



Swimming Pool Heat Pumps
HHP16B, HHP23B, HHP28B, HHP35B

INSTALLATION & OWNERS MANUAL



IMPORTANT
Please read carefully



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

Contents

Swimming Pool Heat Pumps

INSTALLATION

1. HOW IT WORKS	4
1.1 Important Facts	4
1.2 Key Specifications	4
2. INSTALLATION	5
2.1 Installation Site	5
2.2 Bypass System	5
2.3 Water Connection	5
2.4 Electrical Connection	5
2.5 Connecting a Henden H8VSPBT pump	7
2.6 Settings	8
2.7 FIL Mode (optional)	10
3. BEFORE START-UP	10
4. WINTERISING	10
5. MAINTENANCE	10
5.1 Safety Instructions	10
5.2 Regular Maintenance	11
6. WATER QUALITY	11
7. TROUBLESHOOTING	12
8. HENDEN™ REPAIR OR REPLACEMENT GUARANTEE	13

Congratulations on the purchase of your Henden by Nirvana heat pump. It is designed and manufactured in Canada and is renowned for its efficiency and reliability.



In accordance with AS/NZS 60335.2.41 we are obligated to inform you that this Henden heat pump is not to be used by children, or infirm persons and must not be used as a toy by children. Please ensure young children are supervised to ensure that they do not play with the heat pump.

1. HOW IT WORKS

The Henden heat pump is equipped with a large surface evaporator that allows heat to be extracted from the surrounding air. This heat is transferred to the pool water by the titanium heat exchanger. This method generates substantial energy savings compared to: a conventional electric resistance heater; and natural, or propane gas pool heaters.

1.1 Important facts

- The Henden heat pump is designed to operate at water pressures ranging from 34kPa - 206kPa;
- The optimal water flow to maximise performance is 265L/min minimum flow is 160L/min;
- Your pool pump should always be on when the Henden heat pump is in operation.

1.2 Key Specifications

Performance Data						
	27°C 80% 27°C**		27°C 63% 27°C**		10°C 63% 27°C**	
Model	kW	COP	kW	COP	kW	COP
HHP16B	16.0	6.6	15.0	6.4	10.5	4.4
HHP23B	23.5	6.6	22.0	6.4	14.5	4.5
HHP28B	28.0	6.4	27.0	6.2	19.0	4.3
HHP35B	35.0	6.2	32.5	6.0	23.0	4.2

Dimensions					
Model	Height (mm)	Width (mm)	Length (mm)	Weight (kg)	Water Connections
HHP16B	770	970	990	90	50mm
HHP23B	970	970	990	110	
HHP28B	970	970	990	112	
HHP35B	1070	970	990	114	

Technical Data	
Heat Exchanger	Titanium Double Coil
Control Board	4 line digital
Defrost Mode	Passive
Compressor Type	Scroll
Cabinet	Injected polypropylene composite reinforced with fibreglass
Refridgerant	R410A

Warranty	
Component	Coverage
Labour	1 year
Parts	3 Years
Compressor	5 Years
Titanium Coil	10 Years
Cabinet	15 Years Limited

Table 1

Electrical Data		
Model	Phase	Amp Total
HHP16B	1	14.7
HHP23B	1	23.2
HHP28B	1	28.6
HHP35B	3	15.7

Table 2

2. INSTALLATION

2.1 Installation Site

To get the best results from your Henden heat pump, its location is critical. The Henden heat pump takes hot air from its surroundings and transfers this heat through its heat exchanger, to the pool water.

The Henden heat pump must be installed on a level surface. Henden recommends a concrete slab, or stable pavers that are detached from the foundations of the building. The Henden heat pump should not be installed in an enclosed space (e.g. under a deck, or in a shed).

The Henden heat pump is for outdoor installation only. To get the best performance from your unit, ensure 60cm of clearance around and 120cm above the Henden heat pump, see Image 1.

