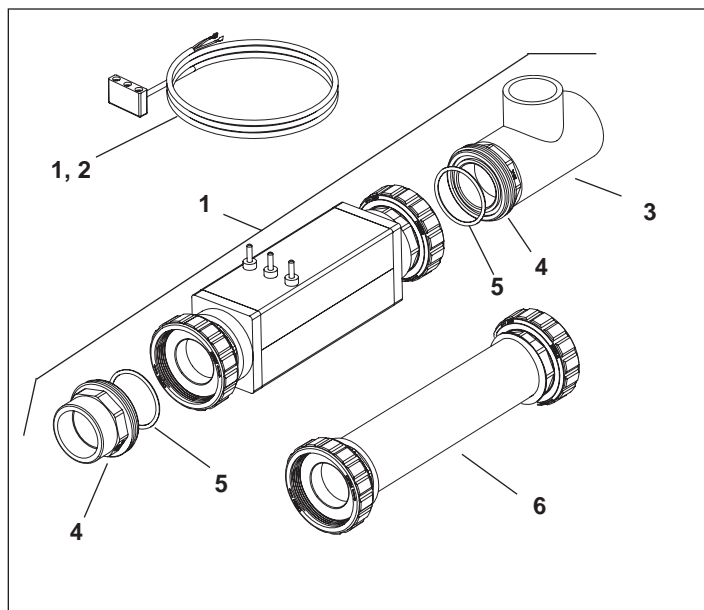


Figure 20. 1½" ABS Union, Electrolytic Cell and DC Cable

## LIMITED WARRANTY

Thank you for purchasing Jandy® pool and spa products. Jandy Pool Products, Inc. warrants all parts to be free from manufacturing defects in materials and workmanship for a period of one year from the date of retail purchase, with the following exceptions:

- AquaLink® RS units installed with Jandy® Surge Protection Kits will be covered for two years.
- NeverLube® valves are warranted for the life of pool and/or spa on which they were originally installed.
- AquaPure™ Electronic Chlorine Generator Electrolytic Cells carry a 5 year limited warranty on a prorated basis.

This warranty is limited to the first retail purchaser, is not transferable, and does not apply to products that have been moved from their original installation sites. The liability of Jandy Pool Products, Inc. shall not exceed the repair or replacement of defective parts and does not include any costs for labor to remove and reinstall the defective part, transportation to or from the factory, and any other materials required to make the repair. This warranty does not cover failures or malfunctions resulting from the following:

1. Failure to properly install, operate or maintain the product(s) in accordance with our published Installation, Operation and Maintenance Manuals provided with the product(s).
2. The workmanship of any installer of the product(s).
3. Not maintaining a proper chemical balance in your pool and/or spa [pH level between 7.2 and 7.8, Total Alkalinity (TA) between 80 to 120 ppm, Total Dissolved Solids (TDS) less than 2000 not including salt ppm].
4. Abuse, alteration, accident, fire, flood, lightning, rodents, insects, negligence or acts of God.
5. Scaling, freezing, or other conditions causing inadequate water circulation.
6. Operating the product(s) at water flow rates outside the published minimum and maximum specifications.
7. Use of non-factory authorized parts or accessories in conjunction with the product(s).
8. Chemical contamination of combustion air or improper use of sanitizing chemicals, such as introducing sanitizing chemicals upstream of the heater and cleaner hose or through the skimmer.
9. Overheating; incorrect wire runs; improper electrical supply; collateral damage caused by failure of O-Rings, DE grids, or cartridge elements; or damage caused by running the pump with insufficient quantities of water.

### LIMITATION OF LIABILITY:

This is the only warranty given by Jandy Pool Products, Inc. No one is authorized to make any other warranties on behalf of Jandy Pool Products, Inc. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. JANDY POOL PRODUCTS, INC. EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT OR PUNITIVE DAMAGES FOR BREACH OF ANY EXPRESSED OR IMPLIED WARRANTY.** This warranty gives you specific legal rights. You may also have other rights which vary by state or province.

### WARRANTY CLAIMS:

For prompt warranty consideration, contact your dealer and provide the following information: proof of purchase, model number, serial number and date of installation. The installer will contact the factory for instructions regarding the claim and to determine the location of the nearest designated service center. If the dealer is not available, you can locate a service center in your area by visiting [www.jandy.com](http://www.jandy.com) or by calling our technical support department at (707) 776-8200 extension 260. All returned parts must have a Returned Material Authorization number to be evaluated under the terms of this warranty.

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