

DAVEY

Heat Pump

DAT 110, DAT 140, DAT 170, DAT 220, DAT 270

Installation and Operating Instructions

DAVEY
AquaThermPRO



IMPORTANT
Please read carefully

daveywater.com

Please pass these instructions on to the owner of this equipment once the product has been installed.

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WARNINGS



WARNING:
This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance. This appliance can be used by children from aged 8 years and above and persons with reduced physical sensory, mental capabilities, or lack of experience and knowledge if they have been given supervision, or instruction concerning use of the appliance in a safe way and understand the hazards involved.

**WARNING:**

Always isolate equipment from water supply prior to commencing any work.
Always ensure work area and equipment are dry before and disassembly work is undertaken.

**WARNING:**

Low velocity burning material. Keep away from all ignition sources.



R32 Gas

The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury or injury to a third party. These signs are rare, but are extremely important.



R32 Gas

WARNING:

Do not use means to accelerate the defrosting process or to clean other than those recommended by the manufacturer.



The appliance shall not be stored near any ignition sources (for example; open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Be aware that refrigerants may not contain an odour.

**INSTALLATION REMINDERS:**

The installation of any pipework should be kept to a minimum.

It is not recommended to position the heat pump greater than 10mts from the pool, as it will reduce heat pump performance and efficiency.

Pipework should be protected from physical damage and shall not be installed in an unventilated place.

The heat pump should not be installed indoor. Do not stack objects surrounding the heat pump as they may restrict required air flow.

Any mechanical connections need to be kept accessible for maintenance purposes.

Any maintenance or service needs to be carried out in compliance with national gas regulations.

**QUALIFICATION OF WORKERS:**

A technician with a Refrigerant Handling Licence should carry out any service or maintenance carried out on the heat pump refrigerant equipment.

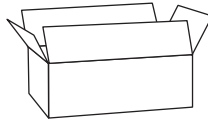
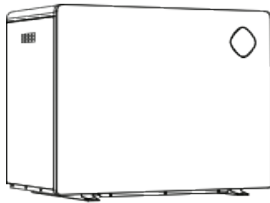
A registered electrician should carry out any service or maintenance required for the heat pump electrical equipment.

**ATTENTION:**

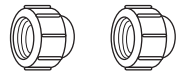
Davey Water Products recommends that all installations are fitted with earth leakage or residual current protection devices. Power supply to this pump needs to be through an isolating transformer or RCD, having a rated operating current not exceeding 30mA. In the interests of safety, we advise that the installation must be in accordance with AS3000 wiring rules, or local equivalent. Ensure that an electrical isolation switch be located within easy access so that the pump can be turned off in an emergency.

HEAT PUMP CONTENTS

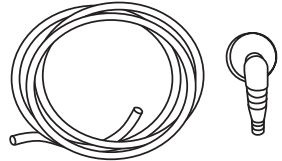
- 1 x Heat Pump unit, 2 x Barrel union 40mm
- 1 x Drainage kit (hose and fitting)
- 1 x Installation Manual



Water Union

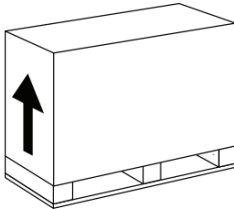


Drainage Kit

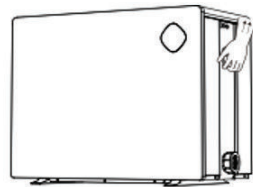


TRANSPORTATION

A. Always keep upright



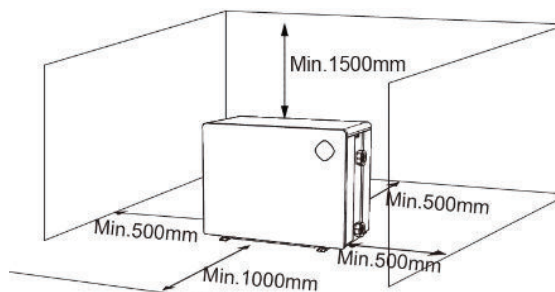
B. Do not lift unit using the outlets, as this may damage the heat pump.



