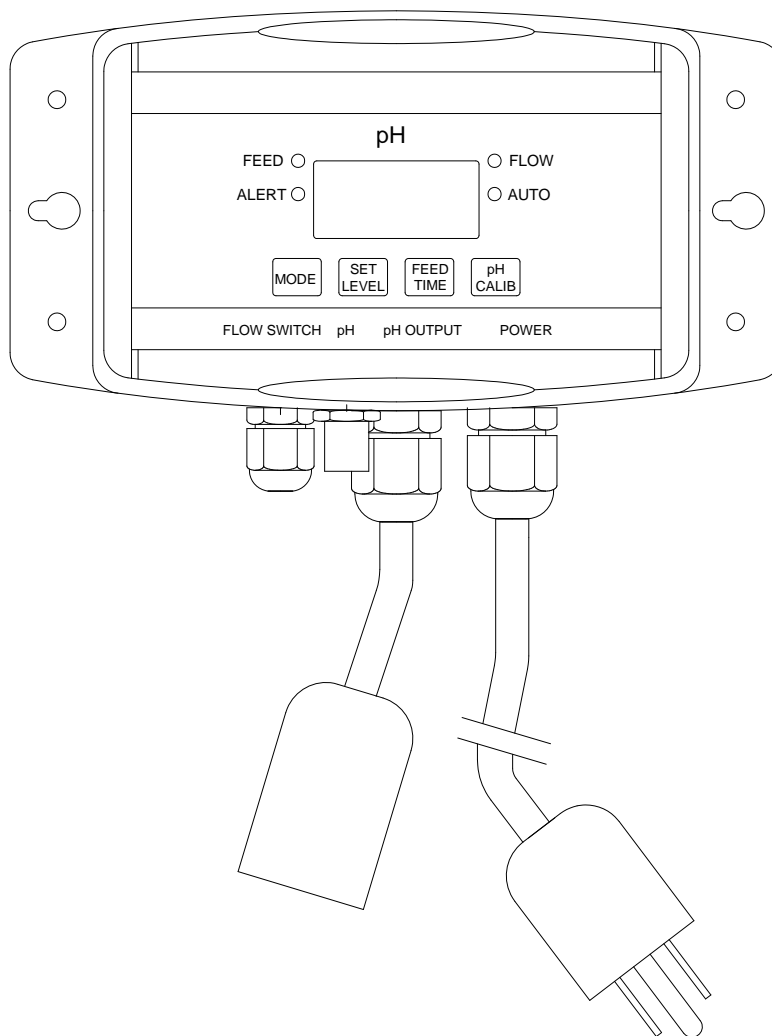


MODEL RC554P AND 554200

pH Digital Controller



IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

1. SAFETY: When installing and using this electrical equipment, basic safety precautions should always be followed, including:

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

1.2 WARNING! Risk of electric shock.

Connect only to a grounding type receptacle protected by a ground-fault circuit interrupter (GFCI). Contact qualified electrician if you cannot verify that the receptacle is protected by a GFCI and that your installation meets local electrical codes, including grounding of water system components.

1.3 WARNING! Risk of electric shock.

Do not bury electric cords. Locate cord to minimize abuse from lawn mowers, hedge trimmers, and other equipment. Replace damaged cords immediately. Do not use extension cords.

1.4 WARNING! Risk of electric shock.

Install at least 10 feet (3.0m) from inside wall of water enclosure using non-metallic plumbing. Do not install this controller in a location accessible to the public.

1.5 WARNING! Risk of Chemical Overdose/Exposure.

Removing power from circulating pump must also remove power from the controller. Provide a properly located outlet controlled by the circulating pump circuit.

1.6 WARNING! Risk of electric shock/pinching/chemical exposure.

Remove power sources or lockout circuit prior to performing maintenance on controller.

1.7 WARNING! Risk of Chemical Overdose/Exposure

Use a device such as a flow switch to shut off power from the controller in the event of circulating pump failure. It is unsafe to automatically dispense chemicals into a circulating system that is not running.

1.8 WARNING! Risk of Chemical Exposure.

Pool water must be balanced and stabilized before operating this controller.

1.9 WARNING! Risk of Chemical Overdose/Exposure.

Minimize amount of chemical on site that is available to dispense.

