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092xxx RevA_draft10

CAT 6000®

Water Quality Controller

Owner's Manual



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CAT-6000

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IMPORTANT SAFETY INSTRUCTIONS

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

- READ AND FOLLOW ALL INSTRUCTIONS
- **WARNING:** Risk of Electric Shock. Connect controller only to a grounding type receptacle protected by a ground-fault circuit interrupter (GFI). CAT Controllers recommends installation to a dedicated GFI circuit breaker performed by a licensed electrician.
- **WARNING:** Disconnect power before servicing. Other than the fuses, there are no user serviceable parts inside the controller.
- **WARNING:** All power cords should be inspected frequently. Any damaged power cords must be replaced immediately to reduce the risk of electric shock. Never operate a controller without functional flow protection.
- **WARNING:** Installation requires a properly located GFI protected receptacle. Never use an extension cord for electrical connections to the controller.
- **WARNING:** Always mount controller in a safe area not subject to damage by moving objects. Never bury controller power cords.
- **WARNING:** Any person using, adjusting, or monitoring the controller must be at least 18 years of age and be familiar with these instructions and the contents of this manual.
- **WARNING:** Always take and record manual water chemistry readings in conformance with Health Department requirements. Although automated controllers are a great aid in maintaining healthy water quality, controllers are not a substitute for manual water testing with an accurate test kit.
- **WARNING:** Always read and become familiar with Material Safety Data Sheets (MSDS) and safe handling instructions for all chemicals used with the controller.
- **Caution:** The automatic controller should not be installed where it is accessible to the public.
- Overfeed Timers prevent potentially dangerous, unintentional dispensing of chemicals. CAT Controllers recommends always having the "Over Feed Timeout" functions enabled as a precautionary measure. By disabling the "Overfeed Timeout" the overfeeding of chemicals could occur and create unsafe water chemistry conditions. Overfeeding chemicals is dangerous and could potentially harm patrons. NSF certification is void if controller is operated with "Overfeed Timeout" disabled.

Certification - NSF 50 Certified for pH/ORP/FCI Display and Output only

SAVE THESE INSTRUCTIONS



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Introduction

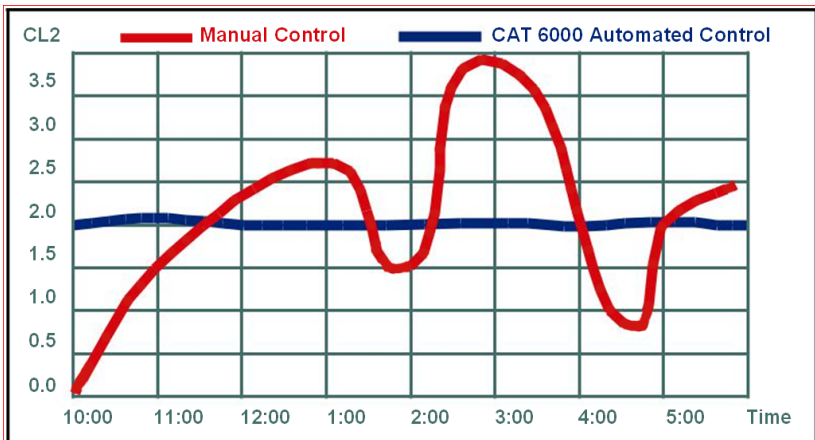
Description

The CAT 6000 revolutionizes the manner in which water quality can be monitored and maintained. A pool operator typically checks, records and adjusts pool or spa water chemistry hourly at best. The CAT 6000 Controller scans and interprets the signals from the pH, ORP, flow, and optional digital flow rate and level sensors, displays water quality readings and alarms in alphanumeric format, and activates chemical feeders in proportion to demand to maintain pH and ORP setpoint levels. Hourly water quality readings are sent along with any alarms or service requests through a wireless network to the POOLCOMM web server for remote monitoring and management through any internet connection. *NOTE: The POOLCOMM website is a subscription based service. Monthly charges apply.*

From the website, the subscriber can monitor water quality, print charts, graphs and logs, change controller settings, and designate contacts for outbound notification via email, cell phone or PDA. Optional digital flow and level sensors are available to monitor flow rate, chemical storage tank levels, and even automate water level control.

The results include elimination of “human error”, accurate and reliable maintenance of chemical levels twenty-four hours a day, compliance with Health Department operating standards, reduced burden on operating staff, and a reduction of chemical usage and costs. The CAT 6000 controller and POOLCOMM water quality management website together provide unprecedented control, access and documentation.

The following graph compares typical chlorine levels when chemistry is adjusted manually versus automatically with the CAT 6000 controller:



What's Included

Description

The following is a description of the components incorporated in a typical CAT 6000 wireless water quality control system:



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The Professional-Series pH Sensor samples water from the filtration system and sends signals to the controller indicating the acidity of the water. The ideal pH range for pools and spas is 7.4 - 7.6. The CAT 6000 controller is preset from the factory to maintain pH 7.5. If pH is maintained below 7.4 (too acidic), eye irritation, corrosion of equipment, and damage to the pool or spa surface can occur. If pH is maintained above 7.6 (too alkaline), sanitizer activity is reduced, water may become cloudy, and eye irritation may result.

The Professional-Series ORP Sensor samples water from the filtration system and sends signals to the controller indicating the oxidation-reduction potential (redox) of the water. ORP is an actual measure of sanitizer activity (chlorine, bromine, ozone, etc.) and bacteriological water quality rather than an expression of chemical residual levels. The CAT 6000 controller is preset from the factory to maintain ORP at 650 millivolts.

The Free Chlorine Sensor allows for optional sanitizer control by monitoring chlorine levels. The CAT 6000 can also be programmed to use a "Dynamic" control mode to consider both chlorine and ORP levels to maintain sanitizer levels.

The Conductivity/Temperature Sensor This sensor monitors the Total Dissolved Solids (or TDS) which is the measure of the total of all the soluble substances dissolved in the water. The CAT 6000 will display the value in ppm (parts per million). The TDS information is also used to calculate NaCl levels. Knowing your TDS level will aide in maintaining the water at optimum levels.

The Flow Sensor monitors the rate of flow across the pH and ORP sensors and signals the controller to disable automated chemical feeding during periods when the filtration system is off or low recirculation flow is detected.

The Flow Cell provides a convenient location for mounting the pH, ORP and Flow sensors while ensuring ideal hydraulic conditions to maximize sensor performance and life.

The CAT 6000 Controller scans and interprets the signals from the pH, ORP, flow, and optional digital flow-rate and level sensors, displays water quality readings and alarms in alphanumeric format, and activates chemical feeders in proportion to demand to maintain pH and ORP setpoint levels.

The controller incorporates audible and visual safeguard alarms for out of range conditions and menu-driven control of setpoints, alarms, and a host of advanced features. The CAT 6000 controller also features an internal transceiver for wireless transmission of data between the controller and POOLCOMM website.

The Level Sensors (optional) provide signals to the controller indicating low pH chemical tank level, low ORP tank level, and low water level.

The Digital Flow Sensor (optional) provides a flow rate to be displayed by the controller and an alarm indication when filter maintenance is required.

Package Contents:

- (1) CAT 6000 Wireless Water Quality Controller
- (1) Mounting Bracket for Easy Installation
- (1) Professional Series pH Sensor with 24" Cable and BNC Connector
- (1) Professional Series ORP Sensor with 24" Cable and BNC Connector



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- (1) Solid State Free Chlorine Sensor
- (1) Solid State Total Dissolved Solids Sensor
- (2) Sensor Storage Containers
- (1) Machined Acrylic Flow Cell
- (3) 1/4" NPT x 3/8" Tubing True-Seal Ball Valve
- (1) Flow Switch with 24" Cable and Specialty Connector
- (2) BNC Connector Protective Covers (Remove to Connect Sensors)
- (1) 30' Roll, Blue Poly Installation Tubing (3/8" OD)
- (2) 1/4" NPT x 3/8" Tubing True-Seal Connectors

NOTE: Before commencing installation, please confirm that items listed above have been included. Please report any shortages immediately to the factory.

What You Will Need

The following tools are recommended for installation:

- Drill (Cordless preferred)
- 3/8" Drill Bit
- 1/4" NPT (National Pipe Tapered) Tap
- Masonry Drill Bit & Anchors (if required)
- 13/16" Wrench or Channel-Lock Pliers.

Installation

Installation Procedure

The key to a successful flow cell installation is in the plumbing. A pressure differential is required to allow clean, untreated water to pass through the cell and across the sensors.

1. Turn off heater, chemical feeders, pump, and any other related equipment. Relieve pressure from filtration system.
2. Follow the steps shown in Figure 1 and Figure 2.

Unpack the unit.

Remove 4 screws to remove the Flow Cell assembly.

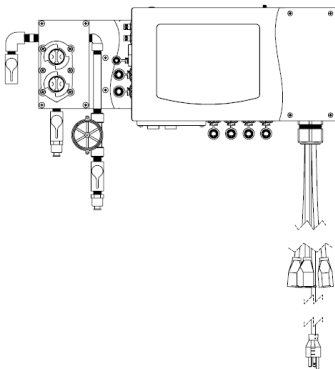
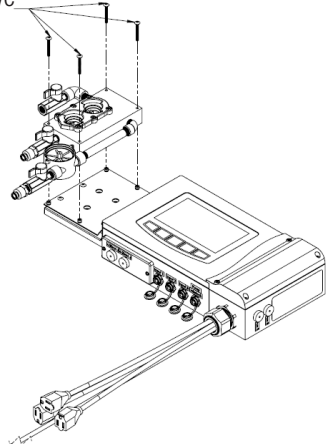


Fig 1





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Remove three (3) screws to remove the wall mount bracket cover and Flow Cell counting plate together.

