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LA1046 REV6: Device Box Label

Notification Change

ClorMatic® III Model CM601

DOMESTIC Chlorine Generating Device for Swimming Pools

Zodiac Pool Systems, Inc.

~~Huron Tech Systems~~

~~Jandy Pool Products Inc.~~

~~4815 Executive Park Court, Suite 210~~

6000 Condor Drive

~~Jacksonville, Florida 32216~~

Moorpark CA 93021-2601

~~(904) 292-1793~~

United States

~~www.clormatic.com~~

Model CM601

(Power Supply Only)

ClorMatic® is Made Entirely in the USA

Read all Labels and the Owner's Manual Completely Before Attempting to Operate.

Maximum Overcurrent Protection - 15A

Use Copper Conductors Only

Disconnect Power before Opening Service Cover

For Outdoor or Indoor Use

WARNING: Operating the ClorMatic III Model CM601 without water flow through the cell can cause a build up of flammable gases which can result in FIRE OR EXPLOSION.

KEEP OUT OF REACH OF CHILDREN

The maximum volume of water that can be treated with one unit of Clormatic III model CM601 is 113,600 liters (113.6 m³).

For swimming pools, a minimum of 1 ppm of available chlorine must be maintained.

Maximum output of hypochlorous acid equivalent to 600 g of free available chlorine per day.

Controls Bacteria and Algae in swimming-pool water.

NOTICE TO USER: This control product is to be used only in accordance with the directions on this label. It is an offense under the Pest Control Products Act to use a control product under unsafe conditions."

Electrical Requirements:

115 / 230 VAC 50/60 Hz 3 Wire

2.5 / 1.25 AMP

3.0 to 3.5 Grams per Liter Salt

Date of Manufacture _____ / Serial Number _____

REGISTRATION NUMBER 23420 P.C.P. ACT



114170



Conforms to UL Std. 1081

Certified to CAN/CSA Std. CSA C22.2 No. 218.1

Conforms to NSF Std. 50

For European Nations :

Application of Council Directive : 73/23/EEC

Standard to which Conformity is Declared : EN 60335-1 : 1994

More Chlorine

Less Chlorine

Test Salinity

Chlorine Production

Salinity

Add Salt

Cell Off

Service

GPL

No Flow

Wait

Clean

LA1046 REV6

ClorMatic™

Zodiac Pool Systems, Inc.

Notification Change

~~by Huron Tech Systems~~
~~4815 Executive Park Court, Suite 210~~
~~Jacksonville, Florida 32216~~
~~(904) 292-1793~~
~~www.clormatic.com~~

Jandy Pool Products Inc.
 6000 Condor Drive
 Moorpark CA 93021-2601
 United States

DOMESTIC Chlorine Generating Device

Clormatic III Model CM601

REGISTRATION NUMBER 23420 PEST CONTROL PRODUCTS ACT.

Installation and Operation Manual

Maximum Overcurrent Protection - 15A

Use Copper Conductors Only

Disconnect Power before Opening Service Cover

For Outdoor or Indoor Use

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Controls bacteria and algae in swimming pool water.



Conforms to UL Std. 1081

Certified to CAN/CSA Std. CSA C22.2 No. 218.1

Conforms to NSF Std. 50

WARNING

FOR YOUR SAFETY - This product must be installed and serviced by a professional pool 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.

Operating Clormatic III model CM601 without water flow through the cell can cause a buildup of flammable gases which can result in FIRE OR EXPLOSION.

KEEP OUT OF REACH OF CHILDREN

Notice to User

Read all Labels and the Owner's Manual Completely Before Attempting to Operate this Equipment.

This control product is to be used only in accordance with the directions on this label.

It is an offense under the Pest Control Products Act to use a control product under unsafe conditions.

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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 or unauthorized personnel to use this product.

 **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**

Operating Clormatic III model CM601 without water flow through the cell can cause a buildup of flammable gases which can result in FIRE OR EXPLOSION.

⚠ WARNING

Installation must be done in accordance with the National Electric Code(NEC), NFPA-70; or, in Canada, with the Canadian Electrical Code (CEC), CSA C22.1. All applicable local installation codes must also be adhered to.

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.

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

It is recommended that the water Flow/Salinity Sensor is installed in the same piping as the electrolytic cell, without any valves or diverters between them. (See Section 2, Figure 1).

The Flow/Salinity Sensor must be mounted as in Section 3.5, Figure 4.

SAVE THESE INSTRUCTIONS

Section 2. System Description

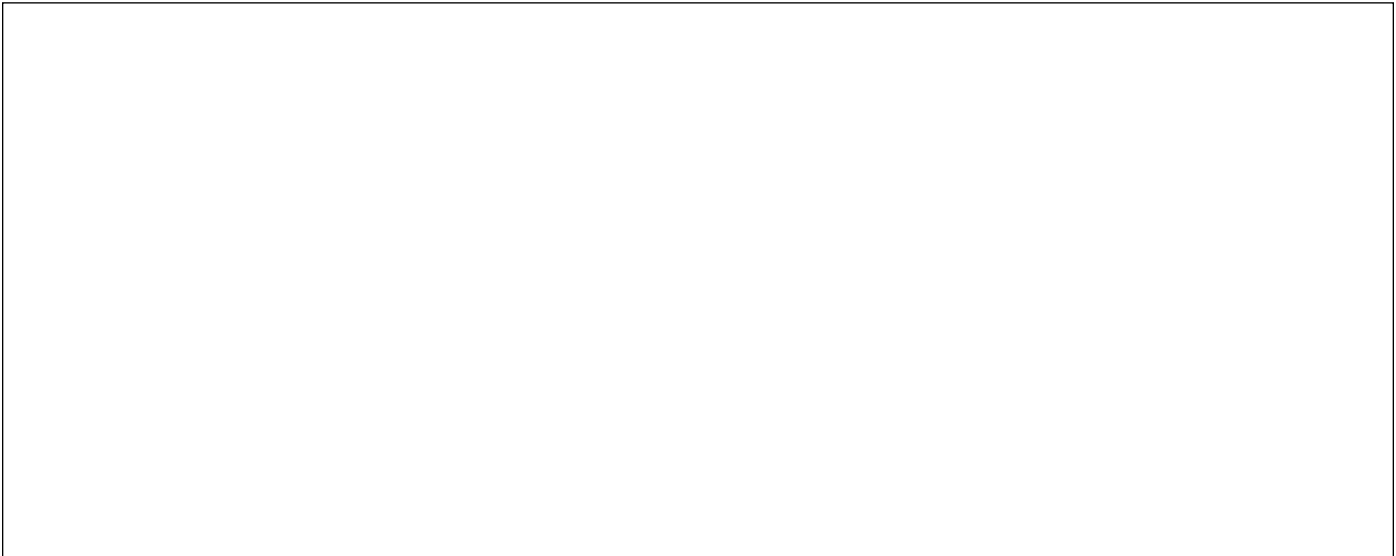


Figure 1. Typical Chlorinator Installation With Options

The Chlorinator 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 Chlorinator then reuses the salt and the process starts over again. The Chlorinator 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 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 control center or by varying the number of hours the Chlorinator is on each day. *The Chlorinator automatically cleans the Cell electrodes once every 3 hours. This does not interrupt the production of Chlorine.*
- Flow/Salinity/Temperature 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 (g/l) 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 Chlorinator. 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 Chlorinator.

2.1 Electrical Specifications

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

	<u>Model CM601</u>
Input:	115 VAC, 50/60 Hz, 2.5 AMPS 230 VAC, 50/60 Hz, 1.25 AMPS
Output:	22-30 VDC @ 6 AMPS maximum
Chlorine:	Maximum output of hypochlorous acid equivalent to 600 g of free available chlorine
External Control:	ORP/External Control Connector AquaLink® RS485 Connector

 **CAUTION**

Factory wired for 230 VAC service. If available electrical service is 115 VAC, the power supply wiring must be changed to operate on 115 VAC as shown in the wiring diagram below. (Figure 2.)