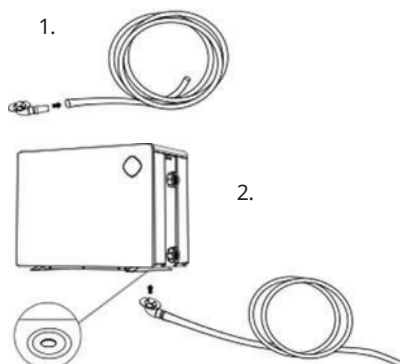
HEAT PUMP INSTALLATION

1. It is recommended that an experienced pool technician perform the installation of your new Davey Heat Pump and to read all instructions prior to commencing works.
2. Position the heat pump on a solid, flat and level base. Failure to provide this may result in damage to the unit. It is recommended to house the unit to protect it from weather conditions. Ensure that adequate ventilation is provided to the unit by following the recommended clearance dimensions outlined in the diagram below (1). The heat pump draws air in through the rear and out through each side of the heat pump. In addition, it is best to mount the unit within the minimum practicable distance of the pool and the pool filtration system, this will maximise the efficiency of the unit.
3. Install the drainage kit hose to the connection point on the underside of the heat pump and route the hose to drain the condensation water in a suitable location.
4. Secure the unit to the base using 4 x M10 sized expansion bolts or similar.
5. Although a bypass system is not necessary for your Davey heat pump to operate properly, we strongly recommend the installation of a bypass system to regulate the flow rate and make maintenance and winterising of the Davey heat pump easier.
6. Using the supply 40mm barrel unions and using hard PVC 40mm (minimum) pipework connect your Davey heat pump into the pool system as per the diagram (2). For optimal heating performance its recommended to use insulation on the pipe work supplying the pool.
7. Prior to operating the unit, run the pool filtration system to ensure the unit is flushed and primed with water. During this time also check the connections to ensure they are free from leaks.

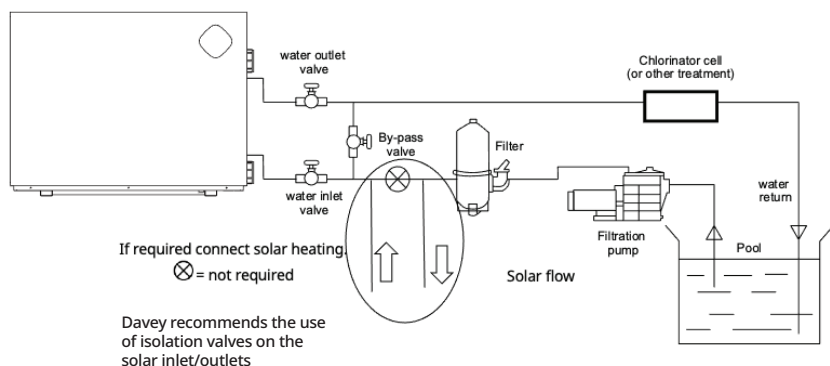
Air flow clearance - diagram 1



Drainage Kit - diagram 1a

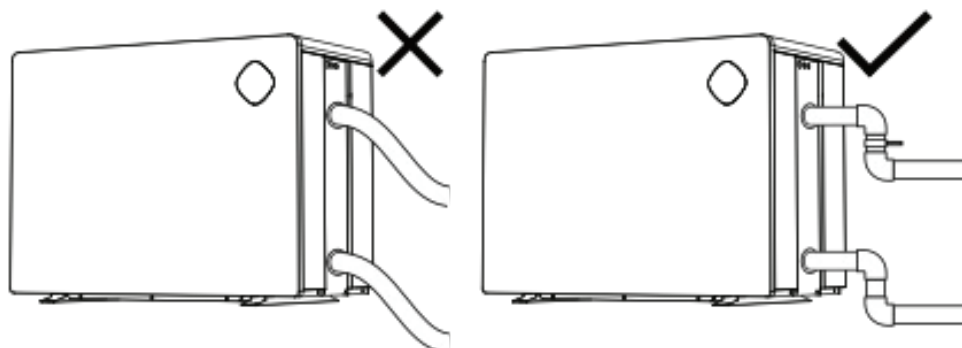


Installation - diagram 2










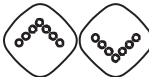
Water pipe connection

The inlet and outlet water unions need to utilise fixed hard pipe connections that are well supported as to minimise load and vibration on the heat pump connections.

