pH Mini Controller

Installation and User Guide

Simple. Robust. Reliable.

- Measures pH
- Doses either acid (lower) or alkali (raise)
- Displays pH, Dose Count Total (DCT) and Dose Count per hour (DC/h)
- Direct drive dosing pumps (keeps costs down)

Contents

Important notice:
When using automatic dosing equipment, all chemicals must be in a form diluted state, especially acids and alkalis.

Acids and alkalis should be diluted to a maximum strength of 2% or less.

Introduction

The pH Mini Controller is from a family of monitors and dosers that have been proven over many years. This controller has built upon this pedigree of simplicity and innovative features.

Features

The pH Mini Controller may be used as a simple pH monitor. The addition of peristaltic pumps turns it into a complete control system capable of both raising or lowering pH.

Failsafe Dosing

Dosing may be inhibited if any of the following is detected:

- pH outside limits detected
- Dose count per hour exceeded (DC/h)

These are useful if a leak should develop or the pump fails and should prevent continuous dosing.

Alarms

The alarms can be enabled to operate on the controller when the pH or DC/h deviates outside the user setpoint.

Outputs

The 24VDC outputs allows direct drive of 24VDC peristaltic pumps. Always ensure that the current capability of the power adapter is greater than the current draw of the pumps. The pumps that we supply take a peak current of 1.2A. The controller is normally supplied with a 2.5A power supply.

Menu Structure and Settings

The menu structure of the pH Mini Controller is split into 2 sections - **Readings** and **Settings**. Toggling between the two menus is achieved by pressing the **Menu** button. Once in the **Readings** or **Settings** Menu, navigation is achieved through the **Up** and **Down** arrow keys. Settings may be changed by holding down the **Edit** button and then pressing the **Up** or **Down** arrow keys. The new setting is automatically saved when the edit button is released. Some **Readings** can be zeroed; to do this hold down the **Edit** button and then press the **Down** arrow.

Readings

Display pH

Display Dose Count Total (DCT)

Display Dose Count per Hour (DC/h)

Display System Status

Settings

S1	Set Point	The desired pH Level
S2	Dose Time (secs)	The time in seconds that the peristaltic pump will run to add acid (lower) or alkali (raise)
S3	Dose Interval	The time in minutes between doses to allow for mixing to occur
S4	pH Lower/Raise	This switches the controller to dose either acid (lower) or alkali (raise)
S5	Force Dose	This forces a dose to occur straight away
S6	Alarm Deviation	If the measured pH deviates from the setpoint by more than this value, the alarm will sound (if enabled)
S7	Alarm Dose Count	If the Dose Count per hour reaches this value then the alarm is sounded and the dosing is inhibited (if enabled)
S8	Alarm ON/OFF	This enables/disables the alarm functions
S9	Cal pH7	Calibrate using 7.0pH buffer
S10	Cal pH4	Calibrate using 4.0pH buffer

Dose Time and Dose Interval Timing

Dose times and interval are set by trial and error. The smaller the reservoir, the smaller the dose times need to be. The strength or concentration of your stock solutions will also affect the dose time setting. The stronger the stock solution, the shorter the time the pump runs. If you are using a small reservoir tank you must ensure that your stock solutions are very dilute.

Ideally, you would set the dose time to change the pH reading by 0.1pH per dose.

The dose interval is set to allow time for a dose to fully mix in before the controller makes the decision as to whether another dose is required. Normally set to 1 minute for a small tank and up to 10 minutes for very large systems.

Every system is unique and will have its own requirements. If you would like help to determine the best dose times and intervals, please contact support@autogrow.com.

