



DAVEY

PowerMaster[®]

ECO-SERIES

Installation and Operating Instructions

Models: PMECO & PMECO3



PMECO



PMECO3



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.

Congratulations on the purchase of a quality product from the Davey Water Products range of Pool and Spa Equipment. You are assured of many years of reliable and super-efficient performance from your Davey PowerMaster® ECO-Series pump.

Read these instructions in their entirety before switching on this pump. If you are uncertain as to any of these installation and operating instructions please contact your Davey dealer or the appropriate Davey office as listed on the back of this document.

Davey PowerMaster® ECO has been designed to circulate swimming pool and spa water in conditions set out in the Australian Standard for swimming pool water quality AS 3633 or equivalent. They should not be used for any other purpose without first consulting your Davey Dealer or the Davey Customer Service Centre.

Every Davey PowerMaster® ECO is thoroughly water tested against a number of flow, pressure, voltage, current and mechanical performance parameters. Davey's advanced pump manufacturing technology provides reliable and efficient pumping performance that lasts and lasts.

Saving Energy with your Davey PowerMaster® ECO-Series Pump:

The Davey PowerMaster® ECO Series Pool & Spa pump is an 8 Star super efficient pump utilising a very clever, state of the art 3 speed brushless DC motor that provides lower levels of noise, lower operating costs and lower greenhouse emissions than traditional pool pumps.

Due to its ability to run at lower speeds than conventional pumps, your PowerMaster® ECO Series pump will also experience less mechanical wear and tear due to less stress on the internal mechanical components.

To achieve energy efficient pumping is easy. Simply run the filtration pump at a low speed, but run it for longer (see table on page 9) than a conventional fixed speed pump to “turn over” your pool water for adequate filtration and sanitisation. The result is lower energy use and up to 70% lower operational costs. It's like driving your car on a long distance trip at 80 kmh instead of 110 kmh. It will take you a lot more time, but you will use a lot less fuel!

The PowerMaster® ECO Series has 3 speeds, so you can circulate the water at Eco speed, then switch to medium or high speed only if required. Medium speed will help to power an automatic pool cleaner, while high speed should be selected to backwash a media filter or when you want to manually vacuum your pool.

What to expect with Eco speed pumping (energy efficient operation) on your pool:

If your PowerMaster® ECO-Series pump is replacing a traditional AC motor pump, you will need to run it longer than your old fixed speed pump. This is NORMAL and you will save energy when using Mid or Eco Flow settings.

You may also notice that the pressure gauge on your filter is indicating a much lower pressure than you are used to. This is also NORMAL. The lower system pressure is simply a result of the lower speed and flow rate produced by the pump.

Your PowerMaster® ECO-Series pump is capable of being programmed in 50rpm increments from the Eco speed to the High speed and from High speed to the Eco speed. The Mid speed is also programmable in 50rpm increments up to the High speed and down to the Eco speed. This function is available to assist in those applications where greater than normal friction losses are experienced in your pool hydraulics circuits.

- Please consult your pool pump installation professional, Davey or your Davey dealer for advice on this function.

While running at the lower speed settings you will also notice a significant reduction in pump noise. This is a major benefit for you as it allows you to run your pump during off peak electricity tariffs, which will also assist in the reduction of your operating costs. Plus you will also have much happier neighbours.

Important Considerations for Low Flow Operations:

Many pool products rely on particular minimum flow rates for best operation and/or efficiency. If you are using a low flow pump on your pool, such as the PowerMaster® ECO Series pool pump, Davey recommends that you check the compatibility of it with other pool equipment such as:

- Automatic and Robotic pool cleaners
- Ozone generators
- Pool Heaters
- Solar Heating systems
- Salt Water Chlorinator cells
- In-floor pool cleaning systems

Technical Specifications:

