pH-Control 640

Instructions for Use

Ref: V3 Aug ' 15

Contents

Featuring V3 Programming

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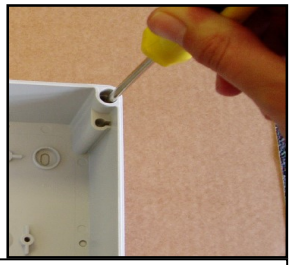
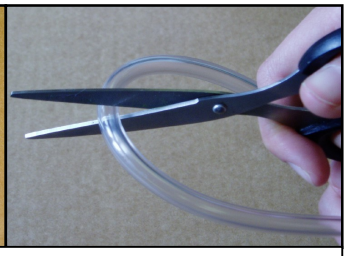
DS DOSING SOLUTIONS

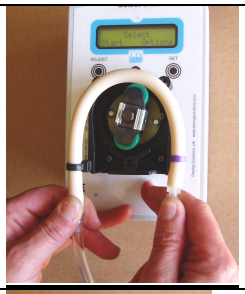
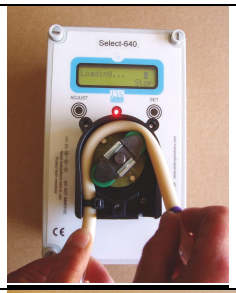
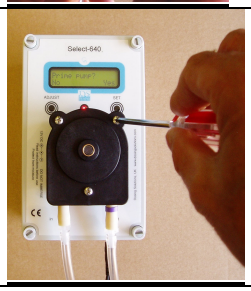
Quick Guide



Remove the cover of the pH Control Doser. **CARE: The lid is necessarily close coupled with the base.** Mount the doser base in a convenient position. Replace cover.



Unpack the 3m delivery tube. Cut the tube to appropriate lengths to suit suction from product stock container, and delivery to

Remove the 3 screws holding the pump cover in place and remove cover.		Using the tube connectors provided, connect the pump tube as shown.	
Place the tube restraint (black zip tie) in the left hand (IN) side restraint of the pump-head as shown. Select “Load tube? Yes from the screen controls.		With the rotor pulse turning, feed in the pump tube so that it lies horizontally in the pump-head and fully into the tube guides. **CARE – MIND YOUR FINGERS**	
Replace the pump cover and the 3 screws. The tube can be primed using the on-screen controls once the cover is re-fitted.			

Description

The pH-Control dosing system is a peristaltic pump designed to maintain a chosen pH level. Pumps are available to:

1. Increase or decrease the pH of a bulk liquid to a chosen pH level by the addition of either an alkali or an acid depending on the normal pH level of the bulk liquid.
2. Maintain a bulk liquid within a chosen pH range by the addition of either an acid or alkali (double pump-head version)

There are no user serviceable parts inside the PH Control doser.

Operating hints
The Select pH doser works best in an enclosed (recirculated) tank situation. It is a target pH that is being aimed for, this is best achieved with good mixing and a slow addition of either acid or alkalis.

Chemical Compatibility
Peristaltic pumps have the benefit that there is no contact between the dosed product and the pump mechanism. It is, though, advisable to check that there is good chemical compatibility between the pump tube and the dosed product. For commonly dosed products contact Dosing Solutions or the supplier of this equipment. For less common products, soaking a small section of pump tube in a sample of the dosed liquid for 48 hours should be sufficient. If no change in dimensions or appearance of the tube is detected after soaking, then the pump tube is compatible with the dosed product. Note: It is not normally possible to dose oil based products through a peristaltic pump using standard pump tubes.

Changing Pump Tubes
The wearing part of a peristaltic pump is the pump tube. Changing the pump tube regularly (monthly to begin with) will ensure trouble free dosing. Failure to change pump tubes will result in the tube splitting and causing the pumped product to spill.

ENSURE EITHER THE POWER SUPPLY IS DISCONNECTED BEFORE CHANGING
THE PUMP TUBE.
OTHERWISE ROTOR TURNING IS POSSIBLE

Removal of pump tube - Unclip the pump tube at the inlet. Lift out the pump tube whilst rotating the pump rotor by hand in a clockwise direction. When the pump tube is clear of the rotors, unclip the pump tube at the outlet.

Installing new pump tube – See above.

Ensure that all connectors between the pump tube and delivery tubes are securely fitted. If necessary warm the delivery tube with warm water to soften it to make fitting more easy.

