

# DAVEY

## Davey Peristaltic Pump AS Series

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 bu 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 N° 89/336/CEE “electromagnetic compatibility” and N°73/23/CEE “ low voltage ” and also the subsequent modification N° 93/68/CEE

**Note:** This pump has been constructed in accordance with best practice. Product life, electrical and mechanical reliability will be enhanced if it is correctly used and regularly maintained.

	<b>WARNING</b> Any intervention or repair to the internal parts of the pump must be carried out by qualified and authorised personnel. The manufacturers decline all responsibility for the consequences of failure to respect this rule.
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## 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. The manufacturer of this product will not be liable for damage deriving from improper, erroneous or unreasonable use of the pump.

## 1.2 Risks

- After unpacking the pump, make sure that it is completely sound. In case of doubt, do not use the pump and contact Davey
- The packing materials (plastic bags, polystyrene, etc.) should be kept out of the reach of children: As they may constitute a potential source of danger
- 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 state or country under consideration

Use of electrical equipment always implies observance of some basic rules. In particular:

- Do not touch with wet or damp hands or feet.
- Do not operate the pump with bare feet (example: swimming pool equipment)

	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.
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- Do not leave the equipment exposed to atmospheric agents
- Do not allow the pump to be used by children or unskilled individuals without supervision
- In case of breakdown or improper functioning of the pump, switch it off, but do not touch. Contact Davey for technical assistance for any necessary repairs and insist on the use of original spares. Failure to respect this condition could render the pump unsafe to use
- When the Davey AS Series pump is not in use for a substantial period of time, or use is to be discontinued, disconnect the unit from any power supply

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 losses on the hydraulic system of the pump (breakage of the O-ring, the valves or the hoses), stop the pump immediately and contact Davey.

### **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 hydraulic part of the pump and use it only if it is in perfect condition
- Use only the correct materials for the tubing, valves and seals to suit the liquid to be dosed: where possible shield the tubing with PVC conduit
- Before disconnecting the metering pump, make sure to flush out and neutralise the pump head with the proper reagent liquid

### **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 characterised by its ability to measure pH value (between 0 and 14) with its probe placed on the filtration system that analyses the pool water.

Depending of the measured value, the pump will inject the required amount of product needed to maintain the balance of the pool water.

### 2.1 Parts description

Here are the complete contents of the package you received. All parts will be necessary for the proper operation of your device.

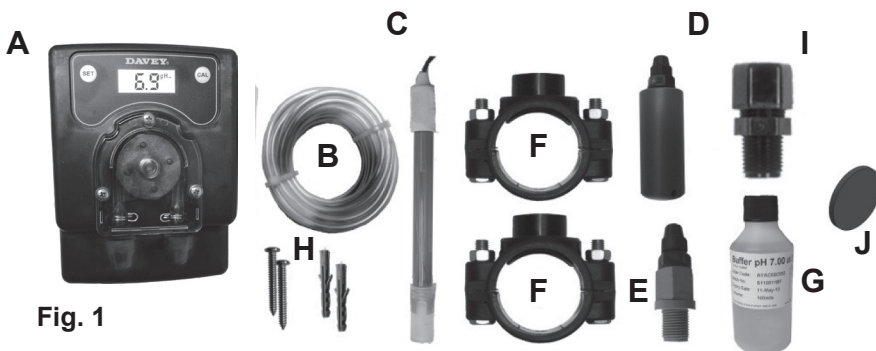


Fig. 1

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

## 2.2 Buttons Description

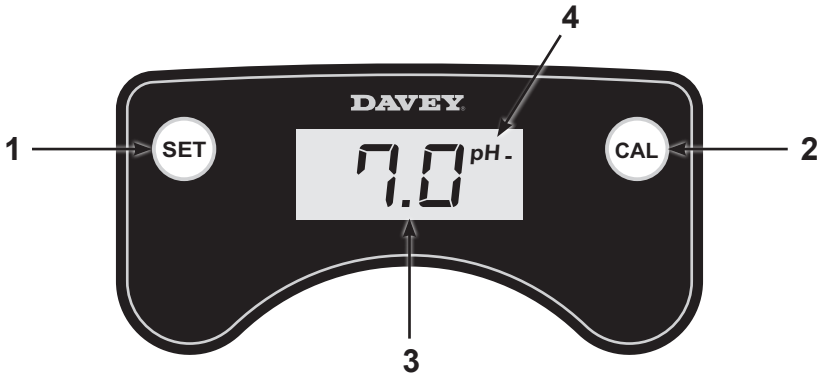


Fig. 2

1. Press **SET** to see and adjust the set point.
2. Press **CAL** allows calibration of the pH level associated to the SET button to change the value of the set point
3. Value/level of pH in water
4. pH - unit of measure to determine pool water chemical level. pH level should remain between 7.2 and 7.6