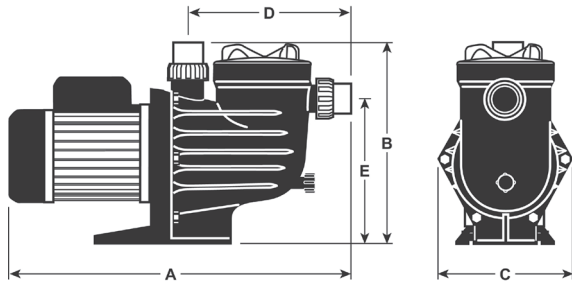
Model	PMECO, PMECO3 & PMECO4
RPM	Eco Flow Speed – 1400
	Mid Flow Speed – 2400
	High Flow Speed – 2850
Enclosure Class (IP)	24
Insulation Class	Class B130 Insulation
Voltage (V)	240 AC
Supply Frequency (Hz)	50
Run Current (A)	6.3
Motor Input Power (W / hp)	Eco Flow - 180W / 0.24 hp
	Mid Flow – 720W / 0.96 hp
	Hi Flow – 99W / 1.32 hp
Motor Output Power (W / hp)	Eco Flow - 127W / 0.17 hp
	Mid Flow – 521W / 0.70 hp
	Hi Flow – 853W / 1.14 hp

*PMECO3 supplied with a 3 metre wired remote control

Operating Limits:

Max Water temperature	50°C
Max Ambient temperature	55°C

Dimensions:



Model	A	B	C	D	E	Mounting Holes Diam	Inlet / Outlet PVC	Net Weight (kg)
PMECO	645	330	250	305	246	10	*40/50	16.8
PMECO3	645	330	250	305	246	10	*40/50	16.8

All dimensions in mm unless otherwise stated

*Suction & delivery accept 40mm PVC pipe on the ID & a 50mm fitting on the OD

Installation of the PowerMaster® ECO Series Pumps:

Location

The pump should be located as close to the water as practicable and mounted on a firm base in a well drained position, high enough to prevent any flooding. It is the installer's/owner's responsibility to locate the pump such that the nameplate can be easily read and the pump can be readily accessed for service.

The PMECO3 with Wired Remote Control

It is recommended that the remote be securely fixed to a pool equipment wall, fence or post at a height that is convenient to access and operate.

Weather Protection

It is recommended that the pump is protected from the weather. Enclosures should be ventilated to prevent condensation build-up and allow a free flow of air for the fan cooled motor.

Power Connection

Davey PowerMaster® ECO is suitable for connection to a nominal 240 volt 50Hz power supply and are equipped with a flex and 3 pin plug. If a power outlet is not available within 3 metres of the pump, a 3 pin power point in a safe, dry place may need to be provided by an electrician. Extension cords are unsafe around pools - and should be avoided. If the supply cord of this product is damaged it must be replaced by the dealer or manufacturer, with genuine Davey spares.

This PowerMaster® Eco Series pump incorporates motor overload detection designed to protect the motor from overheating. If the motor gets too hot during operation, it's operating speed will reduce to bring it within a acceptable operating temperature and then will speed up to the originally set speed.

To reset the motor, switch the power off for 30 seconds, and then return the power from the mains switch not the "STOP" button on the speed selection panel.



Davey Water Products recommends that all installations are fitted with earth leakage or residual current protection devices.



CAUTION: In the interest of safety, we advise that all brands and types of pool pumps must be installed in accordance with AS3000 wiring rules or equivalent.



If the pump and filter are located below pool water level, it is necessary to fit isolating valves in the pipe between the pump and skimmer box and in return pipe from the filter to the pool.



The fittings on this product are constructed of ABS. Some PVC jointing compounds are incompatible with ABS. Check compound suitability before use.

NOTE: PowerMaster® Pool Pumps are fitted with an internal check valve to reduce reverse flow of water through the pump.



Warning! Ensure that an electrical isolation switch is located with easy access so that the pump can be switched off in an emergency.

Pipe Connection

A barrel union is provided for connecting to the piping from the pool. The pumps are designed to accept 40mm PVC on the ID or a 50mm PVC fitting on the OD.

When plumbing the discharge pipe, ensure that the pipework does not interfere with the touchpad's protective cover, which needs to fully open and close.

Ensure pipework from discharge does not interfere with protective cover.



The use of any pipe smaller than those specified above is not recommended. Suction piping should be free from all air leaks and any humps and hollows which cause suction difficulties.

The discharge piping from the pump outlet should be connected to the inlet connection on the swimming pool filter (usually at the filter control valve).



Barrel unions need to be hand tightened. No sealant, glues or silicones are required.