Pump Tube Life
The life of the pump tube will depend on many factors including the product being dosed, the back pressures under which the pump is working, and the amount of time the pump needs to run to perform correctly. It is suggested that, in order to maintain dosing accuracy, the pump tube is replaced on a MONTHLY BASIS or sooner if wear or disfiguration of the tube is apparent. Spare tubes are available from your pump supplier. Note: Only tubes supplied by Dosing Solutions Ltd are recommended for use in the pH-Control dosing system to ensure accuracy of operation and longevity of the pump.

Safety
The PH Control doser is an extremely safe unit. However, the following points should be observed:

Normal electrical safety precautions apply. Avoid water contact with any pump parts apart from the pump tube in normal working. Do not immerse the pH-Control doser.

Take precautions to ensure the pH-Control doser can not fall into liquid tanks. Consider extra tethering if necessary. If immersion does happen accidentally, isolate the pH-Control Doser from the electrical supply immediately.

The use of safety circuit breakers is recommended. If in doubt seek advice from a qualified electrician.

Accuracy
The pH Control doser is designed to give accurate dosing. However, accuracy will depend on regular calibration of the pH probe using fresh buffer solutions.

It is the responsibility of the user to ensure that the pH–Control unit is performing accurately.

Electrical Supply
The PH Control doser uses a 12V DC power supply. This can either be supplied from a 12V battery or via a transformer power supply from the mains electricity supply.
A 5.0A maximum current power supply is recommended.

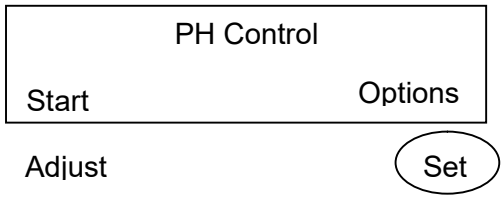
Options

Calibration

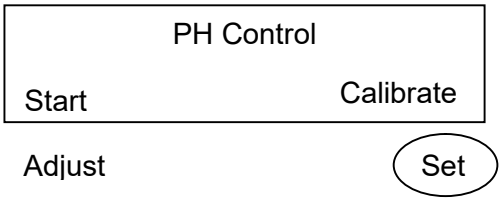
Accuracy of dosing depends on regular calibration of the pH probe. Although high quality probes are supplied with the pH-Control doser that should hold their calibration for several months, it is advisable to calibrate the probe frequently depending on the level of accuracy required.

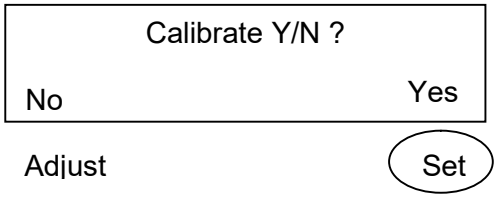
Use only fresh buffer solutions for calibration.

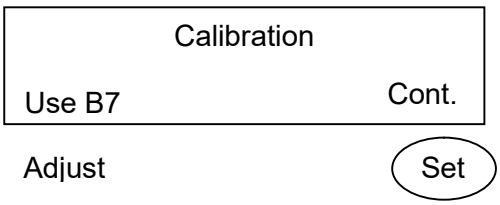
From the Welcome Screen, go to Options (press Set) and Calibrate (press Set)



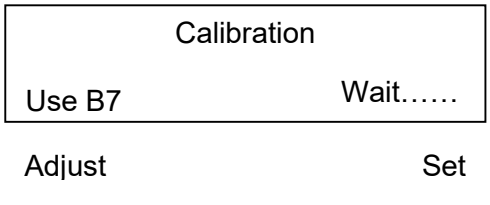
The welcome screen

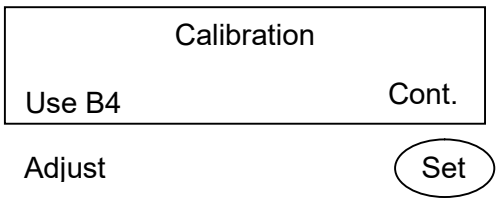






Insert the pH electrode into pH 7.0 buffer solution before pressing “Cont.” The following screen will appear whilst the electrode is being calibrated against the pH 7.0 buffer solution:



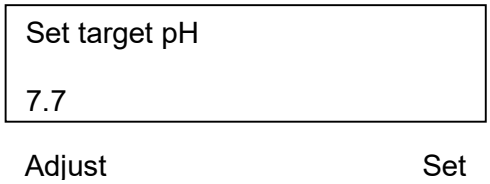


Insert the pH electrode into pH 4.0 buffer solution before pressing “Cont.” The following screen will appear whilst the electrode is being calibrated against the pH 4.0 buffer solution:

Once the pH 4.0 calibration is complete, the next screen to be shown is the Welcome Screen.