Size the feeder and container to pool/spa capacity.

Dilute chemical for small bodies of water.

1.10 WARNING! Risk of Chemical Exposure

Do not shut down circulation and control system immediately after using pool, spa or hot tub. Systems must operate until water chemistry is stable. Systems must be restarted before water chemistry is out of NSPI recommended ranges or water chemistry must be manually corrected.

1.11 WARNING! Controller uses microprocessor.

Wireless communication equipment or other electrical devices operated in close proximity may cause inadvertent actuation of chemical feed pumps.

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2. Quick Start Reference

Use this section for reference. Please read all safety instructions and appropriate manual sections for installation and operation instructions.

- Do NOT add chemicals to feeders until all startup operations are completed.
- Manually adjust and balance pool/spa to acceptable levels and verify using DPD test kit prior to startup. Automation should be used to maintain chemical levels, not to balance a pool/spa that is out of acceptable chemical ranges.

On/Off:

- Press the MODE button to turn the unit on. Note: 'FLOW' light must illuminate.
- To turn the controller off press the MODE button to turn the AUTO light off then hold the MODE button until display reads "OFF".

To Operate:

- Press and release the MODE button until the "AUTO" light is lit.
Unit will now operate in the factory preset settings:
 - Set level: pH = 7.4
 - Limits/Alerts: pH: 8.0 high, 7.0 low
 - Feed times: 0.6 second feed with a 5-minute delay

To Change Settings:

Press and release the MODE button until AUTO light is off. Once the settings are changed, they will remain at those settings until they are manually changed again.

- Set Level: press the SET LEVEL button until the desired set point is reached.

- Feed Time: press the FEED TIME button until the desired feed time is reached.

The number represent the seconds of feed time (all with 5 minute delays).

Range is 0.6 to 900 sec. (15 min.). Continuous feed is 'con'.

- High Alert: press and hold the MODE button then press SET LEVEL button (red pH alert LED will come one), release both buttons. Use SET LEVEL button to increase or decrease the pH High Alert. Press MODE button to continue.

- Low Alert: press and hold the MODE button then press SET LEVEL button (red pH alert LED will come one), release both buttons. Use FEED TIME button to increase or decrease the pH Low Alert. Press MODE button to continue.

Other: See the appropriate manual sections for:

- Calibrating the pH sensor – See section 5.3
- Changing function (acid/base chemical feed) – See section 4.3.3

3. Description and Specifications

3.1 General Description

The controller is a microprocessor-based chemical automation system which continuously monitors and maintains the pH balance in a swimming pool or spa.

The pH is displayed using sun-bright light emitting diodes. The pH level is continuously monitored and displayed on the controller's front panel. The controller has been designed to be user friendly. One MODE button and three SET buttons allow the operator to easily set parameters.

The pH display range is 6.0 to 8.4 with a .1 unit resolution. The pH set point is adjustable from 7.0 to 8.0 with a factory default set point of 7.4. During a feed cycle, the feed lamp will flash when chemicals are being fed and illuminate continuously during the feed delay portion of the feed cycle. The Alert lamp will illuminate when the pH reading is higher or lower than the factory set limits for more than 10 minutes and prevent the feeding of pH chemicals.

The feed cycle is a timed based 'feed then delay' system. The controller has a series of fixed feed times (0.6 to 900 sec.) with associated delays as well as a Continuous feed mode (**con**). A feed cycle consists of a feed time plus a delay time. Example: a 30 second feed time followed by a five-minute delay would have a 5½ minute feed cycle. The chemical feeder dispenses chemical only during the feed time portion of the cycle and then waits for a delay period to allow for chemical to disperse throughout the swimming pool or spa.

Consecutive Feed Alert occurs after 120 minutes 'Continuous' feed or 30 cycles in timed feed mode. Feeders will be disabled and digital display will flash (requiring reset).

The controller incorporates an internal non-volatile memory in which all factory default settings as well as field-modified settings are stored. The internal memory is not affected by power interruption and requires no backup battery.

The pH output is capable of handling 5 amps at 120 Volt AC. The relay output is fused and transient protected. An internal terminal strip is provided for field wiring of the controller. The internal step-down transformer has a class-two energy limiting rating to provide for electrical safety.