## 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 45°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
- The Davey AS Series pump will be in operation only when your filtration pump is running



#### **WARNING**

- It is important to keep a minimum distance of 200mm between the probe “C” and the injection valve “E”
- The injection valve “E” must be placed last in the pipework hydraulic installation
- 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
- For optimal service life of your peristaltic pump tube, it is advised not to exceed a pressure of 1 bar and under no circumstances exceed a pressure of 1.5 bar
- The pH probe must be located before any other device such as a heater or an electrolyser

Please refer to the enclosed Davey ChloroMatic or Sanitiser Installation & Operating Instructions for the “Injection Valve” and “pH probe” location and positioning.

## 3.2 Mounting the Pump

### 3.2.1 Bracket

- Use mounting accessories « H » to fix the bracket of the pump
- Remove the bracket on the pump by sliding it down
- Locate the bracket in the space chosen and mark the holes
- Drill the holes as required  
(3mm for timber walls & 6mm for masonry walls)
- Fix the bracket to the wall
- Slide and secure pump into the bracket

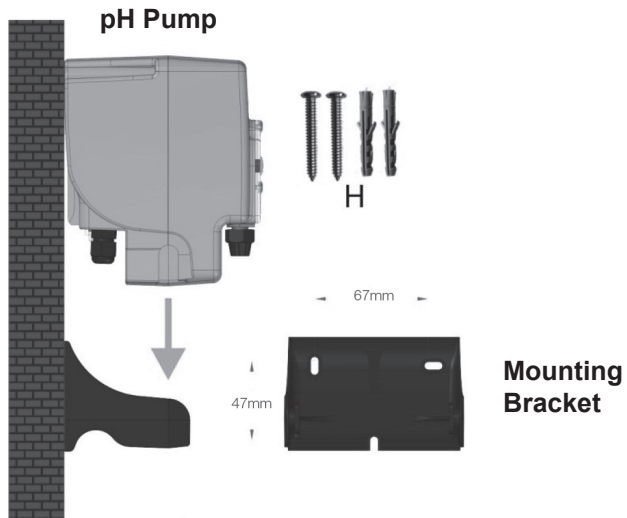


Fig. 4



### 3.2.2 Mounting of the Probe clamp

This assembly is fixed on the pipe work.

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

- Ø 8mm for the injection valve
- Ø 14 mm for the electrode/pH probe.

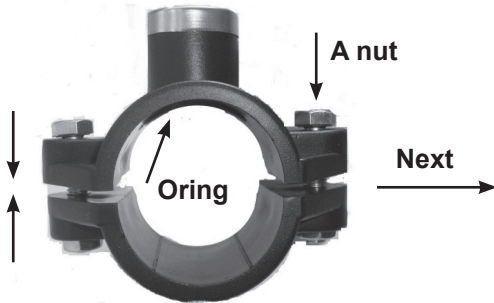


Fig. 5



Fig. 6

### 3.3.3 Mounting of Injection Valve

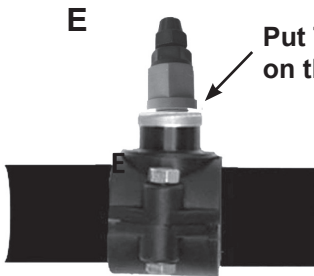


Fig. 7



Fig. 8

### 3.2.4 Mounting of the pH Probe into the Probe Holder

After removing the protective cap from the probe, you need to insert all the parts as shown in the Fig.9.

Once the probe has been constructed as indicated in Fig.9, tighten the probe nut without crimping the probe body. Push the probe approximately 20mm into the pipe work so that the probe tip is approximately halfway into the pipe work. Connect the probe lead to the BNC terminal on the pump. (Fig.10)