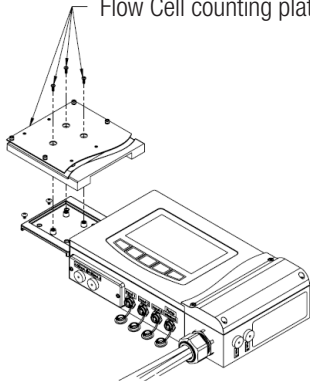
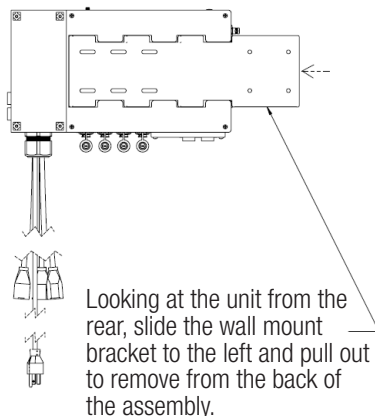


Fig 2



3. Select a convenient mounting location for the controller unit which will meet the following criteria:
 - A. Facilitates a combined (influent and effluent) maximum tubing run of 30'.
 - B. Located a minimum of ten feet from pool or spa.
 - C. GFI protected power source available.
 - D. Easily accessible to pool or spa operator.
 - E. Away from corrosive materials and physical hazards.
4. Securely attach the Mounting Plate to a vertical wall according to Figure 3a and 3b.

Wall Mount Bracket

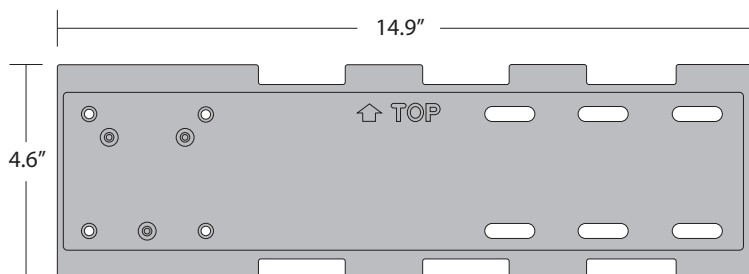
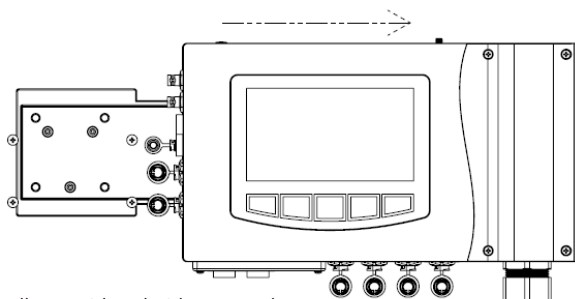


Fig 3a

Use the provided wall mount bracket template to locate screw holes where the unit is to be installed. A minimum of four (4) screws, two (2) at either end, is required. The location and hardware used must be able to support 35lbs, minimum. Ensure the mounting bracket is level when installing. The install location should have enough space to accommodate the unit and be within reach of a 110 Volt, 15 Amp (minimum) outlet to receive power.



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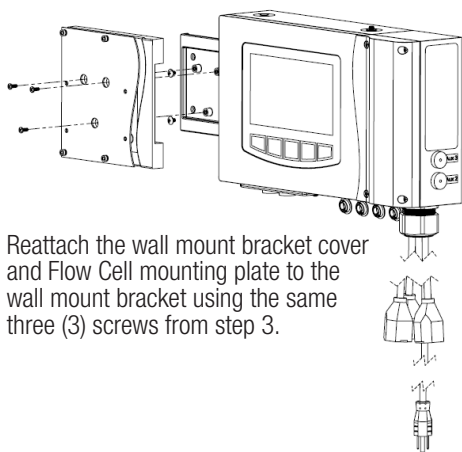


When the wall mount bracket is secured in location, attach the unit by aligning the tabs and slot on the back of the unit as when the wall mount bracket was removed in step 4. Slide the unit to the right to “lock” it into position.

Fig 3b

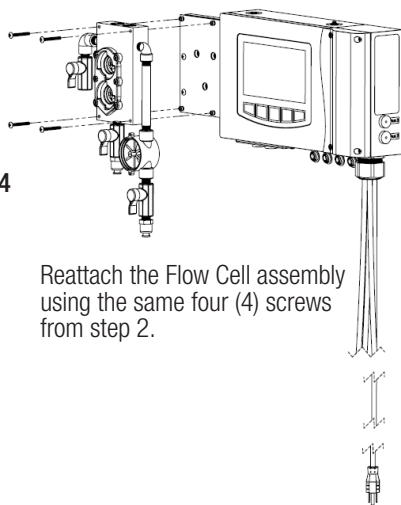


5. Assemble the unit as described in Figure 4.



Reattach the wall mount bracket cover and Flow Cell mounting plate to the wall mount bracket using the same three (3) screws from step 3.

Fig 4



Reattach the Flow Cell assembly using the same four (4) screws from step 2.



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6. The system should resemble the picture below.



7. Ready each of the sensors for installation according to the steps and illustrations below.

Note: Do not touch the capped end of any sensor after the cap is removed.

Note: Do not remove the battery from the chlorine sensor until instructed to do so.

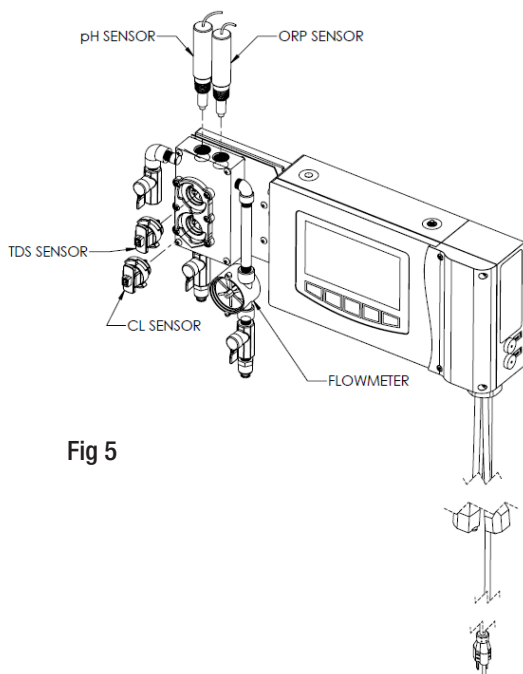


Fig 5



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- A. Uncap the pH sensor by holding the cap and twisting the sensor counterclockwise. Retain the cap for future storage of the sensor when it is not in use.



- B. Uncap the ORP sensor by holding the cap and twisting the sensor counterclockwise. Retain the cap for future storage of the sensor when it is not in use.



- C. Uncap the TDS sensor. Retain the cap for future storage of the sensor when it is not in use.



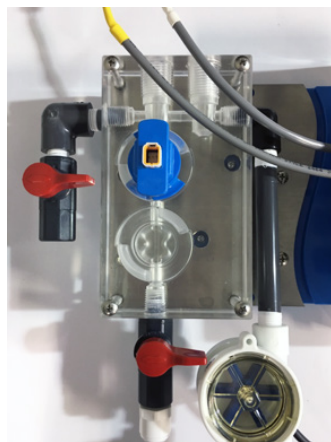
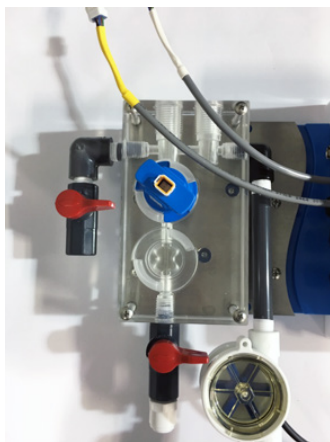


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- D. Uncap the chlorine sensor; water will be inside of this cap. Retain the cap for future storage of the sensor when it is not in use. (Do not remove the battery from the sensor)



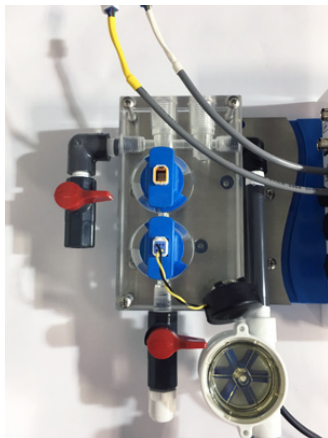
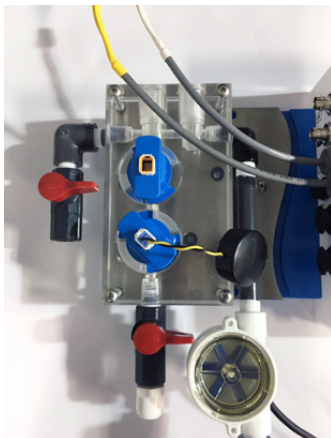
- E. Align the TDS sensor in the top keyed flange. Push in on the sensor and turn it clockwise until it is fully seated in the correct position, as shown.





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- F. Align the chlorine sensor in the bottom keyed flange. Push in on the sensor and turn it clockwise until it is fully seated in the correct position, as shown on the top of the next page.



- G. The system should resemble the picture below.

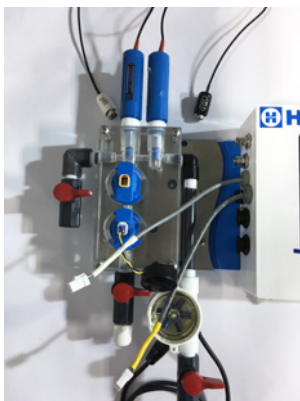




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H. Install the pH and ORP probes by wrapping the threads on each probe in a PTFE pipe tape and screwing them, clockwise, into their designated ports. The pH probe goes in the left port. The ORP goes in the right port.

Note: Do not over-tighten the probes when installing, as the probes may get damaged if they bottom out in the manifold.



8. Connect the pH, ORP, TDS, and Flow sensor cables to the controller unit as labeled. Refer to the pictures below.

Note: Sensor cables are constructed from a specialized material- never cut or splice.





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Note: For steps 9 and 10 refer to the "Typical CAT 6000 Installation Diagram" at the end of this document as well as Figure 6 below.