Note: When automating any body of water, it is essential to size the feeder to reach desired levels in a relatively short period of time. Generally, automating an existing body of water with an existing feeder will require the output of the feeder to be increased accordingly. If feeder is unable to keep up with demand in a short period of time, automation becomes ineffective.

3.2 Specifications

Display Range: pH 6.0 to 8.4
Set Level Range: pH 7.0 to 8.0
Factory default: pH 7.4

Input Power:
120 Volts AC, 50/60 HZ, 3 wire grounded power cord.
GFCI source required.

Output Power:
120 Volts AC, 50/60 HZ, 5 amps (fused)
Two 3-wire grounded power receptacles
Terminal strip for hardwire applications included

Displays:

pH reading	-red digital LED
Flow/Power indicator	-green LED
Auto (operating mode) indicator	-red LED
Alert indicator	-red LED
Feed indicator	-green LED

Note: Lamps flash during feed time and are on continuously during delay time of feed cycle.

Operating Temperature: 40 to 120° F

Features and Options

+ pH setting	+ pH feed/delay time	+ Alert (high & low)
+ Acid/base feed	+ Calibration	+ Flow switch input
+ Feed time out	+ Fused outputs	

3.3 Description of Controls

Modes: The controller has two modes of operation:

- ON/OFF/Set mode
- AUTO mode – normal operation mode
To move from one mode to another simply press the MODE button.

3.3.1 On/off /Set mode:

- To turn the controller “ON” press the MODE button.
- To turn the controller “OFF” press the MODE button to turn the AUTO light off then hold the MODE button for several seconds until the pH display reads “OFF”.
Release the MODE button and the controller turns off and the display goes blank.

Note: Turning the controller “OFF” using the MODE button simply turns off the controller functions, but does not turn off the power to the controller. The FLOW lamp is both the power light and a flow indicator when an optional flow switch is used.

- When FLOW light is on and AUTO light is off, levels can be set.

Set level button: Pressing the SET LEVEL button once will display the current set level. To change the set level, press the SET LEVEL button until the desired level is reached.

Feed time: The feed times are displayed in seconds. Each feed cycle includes a five (5) minute delay time. Pressing the FEED TIME button allows the user to select available feed times. Release the button when the desired feed time is reached. To set the controller in Continuous feed, release the button when the display reads “con”. Continuous feed runs feeder continuously; (1) until set point is reached or (2) until consecutive feed alert limit is reached or (3) until High/Low Alert limit is reached. See 3.1 General Description for Consecutive Feed Alert details. Feed time can also be set to “off”.

Note: The controller will overshoot the pH Set Level by 0.1 to reduce on/off cycles.

pH calibrate: This button allows calibration of the pH sensor to a buffer or sample tested with a test kit. Press the pH CALIB button to set the pH reading to match the buffer or test kit value.

Note: The sample to be tested should always be taken from the flow cell or container in which the pH sensor is located. The pH calibration allows the adjustment of +/- 1 pH in .1 pH increments.

Consecutive Feed Alert Limit: The Digital Display number will flash and the pump/feeder will not activate if the Set Level is not reached within 120 minutes in ‘Continuous’ feed mode or 30 cycles in timed feed mode. See appendix for setting Consecutive Feed Alert Limit.

3.3.2 AUTO mode: This is normal operation mode. The controller operates the feeder to automatically maintain the parameters set for pH.

4. Installation

4.1 Locating the Controller

Install the chemical pump/ feed systems as shown in manuals included with the feeders. Before installing the controller, it is important to do a site assessment to consider where and how you will mount the unit. The controller should be mounted on a wall or other surface within eight feet of the feeder, at least ten feet away from the edge of the water, and within six feet of the GFCI power source. Never mount a controller above or near an acid tank. Never mount a controller in a location accessible to the public. Install the controller in an area protected from natural elements (sun, rain, freezing, etc.). See appendix for typical feed system schematics.

