

DAVEY

Davey pH Peristaltic Pump

Model: M5138

Installation and Operating Instructions



WARNING: Failure to follow these instructions and comply with all applicable codes may cause serious bodily injury and/or property damage.

The installation of this product should be carried out by a person knowledgeable in swimming pool plumbing requirements following the installation instructions provided in this manual.

Please pass these instructions on to the operator of this equipment.

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In accordance with AS/NZS 60335.2.41 we are obligated to inform you that this pump is not to be used by children or infirm persons and must not be used as a toy by children.

1. Warnings and Tips

Please read the warning notices very carefully because they provide important information regarding safety in installation, maintenance and use of the pH pump.

- Keep this manual in a safe place, so that it will always be available for further consultation
- The device complies with EMC:2004/108/EEC “electromagnetic compatibility” and LVD:2006/95/EC “low voltage” and also the subsequent modifications.

Note: Please install and operate this product in conformance with these instructions to ensure a long, reliable product life.



WARNING Any modification or repair to the pump must be carried out by qualified and authorised personnel. Failure to observe this requirement may compromise warranty provisions - see terms and conditions at the end of this document.

1.1 Proper use of the Pump

The pump should be used only for the purpose for which it has been expressly designed namely the dosing of liquids. Any different use is to be considered dangerous. The pump should not therefore be used for applications that were not allowed for in its design. In case of doubt, please refer to the details listed within this document, or contact your point of purchase or Davey Water Products for further information. Davey Water Products will not be liable for damage deriving from improper, erroneous or unreasonable use of the pump.

1.2 Safety

- After unpacking the pump, ensure that all components are in good order and parts listed are all included as per the list of inclusions contained in this document. In case of damage of missing parts contact your Davey dealer before using the product.
- The packing materials (plastic bags, polystyrene, etc.) should be kept out of the reach of children: As they may constitute a potential choking hazard.
- Before you connect the pump make sure that the voltage ratings correspond to your particular voltage supply. You will find this value on the rating plates attached to the pump
- The electrical installation to which the pump is connected must comply with the local standards enforced in the applicable state or country

Before carrying out any service on the pump:

- 1) Disconnect the mains power from the unit and
- 2) Relieve all the pressure from the pump head or the injection tube

In the event of possible fluid leakage from any part of the pump (breakage of the O-ring, the valves or the hoses), stop the pump immediately and contact your Davey dealer.

1.3 Toxic and/or Dangerous Liquid Dosage

To avoid risk from contact with hazardous liquids or toxic fumes, always adhere to the notes in this instruction manual and wear protective clothing (gloves, goggles & overalls).

- Follow the instructions of the dosing liquid manufacturer
- Check the tubing regularly and use only if there is no damage
- Contact your Davey dealer for technical assistance for any necessary repairs and insist on the use of original spares
- Before disconnecting the metering pump, make sure to flush out and neutralise the pump head with water

1.4 Instructions for diluting pool acid

The ChloroMatic Salt Water Chlorinator with pH control, automatically doses a diluted acid solution into the pool when the pH level needs to be reduced. The peristaltic pump draws this diluted acid from a container in which the solution is mixed.

Use the table below to determine what water/acid ratio is recommended for your pool, in an approved 20 litre Hydrochloric Acid container.

IMPORTANT:

**KEEP BARE HANDS AWAY FROM POOL ACID AND ALWAYS
USE CAUTION WHEN HANDLING POOL CHEMICALS.**

Pool Size	Recommended Water/Acid Dilution Ratio		Volumes for a Suitable 20 Litre Container	
	Water (parts)	Acid (parts)	Water (Litres)	Hydrochloric Acid (litres)
Up To 100,000 litres	5	1	17	3
Above 100,000 to 160,000 litres	3	1	15	5

Note: These ratios are based on Hydrochloric Acid strength of 28% and should not be any greater than this percentage.

Please ensure that you keep the storage area of the acid well ventilated and ensure you use a suitable container with resistance to Hydrochloric Acid. These containers can be purchased at pool stores.

2. Pump Description

The Davey Peristaltic pump is designed for adjusting the pH of pool water by injecting a dilute acid into the pool filtration return to pool pipeline. The system includes a probe which must be installed correctly into the pool filtration pipeline. This probe can measure pH values from 0 through to 14.