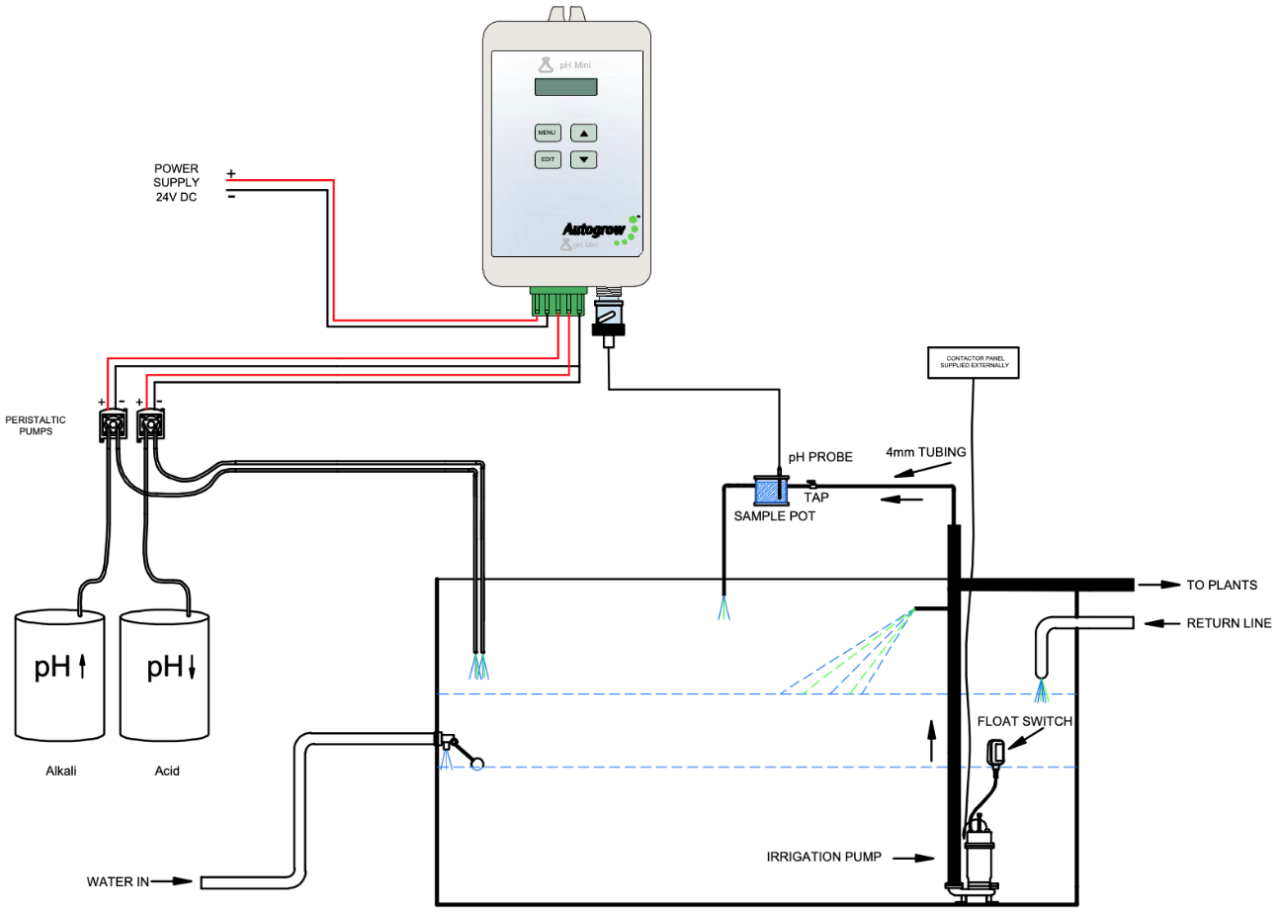
Installation

Mount the mini controller within 5 meters of the sample pot. It should be mounted in a cool, dry place out of direct sunlight. The sample pot is typically mounted just above the reservoir tank. This ensures the flow through the sample pot is unlikely to stop completely if there is a partial loss of pressure in the system (e.g. pump filter partly blocked).