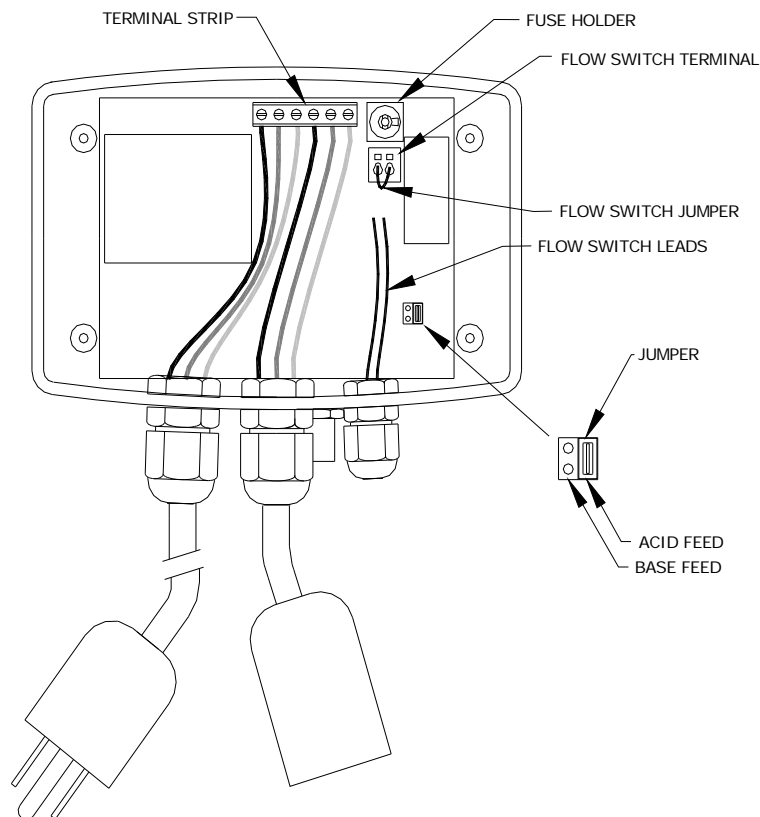
4.2 Mechanical Installation

Once the site is selected, obtain screws or anchors to securely mount the controller on the wall or a panel.

Screw slots are provided in the controller enclosure. Access to flow switch wires, acid/base changes and terminals is located on the back of the enclosure.

4.3 Power panel access

Access to terminals is through the back of the enclosure. With the controller removed from wall/panel, remove four screws holding enclosure panel to enclosure body.



4.3.1 Fuses

Fuses protect the controller from defective feeders. They are located inside the enclosure. The fuse holders are shipped with 5 amp fuses. Replacement fuses are 5mm x 20mm Fast Acting IEC.

4.3.2 Flow Switch Terminal

The controller has a flow switch terminal shipped with a jumper in place. The terminal must either have the jumper or a flow switch installed. The flow light on the face of the controller also indicates the controller is connected to a live power source. If the terminal does not have a closed circuit, the controller will not turn on.

NSF certification of this automated controller requires the use of a flow switch. To install a flow switch, remove the jumper and attach flow switch leads. The jumper should be retained to assist in troubleshooting.

Note: It is recommended that an inline filter be used to help keep the flowcell (including probes) and flow switch free from debris (see Globe Flowcell Operating Manual). Debris may obstruct flow switch and prevent the switch from functioning.

4.3.3 Acid/Base Feed Selection:

The controller is shipped with a jumper used to select acid or base chemical. The jumper can be moved to change type of feed. See Figure in Section 4.3 power panel access for jumper position details. Factory setting is acid feed. Acid feed mode will feed chemical when the pH reading is above the pH set point.

4.3.4 Globe Flowcell (see Globe Flowcell Operating Manual)

Connect the Globe Flowcell grounding stud to ground in order to prevent erroneous readings and to prevent damage to the probes.

5. Operation

5.1 Startup

Do not add chemicals to the feeders until all startup operations are completed. Using a DPD test kit, manually adjust and balance the water chemistry to acceptable ranges. Automation should be used to maintain chemical levels, not to balance a pool that is out of acceptable ranges. With the controller in the OFF mode, turn the filter pump on and check for leaks in the system and flow through the flow cell. The flow lamp will be illuminated if the controller has power, it is connected to the flow switch and there is adequate flow. If a flow switch is not attached, the flow lamp will be illuminated if there is a jumper in the flow switch terminal. Using a flow switch is always recommended.

