092474 RevE

HAYWARD®

HCC 1000®

Automated Controller

Owner's Manual

Contents

HCC1000-PH
HCC1000-CO2

REGISTER NOW
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WARRANTY

see back of manual for details

Hayward Pool Products
620 Division Street, Elizabeth NJ 07207
Phone (908)-355-7995
www.hayward.com

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). Hayward 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. Hayward recommends always having the “Overfeed 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.

SAVE THESE INSTRUCTIONS

Foreword

Congratulations on your wise investment. The product you have selected from the Hayward® line of automated controllers should provide you with substantially reduced chemical maintenance, improved compliance with Health Department operating standards, chemical cost savings, and many years of reliable operation. Hayward® controllers incorporate state of the art microprocessor-based design technology to provide sophisticated control functions at an affordable price.

Although Hayward® controllers are relatively simple to install, please take the time to read this entire manual, compare package contents with the parts list, and gather all tools required before beginning installation. Improper installation may void the warranty and create unnecessary hazards. Properly preparing for installation will also reduce facility down time.

For the purposes of this manual, it is presupposed that the installer is familiar with the physical characteristics of the pool or spa to be automated. As is the case when installing any filtration system component, all recirculating pumps, heaters, etc. need to be turned off prior to installation of the controller. If the filtration system is located below water level, additionally adjust all valves required to eliminate pressure from the system.

Physically, installation of a Hayward® controller is no more challenging than installation of a chemical feeder. Any swimming pool contractor or maintenance engineer should have the tools and knowledge to perform the installation. Our technical support line can also be used to answer any questions pertaining to controller installation.

Remember that your new Hayward® controller is not a substitute for performing and recording manual water testing in conformance with your state or local health department regulations. Never operate a water chemistry controller without a flow sensor, power interlock, or other means of ensuring that chemicals will not be fed without proper filtration system recirculation.

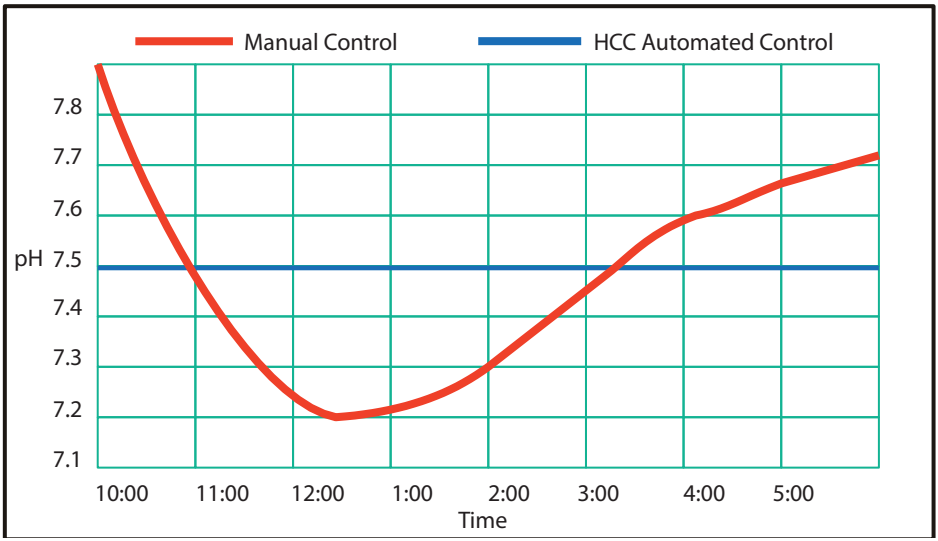
Congratulations on your purchase and welcome to the world of chemical automation. Please complete and return your warranty registration card today.