Peristaltic Pumps

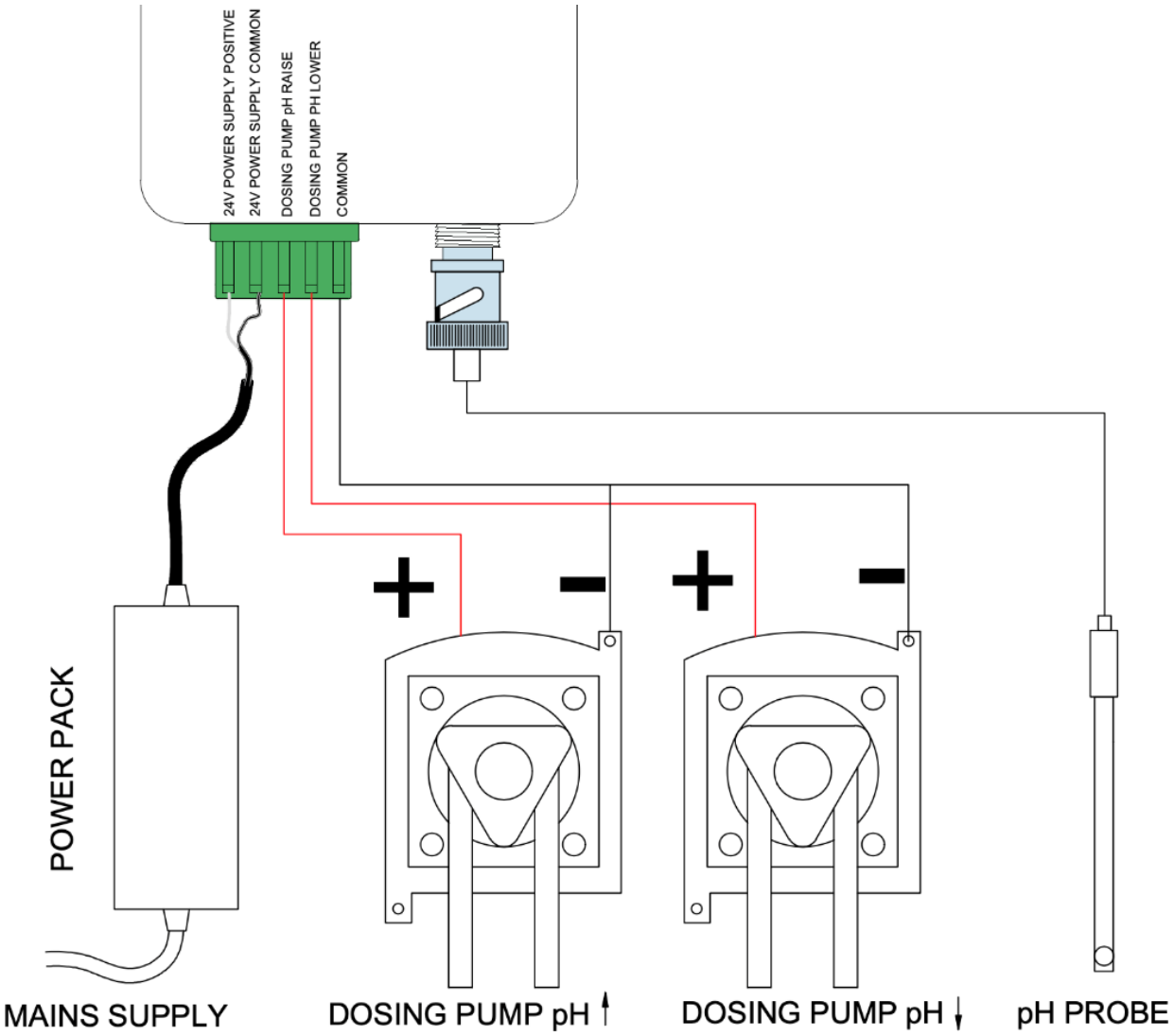
You can direct drive 24VDC peristaltic pumps from the controller, maximum current 2.5A.

Typical Installation using Peristaltic Pumps



Wiring Diagram

pH Mini Controller
(viewed from front)



Note: that all the connections marked **24V Common** are connected internally and you may connect the return wire from any pump to any of these commons. The 24V live wire is normally marked by a white stripe or white printing along its length.

Maintenance

Cleaning the pH Probe

The pH electrode is supplied with a protective cap or cover over its active end. Its purpose is to keep the glass bulb moist during storage and transit. This cover must be removed before use.

The glass bulb at the end of the pH electrode should be shiny and clear. If necessary, clean the glass bulb at the tip of the sensor with a very soft "child's" toothbrush or a special cleaning tool with a little liquid dish washing soap. The bulb is very delicate – **TAKE CARE**.

Note: the glass bulb on the end of the pH probe cannot go dry, it will ruin the probe. If you are not currently using the probe, please store in calibration solution or distilled water.

Calibrating pH

Every week you should check the pH calibration. To do this, place the probe in the pH7 buffer solution and allow to stand for 5 minutes. The reading should be 7.0 +/- 0.1pH. If not, navigate to the pH7 calibration screen, hold in the edit key and use the up/down arrows to correct the displayed reading. When the edit button is released the new calibration will be saved.

