

# Aquasol Controllers, Inc.

## Owners Manual – Text Only

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## **1. The Aquasol SPC/ SPC-M/ WTC/ WTC-P Controllers**

Your Aquasol Controller is a highly engineered electronic instrument that automatically maintains pH and sanitizer balance in swimming pools, spas, fountains and other re-circulating bodies of water. It will operate with all types of chlorine and bromine systems in any size body of water.

Aquasol Controllers have been maintaining accurate control of water chemistry since 1975. Your Aquasol Controller will give you many years of service with minimum maintenance.

We recommend your pool be tested at least once a day with a DPD test kit.

## **2. Your Aquasol Controller contains the following items:**

- A. Controller (SPC, SPC-M, WTC or WTC-P)
- B. Flow Cell
- C. ORP/ Chlorine electrode (red color)
- D. pH electrode (blue color)
- E. 2 electrode fittings
- F. 4 water flow fittings
- G. 2 plugs
- H. Teflon tape
- I. 20 feet of 3/8" tubing
- J. 4 mounting feet for controller
- K. Warranty card
- L. Operating manual

## **3. Controller features**

A. Face Panel: The face panel is modular in design and is easily disconnected from the circuit board.

1. Set instructions: Gives basic calibration instructions for the controller.
2. pH control knob: Adjusting this knob will at some point activate the "pH" LED and the pH power outlet . It allows you to match the controller to the

current pH of the water. pH is a measure of quality not quantity. Turning the control knob to "LOWER" indicates your desire to lower the pH while turning the knob towards "HIGHER" means you want to raise the pH.

If you cannot activate the "pH" LED, or if the "pH alert" or "feed limit" LEDs are lit, refer to section 7 on calibration.

3. Cl/ORP control knob: Adjusting this knob will at some point activate the "Cl/ORP" LED and the Cl/ORP power outlet. It allows you to match the controller to the current level of sanitizer in the water. Turning the knob towards "LOWER" indicates you want less sanitizer in the water while turning towards "HIGHER" means you want a higher level of sanitizer.

If you cannot activate the "Cl/ORP" LED, or if the "Cl/ORP alert" or "Feed limit" LEDs are lit then refer to section 7 on calibration. Also read about DIP switch 4 in section 4.

4. "Power" LED: When lit, this LED indicates that you have power to the controller.

5. "pH" LED: When lit, the controller is calling for additional chemical to adjust the pH of the water.

6. "Cl/ORP" LED: When lit, the controller is calling for additional sanitizer to be added to the water.

7. "pH alert" LED: When lit, the controller is indicating that the signal coming from the pH electrode is out of the range of the pH control knob. The pH alert overrides the pH feed system. The controller cannot make pH adjustments when in pH alert.

8. "Cl/ORP alert" LED: When lit, the controller is indicating that the signal coming from the ORP electrode is out of the range of the Cl/ORP control knob. The Cl/ORP alert overrides the Cl/ORP feed system. The controller cannot make sanitizer adjustments when in Cl/ORP alert.

9. "pH test": This is a spring loaded switch that allows you to confirm that you can get power to the pH feed system. If the "pH alert" or "feed limit" LEDs are lit, this switch will not operate.

10. "Cl/ORP test": This is a spring-loaded switch that allows you to confirm that you are getting power to the Cl/ORP feed system. If the "Cl/ORP alert" or "feed limit" LED's are lit, this switch will not operate. This switch will also not operate if DIP switch 4 is in the "ON" position **and** the "pH" LED is lit.

11. "Feed limit" LED: This is an optional feature of your controller. When lit, the controller is informing you that one of the feed systems ran for four (4) hours continuously. It is normally an indication of a problem with the feed system or that an electrode failed. The controller will cease to operate until manually restarted, which is accomplished by unplugging the controller from its power source and plugging it back in.

12. "pH set" button: This is used, in conjunction with the pH control knob, to calibrate when you are using the pH timed monitoring feature. See DIP switch 1 in Section 4 (DIP Switches).

13. Meters (Model WTC and WTC-P): Two individual LCD meters continuously display ORP and pH readings. The ORP display is a millivolt reading.

14. Meter (Model SPC-M): One LCD meter continuously displays ORP **or** pH readings. The ORP display is a millivolt reading. Use the toggle switch below the meter to select either pH or ORP readings. **Note:** The controller continuously maintains both the pH and sanitizer although displaying just one reading.