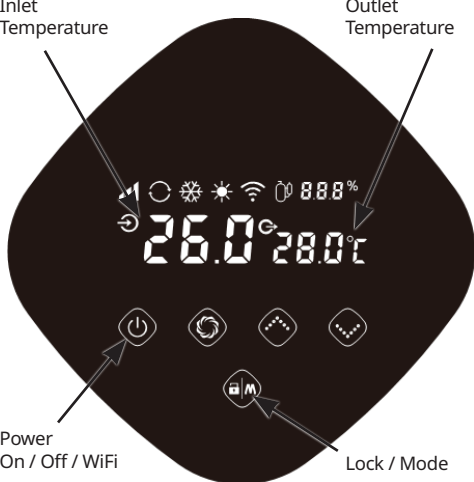










OPERATIONAL CONTROLS

1. Key Functions

Key Symbols	Function	Operation
	1. Power ON/OFF 2. Wi-Fi activation	1. Momentary press 2. Press and hold for 3 seconds,  will flash ready for WiFi connection
	1. Lock / Unlock 2. Heating Mode 18 - 40°C 3. Cooling mode 12 - 30°C 4. Auto mode 12 - 40°C	1. Press and hold for 3 seconds to lock / unlock screen. 2. Momentary press to toggle through mode selections
	1. Turbo mode  2. Perfect mode  3. Silence mode 	1. Momentary press to toggle through mode selections Note: Silence Mode only applicable in heating mode
	1. Temperature settings	1. Momentary press to toggle temperature up and down

2. Display Icons

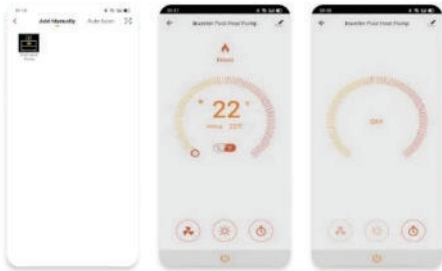
Display	Display Icon	Operational Condition
		Heating mode
		Cooling mode
		Auto mode
		Running speed percentage
		WiFi connection
		Performance modes
		Inlet
		Outlet

WiFi / APPLICATION SETUP

Before setting up your Davey heat pump Wi Fi you will need to download to your phone the Davey heat pump app from the Playstore or App store.



Davey Heat Pump
Davey Water Products • Tools
Installed

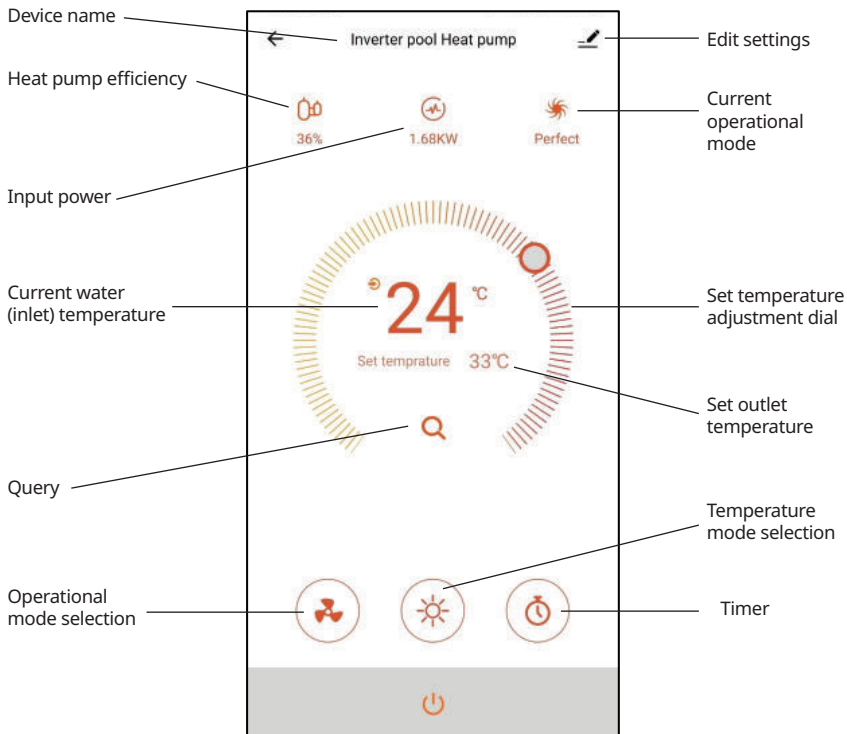


- Open the Davey heat pump application on your mobile phone and follow the instructions to setup the account and login.*
- On the heat pump press and hold the power on/off key for 3 seconds, until you hear a "BEEP", the symbol will start flashing.
- You should be able to see the model of heat pump on your phone and be able to connect to that using the 'add device' prompt.