Introduction

Description

A pool operator typically checks and adjusts pool or spa water chemistry hourly at best. The HCC 1000 continuously monitors pH, constantly adjusting the feeding of chemicals on a basis proportional to the demand. The results include elimination of "human error", accurate and reliable maintenance of chemical levels twenty-four hours a day, compliance with safe water chemistry standards, reduced burden on operating staff, and a reduction of chemical usage and costs.

The following graph compares typical pH levels when chemistry is adjusted manually versus automatically with the HCC 1000 controller.



What's Included

Description

The following is a description of the components incorporated in a typical HCC 1000 controller system:

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 HCC 1000 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 Flow Sensor (required) monitors the rate of flow across the pH sensor 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 sensor while ensuring ideal hydraulic conditions to maximize sensor performance and life.

The HCC 1000 controller unit scans and interprets the signals from the pH sensor, displays water quality readings in digital format, and activates chemical feeder in proportion to the demand required to maintain the pH setpoint level. The unit incorporates audible and visual safeguard alarms for out of range conditions, calibration adjustment for pH, and mode selections to manually feed or disable feeding. The HCC 1000 controller unit also features an internal micro-computer for unsurpassed accuracy, adaptability, and ease of use. All user-entries and adjustments are made through the touch-screen interface front panel.

Package Contents
Please unpack your new controller system carefully. Do not use a razor or sharp instrument to remove contents. Report any shipping or handling damage immediately to your shipping company. Enclosed in the packaging you should find all of the following:

(1) HCC 1000 Water Chemistry Controller
(1) Professional Series pH Sensor with 24" Cable and BNC Connector
(1) BNC Connector Protective Covers (Remove to Connect Sensor)
(1) Sensor Storage Container
(1) HCC 1000 Owner's Manual
(1) PVC Backboard with Mounting Holes and Stainless Hardware
(1) Round Machined Acrylic Flow Cell assembled with:
(2) 1/4" NPT x 3/8" Tubing Parker Ball Valves
(1) Pressure Flow Switch with Cable
(1) 30' Roll, Black Poly Installation Tubing (3/8" OD)
(2) 1/4" NPT x 3/8" Tubing True-Seal Connectors

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)
7/16" Drill Bit
1/4" NPT (National Pipe Tapered) Tap
Masonry Drill Bit & Anchors (if required)
13/16" Wrench or Channel-Lock Pliers.

Installation

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 sensor. We recommend using a pressure-suction “loop” line.

1. Turn off heater, chemical feeders, pump, and any other related equipment. Relieve pressure from filtration system.

2. 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.

3. Securely mount Controller or PVC Backboard on vertical wall.

4. Drill and tap a 1/4” NPT port at a location just downstream of the filter, but upstream from any chemical injection point. Install a tubing connector, and run flex tubing to the influent flow cell port.

5. Drill and tap a 1/4” NPT port at a location subject to vacuum or reduced pressure. Install the remaining tubing connector and run flex tubing to the effluent flow cell port.

6. Cut a 3” to 6” length of flex tubing and insert into the sample stream port.

7. Remove pH sensor from the plastic storage bottle and save bottle and storage fluid for future use. Apply teflon tape and thread sensor into flow cell.

8. Remove BNC protective cover from left side of controller unit and store for future use. This cover protects the controller unit from electrostatic discharge (ESD) and should be used whenever handling or transporting the controller unit.

9. Connect the pH and Flow sensor cables to the controller unit as labeled. Sensor cables are constructed from a specialized material - never cut or splice.

10. If new or additional chemical feeders are to be used with the controller, install according to manufacturers instructions at this time.