Prior to using this pump you must ensure that:

Checklist

- Low Speed Setting is compatible setting with other pool equipment
- The pump is installed in a safe and dry environment
- The pump enclosure has adequate drainage in the event of leakage
- Any transport plugs are removed
- The pipe-work is correctly sealed and supported
- The pump is primed correctly
- The power supply is correctly connected
- All steps have been taken for safe operation
- The filter has been plumbed with 40/50mm pipe

To realise the best energy efficiency from your pump, please follow these installation recommendations:

- Suction pipe length should be kept as short as possible
- Install a 450mm long straight pipe horizontally into the front of the pump
- Minimise the number of bends in the plumbing

Starting the Pump

To operate efficiently and prevent pump damage there must be a free flow of water to and from the pump. Before starting ensure that:


- All pipework is correctly sealed.
- The pool/spa water level is at the correct height.
- All appropriate valves are open and there is nothing preventing the flow of water through the system.

The Davey PowerMaster® ECO Series motor has 3 speed settings, Eco Flow, Mid Flow and High Flow. It will always start on High Flow setting to aid priming and after 2 minutes will automatically revert to the last used speed setting.

NOTE: During high speed start up, the LED for the last set speed will flash.

1. First prime the pump by removing the strainer basket lid and filling the strainer basket area with water. Replace the lid, ensuring that it seals on the large o'ring.
2. Connect to the power supply and switch on.
3. Allow the pump to run, so that any air trapped may be expelled. It will start in High Flow mode (high speed) for 2 minutes in order to prime effectively.
4. If prime is not established within approximately two minutes, as evidenced by a strong flow of water and no bubbles returning to the pool, **switch off the pump and repeat the procedure**. Continued evidence of air under the strainer basket lid indicates an air leak in the suction piping which should be rectified to avoid pump damage.

For optimum pump performance, the strainer basket housing should always be full of water and free from air bubbles. The water level of the pool should always be maintained to at least halfway up the skimmer box ensuring water is in the pump at all times. From time to time it may be necessary to re-prime the pump. This should be carried out as described above.

 Never run pump dry. Running the pump with no water may damage the mechanical seals, causing leakage and flooding. Dry running damage and associated damage is not covered under warranty.

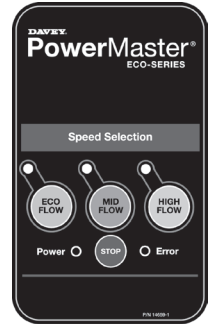
Low Energy Operation:

Your PowerMaster® ECO Series pump has 3 speed settings which are also programmable:

1. Eco Flow – Lowest Speed
2. Mid Flow – Medium Speed
3. High Flow – Highest Speed

- Eco Flow mode provides the lowest speed and therefore the greatest energy savings.
- For programmable speed options and settings, please contact your pool pump installation professional, Davey or your Davey dealer.

PMECO Touch Pad



PMECO3 Remote Touch Pad



Operation	Recommended Speed Setting
Pool Filtration	ECO Flow
Automatic pool cleaner operation	Mid Flow
Backwashing your media filter	High Flow
Manually cleaning your pool	
Water Feature operation	
Spa Jet operation	
Solar pool heating	

Guidelines for Recommended Pump Operating Hours:

Australian Standards AS3633: “Private swimming pools - water quality” states that “The minimum turnover rate shall be a single turnover of the full volume of the pool water, within the period that the pump would normally be operating....”

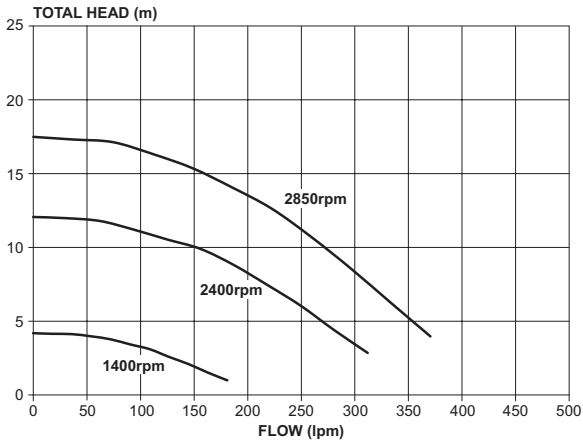
The table below provides a guide to the running times of your pump while in filtration mode in order to achieve the minimum turn over rate:

Pool Size (Litres)	Speed Setting (hours)		
	ECO Flow	Mid Flow	High Flow
20,000	2.7	1.6	1.3
30,000	4.1	2.4	2.0
40,000	5.4	3.2	2.7
50,000	6.8	4.0	3.3
60,000	8.1	4.8	4.0
80,000	10.8	6.4	5.4
100,000	13.5	8.0	6.7

Using your PowerMaster® 3 Speed pump with a Davey Salt Water Chlorinator:

Davey ChloroMatic and EcoSalt salt water chlorinators require a minimum flow rate of 80 litres per minute (lpm) through the chlorinator cell for best efficiency and cell life. The Davey PowerMaster® Eco Series can provide 130 lpm at 25 kPa (2.5 meter head). Please refer to the performance graph below as a reference for the flow in your pool and refer to the pressure indicated by the gauge on the filter.