Most pool water should have a pH of between 7.2 and 7.6 - note small variations to this figure depending on pool surface finish apply. The acid dosing is designed to drop the value of pH to acceptable levels.



Power supply: 230V~
Power: 10W
Max flow rate: 1.5 l/h

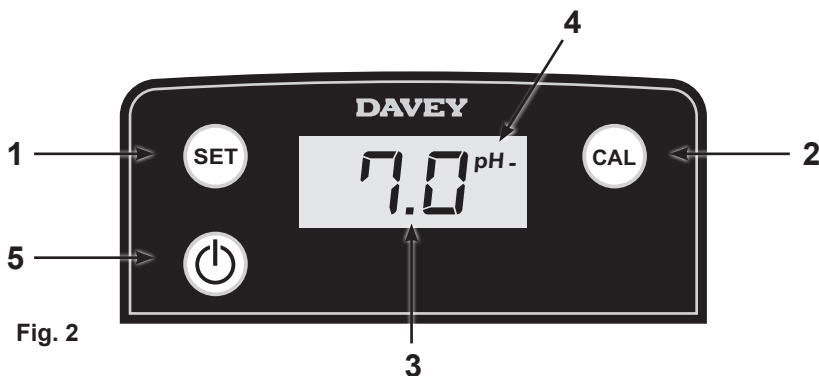
2.1 Parts description

The Davey pH Peristaltic Pump comes with the following parts, all parts will be necessary for the proper operation of your device.



- | | |
|--|--------------------------------|
| A. Peristaltic pump | G. Clamp DN50 x 2 |
| B. 4 meters of PVC Cristal tube | H. Foot filter |
| C. Screws for wall mounting | I. Injection valve |
| D. Masonry plugs for wall mounting | J. Inline electrode holder |
| E. Electrode/pH Probe & Protective Cap | K. Buffer solution pH7 |
| F. Clamp DN40 x 2 | L. Shutter washer |
| | M. Controller mounting bracket |

2.2 Buttons Description



1. Press **SET** to see and adjust the set point.
2. Press **CAL** allows calibration of the pH to pH 7.0 when using the buffer solution pH7.
3. Current value of pH being measured, eg 7.0
4. pH - unit of measurement and indicates that the device must inject acid.
5. On/off button to turn on the device. When held down, primes the pump.

3. Installation Recommendations

3.1 Recommendations

- Install the pump in a dry place and well away from sources of heat and in environments not exceeding 40°C. The operating minimum temperature depends on the liquid to be pumped, bearing in mind that it must always remain in a liquid state
- Carefully observe any standards in force in your state, territory or country, as to electrical installation regulations and requirements
- N.B. The Davey pH pump should be in operation only when your filtration pump is running



WARNING

- It is important to keep a minimum installed distance of 200mm between the injection valve “E” and the probe “C”
- The injection valve “E” must be placed last in the pipework
- In the case of an installation with redox and pH regulation, it is advised to put the two sensors side by side and the pH injection before chlorine injection to minimise the risk of scale deposition on the chlorine injection port
- For optimal service life of your peristaltic pump tube, it is advised not to exceed a pressure of 7kPa (1 psi) and under no circumstances exceed a pressure of 10kPa (1.5psi)
- The pH probe must be located before any other device such as a heater or an salt chlorinator

3.2 Mounting Instructions

3.2.1 Bracket

1. Locate the bracket in the space chosen and mark the holes
2. Drill the holes as required
(3mm for timber walls & 6mm for masonry walls)
3. Fix the bracket to the wall
4. Slide and secure pump into the bracket

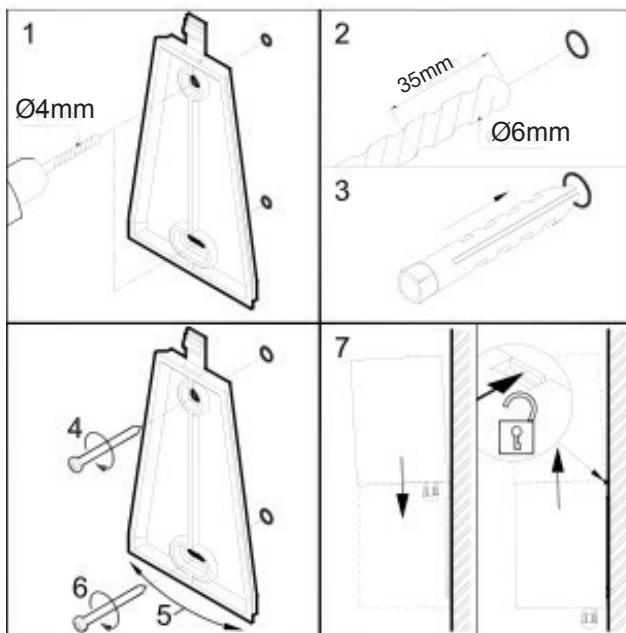


Fig. 4

3.2.2 Mounting of the Probe clamp

Choose a mounting location on your pipework that is:

1. Prior to your salt cell
2. BEFORE the placement of the acid injection point

3. Ensure the probe clamp lead is within reach of the pH pump controller

Pierce the top wall of the pipe work through the clamp:

- Ø 14 mm for the electrode/pH probe.

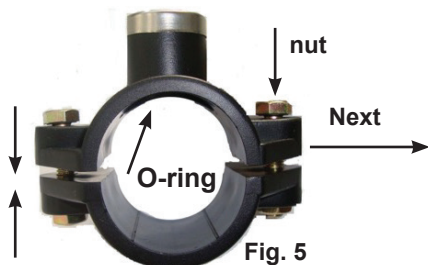


Fig. 5

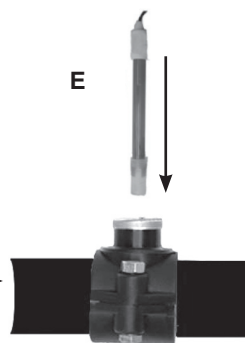


Fig. 6

3.2.3 Mounting of the pH Probe into the Probe Holder

After removing the protective cap from the probe, you need to ensure all the parts are as shown in the Fig.7.

Once the probe assembly has been constructed as indicated in Fig.7, loosely tighten the nut so that the probe position is still free to be adjusted. Push the probe approximately 20mm into the pipe work so that the probe tip is approximately halfway into the pipe work. Tighten the probe nut without crimping the probe body. Connect the probe lead to the BNC terminal on the pump. (Fig.8)

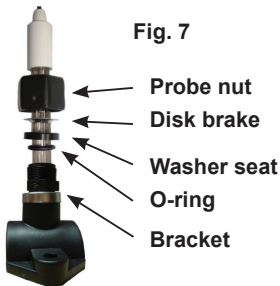


Fig. 7

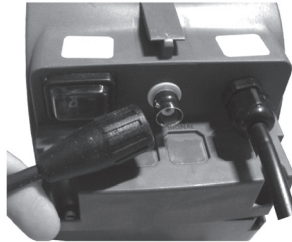


Fig. 8

3.2.4 Mounting of Injection Valve

Choose a mounting location on your pipework that is:

1. Prior to your salt cell
2. AFTER the placement of the probe clamp
3. Ensures the probe clamp lead is within reach of the pH pump controller.

Pierce the top wall of the pipe work through the clamp:

- Ø 8mm for the injection valve

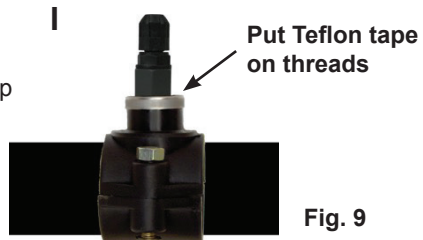
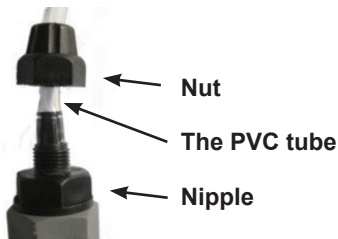


Fig. 9

3.2.5 Mounting of the tube into the Injection Valve



ensure no leaks from fittings



Fig. 10

The hydraulic hose is placed in the same way on the foot filter and on the pump.

1. Slide the tube through the nut
2. Put the tube at the bottom of the conical nipple
3. Screw the nut by hand onto the nipple

4. Connecting the power and pool pump to your

Connection diagram for the Davey pH Pump System

The Davey pH pump system should ideally be plumbed and connected up as shown in the diagram below.