15. "CAL" (Models SPC-M, WTC and WTC-P): This small screw allows you to calibrate the pH meter only. **It has a very limited range.** The controller must be properly calibrated before adjusting the pH meter.

B. Circuit module: The circuit module is easily exchanged by removing all slip on connectors and the four mounting posts or screws. All solid state circuitry on the module carries a functional lifetime warranty. Read your warranty card for details.

1. Fuses: All fuses are electronic slo-blo. The top fuse is 1/4 amp and powers the controller. The middle fuse is 3 amp and powers the pH feed system. The bottom fuse is 15 amp and powers the sanitizer feed system.

2. Relays: Transfer power to the pH and sanitizer feed systems. Relays plug into the circuit board and are easily replaced.

3. Cl and pH potentiometers: These are used to calibrate the face panel control knobs.

4. DIP switches: Allow you to choose optional features for operating your controller. See Section 4 for explanation of each switch.

5. Acid/Caustic switch: The position of this switch is determined by what chemical you use for your pH. Place in "Acid" position if your chemical lowers pH. Place in "Caustic" position if your chemical raises pH.

#### 4. DIP switches

Located on the top right of the circuit board. It is red in color and has 8 white switches on it. They offer optional features for you to use:

<u>DIP switch</u>	<u>OFF position</u>	<u>ON position</u>
1.	pH continuous monitoring	pH timed monitoring
2.	2 minute pH feed	1 minute pH feed
3.	low chlorine alert inactive	low chlorine active
4.	continuous chlorine feed	pH feed overrides chlorine feed
5.	feed limit active	feed limit inactive
6.	high pH alert inactive	high pH alert active
7.	high pH alert doesn't deactivate chlorine feed	high pH alert deactivates chlorine feed
8.	Open	

##### Switch 1 and 2

These switches are turned OFF when feeding acid or caustic into the return line to the pool. Timed monitoring of the pH is used on pools that require acid for pH adjustment but consume only small amounts. When switch one is ON, the controller will treat the water once every 30 minutes **if** acid is needed. The acid is ejected from your acid pump into the flow cell, which helps to clean the electrodes every time the pH is adjusted.

If you need to set the pH control knob on the face panel, You must hold in the "pH set" button while adjusting the pH control knob.

Switch 2 is active only if switch 1 is ON. Switch 2 in the OFF position will feed for 2 minutes when acid is called for. Switch 2 in the ON position will feed for 1 minute.

##### Switch 3

Switch 3 in the OFF position removes the low chlorine alert. This switch is used when chlorine may be consumed faster than the controller can react to the changes in the water. A good example is a spa with no bathers one minute and many bathers the next. Removing the low alert will allow the controller to bring the water chemistry back to its proper level without going into an alert mode. **Caution:** you are removing a safety feature of the controller when you have switch 3 in the OFF position.

##### Switch 4

Switch 4 in the ON position will not allow both the Cl/ORP and pH feeders to run at the same time. When switch 4 is ON, the pH feed will always override the Cl/ORP feed. Because ORP is pH sensitive, correcting the pH first may satisfy the demand for chlorine to be added to the pool. **Remember:** If switch 4 is on **and** the pH LED is lit, you cannot calibrate the Cl/ORP.

### Switch 5

Switch 5 controls the "feed limit" LED on the face panel. With switch 5 is in the OFF position, if either feeder runs four hours nonstop, the controller will shut down. This is a safety feature. This alert requires manual restart of the controller. Unplug the controller from its power source and plug it back in.

If a feeder is properly sized it should not have to run for over 4 hours continuously. You may have a faulty electrode, a failure with a chemical feeder or you could be out of chemical(s). Switch 5 in the ON position will remove the "feed limit" feature. **Caution:** you are removing a safety feature if you put switch 5 in the ON position.

### Switch 6

Switch 6 in the ON position activates the "high pH alert". If your controller is set for acid feed, we recommend putting switch 6 in the OFF position.

### Switch 7

Switch 7 in the ON position will deactivate the Cl/ORP feed if the controller is in "high pH alert". Switch 6 must be ON in order for switch 7 to operate.