Ensure flow rate is sufficient to cover cell plates completely at all times of operation.



Operating your Automatic Pool Cleaner:

Before installing or purchasing a pool cleaner for use with your PowerMaster® Eco series Pump, it is important to know the minimum flow rates required for it to operate effectively:

Davey PoolWIZARD & PoolSweepa™ Hybrid Cleaners

The Davey automatic pool cleaners have the following minimum required flow rates:

Davey Pool Cleaner Model	Min Required Flow Rate (lpm)	Recommended speed setting
Frill-NeckWIZARD®	60	Mid Flow
PoolSweepa™ Hybrid	133	Mid Flow

To operate an automatic pool cleaner with your PowerMaster® Eco Series pump:

1. Activate the High Flow setting and allow the pump to fully prime by running for around 2 minutes. You will know the pump is primed when you can see a strong flow of water through the clear leaf basket lid.
2. When all air is expelled from the leaf basket, connect the pool cleaner hose firmly into the skimmer plate or dedicated wall suction.
3. Select the speed setting that enables best performance from your automatic pool cleaner. Mid setting should be ample for most cleaners but if the cleaner requires better performance, activate the High Flow setting. Eco Flow can be used to run a Davey Frill-NeckWIZARD® pool cleaner, but it is recommended that Mid Flow is used.
4. The cleaner should only be connected for as long as is required to clean the surface of your pool. When cleaning is complete, disconnect the cleaner and remove the skimmer plate from the skimmer box.

NOTE: To get optimum energy efficiency from your PowerMaster® ECO pump **DO NOT** keep the automatic pool cleaner connected when cleaning is not required.

5. Reactivate the most efficient speed setting for daily filtration. The ECO Flow setting is recommended.

**Maintenance:
Emptying the Strainer Basket**

The strainer basket should be inspected frequently through the transparent lid and emptied when a build up of rubbish is evident. The directions below should be followed.

1. Switch off pump.
2. Unscrew the strainer basket lid anti-clockwise and remove.
3. Remove the strainer basket by lifting upwards from its housing.
4. Empty the trapped refuse from the basket. Hose out with water if necessary.

NEVER knock the plastic basket on a hard surface as it will cause damage.

5. Check the strainer basket for cracks, replace the strainer basket in the pump if OK.
6. Replace the lid and ensure that it seals on the large rubber o'ring. **Firm hand tightness only is required.** The o'ring & thread can be lubricated with Hydra slip or equivalent products.



Failure to undertake regular maintenance may cause damage not covered by warranty.



Power supply to this pump needs to be through an isolating transformer on RCD, having a rated operating current not exceeding 30mA.

Trouble Shooting

If the pump runs but there is no water flow or water flow is reduced, the following condition may apply:

1. The filter requires backwashing or it is blocked. Refer to the relevant section in the Filter Manual.
2. The pump is not primed. Re-prime as per instruction in 'Starting the pump'
3. There are air leaks in the suction piping. Check all piping and eliminate leaks, also check for a loose strainer basket lid. Air bubbles in the water flowing back to the pool would indicate a leak in the suction to the pump allowing air to enter the pipework.
4. A leaking pump shaft seal may also prevent operating. Evidence of this would be water on the ground under the pump.
5. The pump is not able to get water from the pool. Check that the valves to the pump are fully open and that the pool water level is up to the skimmer box.
6. Blockage in the piping or pump. Remove the strainer basket and check for any blockage to the pump impeller entry. Check the skimmer box for blockage.

If the pump does not operate, the following conditions may apply:

1. The power is not connected. For 240 volt only, check the power point by plugging in a portable appliance to ensure power is available. Also check fuses and the main power supply switch
2. Automatic overload is tripped. The pump has an in-built thermal overload which will re-set automatically after the motor has cooled following an overheating period. Determine the cause of the overload tripping and rectify. Re-set the pump by switching the power OFF for 30 seconds.
3. Blockage is preventing the pump from rotating.
4. Motor is burnt out - burning smell is evident. Replacement is required. If you are unable to resolve any installation or operation difficulties with your PowerMaster®, contact the supplier from whom the pump was purchased or your nearest Authorised Davey Pool Equipment Service Centre. If any further assistance is required, contact the Davey Customer Service Centre at the address indicated in this manual.

