

# **650 MPC Installation and Operating Instructions**

## **IMPORTANT SAFETY INSTRUCTIONS**

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

**READ LABEL AND GUIDE BEFORE USING. FOLLOW ALL INSTRUCTIONS.**

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

**WARNING:** *Risk of electric shock. Connect only to a 110V AC grounding type receptacle protected by a ground fault circuit interrupter (GFCI). Contact a qualified electrician for installation or if you cannot verify that the receptacle to be used is protected by a GFCI. To reduce risk of shock, replaced damaged cord immediately.*

**WARNING:** *Do not bury cord. Locate system and cord to minimize abuse from lawnmowers, trimmers and other equipment.*

**WARNING:** *To reduce the risk of electric shock, do not use with extension cords. Connect only to a properly installed and located electrical outlet*

**WARNING:** *All installations must be minimum of 10 feet from pool or spa.*

**WARNING:** *Transformer 4-29-5024 BL01 120V or 4-29-5024 AL00 230V (outdoor use) with (Class 3 NEMA enclosure). For permanent installation, wire into filter pump timer box.*

**WARNING:** *Do not sprinkle granular chlorine into the water. It can settle on the bottom undissolved and may cause black stains.*

**Save these instructions. Refer problems to qualified personnel. Do not attempt to dismantle or repair. No user serviceable parts. Warranty void if tampered with.**

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## **Installation:**

*Installation of the 650MPC includes the plumbing of the flow cell into the recirculation system, connecting the controller to the terminals of the electrodes and to the transformer power supply. The electrodes are held in place in the flow cell by a quick release sanitary clamp system. The standard flow cell provided with the 650 MPC is a 2" PVC Tee. It is plumbed in line in the recirculating system using standard PVC primer and glue. A full stainless steel flow cell is available as an upgrade.*

*A suitable position for the flow cell is on the return side of the recirculation system where there is room to cut out a section of pipe and install the flow cell. Ensure there is room to access the electrodes for periodic inspection or replacement. Optimum positioning would be on the return line after the filter.*

## **Step-by-Step Flow Cell Installation:**

- 1) Cut the required section out of the return line in the recirculation system.*
- 2) Smooth all cut ends with a file or sandpaper.*
- 3) Apply PVC primer to both these cut ends (about 1"), the reducers if required and the inside ends of the flow cell.*
- 4) Apply a liberal coating of PVC glue to all primed sections of the reducers and flow cell. Insert the reducers into the flow cell and hold for approximately 30 seconds or until the glue sets.*
- 5) Follow the same procedure to glue the flow cell into the correct position, pushing the pipe into the flow cell until it seats. Hold until set.*

*The installation of the flow cell is now complete. Check for leaks.*

## **Controller Installation:**

- 1) Mount the controller in a convenient, dry, sheltered position close to the application and to an electrical source.*
- 2) After all connections are made, plug in the transformer into the AC outlet.*

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## **Operation:**

*The following outlines the procedure for the setting and operation of the control panel of the 650 MPC.*

*The lights and functions on the control panel are as follows:*

*“FWD” is the operation of the forward cycle of the ionization process. Current direction is from anode (+) to cathode (-). The indicator is on when this is functioning*

*“REV” is the reverse cycle of the ionization process. Current direction is from cathode (-) to anode (+). The indicator is on when this is functioning.*

*“ANODE” indicates there is current flowing from one electrode to another. The indicator is on when this is functioning.*

*“SET/RESET” is used to start the ionization process or allow the operator to change the duty cycle.*

*“SET DUTY CYCLE” increases or decreases the numbers in the digital readout.*

*The “DUTY CYCLE” display gives a visual reading from 1 to 99. This indicates the percentage of time the system is actually sending power to the electrodes. A more detailed description of the operation follows.*

## **Step-by-Step Operation:**

*When the transformer is plugged into the AC power, the digital readout on the control panel will activate. To activate the system or change the settings follow the instructions below.*

- 1) Press the “Set/Reset” button. The digital readout will start to flash.*
- 2) Press the “Set Duty Cycle” button and the numbers on the readout will increase in single digits each time the button is pressed. If you continue to hold the button down, the readout will advance for as long as the button is held and will cycle through the range from 1 to 99 continually. Cycle through to reach the chosen number.*
- 3) Press the “Set/Reset” button again. This will activate the system on the desired setting. The display will stop flashing, and show the selected setting.*

*By adjusting the time the current is sent to the anode and cathode, you adjust the amount of copper and silver dispensed into the water. A test kit is provided to measure the copper content of the water. Follow the instructions on the test kit to determine the level. The recommended*

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range is between 0.25 and 0.4 parts per million (PPM). If the level is high, turn the system down by lowering the number on the readout. If it is low increase the number.