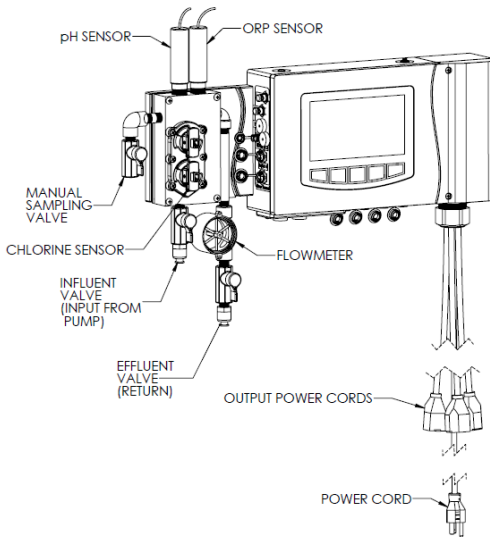


Fig 6

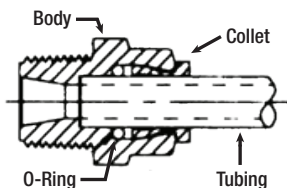
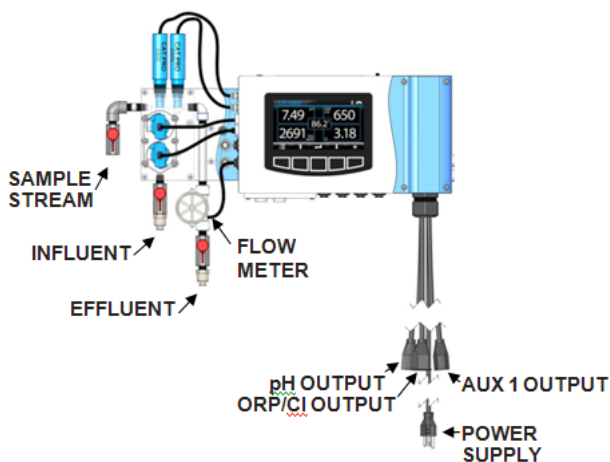
9. Drill and tap a 1/4" NPT port at a location just down-stream of the filter, but up-stream from any chemical injection point. Install a tubing connector, and run flex tubing to the influent flow cell port.
10. Drill and tap a 1/4" NPT port at a location subject to vacuum or reduced pressure, such as a point upstream of the pump. Install the remaining tubing connector and run flex tubing to the effluent flow cell port.
11. If new or additional chemical feeders are to be used with the controller, install according to manufacturer's instructions at this time.
12. Power the unit using the power supply cord.
13. In order to minimize the time that the sensor is without power, disconnecting the chlorine sensor from the battery and reconnecting it to the unit should be done as quickly as possible. Disconnect the battery from the mounted sensor and immediately plug the sensor into the powered controller using the designated wire.



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14. Check all electrical and mechanical connections. Ensure that the Influent and Effluent Flow Valves are open. Ensure that the Sample Stream valve is closed. Resume filtration system operation and check for any leaks. Ensure that the flow meter is spinning, indicating flow.



Prepare Tubing

Cut tubing squarely and remove any burrs. Mark tubing 3/4" from end. This is the insertion mark.

Insert Tubing

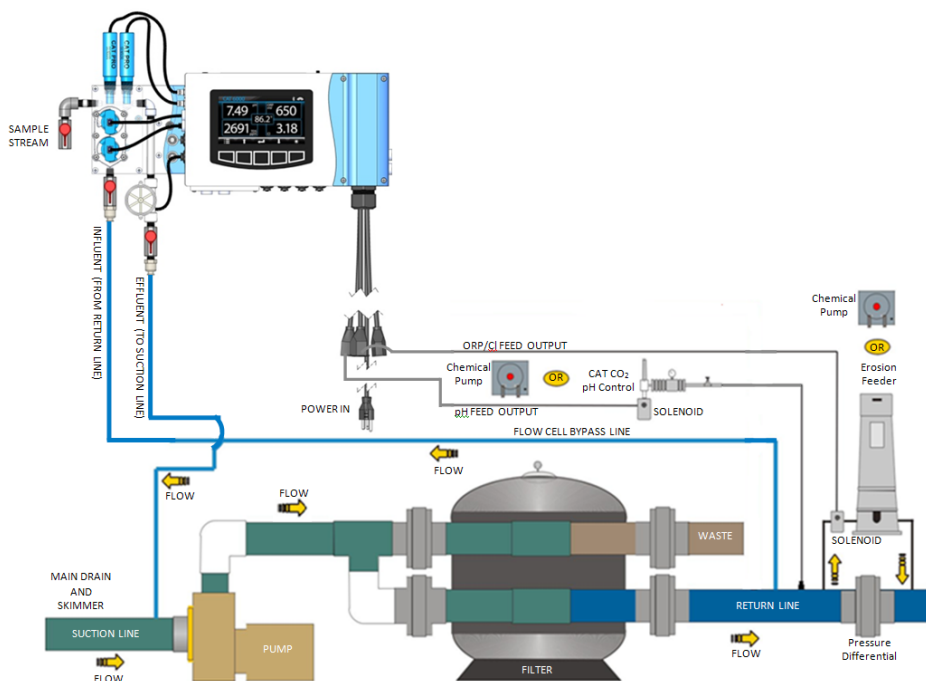
Insert tubing straight into fitting until it bottoms out and insertion mark is no longer visible.

To Release Tubing

Push collet toward fitting body and pull on tubing to release. Repeat steps 1 and 2 to reuse fitting.

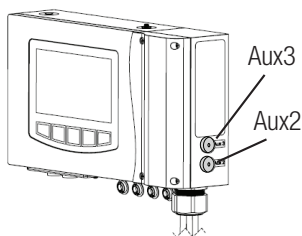
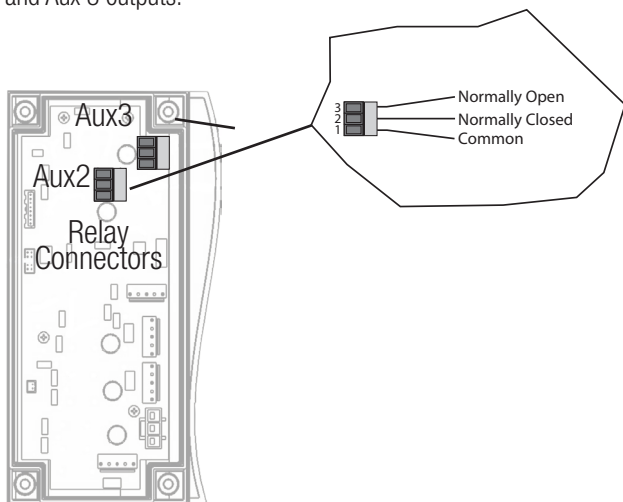


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Aux 2 and Aux 3

Refer to Appendix B-Input and Output Wiring Information for information on how to wire the Aux 2 and Aux 3 outputs.





Pool Chemistry

Now that your new controller has been physically installed, water chemistry should be tested and adjusted prior to initiating automated control of the pool or spa. Confirm that your pool or spa water conforms to the following ranges before powering on and setting up the CAT 6000.

The table on the following page indicates generally accepted guidelines. Always maintain water chemistry according to standards set by your local or State Health Department.

Test	Minimum	Ideal	Maximum
pH	7.2	7.5	7.8
Free Chlorine (PPM)	1	2	3
Bromine (PPM)	2	3	4
Cyanuric Acid (PPM)	0	-	100
ORP (mV)	650	-	-
Total Alkalinity	80	-	120
Calcium Hardness	200	-	400
NaCl/Salt (PPM)	2500	4000**	5000

**Refer to manufacturer's recommendations.

All CAT water quality controllers maintain sanitizer levels (chlorine, bromine, ozone, etc.) based on ORP. Although ORP is a superior index of water quality compared to part per million sanitizer residual levels, factors such as pH, cyanuric acid concentration and total dissolved solids can affect sanitizer residual readings relative to ORP.

CAT Controllers recommends establishing desired pH, sanitizer residual, calcium hardness, total alkalinity, temperature and cyanuric acid levels prior to initiating automated control of the pool or spa. The ORP setpoint will need to be changed periodically as described later in this section if the goal is to provide consistent sanitizer residual levels rather than consistent control of ORP.

System Operation

Overview

The CAT 6000 utilizes a bright, LCD interface and five touch-sensitive buttons to display an array of water chemistry characteristics as well as water quality control information and alarms.

Status information can be seen in the status icon bar at the top of the screen. This bar indicates any present alarms, active feeds, the flow status, and the network connectivity status of the unit.



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Status Icons

Information Display

Button Icons

Buttons



Status Icons



Alarm Icon- Indicates that an alarm is active



pH Feed Icon- Indicates that pH control chemical feed is on



Feed is on Flow Icon- Indicates that the unit has flow



ORP Feed Icon or Chlorine Feed Icon - Indicates that ORP or Chlorine chemical feed is on. The displayed icon depends on the selected control mode



Wi-Fi Icon- Indicates that the unit is connected to a Wi-Fi network

Button icons

Button icons are located above the button which, when pressed, will carry out the function designated by the icon.



Menu Icon- Allows for access to the menu



Brightness Icon- Allows for screen brightness to be adjusted



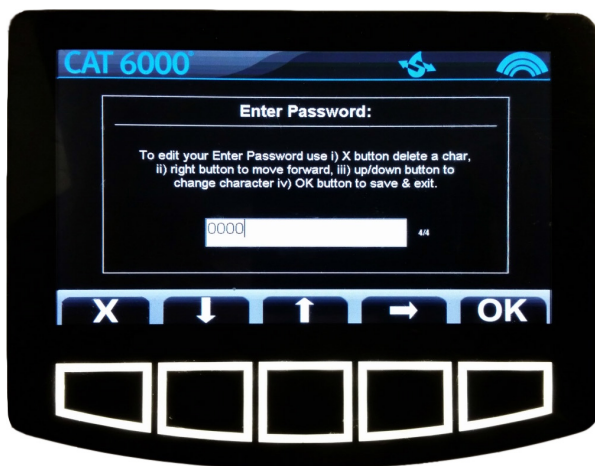
Alarm Icon- Allows for access to the Alarm Screen, where active alarms are displayed



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The CAT 6000 menu provides access to all necessary controls, setup information, and specifications. The menu can be selected through the use of the Menu button.

