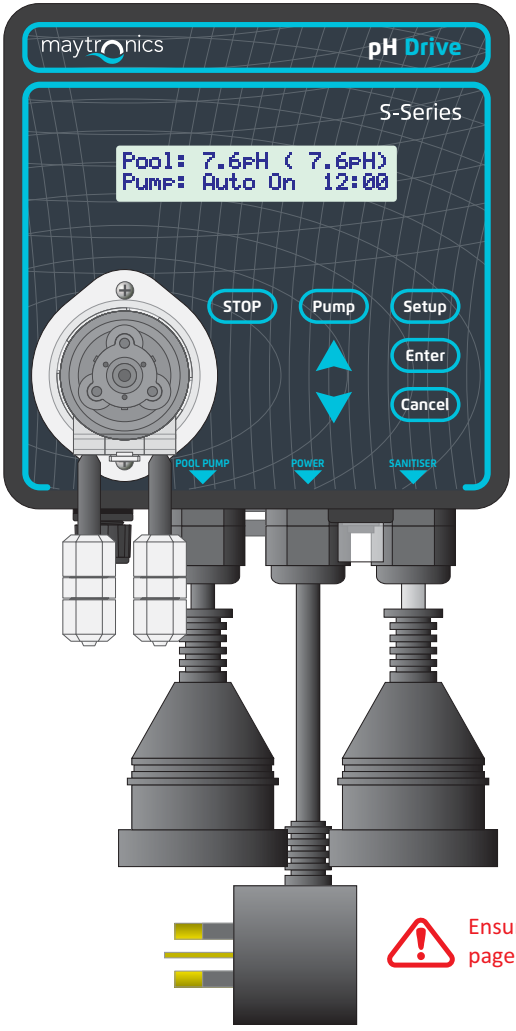
maytronics

pH Drive S-Series
Automatic pH Controller with Pool Pump Timer

Instruction Manual



Ensure Acid is diluted, as per page 7 of these instructions.

Contents

Thank you for purchasing the Maytronics pH Drive.

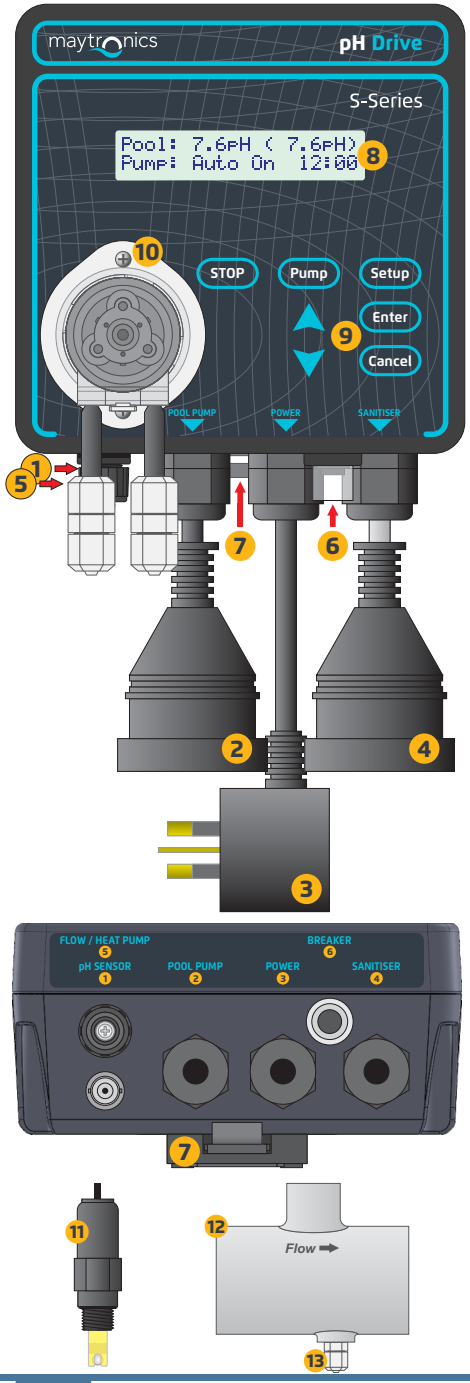
The **pH Drive** has been designed for maximum reliability and long service life. Please be sure to follow the instructions in this manual to get the best performance and life from your equipment. If you require assistance at any stage, please contact your Maytronics Authorised Dealer.

Cautions & Warnings

- Please read the instructions fully and keep this manual on hand whenever operating or maintaining your **pH Drive**.
- **Always use diluted acid. Concentrated acid will cause damage to the squeeze tube and fittings, which are not covered by the warranty.**

  See page 7 for information on the safe handling and dilution of acid.
- DO NOT add acid into a drum that previously contained liquid chlorine until that drum has been rinsed three times with fresh water. Ensure that the label on the drum indicates that the drum contains acid.
- As for all pool equipment and chemicals, the **pH Drive** should be installed out of reach of children. Children must not have access to operating the **pH Drive** without adult supervision.
- Although the **pH Drive** has a weather resistant design, its service life will be considerably longer if it is not exposed to direct sunlight and rain. Wear and tear from direct exposure to the elements is not covered by the warranty.
- Do not allow grass or weeds to grow around the **pH Drive**, or the tubing and cables to prevent accidental damage from garden trimming equipment.
- Any damaged cables must be replaced immediately to prevent electrical shock.
- Unplug the **pH Drive** power lead before servicing or changing the dosing pump cassette.
- The **pH Drive** must be serviced only by an authorised service agent. Please contact your Maytronics Authorised Dealer for details.

Getting to know your pH Drive



1 pH SENSOR SOCKET

Connect the pH Sensor to the BNC pH Sensor socket.

2 POOL PUMP POWER OUTLET

Connect the swimming pool pump to the pool pump power outlet socket.

3 POWER CORD

Power cord for connection to mains power outlet.

4 SANITISER SYSTEM POWER OUTLET

Connect the Ozone System or Salt Chlorinator to the sanitiser system power outlet socket, which has a white ring around the cord section.

5 FLOW SWITCH / HEAT PUMP SOCKET

Waterproof socket for connecting either an optional Flow Switch, or optional Heat Pump Interlock cable.

6 CIRCUIT BREAKER

10 Amp Circuit Breaker with weatherproof cover protects the pH Drive from power overload. Push the button in to reset if the breaker trips.

7 MOUNTING CLIP

Pull the clip downwards when mounting the **pH Drive** to the mounting rail, or to unclip when removing.

8 DISPLAY

User-friendly plain text menu and help system.

9 KEYPAD

Used for setup and maintenance of your **pH Drive**.

10 DOSING PUMP

High quality, low maintenance peristaltic dosing pump.

11 pH SENSOR

Commercial quality pH Sensor screws into pH Tee to firm hand tightness.

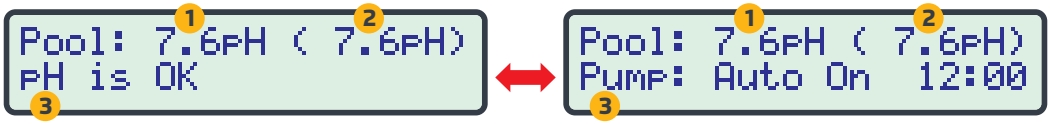
12 pH TEE

A single pH Tee for installing the pH Sensor and non-return injection valve.

13 NON-RETURN VALVE

High quality polypropylene non-return injection valve.

pH Drive Display



1 POOL pH

This is the readout of the current pH of your pool. "---pH" is displayed when the pool pump is off.

2 SET POINT

The **pH Drive** maintains the pool pH at the programmed Set Point.

3 INFORMATION LINE

This is where **pH Drive** indicates helpful messages and warnings, so you know what's happening at all times. The **pH Drive** alternates between pH Control status and Pool Pump status on this line.

pH Control Status

pH is OK..... The current pH of the pool is within the Set Point. No dosing is required at this time.

Adding Acid (or Base) ..... The **pH Drive** is operating the dosing pump to add acid or base to correct the pH of the pool back to the Set Point. The default setup of the **pH Drive** is to add acid.

pH Alert! Reset:Enter ..... The pH of the pool has been above the Set Point for 4 hours or more, without returning to the Set Point. Press Enter to reset the alert timer.

24 Hr Delay..... The user has selected the 24 Hour Delay function. This is normally used when buffer or other chemicals have been added to the pool, which can temporarily change pool pH. The 24 Hour Delay function prevents excessive usage of acid or base.

Acid (or Base) Pump is Off .... The user has set the dosing pump to being totally off, regardless of the pool pH reading.

Mixing Time Delay..... After the dosing pump has added a quantity of acid or base, the **pH Drive** will switch it off for some time. This allows the added acid or base to mix through the pool before adding more, if required.

Chemical Degassing..... For the last two minutes of every Pool Pump Timer cycle, the **pH Drive** will switch off the Sanitiser System output and Dosing Pump to ensure that any acid and gases have been flushed through the pipes.

Cool Squeeze Tube ..... The dosing pump has stopped for a short time to allow the squeeze tube to cool down.

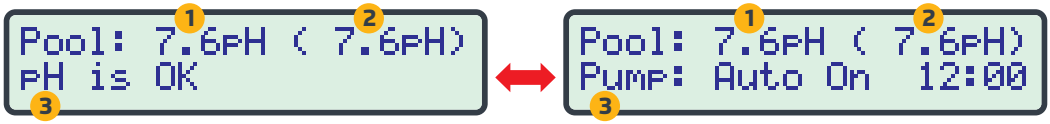
Startup Time Delay ..... The **pH Drive** has just been switched on, and is waiting for its pH reading to become stable, before doing any automatic control.

pH is Out of Range..... The **pH Drive** has detected that the pool pH reading is extreme and needs to be checked.

pH Calibration Due ..... 12 months has passed since the last time that the **pH Drive** was calibrated. Calibration ensures that pool pH readings are accurate.

Check Squeeze Tube ..... The dosing pump has operated for 50 hours or more, which is time for the squeeze tube to be replaced. This is important maintenance.

pH Drive Display



Pool Pump Status

Auto On 12:00 ..... The Pool Pump output is ON, due to the Timer Cycle settings. The current time is displayed on the right.