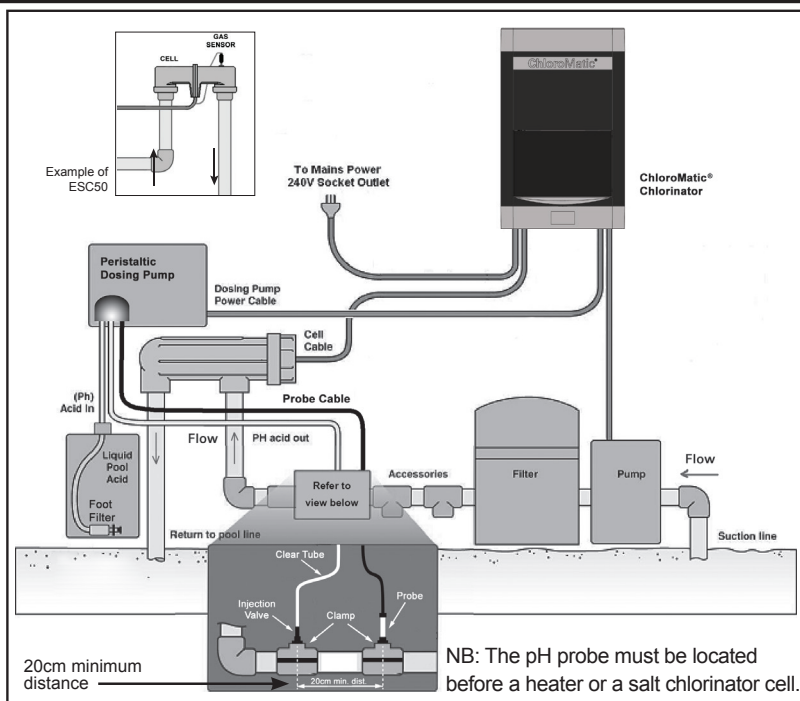
Never connect your pH pump direct to mains power. Always connect it to the chlorinator power supply so it operates during the preset filtration time cycles.



ATTENTION: The acid drum should be located at least 2 meters from any other pool equipment. If the acid drum is located inside a room or an area with limited ventilation then a vent hole needs to be drilled in the lid and tubing run out to open area.

Davey recommends the use of low fuming pool acid.

Acid fumes will damage equipment and will not be covered by warranty.



If your pool pump is plugged into your Chlorinator:

1. Remove the pump plug from the Chlorinator pump power socket. (Usually at the bottom of the Chlorinator)
2. Plug the 3 pin male piggy back plug on your pH pump into the Chlorinator pump power socket.
3. Plug your pool pump into the female piggy back socket on the back of the pH pump power socket.

5. Commissioning and Operation

5.1 Calibration Procedure

This operation is used to set the sensor response reading of the pH and peristaltic pump.

Before carrying out the calibration of the probe, remember to:

- Stop the filtration pump
- Close the isolation valves, if fitted
- Relieve all water pressure in the pipeline prior to undoing any pipe fittings
- Remove the probe from the probe holder
- Put the shutter washer (fig. 11) in to close off the hole in the probe holder
- Open the isolation valves, if fitted
- Turn on the filtration pump and check that the ON/OFF switch (I/O) of the Davey pH pump is switched to "I"
- Carry out the calibration of the probe and repeat the previous actions to put the probe back in place. As described in 3.2.4

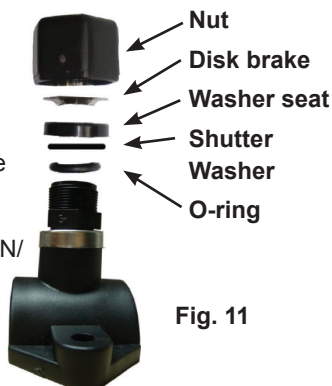


Fig. 11

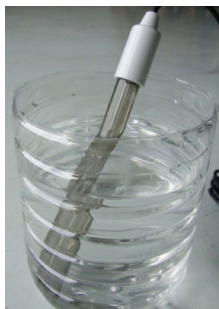
Some important points

- To ensure the probe signal remains as accurate as possible, please follow the procedure as listed below during the commissioning of the pool and every 3-4 weeks thereafter, or as required.
- The recalibration process is important to ensure all readings are appropriate and correct for best pool chemistry management.