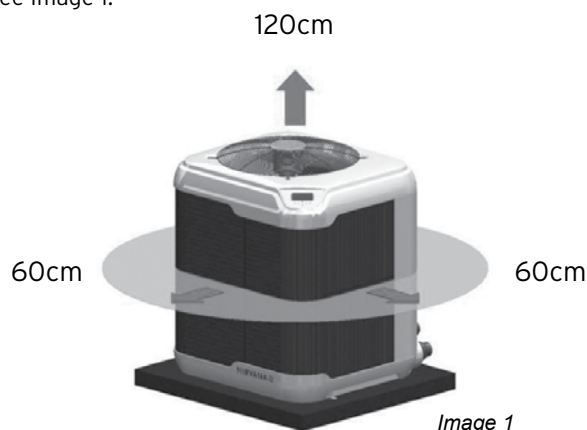


Image 1

2.2 Bypass System

Although a bypass system is not necessary for your Henden heat pump to operate properly, we strongly recommend the installation of a bypass system to make the maintenance and winterising of the Henden heat pump easier.

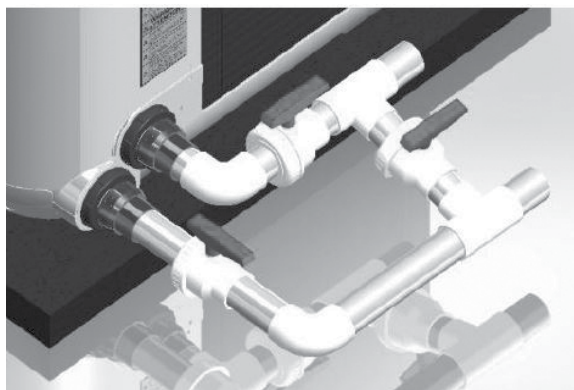
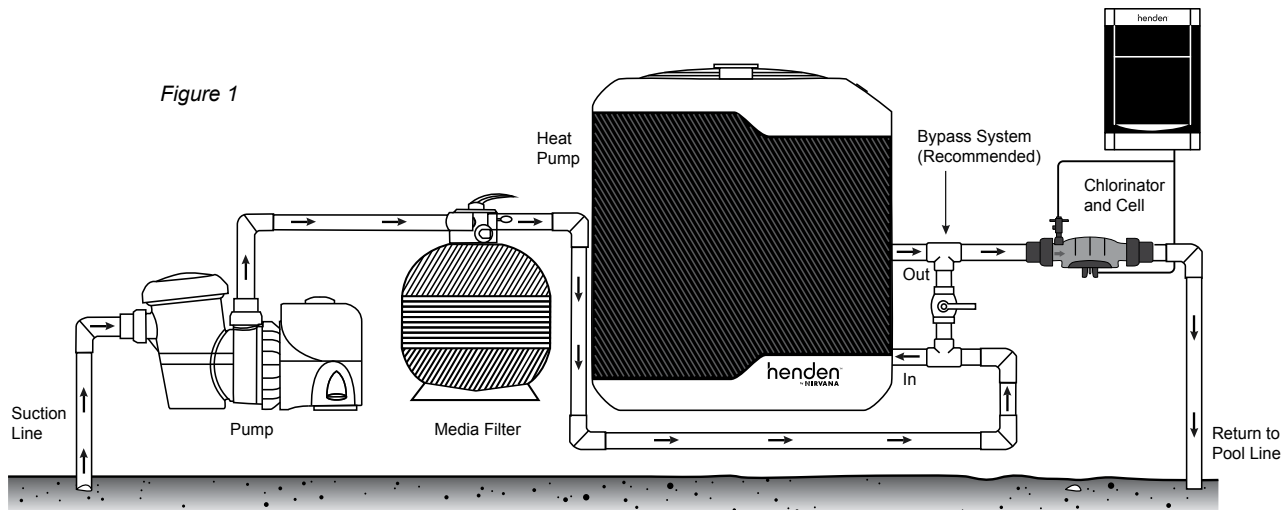


Image 2

2.3 Water Connection

Figure 1



For connections using a single pool pump:

- With your pool pump connected to your filter, connect the discharge line of the filter to the inlet connector located on the base of the Henden heat pump.
- Connect the pool water return line to the discharge connector located on the base of the Henden heat pump.