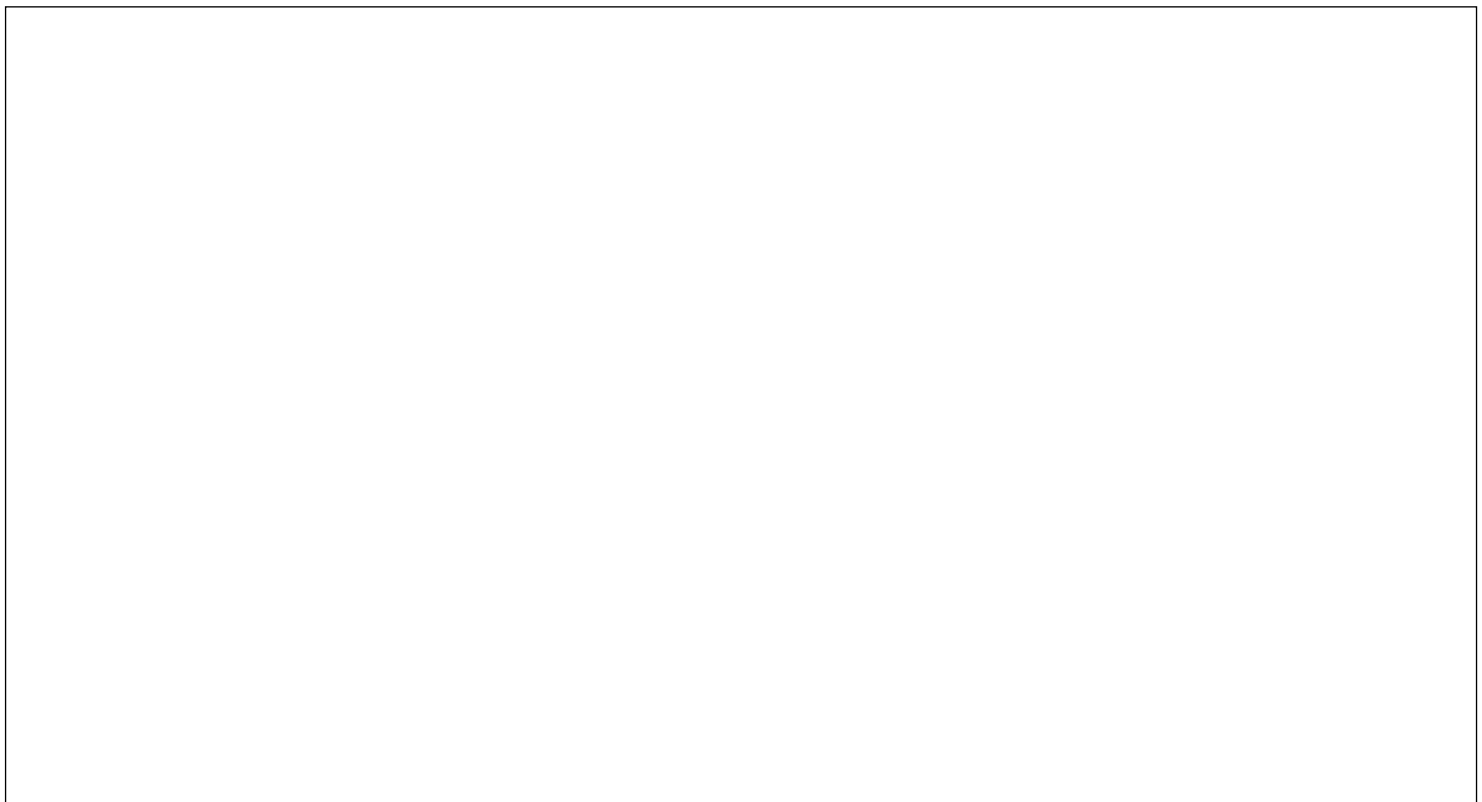


Figure 2. CM601

Section 3. Installation Instructions for the CM601

3.1 Materials and Tools

NOTE Salt not included. See pages 17 - 19.

Installation Materials Furnished	Tools Needed for Installation
(1 ea.) Electrolytic Cell	Tape Measure
(2 ea.) Cell Union with (2-each) O-Rings and 2" Tee	Phillips & Flathead Screwdrivers
(1 ea.) 2" to 1½" Reducing Bushing	Pliers
(1 ea.) Roll Teflon Tape	Hacksaw
(1 ea.) Flow/Temp/Salinity Sensor with 2.44 m (8 ft) cable	Voltmeter to determine line voltage of AC wiring to power supply
(1 ea.) 2.44 m (8 ft) DC Power Cord	Electric Drill Motor and 1/4 " masonry drill bit for mounting power supply on block or stucco wall
(1 ea.) Power Supply/Control Center	An NSF® approved All Purpose Cleaner Primer
(2 ea.) Anchors, Screws, Weather Seals, & Wire Nut	An NSF® approved All Purpose Cement (such as Weld-On 794, 793)
(1 ea.) Owner's Manual - Warranty Information	
(1 ea.) Installation Template	

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, Section 3.4).
- Install to permit access for servicing.
- Read Cautions and Important Instructions Section 1. **Before attempting any electrical wiring, be sure to read and follow Safety Instructions. Wiring should only be attempted by a qualified professional.**
- All installation and wiring must be in accordance with the National Electric Code (NEC), NFPA-70; or, in Canada, with the Canadian Electrical Code (CEC), CSA C22.1. All applicable local installation codes must also be adhered to.

3.2 Plumbing Configurations

3.2.1 Recommended Plumbing Configuration

The preferred installation is that the Sensors and Cell are plumbed in the return line to the pool after (downstream) all the pool equipment (filter, heater, solar, etc.). The Cell and Sensor Tee fitting are designed to be plumbed into 2" PVC pipe. Adapters can be used for systems with 1.5" plumbing. Figures 3 and 4 illustrate the recommended plumbing configuration, which result in the most reliable operation.

NOTE The Chlorinator 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.