Steps:



1) Remove the protective cap of the probe and keep it for reuse at the time of winterising



2) Rinse the probe in tap water for at least 20 minutes



3) Next immerse the probe in the pH 7 solution, stir around in bottle and leave it in the solution being careful not to touch the probe or the cable.



4) After a period of at least one minute, the calibration value is displayed. Press the CAL button until the display shows CAL flashing then release. The value of the probe reading is then briefly displayed.

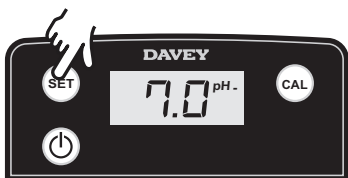
The calibration of Davey pH pump is completed; It is now ready to measure the pH of your pool.

5.2 Settings

Functions	Factory Settings
Unit of measure	pH
Set point	7.4
Type of regulation	Acid- reduce the pH by dosage of an acid (pH-)
pH 7 calibration	To an accuracy more than 0.2 pH
Proportional regulation*	Factory function

* Proportional: The Davey Peristaltic pump will automatically increase dosage rates depending on pH readings. The closer the reading gets to the setting, the slower the pump will operate.

5.2.1 Adjustment of the Set Point



Pressing the SET button displays the current set point value.



To change the value of the set point, press SET and press CAL by pulse. Each pulse changes the pH value by 0.1 pH, between 7.0 and 7.6.

5.3 Operating Principle

The Davey Peristaltic pump adjusts its dosage in proportion to the demand. It will dose less if the displayed measure is near the set point.

In normal operation, the Davey Peristaltic pump will increase its 'non operational' time period proportional to the required dosage demand. That is why the device often has the pump off. **This is normal.**

Adjust the pH slowly to preserve the natural quality of your water.

After 30 minutes without pressing the keys, the backlight turns off to save energy. A short press on **SET** or **CAL** turns it on again.

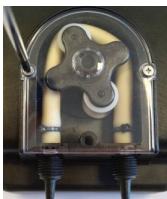
6. Maintenance

6.1 Replacement of the Peristaltic Tube



NOTE: Prior to tube replacement ensure all pipelines are relieved of pressure, pumps are turned off and all acid flushed from tube.

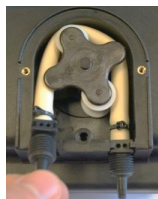
Follow steps 1 to 9 as shown



1.



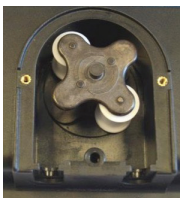
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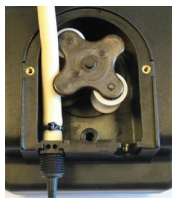
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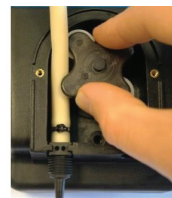
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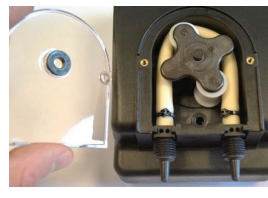
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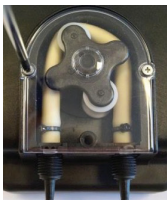
6.



7.



8.



9.

6.2 Maintenance of the Peristaltic Tube and Roller Holder

The Peristaltic Pump uses a roller holder and a “squeeze” tube to pump the acid into the pool. This tube is perishable and must be replaced periodically. We recommend replacement approximately once per year. The tube should be visually inspected regularly for leaks or damage. It is recommended that the roller holder be periodically inspected and replaced every 2 years.

6.3 Maintenance of the probe

Over time, in addition to the normal wear of the probe, according to use and water quality with reference especially if the water is more or less calcareous, measurement accuracy will deteriorate. A thin layer of limestone or calcium scale with other elements present in the pool water will deposit on the sensing element of the probe. To overcome this problem, it is advisable to use the cleaning solution for electrode/pH probe and redox AYACSOLNET01 or similar and follow the procedure on the suppliers' bottle.

6.4 Controller Wintering

Only in areas where subzero temperatures are experienced

- During winterising, you must protect the peristaltic tube
- It is advisable to remove the peristaltic tube and flush it with fresh water. Once complete ensure the tube is completely dry and re-install as shown on page 12, section 5.1, figure 11.