The various features of the CAT 6000, including parameter set point controls, water quality control methods, displayed parameters, output configurations, and other options can be navigated and manipulated through this menu. To access the menu, a correct 4 digit password must be entered. The default password is "0000".



Normal Operating Mode

During normal operating mode, the display will indicate sensed pH, ORP, free chlorine, temperature, and TDS.





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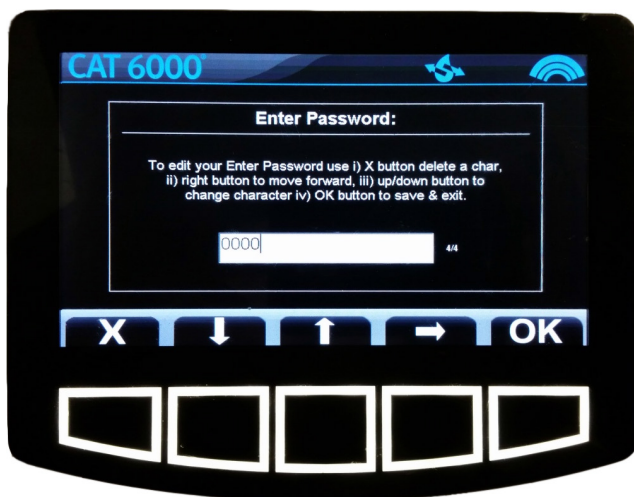
Change The Brightness Of The Display

The brightness of the display can be changed using the Brightness button on the main screen. Pushing this button will cycle through the brightness levels.



Enter The Menu

The CAT 6000 utilizes a password protected menu. In order to enter the menu structure, a valid four digit numeric password must be entered. The default password is "0000". The CAT 6000 allows for up to two valid passwords at any time.

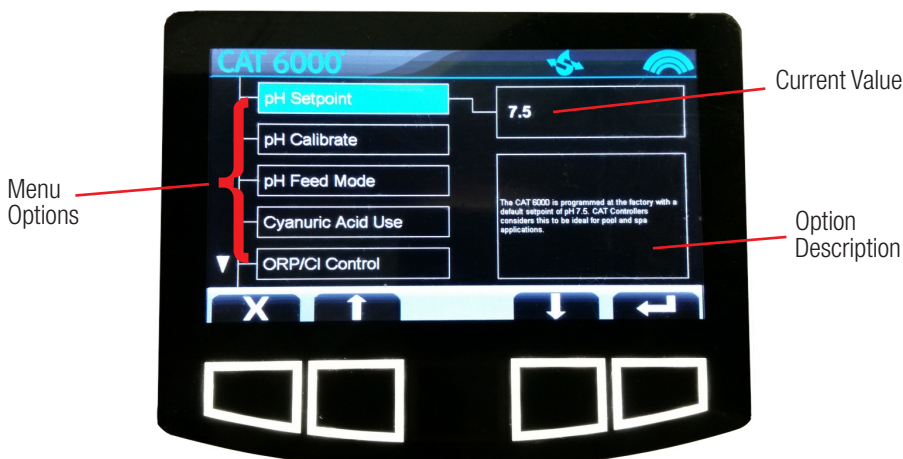




The two passwords are the Dealer Password and the Operator Password. Each password allows for access to different portions of the menu. The Dealer Password allows for full access to all available menu options. The Operator Password allows for access to the same menu options, with the exception of those in the Configuration section of the menu.

The passwords are defined through the Configuration section of the menu. The default password, "0000", is considered a Dealer Password.

Navigate The Menu



The CAT 6000 menu structure can be navigated through the use of buttons associated with the Menu Button Icons. In the menu, the current active option is highlighted blue.

Menu Button Icons



Exit/Back/Backspace: Used to exit the menu, return to a previous screen, or backspace while entering text.



Up, Down, Right: Used to scroll through menu options, select values and text, or move to the next text character.



Enter: Used to enter the next menu level for a selected menu option.



OK: Used to verify a menu selection.



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Change The pH Setpoint

The CAT 6000 is programmed with a factory default setpoint of pH=7.5. CAT Controllers considers this to be ideal for pool and spa applications. The following steps enable the selection of a different setpoint.

From the menu, select the pH setpoint option using the Enter button. Use the Up and Down buttons to select a value for the setpoint. Push the OK button to save the setpoint.

Calibrate pH

pH calibration is necessary to match manual water testing results, compensate for an aging or unclean pH sensor, and confirm proper operation of the system. To calibrate pH:

- From the menu, select the pH Calibrate option using the Enter button. The current pH measurement is displayed.
- Use the Up and Down buttons to select a value for the calibration.
- Push the OK button to calibrate to the selected value.

Select pH Feed Mode

The CAT 6000 is programmed with a factory default setting to operate in automatic feed mode. Other pH feed mode selections include Off (disabled), and Manual On for a fixed interval up to 30 minutes after which automatic feed will resume. To select a pH Feed Mode:

- From the menu, select the pH Feed Mode option using the Enter button.
- Use the Up and Down buttons to select the desired feed mode.
- Push the OK button to switch to the selected mode.

The Off (disabled) mode is useful when servicing pH feed equipment, or if pH chemical supply has been depleted. The Manual On mode allows constant chemical feed for a fixed interval of up to 30 minutes. This feature is useful when the addition of extra chemicals is desired, as well as during initial balancing of the water. Note: Always disconnect chemical feeder power cords prior to performing any electrical service.

Select Cyanuric Acid Use

The CAT 6000 is set by default for use with no cyanuric acid/stabilizer. The following steps enable the selection of cyanuric acid use:

- From the menu, select the Cyanuric Acid Use option using the Enter button.
- Use the Up and Down buttons to indicate whether or not cyanuric acid is being used.
- Push the OK button to make the selection.

Select The Sanitizer Control Method

The CAT 6000 offers the ability to control sanitizer control through ORP (mV) or through free chlorine (ppm). The following steps enable the selection of the sanitizer control method:

- From the menu, select the ORP/Cl Control option using the Enter button.
- Use the Up and Down buttons to select the desired control method.
- Push the OK button to switch to the selected method.



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Change The ORP Setpoint

The CAT 6000 is programmed with a factory default setpoint of ORP=650 mV. CAT Controllers considers this to be ideal for pool and spa applications. If drastic changes to the pool chemistry occur, in order to maintain accurate sanitizer levels relative to ORP, adjustment of the ORP setpoint may be needed. Changes in pool chemistry may include a change in the pH set point, TDS set point, or cyanuric acid level. The following steps enable the selection of a different setpoint:

- From the menu, select the ORP Setpoint option using the Enter button.
- Use the Up and Down buttons to select a value for the setpoint.
- Push the OK button to save the setpoint.

Change The Chlorine Setpoint

The CAT 6000 is programmed with a factory default setpoint of Cl=3 ppm. CAT Controllers considers this to be ideal for pool and spa applications. The following steps enable the selection of a different setpoint:

- From the menu, select the Cl Setpoint option using the Enter button.
- Use the Up and Down buttons to select a value for the setpoint.
- Push the OK button to save the setpoint.

If a chlorine setpoint change is made, it is recommended that the chlorine sensor is calibrated at the new setpoint.

Select ORP Feed Mode

The CAT 6000 is programmed with a factory default setting to operate in automatic feed mode. Other feed mode selections include Off (disabled), and Manual On for a fixed interval up to 30 minutes after which automatic feed will resume.

- From the menu, select the ORP Feed Mode option using the Enter button.
- Use the Up and Down buttons to select the desired feed mode.
- Push the OK button to switch to the selected mode.

Select Chlorine Feed Mode

The CAT 6000 is programmed with a factory default setting to operate in automatic feed mode. Other feed mode selections include Off (disabled), and Manual On for a fixed interval up to 30 minutes after which automatic feed will resume.

- From the menu, select the Cl Feed Mode option using the Enter button.
- Use the Up and Down buttons to select the desired feed mode.
- Push the OK button to switch to the selected mode.

Calibrate Chlorine

Chlorine calibration is necessary to match manual water testing results, compensate for an unclean or aging chlorine sensor, and confirm proper operation of the system. Before chlorine calibration, ensure that the pH and chlorine levels of the measured water are stable at their desired setpoints.

- From the menu, select the Cl Calibrate option using the Enter button.
- The current chlorine measurement is displayed.



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- Use the Up and Down buttons to select a value for the calibration.
- Push the OK button to change the setpoint to the selected value.

Chlorine calibration is recommended if drastic changes in water chemistry occur. Changes in pool chemistry may include a change in the pH set point, TDS set point, or cyanuric acid level.

Calibrate TDS

The CAT 6000 requires TDS calibration in order to match manual water testing results, compensate for an unclean or aging TDS sensor, and confirm proper operation of the system.

- From the menu, select the TDS Calibrate option using the Enter button.
- The current TDS measurement is displayed.
- Use the Up and Down buttons to select a value for the calibration.
- Push the OK button to calibrate to the selected value.

Calibrate NaCl (Salt)

The CAT 6000 requires NaCl calibration in order to match manual water testing results and confirm proper operation of the system. Before NaCl calibration, it is necessary to calibrate TDS.

- From the menu, select the NaCl Calibrate option using the Enter button.
- Use the Up and Down buttons to select a value for the calibration.
- Push the OK button to calibrate to the selected value.

Enter Total Alkalinity

The CAT 6000 can display this entered value and utilizes the total alkalinity in calculating the Langelier Saturation Index (LSI) of the water.

- From the menu, select the Total Alkalinity option using the Enter button.
- The current total alkalinity value is displayed.
- Use the Up and Down buttons to enter the total alkalinity of the water as measured by a test kit.
- Push the OK button to enter the selected value.

Enter Calcium Hardness

The CAT 6000 can display this entered value and utilizes the calcium hardness in calculating the Langelier Saturation Index (LSI) of the water.