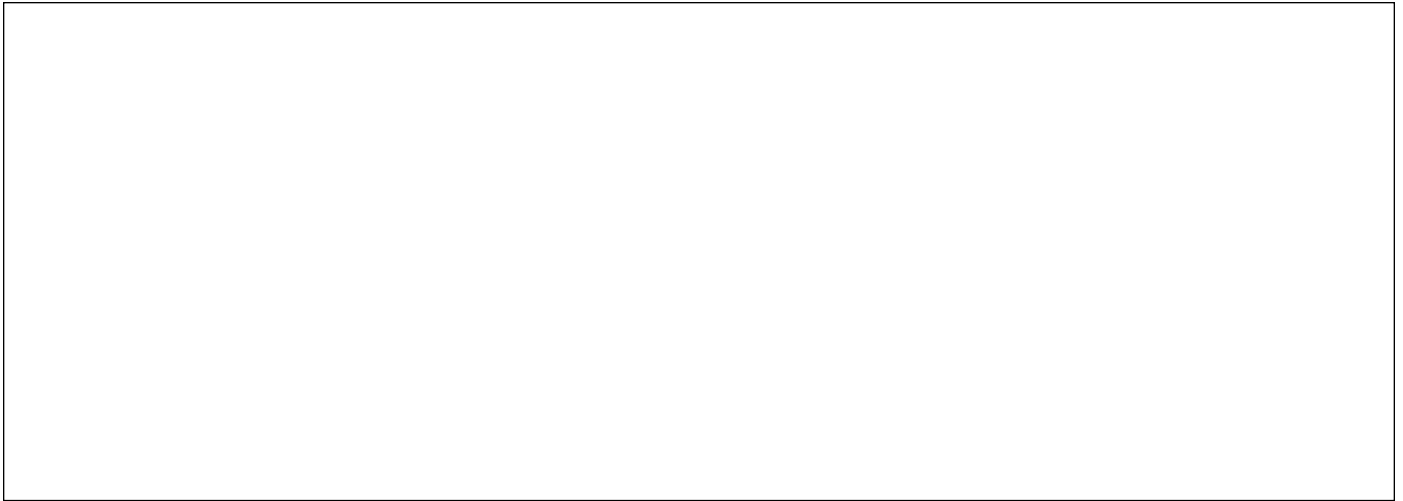


Figure 3. Recommended Plumbing Configuration with Cell and Sensors #1, Top View

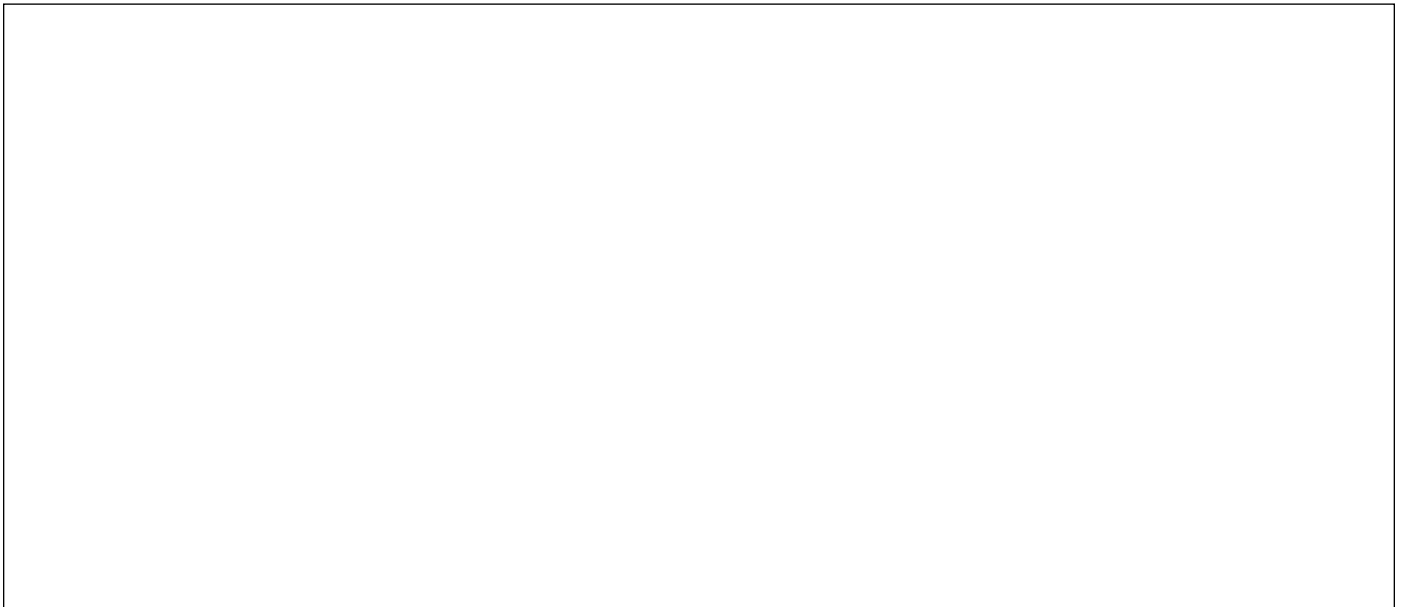


Figure 4. Recommended Plumbing Configuration with Cell and Sensors #2, Side View

⚠ WARNING

AVOID HAZARDOUS PLUMBING: Do not mount the **Flow/Temp/Salinity Sensor** and **Cell** as shown in Figure 5. If a valve is located improperly between the flow/temp/salinity sensor and the electrolytic cell, it may cause the cell to operate without water flow through the cell which can create a **HAZARDOUS** condition.



Figure 5. Hazardous Plumbing Configuration with Cell and Sensors, Cell Mounted on Pool Return Line

3.3 Installing the Control Center for the CM601

1. Locate the Control Center as close to the pump and filtration system as possible. Make sure the 2.44 m (8 ft) DC power cord and the 2.44 m (8 ft) 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 3 m (10 ft) of the pool edges.***
2. Use hardware provided and mount the control center at eye level. Leave sufficient clearance on all sides of the backplate (chassis). If possible leave a minimum of 241 mm (9½ inch) on the left side. Mark screw centers and drill two 6.35 mm (¼ inch) holes spaced 159 mm (6¼ inches) on center. Install the anchors, rubber weather seal, and screws provided. See Figure 6.
3. The control center front cover is held to the metal back plate (chassis) by four retaining screws. Unscrew the four screws and remove the front cover. Position the back plate (chassis) keyhole slots over the two mounting screws just installed. Tighten the screws until snug. See Figure 6.

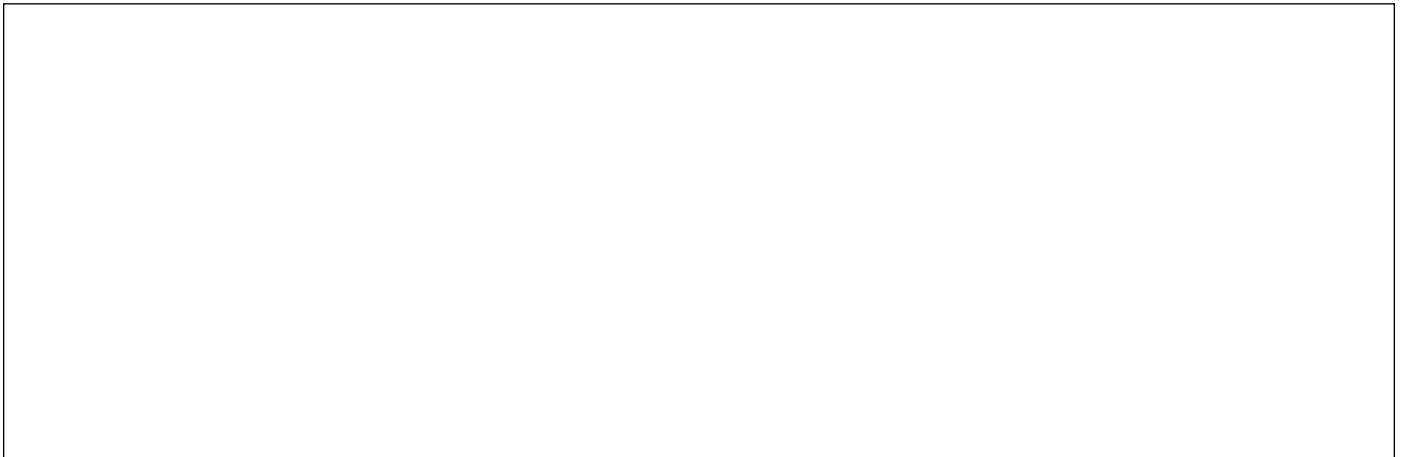


Figure 6. Mounting the Control Center

4. Check source voltage. (All units are factory wired for 230 VAC). ***In order to use on 115 VAC, the internal factory wiring of the control center must be changed. (See wiring diagram Section 2, Figure 2).***
5. 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 Section 2.1, 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 insure personal safety and safety of equipment.***

3.4 Earth Bonding (Grounding)

A # 8 awg (8.4 mm²) wire is recommended for connecting the control center to a Permanent Earth Ground connection that is acceptable to the local inspection authority. Attach the bonding point located on bottom of the back plate (chassis) to a Common Earth Bonding Point. Do not use the Chlorinator as the Common Bonding Point. Each piece of non-Chlorinator related pool equipment requiring a ground should be bonded to the Common, Approved Earth Bonding Point. ***Never ground pool pump to back plate (chassis).***

3.5 Installing the Cell - Flow/Temp/Salinity Sensor for the CM601

NOTE Maximum operating Pressure is 517 kPa or 75 PSI - Minimum Flow Rate is 76 L/m (20 GPM).