6.5 Probe Wintering

- During winterising, the probe must be removed from of the installation and pipe work
- The protection cap as shown on page 12, must be filled with fresh water a 1/3 of the way up
- Place the probe into the protection cap and water and store in a safe place until after the winter period is over. (Re-install as shown on page 10, figure 8)

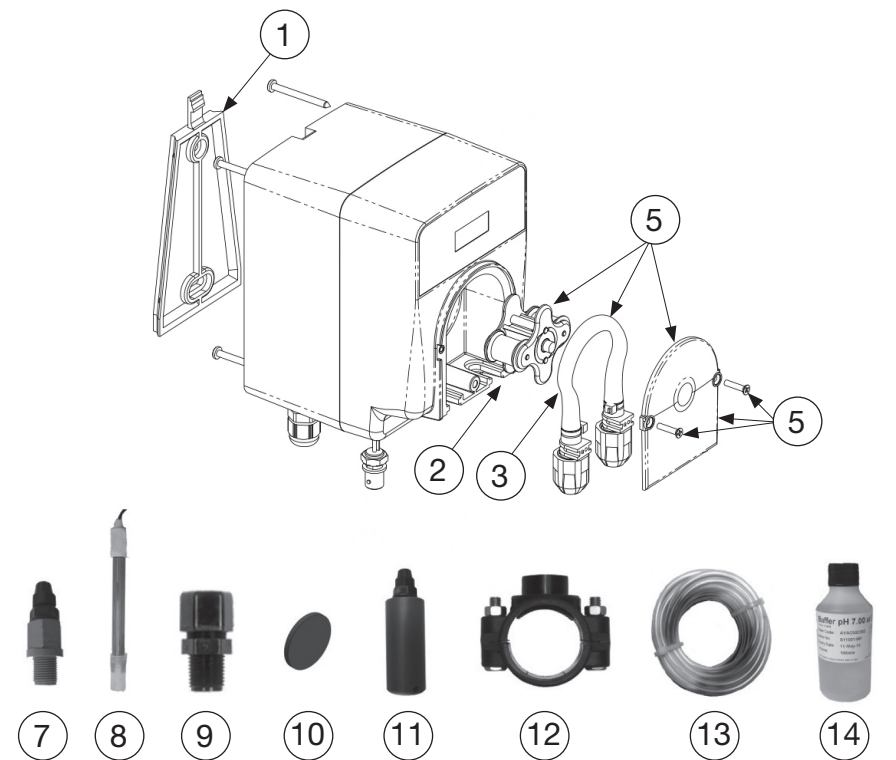
7. Trouble Shooting

Error	Reasons	How to solve it
CAL Err	If this error is displayed during the calibration phase and cycle it is as a result of: 1) Your pH probe is not working properly 2) Your buffer solution is polluted 3) You have water/oxidisation in the probe connector	1) Change the probe 2) Change the buffer solution 3) Change over the probe
Alarm Alr Err	If the pH is lower than pH 5 or above pH 9, this alarm will be displayed and dosing will be stopped.	Adjust your water parameter manually so that it comes back to the required value of these parameters: - Total alkalinity - TH (hardness) - pH The dosing pump will restart as soon as the pH reading

If trouble persists, please contact your nearest Davey Dealer for assistance (see back page).

8. Spare Parts

PH Peristaltic Dosing Pump	M5138
Notes: A. Items only required in units manufactured Post March 2018. Check serial number for manufacture date. The 2 numbers are the year of manufacture & the letter refers to month of manufacture (A=Jan, B=Feb etc).	
B. For units manufactured Post March 2018, the roller assembly can only be purchased as a kit.	



ITEM	PART NO.	DESCRIPTION	NOTE	QTY REQ'D
1	403462	Bracket (Post Mar 18 only)	A	1
2	402803	Roller assy (Pre April 18 only)		1
2		Roller assy (Post Mar 18 only)	B	1
3	402802	Squeeze tube assy inc clips (Pre April 18 only)		1
3		Squeeze tube assy inc clips (Post Mar 18 only)	B	1
5	403464	Kit: roller assy + probe holder + front cover + squeeze tube	B	1
7	402611	Injection valve		1
8	402609	pH Electrode		1
9	402614	Probe Holder		1
10	402615	Shutter		1
11	402610	Foot Filter		1
12	402612	Saddle clamp (suits 40mm PVC)		1
12	402111M	Saddle clamp (suits 50mm PVC)		1
13	402608	Tube 4m x 6mm PVC Cristal		1
14	402613	Buffer solution pH7		1
NOT SUPPLIED		Storage liquid for probe pH-RX 100mL		1
NOT SUPPLIED		Cleaning solution for probe pH-RX 250mL		1

Davey Warranty

Davey Water Products Pty Ltd (Davey) warrants all products sold will be (under normal use and service) free of defects in material and workmanship for a minimum period of one (1) year from the date of original purchase by the customer as marked on the invoice, for specific warranty periods for all Davey products visit daveywater.com.