## **5. Items required for installation**

- A. Electric drill with 7/16" drill bit
- B. 1/4" NPT tap
- C. Screws to mount controller and flow cell to wall
- D. Screwdriver

## **6. Installation**

Your Aquasol Controller is designed to be easily installed on the circulation system. It may be installed indoors or outdoors so long as the cover is secured.

### Step 1 (Fig. 8 or 9)

Turn off the pool/ spa circulation pump. Identify the line from the pump to the filter and the return line to the pool after the filter and heater (if present).

#### Step 2 (Fig. 7)

Wrap all fittings with at least three wraps of Teflon tape. Install the water flow fittings in the flow cell into the holes labeled INLET and OUTLET. **Hand tighten only! Applying a wrench to the fittings can cause damage to the flow cell !** Install the electrode fittings into their respective holes in the flow cell. If you are not using any auxiliary equipment or you are not using the timed monitoring of pH feature then the 2 plugs may be installed in the remaining holes.

#### Step 3 (Fig 8 or 9)

Mount the Controller and Flow Cell on a convenient wall. The Controller should be located close to a properly grounded 110 VAC outlet. Do not use extension cords unless necessary.

The Flow Cell must be mounted within 9 feet of the Controller. The Flow Cell must be mounted vertically so the water OUTLET fitting is on top.

#### Step 4

Drill a 7/16" hole in the circulation line between the pump and filter and another in the return line to the pool as noted in Step 1. Tap both holes with a 1/4" NPT tap. **Do not over tap!** Install a Teflon wrapped water flow fitting into each hole. **Hand tighten only!**

#### Step 5 (Fig 8 or 9)

Cut a proper length of 3/8" tubing to run from the fitting between the pump and filter to the INLET fitting on the flow cell. Refer to Fig. 7B to connect tubing to the fitting. Install another piece of tubing from the OUTLET fitting to the fitting in the return line to the pool.

#### Step 6 ( Fig 7 & 7A)

Carefully remove the storage bottle from each electrode. Save the bottles for storage purposes. **Electrodes are fragile. Damage to electrodes by mishandling is not covered by warranty.**

Dip each electrode in some muriatic acid (if available) to help clean off the storage solution.

Insert each electrode all the way into the fitting per Fig. 7A. Note that the nut for the

fitting slides down the length of the electrode cable. Hand tighten the nut to hold the electrode in place.

#### Step 7

Connect each electrode to the proper BNC connector on the bottom of the controller. Slide the rubber boot on the electrode cable over the BNC to protect it from corrosion. Secure and protect the electrode cables from accidental damage.

#### Step 8 (Fig 9)

If you are using a Safety Pressure Switch (a must for liquid chlorine (bleach) systems), the power cord for the controller will plug into the Safety Pressure switch. Otherwise, plug the controller directly into the 110 VAC outlet.

#### Step 9

Turn on the circulation pump. Check for leaks in the Flow Cell water lines. If you are using a pressure switch, check to make sure it is operating properly by referring to the instructions that came with the pressure switch.

#### Step 10

Manually balance your pool water to your or your health department's desired levels of chlorine/ bromine, pH and total alkalinity.

#### Step 11

Allow the circulation system to run for 30 minutes before calibrating. This will allow the electrodes to acclimate to your pool water. Do not plug chemical feeders into the controller during this period.

### **7. Calibration**

**Note:** Unplug chemical feeders from your controller when calibrating.

**Note:** If the "feed limit" LED on the controller face panel is lit, unplug the controller from its power source and plug back in.

#### **A. Models SPC, SPC-M and WTC**

##### **pH:**

If the "pH Alert" LED is lit, unplug the controller from its power source and plug back in. This resets the timer for the pH alert. (If you do not turn off the "pH Alert" LED, you



cannot calibrate the pH). Turn the pH control knob to the point where the "pH" LED comes on and off. If this "set point" is between the 10 o'clock and 2 o'clock positions, then leave the pH control knob set where the pH feed light is just off.

If the "set point" is not within the 10 o'clock to 2 o'clock range, you will need to do an internal calibration.

For internal calibration, remove the four screws holding the face panel. Set the panel in the lid of the controller. Do not disconnect the face panel from the circuit board.

**Warning:** The left side of the circuit board carries 110 volts of electricity. Do not stick fingers or tools near fuses, relays or other electrical components.

