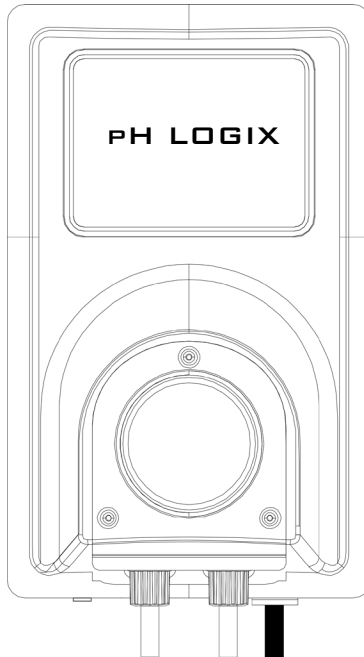


# PH LOGIX

## INSTRUCTION MANUAL

pH Controller



CAS Instruments by **CRYSTAL AQUATIC SYSTEMS**

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# 1. SAFETY

**Important Warnings:** This manual contains important information about the installation, operation, and safe use of this product. This information should be given to the owner and/or operator of this equipment. When installing and using this electrical equipment, basic safety precautions should always be followed. Failure to follow safety warnings and instructions in this manual can result in serious injury and/or damage to your equipment. Read and follow all warning notices and instructions which are included in this manual.

- The pH controller case contains live components internally. There is a danger of electric shock if opened. If the power cord is damaged then it should be replaced by the manufacturer, their agent or similar qualified person, to avoid a hazard.
- The product shall be installed by a qualified person in accordance with AS/NZS 3000 wiring rules.
- The pH controller should be installed in the correct pool zone and connected to supply via a power outlet that is protected by a residual current device (RCD) having a rated residual operating current not exceeding 30 mA. The power outlet should have a degree of protection suitable for the pool zone.
- To reduce the risk of injury, do not permit people with lack of experience and knowledge to use this appliance unless they have been given supervision or instruction concerning use of the appliance.
- To reduce the risk of accidents or incidents, service on the unit should only be performed by a qualified pool service professional, after disconnecting it from the mains power supply.
- During the installation check the following:
  - That the injector point pressure is lower than 150 kPa (to ensure optimum flow).
  - That the peristaltic pump's acrylic front cover is correctly fitted.
  - That the suction tube is securely fitted in the acid container, with weight touching the bottom and the drum label is fitted on the outside of the container.
  - That the suction tube is fitted to the left side and the injector tube to the right.
  - That the injector valve o'ring is fitted between the valve and the CLEAR faucet tee and the BLACK lock nut is securely fastened.

**Important Safety Instruction:** When mixing acid with water, **ALWAYS ADD ACID TO WATER. NEVER ADD WATER TO ACID.** Always wear the appropriate safety equipment specified by the acid supplier when handling acid.

The system uses a **1 : 3 Acid : Water** mix ratio (e.g. with a 20-litre drum add 15 litres water then 5 litres acid). It is important to use this mix for the correct acid volume to be added.

**DO NOT PLUG IN IF CARTON IS WET.**

**IMPORTANT: This equipment adds a highly corrosive chemical (supplied by others – read their instructions on safe handling), in small quantities, which is critical in balancing your pool water. PLEASE CHECK FOR ANY SIGNS OF LEAKS REGULARLY AS DAMAGE COULD OCCUR DUE TO EITHER PRODUCT FAILURE OR EXTERNAL FACTORS.**

Should you require further information visit [www.crystalas.com](http://www.crystalas.com)



**When using the pH LOGIX:**

- Observe all applicable local, state, and federal safety regulations.
- Take proper precautions with prescribed environmental and operational conditions.
- Consider chemical compatibility with all wetted materials.

## 2. GENERAL OVERVIEW

Congratulations on your recent purchase of your Crystal Aquatic Systems pH LOGIX controller. Please take a moment to read through the entire manual before installing your new unit. Your pH LOGIX controller must be installed and operated as specified.

While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions. Crystal Aquatic Systems reserves the right to change the specifications of the hardware and software described herein at any time without prior notice.