11. Connect chemical feeder to the controller as labeled.

12. Check all electrical and mechanical connections. Resume filtration system operation and check for any leaks.

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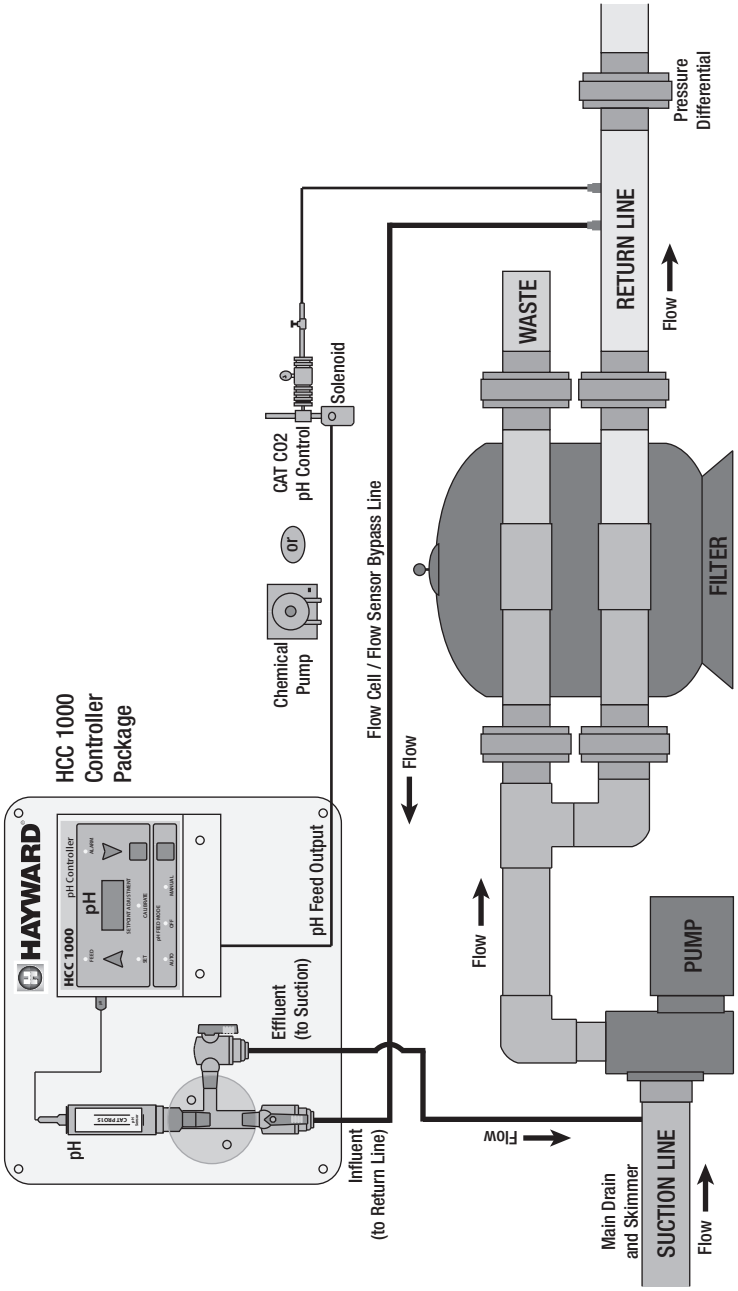
Typical HCC 1000 Installation Diagram



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 HCC 1000.

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

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

Hayward® strongly 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.

Configuration

Basic Configuration Options

Once desired start up chemistry parameters have been established, you are ready to set the HCC 1000 to automatically maintain pH. Please refer to the Illustration on page 9 for controller unit button designations. Button designations appear in bold type.

Selecting Acid or Base Feed

The HCC 1000 is preset from the factory to operate in the acid feed mode (when pH exceeds the setpoint, the pH chemical feeder is activated). If the sanitizer used at your pool or spa causes the pH to decrease you must select base feed mode. To switch the controller between acid feed and base feed modes, perform the following steps.

1. Press and hold the **Hidden Button** (#1) for five seconds to enter advanced setup mode.
2. Scroll to pFD and press the enter key. Scroll to select A for acid feed or B for base feed. Press the Enter key to set your selection, then press the **Hidden Button** (#1) again to return to normal operating mode.

As the unit powers on, the digital pH readout will display an “A” or “B” indicating whether acid feed or base feed mode has been activated.