- From the menu, select the Calcium Hardness option using the Enter button.
- The current calcium hardness value is displayed.
- Use the Up and Down buttons to enter the calcium hardness of the water as measured by a test kit.
- Push the OK button to enter the selected value.



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Screen Display Enables

The CAT 6000 can display various system and water chemistry values, including ORP, chlorine, TDS, pressures, flow rates, and the LSI of the water. The display of these values, as well as others, can be toggled on and off. The following steps allow for a display to be enabled or disabled:

- From the menu, select the Display option using the Enter button.
- Use the Up and Down buttons to select which display is to be enabled or disabled.
- Push the OK button.
- Use the Up and Down buttons to select Enabled or Disabled.
- Push the OK button to set the display status.

Transmit Statistics

The CAT 6000 can communicate with the PoolComm website via email. Water chemistry data and controller alarms can be sent to the website through the following steps:

- From the menu, select the Transmit Statistics option using the Enter button.
- Use the Up and Down buttons to select Request.
- Push the OK button, the data will be sent to the PoolComm website.

Receive Statistics

The CAT 6000 can communicate with the PoolComm website via email. Controller settings and other communications can be received from the website through the following steps:

- From the menu, select the Receive Statistics option using the Enter button.
- Use the Up and Down buttons to select Request.
- Push the OK button, the controller will check for emails from the PoolComm website.



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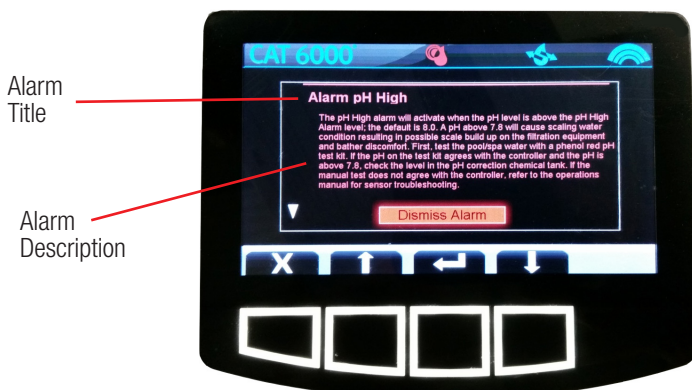
Alarm

The CAT 6000 displays alarms that indicate system problems or abnormal water chemistry values. An alarm will activate if a value moves outside of its user defined alarm levels. Multiple alarms may activate at the same time.

Alarms will display on the main screen any time an alarm condition is active. An alarm icon is also displayed in the status icon bar. If a displayed value is directly associated with an alarm, the value display box will turn red. Alarms can be viewed from the main screen by clicking the button associated with the alarm icon.



Selecting the Alarm Button will bring you to the Alarm Screen. Here, all active alarms will be listed and a description of the alarm will be given. If an alarm has not been acknowledged, the “Dismiss Alarm” option will be displayed. Use the Up and Down buttons to scroll through alarms and the Enter button to acknowledge or clear each alarm. From the main screen, no other functions can be accessed until all alarms have been acknowledged or cleared.





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pH Setpoint	7.0 to 8.0 (Default 7.5)
pH Calibrate	Plus or Minus 0.9 pH
pH Feed Mode	Automatic Off On for Specified Time
Cyanuric Acid Use	Yes No
ORP/CL Control	ORP Chlorine
ORP Setpoint	0 to 1000 (Default 650 mV)
Cl Setpoint	0 to 5.0 (Default 3.0)
Control Sanitizer Feed	Automatic Off On for Specified Time
Cl Calibrate	Plus or Minus 2.0 ppm
TDS Calibrate	0-5000 ppm
Total Alkalinity	0-200 ppm
Calcium Hardness	0-1000 ppm
Display	
Cl	Enabled Disabled
TDS	Enabled Disabled
NaCL	Enabled Disabled
Manifold Flow	Enabled Disabled
Digital Flow After Filter	Enabled Disabled
Digital Flow Before Filter	Enabled Disabled



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Display	
Total Alkalinity	Enabled Disabled
Calcium Hardness	Enabled Disabled
CYA	Enabled Disabled
LSI (Saturation Index)	Enabled Disabled
Filter Pressure	Enabled Disabled
Pump Pressure	Enabled Disabled
Pump Suction	Enabled Disabled
TDH	Enabled Disabled
ORP	Enabled Disabled
TDH	Enabled Disabled
ORP	Enabled Disabled
Configuration	
Unit Name	Pool 1-3 Spa 1-3
System of Measurement	Imperial (US) Metric (INT)
pH Control Mode	Acid Feed Base Feed
pH Priority	Off On
pH Interlock	Off On
pH Feed	Proportional Fixed Mixing Time
pH Low Alarm	6.0 - 9.0
pH High Alarm	6.0 - 9.0



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Configuration

pH Overfeed Timeout	Off On
"Control Sanitizer" Feed	Proportional Fixed Mixing Time
ORP Low Alarm	200 - 995 mV
ORP High Alarm	200 - 995 mV
"CS" Overfeed Timeout	Off On
Dynamic "CS" Control	Off On
Cl Low Alarm	0 - 9.9
Cl High Alarm	0 - 9.9
Alarm Setup	Audio and Visual Visual only
Feed on Alarm	Yes No
Stop Feed on any Sanitizer Alarm	Yes No
AUX1 Output Line Pwred	Disabled Selection
AUX2 Output Dry Contact	Disabled Selection
AUX3 Output Dry Contact	Disabled Selection
Input 1 Setup (Optical)	Disabled Selection
Input 2 Setup (Optical)	Disabled Selection
Input 3 Setup (PIs/Optical)	Disabled Selection
Input 4 Setup (PIs/Optical)	Disabled Selection
Input 5 Setup (4-20mA)	Disabled Selection
Input 6 Setup (4-20mA)	Disabled Selection



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Configuration

NaCL High

0 - 7500 ppm

NaCL Low

0 - 7500 ppm

TDS High

0 - 7500 ppm

Saturation Ind Corrosive

-.5 - +.5

Saturation Ind Scaling

-.5 - +.5

Temp Low Alarm

32 F - 105 F

Temp High Alarm

32 F - 105 F

Display Info

Info

Wlan Setup

Scan and Select Network

Reset to Defaults

Reset

Demo

Off On

Operator Password

0000

Dealer Password

0000



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System Maintenance

CAT 6000 Controller Package

The CAT 6000 controller unit is virtually maintenance free. Cleaning of the enclosure, front panel and flow cell can be performed using a clean, soft cloth moistened with mild soap and water solution or glass cleaner. Use of abrasives or harsh chemicals may damage the enclosure and membrane switch panel.

Water Maintenance

Always test and record water chemistry readings in compliance with Health Department requirements using a quality manual test kit. Calibrate pH periodically as described earlier in this manual.

It is important to note that changes in pH, cyanuric acid concentration, total dissolved solids, and use of additional or alternative sanitizers will all affect the primary sanitizer residual level relative to ORP. It is important to maintain total alkalinity on a regular basis to ensure pH stability. To maintain a consistent sanitizer residual in parts-per-million (ppm), periodically adjust the ORP setpoint.

Precision Calibration

The CAT 6000 controller provides instrument-grade accuracy which exceeds that of most liquid-standard water testing kits. Therefore, it may be preferable to calibrate pH using commercially available reference solutions.

Sensor Maintenance

The sensors must be clean and free from oil, chemical deposits and contamination to function properly. After saturation in pool or spa water, the sensors may need to be cleaned on a weekly or monthly basis depending on bather load and other facility-specific characteristics. Slow response, increased need to calibrate pH, and inconsistent readings are indications that the sensors are in need of cleaning.

To clean the sensors, disconnect from the controller and carefully remove them from the flow cell. Clean the reference junction (the white teflon ring at the bottom of sensor body) with a soft tooth brush and regular tooth paste. A household liquid dishwashing detergent may also be used to remove any oil. Rinse with fresh water, replace teflon thread-seal tape, and reinstall sensors.

Sensor Replacement

CAT Professional Series pH and ORP sensors are engineered to provide the highest performance and longest possible functional service life. If properly cleaned, sensors provide unstable readings or require excessive calibration, the pair of sensors should be replaced. For optimum controller performance, replace with genuine CAT Professional Series sensors PRO15-2 and PRO25-2.

Sensor Storage

Exposure to atmospheric conditions will cause the sensor tips to dry out. Always remove and properly store sensors in the soaking caps provided if sensors are to be removed or stored for one hour or longer. Although CAT Professional Series sensors are freeze-resistant, they must be protected from freezing temperatures when not in use.



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Store sensors in the soaking caps provided, making sure that each container is filled with the original storage solution or clean water. If the storage containers have been misplaced, store sensors individually in small glass or plastic containers with clean water covering sensor tips.

Controller Storage

The controller unit is subject to damage by electro-static discharge (ESD) when the sensor cables are disconnected. Always reinstall the BNC protective covers prior to storing or transporting the CAT 6000 controller unit.

Winterization

The sensors should be prepared for storage as outlined above and protected from freezing temperatures. Although the CAT 6000 controller is designed to withstand a broad temperature range, winter storage in a secure location may be desirable.

The flow cell and poly tubing must be drained prior to exposure to freezing temperatures. Either purge all water using compressed air or thoroughly drain through the valve ports and tubing connections.

Network Communications

Cell

All CAT controllers set up on Cell networks come already activated for wireless communication. Once the unit has been installed and registered on www.poolcomm.com, the devices will begin to communicate. Local reception and antenna positioning can affect communication capability, if the unit does not communicate, please call 301-838-4001 and ask for technical support.

WIFI

WIFI Controllers communicate via local WIFI networks. Before these units can begin to communicate, they must be configured to connect to the local WIFI network. Please consult the WIFI Connectivity Checklist also included for technical information and see WIFI Connectivity Setup included.

Test w/ a CAT 6000

The best way to check for coverage at a facility is to test with an actual CAT 6000. The Transmit data button has been provided specifically for this purpose. Place the CAT 6000 unit where you expect to install it and press the transmit data button. Within 2 minutes a service request alarm will be generated. This alarm will show up at the POOLCOMM web site, and can also be directed to your cell phone or portable 2-way device. Make sure your email address has been entered under Notifications and that address box is checked on the unit management page.