Set the pH control knob on the face panel to the 12 o'clock position. If DIP switch 1 is "ON", put it temporarily in the "OFF" position. If you are feeding caustic, temporarily put the unit in "acid" mode.

**IF:**

a. "pH" LED is on, adjust pH potentiometer VR17 on the circuit board CLOCKWISE until it turns off.

b. "pH" LED is off, adjust pH potentiometer VR17 on the circuit board COUNTERCLOCKWISE until it turns on.

**Note:** If the "pH alert" LED comes on during calibration, unplug the controller and plug back in. This will give you one more minute to finish calibrating.

When you are finished calibrating the pH, if you turned off DIP Switch 1, remember to turn it on again. If you are feeding caustic, remember to put the "acid/caustic" switch in caustic mode.

**ORP/ Chlorine:**

If the "Cl/ORP Alert" LED is lit, read further for instructions about internal calibration of the controller. If the "Feed limit" LED is lit, unplug the controller from its power source and plug back in.

Adjust the Cl/ORP control knob on the face panel of the controller to the point where you get the "Cl/ORP" LED to come on and off.

If this "set point" is between the 10 o'clock and 2 o'clock position, leave the knob set to where the "Cl/ORP feed" LED is just off. If the "set point" is outside the 10 o'clock to 2 o'clock range, the controller will require internal calibration.

For internal calibration, remove the four screws holding the face panel. Set the panel in the lid of the controller. Do not disconnect the face panel from the circuit board.

**Warning:** The left side of the circuit board carries 110 volts of electricity. Do not stick fingers or tools near fuses, relays or other electrical components.

If the "Cl/ORP alert" LED is lit, turn DIP switch 3 to the "OFF" position. If the controller goes from "alert" to "feed", you are in "low alert". If the "Cl/ORP alert" remains lit, you are in "high alert".

If you turned DIP switch 3 to "OFF" set it back to "ON" at this time.

Set the Cl/ORP control knob on the face panel to the 12 o'clock position.

**IF:**

You are in "high" alert or, the "Cl/ORP alert" and "Cl/ORP" LEDs are not lit, adjust the Cl potentiometer (VR16) COUNTERCLOCKWISE until the "Cl/ORP" LED is lit.

**IF:**

You are in "low" alert or the "Cl/ORP" LED is lit, adjust the Cl potentiometer (VR16) on the circuit board CLOCKWISE until the "Cl/ORP" LED goes out. Note: If you started with the "Cl/ORP Alert" LED lit, as you adjust the potentiometer the alert LED will go off and the feed LED will come on. Continue adjusting until the feed light goes off.

**Meters (SPC-M and WTC)**

There is no calibration for the ORP meter. It is showing a direct reading from the ORP electrode.

To calibrate the pH meter, the controller must be in calibration first. If the "set point" for the pH control knob is not between 10 o'clock and 2 o'clock, you must calibrate the circuit board. Once the controller is properly calibrated, the pH meter will read very close to the actual pH of the pool water. At this time you may adjust the calibration screw by the pH meter to match your test kit. The pH meter calibration screw has a limited range of about 180 degrees. Do not force it past its stop point!

**B. Model WTC-P**

**pH:**

If the pH Alert LED is lit, unplug the controller from its power source and plug back in. This resets the timer for the pH alert. (If you do not turn off the "pH Alert" LED, you cannot calibrate the pH).

Test the pH of the water. The pH must be between 7.2 and 7.8. If it is not, you must adjust your water before continuing.

Set the pH control knob in position as described:

<u>pH of water</u>	<u>Position of pH control knob</u>
7.2	9:00 (o'clock)
7.3	10:00
7.4	11:00
7.5	12:00
7.6	1:00
7.7	2:00
7.8	3:00

If the "pH feed" LED does not turn on at the position listed above, you will need to do an internal calibration. If you are in timed monitoring (DIP switch 1 ON) you need to press the "pH set" switch to see if the "pH" LED lights.

For internal calibration, remove the four screws holding the face panel. Set the panel in the lid of the controller. Do not disconnect the face panel from the circuit board.

**Warning:** The left side of the circuit board carries 110 volts of electricity. Do not stick fingers or tools near fuses, relays or other electrical components.

Set the pH control knob on the face panel to the position respective to the actual pH of the pool as shown above.

If DIP switch 1 is "ON", put it temporarily in the "OFF" position. If you are feeding caustic, temporarily put the unit in "acid" mode.