For connections using a secondary pool pump:

- Connect the pump discharge line to the inlet connector located on the base of the Henden heat pump
- Connect the pool water return line to the discharge connector located on the base of the Henden heat pump

Once all the connections have been made, turn the pool pump on to check water pressure and to ensure that all connections are watertight. The flow rate must be between 160L/min - 300L/min maximum. Correct water flow will ensure optimum performance and efficiency of the Henden heat pump. Optimum flow rate is 265L/min.

For use in conjunction with solar pool heating:

Should the Henden heat pump be used in conjunction with a solar pool heating manifold, the water entering the Henden heat pump should first run through the solar absorber. Do not plumb the solar absorber after the Henden heat pump. Henden doesn't recommend this practice as solar absorbers can't typically accommodate the same flow rates as the Henden heat pump. The solar absorber may also act to cool water rather than heating, in cooler weather. A better practice would be to run separate flow circuits.

For use in conjunction with a Henden Chlorinator:

Should the Henden heat pump be used in conjunction with a Henden chlorinator, the chlorinator cell is required to be installed after the Henden heat pump. If the chlorinator cell is installed before the Henden heat pump this will allow heavily chlorinated water to enter the Henden heat pump. This will significantly shorten the life expectancy of the Henden heat pump and may void warranty.

2.4 Electrical Connection



WARNING: The electrical connection should be done by a qualified electrician according to national, state and local city codes or standards. The unit should be connected to a compatible RCD (Residual Current Device).

	HHP16B	HHP23B	HHP28B	HHP35B
Voltage (V)(AC)	240	240	240	415
Frequency (Hz)	50	50	50	50
Phase	Single	Single	Single	Three
Compressor starting current (A)	67	126	130	90.5
Current total (A)	14.7	23.2	28.6	15.7
Min circuit current (A)	21.5	34.5	40.0	15.7
Max circuit current (A)	30.0	40.0	50.0	20.0