Auto Off 12:00 ..... The Pool Pump output is OFF, due to the Timer Cycle settings. The current time is displayed on the right. When the pool pump is off, the pH reading is also displayed as "---pH".

Over ON 1:00 ..... The Pool Pump output is ON, due to Override ON setting. The remaining Override ON time is displayed on the right.

When the Override ON time has elapsed, the **pH Drive** will return to Automatic pool pump operation using the Timer Cycle settings.

Over OFF 1:00 ..... The Pool Pump output is OFF, due to Override OFF setting. The remaining Override OFF time is displayed on the right.

When the Override OFF time has elapsed, the **pH Drive** will return to Automatic pool pump operation using the Timer Cycle settings.

Slave Mode ..... Use this setting when the **pH Drive** is being controlled by an external device such as the pool pump output of a sanitising system, or an intelligent pool control system or timer.

The Pool Pump output is switched on continuously, whenever the **pH Drive** unit is powered on, so the pool pump can be connected to that outlet socket.

pH Control functions will be active, but the Sanitiser output is off.

Since the **pH Drive**'s clock is not being used to control any timers, the time is not displayed when the unit is in Slave Mode.

Sanitiser: On/Off/Complete .. This indicates whether the Sanitiser output is current switched On or Off. "Complete" indicates that the Sanitising time is finished for the day (see page 21).

Using the User-Friendly Menu System

- Press **Setup** to enter the user-friendly menu system.
- Press ▲ and ▼ to scroll through menu choices, then press Enter to select the required option.
- Press **Enter** to save changes.
- Press **Cancel** to quit without saving changes at any screen.
- All setup screens time out if no key has been pressed for 30 seconds. Any changes will not be saved.

Acid Safety & Dilution

Maytronics recommends using pre-diluted acid purchased from your reputable pool shop or service agent.

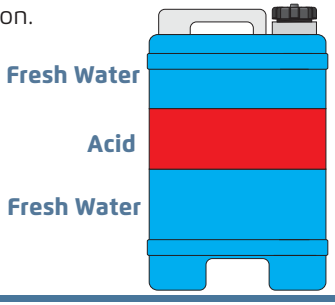
Alternatively, this section provides information on the safe handling and dilution of acid to use with your pH Drive. Please take the time to read and understand this section, to prevent injury or illness due to acid spillage.

Safety Information

- Dilute acid in a well ventilated area, preferably outdoors.
- Have a supply of fresh running water (e.g. a garden hose) readily to hand, in case of spillage.
- Wear protective clothing, safety goggles and gloves when diluting acid.
- Use only a Dangerous Goods certified drum. Your pool store can advise on this.
- If an acid spillage does occur, wash down well with copious amounts of fresh water immediately. **Seek Medical advice if any acid burn has occurred or if breathing is affected.**

Acid Dilution Procedure

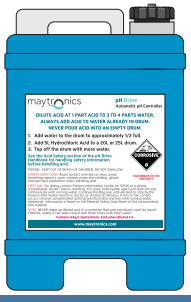
1. DO NOT add acid into a drum that previously contained liquid chlorine, until that drum has been thoroughly rinsed three times with fresh water.
2. Fill a 20 or 25 Litre dangerous goods certified drum to around half way with fresh water.
3. Add 5 Litres of concentrated Hydrochloric, Muriatic or Non-Fuming acid to the drum. Pour slowly to prevent spillage.
4. Top up the drum with more fresh water. Do not overfill.
5. Replace the drum lid and swish around to mix the acid well with the water. Keep this drum lid fitted until the diluted acid drum is in position.



Additional Information

- Always use acid to at least 3 parts water to 1 part acid. Damage from undiluted or insufficiently diluted acid is not covered by the warranty.
- Always add acid to water. Never add water to acid.
- The acid drum must be below the level of the non-return valve in the pH Tee when installed. This prevents acid syphoning into the pipeline.
- Fit the Acid Drum label supplied with your **pH Drive** to your drum of diluted acid. This will identify its contents and shows the dilution instructions.

Fit Acid Drum Label

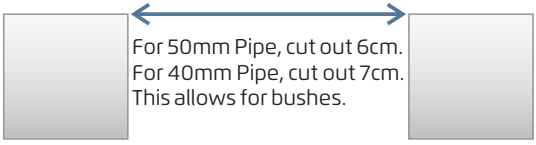


pH Tee Installation

Install the pH Tee first, so that the glue can set while you are installing the pH Drive unit itself.

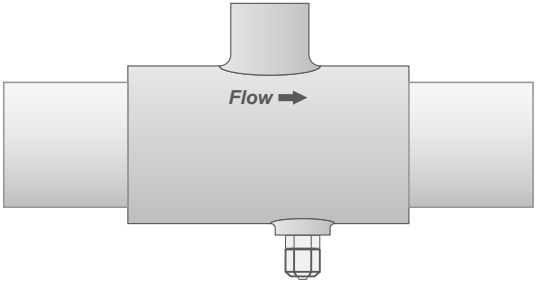
Pre-Installation Checklist

- You will require a saw suitable for cutting PVC pipe, PVC Primer and PVC Glue.
- Install the pH Tee after the filter, before any sanitation equipment, but after heating equipment.
- The pH Tee must be fitted to a horizontal section of pipe, so that the pH Sensor is within 45° of vertical (with the glass bulb pointing downwards).
- The pH Tee should be installed before an Ozone venturi, Salt Chlorinator cell, Electro Oxidizing Cell or Liquid Chlorine injection point.
- For installations into 40mm Pipe, a pair of 50x40 mm reduction bushes have been supplied. Glue these into the pH Tee before installing the Tee.
- Check the Water Flow direction arrows on the pH Tee, and ensure that it is installed in the correct direction.



CUT PIPE

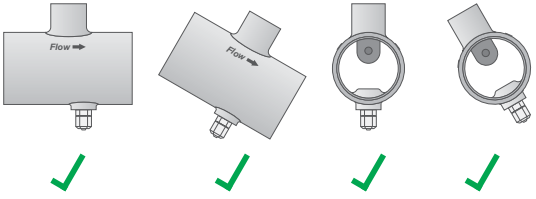
The pH Tee must be fitted to the return to pool pipe, where the water is clean and the pressure is low.



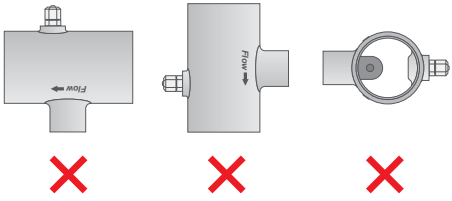
GLUE IN pH TEE

- Use PVC primer on all surfaces to be glued.
- Use suitable PVC pressure glue for joints.
- Ensure Water Flow arrows are pointing in the correct direction.
- pH Sensor must be within 45° of vertical.

These examples are all correct:



These are incorrect:



Optional Flow Switch Installation

Install the Flow Switch Tee second, so that the glue can set while you are installing the pH Drive unit itself.

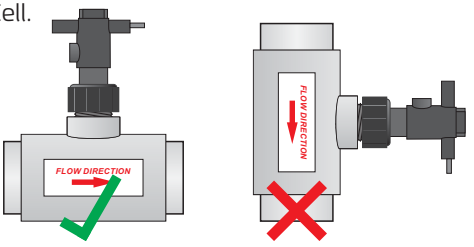
- For 50mm pipe, cut out a 6 cm section of pool return pipe.

  For 40mm pipe, cut out a 7cm section of pool return pipe, which allows for reduction bushes.

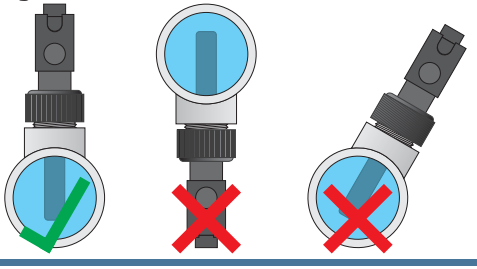
- Glue the Flow Switch Tee onto the pipe, taking note of the Flow Switch Orientation information below.

CORRECT ORIENTATION OF THE FLOW SWITCH

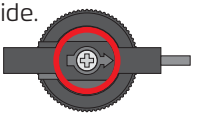
The Flow Switch tee must be installed onto a horizontal section of pool return pipe. Do not install on a vertical or angled section of pipe. There is no restriction on position of the flow switch. It can be installed before, between, or after the pH Tee and Sanitation Cell.



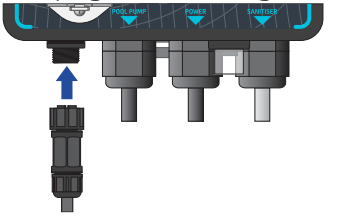
The Flow Switch must be mounted vertically upwards. Do not install downwards or at an angle.



Ensure that the Flow Switch flow direction arrow is pointing in the direction of the water flow. The cable exits on the downstream side.

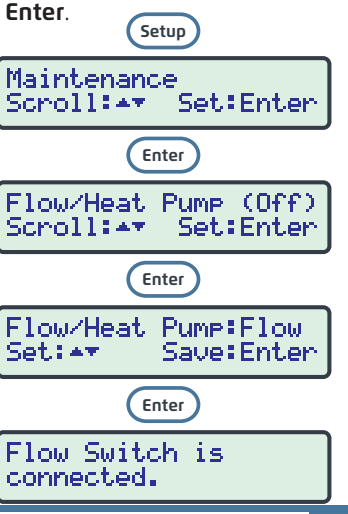


Unscrew the dust cover from the **FLOW / HP** input of the **pH S-Drive**, and connect the **Flow Switch** plug. Do no over tighten.



Adjust the **pH Drive** Flow Switch settings:

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Maintenance** is selected and press **Enter**.
- Press ▲ and ▼ until **Flow/Heat Pump** is selected and press **Enter**. The current setting is shown in brackets.
- Press ▲ and ▼ until **Flow** is selected and press **Enter**.