The pH in your swimming pool will slowly rise due to factors such as alkalinity, the addition of fresh water and as sanitiser is produced in a salt/mineral water system. A rise in pH reduces the effectiveness of the sanitiser, so it is important to ensure that the pH remains in the correct range.

The pH of the water can be lowered by the addition of hydrochloric acid – and if your system has the optional pH control, this can be done automatically. Crystal Aquatic Systems pH LOGIX controller uses an algorithm to calculate how much acid needs to be dosed to correct the pH.

**Note:** While algorithmic pH control is effective, it does not measure pH. pH testing should be undertaken manually on a weekly basis to ensure the pH is correct.

## 3. SPECIFICATIONS

SPECIFICATIONS	
Volts & Amps Input (AC)	220-245 V, 0.1 A
Total Power Consumption	13 W Motor, 20 W Max.
Frequency	50 Hz
Output as Controlled by Sanitiser	0-1000 ml per hour
Rated Pressure	350 kPa (optimum for injector is 150 kPa)
Squeeze Tube	Tygon® Norprene® (Commercial spec)
Motor Speed	10 RPM
Tubing Size	4 m long x 6 mm diameter Clear Flexible PVC
Power Cord	Approved piggy-back type
Wall Mounting	Simple Click ON - Clip OFF
Water Connection	CLEAR Acrylic Faucet Tee 50 mm pipe
Water Flow Rate (L/min)	80-650 L/min
Ingress Protection Rating	IP 35

- **NOTE:** Certain specifications may change without notice for reasons of improvement or better performance.

## 4. MAINTENANCE

Whilst this pH controller is built from the best engineered practices and material, please ensure you regularly undertake the following basic maintenance:

### 4.1 Injection Point on Injector Valve

Check the injection point periodically, by looking through the CLEAR faucet tee, for build-up of solid matter at the end of the clear flexible PVC tubing. This could only occur from contaminants in your acid container and the result is a blockage hindering the flow of acid and reducing the life of the pump tube and roller block. While unscrewing the BLACK lock nut, take care not to lose the rubber O-ring.

### 4.2 Lubricate Squeeze Tube

Lubricate the pump squeeze tube every 3-6 months. Using a silicone-based lubricant only as petroleum-based lubricants will cause damage to the tube and rollers.

### 4.3 Replace Squeeze Tube

Depending on usage, the squeeze tube may need replacement after 1-2 years of use. Before replacing, please ensure that the suction and injection tubes are empty. To change the squeeze tube, please follow the instructions included with the replacement kit. Only use the original sized commercial grade Tygon® Norprene® tube as incorrect sizing will result in early failure of the TriRoller Block. **WE RECOMMEND, TO PREVENT LEAKS, THAT YOU REPLACE BOTH THE SQUEEZE TUBE AND TRI ROLLER BLOCK AT THE LATEST AFTER 24 MONTHS.**

### IMPORTANT WARNING:

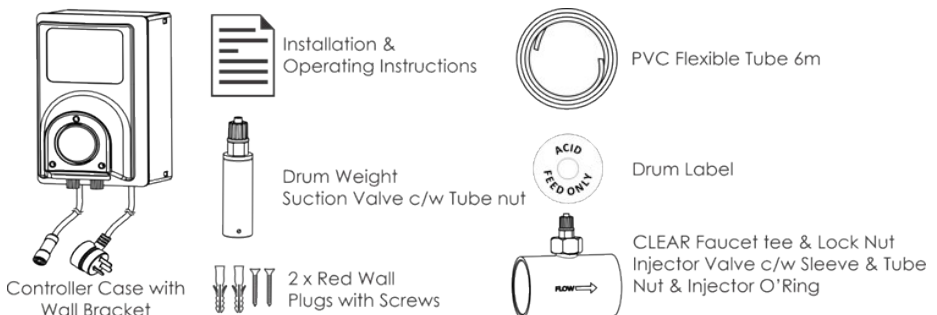
When removing the clear vinyl tube between the pH pump and injector nozzle, pressurised contents will be expelled. Correct PPE needs to be worn and adhered to, to avoid contact with skin and/or eyes. Cover the tube nut with a wet rag when loosening the nut to contain any pressurised discharge. Clean up any spillage immediately.