* Please ensure you have Bluetooth activated allow for the application to discover the heat pump.

Note: this device utilises that 2.4Ghz WiFi band width if you experience difficulties ensure your modem is set to the correct band.

SMART PHONE APPLICATION DETAILS



INITIAL STARTUP MANUAL MODE

- a. It is important that you ensure that the pump / filtration system is turned on before starting your Davey heat pump as it may cause damage not have sufficient water flow through the unit. (subsequently also ensure the unit is turned off prior to the pump / filtration system).
- b. Check the inlet and outlet for leaks while the system is operational and rectify if required.
- c. Adjust the unit to your required temperature settings either on the app or manually on the control unit. For the heat pump to startup it requires a temperature difference of greater than 2°C between inlet and outlet.
- d. After a few minutes of operation your display should start to show both inlet and outlet temperatures that correspond with what is expected of the settings.
- e. Initial Heating
To achieve initial heating, your pool heat pump and the pool pump may require extended operation until desired temperature is achieved. The initial heating time may vary depending upon the five factors listed below. After initial heating, operating time may be reduced to match daily heat loss.
 1. Size of the pool.
 2. How many degrees the water is to be heated.
 3. Ambient air temperature - the warmer the air, the less time required to heat.
 4. Use of a pool cover /solar blanket.
 5. The size of the pool heat pump.

MAINTENANCE

1. Winterising your heat pump:

Winterising is required in conditions where any water inside the heater can drop below 0°C. In this situation, if not carried out, severe damage is likely to occur to the Davey heat pump.

- a. Turn off the circuit breaker, or isolation switch.
 - b. Drain the Davey heat pump. Loosen all water connections. Failure to drain the unit in temperatures below 2°C can result in damage to the unit.
 - c. Rinse the interior of the heat exchanger cylinder with a stream of tap water for about 15 minutes to remove any chlorine residue that could cause damage to the heat exchanger.
 - d. Tilt the unit towards the back to remove all water from the unit.
 - e. Block water inlet and outlet with a cloth or plastic to prevent mice, or other animals from entering the unit.
2. Only use household detergents and clean water to clean the unit.
 3. Regularly check fasteners are tight and the unit is solidly mounted, check connections for water leaks
 4. This unit contains R32 refrigerant gas, only authorised suitably qualified personnel or your Davey dealer are to conduct any repair works on this unit. Failure to comply to these requirements could result in injury or death.

TROUBLESHOOTING AND FAULT CODES

Failure	Reason	Solution
When powered on, the controller displays a code	Startup code	This is normal. Please wait until it disappears.
Unresponsive controller	Some models have screen lock function	Press Lock/Unlock button for 3 seconds
Heat pump doesn't run	Improper operation	Refer to the manual
	No power	Wait until the power recovers
	Unit is powered off	Switch on the power
	Blown fuse	Check and change the fuse
	The house circuit breaker is off	Check and turn on the circuit breaker
	Voltage anomaly	Inspection by professional
Unit suddenly starts or stops running	The unit may be in defrost. At this point the fan stops spinning and the heat indicator on the controller will flash.	Not failure, the unit will switch back after defrosting
	Some models have a timed power on/off function.	Refer to the manual to disable this function
	Once the set temperature is reached, the heat pump will go into standby	This is normal
Air is blowing out, but unit is not heating well	Evaporator blocked	Check and clear the blockage
	Air inlet and/or outlet blocked	Check and clear the blockage
	3 minutes start delay protection for compressor	Wait until start delay protection timer finishes. If the same failure exists check any loose connections. Ensure set temperature is more than 2°C the inlet temperature.
Display normal, but no heating	Set temperature too low	Set to proper temperature
	3 minutes start delay protection for compressor	Wait until start delay protection timer finishes. If the same failure exists check any loose connections. Ensure set temperature is more than 2°C the inlet temperature.
Unit is releasing white smoke	The unit is defrosting	This is normal. Please wait until unit finished defrosting.
Unit is leaking water	In heating mode, condensation will be generated on the evaporator and released through the bottom of the unit.	This is normal

If issues persist, please contact your Davey dealer or authorised service person for further diagnosis of the unit.