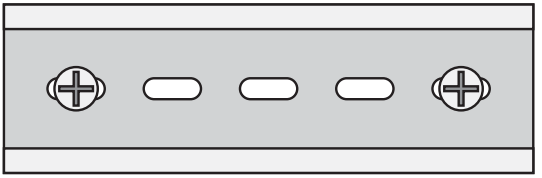
pH Drive Installation

Pre-Installation Checklist

- The **pH Drive** unit MUST be mounted vertically, with the cables at the bottom, in order to be weather resistant. Any water ingress due to the unit being incorrectly mounted is not covered by warranty.
- Choose a position that will allow the cable from the **pH Sensor** to reach the **pH Drive** without straining. The dosing pump tubes must also be able to reach the chemical drum and the pH Tee.
- Ensure that the optional Flow Switch or Heat Pump Interlock cables reach the waterproof socket on the **pH Drive** without straining.
- Ensure that the power leads from the Pool Pump and Sanitation System can reach the power outlets on the **pH Drive** without straining. The power outlet sockets must be hanging downwards to be weather resistant.
- Ensure that the **pH Drive** is protected from direct sunlight and weather. Although the unit has a weather resistant design, damage from long term exposure is not covered by the warranty.
- Do not power up the **pH Drive** until all installation steps are complete.

INSTALL MOUNTING PLATE

Install the mounting plate levelly in the desired location. Screws and wall plugs are provided.

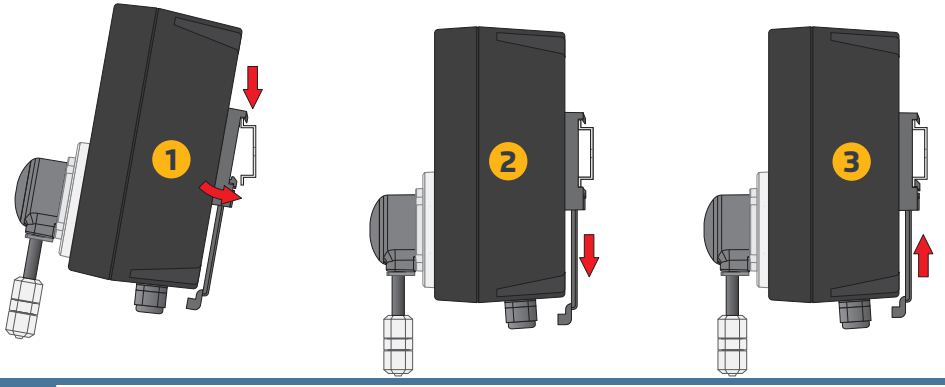


MOUNT pH DRIVE

❶ Hook the **pH Drive** mounting clip onto the top rail of the mounting plate.

❷ Pull the mounting clip down pull pushing the **pH Drive** against the bottom rail of the mounting plate.

❸ Allow the mounting clip to lock in place behind the bottom rail.



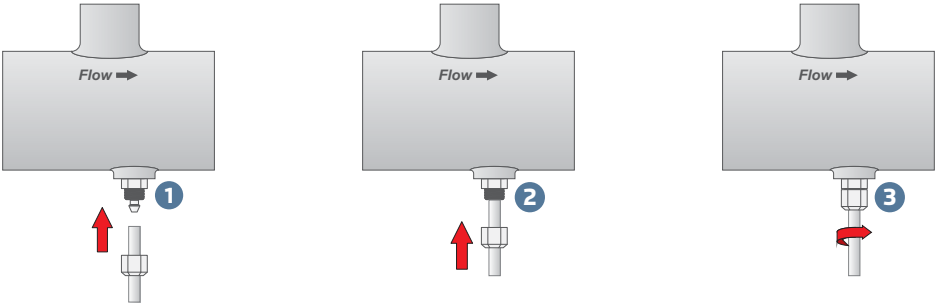
Tube Installation

pH TEE TUBE INSTALLATION

❶ Remove the nut from the non return valve on the Tee piece. Slip the Nut over the tube.

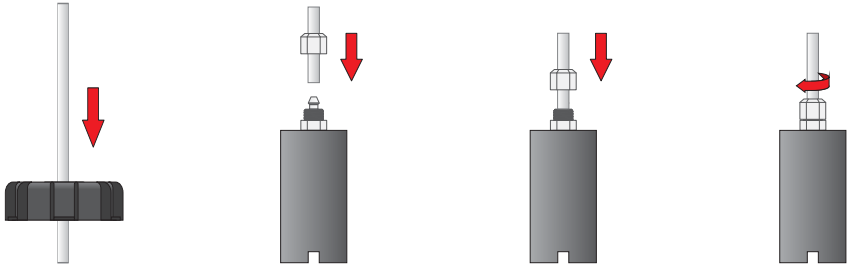
❷ Push the tube firmly onto the tube fitting.

❸ Tighten the nut over the tube. Tighten firmly with fingers. If the tubing can still be easily pulled out, use a tool to tighten an extra 1/2 turn to ensure that it is securely fastened.



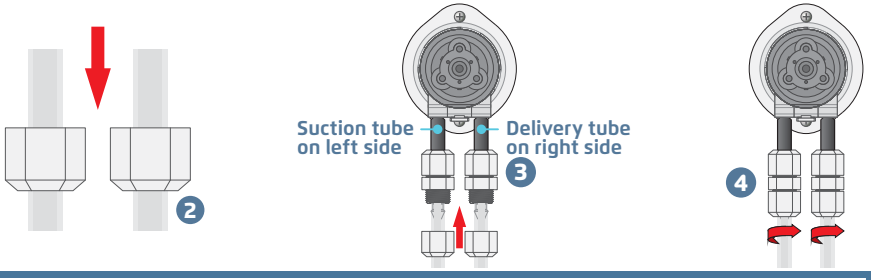
DRUM WEIGHT TUBE INSTALLATION

1. Push the end of the drum weight tube through the drum lid that was supplied with the **pH Drive**.
2. Fit the tube onto the drum weight tube fitting in the same way as described in the pH Tee Tube Installation section above and illustration below.

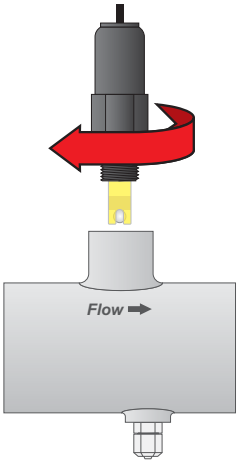


DOSING PUMP TUBE INSTALLATION

1. Cut Suction and Supply tubes to required length from the single length of clear PVC tube suppled with the **pH Drive**.
2. Fit compression nuts over the two tubes.
3. Push Suction and Supply tubes onto dosing pump fittings.
4. Tighten the nut over the tube. Tighten firmly with fingers.



pH Sensor Installation



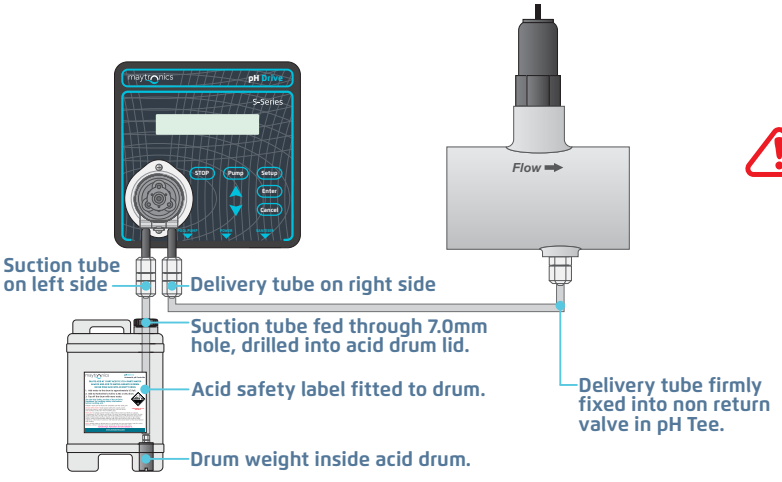
1. Carefully remove the protective cap from the tip of the sensor.

Caution: The glass bulb of the pH Sensor is fragile. Handle with care.

2. Screw the pH Sensor into the pH Tee thread. Tighten firmly by hand. DO NOT OVER-TIGHTEN. DO NOT USE A TOOL.

3. After the pH Sensor is installed in the pH Tee, connect plug on the pH Sensor cable into the **pH Sensor** socket on the **pH Drive**. Push the plug into place and 1/4 turn clockwise to lock it into place.

Completed Installation



DO NOT fit suction tube directly into neat acid container. See page 7 for Acid Dilution information.

Heat Pump Interlock Cable

For installations where a Heat Pump is being used with shared plumbing and a single pool pump, the optional Heat Pump Interlock cable can be used.

When the Heat Pump Interlock is used, the **pH Drive** will switch on the pool pump outside of the normal filtration times when the Heat Pump calls for heating.

The Heat Pump Interlock function is disabled when the **pH Drive** is set to Slave Mode.

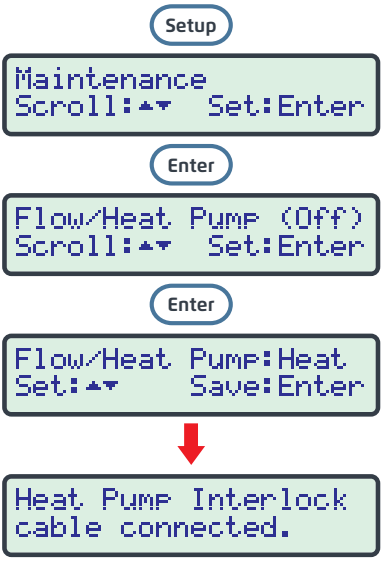
❶ Connect the optional Heat Pump Interlock cable to the **FLOW / HEAT PUMP** ❺ socket.