The Select pH dosers are calibrated before despatch.

Target pH
From the Welcome Screen, press “Options” (Calibrate will be shown), press “Adjust” and “Set Target pH” will be shown. Press “Set”.



Press “Adjust” to scroll through pH values from 1.0 to 13.9. Choose the pH value:

When the desired value is shown, press “Set”.

Acid or Alkali Dosing (Mode)
From the Welcome Screen, press “Options” (Calibrate will be shown), press “Adjust” and “Set Target pH” will be shown. Press “Adjust” and Operating Mode option will be shown. Press “Set”.

The pH Control doser needs to be set to either:

- Dose alkali into a normally acid bulk liquid. This is termed **Active Low** as the pump will be active when the pH in the bulk liquid is lower than the Target pH.
- Or to dose acid into a normally alkali bulk liquid. This is termed Active High as the pump will be active when the pH in the bulk liquid is higher than the Target pH.

Press Adjust to display either “Active Low” or Active High”, then press Set to select the Mode required.

Measurement Type
There are two measurement types – Direct and Average.

If Direct is selected, the doser will take an instantaneous reading from the pH electrode and use this to calculate dosing.

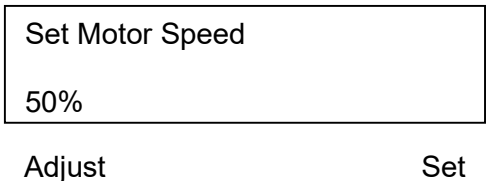
If the Average type is selected, the doser uses a rolling average of electrode pH readings taken over the previous 30 seconds. This method has a dampening effect on the doser performance that may be useful in some situations.

From the Welcome Screen, press “Options” (Calibrate will be shown), press “Adjust” and “Set Target pH” will be shown. Press “Adjust” and Operating Mode option will be shown, Press “Adjust” and Measurement Type option will be shown. Press “Set”. Chose between Direct and Average by toggling using the Adjust button.

Pump Speed
The rate of pumping of the pH-Control doser to return a bulk liquid to the desired pH will be determined by the specific requirements of the process. Output graphs for each of the 4 coloured pump tubes are shown below and in the Quick Guide on Page 2. In order to maximise the life of the pump motor as far as possible, select a tube colour so that a motor speed of between 20% and 80% can be used.

If a pumping rate of greater than 13.5 litres per hour is required the pH-Control 800 Series pump is available with pumping rates available up to 90 litres per hour. Consult your Distributor.

From the Welcome Screen, press “Options” (Calibrate will be shown), press “Adjust” (Set Target pH) will be shown, press “Adjust” (Set Mode option will be shown), press “Adjust” and Measurement Type option will be shown, press “Adjust and “Set Pump Speed” option will be shown.. Press “Set”:



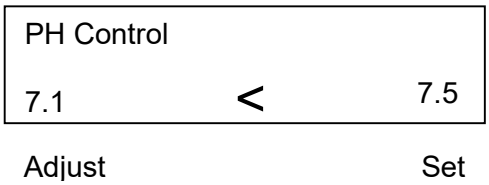
Press “Adjust” to select the motor speed required. Then press “Set”. The Welcome Screen will be shown. Note: the motor speed can be set between 20% and 100%. Less than 20% is not available to prevent the motor stalling.

The following chart gives the output of the pump when the motor is running at 100% speed. The output also varies with the colour pump tube fitted.

Pump Tube Colour	Priming pump rate 20 to 100%
Purple	7.2 to 36 l/hr
Grey	14 to 76 l/hr

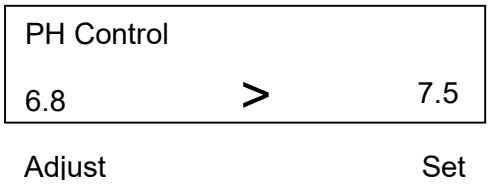
Operation
Press “Start” from the Welcome Screen.