Activating Communications

To activate your first CAT 6000 wireless controller on the POOLCOMM web site you must first register an account. Call 301-838-4001 and ask for the POOLCOMM Program Administrator if you need assistance.

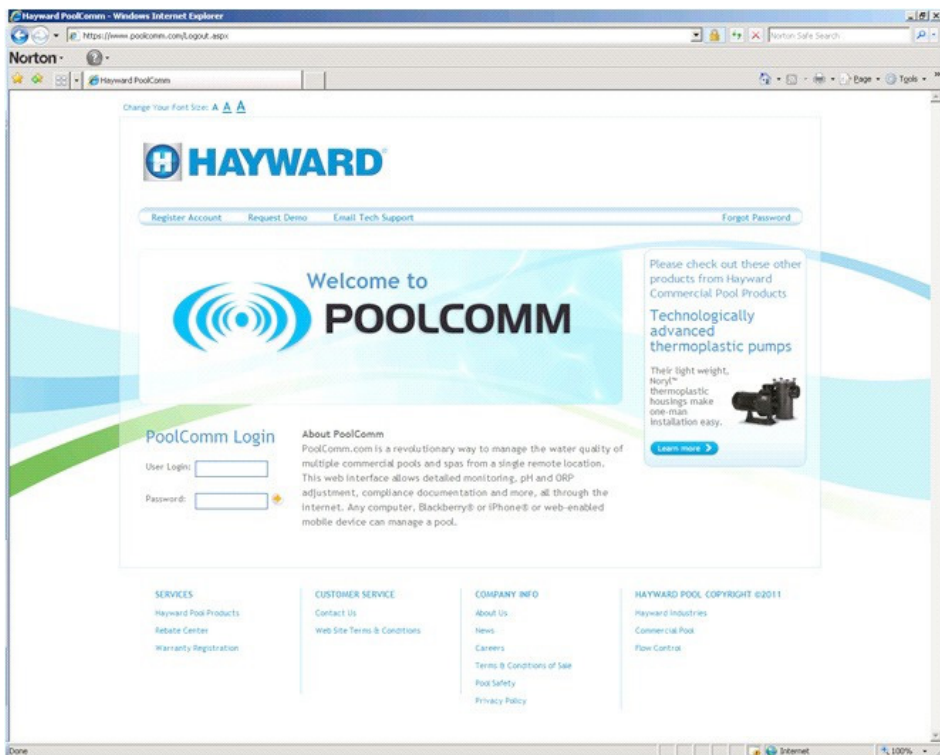
Visit www.poolcomm.com from any internet-connected computer. Click on Register Account and complete all requested account information. Click on Register Account again to register with the system.



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The next screen will then inform you that your account has been created and an email has been sent to you with your username and password. You may now log in to your account by typing your username and password, then clicking on the Login icon.

The Register Account Unit screen will now appear. Enter the requested information and click on Register Unit to begin accessing your CAT 6000 over the internet.

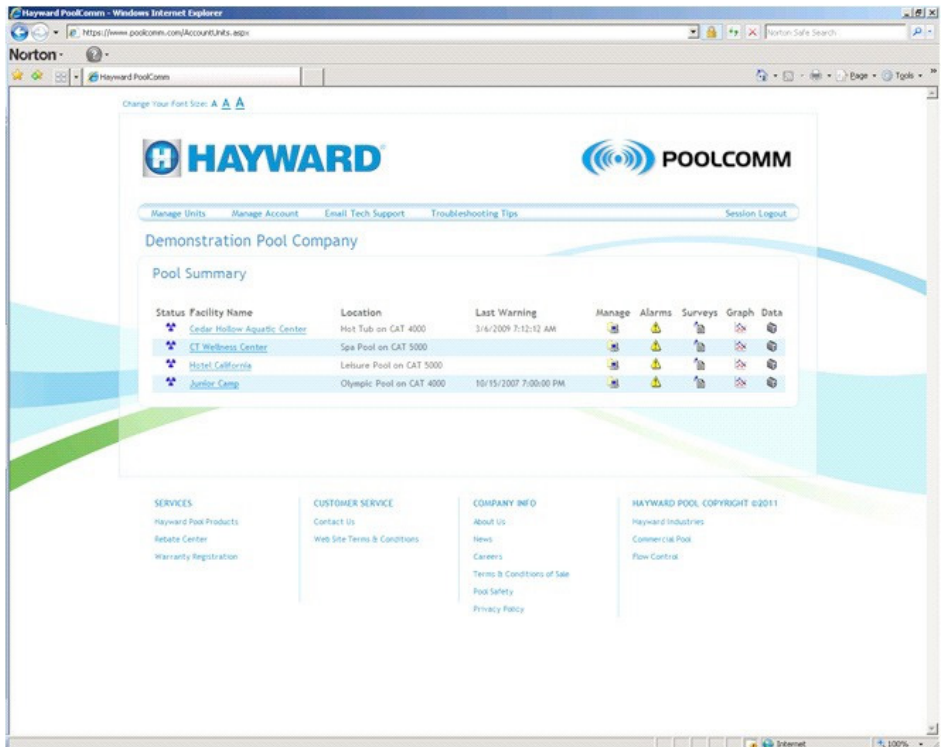




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Using The POOLCOMM Website

Browse to www.poolcomm.com. At the Login screen type your username and password, then click on Login. This will bring up the Account Unit Management Screen, which allows you to view all of your communicating units:



Status Symbol

The status symbol indicates the 24 hour alarm status of individual controllers. Blue: No warning during the past 24 hours. Yellow: A warning condition has been corrected during the past 24 hours. Red: A warning condition currently exists.

Facility Name

This field provides a list of facilities automated with CAT 6000 wireless controllers. Click on a facility name to enter the Unit Profile for the controller. From the Unit Profile, the following settings can be modified online:

- Facility name, location and time zone information.
- pH and ORP setpoint values.
- pH, ORP, tank level, flow and service key alarm settings.
- Alarm time delays for nuisance alarm filtering.
- Warning notification contacts for facility.



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When the desired settings have been entered through the web interface, click the Update link to sent the settings to the CAT 6000 controller.

To update the website with the latest data from the CAT 6000, click the Get Data link at the bottom of the page.

The following screen capture shows the settings which can be modified from the Unit Profile screen:

Telemetry Portal - Registration - Microsoft Internet Explorer

Address: <http://www.poolcomm.com/UnitDetail.aspx?UnitID=5>

Update Unit Profile

Demonstration Pool Company
American Pool Center

Unit Management
[Manage](#)
[Alarms](#)
[Graph](#)
[Data](#)

Unit Registration
[Update Account](#)

Notifications
[Logout](#)

Unit Details	
* Unit Serial #: 5 Type: PoolController Version: 2	
Facility Name:	American Pool Center
Site Location:	Wading Pool
Street Address:	9500 Concord Drive
Address Line 2:	Aquatic Center Complex
City:	Atlanta
State:	GEORGIA
Zip Code:	
Country:	UNITED STATES
* Time Zone:	Eastern Time (GMT-5:00)
<input checked="" type="checkbox"/> Adjust time for daylight savings	

Category	Description	Type	Settings	Delay
Warnings	pH Level	RANGE	7.2 7.8	5
	pH Overfeed	ONOFF	<input checked="" type="checkbox"/> Enabled	5
	pH Tank Low	ONOFF	<input checked="" type="checkbox"/> Enabled	5
	ORP Level	RANGE	670 800	5
	ORP Overfeed	ONOFF	<input checked="" type="checkbox"/> Enabled	5
	ORP Tank Low	ONOFF	<input checked="" type="checkbox"/> Enabled	5
	No Flow	ONOFF	<input checked="" type="checkbox"/> Enabled	10
	Service Request	ONOFF	<input checked="" type="checkbox"/> Enabled	
	Key Inserted	ONOFF	<input checked="" type="checkbox"/> Enabled	
Set Points	ORP Set Point	VALUE	675	
	pH Set Point	VALUE	7.5	

Warning Contacts:

<input type="checkbox"/> intmcginty@chemauto.com	<input checked="" type="checkbox"/> 3015264592@mobile.att.net	<input checked="" type="checkbox"/> 2406749157@nextel.com
--	---	---

Site Location

This field is used to identify the specific asset being monitored (main pool, lap pool, spa, etc.) within the facility.

Last Warning

This field provides a timestamp of the last warning received.



Commands



This icon opens the Unit Profile page (shown on previous page).



This icon opens the Unit Warning Alarms page.



This icon opens the Unit Data Graph page.



This icon opens the Unit Data Report screen.

Troubleshooting

pH Out Of Range

pH is measured on a scale ranging from 0 to 14, with pH 7.0 considered neutral. pH below 7.0 is considered acidic and above 7.0 is alkaline. pH is a significant variable in determining water quality as it affects sanitizer activity, color, and human compatibility with the water. The proper pH range for swimming pools and spas is between 7.2 and 7.8.

pH Low

A pH below 7.2 will cause corrosive water resulting in possible damage to the filtration components and pool surface as well as bather discomfort. First, test the pool/spa water with a phenol red pH test kit. If the pH on the test kit agrees with the controller and the pH is below 7.2, check the pH correction chemical level. If the manual test does not agree with the controller clean the sensor.

pH High

A pH above 7.8 will cause scaling on the pool surface, plumbing, and filtration equipment as well as cloudy water, inefficient use of sanitizer and bather discomfort. First, test the pool/spa water with a phenol red pH test kit. If the pH on the test kit agrees with the controller and the pH is above 7.8, check the pH correction chemical level. If the manual test does not agree with the controller clean the sensor.

pH Overfeed

The pH Overfeed timeout occurs when the CAT 6000 has been feeding chemicals for a time greater than the selected maximum feed time and has not reached its setpoint. A properly selected Overfeed timeout prevents the unit from continuing to feed chemicals when the chemical supply has been diminished or a chemical feeder has become clogged or broken. First, check the chemical supply and chemical feeder. If both are in order, check the Overfeed timeout setting as it may need to be increased to keep up with chemical demand.

pH Tank Low

The pH Tank Low alarm will sound when the chemical being fed falls below the optional optical level sensor in the tank. First check the chemical level. If the level is above the sensor, check the sensor for obstruction or scaling.