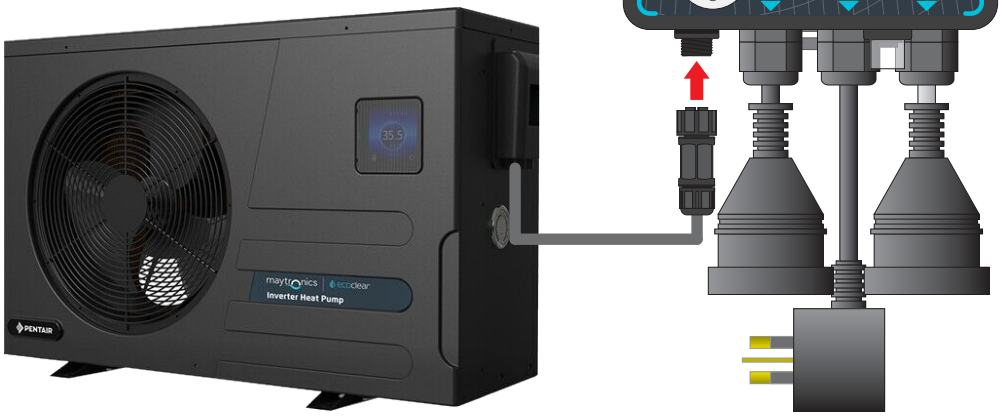
❷ Connect the fork terminals of the Heat Pump Interlock cable to the Heating Call terminals of the heat pump. Different brands of Heat Pump will have their own labelling for these terminals, so please consult the Heat Pump's manual.

Heat Pump connections should only be attempted by qualified installers.

❸ Adjust the **pH Drive** settings for Heat Pump Interlock:

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Maintenance** is selected and press **Enter**.
- Press ▲ and ▼ until **Flow/Heat Pump** is selected and press **Enter**. The current setting is shown in brackets.
- Press ▲ and ▼ until **Heat** is selected and press **Enter**.
- The **pH Drive** will now show a confirmation message for the new setting and then return to normal operation.





Power Connections as Slave

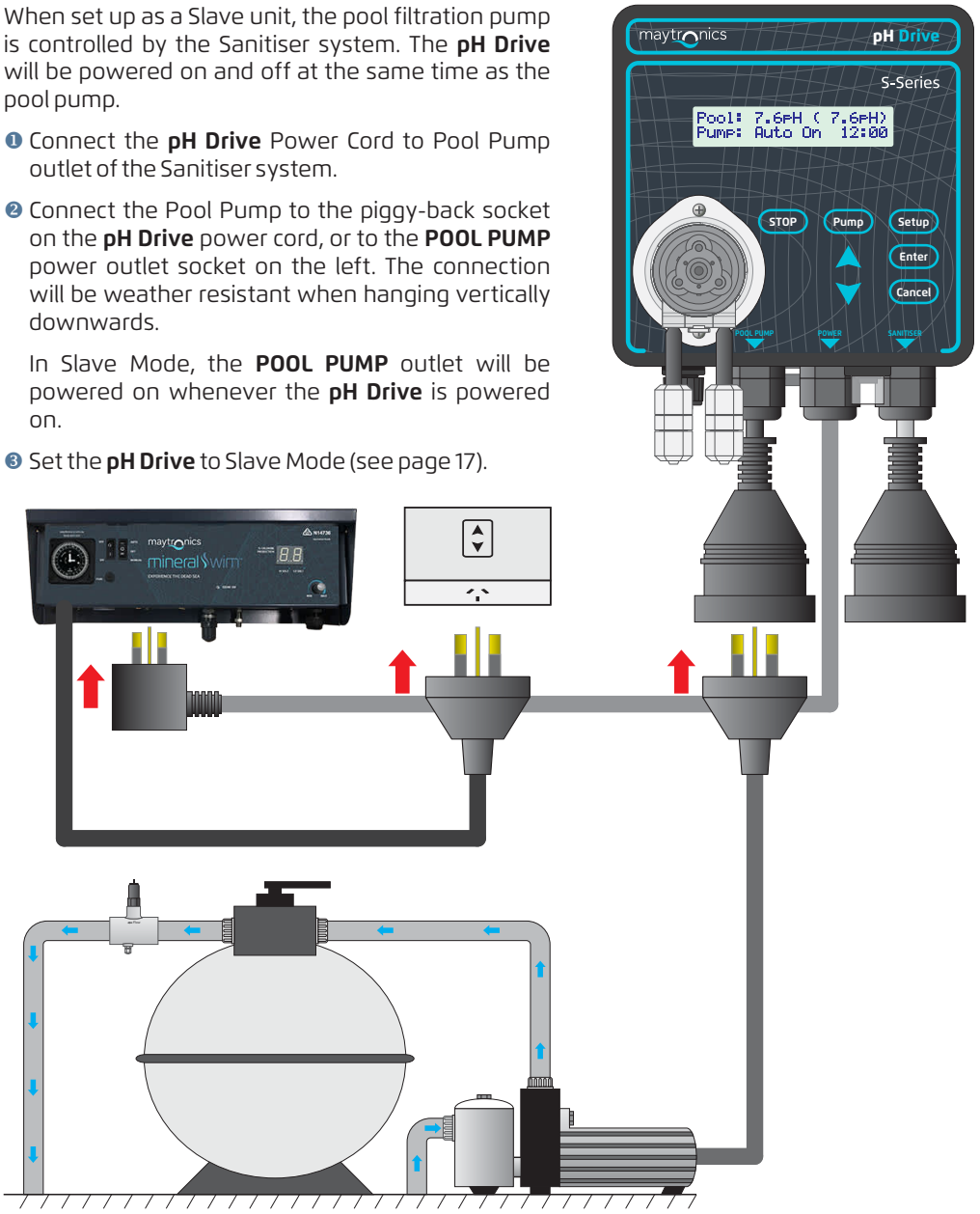
When set up as a Slave unit, the pool filtration pump is controlled by the Sanitiser system. The **pH Drive** will be powered on and off at the same time as the pool pump.

❶ Connect the **pH Drive** Power Cord to Pool Pump outlet of the Sanitiser system.

❷ Connect the Pool Pump to the piggy-back socket on the **pH Drive** power cord, or to the **POOL PUMP** power outlet socket on the left. The connection will be weather resistant when hanging vertically downwards.

In Slave Mode, the **POOL PUMP** outlet will be powered on whenever the **pH Drive** is powered on.

❸ Set the **pH Drive** to Slave Mode (see page 17).



All installation steps are now complete. It is recommended that you use the Quick Dose function (page 22) with 1 Litre of fresh water to test the system for leaks before using your pH Drive with acid.

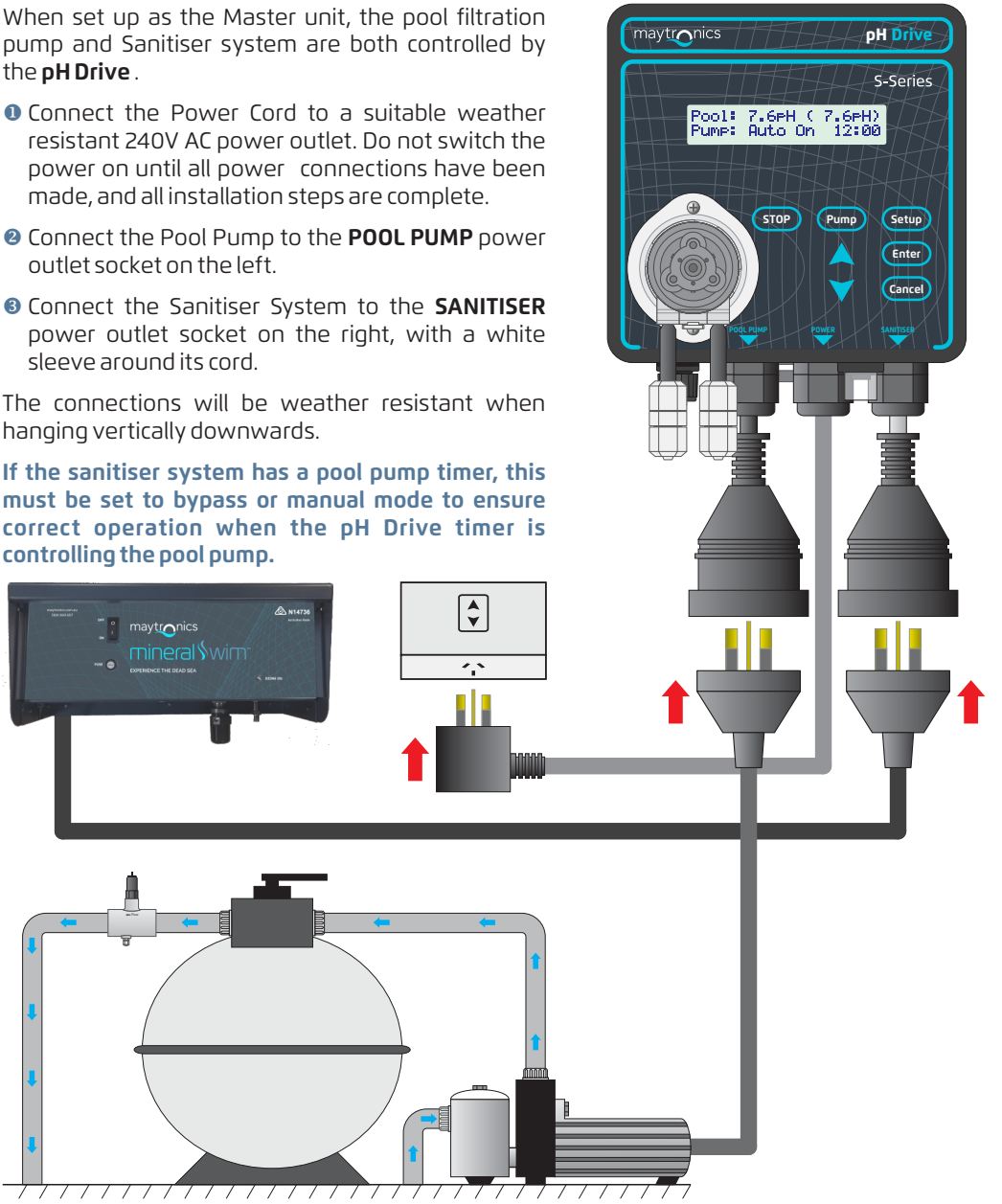
Power Connections as Master

When set up as the Master unit, the pool filtration pump and Sanitiser system are both controlled by the **pH Drive** .