**IF:**

a. "pH" LED is on, adjust pH potentiometer VR4 circuit board CLOCKWISE until it turns off.

b. "pH" LED is off, adjust pH potentiometer VR4 on the circuit board COUNTERCLOCKWISE until it turns on.

**Note:** If the "pH alert" LED comes on during calibration, unplug the controller and plug back in. This will give you one more minute to finish calibrating.

When you are finished calibrating the pH, if you turned off DIP Switch 1, remember to

turn it on again. If you are feeding caustic, remember to put the "acid/caustic" switch in caustic mode.

### **Chlorine/ORP (WTC-P)**

If the "Cl/ORP Alert" LED is lit, read further for instructions about internal calibration of the controller. If the "Feed limit" LED is lit, unplug the controller from its power source and plug back in.

Adjust the Cl/ORP control knob on the face panel of the controller to the point where you get the "Cl/ORP" LED to come on and off.

If this "set point" is between the 10 o'clock and 2 o'clock position, leave the knob set to where the "Cl/ORP feed" LED is just off. If the "set point" is outside the 10 o'clock to 2 o'clock range, the controller will require internal calibration.

For internal calibration, remove the four screws holding the face panel. Set the panel in the lid of the controller. Do not disconnect the face panel from the circuit board.

**Warning:** The left side of the circuit board carries 110 volts of electricity. Do not stick fingers or tools near fuses, relays or other electrical components.

If the "Cl/ORP alert" LED is lit, turn DIP switch 3 to the "OFF" position. If the controller goes from "alert" to "feed", you are in "low alert". If the "Cl/ORP alert" remains lit, you are in "high alert".

If you turned DIP switch 3 to "OFF" set it back to "ON" at this time.

Set the Cl/ORP control knob on the face panel to the 12 o'clock position.

#### **IF:**

You are in "high" alert or, the "Cl/ORP alert" and "Cl/ORP" LEDs are not lit, adjust the Cl potentiometer (VR3) COUNTER CLOCKWISE until the "Cl/ORP" LED is lit.

#### **IF:**

You are in "low" alert or the "Cl/ORP" LED is lit, adjust the Cl potentiometer (VR3) on the circuit board CLOCKWISE until the "Cl/ORP" LED goes out.

**Note:** If you started with the alert LED lit, as you adjust the potentiometer the alert LED will go off and the feed LED will come on. Continue adjusting until the feed light goes off.

Remember to plug in chemical feeders when you are finished calibrating.

## **Meters:**

There is no calibration for the ORP meter. It is showing a direct reading from the ORP electrode.

To calibrate the pH meter, the controller must be calibrated first. If the "set point" for the pH control knob is not between 10 o'clock and 2 o'clock, you must calibrate the circuit board. Once the controller is properly calibrated, the pH meter will read very close to the actual pH of the pool water. At this time you may adjust the calibration screw by the pH meter to match your test kit. The pH meter calibration screw has a range of about 180 degrees. Do not force it past its stop point!

## **8. Voice Module (Model WTC-P)**

The controller will require a dedicated phone line. It can be called at any time for pool readings. When called, the controller will identify itself and give pH and ORP readings.

Call 1-800-444-0675 once you have a phone line to the controller. The following functions can be programmed by Aquasol over the phone:

- A. The controller will call a programmed phone number if the pH or ORP go beyond their programmed ranges.
- B. The controller will wait a programmable amount of time, upon going into alert, before it will begin to call.
- C. The controller will continue to call at programmable intervals until receipt of the call is acknowledged. Acknowledgment is accomplished by calling the controller and hanging up. If messages have been left with a pager or answering machine, the controller must be called and receipt acknowledged.
- D. Once receipt of alert status is acknowledged, the controller is programmable as to the amount of time you have to service it. If not serviced (brought back into range mode) within the allotted time, the controller will begin its alert status calling function again.

## **9. Electrodes**

### **A. Electrode care and handling**

The electrodes provided are the finest available. Electrodes are fragile and are subject to damage by freezing, bending, crushing or dropping on a hard surface. Damaged electrodes cannot be repaired, they must be replaced. Damaged electrodes are not covered by warranty.

The tip of the electrode must be kept wet. If not in service or if you are storing them for the winter, they can be stored in a glass with the tips immersed in water, or add some water to the storage bottle (if available) and slide on the electrode tip.