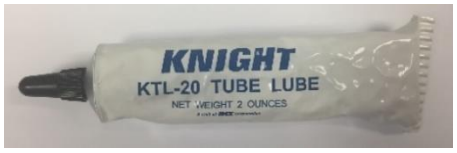
Next, rinse the probe in fresh water and shake off excess water. Now place in the pH4 buffer solution and allow to stand for 5 minutes. The reading should be 4.0 +/- 0.1pH. If not, navigate to the pH4 calibration screen to correct.

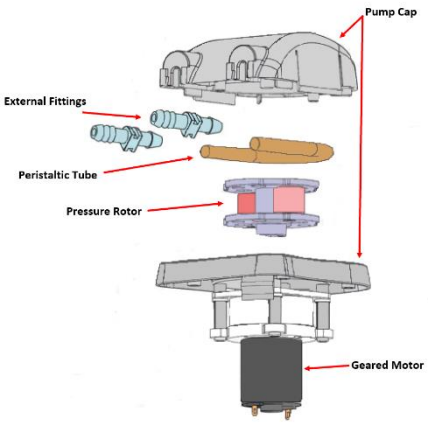
> Important Note:
>
> The pH7 calibration **MUST** be carried out before the pH4 calibration

pH probes typically last for between 6 months and two years. As soon as the probe shows signs of drifting or slow response it should be replaced. **Do not wait for it to completely fail!**

Peristaltic Pump Maintenance

These require very little maintenance. It is important to lubricate the inner peristaltic tubing every 3-4 months. Simply pinch the sides of the pump head to remove it from the motor. Put 2-3 drops of lubricant on the tube at each roller point. This lubricant can be purchased via your distributor.





General Maintenance

Frequently inspect your system for leaks, repair as soon as possible. Water dripping onto power supplies or pumps could cause them to fail. Ensure the controller, pump unit and power supply are kept clean and shielded from all water splashes and vapours.

Fault Finding

- **Unit is completely dead** – i.e. no display, no power light, no outputs. Check the power pack is functioning, (by measuring with a voltmeter if possible), is plugged in, switched on and properly connected to the controller. If unit still fails to function, the probability is the internal 4A fuse (20mm x 5mm miniature glass fuse) may have blown. Most likely cause is that wires connecting to the pumps have touched together and shorted out. To fix this it is important to clear the fault first. Inspect all wiring and ensure all wires are well insulated right to the point where they enter the terminal block. Then replace the fuse with a genuine 4A fuse. DO NOT ATTACH WIRE OR ALUMINIUM FOIL ACROSS IT.

- **Cannot calibrate pH.** - Ensure your calibration solution is new and has been stored at room temperature. NEVER reuse calibration solution. If the calibration solution is fine, you will need to replace the pH probe. Any pH probe with a standard BNC connector will do.

- **pH fails to dose** - Ensure that the controller is set for raise or lower to match the solution used. i.e. if you are using acid (pH down), set the controller to pH lower and ensure the pump is connected to the pH lower output.

- **pH overdoses -** Check that the controller is set for pH raise or lower as described in 4 above. Also, check that the dose time is not excessive. Each dose should change the pH by about 0.1pH

Specification

- 2 outputs for pH raise and pH lower
- Output voltage same as supplied voltage 12V to 24V AC or DC, normally 24V DC supplied (Please contact Autogrow before using an AC power supply)
- pH resolution and accuracy – 0.1 pH
- pH measurement range 2pH to 12pH
- Operating temperature range 0-45^{o}C, 32-110^{o}F (and not in direct sunlight)
- Dosing fail safe shut-off if pH below 4.5pH or above 8.0pH

In the box:

HKIT-PH-001-01

1 x pH Mini controller
1 x 24V DC 2.5A power supply with universal plug
1 x pH Probe
1 x Mounting hardware
1 x Instruction manual

HKIT-PH-002-01

1 x pH Mini controller
1 x 24V DC 2.5A power supply with universal plug
1 x pH Probe
1 x Mounting hardware
1 x Instruction manual
1 x Mini Peristaltic Pump 350ml/min

Warranty and Replacements

If you have equipment purchased from Autogrow and it has developed a fault, please complete this form so that our support staff can diagnose the problem.

- Visit this page for Terms and Conditions https://autogrow.com/terms-conditions
- Visit this page for the RMA Form https://autogrow.com/support-and-rma-form
- Contact the distributor you bought the product from.
- Contact support@autogrow.com

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