Calibrating pH

Readings from the HCC 1000 are far more accurate than those obtained from most liquid test standards. To match manual water testing results or compensate for a depleted or unclean pH sensor, the pH channel of the controller may be calibrated as follows:

1. Press the **pH Setpoint Adjustment Button** (#4) twice, illuminating the green "CALIBRATE" LED.
2. Press the arrow-shaped **pH Channel Increase Button** (#2) or **pH Channel Decrease Button** (#3) until the digital display matches your manual pH test reading.
3. The controller will automatically return to the normal operating mode after twenty seconds, storing any changes.

Changing the pH Setpoint

The HCC 1000 is preset from the factory to maintain pH at 7.5. To set pH control at a different level, perform the following:

1. Press the **pH Setpoint Adjustment Button** (#4) until the green "SET" LED is illuminated.
2. Press the arrow-shaped **pH Channel Increase Button** (#2) or **pH Channel Decrease Button** (#3) until the digital display matches your desired pH control level.
3. The controller will automatically return to the normal operating mode after twenty seconds, storing any changes.

Manually Activating pH Feed

To manually enable the pH chemical feeder press the **pH Channel Mode Selection Button** (#5) until the green "MANUAL" LED is illuminated. The chemical feeder will operate continuously for 30 minutes, and then automatically revert to "Auto" to prevent accidental over-feeding.

Manually Disabling pH Feed

To manually prevent operation of the pH chemical feeder press the **pH Channel Mode Selection Button** (#5) until the red "OFF" LED is illuminated. Automatic pH feeding will be disabled. So that the user may have time to enter selections, the chemical feeding cycle will not be interrupted for approximately ten seconds.

Automatically Controlling pH Feed

For automated control of the pH chemical feeder press the **pH Channel Mode Selection Button** (#5) until the green "AUTO" LED is illuminated. The chemical feeder will operate automatically in proportion to chemical demand. So that the user may have time to enter selections, the chemical feeding cycle will not be interrupted for approximately ten seconds.

About Proportional Feed

The HCC 1000 features an advanced proportional feed algorithm which constantly analyzes demand for chemicals and initiates feeding in intervals based on the relationship between setpoint and actual water sample values. This feature is highly valuable in maintaining precise control of water chemistry in most applications.

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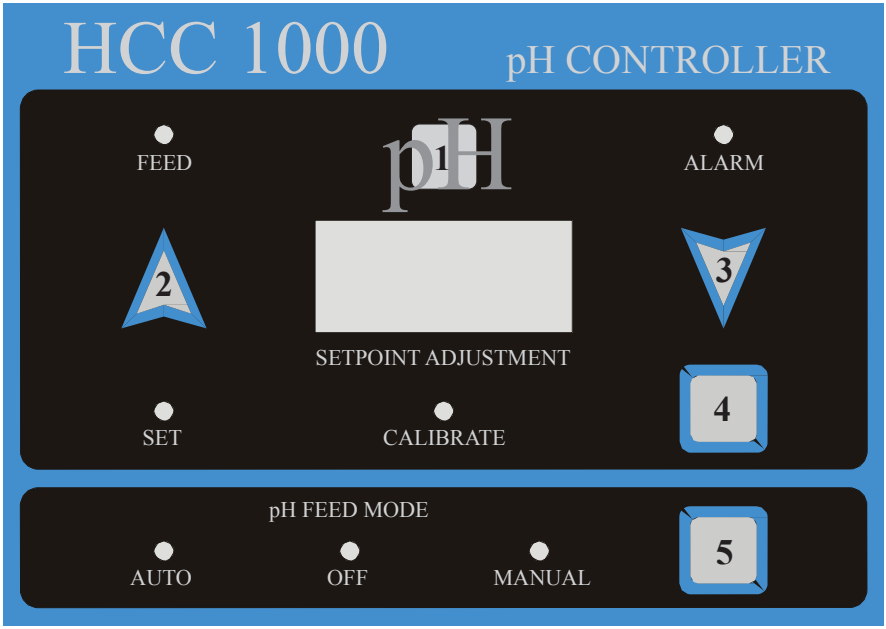
HCC 1000 Switch And Keypad Functions