1. Connect the Power Cord to a suitable weather resistant 240V AC power outlet. Do not switch the power on until all power connections have been made, and all installation steps are complete.
2. Connect the Pool Pump to the **POOL PUMP** power outlet socket on the left.
3. Connect the Sanitiser System to the **SANITISER** power outlet socket on the right, with a white sleeve around its cord.

The connections will be weather resistant when hanging vertically downwards.

If the sanitiser system has a pool pump timer, this must be set to bypass or manual mode to ensure correct operation when the pH Drive timer is controlling the pool pump.

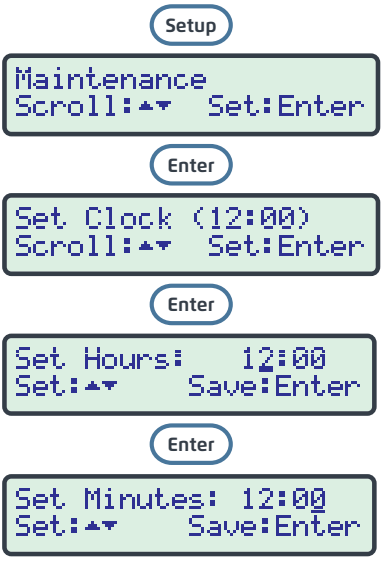


All installation steps are now complete. It is recommended that you use the Quick Dose function (page 22) with 1 Litre of fresh water to test the system for leaks before using your pH Drive with acid.

Setting the Clock

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Maintenance** is selected and press **Enter**.
- Press ▲ and ▼ until **Set Clock** is selected. The current time is shown in brackets.
- Press **Enter** to set the clock.
- Press ▲ and ▼ to set the clock hours. This is in 24 hour format. Hold down the ▲ or ▼ button to scroll quickly.
- Press **Enter** to save the clock hours.
- Press ▲ and ▼ to set the clock minutes. Hold down the ▲ or ▼ button to scroll quickly.
- Press **Enter** to save the clock minutes.
- The **pH Drive** will now return to normal operation.

The pH Drive clock is backed up by a super capacitor when power is lost. This will maintain the correct time for several days without needing to reset the clock.



Pool Pump Settings

Setting the Pool Pump Mode

- Press **Pump** to enter the **Pool Pump Settings** menu.
- Press ▲ and ▼ until **Pump Mode** is selected. The current mode is shown in brackets.
- Press **Enter** to go to the **Mode** menu.
- Press ▲ and ▼ to select between the Mode settings:

Slave ..... The Pool Pump outlet will be switched on whenever the **pH Drive** is powered on. Use this setting when using the timer of the sanitation system, or an external pool control system.

Master Timer . The Pool Pump will be switched on and off according to the programmed Timer Cycles (see page 18).

Override ON . . The Timer Cycles will be overridden, and the Pool Pump will be switched ON.

Press ▲ and ▼ to set the how long to override the Timer Cycles, from 15 minutes to 24 hours, then press **Enter**.

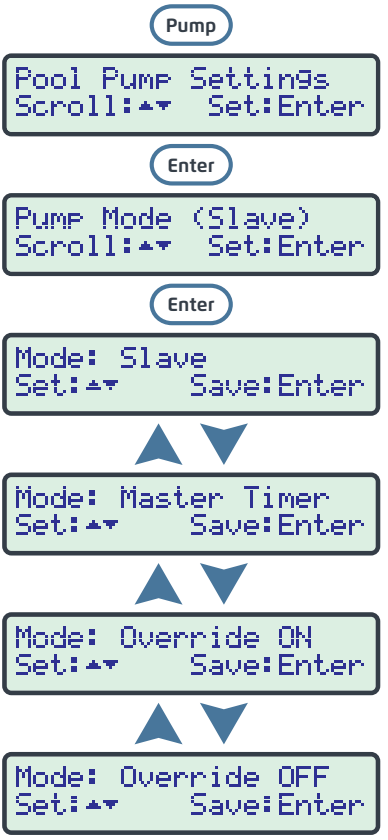
When the Override time has elapsed, the **pH Drive** returns to the previously selected Slave or Master Timer mode.

Override OFF. . The Timer Cycles will be overridden, and the Pool Pump will be switched OFF.

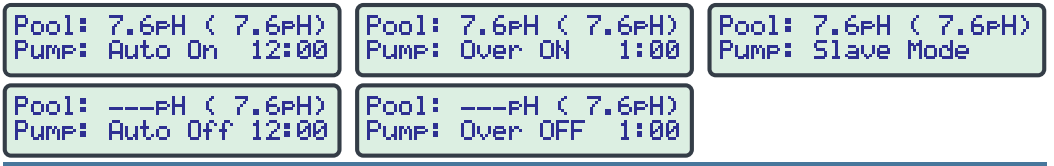
Press ▲ and ▼ to set the how long to override the Timer Cycles, from 15 minutes to 24 hours, then press **Enter**.

When the Override time has elapsed, the **pH Drive** returns to the previously selected Slave or Master Timer mode.

- When the Pool Pump Mode has been set, the pH Drive will show the pump status alternately on the display.
- The pH reading is shown as "---pH" when the pool pump is off, when using the Master Timer mode.



Examples of Pump Status messages on main display:



Pool Pump Settings

Setting the Pool Pump Timer

This section is applicable when the **pH Drive** is set to Master Timer mode. In Slave Mode, the Pool Pump Timer is not used.

The pH Drive has up to 4 pump timer cycles per day, labelled A to D. The default setting is Cycle A 7:00 to 11:00 and Cycle B 14:00 to 18:00, with Cycles C and D being off.

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Pool Pump Settings** is selected and press **Enter**.
- Press ▲ and ▼ until **Set Pump Timer** is selected.
- Press **Enter** to go to the **Cycle A ON** time.

  Press ▲ and ▼ to set the required start time for Cycle A.
- Press **Enter** to go to the **Cycle A OFF** time.

  Press ▲ and ▼ to set the required end time for Cycle A.
- Repeat these steps to set the start and end times for Cycles B, C and D.

  To disable any of the timer cycles, press ▲ or ▼ past midnight until "**OFF**" is displayed for the start or end time.

  A short press of the **Cancel** button at any screen goes back one setting without saving changes.

  A long press of the **Cancel** button at any screen exits the Pump Timer setting system without saving any changes that have been made for any timer cycle.

  A long press of the **Enter** button at any screen saves all current timer cycle settings and exits the Pump Timer setting system.

NOTE:

For the last two minutes of every Pool Pump Timer cycle, the **pH Drive** will switch off the Sanitiser System output and Dosing Pump to ensure that any acid and gases have been flushed through the pipes.

The unit will display "Chemical Degassing" during these two minutes.

Filter Backwashing Helper

The **pH Drive** can be used to assist you with backwashing your sand filter. The **pH Drive** will switch the Pool Pump on and off as required, and disable the dosing pump and sanitising system output. Backwashing is applicable only to sand filters, not cartridge filters.

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Pool Pump Settings** is selected and press **Enter**.
- Press ▲ and ▼ until **Backwash Filter** is selected.
- Press **Enter** to proceed to the Filter Backwashing Helper function.
- While the **Set Filter: Backwash** prompt is being displayed, the Pool Pump will be off.

  Set the filter's multi port valve to Backwash.

  Press Enter to run the Pool Pump to Backwash the filter for 60 seconds.
- When the 60 seconds of Backwashing is complete, the **pH Drive** will switch the Pool Pump off.

  While the **Set Filter: Rinse** prompt is being displayed, the Pool Pump will be off.

  Set the filter's multi port valve to Rinse.

  Press Enter to run the Pool Pump to Rinse the filter for 15 seconds.
- When the 15 seconds of Rinsing is complete, the pH Drive will switch the Pool Pump off.

  The **pH Drive** will now prompt the user to repeat the Backwashing and Rinsing two more times. This achieves the best possible cleaning of the filter media.
- When the last Rinse cycle is complete, the **pH Drive** will switch the Pool Pump off.

  While the **Set Filter: Normal** prompt is being displayed, the Pool Pump will be off.

  Set the filter's multi port valve to the normal filtration position.
- Press **Enter** to return to normal filtration operation.
- Press **Cancel** at any screen to quit the Backwashing Helper function.

Pump to Waste Helper

The **pH Drive** can be used to assist you with pumping pool water to waste. This is a useful function when emptying excess water after rain, or when vacuuming to waste after a flocculent has been used.

The **pH Drive** will switch the Pool Pump on and off as required, and disable the dosing pump and sanitising system output during this process.

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Pool Pump Settings** is selected and press **Enter**.
- Press ▲ and ▼ until **Pump to Waste** is selected.
- Press **Enter** to proceed to the Pump to Waste Helper function.
- While the **Set Filter: Waste** prompt is being displayed, the Pool Pump will be off.

  Set the filter's multi port valve to Waste.

  Press **Enter** to run the Pool Pump to Waste. This is limited to 15 minutes as a precaution to prevent emptying too much water out of the pool.
- When the 15 minutes of Pumping to Waste is complete, the **pH Drive** will switch the Pool Pump off.

  While the **Set Filter: Normal** prompt is being displayed, the Pool Pump will be off.

  Set the filter's multi port valve to the normal filtration position.
- Press **Enter** to return to normal filtration operation.
- Press **Cancel** at any time during the 15 minute countdown to quit the Pump to Waste Helper function.

Sanitiser Setting

When the **pH Drive** is the Master Timer unit, it controls the pool pump and sanitiser system. This separate setting is provided for the amount of sanitiser system run time per day.

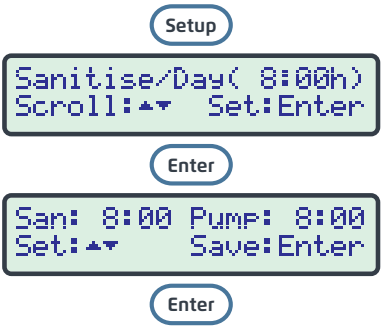
By controlling sanitising in this way, the pool will not be over-sanitised by additional pool pump run time due to Heat Pump demand (page 13) or manual Pump Override (page 17).