Lockout codes

Blinks	Fault	Cause
1	Micro controller failure	Micro controller is continually rebooting.
2	Mains under voltage	The mains voltage has dropped below 180 volts AC running. <u>NOTE</u> : If this fault is active, the controller will reboot after voltage comes above 209 volts AC for at least 6 seconds.
3	Temperature	Over temperature (100°C) Under temperature (-20°C)
4	Over current trip	Over current protection has tripped
5	Mains over voltage	The mains voltage has risen above 269 volts AC.
6	Output shaft seized	Motor failed to start. Motor was stopped.
7	Self check	One or more of the self-tests failed either at start-up or while running.
8	Motor fault	One or more of the phases has become disconnected.
9	Other fault	Any fault not covered by the other codes. Presently no faults should trigger this.
10	EEPROM load failure	Checksum failed while loading EEPROM to memory.

Removal of the Pump from Pipework

Should it be necessary to remove the pump, follow these instructions:

1. Switch off the power and remove the plug from the power source.



NOTE: If the pump is wired into a time clock or another automatic control, the wiring should be removed by a qualified technician.

2. Close the water valves on the pool return and the pump inlet pipework.
3. Remove the discharge & suction barrel unions taking care not to lose the o'rings.
4. Move the pipework with the barrel unions attached until the pump can be pulled clear.



NOTE: When making any enquiries about your PowerMaster® be certain to quote the model number from the nameplate located on the motor.

Water Quality

Maintaining balanced water chemistry is important to the life of your pool pump. This pump is designed to be used with Pool & Spa water, balanced in accordance with Langlier Saturation Index, with a pH level of between 7.2 and 7.8 and is regularly treated with a chlorine sanitising agent with the level not exceeding 3.0 ppm.

Please consult your local pool shop regularly to have your water tested.



POWER CONNECTIONS AND WIRING MUST BE CARRIED OUT BY AN AUTHORISED ELECTRICIAN.



DANGER - Hazardous suction. Do not block water entry into filtration system with any part of your body as the pressure can trap hair or body parts, causing severe injury or death. Do not block suction. Turn off pump immediately if someone becomes trapped.



Caution! Do not add chemicals directly to the pool skimmer. Adding undiluted chemicals may damage pump and filter and void warranty.



Routine Maintenance tasks - to maximise the life of your pool equipment & personal safety, use this checklist once a week. Turn pump off first.

- a. Make sure that any pressure gauges are in working condition and the operating pressure is within limits as specified on the product.
- b. Make sure that each suction inlet, and main drain has a cover that is securely attached and in safe working condition.
- c. Make sure that all skimmer cover are securely attached and in safe working condition. These should be replaced every 3 to 4 years.
- d. Remove any obstructions or debris from the main drain cover.
- e. Ensure the skimmer baskets and the pump hair and lint pots are free of leaves and debris at least once a week.
- f. Remove obstructions and combustibles from around the pump motor.
- g. Make sure all wiring connections are clean and that all wiring and electrical equipment is in good condition. Damaged wiring must be repaired or replaced by a qualified electrician as soon as damage is discovered.
- h. Check water balance and sanitiser levels at your local pool shop.



WARNING! Pump suction is hazardous and can trap and drown or disembowel bathers. Do not block suction. Do not use or operate swimming pools, spas or spa baths if a suction cover is broken, missing or loose. Two suction covers and inlets must be provided into every pump to avoid suction entrapment.



In accordance with AS/NZS60335.2.41 we are obliged to inform you that this device is not to be used by children or infirm persons and must not be used as a toy by children.

Davey® Repair or Replacement Guarantee

In the unlikely event in Australia or New Zealand that this Davey product develops any malfunction within warranty periods beginning from 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 phone our Customer Service line on 1300 367 866 in Australia, or 0800 654 333 in New Zealand, or send a written letter to Davey at the address 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 Three 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 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 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 under the Australian or New Zealand legislation and does not affect any rights or remedies that may be available to you under the Australian or New Zealand Consumer Legislation.

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 number listed below.

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



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

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Davey Support Centre
6 Lakeview Drive,
Scoresby, Australia 3179
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Website: davey.com.au

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