BUTTON DESIGNATION	DESCRIPTION
1	Hidden Button (Located Behind “pH” Text)
2	pH Channel Increase Button
3	pH Channel Decrease Button
4	pH Channel Setpoint Adjustment Button
5	pH Channel Mode Selection Button



Advanced Configuration Options

The HCC 1000 offers a host of advanced options to ensure compatibility with a wide variety of applications. The advanced programming menu contains features which are usually implemented during initial dealer setup and do not need to be routinely changed by the operator.

no Flo (Enhanced No-Flow Alarm)

The no-flow alarm displays the prompt on the LED display, in addition to activating the pH Alarm indicator and sounding an audible alarm.

Power On Display

At power on, the controller displays the pH feed mode and firmware version number. The pH feed mode is displayed on the LED display:

A: Acid feed selected.
b: Base feed selected.

The firmware version number is displayed on the ORP channel LED display:

Firmware version number (or later).

Entering Advanced Setup Mode

Find the **Hidden Button** (#1) located behind the large pH text over the pH digital display.

1. Press and hold the **Hidden Button** (#1) for five seconds to enter advanced setup mode.
2. Press the Up (#2) and Down (#3) arrow buttons to scroll through programming options.
3. Press the **Enter Button** (#4) to make a selection.

P.Fd (pH Feed Mode)

Selects the condition under which the pH feed output is activated. This can be set to either acid or base feed.

A: Acid (default). pH feed output is activated when the measured pH is greater than the pH setpoint, indicating the need to feed acid to decrease the pH of the water.

b: Base. pH feed output is activated when the measured pH is less than the pH setpoint, indicating the need to feed base to increase the pH of the water.

P.PF (pH Proportional Feed)

Selects either fixed setpoint or proportional control.

Off: The pH feed output is activated based on a simple above or below setpoint decision. When the measured pH value is less than or equal to the pH setpoint (pH Feed: Acid selected) or greater than or equal to the pH setpoint (pH Feed: Base selected) the pH output feed is turned off. Otherwise, the pH feed output is turned on.

On: The pH feed output is activated based on the difference between the pH setpoint and the measured pH value. As the difference increases, the duration the pH feed output is turned on increases to 20, 30, 40, and 50 seconds of the 60 second cycle, and then the pH feed output is turned on continuously. This is the default setting.

P.OF (pH Overfeed Timer)

Overfeed Timers prevent potentially dangerous, unintentional dispensing of chemicals. Hayward recommends always having the “Overfeed Timeout” function 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.

When Off is selected, the pH feed output will remain activated as long as a pH feed condition is indicated. When any other selection is made, an overfeed limit timer is enabled on the pH feed output. After the pH feed output has been turned on for a period of time greater than this limit, the pH channel is turned off and placed into an overfeed alarm condition which must be manually reset.

If pH Proportional Feed: On has been selected, the pH feed output must be on continuously for the overfeed time limit, rather than in the part of the proportional feed cycle in which the pH feed output is on for only a portion of the 60 second proportional feed cycle.

After the pH feed channel is placed into the overfeed alarm condition, the pH channel is turned off and the pH Feed Mode indicator flashes rapidly to indicate the alarm. Press the pH Feed Mode button to return the pH channel to the off, manual or automatic feed mode. This will reset the pH overfeed alarm and restart the overfeed timer. The pH overfeed alarm will also be reset if the controller is powered off and then back on.

The pH overfeed timer is disabled when the pH Feed Mode button is used to place the pH channel in the manual feed state.