## 5. HELPFUL HINTS

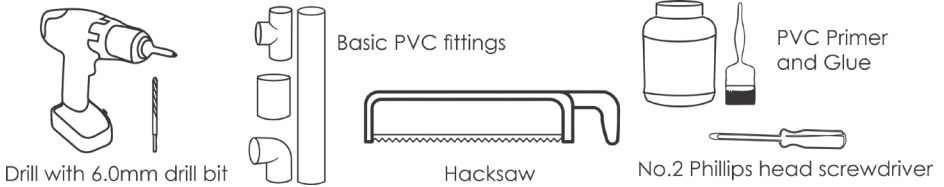
Read and keep your Manual in a safe place.

Test your swimming pool water on a regular basis and take your pool water sample to your local pool professional at least twice a month.

## 6. CONTENTS



## 7. TOOLS NEEDED



## 8. POOL PREPARATION

Please ensure that your pH is balanced to the recommended level for your swimming pool surface.

Ideal pH Levels: Concrete Pools: 7.4-7.6

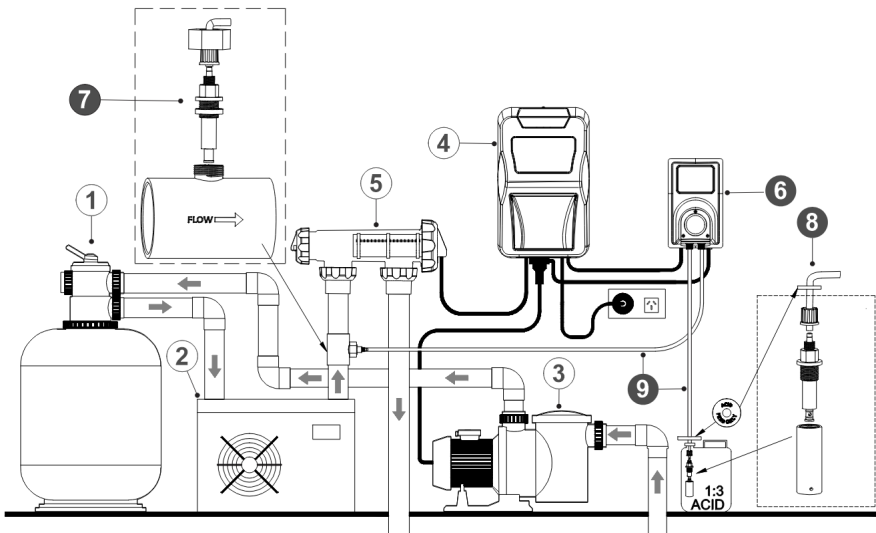
Fibreglass and Vinyl Pools: 7.0-7.2

A pH of 8.0 makes your chlorine only about 26% efficient so that is why it is critical to keep your pH in range. A correct pH level must be maintained to prevent problems such as black spot, staining, cloudy water etc. An incorrect pH level can damage the surface finish and walls of your pool.

When pH is high you can add Hydrochloric Acid to lower the pH. When pH is low you can add sodium bicarbonate (soda ash) to increase the pH.

## 9. INSTALLING THE pH CONTROLLER

Installation Diagram



1 ● Pool Filter

2 ● Heat Pump

3 ● Pool Pump

4 ● Pool Sanitiser

5 ● Cell Housing

6 ● pH Controller

7 ● Injection with Tee

8 ● Suction with Drum  
Weight & Label

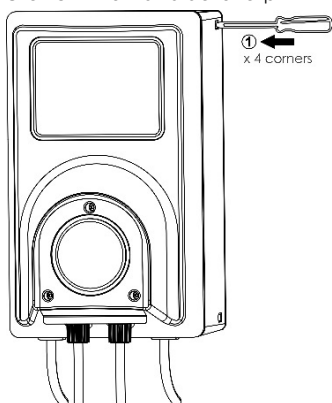
9 ● PVC Flexible Tube 6m

**STEP 1:** Remove the contents from the box and carefully plan all steps using the installation diagram, and by reviewing the steps below.