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Test the copper level every day initially. When it reaches an acceptable range and remains stable, take note of the setting. Whenever you change your water you can return it to this setting.

It is recommended that you test the water on a weekly basis to insure a proper copper level. If the level is not within range adjust the controller accordingly.

Here is a more detailed description of the operation of the 650 MPC.

The controller on the 650 MPC supplies power to the anode. The output from the controller is preset and non variable. To adjust the amount of copper dispensed into the water, you adjust the timing of the duty cycle. A duty cycle is simply the time it takes for the controller to complete a timed sequence of functions. Or, the time it takes the system to go through one complete operation. Rather than varying the power to the anode to adjust the ion output, the amount of time that power is applied is adjusted. A full duty cycle of the 650 MPC would include a "FWD" stage, a "REV" stage and an off stage to complete a full duty cycle.

When changing the number on the digital readout with the set/reset and duty cycle buttons, you are changing the amount of time in seconds that power is being sent to the electrodes.

So what would you see on the control panel? The duty cycle consists of four stages; forward, off, reverse and off. The number on the readout is the length of time in seconds that power is applied to the electrodes in the forward and reverse stage. Keep in mind, the longer the "on" cycle, the shorter the "off" cycle. As an example: assume the controller is set at 25. In the first stage, the "FWD" indicator is on for 25 seconds. The anode indicator is also on. The anode indicator will remain on throughout the full duty cycle. After 25 seconds the controller will change to the "off" cycle. The off cycle will last approximately 75 seconds. Next, the "REV" indicator will light for 25 seconds. Next, the system will move to the off cycle for an additional 75 seconds. This is one complete duty cycle. The process then repeats. If the controller were set at 90, it would be in the on cycle for 90 seconds and the off cycle for only 10 seconds. This allows for greater control at lower levels. Set at 00, the 650 MPC is off.

### **WATER BALANCE & MAINTENANCE**

**It is very important to maintain correct water balance and maintenance habits. Perform the required water tests as recommended and add an oxidizer as required.**

The 650 MPC ion system does not control or change the need for correct water balance. Consult with your local pool or spa dealer. They will be able to provide you with proper instructions for your specific application. Failure to maintain correct water balance and oxidize as required can affect the performance of the ion system.

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*As the 650 MPC ion system has no oxidizing potential, it is important to add an oxidizer to the pool or spa once each week. This will help keep your water clear and sparkling, non-stabilized chlorine or any one of the commercially available non-chlorine shocks can be used.*

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*If using chlorine, dilute the required amount in water and pour into the pool or spa. For a non-chlorine oxidizer, follow the manufacturer's directions for use. Ozone is also a very effective oxidizer.*

*Recommended levels for correct water balance*

<i>pH</i>	<i>7.2 to 7.4</i>
<i>Total Alkalinity</i>	<i>80 to 120 ppm</i>
<i>Calcium Hardness</i>	<i>200 to 300 ppm</i>
<i>Copper</i>	<i>0.25 to 0.4 ppm</i>
<i>Free Available Chlorine</i>	<i>0.4 ppm</i>

### **CLEANING THE ELECTRODES**

*If the indicator on the control panel is not lighting or the performance of the unit deteriorates, check the condition of the electrodes. They may become coated with a calcium deposit. This is normal but means they require cleaning. To do this, unplug the unit. Then, disconnect the leads from the electrodes. Remove them from the flow cell. Remove the gasket from the cap. Stand the electrodes in about two inches of muriatic acid for a few minutes or until the coating is dissolved. Be careful to only immerse the electrodes only not the cap. Remove them from the acid and place it in a solution of sodium bicarb to neutralize the acid. Rinse, reinstall in the system and set the controller as before. It is very important to wear protective gloves, clothing and eye wear when working with any acids or caustic chemicals.*

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