Off: The pH feed output will remain on for an unlimited amount of time.
15: 15 Minutes.
30: 30 Minutes.
60: 60 Minutes (1 Hour).
120: 120 Minutes (2 Hours).
180: 180 Minutes (3 Hours).
240: 240 Minutes (4 Hours) - default.

P.AL (pH Low Alarm Limit)

Sets the low alarm point for the pH channel. When the measured pH value is less than this limit, the audible alarm will be activated and the pH feed output will be disabled. The alarm will be cleared and feed will resume automatically when the measured pH value returns to within the non-alarm range.

6.8: Use the UP and DOWN buttons to select a value between 6.0 and 9.0 pH. The value must be less than the pH alarm high value. The default value is 6.8 pH.

P.AH (pH Alarm High Limit)

Sets the high alarm point for the pH channel. When the measured pH value is greater than this limit, the audible alarm will be activated and the pH feed output will be disabled. The alarm will be cleared and feed will resume automatically when the measured pH value returns to within the non-alarm range.

8.2: Use the UP and DOWN buttons to select a value between 6.0 and 9.0 pH. The value must be greater than the pH alarm low value. The default value is 8.2 pH.

Clr (Clear All Programming and Restore Factory Defaults)

Factory Clear. Returns all controller operating parameters to their default values.

dEo (Demonstration Mode)

Places the controller in Demo Mode for showroom display, presentations, etc.

bPr (Audible Alarm)

The Beeper setting allows the audible alarm to be enabled (default) or disabled.

Srl (Serial Interface)

The HCC 1000 includes a standard RS232 serial interface. A header assembly and cable are required to connect.

Onl: Online Communications. Use this selection when the controller is attached to a PC or building automation system.

Prn: Printer. Use this selection when the controller is attached to an optional Serial Printer to make a hard-copy record of controller operating parameters. The printer is supplied with a cable to connect it to the controller. The Serial Printer prints one data record at 15 minute intervals. Data recorded includes pH measured values, and the feed output and alarm status. This is the default setting.

When all desired settings have been entered, press the **Hidden Button** or wait 30 seconds and the controller will return to default operating mode

Display Functions

Please refer to the Illustration on the following page with reference to designations of the various LED indicator lights on the front panel. Please note that for enhanced viewing the HCC 1000 features a "dead-front" display panel, so only illuminated indicators will be visible to the user. All lights and indicators are activated during power-on.

pH Feed Indicator (#1)
This green LED is illuminated whenever the pH chemical feeder is automatically or manually activated.

pH Alarm Indicator (#2)
Illumination of this red indicator is accompanied by an audible alarm and indicates that pH is outside of the safe operating range. Check that the pH chemical feeder is functioning properly and that an adequate chemical supply is available.

pH Digital Display (#3)
The red digital numeric display of the pH channel normally indicates the current pH of the pool or spa water (as calibrated) passing through the filtration system. Pressing the **pH Setpoint Adjustment Button** until the red "SET" LED is illuminated causes the pH setpoint to be displayed.

pH Setpoint Adjustment Mode Indicator (#4)
This green LED is illuminated whenever the controller is in the pH setpoint adjustment mode. Setpoint adjustment is allowed only when this LED is illuminated.

pH Calibrate Mode Indicator (#5)
This green LED is illuminated whenever the controller is in the pH calibration mode. Calibration of the pH display is allowed only when this LED is illuminated.

pH Automatic Control Indicator (#6)
This green LED is illuminated when pH is under automated control.

pH Manual Off Indicator (#7)
This red LED is illuminated when pH feeding is manually disabled.

pH Manual On Indicator (#8)
This green LED is illuminated when pH feeding is manually activated.