If the Active Low operating mode has been chosen, the screen will look similar to:



The Target pH is 7.5. The actual pH detected by the pH probe is 7.1. Therefore, the pump motor will be running. The inlet to the pump should be in an alkali product to increase the pH of the bulk liquid. When the pH of the bulk liquid reaches the target pH, the pump will stop. The Actual pH will continue to be monitored so that the pump can start pumping again when the pH drops below the Target pH (in fact it will start pumping again when the pH drops to 7.3 to avoid the hysteresis effect).

If the Active High operating mode is selected, the screen will look similar to:



The Target pH is 7.5. The actual pH detected by the electrode is 6.8. The Mode is chosen as Active High, the motor will only run when the pH detected by the electrode is higher than the Target pH, therefore the motor will not be running in this case.

When the pH of the bulk liquid rises above 7.5 the pump will start to run and acid should be dosed to reduce the pH of the bulk liquid to below 7.5.

Water Line Pressure
The Select-640 doser will operate against a water pressure in the drinking line of up to 3 bar. (3 bar = 43.5psi = 99ft H_2O = 30.6m H_2O). Fit a pressure reduction device if necessary. The flow sensor is rated to 6 bar.

The standard pH electrode sold by Dosing Solutions is a low pressure (<0.1 bar) sensor. High pressure electrodes are available.

Installation
Connect the pH electrode to the lower BNC socket only (as shown in pictures above). The upper socket is used for through flow pH correction only.

The PH Control doser can be powered from a 12V DC battery or via a transformer from the mains electricity supply. Position the doser so as to be convenient for both a power source if power is to be taken via a transformer from the mains, and to the bulk liquid to be treated. Ensure that the pH-Control doser is properly secured to prevent it becoming immersed in water or stock additive solution.

Note: The pump will self prime. The pump can also be run dry without damaging any parts although it is not recommended to run the pump dry for extended periods.

Consider wiring the power supply for the doser so that the doser is activated when a circulation pump is also active. This may prevent dosed product collecting in a concentrated are without proper mixing.

It is also possible to link the pH-Control doser to other sensing devices (e.g. a float switch) to ensure the doser only functions when other criteria (e.g. tank level) are correct.

Pumping Problems / Errors

If the pH-Control doser fails to operate correctly, check the following: (If the problem can not be resolved contact your Distributor)

Problem	**Solution**
Product not being pumped from stock container.	1. Check all tube connections are firmly in place. 2. Inlet tube could be blocked. Clear as necessary. 3. tube connector on the suction side of the pump tube could be damaged allowing air to be sucked in. Replace tube connector.
Sudden loss of pumping pressure (with possible return of fluid into stock container)	1 Check if there is any lateral movement in the rotor. It is possible the rotor shaft bearings may have worn. Consult Distributor. 2 Check for physical damage to pump head fixing screws. If the pump head is loose, pressure will be lost. DO NOT OVER-TIGHTEN FIXING SCREW 3 If non-return valve is fitted into delivery line, check that it is functioning correctly.
Dosing does not commence	1. Is power supply sufficient? Connected 2. Is the correct Mode selected? 3. Is the electrode connected?

Maintenance

Weekly

Inspect the pump tube for signs of wear.
Check doser output. Adjust as necessary via the control screen.

Monthly

Replace pump tube monthly or sooner if any of the following occur:

- Sharply increased rate of dosing
- Split tube

Each 6 Months

After disconnecting from electric supply, remove cover from pH-Control doser and inspect interior of pump enclosure. Ensure no ingress of moisture or other contaminant. In case of difficulty, contact your supplier.

There are no user-serviceable parts within the pH-Control doser case. Any maintenance of working parts within the case should be carried out by an authorised service agent.

Spare Parts and Accessories

Item		**Code**
pH-Control doser 640	Unit	730CA64
pH electrode	Unit	710CA00
pH electrode extension lead	Unit	710CA05
Replacement pump tube pack – 5 tubes	Purple	011CA48/REP
Replacement pump tube pack – 5 tubes	Grey	011CA63/REP
Delivery tube (low pressure)	30m	155CA48
Inlet tube (3m) plus end weight	unit	152CA05
Quick-fit male/female connector	unit	153CA02
Sachet of pH 4.0 buffer solution	25ml	720CA04
Sachet of pH 7.0 buffer solution	25ml	720CA07
Bottle of pH 4.0 buffer solution	460ml	720CA14
Bottle of pH 7.0 buffer solution	460ml	720CA17