Table 1

**Wiring diagram for models:
HHP16B, HHP23B, HHP28B**

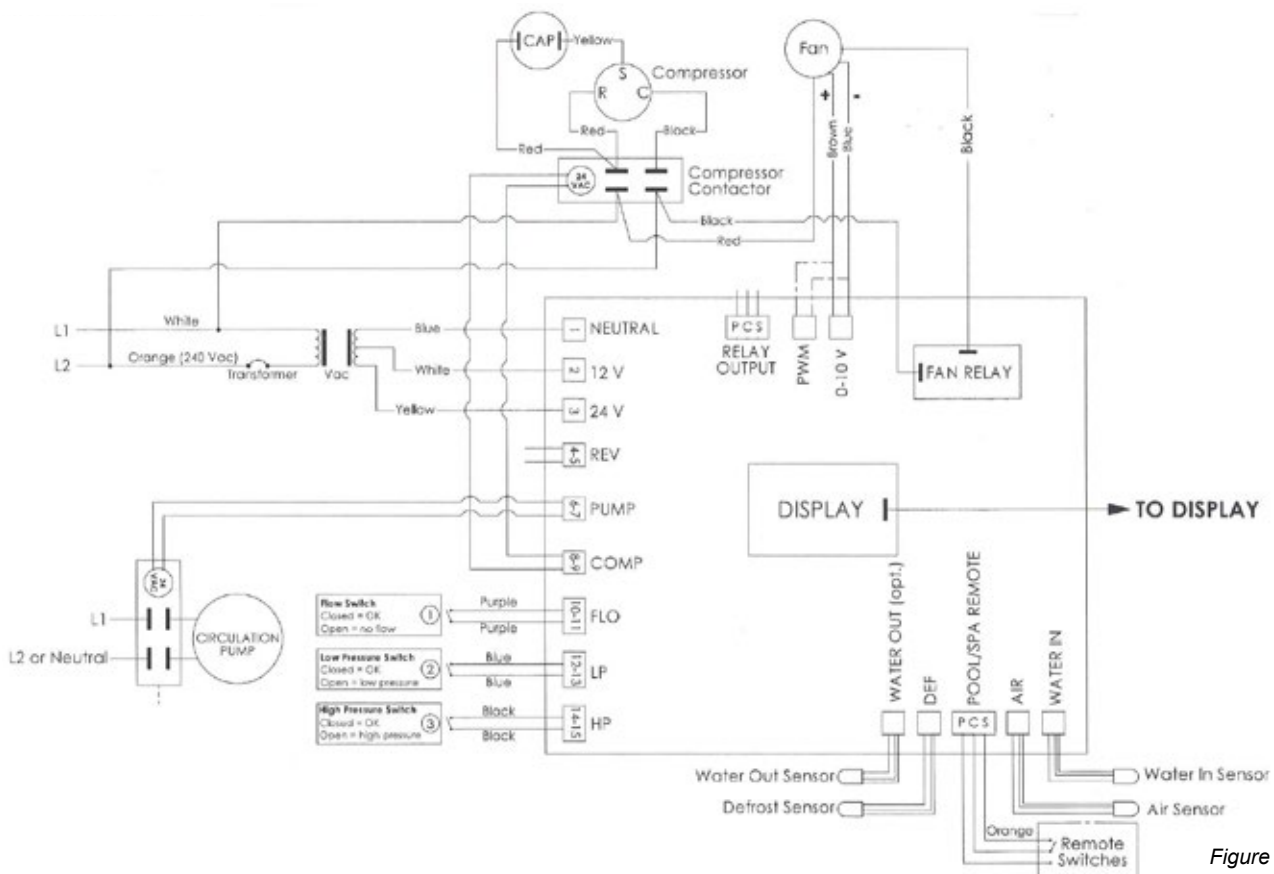


Figure 2

**Wiring diagram for model:
HHP35B**

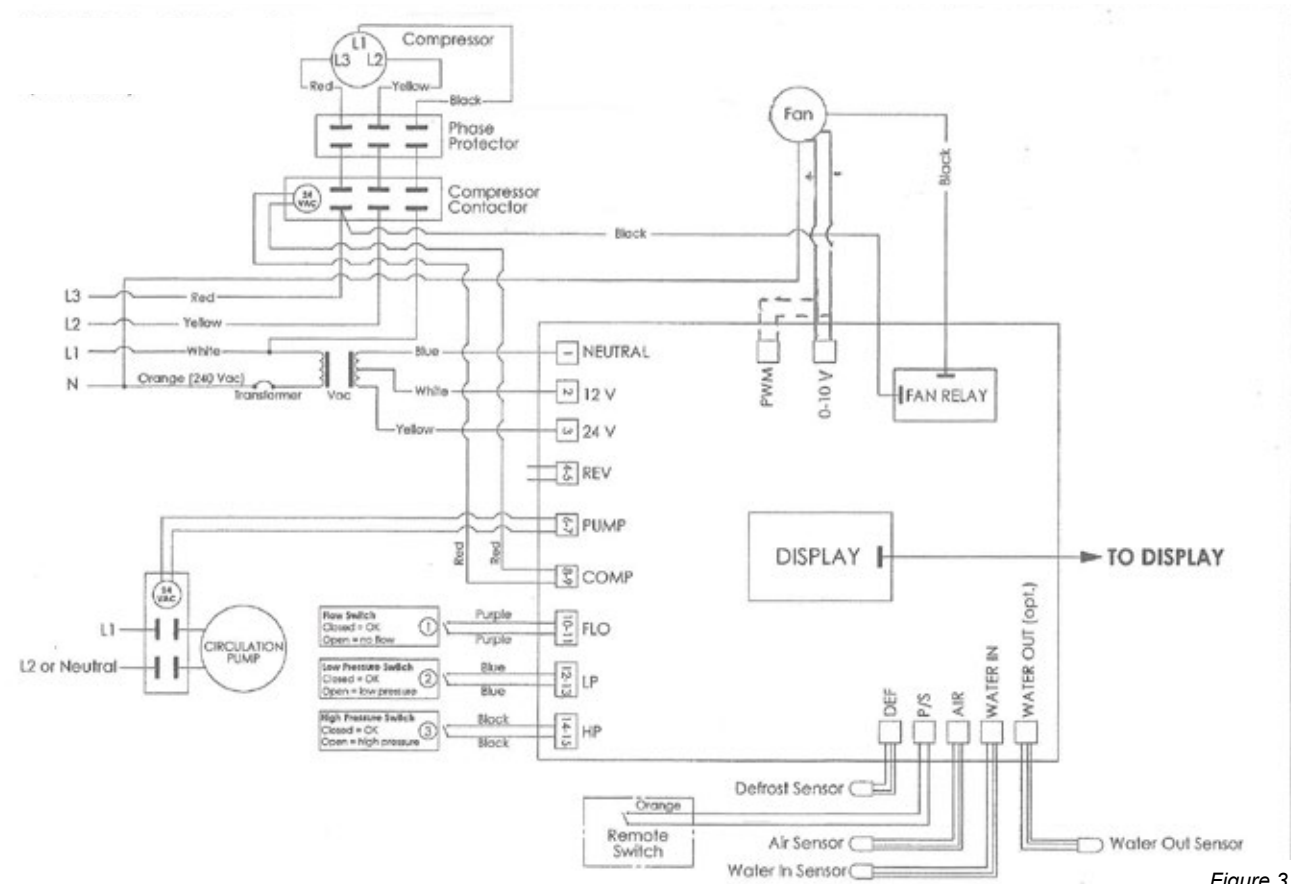


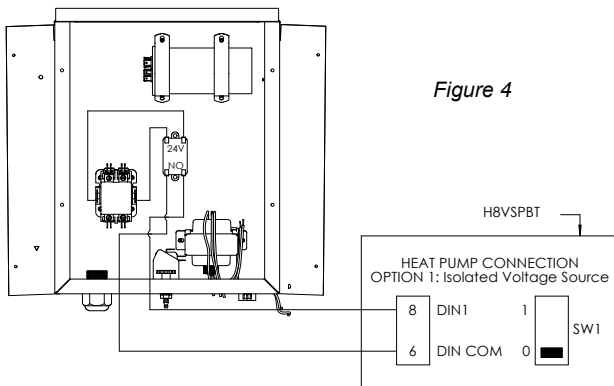
Figure 3

2.5 Connecting a Henden H8VSPBT pump

The following section should be read in conjunction with the installation and operating instructions of the Henden H8VSPBT pump. This option requires the installation of a secondary relay.

To achieve maximum heating efficiency from the Henden heat pump, connect a Henden H8VSPBT pump using an RJ45 cable. When connected and the Henden heat pump detects your pool needs to be heated, it sends a signal to turn the Henden H8VSPBT pump to full speed (or an overridden speed selected by you). You will need to purchase a separate relay to accommodate this. Specifications of relay required:

- 24V AC coil;
- No contact;
- Contact current: 1A minimum;
- Screw contacts preferred as they can be connected to the RJ45 network cable used to signal the Henden H8VSPBT pump more easily.



There is a 17.5mm rail available inside the Henden heat pump for the electrician to use to mount the relay. Alternatively, a panel mount relay may be used.