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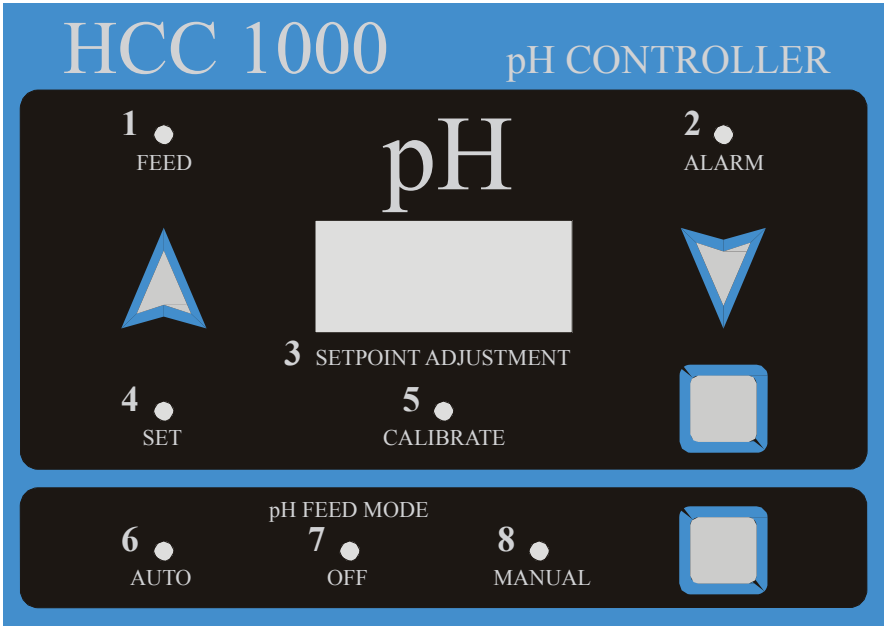
HCC 1000 Indicator Designations & Functions

DESIGNATION	COLOR/TYPE	DESCRIPTION
1	GREEN LED	pH FEED INDICATOR
2	RED LED	pH OUT OF RANGE ALARM
3	DIGITAL DISPLAY	pH INDICATOR/SETPOINT/CALIBRATION
4	GREEN LED	pH SETPOINT ADJUSTMENT MODE INDICATOR
5	GREEN LED	pH CALIBRATION MODE INDICATOR
6	GREEN LED	AUTOMATIC pH CONTROL INDICATOR
7	RED LED	pH FEED MANUALLY DISABLED
8	GREEN LED	pH FEED MANUALLY ACTIVATED



System Maintenance

HCC 1000 Controller

The HCC 1000 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.

Precision Calibration

The HCC 1000 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 sensor must be clean and free from oil, chemical deposits and contamination to function properly. After saturation in pool or spa water, the sensor 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 sensor is in need of cleaning.

To clean the sensor, disconnect from the controller and carefully remove 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 sensor. Hand tighten only.

Never allow a pH sensor to dry completely. Drying will damage the reference junction and void the sensor warranty.

Sensor Replacement

HCC Professional Series pH sensors are engineered to provide the highest performance and longest possible functional service life. If a properly cleaned sensor provides unstable readings or requires excessive calibration, the sensor should be replaced. For optimum controller performance, replace with genuine HCC Professional Series sensor PRO15-2.

Sensor Storage

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

Store sensor in the soaking cap provided, making sure that the container is filled with the original storage solution or clean water. If the storage container has 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 HCC 1000 controller unit.

Winterization

The pH sensor should be prepared for storage as outlined above and protected from freezing temperatures. Although the HCC 1000 controller is designed to withstand a broad temperature range, winter storage in a secure location is 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.

Troubleshooting

Each HCC 1000 controller is manufactured to the highest quality standards and then thoroughly tested before leaving the factory. State of the art design and fabrication technology ensure years of trouble free operation. Most apparent malfunctions can be solved through the following corrective actions:

No lights are illuminated when controller is powered on.

1. Check circuit breaker and/or receptacle for proper operation. Connect to functional grounding-type GFCI protected power source.
2. Check for damaged power cord or connector.

Alarm light(s) and tone are observed.