1. Be sure pool pump is turned off.

WARNING

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 resulting in a FIRE OR EXPLOSION.

- Mount as shown in Figure 7 Detail A. 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.
 - (3) preferably between the Pool Pump and the Cell.
- Do not mount the Flow/Salinity Sensor as shown in Detail C of Figure 7. This mounting position may allow the cell to operate without water flow, which could result in a buildup of flammable gases resulting in FIRE OR EXPLOSION.
- 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. Water passes through the Flow/Temp/Salinity Sensor before the Cell. The Cell can be installed in either a horizontal (as shown in Figure 8) or a vertical position.
3. Position the Flow/Temp/Salinity Sensor Tee and Cell in the recommended position (See Figure 7 Detail A) and (Section 2, Figure 1).
4. Locate a suitable section of pipe, approximately 533 mm (21 inches) long. The Flow/Temp/Salinity Sensor cable and Cell DC cord *must* be able to reach from the control center to this section.
5. If using 40 mm (1½ inch) pipe, cut out a 454 mm (17 7/8 inch) section of pipe to insert the Cell - Flow/Temp/Salinity Sensor Assembly (see Figure 9).
If using 50 mm (2 inch) pipe, cut out a 492 mm (19 3/8 inch) section of pipe to insert the Cell - Flow/Temp/Salinity Sensor Assembly (see Figure 9).
6. Clean the cut ends of the pipe, 50 mm x 50 mm x 40 mm (2 inch x 2 inch x 1½ inch) Tee, and 40 mm or 50 mm (1½ or 2 inch) ABS Union with an appropriate NSF® approved All Purpose cleaner/primer. Glue the ABS Union and PVC Tee onto the cut pipe ends using an appropriate All Purpose NSF® approved Cement. Tighten the ABS Unions. **Hand Tighten Only.** Allow sufficient drying time before pressurizing system.
7. Wrap the Flow/Temp/Salinity Sensor threads with Teflon tape ONLY (do not use silicone or pipe dope). **Be sure the Flow/Temp/Salinity Sensor (circular metal disks) are free of glue, excess Teflon tape, or any other debris.**
8. Install the Flow/Temp/Salinity Sensor into the 40 mm (1½ inch) threaded opening of the 50 mm x 50 mm x 40 mm (2 inch x 2 inch x 1½ inch) Tee. Tighten to prevent water leakage. **Do not over tighten.**
9. 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 back plate (chassis). **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 Section 2.1, Figure 2. **(Do not pull Flow/Temp/Salinity Sensor cable too tight, allow a little slack.)**
10. Plug the DC cord into the Cell stud terminals protruding from the Cell top. (Plug in - in either direction).

⚠ WARNING

Operating Clormatic III model CM601 without water flow through the cell can cause a buildup of flammable gases which can result in FIRE OR EXPLOSION.

Figure 7. Flow/Temp/Salinity Sensor

Figure 8. Cell Installation

Figure 9. Pipe Cutout

11. 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 Section 2, Figure 2.
12. Tighten strain relief fitting screws for the Flow/Temp/Salinity Sensor and the DC cord. ***Do not pull Flow/Temp/Salinity Sensor cable or DC Cord too tight. Allow a little slack cable inside of Control Center Enclosure.***

CAUTION

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

13. 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.
14. Plug the ribbon cable attached to the front cover PC board into Printed Circuit Board mounted on back plate (See Section 2.1, Figure 2). Now reattach the control center front cover to the back plate.

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 chlorine generator. The Chlorinator will display JA when a button is pressed at the Chlorinator while the Jandy AquaLink RS is in control. Adjustment of the Chlorinator chlorine production rate can be controlled from the main menu of the Jandy AquaLink RS. Boost mode may be activated from the Chlorinator while the AquaLink RS is online. The Chlorinator temperature, salinity, service codes, and LED indicators operate as normal.

NOTE Chlorinator will communicate with AquaLink RS using firmware versions JJ or *later*. When the Chlorinator is controlled by the optional Jandy AquaLink RS control system, the % output and hours must be adjusted from the AquaLink RS control panel. However, **BOOST** is functional from the Chlorinator.

3.6.1 Wiring to a Jandy AquaLink RS

In the AquaLink RS Power Center, wire the Chlorinator power ***directly*** to the LOAD SIDE of the Filter Pump relay (see Figure 10).

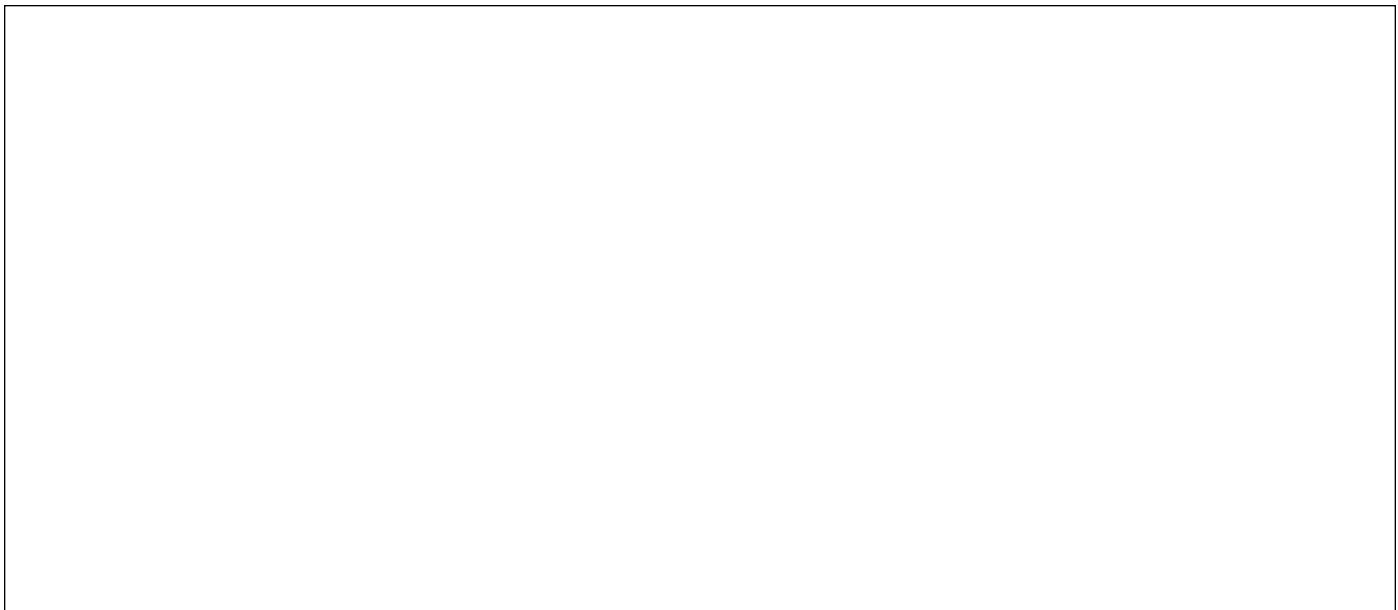


Figure 10. Wiring Chlorinator Power to an AquaLink RS Power Center

The Jandy AquaLink RS and Chlorinator use a four (4) wire connection to communicate and can be wired up to 500 feet apart. Any outdoor rated four (4) conductor cable can be used. Locate the appropriate screw terminals on the circuit board according to Figure 11. Wire the master Chlorinator from the red 4-pin terminal bar to the AquaLink RS red 4-pin terminal bar (see Figure 11).