No.	Display	Protection code description
1	E3	No water protection. No water flow to the unit.
2	E5	Power supply excesses operation range (not failure)
3	E6	Excessive temp difference between inlet and outlet water (Insufficient water flow protection)
4	Eb	Ambient temperature too high or too low protection (not failure)
5	Ed	Anti-freezing reminder (not failure)
No.	Display	Failure code description
1	E1	High pressure protection
2	E2	Low pressure protection
3	E4	3 phase sequence protection (three phase only)
4	E7	Water outlet temp too high or too low protection
5	E8	High exhaust temp protection
6	EA	Heat exchanger overheat protection/Evaporator overheat protection (only at cooling mode)
7	P0	Controller communication failure
8	P1	Water inlet temp sensor failure
9	P2	Water outlet temp sensor failure
10	P3	Gas exhaust temp sensor failure
11	P4	Evaporator coil pipe temp sensor failure
12	P5	Gas return temp sensor failure
13	P6	Cooling coil pipe temp sensor failure
14	P7	Ambient temp sensor failure
15	P8	Cooling plate temp. sensor failure
16	P9	Current sensor failure
17	PA	Restart memory failure
18	F1	Compressor driver module failure
19	F2	PFC module failure
20	F3	Compressor start failure
21	F4	Compressor running failure
22	F5	Inverter board over current protection
23	F6	Inverter board overheat protection
24	F7	Current protection
25	F8	Cooling plate overheat protection
26	F9	Fan motor failure
27	Fb	Power filter plate No-power protection
28	FA	PFC module over current protection

ADVANCED OPERATIONAL SYSTEM

Running status data

Press and hold  for 5 seconds to enter the running status data display of the control.

Use   to toggle through the running data as in the table below.

Press  to exit and return to standard operational display.

Note: Due to factorization of the startup and shutdown temperatures, there might be a small variation between temperatures displayed on the control / app and the running status data, this is normal to operation of the heat pump. For the heat pump to start up it requires greater than a 2°C temperature difference between inlet and outlet.

Symbol	Content	Unit
C0	Inlet water temp	°C
C1	Outlet water temp	°C
C2	Ambient temp	°C
C3	Exhaust gas temp	°C
C4	Evaporator coil pipe temp	°C
C5	Return gas temp	°C
C6	Cooling coil pipe temp	°C
C9	Cooling plate temp	°C
C10	EEV opening angle	P
C11	DC motor fan speed	r/min

SPECIFICATIONS

Technical Specifications	Models				
	DAT 110	DAT 140	DAT 170	DAT 220	DAT 270
*Advised Pool Volumes (m³)	20-45	30-55	35-65	40-80	50-95
Operational Temperature Range (C°)	- 15 to 43° C				
Heating Temperature Range (C°)	18 to 40° C				
Cooling Temperature Range (C°)	12 to 30° C				
Power Supply (V/Phase)	230V / Single Phase				
Rated Input Power (kW)	0.24 - 1.79	0.29 - 2.16	0.36 - 2.67	0.45 - 3.33	0.54 - 4.00
Rated Current (A)	1.04 - 7.78	1.26 - 9.39	1.57 - 11.63	1.96 - 14.48	2.35 - 17.39
Sound Pressure Level @ 1m	36.3 - 44.5	36.5 - 45.9	39.3 - 46.7	39.5 - 49.8	39.8 - 50.2
Recommended Water Flow (lpm)	33 - 67	50 - 67	67 - 100	100 - 150	133 - 167
Maximum outlet air flow (m³/hr)*	2700	2800	3500	4350	5200
Pressure drop (kPa)	2.6	2.5	4.2	7.2	8.5
Net weight (kg)	66	73	75	91	114

* Reference only

Performance Specifications	Models				
	DAT 110	DAT 140	DAT 170	DAT 220	DAT 270
Performance Condition: Air Temp 27°C / Water Temp 27° / 80% Humidity					
Turbo Mode Heating Capacity (kW)	11.5	14	17	22.5	26.5
Perfect Mode Heating Capacity (kW)	9.3	10.9	13.5	18	20.6
COP (Coefficient of Performance)	15~7.3	15~7.4	15~7.1	15.5~7.4	15.2~7.2
Performance Condition: Air Temp 15°C / Water Temp 26° / 70% Humidity					
Turbo Mode Heating Capacity (kW)	7.7	9.3	11.5	15	18
Perfect Mode Heating Capacity (kW)	6.3	7.6	9.2	12.6	14.4
COP (Coefficient of Performance)	7.5~5	7.6~5.1	7.8~5	8.2~5.1	7.9~5.2
Performance Condition: Air Temp 35°C / Water Temp 28° / 80% Humidity					
Cooling Capacity (kW)	4.6	5.6	6.5	8.1	10.2

* Advised pool volumes apply to residential pools, using Isothermal pool covers during the summer season.