This warranty does not cover normal wear and tear or apply to a product that has:

- been subject to misuse, neglect, negligence, damage or accident
- been used, operated or maintained other than in accordance with Davey's instructions
- not been installed in accordance with the Installation Instructions or by suitably qualified personnel
- been modified or altered from original specifications or in any way not approved by Davey
- had repairs attempted or made by other than Davey or its authorised dealers
- been subject to abnormal conditions such as incorrect voltage supply, lightning or high voltage spikes, or damages from electrolytic action, cavitation, sand, corrosive, saline or abrasive liquids,

The Davey warranty does not cover replacement of any product consumables or defects in products and components that have been supplied to Davey by third parties (however Davey will provide reasonable assistance to obtain the benefit of any third-party warranty).

To make a warranty claim:

- If the product is suspected of being defective, stop using it and contact the original place of purchase. Alternatively, phone Davey Customer Service or send a letter to Davey as per the contact details below
- Provide evidence or proof of date of original purchase
- If requested, return the product and/or provide further information with respect to the claim. Returning the product to the place of purchase is at your cost and is your responsibility.
- The warranty claim will be assessed by Davey on the basis of their product knowledge and reasonable judgement and will be accepted if:
 - a relevant defect is found
 - the warranty claim is made during the relevant warranty period; and
 - none of the excluded conditions listed above apply
- The customer will be notified of the warranty decision in writing and if found to be invalid the customer must organise collection of the product at their expense or authorise its disposal.

If the claim is found to be valid Davey will, at its option, repair or replace the product free of charge.

The Davey warranty is in addition to rights provided by local consumer law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

For any internet connected products the consumer is responsible for ensuring a stable internet connection. In the event of a network failure the consumer will need to address the concern with the service provider. Use of an App is not a substitute for the User's own vigilance in ensuring the product is working to expectation. Use of a Smart Product App is at the User's own risk. To the fullest extent permitted by law Davey disclaims any warranties regarding the accuracy, completeness or reliability of App data. Davey is not responsible for any direct or indirect loss, damage or costs to the User arising from its reliance on internet connectivity. The User indemnifies Davey against any claims or legal actions from them or others relying on internet connectivity or App data may bring in this regard.

Products presented for repair may be replaced by refurbished products of the same type rather than being repaired. Refurbished parts may be used to repair the products. The repair of your products may result in the loss of any user-generated data. Please ensure that you have made a copy of any data saved on your products.

To the fullest extent permitted by law or statute, Davey shall not be liable for any loss of profits or any consequential, indirect or special loss, damage or injury of any kind whatsoever arising directly or indirectly from Davey products. This limitation does not apply to any liability of Davey for failure to comply with a consumer guarantee applicable to your Davey product under local laws and does not affect any rights or remedies that may be available to you under local laws.

For a complete list of Davey Dealers visit our website (daveywater.com) or call:

DAVEY

Davey Water Products Pty Ltd
Member of the GUD Group
ABN 18 066 327 517

daveywater.com

NEW ZEALAND

7 Rockridge Avenue,
Penrose, Auckland 1061
Ph: 0800 654 333
Fax: 0800 654 334
Email: sales@dwpc.co.nz

NORTH AMERICA

Ph: 1-888-755-8654
Email: info@daveyusa.com

AUSTRALIA

Head Office
6 Lakeview Drive,
Scoresby, Australia 3179
Ph: 1300 232 839
Fax: 1300 369 119
Email: sales@davey.com.au

EUROPE

7 rue Eugène Hénaff 69200
Vénissieux, France
Ph: +33 (0) 4 72 13 95 07
Fax: +33 (0) 4 72 33 64 57
Email: info@daveyeurope.eu

MIDDLE EAST

Ph: +971 50 6368764
Fax: +971 6 5730472
Email: info@daveyuae.com