NOTE The screw terminals are removable to aid in installation.

IMPORTANT Attach the master Chlorinator wires to the like-numbered screw terminals on both the Chlorinator and AquaLink RS as shown in Figure 11.

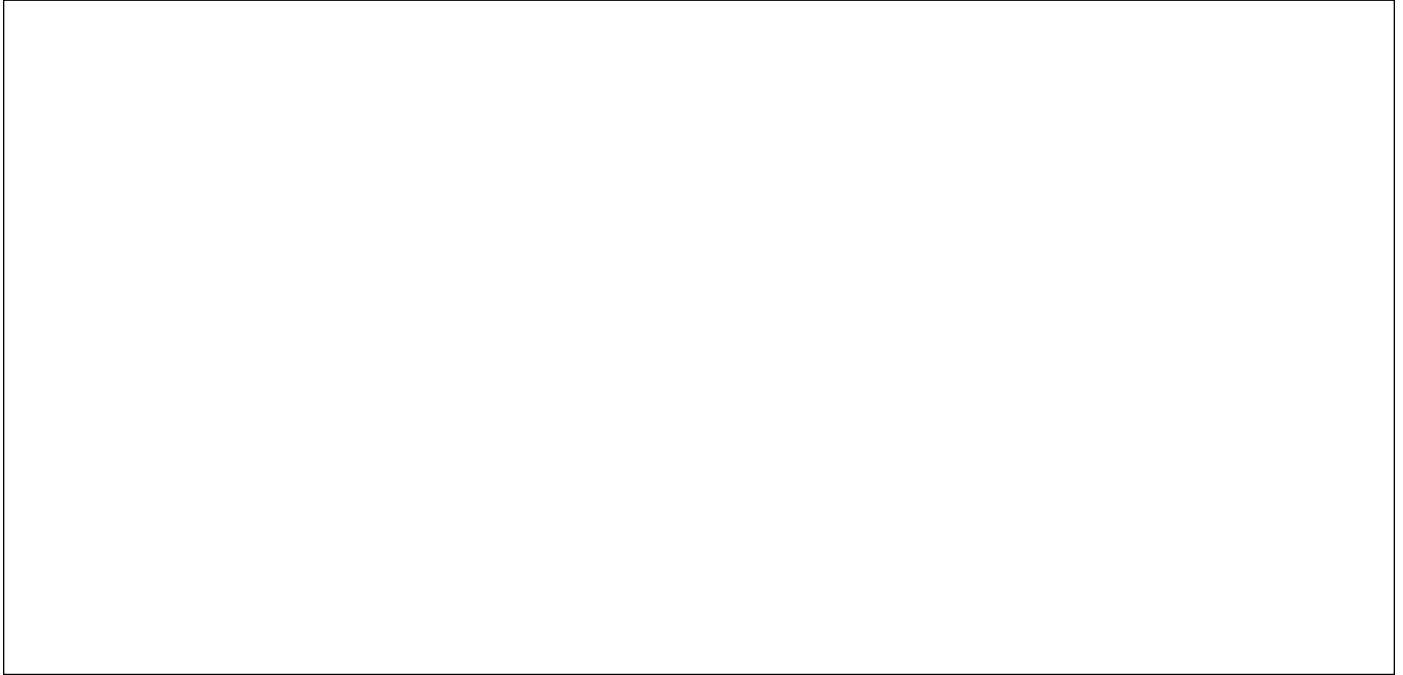


Figure 11. Wiring an Chlorinator to an AquaLink RS Control System Network

3.6.2 Wiring Multiple Chlorinator Units to a Jandy AquaLink RS

Only the master Chlorinator unit can be connected to the AquaLink RS network. Additional Chlorinator 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 (m³ of Water in Your Pool)

- **Rectangular Pools**

Average length (meters) x average width (meters) x average depth (meters) = m³ capacity.

- **Circular Pools**

Diameter (meters) x diameter (meters) x average depth (meters) x 0.79 = m³ capacity.

- **Oval Pools**

Long diameter (meters) x short diameter (meters) x average depth (meters) x 0.79 = m³ capacity.

- **Sloping Sides**

Multiply total m³ by 0.85 = m³ 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 = US gallon capacity.

- **Circular Pools**

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

- **Oval Pools**

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

- **Sloping Sides**

Multiply total gallons by 0.85 = US 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 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 must be maintained between 30 - 100 PPM. See Table 3.
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 to 15 PPM the pool water is said to have been Super Chlorinated (shocked). As pool water is continuously passed through the Chlorinator Electrolytic Cell, all pool water inside the cell is being Super Chlorinated.

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 Chlorinator 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 Chlorinator tends to stabilize at approximately 7.8. This is within NSPI 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 Chlorinator 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 Chlorinator's ability to chlorinate properly. Make sure the water is tested by a pool professional and properly balanced before turning on the Chlorinator.

4.4 Optimum Pool Water Conditions

The Chlorinator is warranted to operate properly only if these conditions are met.

Free Chlorine	1 - 3 PPM
pH	7.2 - 7.8
Total Alkalinity	100 - 120 PPM
Calcium Hardness	200 - 300 PPM
Cyanuric Acid	30 - 100 PPM

NOTE Free Chlorine, pH, Total alkalinity, and Calcium hardness must be tested daily.

4.5 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 Chlorinator is producing chlorine.

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

4.6 Salt (NaCl sodium chloride)

4.6.1 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).

4.6.2 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 Chlorinator 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 Chlorinator is wired in (connected), use it to determine the salinity.

Turn the Chlorine Production down to 00% by pressing the arrow button **A** on front of the control center. Operating the unit above 00% production without salt will damage Cell. The **Salinity** button **C** on the Chlorinator 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 g/l of salt is recommended for optimum water conditions.
- Low salt concentration below 2.0 g/l will cause premature cell failure.
- High salt concentration above 4.0 g/l may damage the control center.
- High salt concentration above 6.0 g/l 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 g/l (grams per liter) of a salt solution to PPM (Parts Per Million) of a salt solution multiply by 1000, i.e., 3.0 g/l salt X 1000 = 3000 PPM salt.

4.6.3 How to Add Salt to the Pool?

1. Turn on pump to circulate pool water.
2. **IMPORTANT - Turn the Chlorinator 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 Chlorinator and set to desired Production rate (Press arrow button B).

Table 1. Approximate Weight (kg) of Salt Needed to Obtain 3.0 g/l (3,000 PPM) in Pool

Salt Conc. Before Addition	Pool Size (US gallons)										
	38 m ³ (10,000)	45 m ³ (12,000)	53 m ³ (14,000)	60 m ³ (16,000)	68 m ³ (18,000)	76 m ³ (20,000)	83 m ³ (22,000)	91 m ³ (24,000)	98 m ³ (26,000)	106 m ³ (28,000)	113 m ³ (30,000)
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)
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)
0.50 g/L	95 kg (210 lbs)	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)
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)
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)
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)
1.50 g/L	57 kg (125 lbs)	68 kg (150 lbs)	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)
1.75 g/L	48 kg (105 lbs)	59 kg (130 lbs)	68 kg (150 lbs)	77 kg (170 lbs)	86 kg (190 lbs)	95 kg (210 lbs)	104 kg (230 lbs)	113 kg (250 lbs)	125 kg (275 lbs)	134 kg (295 lbs)	143 kg (315 lbs)
2.00 g/L	39 kg (85 lbs)	45 kg (100 lbs)	54 kg (120 lbs)	63 kg (140 lbs)	68 kg (150 lbs)	77 kg (170 lbs)	86 kg (190 lbs)	93 kg (205 lbs)	100 kg (220 lbs)	109 kg (240 lbs)	116 kg (255 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)
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)
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)

NOTE Add salt as required to maintain 3.0 g/l concentration

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

Table 2. Approximate Weight (kg) of Salt Needed to Maintain 3.0 g/l (3,000 PPM)