Ideal operating temperatures between 15 - 25°C

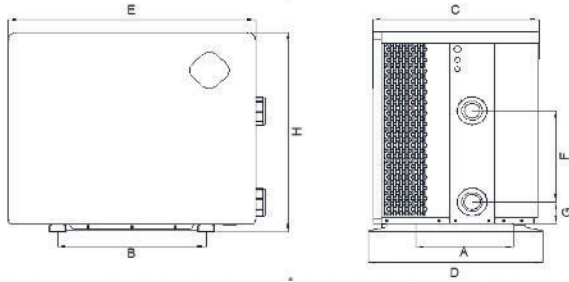
The AquaTherm Pro heat pump performance cannot be assured outside of the operational temperature range as stated above. Please take into consideration the individual conditions of your installation.

Power Supply Specifications		Models				
		DAT 110	DAT 140	DAT 170	DAT 220	DAT 270
Breaker	Rated Current (A)	12	13	16	18	20
	Rated Residual Action Current (mA)	30				
Fuse (A)		12	13	16	18	20
Power Cord (mm²)		3x2.5	3x2.5	3x2.5	3x4	3x4
Signal Cable (mm²)		3x0.5				
Maximum Current (A)		9	11	13	16	18

Please note that for applications that require power supply distance to be greater than 10m from the unit the cable size will need to be increased to suit.

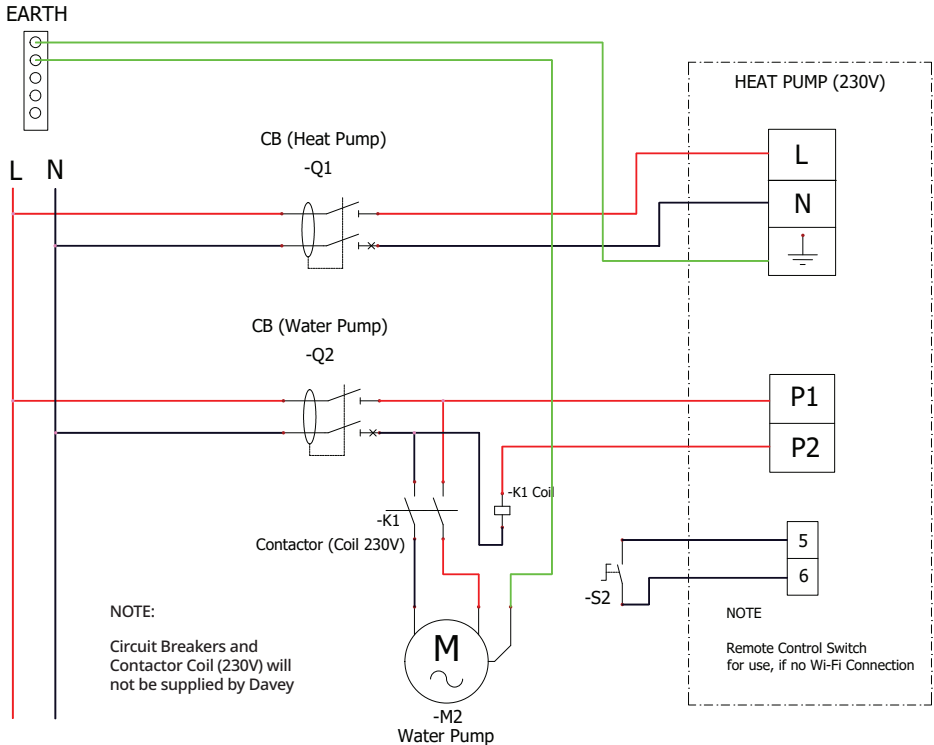
It is not recommended to extend cable greater than 50m.

DIMENSIONS (mm)



Models	A	B	C	D	E	F	G	H
DAT110	510	450	504	530	750	300	75	656
DAT140	510	450	504	530	750	280	75	656
DAT170	510	540	504	530	840	350	75	656
DAT220	510	680	504	530	980	460	75	756
DAT270	520	760	514	540	1135	460	75	756

WATER PUMP CONTROL CONNECTION WIRING



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).

DAVEY

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