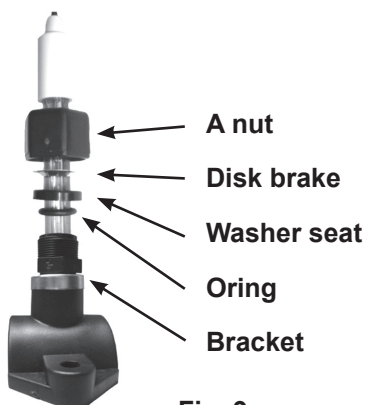


Fig. 9



Fig. 10

### 3.2.5 Mounting description of the Tube on the Injection Valve

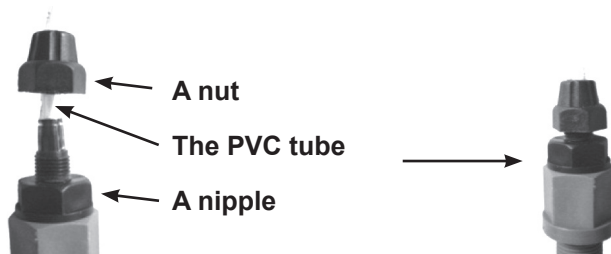


Fig. 11

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

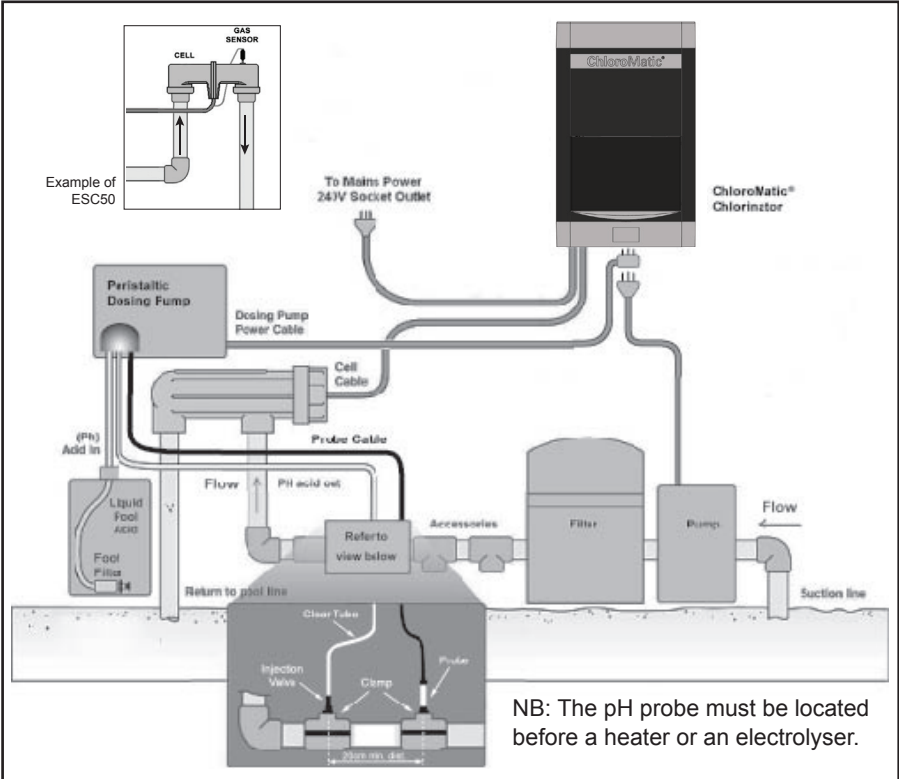
## 4. Connecting the power and pool pump to your pH Controller

### Connection diagram for the ESC pH Pump System

The ESC 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.



If your pool pump is plugged into your Chlorinator:

- Step 1. Remove the pump plug from the Chlorinator pump power socket. (Usually at the bottom of the Chlorinator)
- Step 2. Plug the 3 pin male piggy back plug on your pH pump into the Chlorinator pump power socket.
- Step 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
- Remove the probe from the probe holder
- Put the shutter washer (fig. 12) 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 AS Series 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

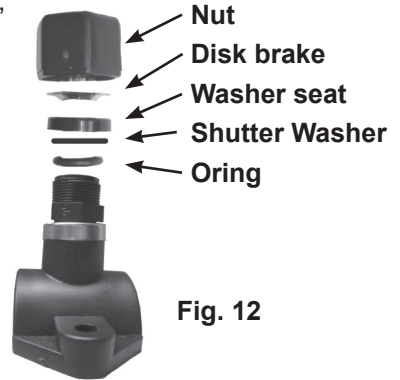
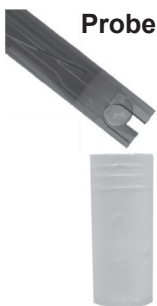


Fig. 12

### 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 procedure is renewed in case of abnormal consumption of chemicals.

### Steps:



Protective Cap

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 stabilized value is displayed. Press the CAL button until the display shows CAL flashing then release. The quality of the probe reading is then briefly displayed.

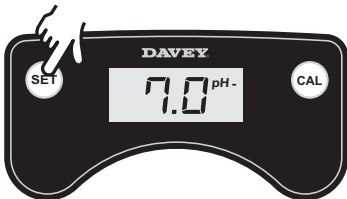
**The calibration of AS Series is completed;  
It is now ready to measure the pH of your pool.**

## 5.2 Settings

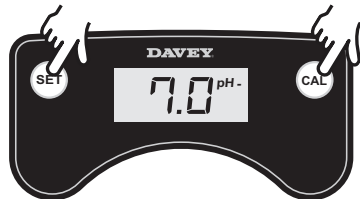
Functions	Factory Settings
Unit of measure	pH
Set point	7.4
Type of regulation	Acid- reduce the pH by dosage of an acid (pH-)
pH 7 calibration	To an accuracy more than 0.2 pH
Proportional regulation*	Factory function

\* Proportional: Dosage adjusted according to different cycles time/breaks. At the approach of the set point, the pump reduces its time of dosing.