The **pH Drive** will switch the Sanitiser output on and off as required.

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Sanitise/Day** is selected and press **Enter**. The current setting is displayed in brackets.
- Press ▲ and ▼ to set the required sanitising run time for each day, in 15 minute increments.

  The **pH Drive** shows the total hours of the daily pump cycles, as a guide to the maximum Sanitising time you may wish to set each day.
- Press **Enter** to save the daily Sanitiser run time.

  Press **Cancel** to quit without saving the changes.
- The **pH Drive** will now return to normal operation.



Notes

- If the Sanitising time per day is less than the Pool Pump time per day, Sanitising will start at the beginning of the first pump cycle, and run constantly when the pool pump is running until the Sanitising time is completed.
- You are able to enter more Sanitising time per day than the total pump hours. This is kept in memory, in case you increase the amount of pumping time later.
- If the daily Pool Pump times are reduced to less than the daily Sanitising time (for example in winter), the **pH Drive** will keep the programmed Sanitising time in memory. Therefore, the user does not need to remember their summer Sanitising time when reverting to summer filtration times.
- The daily Sanitising time setting can be used to increase or decrease pool sanitiser levels without having to change pool filtration times.
- The Sanitiser output is switched OFF when the **pH Drive** is in Slave Mode (page 17).

pH Settings

Press the STOP button to instantly stop the Acid Pump operating at any time. This will immediately change the pH Setting to Standby Mode.

Setting the pH Mode

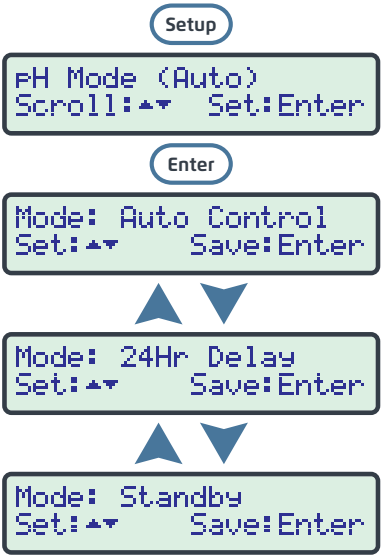
- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **pH Mode** is selected. The current mode is shown in brackets.
- Press **Enter** to go to the **pH Mode** menu.
- Press ▲ and ▼ to select between the Mode settings:

  Auto Control . . The dosing pump will add acid or base when the pH is outside the Set Point.

  24Hr Delay . . . . The dosing pump is switched off for 24 hours, to allow buffer or other chemical to mix and stabilise.

  Standby . . . . . The dosing pump is switched off and will not add any acid or base automatically.

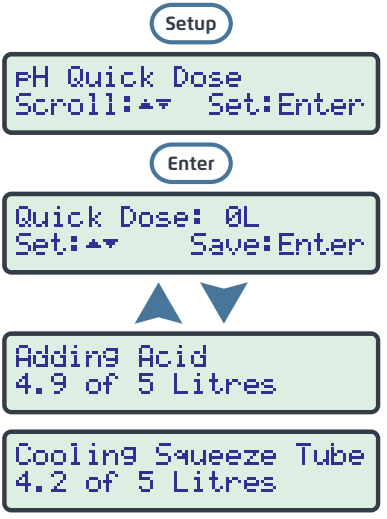
- Press **Enter** to save the selection, or press **Cancel** to quit without saving.



Adding a Quick Dose of Chemical

- Use this function if you need to manually add a dose of acid or base to the pool
- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **pH Quick Dose** is selected.
- Press **Enter** to go to the **pH Quick Dose** menu.
- Press ▲ and ▼ to select the number of litres of acid or base to dose into the pool. The range of settings is 1 to 5 litres.
- Press **Enter** to start dosing, or press **Cancel** to quit.

  If the Pool Pump is currently off, the **pH Drive** will switch this on for 1 hour to allow time for the Quick Dose, plus mixing the acid or base in the pool.
- The **pH Drive** counts down the litres as it doses.
- Every 4 minutes of dosing pump operation, the **pH Drive** will switch it off for 1 minute, to allow the squeeze tube to cool down. This extends squeeze tube life.

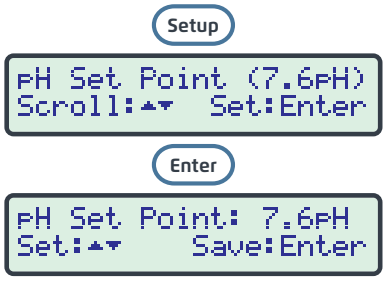


pH Settings

Setting the pH Set Point

The default pH Set Point of 7.6 is suitable for most pool systems. You should only change this setting if advised by a pool professional.

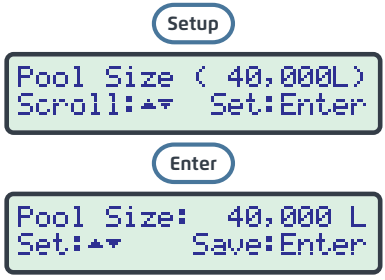
- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **pH Set Point** is selected. The current Set Point is shown in brackets.
- Press **Enter** to go to the **pH Set Point** menu.
- Press ▲ and ▼ to set the required pH Set Point.
- Press **Enter** to save the new setting, or press **Cancel** to quit without saving.



Pool Size Setting

The pH correction demand and pool turnover time is different from pool to pool, even when two pools are the same size. The Pool Size setting will be suitable for the majority of pools. However, it may be necessary to adjust this during the first few days or weeks of operation, as detailed in this section.

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Pool Size** is selected. The current Pool Size setting is shown in brackets.
- Press **Enter** to go to the **Pool Size** menu.
- Press ▲ and ▼ to set the required Pool Size.
- Press **Enter** to save the new setting, or press **Cancel** to quit without saving.



NOTES

If the **pH Drive** does not keep up with acid or base demand, and the Alarm sounds, increase the Pool Size setting by one step and check in 2 days.

If the **pH Drive** overdoses too much acid or base, reduce the Pool Size setting by one step and check in 2 days.

New concrete pools have an extremely high acid demand for the first few months. It may be necessary to enter a Pool Size up to 50% more than the true size of the pool if your **pH Drive** is not keeping up with acid demand during this initial period. The setting can be reduced again 1 to 3 months later.

pH Settings

Enabling or Disabling the pH Alert Function

The **pH Drive** will sound an alarm and display an alert if the pH has been outside the set point for 4 hours or more.

If this function is disabled, the alarm will never be triggered and the **pH Drive** may over dose acid or base. Only advanced users should change this setting, and only as a temporary measure.

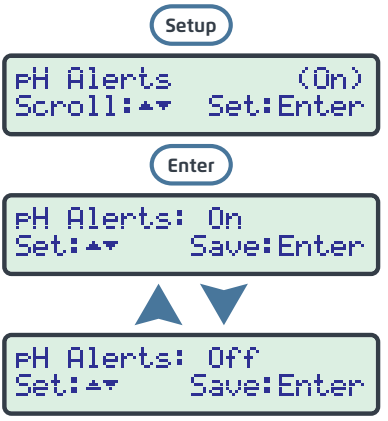
- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **pH Alerts** is selected. The current Set Point is shown in brackets.
- Press **Enter** to go to the **pH Alerts** menu.
- Press ▲ and ▼ to select between On and Off.
- Press **Enter** to save the selection, or press **Cancel** to quit without saving.

When the pH Alert is Triggered

When the pH Alert is triggered, the **pH Drive** will display the alert message and sound the beeper.

```
Pool: 7.6pH ( 7.6pH)
pH Alert!Reset:Enter
```

- The Dosing Pump will now be disabled, and will not operate again until the Alert has been reset.
- Press **Enter** to reset the pH Alert.
- Refer to the list of possible causes and fixes on this page, to rectify the condition that caused the alert to be triggered.



Possible causes and solutions for the pH Alert being triggered:

Cause ....Very high acid demand in new concrete pool.
Fix .....Increase Pool Size Setting to a higher value until the acid demand settles to normal amounts.

Cause ....Acid or Base drum empty.
Fix .....Refill drum with water and acid or base as per instructions on page 7.

Cause ....Pool Size Setting is too low or too high.
Fix .....See page 23 for information on how to change Pool Size Setting.

Cause ....pH Reading is inaccurate.
Fix .....Re-calibrate pH Sensor.

Cause ....pH Sensor broken or faulty.
Fix .....If re-calibration is not possible, then replace pH Sensor.

Cause ....Pump is not pumping acid correctly.
Fix .....Check all tube fittings for leakage. Re-fit or replace as necessary.

Check squeeze tube inside pump cassette for leakage and replace if necessary.

pH Sensor Calibration

The **pH Drive** will display a reminder to calibrate the pH Sensor approximately every 12 months:

```
pH Calibration Due
```

The pH Sensor should be calibrated to ensure that the readout is correct. Calibration is simply the process of placing the pH Sensor into a solution of known pH, and adjusting the readout to that value.

The **pH Drive** can be calibrated in one of two ways:

1. **Inline Calibration**
   This is done by obtaining an accurate pH measurement of the pool water and adjusting the readout to that value.
2. **pH7.0 Buffer Calibration**
   This involves removing the pH Sensor from the pH Tee, placing it into a pH7.0 Buffer solution, and adjusting the readout to 7.0.

Inline Calibration

1. **Measure the pH of the Pool**
   Set the **pH Drive** to Standby or 24Hr Delay mode an hour or more before measuring the pH of the pool. Do not change back to Auto Control mode until after pH calibration is completed.

   Ensure that the pool pump has been running and no acid has been added for at least 1 hour prior to doing an Inline Calibration. This is to ensure that the pH level is stable throughout the whole pool. If necessary, use the **Override ON** function (page 17) to run the pool pump, and **Standby pH Mode** (page 22) to stop any acid being dosed.