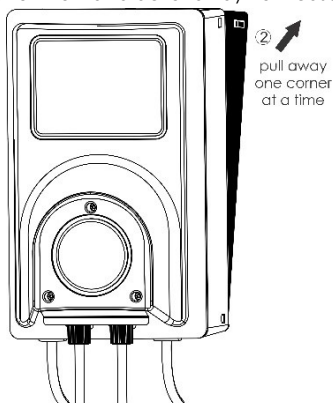
**STEP 2:** Position the pH LOGIX controller box as indicated in the installation diagram, ensuring it is NOT too close to other equipment or power outlets, but close enough to the VAPURE power supply so the piggy-back power cord can plug in to its socket outlet.

**STEP 3:** Attach the pH LOGIX controller to the wall by removing the simple "Click ON – Click OFF" wall mounting bracket that is attached to the controller case. Use the wall plugs and screws provided.

3.1: Click OFF the wall bracket clip



3.2: Pull the wall bracket away from case.



3.3: Mount the bracket to the wall

3.4: CLICK ON the case to the wall bracket

This unique design protects the controller case from any water entry.

**STEP 4:** Fit the CLEAR faucet tee c/w injection valve to the pool water line, avoiding high pressure areas (i.e., after the pump, filter, and prior to heat pump). It can be installed prior to the cell housing (or after if needed).

**STEP 5:** Cut and connect a length of clear flexible PVC tube that will reach from the outlet at the base of the peristaltic pump (right side) to the injection valve, which is mounted in the CLEAR faucet tee, using the tube nut to secure the tube.

**STEP 6:** Do not cut the other length of clear flexible PVC tube yet. Place the acid drum (with the required mix) in the required position, in a ventilated area, preferably not near this or other pool equipment (at least 2 m or more away), as the acid is corrosive and equipment damage will occur.

The system uses a **1 : 3 Acid : Water** mix ratio (e.g. with a 20-litre drum add 15 litres water then 5 litres acid). It is important to use this mix for the correct acid volume to be added.

**Important Safety Instruction:** When mixing acid with water, **ALWAYS ADD ACID TO WATER. NEVER ADD WATER TO ACID.** Always wear the appropriate safety equipment specified by the acid supplier when handling acid.

**STEP 7:** Pass this clear flexible PVC tube through the drum label and a 6.0 mm hole in the acid drum vent cap. Connect the clear flexible PVC tube to the suction valve that is mounted to the drum weight, using the tube nut to secure the tube. Before placing the tubing into the drum, measure the tubing against the outside of the drum and measure the feed tubing so that there is sufficient tubing. Lower the drum weight into the acid drum and screw on the drum cap.

**STEP 8:** Connect the pH Signal Cable with 5 Pin Plug to the CAS Vapure Salt & Mineral Chlorinator programming cable port. This is where the signal from the chlorinator comes from to turn the pH controller ON & OFF.

**STEP 9:** Connect the piggy-back power cord to the AC socket outlet of the VAPURE Salt & Mineral Chlorinator and the pool pump plugs in to the other end of the piggy-back socket.

**STEP 10:** Start up your pool pump and check the system for any leaks. Repair any such issues.

**STEP 11:** Prime the acid feed lines and finalise run settings using the menus below.

## 10. NAVIGATING THE LCD pH MENUS ON YOUR SANITISER

As fresh water is added, or chlorine is produced, the pool pH will slowly increase. This can be offset by adding small doses of acid to the pool automatically. This pH controller uses a maintenance free algorithm that calculates the amount of acid per dose, which is needed to maintain the pH. Initially it is based on the size of your pool, but through your testing, it can smartly be adjusted to make it truly near-maintenance free for you the owner.

**NOTE: It is important that the system is initially adjusted based on pH result to suit your pool and that pool pH is still checked regularly.**

### 10.1 Accessing the pH Control Menu

These are the menus on the CAS VAPURE Salt & Mineral Chlorinator.

PROCEDURE	On the CAS Vapure power pack press [OK] to access the Main Menu system and use the [+]/[-] buttons to scroll through the menu until the LCD reads 'pH Control Mode' – press [OK] to enter this mode.
LCD DISPLAY	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;"><p>13 Winter/Blanket</p><p>14 pH Control Mode</p><p>[+]UP [-]DN [OK]ENTER</p></div>



## 10.2 pH Control Mode – Turning ON or OFF the pH Mode

The default setting on the chlorinator is for the acid dosing system to be 'OFF'. This needs to be turned to 'ON' to operate the pH Logix.