### 5.2.1 Adjustment of the Set Point



When you press the SET button, the value of the set point is displayed.



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 AS Series 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.**

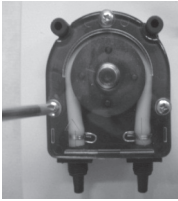
Adjust the pH slowly to preserve the natural quality of your water.

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

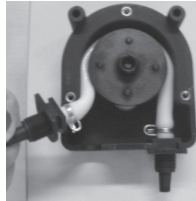
Follow steps 1 to 10 as shown



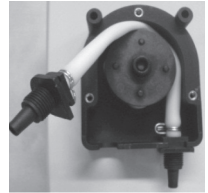
1.



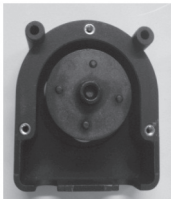
2.



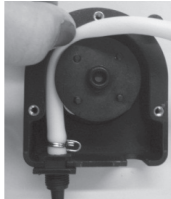
3.



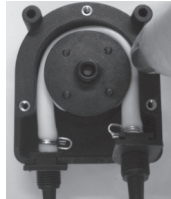
4.



5.



6.



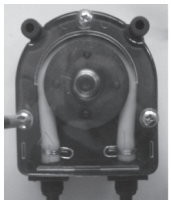
7.



8.



9.



10.

Fig. 13

## **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 more or less calcareous, measurement will deteriorate. A thin layer of limestone 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 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 13, Fig 13, 5.1

## **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 11, 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 9)

## 7. Trouble Shooting

Error	Reasons	How to solve it
CAL Err	<p>If this error is displayed during the calibration phase and cycle it is as a result of:</p> <ol style="list-style-type: none"> <li>1). Your pH probe is not working properly</li> <li>2). Your buffer solution is polluted</li> <li>3.) You have water/oxidisation in the probe connector</li> </ol>	<ol style="list-style-type: none"> <li>1). Change the probe</li> <li>2). Change the buffer solution</li> <li>3). Change over the probe</li> </ol>
Alarm Alr Err	<p>If the pH is lower than pH 5 or above pH 9, this alarm will be displayed and dosing will be stopped.</p>	<p>Adjust your water parameter manually so that it comes back to the required value of these parameters:</p> <ul style="list-style-type: none"> <li>- Total alkalinity</li> <li>- TH (hardness)</li> <li>- pH</li> </ul> <p>The dosing pump will restart as soon as the pH reading</p>

If trouble persists, please contact Davey or your nearest Davey Dealer for assistance.



# Davey® Repair or Replacement Guarantee

In the unlikely event that this Davey product develops any malfunction within one year of the date of original purchase due to faulty materials or manufacture, Davey will at our option repair or replace it for you free of charge, subject to the conditions below.

Should you experience any difficulties with your Davey product, we suggest in the first instance that you contact the Davey Dealer from which you purchased the Davey product. Alternatively you can send a written letter to Davey at the addresses listed below. On receipt of your claim, Davey will seek to resolve your difficulties or, if the product is faulty or defective, advise you on how to have your Davey product repaired, obtain a replacement or a refund.

Your Davey One Year Guarantee naturally does not cover normal wear or tear, replacement of product consumables (i.e. mechanical seals, bearings or capacitors), loss or damage resulting from misuse or negligent handling, improper use for which the product was not designed or advertised, failure to properly follow the provided installation and operating instructions, failure to carry out maintenance, corrosive or abrasive water or other liquid, lightning or high voltage spikes, or unauthorized persons attempting repairs. Where applicable, your Davey product must only be connected to the voltage shown on the nameplate.

Your Davey One Year Guarantee does not cover freight or any other costs incurred in making a claim. Please retain your receipt as proof of purchase; you **MUST** provide evidence of the date of original purchase when claiming under the Davey One Year Guarantee.

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 and does not affect any rights or remedies that may be available to you under Consumer Legislation in your state, territory or country.

If in Australia, you are entitled to a replacement or refund for a major failure and for 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.

Should your Davey product require repair or service after the guarantee period; contact your nearest Davey Dealer or phone the Davey Support Centre on the numbers listed below.

For a complete list of Davey Dealers visit our website ([davey.com.au](http://davey.com.au)) or call:



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\* Installation and operating instructions are included with the product when purchased new.  
They may also be found on our website.