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ORP Out Of Range

Oxidation Reduction Potential is a measure of the oxidizing capacity present in water. Unlike a DPD chlorine reading, which can only differentiate between free available chlorine and the less effective combined chlorine, ORP provides an accurate measure of water quality regardless of pH, TDS, cyanuric acid, or non-chlorine oxidizers. The proper ORP range for swimming pools and spas is between 650 and 800 mV, with any value above 650 resulting in healthy water quality.

ORP Overfeed

The ORP Overfeed timeout occurs when the CAT 6000 has been feeding chemicals for a time greater than the selected maximum feed time and has not reached its set point. A properly selected Overfeed timeout prevents the unit from continuing to feed chemicals when the chemical supply has been diminished or a chemical feeder has become clogged or broken. First, check the chemical supply and chemical feeder. If both are in order check the Overfeed timer setting as it may need to be increased to keep up with chemical demand.

ORP Tank Low

The ORP Tank Low alarm will sound when the chemical being fed falls below the chemical level in the tank. First check the chemical level. If the level is above the sensor, check the sensor for obstruction or calcification.

No Flow

The CAT 6000 is equipped with a flow sensor to prevent the controller from feeding chemicals in the absence of proper recirculation. First check the filtration system to ensure that it is running and that water is moving through the Flow Cell. If water is flowing and the alarm is still sounding check flow sensor for obstruction.

When using the optional Digital Flow Sensor, the digital flow alarm setting can be entered in gallons-per-minute to send a No Flow alarm when the filters require cleaning or backwashing.

Service Request

The Transmit Statistics button on the CAT 6000 sends logged data to the PoolComm web site for immediate viewing and generates a service request alarm.



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Technical Specifications

Enclosure:	15.0" x 9.8" x 3.6", NEMA 4X
Display:	7" Color LCD w/Backlight and brightness control
On Screen Display:	pH, Water Temperature, Alarm, Flow, Wifi Communications
Flow Cell:	Machined Acrylic
Flow Sensor:	Rotary
Power Input:	120VAC, 13A, 60HZ Min Supply Conductors: 14AWG, 2 Wires w/ Ground Fuse/Circuit Breaker Rating: 15A Max.
Output Power:	pH Feed: 4 Amp, 115 VAC ORP Feed: 4 Amp, 115 VAC Programmable AUX1: 4 Amp, 115 VAC
Auxiliary Relays:	AUX2 Relay: Dry Contacts - 5VDC, 1A Max AUX3 Relay: Dry Contacts - 5VDC, 1A Max
Communications Output:	2.4 GHz WiFi, IEEE 802.11 b/g/n
Warranty:	5-year limited warranty on controller 2-year warranty on sensors
Keys:	5-Key Capacitive Touch w/Backlight
Internet URL:	http://www.poolcomm.com
Mobile App:	Available for iPhone and Android devices
Alarm Format:	Visual, Audible, Email, Internet
Safety Systems:	pH Low and High Alarms Control Sanitizer Low and High Alarms pH Priority Feed Control Sanitizer Overfeed Timeout pH and ORP Overfeed Timeout Pump Activation Interlock Flow Alarms pH Interlock Tank Level Filter, Vacuum, Suction Pressure



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Set Point Range:	pH: 7.0-8.0 ORP: 525-1000 mV Cl: 0-10.0 ppm
Control Accuracy:	pH: +/- 0.1 pH ORP: +/- 5.0 mV Cl: +/- 1.0 ppm
Alarm Ranges:	pH: low 6.0 pH / high 9.0 pH ORP: low 200 mV / high 995 mV Cl: 0-10.0 ppm TDS: 0-7500 ppm NaCl: 0-7500 ppm Temp: 32° - 105° F Saturation Index: -.5 - +.5 Pressure: 0 - 200 PSI/inHg Flow: 0 - 2400 gpm
Optional Equipment:	Optical Level Sensors Digital Flow Rate Sensor Rotary Flow Sensor Chemical Feed Systems
Auxiliary Outputs:	User Programmable Remote Alarm pH Base Feed pH Acid Feed ORP Feed Up ORP Feed Down Cl Feed Up Cl Feed Down NaCl Down NaCl Up TDS Down TDS UP Temp Up Temp Down Time-based Activation Periodic Time of day based Activation Primary Control Sanitizer User Programmability



Appendix A- Sensor Specifications

Chlorine Sensor Specifications P/N PRO75

Description	Free Chlorine Sensor
Range	1 to 10 ppm (Reduced accuracy outside this range.)
Accuracy	Within 10% of displayed value for the levels in the specified range around the calibration point. 1–2 ppm (+/- 0.15 ppm & +/- 0.28° C from calibration point) 2-5 ppm (+/- 0.5 ppm of calibration point) 5-10 ppm (+/- 0.4 ppm of calibration point) (Dependent on accuracy of the chemical test used to calibrate the sensor)
pH Range	7.0 to 8.0 (With active pH compensation. Reduced accuracy outside of this range)
Resolution	0.1 ppm
Temp Range	4 to 41°C
Temp Compensation	Yes
Temperature Output	Temperature (Thermistor 10K @ 25°C)
Flow Range	0.3 to 0.6 GPM. With an optimal rate of 0.45 to 0.5 GPM. Flow rates above 0.5 GPM may result in a reduced range.
Max Pressure	29.4 psi (2 bars)
Response Time	< 10 minutes to 80% of final value at 25°C and stabile pH for acclimated sensor.
Cross Sensitivity	Bromine, ozone, ClO ₂ (chlorine dioxide) and Cyanuric Acid, pH, TDS & Temperature
Wetted Parts	PVC, hydrophilic membrane over a platinum anode, gold cathode and medical grade epoxy.
Calibration Frequency	Application dependant. Sensor to be calibrated near desired set point with a stable pH of 7.4 to 7.6

Warning: When manually dosing chemicals, the ball valves on the flow cell must be closed to prevent concentrated chemicals from coming in contact with the Cl Sensor as this will cause temporary sensor calibration issues and will require the sensor to undergo a re-acclimation period. It is recommended keep the valves closed for a minimum of 2 hours after manual dosing.



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Chlorine Sensor Acclimation

When a Chlorine sensor is first installed in a new body of water it needs time to acclimate prior to being used for control. The suggested sensor acclimation time is 48 hours for which the sensor needs to be installed in the flow cell, in flow and connected to the Cl sensor input of a powered CAT 6000 controller.

Chlorine Sensor Calibration

After the acclimation period the Chlorine sensor must be calibrated. Calibration should be made when the Chlorine levels are relatively stable and not varying by more than .1 ppm in a 30 minute time period as indicated by CAT 6000 display and manual measurement methods such as DPD. The calibration ideally is made near the desired set point level of the Chlorine for the body of water the CAT 6000 will be controlling. Do not calibrate the sensor below 1 ppm of Chlorine. Please note the Cl sensor is not intended for chlorine control under 2 ppm. Ensure that temperature and pH are also stable and calibrated. pH should be at a normal desired level of 7.4 to 7.6 before calibrating the sensor. Never calibrate the sensor when Chlorine levels are transitioning rapidly up or down due to manual dosing. A minimum TDS level of 2000 ppm's is suggested for best results. Initial calibration of the sensor may require daily calibrations until the desired tolerance is achieved as compared to manual measurement methods such as DPD. The sensor calibration needs to be evaluated after changes in temperature, flow and chemistry changes. The calibration then needs to be checked every 4 to 10 days and calibrated as needed. See the CAT 6000 operations manual for instructions on how to calibrate the sensor.

Chlorine Sensor Storage

Exposure to atmospheric conditions will cause the sensor tips to dry out. Always remove and properly store the sensor in the soaking cap with clean water and the provided battery pack (originally shipped with the controller) attached to the sensor if the sensor is to be removed or stored for one hour or longer. Although Chlorine sensor is freeze-resistant, they must be protected from freezing temperatures when not in use. Replace the battery in the sensor battery pack each season or every 90 days. The acclimation and calibration procedures will need to be repeated at the beginning of each season or after prolonged storage periods.

Chlorine Sensor Cleaning

The sensor should be inspected periodically for discoloration of the gold and platinum sensor wires, for damage to the protective tube covering the platinum sensor wire and any physical damage to the sensor. If discoloration is present, the sensor has been behaving erratically or when it has been in prolonged storage it may need to be cleaned. If the sensor requires cleaning, ensure that it is connected to a sensor battery pack (Hayward P/N CAX-6005) after disconnecting from the CAT 6000 controller. If the sensor has been in storage for a prolonged time and has a sensor battery pack already attached, replace the battery before cleaning. The sensor is cleaned by soaking in a 5% hydrochloric acid (muriatic acid) solution until the discoloration is removed. Usually, a five minute soak is sufficient. The sensor should then be briefly rinsed with tap water and re-connected to the controller. Do not touch or rub the protective covering on the platinum sensor wire as this may damage the sensor and require sensor replacement. After cleaning, the sensor should go through the normal acclimation and calibration processes before it is fully functional. If abnormal behavior persists, the sensor may need to be replaced.



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TDS Sensor Specifications P/N PRO65

Description	Total Dissolved Solids Sensor
Range	TDS Range: 500 - 7500 ppm
Accuracy	± 15%
Temp Range	10°C to 42°C
Temp compensation	Yes
Temp Output	Thermistor 10K @ 25°C
Flow range	0.3 to 50.0 GPM
Max pressure	29.4 psi (2 bars)
Response Time	< 15 minutes to 80% of final value at 25°C
Wetted Parts	PVC, Stainless Steel Electrode, Medical grade epoxy
Calibration Frequency	Calibrate as necessary depending on application and flow cell geometry

TDS Sensor Acclimation

When a TDS sensor is first installed in a new body of water it needs time to acclimate prior to being used. The suggested sensor acclimation time is 1 hour, for which the sensor needs to be installed in the flowcell, in flow and connected to the TDS sensor input of a powered CAT 6000 controller.