1. Ensure that filtration system is functioning properly, flow is adequate, and water chemistry is in balance.
2. Ensure that sensor and power cables are properly connected to their respective connectors on the controller unit.
3. Check chemical feeders for proper operation.
4. Ensure that flow sensor is properly installed and connected.

pH chemical feeder is not activated as expected.

1. Ensure that acid/base feed mode is properly set for your chemical feeding requirements.
2. Make sure “auto” pH feed mode is selected.
3. Check pH Setpoint.

pH requires frequent calibration.

1. Clean the pH sensor as outlined in the maintenance section. If sensor continues to provide unstable readings after cleaning, replace sensor.

pH readings are inconsistent or slow in response.

1. Ensure that sensor cables are properly connected to their respective BNC connectors on the controller unit.

2. Clean the sensors as outlined in the maintenance section. If sensors continue to provide unstable readings after cleaning, replace sensors.
3. Check to ensure that all electrical equipment in the facility pump room is properly bonded.

pH chemical feeder runs continuously.

1. Make sure "auto" feed mode is selected.
2. Ensure that chemical feeders are properly connected to their respective connectors on the controller unit.

pH feeding overshoots the setpoint.

1. Ensure that each chemical feeder is properly sized.
2. Check concentration of sanitizer or pH chemical.

pH feeding does not reach the setpoint.

1. Ensure that each chemical feeder is properly sized.
2. Check concentration of sanitizer or pH chemical.
3. Check chemical feeders and injection points for proper operation.

Technical Specifications

Display Range:	pH	0.0 - 9.9
Setpoint Range:	pH	7.0 - 8.0
Default Settings:	pH	7.5
Calibration Range:	pH	2.0 pH +/-
Control Accuracy:	pH	0.1 pH
Mode Selections:	pH Feed pH Selection pH Mode	Auto/Off/Manual Acid/Base Auto/Set/Calibrate
Safety Systems:	pH Controller Unit Required Optional	Audible & Visual Alarms Diagnostic Self Test Flow Sensor Remote Alarm
pH & Sensor:	Casing Material Junction Type Wet End Connector	Molded ABS Teflon Reference ½" NPT Shielded BNC
Sensor Output Signal Requirements:	0-14 pH	
Power Input:	120/240 Volt AC, 10 AMP, 50/60 Hz	

Outputs:	pH Feed	4 Amp / 120 VAC 4 Amp / 240 VAC 1 Amp / Dry Contact 1 Amp / Dry Contact
	Remote Alarm	1 Amp / Dry Contact

Optional Equipment

RS232 Computer Interface Cable
Thermal Printer
Three-Year Professional Series Sensor

WARRANTY

Hayward® warrants the HCC 1000 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 sensors, flow switches, fittings and accessories to be free of defects in material and workmanship for a period of one 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.

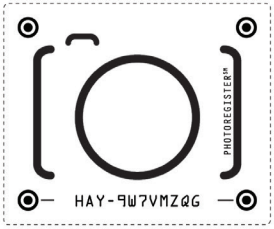
Hayward® makes no warranties, either expressed or implied, other than those stated above. No representative has authority to change or modify this warranty in any respect. After obtaining a Return Merchandise Authorization form, any warranty claims should be directed to the following address:

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

90 DAY EXTENDED WARRANTY*
REGISTER WITH YOUR SMARTPHONE

PROTECT YOUR INVESTMENT IN 2 EASY STEPS

1. TAKE A PHOTO
Take a photo of the camera icon



2. SEND IT IN
Send it in using **one** of the methods below

SMARTPHONE
Text a photo of the camera icon to **71403**

OR

ONLINE
Visit **Hayward.com/Warranty**

OR

MESSENGER
Send photo to **photoregister**

*Extended warranty is in addition to applicable product warranty and is for parts only, labor not included.
Need help? Visit photoregister.com/help or text HELP to 71403.

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

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