5.2 pH setting

Press and release the controller MODE button until the AUTO light is off. Then select the desired Set Level and Feed Time.

Note: Controller can be set to feed acid or base. See Acid/Base Feed Selection section 4.3.3 for jumper setting detail. To verify that acid feed mode is selected adjust the pH set level below the pH indicated on the display. The feed lamp should come on if the controller is in acid feed mode. To verify that base mode is selected adjust the pH set level above the pH indicated on the display. The feed lamp should come on if the controller is in base feed mode.

5.3 pH Calibration

The pH sensor can drift slightly over time and calibration will offset this drift. Always calibrate using water from the sample port of the flow cell and use an independent pH test method to determine pH value of sample, unless using preset buffer solution. Press and release the controller MODE button until the AUTO light is off. Then use pH CALIB button to adjust reading to match known pH value of sample. It may take up to 24 hours for the sensors to acclimate to the system so recalibrate 24 hours after the first calibration. The pH sensor calibration should be checked every four to six weeks. If calibration is required more often then probe may need cleaning or replacement.

5.4 Operating Mode

Press the MODE button until AUTO is lighted. This is the operational mode for the controller. The controller must be in this mode to maintain the desired parameters.

Note: When using the RC554P or 554200 controller with ROLA-CHEM pump, the pump switch should be in the CONTINUOUS position (not Timed or Off).

Note: the ORP reading is highly dependent on both the pH and the cyanuric acid levels. Both of these variables must be kept within acceptable ranges to maintain an acceptable relationship between the ORP and the ppm of the sanitizer.

Note: Low feed rates can cause the feeder to lag or feeding to be extended. A high feed rate can result in too much pH chemical being added.

Timed feed settings: The feed lamp will flash during the feed time and be lit continuously during the delay time of the feed cycle. If over feeding is occurring, consider using a shorter feed cycle.

Continuous feed setting: The feed lamp will flash while feeding.

When pH alert lamp is on indicating that pH is below or above the alert settings the pump/feeder will not activate. The Digital Display number will flash and the pump/feeder will not activate if the Set Level is not reached within the preset Consecutive Feed Alert Limit..

5.5 Reset to factory default

The controller can be reset to the default factory settings by using the steps below:

Note: Record current settings before performing reset.

- A. Press MODE to turn AUTO light off.
Hold MODE button until display reads "oFF".
Release the MODE button. Only the flow light should be on.
- B. Simultaneously depress and hold SET LEVEL and pH CALIB buttons.
While they are depressed, press the MODE button.
The display will read 'Ld' and then turn On.
- C. Release the buttons.
- D. The controller is now in test mode. Test mode reduces the feed delay time from 5 minutes to 5 seconds to simplify diagnostics.
- E. Turn the controller Off again to exit test mode.
- F. Turn the controller On to return to operating mode.

The last two steps are extremely important since this puts the controller back in operating mode. If these two steps are not performed the controller will remain in test mode and it will not operate properly.

6. Troubleshooting

6.1 Chemicals not feeding

- * FLOW light on Controller must be illuminated.
Check flow switch in Globe Flowcell if light is not on.
- * Feeder power and time switches must be in 'CONTINUOUS' position.
Check feeder by using alternate power source.
- * Factory setting for feed time is 0.6 sec on with 5 minute delay.
Feeders may require longer feed time.
- * Chemical reading has met Set Level.

6.2 Displayed chemical level does not correspond to actual level

- * Sensor (probe) is not attached to connector.
- * Sensor (probe) needs cleaning. (see Globe Flowcell Operating Manual)
- * Sensor (probe) needs replacing.
- * Connect Globe Flowcell ground stud to ground. (see Globe Flowcell Operating Manual)

6.3 Set-points not being reached or maintained

- * Factory setting for feed time is 0.6 sec on with 5 minute delay. Feeders may require longer feed time. If time is too short, set-points will not be maintained. If time is too long, overfeeding chemicals will occur. Correct time is dependent on multiple factors such as pool/spa water volume, feeder output, chemical concentration and chemical needs.
- * Controllers are designed to maintain set-points. Do not expect controllers to make major adjustments—major changes should be done manually.
- * Pump/feeders must be large enough to reach desired set-points in a relatively short time. Automation using controllers may require larger feeder or more concentrated chemicals than system that uses continuous time controlled feeding (i.e. feeders only).
- * Factory setting for Consecutive Feed Alert Limit is 30 cycles for timed feed mode or 120 minutes for continuous feed mode. If set level has not been reached within this limit the Digital Display numbers will flash and pump/feeder will be disabled. If set level cannot be met within this limit then longer feed time may be required.