PROCEDURE	To turn ON the acid dosing of the pH controller, enter the 'pH MODE' menu from the 'pH Control Mode' menu explained in 10.1, using the [+], [-] & [OK] button change the selection from OFF to ON.
LCD DISPLAY	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"><p>pH CONTROL MODE</p><p>pH Mode: OFF</p><p>[+] or [-] to change</p><p>[OK] SAVE [&lt;] BACK</p></div>

**NOTE: the pH software includes a feature where the pH run time adjusts based on the Chlorinator output setting. For instance, for a 50K pool, the pH run time is set to 20 minutes. In Winter mode, at 50% output, the run time decreases to 10 minutes; in SPA mode, at 10% output, it's further reduced to 2 minutes. If your chlorinator output is 75%, the runtime will be 15 minutes. However, if you adjust the runtime, this will become the new default runtime, and the unit will not adjust the output by itself.**

## 10.3 pH1 Run Time – How the dosing system works

The 'pH1 Run Time' is programmed automatically when setting up the volume of the swimming pool in the chlorinator. The system calculates how many minutes per day your pH controller should run based on the volume of your pool, and this can be manually changed.

PROCEDURE	To adjust the run time, enter the 'pH1 Run Time' menu from the 'pH Control Mode' menu explained in 10.1, using the [+], [-] & [OK] button.
LCD DISPLAY	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"><p>pH CONTROL MODE</p><p>pH1 Run Time</p><p>pH2 Demand or Prime</p><p>[+]UP[-]DN [OK]ENTER</p></div>

**PROCEDURE** The LCD will now show 'On Time -----min/day'.  
Press [+] or [-] to adjust the ON Time in min/day.  
Pressing [OK] saves the required run time and returns you to the main menu. Saving this Run Time will result in the time being saved as the new default running time of the unit.  
Entering 0 min/day means the system will not run at all.

**LCD DISPLAY**

pH1 RUN TIME  
ON Time: ---min/day  
[+] or [-] to change  
[OK] SAVE [<] BACK

Record your readings and notes here:

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#### 10.4 pH2 Demand or Prime – Add acid manually or prime clear flexible PVC tubes

The 'pH2 DEMAND or PRIME' quantity can be manually adjusted from 0 - 5000 ml. The default reading is always 100 ml. This function is useful for:

- Priming tubes after an acid drum change.
- Adding the required acid from your acid demand test.



**IMPORTANT:** Enter the exact amount from your test result in ml (e.g., 500 ml) and the system automatically adds 4 times that amount, thereby allowing for the 1 : 3 ACID: WATER mix ratio in the acid drum.

PROCEDURE	To enter a required amount of acid in mL, enter the 'pH2 Demand or Prime' menu from the 'pH Control Mode' menu explained in 10.1, using the [+], [-] & [OK] button
LCD DISPLAY	<div style="border: 1px solid black; padding: 5px; text-align: center;"><p>pH CONTROL MODE</p><p>pH1 Run Time</p><p>pH2 Demand or Prime</p><p>[+]UP[-]DN [OK]ENTER</p></div>

PROCEDURE	<p>The LCD will now show 'Acid Demand: 100 ml'.</p> <p>Press [+] or [-] to adjust the quantity of acid required in millilitres (ml). Pressing [OK] saves the required quantity, the peristaltic pump starts turning and the "Time Left" will display the remaining minutes for the pH controller's run time.</p> <p>You can adjust the "Time Left" in this menu if you wish or you can press [&lt;] and return to the chlorinator default display screen.</p> <p>If the lines are primed, you can stop the peristaltic pump by making "Time Left" 0 min and press [OK].</p>
LCD DISPLAY	<div style="border: 1px solid black; padding: 5px; text-align: center;"><p>pH2 DEMAND OR PRIME</p><p>Acid Demand: 100 ml</p><p>[+] or [-] to change</p><p>[OK] SAVE [&lt;] BACK</p></div>

## 10.5 Turning OFF the pH Logix

Enter the pH Control Mode menu on the CAS VAPURE Salt & Mineral Chlorinator.