Electrodes should be cleaned every 1 to 2 months. Carefully remove the electrode from the flow cell. First swirl the tip in a soapy water solution for 5 to 10 seconds. Then rinse thoroughly. Next swirl the tip in muriatic acid for 5 to 10 seconds. Rinse and return to flow cell. After returning the electrode to the flow cell, do not attempt any calibration of the controller until the electrodes have been flushed with water for at least 15 minutes.

### **B. Electrode test procedure**

Connect electrode to a high impedance millivolt meter or, if you have an Aquasol with meters, to the ORP side of the controller.

Get two cups (about 8 oz.) of pool water. Add several drops of muriatic acid to one cup.

The ORP electrode should read somewhere between 500 mv and 800 mv when put in pool water. When moved to the "acid" water the millivolt reading should increase at least 200 mv.

The pH electrode should read -25 to -100 mv in the pool water. When put in the "acid" water the millivolt reading will change about 100 mv or more to the positive. Example: Pool water reading is -40 mv, "acid" water reading should be +60 mv or more.

**Note:** If you are using the pH timed monitoring feature of your controller and you are injecting acid into the flow cell, the electrode test procedure can be accomplished by using the "pH test" switch on the face panel of the controller.

## **10. Chemical feeders and pumps**

Chemical feeders and pumps are not supplied as part of the controller. However, Aquasol does stock and provide most types of chemical feed equipment.

All chemical feeders should be installed so that the chemical injection occurs in the return line to the pool **after** all pool equipment.

If you are using a dry calcium hypochlorite feeder ( PPG, Pulsar or Watermatic) consult your Aquasol representative for special instructions.

## **11. Warranty**

Every controller purchased from Aquasol comes with its own warranty card. Read it for further details.

## **12. Service and parts**

Contact your dealer or Aquasol (phone: 800-444-0675) for service and parts. Service to the electronic circuitry must be performed by a factory technician. Modification of the circuitry will void warranty coverage.

## **13. Winter Storage**

If your pool circulation system is shut down during the winter, the flow cell must be drained and the electrodes removed and stored to prevent freeze damage.

The electrodes must be kept wet. Put them in a container of water with the tips immersed or use the storage bottle that came with the electrode.

## **14. Troubleshooting**

The recommendations below assume that your pool water chemistry is in balance and that there is circulation through the flow cell.

Feed light on no matter where control knob is set

- A. Test electrode
- B. Calibrate circuit board

Feed light off no matter where control knob is set

- A. Test electrode
- B. Calibrate circuit board

Cl/ORP or pH alert light on

- A. Test respective electrode
- B. Calibrate circuit board (remember to unplug controller and plug back in before calibrating pH)
- C. Electrode not connected to controller
- D. Electrodes are connected but reversed

Power light not on

- A. Blown fuse on circuit board

- B. Pressure switch has cut power
  - C. Controller not plugged in to power source
- Chemical feeder running but feed LED is not lit
- A. Replace relay on circuit board
  - B. Feeder is plugged into another power source
  - C. Feeders are plugged into controller but are reversed

#### 14. Troubleshooting (cont.)

Feed LED is lit but feeder is not on

- A. Feeder is not plugged into controller
- B. Feeders are plugged into controller but are reversed
- C. Blown fuse on circuit board
- D. Replace relay on circuit board
- E. If feeder has its own ON/OFF switch, make sure it is on.

Feed limit LED is lit

- A. Test electrodes
- B. Check chemical feeders for failure
- C. Make sure you have not run out of chemicals.

#### 15. Flow cell accessories

There are two additional 1/4" NPT holes in your flow cell. These can be used to:

- A. Inject acid into the flow cell when using timed monitoring of pH option.
- B. Install a grounding electrode (Available from Aquasol)
- C. Install a water sampling valve (Available from Aquasol)

### Illustrations

Fig 1	SPC Front Panel
Fig 2	SPC-M Front Panel
Fig 3	WTC and WTC-P Front Panel
Fig 4	Bottom view of Controllers
Fig 5	SPC, SPC-M and WTC Circuit Module
Fig 6	WTC-P Circuit Module
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Fig 7A	Electrode and Fitting
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Fig 8	Solid Chlorine/ Bromine tablet installation
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