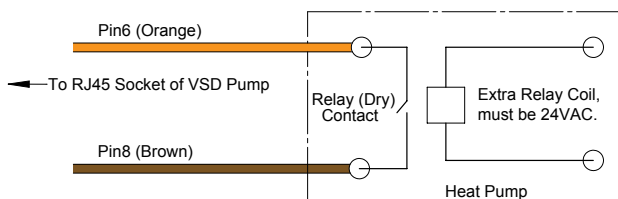
For this feature to work correctly, both the Henden heat pump and Henden H8VSPBT pump must be operating or able to operate at the same time.



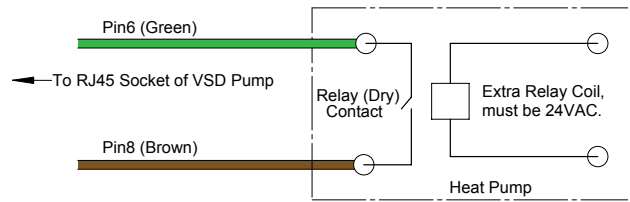
WARNING: The electrical connection should be done by a qualified electrician according to national, state and local city codes and standards.

The Henden heat pump uses a 24V AC contactor to turn on the compressor to operate. Depending on the system your chosen speed of the Henden H8VSPBT pump will require connections as shown in the following diagrams:

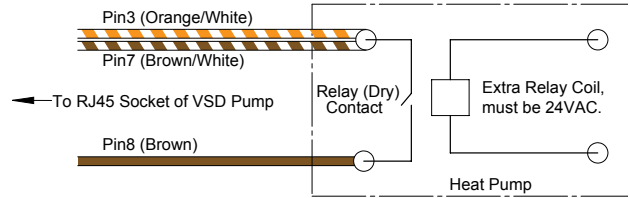
Henden H8VSPBT pump 50% speed using T-568A cable



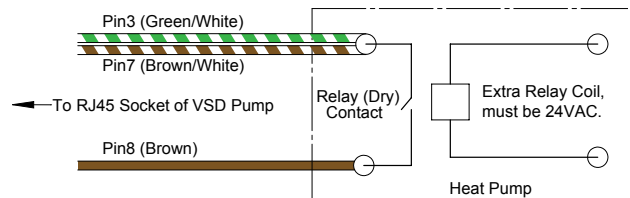
Henden H8VSPBT pump 50% speed using T-568B cable



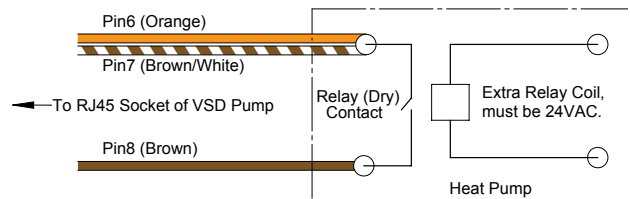
Henden H8VSPBT pump 67% speed using T-568A cable



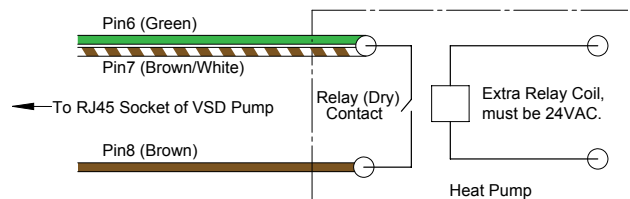
Henden H8VSPBT pump 67% speed using T-568B cable