PROCEDURE	On the CAS Vapure power pack press [OK] to access the Main Menu system and use the [+] / [-] buttons to scroll through the menu until the LCD reads 'pH Control Mode' – press [OK] to enter this mode.
LCD DISPLAY	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;"><p>13 Winter/Blanket</p><p>14 pH Control Mode</p><p>[+]UP [-]DN [OK]ENTER</p></div>

If the setting on the chlorinator has previously been set for the acid dosing system to be 'ON' and the system needs to be 'OFF' then use the following procedure.

PROCEDURE	To turn OFF the acid dosing of the pH controller, press [OK] on the 'pH mode: ON' menu from 'pH Control Mode' menu explained in 10.1. Then use the [+] or [-] button to change the selection from ON to OFF and press [OK] to save.
LCD DISPLAY	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;"><p>pH CONTROL MODE</p><p>pH Mode: ON</p><p>[+] or [-] to change</p><p>[OK]SAVE [&lt;] BACK</p></div>

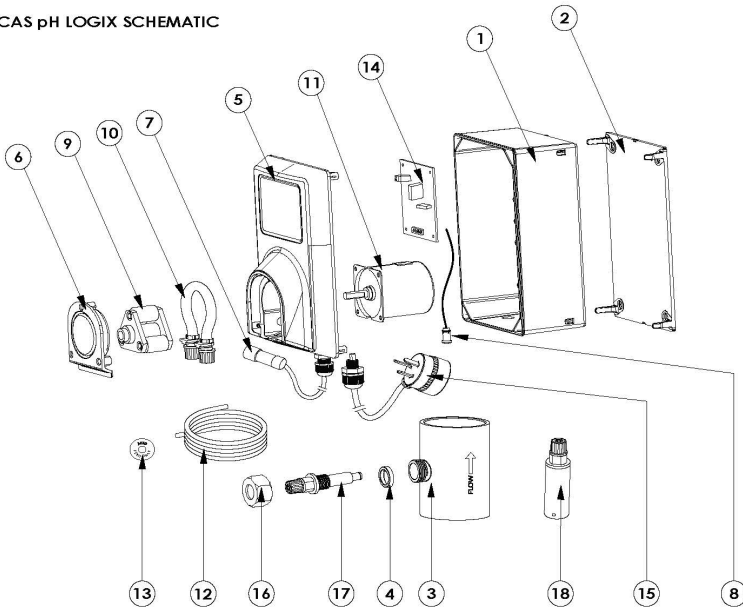
## 11. pH CONTROLLER TROUBLESHOOTING

NO	FAULT INDICATION	POTENTIAL CAUSE	REMEDY
11.1	pH controller is not turning on.	<p>pH control mode has not been turned on.</p> <p>pH controller power cord is not plugged in.</p> <p>No demand for it to turn on from the sanitiser.</p> <p>Demand signal is present but peristaltic pump is not turning.</p>	<p>See Manual Section 10.1.</p> <p>Check that power cord is plugged in to the sanitiser AC socket outlet.</p> <p>The demand takes place each day at the start of T1 ON time or the Chlorinator is turned ON for the first time each day when it is operated through an external controller. Check if signal for the pH demand is ON.</p> <p>Contact your service agent.</p>
11.2	Everything displays correctly but pH level is not changing when testing the pool water.	Acid drum is low or empty.	Check acid level and replenish if necessary.
11.3	pH controller is not running when the sanitiser is in AUTO mode.	The pH controller has already operated in today's timer cycle.	The pH controller will not run again if it has already completed its automatic cycle for the day.
11.4	pH controller is running but the pool pump is not on.	Pump is not plugged in or there is a problem with flow.	The system should automatically stop when the pool pump stops but check that there is not a closed valve and that all pool equipment is plugged in and working properly.
11.5	pH Controller tri-roller is turning but acid is not pumping.	<p>Air leaks in the squeeze tube, injector tube or suction tube due to potential breaks.</p> <p>Excessive wear on the squeeze tube.</p> <p>Excessive wear on the tri-roller block.</p> <p><b>AFTER 24 MONTHS REPLACE BOTH SQUEEZE TUBE &amp; TUBE ROLLER BLOCK</b></p>	<p>Check all tubes for damage or leaks and repair such or replace the tubes.</p> <p>Order and replace the squeeze tube kit.</p> <p>Order and replace the entire tri-roller block assembly.</p>
11.6	Water flow returning from pool to the acid drum.	<p>In the unlikely event of this happening, it can only be one of two things:</p> <ol style="list-style-type: none"> <li>i. Worn/damaged injector sleeve,</li> <li>ii. Worn tri-roller block,</li> </ol>	<p>Replace the entire injector valve as a kit,</p> <p>Replace the tri-roller block,</p>