   Measure the pH of the pool with a good quality, calibrated pH meter. Alternatively, take a sample of pool water to a pool shop which has an electronic pool balance measurement system. A standard pool pH test kit is NOT accurate enough to be relied upon for pH calibration.

2. **Calibration Procedure**

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Calibrate pH Sensor** is selected.
- Press **Enter** to go to the **Calibration** screen.

```
Cal: 7.6pHx ( 7.7pH)
Set:▲▼      Cal:Enter
```

  The current reading is displayed in brackets. The flashing "**X**" indicates that the reading is not yet stable. DO NOT calibrate until the "**X**" changes to a "✓"

```
Cal: 7.6pH✓ ( 7.7pH)
Set:▲▼      Cal:Enter
```

- Press ▲ and ▼ to set the "**Cal:**" pH value to the pH of the pool, as measured in step 1.
- Press **Enter** to calibrate the pH Sensor, or press **Cancel** to quit without calibrating.
- Set the pool pump timer back to **Auto Timer** mode, pH Mode back to **Auto Control**.

Calibration Failure

If pH calibration fails, the **pH Drive** will display this message:

```
pH Calibration Fail
Check Handbook
```

- Clean the pH Sensor as per the troubleshooting section, then retry calibration.
- If the calibration failure persists, the pH Sensor will most likely need to be replaced.

pH7.0 Buffer Calibration is on the next page.

pH7.0 Buffer Calibration

Use the Override OFF function (page 17) to switch the pool pump off and to ensure it remains off for the entire pH Calibration process.

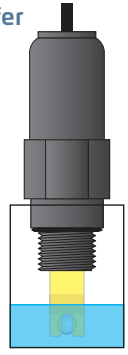
1. Prepare pH7.0 Calibration Buffer

- A sachet containing powder to make pH7.0 Calibration Buffer was supplied with your **pH Drive**. Simply pour the contents into the 250mL bottle and fill to the 250mL mark with deionised or distilled water. Shake well until all salts have dissolved.
- This solution will last up to 6 months after it has been made, providing it is not contaminated and is stored in a cool, dark place

2. Remove the pH Sensor from the Tee

- Disconnect the pH Sensor to avoid straining the cable and plug when removing the sensor from the pH Tee. Unscrew the sensor completely from the Tee.
- Reconnect the pH Sensor to the **pH Drive**.
- Rinse the sensor well in clean water. De-ionized or distilled water is ideal, but tap water will suffice.

3. Place pH Sensor into pH7.0 Buffer



- Decant a small amount of pH7.0 buffer into a clean cup. Place the pH Sensor into this buffer, so it is immersed to 15mm or more, as per the diagram on the right.
- DO NOT place the pH Sensor directly into the 250mL bottle of pH7.0 buffer.

4. Calibration Procedure

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Calibrate pH Sensor** is selected.
- Press **Enter** to go to the **Calibration** screen.

```
Cal: 7.0pHx ( 7.1pH)
Set:▲▼      Cal:Enter
```

The current reading is displayed in brackets. The flashing "**X**" indicates that the reading is not yet stable. DO NOT calibrate until the "**X**" changes to a "✓"

```
Cal: 7.0pH✓ ( 7.0pH)
Set:▲▼      Cal:Enter
```

- Press ▲ and ▼ to set the "**Cal:**" pH value to exactly **7.0**.
- Press **Enter** to calibrate the pH Sensor, or press **Cancel** to quit without calibrating.

5. Re-fit pH Sensor and Pump Timer Settings

- Disconnect the pH Sensor from the **pH Drive** to avoid straining the cable and plug when screwing into the pH Tee. Re-fit into the pH Tee. Re-connect the pH Sensor to the **pH Drive** when done.
- Return the **pH Drive**'s pool pump timer to **Slave or Master Timer** mode (page 17).

Calibration Failure

If pH calibration fails, the **pH Drive** will display this message:

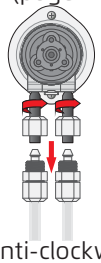
```
pH Calibration Fail
Check Handbook
```

- Clean the pH Sensor as per the troubleshooting section, then retry calibration.
- If the calibration failure persists, the pH Sensor will most likely need to be replaced.

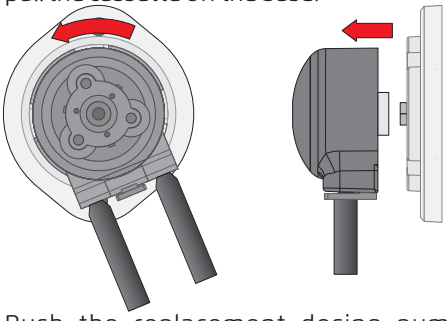
Changing Pump Cassette

The **pH Drive** monitors the running time of the dosing pump and will display a reminder to check the squeeze tube when this time exceeds 50 hours.

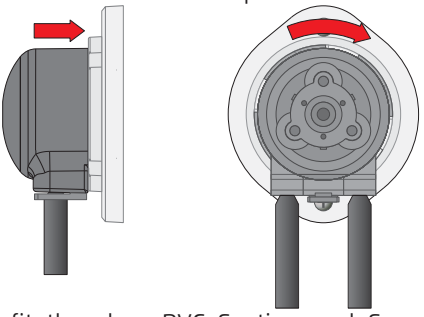
- This section details replacement of the entire pump cassette. To replace just the squeeze tube, see page 28.
- Use the Quick Dose function to pump 1 Litre of fresh water through the system. This will ensure that all acid or base has been flushed out and will make it safe to handle.
- Use the **Override OFF** mode (page 17) to switch the pool pump off.
- Removing the clear PVC Suction and Supply tubes is a reversal of the tube fitting instructions on Page 11.



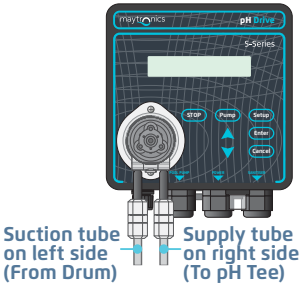
- Turn the pump cassette anti-clockwise around 1/8 of a turn. When you feel it stop, pull the cassette off the base.



- Push the replacement dosing pump cassette onto the pump base. Rotate it a few degrees either way to make the axle in the pump base align with the hole in the back of the cassette. Once it has engaged, push the cassette onto the base at the angle shown at the top, right of this page.
- Turn the cassette clockwise around 1/8 of a turn until it clicks into place.



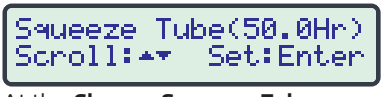
- Refit the clear PVC Suction and Supply tubes. Suction is on the left and Supply is on the right. Refer to tube fitting instructions on page 11.



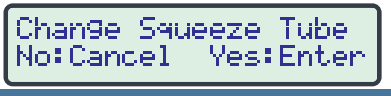
- Return the **pH Drive** to the desired Pump mode (page 17).

Resetting the Squeeze Tube Reminder

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Maintenance** is selected.
- Press **Enter**, then select **Squeeze Tube** from the **Maintenance** menu. The total pump operating hours is displayed on the right.



- At the **Change Squeeze Tube** screen, press **Enter** to reset the Squeeze Tube hours to zero. Press **Cancel** to exit if the pump cassette was not replaced.

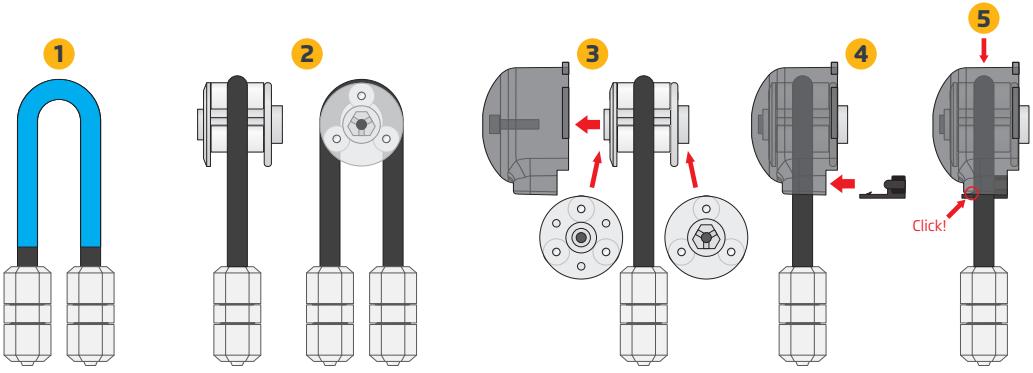


Changing Pump Squeeze Tube

When the "**Check Squeeze Tube**" reminder is displayed by the **pH Drive**, the Squeeze Tube may be replaced as an alternative to replacing the entire Pump Cassette. This is a lower cost option, but the user should check the condition of the rollers to ensure there is no free play between the rollers and their titanium bearings.

- To replace the Squeeze Tube, remove the Pump Cassette as per the instructions on page 27.

1. Use the supplied sachet of Silicone grease to smear a thin film of lubricant on the squeeze tube, (shown in blue below). Do no over-apply, as this will attract grit and dust.
2. Wrap the Squeeze Tube Assembly around the Rotor Assembly as shown. Hold it tightly, so that the squeeze tube is a little flattened.
3. Push the Rotor Assembly with Squeeze Tube fitted into the Cassette Cover. Ensure this is the correct way around, as shown.
4. Slide the Retaining Clip into place, pushing until it clips into place.
5. Using a blunt plastic tool, push the tubing until it is around half way along the roller.



- Refit the Pump Cassette to the **pH Drive** as per the instructions on page 27.