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

Table 3. Approximate Amount of Chlorine Stabilizer (Cyanuric Acid) Needed to Obtain 75 PPM

Stabilizer Level Before Addition	Pool Size (US gallons)										
	38 m ³ (10,000)	45 m ³ (12,000)	53 m ³ (14,000)	60 m ³ (16,000)	68 m ³ (18,000)	76 m ³ (20,000)	83 m ³ (22,000)	91 m ³ (24,000)	98 m ³ (26,000)	106 m ³ (28,000)	113 m ³ (30,000)
0.00 PPM	2.8 kg (6.25 lbs)	3.4 kg (7.50 lbs)	4 kg (8.75 lbs)	4.5 kg (10.0 lbs)	5 kg (11.25lb)	5.7 kg (12.5 lbs)	6.2 kg (13.75 lbs)	6.8 kg (15.0 lbs)	7.4 kg (16.3 lbs)	7.9 kg (17.5 lbs)	8.5 kg (18.75 lbs)
10 PPM	2.5 kg (5.40 lbs)	2.9 kg (6.50 lbs)	3.5 kg (7.60 lbs)	3.9 kg (8.60 lbs)	4.4 kg (9.75 lbs)	5 kg (10.8 lbs)	5.4 kg (11.90 lbs)	5.8 kg (12.9 lbs)	6.3 kg (14.0 lbs)	6.9 kg (15.2 lbs)	7.4 kg (16.25 lbs)
20 PPM	2 kg (4.60 lbs)	2.5 kg (5.50 lbs)	2.9 kg (6.40 lbs)	3.3 kg (7.30 lbs)	3.7 kg (8.25 lbs)	4.1 kg (9.20 lbs)	4.5 kg (10.0 lbs)	4.9 kg (10.9 lbs)	5.4 kg (11.9 lbs)	5.8 kg (12.8 lbs)	6.2 kg (13.75 lbs)
30 PPM	1.7 kg (3.75 lbs)	2 kg (4.50 lbs)	2.4 kg (5.25 lbs)	2.7 kg (6.00 lbs)	3 kg (6.75 lbs)	3.4 kg (7.50 lbs)	3.7 kg (8.25 lbs)	4 kg (9.00 lbs)	4.4 kg (9.75 lbs)	4.8 kg (10.5 lbs)	5.3 kg (11.75 lbs)
40 PPM	1.3 kg (2.90 lbs)	1.6 kg (3.50 lbs)	1.8 kg (4.00 lbs)	2 kg (4.60 lbs)	2.4 kg (5.25 lbs)	2.6 kg (5.80 lbs)	2.9 kg (6.40 lbs)	3.1 kg (6.90 lbs)	3.4 kg (7.58 lbs)	3.7 kg (8.20 lbs)	4 kg (8.75 lbs)
50 PPM	1 kg (2.00 lbs)	1.1 kg (2.50 lbs)	1.3 kg (2.90 lbs)	1.5 kg (3.30 lbs)	1.7 kg (3.75 lbs)	1.9 kg (4.10 lbs)	2 kg (4.60 lbs)	2.2 kg (4.90 lbs)	2.4 kg (5.40 lbs)	2.6 kg (5.80 lbs)	2.8 kg (6.25 lbs)
60 PPM	0.5 kg (1.25 lbs)	0.7 kg (1.50 lbs)	0.8 kg (1.75 lbs)	1 kg (2.00 lbs)	1 kg (2.25 lbs)	1.1 kg (2.50 lbs)	1.2 kg (2.75 lbs)	1.4 kg (3.00 lbs)	1.5 kg (3.25 lbs)	1.6 kg (3.50 lbs)	1.7 kg (3.75 lbs)
70 PPM	0.2 kg (0.40 lbs)	0.2 kg (0.50 lbs)	0.3 kg (0.60 lbs)	0.3 kg (0.66 lbs)	0.3 kg (0.75 lbs)	0.4 kg (0.80 lbs)	0.4 kg (0.90 lbs)	0.4 kg (1.00 lbs)	0.5 kg (1.10 lbs)	0.5 kg (1.20 lbs)	0.6 kg (1.25 lbs)
75 PPM	0 kg (0.0 lbs)	0 kg (0.0 lbs)	0 kg (0.0 lbs)	0 kg (0.0 lbs)	0 kg (0.0 lbs)	0 kg (0.0 lbs)	0 kg (0.0 lbs)	0 kg (0.0 lbs)	0 kg (0.0 lbs)	0 kg (0.0 lbs)	0 kg (0.0 lbs)

NOTE Add 0.57 kg (1.25 lbs) Chlorine Stabilizer to the pool every time 22.7 kg (50 lbs) of Salt is added to the pool. The Stabilizer reading should be maintained at 75 PPM.

Section 5. Operating Instructions



Figure 12. Control Center Front Panel

5.1 Using the Front Panel Controls

NOTE With the exception of **Boost**, the front panel buttons can not be used when the Chlorinator is controlled by the AquaLink RS. If arrow button **A** or arrow button **B** is pressed, **JA** in the Chlorinator display indicates that the AquaLink RS is controlling the Chlorinator and desired output percentages.

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

Pressing the arrow button **A** or arrow button **B** will change the **CHLORINE PRODUCTION** in 1% 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 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

Cell On	The CELL ON indicator shows that the cell has been turned on by the control center. Some reasons for the CELL ON indicator not being on during normal operation, are: CHLORINE PRODUCTION set to 00%, CHLORINE PRODUCTION set to less than 100% and Cell Resting appears during cell rest period, NO FLOW 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 g/l or salinity level too high.
Cell Resting	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 CELL RESTING indicator shows that the cell has been turned off by the control center. The reason for the CELL RESTING indicator, during normal operation, is CHLORINE PRODUCTION set to less than 100%.
Flow or No Flow Indication	When the control center determines that water is flowing past the Flow/Temp/Salinity Sensor, the FLOW indicator is displayed. When no flow is detected, the NO FLOW is displayed and the cell is turned off.
Cell Reversing	The automatic cleaning cycle of the Chlorinator is in progress. The cleaning cycle is factory set and cannot be adjusted. Cell Reversing does not interrupt the production of Chlorine.
Salinity	Salinity is displayed along with the g/l (grams per liter) indicator, when the Salinity button is depressed. If a reading of HH appears, the salinity is above 4.5 to 6.5 g/l (depending on pool temperature) and is too high to measure correctly (at normal temperatures). Maintain Salinity between 3.0 and 3.5 g/l. See Section 4, Tables 1 through 3.
Add Salt	The ADD SALT 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 g/l.
Service and Service Code	The SERVICE indicator will turn on whenever the Chlorinator detects a problem that requires attention. The SERVICE 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" in Section 7, Troubleshooting. Problems can range from insufficient salinity to the DC cord not connected.	
Audible Alarm	An audible alarm (beep) sounds once per hour, and only for the first service code when a Service condition is detected. The Alarm can be cleared by pressing and holding the Salinity button C 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.

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 Section 4, 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 Chlorinator is designed to supply a sufficient amount of chlorine to sanitize pool water on a daily basis. If the Chlorinator is operated 24 hours a day at 100%, more chlorine would be generated than would be needed by most pools (1-3 PPM). The Chlorinator 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 Chlorinator to any size pool just increase or decrease the Chlorine Production from 1% to 100%. (see "Apply Power" Section 5.4.2, steps 1-5)

NOTE When the Chlorinator is controlled by the AquaLink RS, Chlorine Production can be adjusted in 5% increments.

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

If you use a Pool Pump Timer 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 Chlorinator is wired with a Pool Pump Timer (See Section 2.1, 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 Chlorinator is running 24 hours a day through the winter, extremely cold water temperatures can effect Cell life. Sometimes it will be necessary to run the Chlorinator at a very low production rate of 10% to 20% or to turn the unit off. See Section 6.6, Winterizing.