6.4 Error Code Displayed

If an error code appears in the display the controller can be reset by following this procedure.

- A. Unplug power from controller.
- B. Simultaneously depress and hold SET LEVEL and pH CALIB buttons.
While they are depressed, plug in controller power cord.
The displays will read "Ld" and then turn On.
- C. Release the buttons.
- D. The controller is now in test mode. Test mode reduces the feed delay time from 5 minutes to 5 seconds to simplify diagnostics..
- E. Turn the controller Off again to exit test mode.
Press MODE to turn AUTO light off.
Hold MODE button until display reads "oFF".
Release the MODE button. Only the flow light should be on.
- F. Press MODE to turn the controller On and return to operating mode.

The last two steps are extremely important because this puts the controller back in operating mode. If these two steps are not performed the controller will remain in test mode and it will not operate properly.

If the error code continues to appear contact ROLA-CHEM service personnel.

6.5 Digital Display numbers flashing

- * Consecutive Feed Alert Limit has been reached. See Consecutive Feed Alert Limit details in section 3.1 General Description.
- * Adjust feed time as needed.

6.6 Alert light illuminated

- * High/Low alert limit has been reached.
- * Adjust feed time or alert settings as needed.

6.7 Globe Flowcell / Probe / Flow Switch troubleshooting

- * See Globe Flowcell operating manual.

7. Warranty and Service

Limited Warranty:

ROLA-CHEM warrants the original purchaser that this unit is free from manufacturing defects in material and workmanship from the date of the original purchase for one (1) year.

If this unit fails within the one (1) year period, it will be repaired or replaced (ROLA-CHEM's option) at no charge when returned to ROLA-CHEM with proof of purchase receipt. This warranty does not apply to any product damage caused by improper use, accident, misuse, improper line voltage, fire, flood, lightning, earthquake, other acts of nature, or if product was altered or opened by anyone other than qualified ROLA-CHEM personnel.

All expendable items (tubing, etc.) are not covered under this warranty.

Heavy duty probes are warranted from the date of original purchase for one (1) year.

ROLA-CHEM, under no circumstances, shall be liable for any consequential damages directly or indirectly caused by this unit. Please observe all rules and regulations required by state and local regulations, building codes, health codes, OSHA, etc.

Service Procedure: For operation assistance in the United States please call: (800) 549-4473, Monday through Friday 8:00 am-5:00 pm Central Time or email: info@rola-chem.com. Have model number and serial number available.

ROLA-CHEM has specialized knowledge and equipment to test and diagnose your product. Contact our service personnel as noted above for assistance. If you are directed to ship the product to ROLA-CHEM and given an RGA#, please note RGA# on the package and ship freight pre-paid to:

ROLA-CHEM CORPORATION
5858 Centerville Road
St. Paul, MN 55127-6804

www.rola-chem.com

8. Appendix

8.1 Water Chemistry Ranges

(These ranges are in accordance with suggested NSPI Standards for swimming pools.)

pH: 7.4-7.6

Alkalinity: Approx. 80-120 ppm** (parts per million)

Higher levels may be acceptable in areas where it naturally occurs in the local water supply. Consult a pool professional in your area.

Cyanuric Acid: 0-50 ppm.

Maintain at 30 ppm or less for best probe life.*

TDS (Total Dissolved Solids): 300-2000 ppm

Calcium Hardness: 200-400 ppm

Free Chlorine: 1.0-3.0 ppm (> 700 mV ORP)

*20-30 ppm of cyanuric acid provides approx. 95% of the shielding effect for chlorine.

**When using tri-chlor, recommended alkalinity is 95-125 ppm.

8.2 Typical System Installations