TDS Sensor Calibration

After the acclimation period the TDS sensor must be calibrated. Calibration should be made when the TDS levels are relatively stable, as indicated by CAT 6000 display and manual measurement using a TDS meter. The calibration is ideally made near the desired TDS level for the body of water that the CAT 6000 will be monitoring. Do not calibrate the sensor below 500 ppm TDS. Initial calibration of the sensor may require daily calibrations until the desired tolerance is achieved as compared to manual measurement. The calibration should be checked periodically, after changes in temperature or flow, and after any drastic changes in water chemistry. See the CAT 6000 operations manual for instructions on how to calibrate the sensor.

TDS Sensor Storage

In order to protect the sensor tip from physical damage, the sensor should be stored in the sensor cap. It is not necessary to store this sensor with water in the cap. The acclimation and calibration procedures will need to be repeated at the beginning of each season or after prolonged storage periods.

TDS Sensor Cleaning

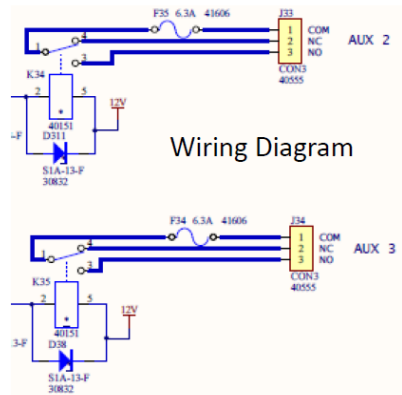
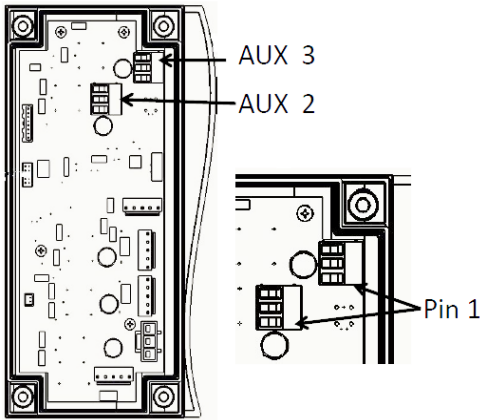
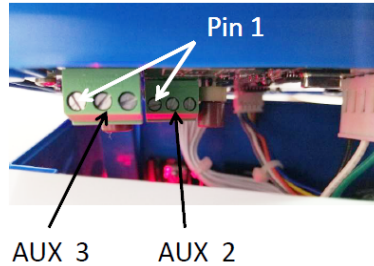
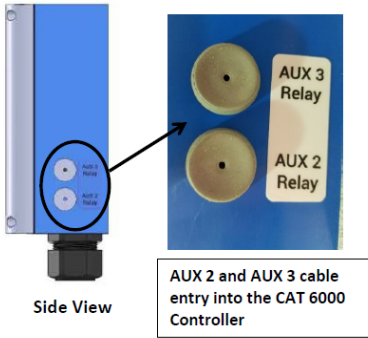
The sensor should be inspected periodically for damage or debris on the sensor wires. If the sensor has been behaving erratically or when it has been in prolonged storage it may need to be cleaned. If any debris is noted, it should be gently wiped from the wires with a paper towel. Any physical damage to the sensor wires may result in a malfunctioning sensor, which must then be replaced. After cleaning, the sensor should go through the normal acclimation and calibration processes before it is fully functional. If abnormal behavior persists, the sensor may need to be replaced.



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Appendix B- Input and Output Wiring Information

AUX 2 & AUX 3 Wiring – Dry Contacts





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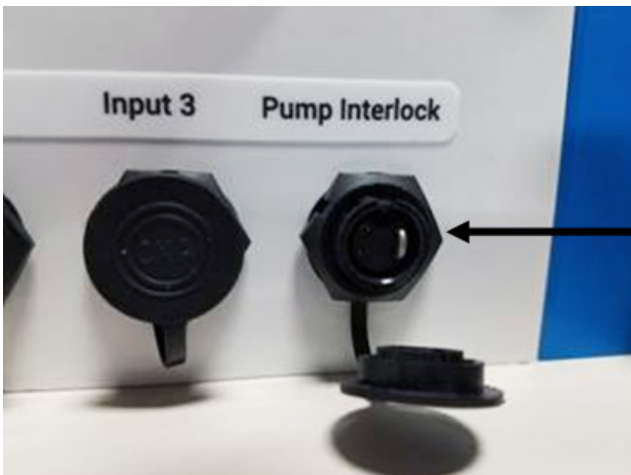
Appendix C – Circulation Pump Interlock

The pump interlock is on pins 3 and 4 of the Pump Interface connector. Pins 3 and 4 should be connected to a dry set of contacts from the pump that are closed when the pump is running.

The mating Conxall/Switchcraft connector kit P/N's are as follows depending on wire gauge and jacket O.D. of the cable being used:

6282-4PG-3DC
6282-4PG-311
6280-4PG-321
6282-4PG-513

Please note that before installing mating connector remove the factory installed jumper across pin 3 and 4 with a pair of needle nose pliers. See picture below.



Remove factory
installed jumper
before connecting
to pump interlock



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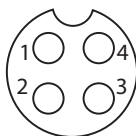
Appendix D – External Input Wiring Guide

- A) Input 1 & Input 2 are Optical inputs and are used for tank level detection. See Configuration Menu for option settings.



The mating Conxall/Switchcraft connector kit P/N's are as follows depending on wire gauge and jacket O.D. of the cable being used:

6282-4PG-3DC
6282-4PG-311
6280-4PG-321
6282-4PG-513



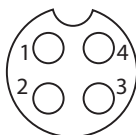
Pin #	Connection
1	Ground
2	Signal
3	5 Vdc
4	Sensor Detect

- B) Input 3 & Input 4 are Optical/Pulse inputs are used for tank level & flow detection. See Configuration Menu for option settings.



The mating Conxall/Switchcraft connector kit P/N's are as follows depending on wire gauge and jacket O.D. of the cable being used:

6282-4PG-3DC
6282-4PG-311
6280-4PG-321
6282-4PG-513



Pin #	Connection
1	Ground
2	Signal
3	5 Vdc
4	Sensor Detect

- C) The Flow Meter Input is dedicated for use with the Hayward CAX-20203 Rotary Flow Meter supplied with the CAT 6000 controller.



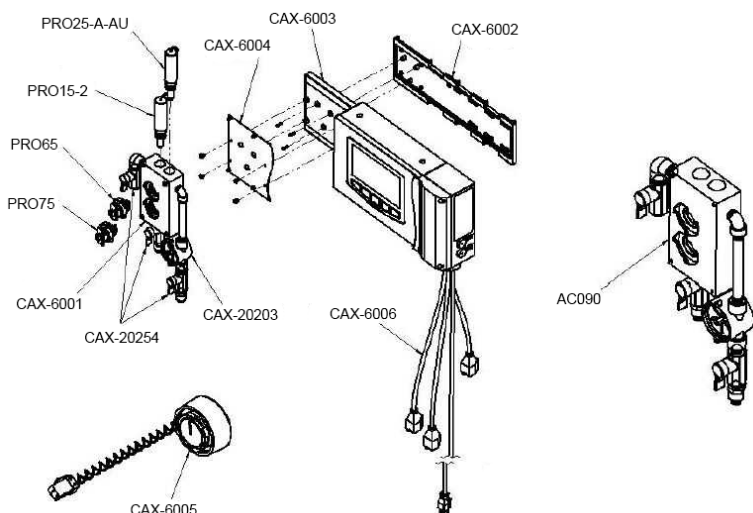
- D) The RS485 Input is currently not available for connection to external devices.





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Appendix E - Spare Parts List



HAYWARD PART #	DESCRIPTION
PRO25-2	Sensor, ORP Probe With 24" Cable
PRO15-2	Sensor, pH Probe With 24" Cable
CAX-20203	Flow Meter, Rotary
CAX-20254	Ball Valve, 1/4" NPT Female X 1/4" Male
AC090	Flow Cell Assembly, Including Flow Meter, Ball Valve and Pipe Fittings
CAX-6001	Plastic, Thrust Plate, Flow Cell, Hybrid II, Machined
CAX-6002	Plastic, Bracket, Wall Mount
CAX-6003	Plastic, Flowcell Mount
CAX-6004	Bracket, Flowcell Mounting Plate, Stainless
PRO65	Sensor Assembly, TDS
PRO75	Sensor Assembly, Cl
CAX-6005	TL Assy, Chlorine Sensor Battery Bias
CAX-6006	Cable, AC Power Assembly, CAT 6000



HAYWARD®

WARRANTY

Hayward® warrants the CAT 6000 automated controller to be free of defects in material and workmanship for a period of five years from date of shipment from our factory or authorized distributor. Liability under this warranty is limited to the repair or replacement of any device or component which is returned to the factory within five years of delivery to original purchaser, shipping prepaid, and which is found to be defective upon examination.

Hayward® warrants all related sensors, flow switches, fittings and accessories to be free of defects in material and workmanship for a period of two year from date of shipment from our factory or authorized distributor. Liability under this warranty is limited to the repair or replacement of any device or component which is returned to the factory within one year of delivery to original purchaser, shipping prepaid, and which is found to be defective upon examination.

Hayward® disclaims all liability for damage during transportation, for consequential damage of whatever nature, for damage due to handling, improper installation or operation, and for determining suitability for the use intended by the purchaser.

Hayward® makes no warranties, either expressed or implied, other than those stated above. No representative has authority to change or modify this warranty in any respect. After obtaining a Return Merchandise Authorization form, any warranty claims should be directed to the following address:

Hayward Commercial Pool Products
10101 Molecular Drive Suite 200
Rockville, MD 20850 (USA)
800-657-2287
301-838-4001



For further information or consumer
technical support, visit our website at
www.hayward.com



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