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 Chlorinator 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 Chlorinator 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 Chlorinator.

5.4.2 Apply Power

1. Turn on the pool pump switch or Pool Pump Timer. When the Chlorinator 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 g/l and 3.5 g/l. 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 g/l refer to Section 4, Tables 1 through 3 and adjust salt level. (Maintain the Recommended Salinity Level of 3.0 to 3.5 g/l). If salinity is below 2.0 g/l the Chlorinator will automatically turn the cell off until the salinity is raised above 2.0 g/l, since operating with low salt will damage Cell. Likewise, if salinity is above the range of measurement the Chlorinator 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 g/l, see Section 7, Troubleshooting.

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 Section 6, Winterizing.

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. 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 Chlorinator is turned off.
- Do not let Chlorine Stabilizer drop below 30 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 Chlorinator.

NOTE When replacing the cell, use *only* replacement cells having a label that clearly states that it is a replacement cell for the chlorine generating device Clormatic III model CM601 - REGISTRATION NUMBER 23420, PEST CONTROL PRODUCTS ACT.

6.1 Daily

NOTE Check the expiration date of the test kit. The test kit may provide inaccurate results if used after the specified expiration date.

1. **Chlorine Test.** Test pool water chlorine level with a reliable test kit. Maintain ideal range by adjusting the chlorine production rate as discussed in Section 5.4.2, 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 Chlorinator is producing chlorine.

2. **pH Level Test.** Test the pH level of your pool with a test kit. Take steps as necessary to maintain a pH level of 7.2 - 7.8.

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.

3. **Total Alkalinity Test.** Test pool water for total alkalinity with a test kit. Take steps as necessary to maintain an alkalinity of 100 - 120 PPM.
4. **Calcium Hardness.** Test pool water for calcium hardness level using test kit or by having a water sample tested by a pool professional. Adjust as necessary to maintain a calcium hardness of 200 - 300 PPM.

6.2 Weekly

NOTE Check the expiration date of the test kit. The test kit may provide inaccurate results if used after the specified expiration date.

1. **Chlorine Test.** Test pool water chlorine level with a reliable test kit. Maintain ideal range by adjusting the chlorine production rate as discussed in Section 5.4.2 steps 3, 4, and 5.

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 Chlorinator is producing chlorine.

2. **pH Level Test.** Test the pH level of your pool with a test kit. Take steps as necessary to maintain a pH level of 7.2 - 7.8.

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 Chlorinator control center. Maintain the ideal range of 3.0-3.5 g/l for optimum performance of the Chlorinator. If additional salt is required, follow the procedures and charts described in Section 4. If salt level does not rise after 24 hours, see Section 7, Troubleshooting.
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. Take steps necessary to maintain an alkalinity of 100 -120 PPM.
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 recommended range of 30 - 100 PPM.
5. **Calcium Hardness.** Test pool water for calcium hardness level using test kit or by having a water sample tested by a pool professional. Adjust as necessary to maintain a calcium hardness of 200 - 300 PPM.
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 Chlorinator, 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. To acid clean the cell, mix one quart of muriatic acid with one US gallon of tap water in a plastic bucket. **Always add acid to the water, never add water to the acid. Always wear eye protection and use rubber gloves. Always work in a well ventilated area.**
 - c. Immerse the cell in the solution. 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 “d”**). 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).**
 - d. Rinse the cell thoroughly with clean tap water and inspect. If deposits are still visible, immerse the cell again in the solution for further cleaning. Additional acid may need to be added to the solution.

- e. Rinse the cell again with clean tap water and inspect. If clean, replace the cell and resume normal operation.
- f. If the acid wash procedure is necessary, it is recommended that a sample of pool water be analyzed by an authorized Chlorinator service representative for excessive hardness and/or improper water balance.
- g. 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 by turning counterclockwise.
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 Section 5.

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. 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.

An optional Spool Piece (Part Number AZ003) is available to replace the cell during winterizing or cell maintenance. This will enable pool pump to circulate water with the cell out of line. See Figure 13.

When a FREEZE CONTROLLER is used on pump equipment and the Chlorinator is run through the winter, turn the 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.

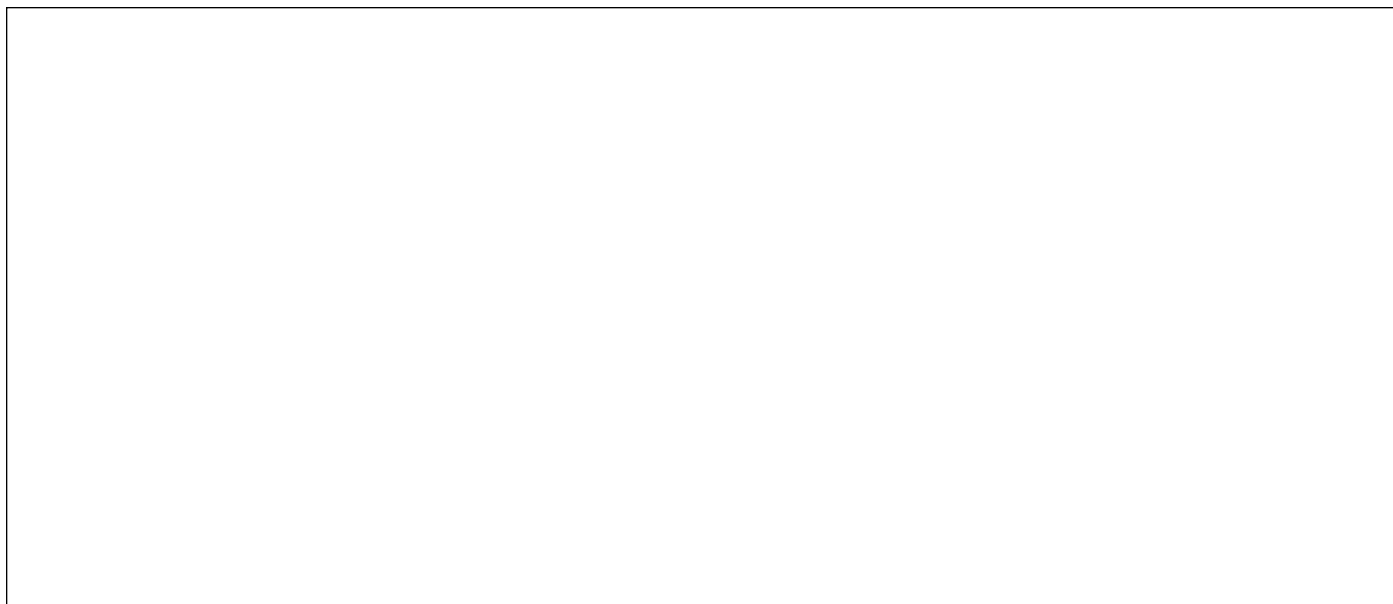


Figure 13. Spool Piece Location

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 30 - 100 PPM. See Stabilizer Chart, Section 4.
	Insufficient operating hours of the Chlorinator unit.	Increase the Chlorinator operating time per day. See Section 5.4.2.
	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 Section 5.
	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 Section 5.
	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).
	Low (Less than 2.5) g/l salt level in pool water.	Test salinity by pressing the Test Salinity button. See Section 4, Table 1.
	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 Section 5.4.1.
	Clogged or dirty cell.	Remove cell for inspection. Clean if necessary. See Section 6.1.

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 230 VAC.	Check that unit is correctly wired for 230 VAC and connected to 230 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 25. Prime pump if necessary.
<i>If No Flow also....</i>	Flow/Temp/Salinity Sensor not plugged in.	Plug in Flow/Temp/Salinity Sensor. See Section 2.1, Figure 2.
	Salt level below 2.0 g/l.	Add salt as described on pages 17 through 19.