NO	FAULT INDICATION	POTENTIAL CAUSE	REMEDY
11.7	pH level in the pool is too high or too low,	<p>Incorrect pH run time,</p> <p>Incorrect ACID : WATER mix.</p> <p>Incorrect ACID DEMAND amount entered.</p>	<p>Adjust pH run time to suit as per procedure in 10.2.</p> <p>The system uses a 1:3 mix ratio. Ensure you have this required mix.</p> <p>You should only enter the required acid amount and not the ACID : WATER mix amount.</p> <p>If you need 500 ml acid, then enter this. The system allows for the 1:3 mix.</p>

## 12. SPARE PART NUMBERS

CAS pH LOGIX SCHEMATIC



PART NO	CODE	QTY	DESCRIPTION
1	N00302-pH-L	1	pH Base Body
2	N00306	1	pH Wall Bracket
3	N01185	1	pH Faucet Tee 50mmx3/4" CLEAR
4	N01186	1	O'Ring - Seal to suit pH Injector Valve
5	N01339-2	1	Case Front Cover - pH-LOGIX BLACK
6	N01340	1	Acrylic Cover - pH Controller CLEAR
7	N01352	1	pH Signal Cable - To suit Sanitiser link
8	N01399	1	Wire Loom - LED Electronic Connection Cable (pH Box)
9	N01353	1	pH Tri Roller Block (assembled)
10	N01355	1	pH Squeeze Tube Kit c/w Adaptors, Clamps & Lube
11	N01357	1	pH Motor - 240Vac 13W 10rpm
12	N01360	1	pH PVC Flexible Tubing, CLEAR, 6.0mmOD (per m)
13	N01361	1	pH Drum Label
14	N01362	1	PCB - pH LOGIX Main Power PCB
15	N01364	1	Power Cord - pH c/w Piggy Back Socket
16	N01365	1	Lock Nut - pH Injector BLACK
17	N01367	1	pH Non-Return Injector Valve c/w Sleeve & Tube Nut
18	N01368	1	pH Drum Weight Kit - includes Weight, Suction Valve and Tube Nut

### 13. WARRANTY

This product is warranted for (12) twelve months against defects in workmanship and materials if used for its intended purpose and maintained according to instructions. This warranty is limited to repair or replacement, depending on the problem of the product. If the product is found to have been misused or damaged due to water entry/mechanical damage/accidental damage, this will not be covered under warranty, and, in such cases, no warranty will apply.

**What is covered?** Repairs/parts/factory labour, or a replacement unit if applicable.

**What is not covered?** Damage due to accident, misuse, water penetration of the handheld enclosure, tampering, or lack of prescribed maintenance is not covered under this limited warranty.

Should you need to lodge a warranty with the CAS service department, ensure to include the product serial number, purchase date, and type of failures. If returned to CAS, ensure proper packaging so that no additional damage occurs during transport. The customer is liable to return the pH LOGIX to CAS.

This limited warranty is the sole and complete warranty for CAS and shall be limited to the cost of the meter. In no event shall CAS be liable for incidental or consequential damages.

### 14. DISCLAIMER

CAS has made every attempt to ensure the accuracy and reliability of the information provided in this manual. However, the information is provided "as is". We shall not be liable for any loss or damage of whatever nature (direct, indirect, consequential, or other), which may arise due to the use of this product.



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