Resetting the Squeeze Tube Reminder

- Press **Setup** to enter the user-friendly menu system, then press ▲ and ▼ until **Maintenance** is selected.
- Press **Enter**, then select **Squeeze Tube** from the **Maintenance** menu. The total pump operating hours is displayed on the right.

```
Squeeze Tube(50.0Hr)
Scroll:▲▼  Set:Enter
```

- At the **Change Pump Cassette** screen, press **Enter** to reset the Pump Cassette hours to zero. Press **Cancel** to exit if the pump cassette was not replaced.

```
Change Squeeze Tube
No:Cancel  Yes:Enter
```

pH Troubleshooting

Symptom	Possible Causes and Remedies
Unstable or inaccurate pH readings	**pH Sensor is dirty.** • Disconnect pH Sensor from the **pH Drive**, then unscrew sensor from the pipe. • Wipe the glass bulb with a soft tissue soaked with methylated spirits. • Soak the tip of the sensor in diluted Hydrochloric acid (for example, from your **pH Drive** diluted acid drum). • Rinse the pH Sensor thoroughly in clean water. • Screw sensor back into pipe and re-connect sensor to **pH Drive**.
	pH Sensor needs to be re-calibrated. • Clean pH Sensor as per procedure above. • Re-calibrate pH Sensor as per details on pages 25 and 26.
	Pool water is very pure and has low conductivity. • Add one bag of pool salt per 50,000 Litres of pool water.
pH reading cannot be calibrated	**pH Sensor is dirty.** • Follow the pH Sensor cleaning procedure above.
	pH Sensor is faulty. • Replace pH Sensor.
pH reads around pH7 without changing	**Short circuit in pH Sensor BNC Plug or Socket** • Disconnect pH Sensor plug from socket. Dry out with a hair dryer or allow to air dry. Reconnect and re-check. • If problem persists, return pH Sensor to have connector replaced, or replace the pH Sensor.
pH reads around pH4 to 5 without changing	**Glass bulb or internal stem of pH Sensor is cracked.** • Replace pH Sensor.
Unit does not power up	**Faulty Unit** • Faulty **pH Drive** main unit. Return for repair.
Unit is not adding acid when dosing pump is operating	• Check that the **pH Drive** diluted acid drum is not empty. • Check that all suction and output tubes are fitted correctly, with no leakage. • Check that squeeze tube inside pump cassette is not leaking. WARNING : IF ANY ACID HAS LEAKED OUT OF TUBES, WASH DOWN THE AREA WITH FRESH WATER IMMEDIATELY. TAKE THE LID OFF THE PUMP, REMOVE SQUEEZE TUBE AND WASH OUT WITH FRESH WATER IF SQUEEZE TUBE WAS LEAKING.
Alarm sounds due to pH being too low	**Pool Size Setting is set too high** • Reduce the Pool Size Setting by one level and check in 2 days.
Acid Pump turns, but acid is not flowing.	**Leaking or worn squeeze tube and/or rollers.** • Tighten Acid Pump fittings further or replace fittings. • Replace squeeze tube or cassette as needed (see page 27 and 28).

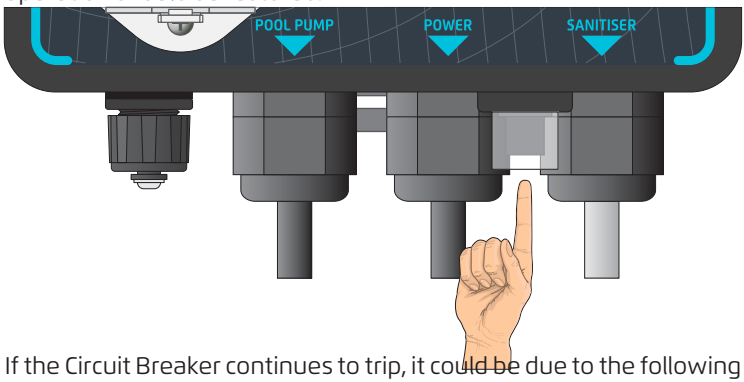
IF YOU NEED TO RETURN YOUR **pH DRIVE** FOR SERVICE OR REPAIRS AT ANY TIME, PLEASE USE THE QUICK DOSE FUNCTION (PAGE 22) TO DOSE 1 LITRE OF FRESH WATER THROUGH THE SYSTEM BEFORE SENDING BACK. THIS WILL STOP ACID LEAKING FROM THE PUMP DURING TRANSPORT (WHICH WOULD DAMAGE YOUR UNIT OR THE PACKAGING, VOIDING WARRANTY), AND IS ALSO A SAFETY HAZARD FOR OUR TECHNICIANS.

pH Troubleshooting

Alert Messages	Possible Causes and Remedies
Pool: 7.6pH (7.6pH) pH Alert!Reset:Enter	**pH has been outside of Set Point for more than 4 hours of operation.** • Please refer to page 24 for a complete list of possible causes and remedies when the pH Alert message is flashing. • The **pH Drive** will not attempt any further acid addition until the alarm is cleared. Press **Enter** to clear the alarm after rectifying the issue.
Pool:13.0pH (7.6pH) pH is Out of Range	**pH reading is above pH12 or below pH2.** • This alert is displayed immediately if the pH reading goes outside the range of pH2 to pH12. A beeper also sounds. This alert can only be cleared when the pH returns to normal range. • Check the actual pH of the pool with an independent test. • Attempt to calibrate the **pH Drive** (see pages 25 and 26). • If calibration fails and the issue persists, the pH sensor may require replacement.
Reminder Messages	**Action Required**
pH Calibration Due	• This reminder is displayed 12 months after the last successful pH Calibration. Calibrate the pH Sensor as per pages 25 and 26.
Check Squeeze Tube	• This reminder is displayed when the peristaltic dosing pump has exceeded 50 hours of operation since the last time the peristaltic pump squeeze tube or cassette was changed. • Check the squeeze tube and change as per page 27 and 28.
General Messages	**Explanation of Message**
pH Drive S-Series v2.2 (c) 2024	• This message is displayed each time the **pH Drive** is switched on. • If you need to contact us for technical support, we may ask you the software version number ("v2.2" in this example).
Squeeze Tube:0:00Hr Calibrate in 365days	• This message is displayed each time the **pH Drive** is switched on, after the version screen above. • On this screen, the **pH Drive** displays the accumulated dosing pump operating time, and number of days since the last pH calibration.
Hardware Fail Messages	**Explanation of Message**
Int clock error Cancel: Restart	• The **pH Drive** has not been able to obtain data from the internal clock chip. • Press Cancel to restart, or switch the **pH Drive** off for 5 seconds, then back on again. If problem persists, return the unit for repair.
pH input error Cancel: Restart	• The **pH Drive** has not been able to obtain data from the pH input. • Press Cancel to restart or switch the **pH Drive** off for 5 seconds, then back on again. If the problem persists, return the unit for repair.

Mains Power Troubleshooting

Symptom	Possible Causes and Remedies

No power to unit, display is blank	**Circuit Breaker has tripped.**
	• Check the **pH Drive**'s Circuit Breaker. If the black button under the weatherproof cover has popped out, press it back in. Normal operation should be restored.
	 
	• If the Circuit Breaker continues to trip, it could be due to the following reasons:
	  • The total power load from the Pool Pump and Sanitising System exceeds 2280 watts (9.5 Amps). Please check the rating labels on your equipment. By law, the **pH Drive** may only be fitted with a 10 Amp breaker. If the total load exceeds this, please contact your Maytronics Authorised Dealer for further advice.
	  • The Pool Pump has a faulty start and run capacitor, which can cause the pump to draw excess power. A pool professional will be able to test the pump's capacitor.
	  NOTE: Testing the Pool Pump directly into a power outlet is not a valid comparison against the pH Drive's Circuit Breaker. Power outlets generally have 16 Amp or higher circuit breakers, which may not trip even if the Pool Pump has a faulty capacitor.
	  • If the Circuit Breaker continues to trip, even if the above items have been checked, please contact your Maytronics Authorised Dealer regarding return of the unit for repair.

No power to Pool Pump or Sanitiser System when output should be on.	**User Setting not correctly configured.** • Check that the displayed clock time is correct, especially not set incorrectly by 12 hours. • Try using the **Override ON** pool pump setting (see page 17). • Note that the Sanitiser System output starts 1 minute after the Pool Pump starts. • Contact your Maytronics Authorised Dealer for further advice.

IF YOU NEED TO RETURN YOUR **pH DRIVE** FOR SERVICE OR REPAIRS AT ANY TIME, PLEASE USE THE QUICK DOSE FUNCTION (PAGE 22) TO DOSE 1 LITRE OF FRESH WATER THROUGH THE SYSTEM BEFORE SENDING BACK. THIS WILL STOP ACID LEAKING FROM THE PUMP DURING TRANSPORT (WHICH WOULD DAMAGE YOUR UNIT OR THE PACKAGING, VOIDING WARRANTY), AND IS ALSO A SAFETY HAZARD FOR OUR TECHNICIANS.

Warranty

Maytronics Australia Pty Ltd ("Maytronics") guarantees the **pH Drive** Controller (including inbuilt peristaltic pump) to be free from defects in material and workmanship when subjected to normal use and service. This is a 2 year limited warranty, whereby the faulty device is returned to Maytronics, or Authorised Dealer, freight prepaid within two years from the date of purchase. The faulty device will be repaired and returned, free of charge.

Maytronics provides the same warranty for the pH Sensor, but limited to a period of one year from the date of purchase.

The squeeze tube inside the peristaltic pump, valves and fittings are not covered by this warranty.

Acid must be diluted as instructed. Wear and damage caused by the use of undiluted acid is not covered by this warranty.

There are no expressed or implied warranties which extend beyond the face hereof, and Maytronics is not liable for any incidental or consequential damages arising from the use or misuse of this product. This limited warranty does not apply to any injury, loss, damage, defect or malfunction of the product or failure to function resulting from any failure to operate the product in accordance with the directions contained in the operating instructions, failure to function resulting from any accidents, acts of God, tampering, abuse, acts, omissions, or negligence by anyone other than Maytronics, including but not limited to such damage or injuries resulting from improper installation. Damage from excessive concentration of one or more chemicals is not covered by this warranty.

This limited warranty shall apply only to the Customer as an original purchaser. It is the customer's responsibility to follow safety regulations and laws regarding electrical installation. Shipping damage is not covered by this warranty.

No claims will be recognised without the proof of purchase. This warranty becomes invalid if unauthorised person or persons attempt modifications or repairs.

Any dispute between customer and Maytronics must be conducted in Queensland, Australia.

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