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 (for example, 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 Chlorinator cell.	Remove cell for inspection. Follow cleaning procedures. See Section 6.4.
	Flow/Temp/Salinity Sensor not installed properly.	Ensure that the Flow/Temp/Salinity Sensor is installed according to Section 3.5, 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 Section 2.1, Figure 2 and 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. Wrap Flow /Salinity sensor threads with teflon tape and reinstall. Section 3 to remove Sensor and Section 6 for cleaning instructions.
	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 g/l to 3.5 g/l.

Problem	Possible Cause	Corrective Action
"Service" Indicator On.	Low salt level in pool water.	Test salinity. Add salt as described Section 4.
	Cell requires cleaning.	Refer to Maintenance Procedure for acid wash cleaning. See Section 6.4.
	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 Section 6.6.
	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 g/l to 3.5 g/l. See Section 4.
	Heavy Rainfall.	Add salt to pool, 3.0 g/l to 3.5 g/l. See Section 4.
	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 Section 6. 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 Section 6). 2. Check DC Cord.
121	Low current in reverse direction to Cell	1. Clean cell if necessary (see Section 6). 2. Check DC Cord.
123	Extremely Low current to Cell	1. Clean or replace cell if necessary (see Section 6). 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 Section 6).
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 g/l)	Add salt to pool to achieve 3.0 g/l (see Section 4).
145	High Salinity (above 4.5 g/l)	Backwash filter. Partially drain pool and dilute with fresh water until salinity returns to 3.0 to 3.5 g/l.
170	Possible Front board service condition or unit not correctly wired to 115 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 Chlorinator	Flow/ Salinity Sensor indicates water temperature at sensor above 42°C. Reduce water temperature.
175	Flow Sensor air lock condition or very low salinity	Verify proper Flow/Temp/Salinity Sensor installation see page 12 Figure 7. Check salinity with Myron "L" meter calibrated for NaCl or test strips. Add salt as necessary, see Section 4.
199	Contact Service Representative	

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 < 10°C. 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 Chlorinator and desired output percentages.
Jb	Boost (AquaLink RS Interface)	AquaLink RS is controlling the Chlorinator 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.



Figure 14. Temperature Conversion Chart

Commercial - Chlorinator and Cell Limited Warranty*

HURONTECH SYSTEMS (hereinafter called "**Huron**") warrants the Chlorinator, all *original* component parts and accessories, to be free from defects in materials or workmanship under normal and proper use for a period of one (1) year from the date of purchase. This warranty applies only to the first purchaser (hereinafter called the "*Original Purchaser*"). This warranty is subject to the terms and conditions **below**. Proof of purchase of the Chlorinator must be presented to **Huron** or its authorized representative at the time any warranty claim is made. This warranty extends only to the Original Purchaser and is not enforceable by any other party.

Note: After the expiration of one (1) year from original purchase date, the Chlorinator commercial cell is warranted on a flat-rate basis as indicated below under "**Extended Flat-Rate Warranty for the Commercial Cell**".

Purchased - Replacement Parts Limited Warranty*

HURONTECH SYSTEMS (hereinafter called "**Huron**") warrants replacement component parts and accessories [**other than cells**], to be free from defects in materials or workmanship under normal and proper use for a period of one (1) year from the date of purchase. This warranty applies only to the first purchaser (hereinafter called the "*Original Purchaser*"). This warranty is subject to the terms and conditions **below**. Proof of purchase of the replacement part must be presented to **Huron** or its authorized representative at the time any warranty claim is made. This warranty extends only to the Original Purchaser and is not enforceable by any other party.

***NOTE: If a residential unit is used in a commercial application the warranty will automatically become void.**

Manufacturer's Obligations

Huron's obligation under this warranty is strictly limited to repairing or replacing the Chlorinator component, part or accessory. Such defective component, part or accessory must be returned to **Huron** or its authorized representative, freight prepaid, within the warranty period. If the defect is found to be a problem with materials or workmanship within the limitations of the warranty, **Huron** will repair or replace such defective component, part or accessory free of charge and return such item to the Original Purchaser, freight prepaid (Within the United States Only). In the event such defective component, part or accessory is replaced by **Huron**, then the defective component, part or accessory becomes the property of **Huron**.

Extended Flat-Rate Warranty for Commercial Cell

After the expiration date of one (1) year from the date of purchase by the Original Purchaser, **Huron** warrants its commercial cells for one additional year on a flat-rate basis. The flat-rate warranty schedule is as follows:

Beginning with the first day of the 13th month and ending on the last day of the 24th month the flat-rate charge to the Original Purchaser for a replacement cell will be 70% of the suggested retail price.

That is, the current suggested retail price x 0.70 = Flat-rate charge for new cell.

Warranty Exclusions

1. Material supplied or workmanship performed by others in the process of installing the Chlorinator.
2. Damage resulting from improper installation of the Chlorinator.
3. Problems resulting from failure to operate the Chlorinator in accordance with recommended instructions contained in the product's Owner's Guide.
4. Problems resulting from failure to maintain pool water chemistry in accordance with recommended operating levels.
5. Problems resulting from improper sizing.
6. Problems resulting from tampering, accident, abuse, negligence, unauthorized repairs or alterations, fire, flood, freezing, external water, acts of God, or other force majeure event.

Total Obligations

The foregoing constitutes the entire liability of **Huron** to the Original Purchaser of a Chlorinator. **Huron** makes no other warranty of any kind whatsoever, expressed or implied, and all implied warranties of merchantability and fitness for a particular purpose are hereby disclaimed by **Huron** and excluded from this limited warranty. In no event will **Huron** be liable to the owner for direct, indirect, incidental or consequential loss, damage or economic injury to any person or property arising out of or relation to the use of the Chlorinator except as expressly set forth herein.

No employee, agent, dealer or other person is authorized to make any warranties, guarantees or representations or to allow any exceptions to this warranty, or to assume any other liability or obligation on behalf of **Huron** in connection with the Chlorinator.

This warranty gives you specific legal rights and you may also have other rights which vary from province to province.

Label: CM601 Flow Sensor:

Part #FSS103
ClorMatic® III Model CM601 Flow Sensor

DOMESTIC

Read the Label and Installation and Operation Manual of the chlorine generating device, ClorMatic III before using.

Replacement flow sensor for the chlorine generating device ClorMatic III Model CM601, REGISTRATION NUMBER 23420, PEST CONTROL PRODUCTS ACT. This flow sensor must only be used on this model of chlorine generating device. **Zodiac Pool Systems, Inc.**

~~Huron Tech Systems
Flow / Salinity Sensor
4815 Executive Park Court, Suite 210
Jacksonville, Florida 32216~~

~~Jandy Pool Products Inc.
6000 Condor Drive
Moorpark CA 93021-2601
United States~~

LA1003

Notification Change

Label: CM601 Cell Label

ClorMatic® III Model CM601 Replacement Cell

Specifications:

DOMESTIC

20 GPM Minimum Flow Rate

22 to 32 Volt DC

6 Amp DC

Model ECR100

Read the Label and Installation and Operation Manual of the chlorine generating device, ClorMatic III before using.

KEEP OUT OF REACH OF CHILDREN

Replacement cell for the chlorine generating device ClorMatic III Model CM601, REGISTRATION NUMBER 23420, PEST CONTROL PRODUCTS ACT. This cell must only be used on this model of chlorine generating device.

Zodiac Pool Systems, Inc.

~~Huron Tech Systems
4815 Executive Park Court, Suite 210
Jacksonville, Florida 32216~~

~~Jandy Pool Products Inc.
6000 Condor Drive
Moorpark CA 93021-2601
United States~~

Notification Change

WARNING: Failure to replace DC cord when replacing cell may cause premature cell failure.

LA1040 REV1

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