Henden H8VSPBT pump 83% speed using T-568A cable



Henden H8VSPBT pump 83% speed using T-568B cable



Henden H8VSPBT pump 100% speed using either T-568A, or T-568B cable

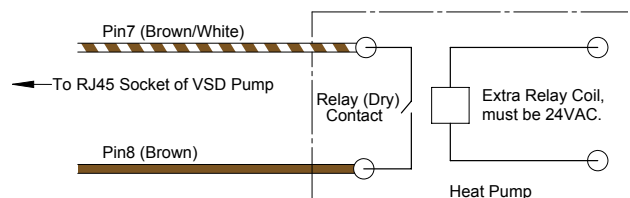
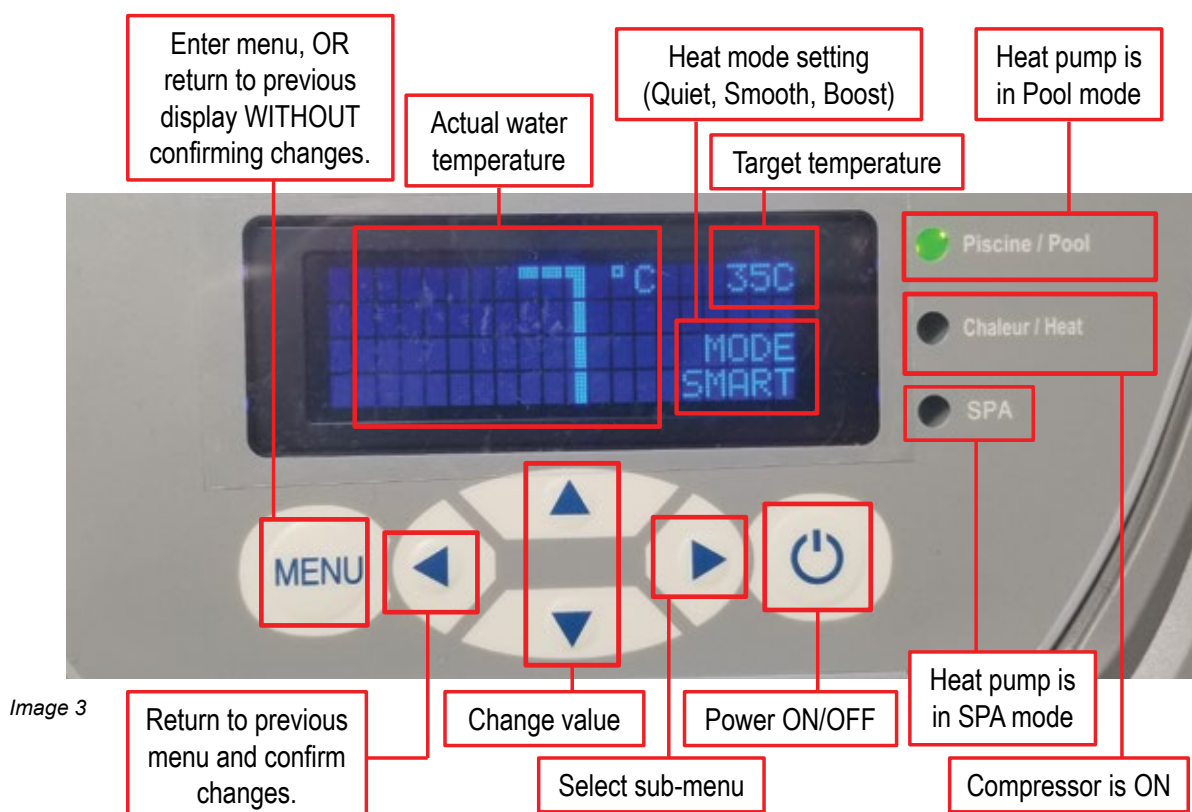


Figure 5

2.6 Settings

Electronic Display



User Menu

Set Temperature -

Set the desired temperature of the POOL or the SPA.

Pool or Spa Mode -

Change between POOL and SPA modes.

Heat Mode -

Change between speed settings:

Quiet Mode - Keeps the fan speed lower to reduce noise when it is warm outside (this mode does not work below 16°C). If the temperature drops below 16°C, heat pump will return to SMART mode. Quiet Mode reduces the pump heat output due to the reduced fan speed.

Smart Mode - Varies fan speed according to outside temperature to produce the best efficiency possible. As temperatures get colder, fan speed increases. As temperatures get warmer, fan speed decreases.

Boost Mode - Fan speed is increased to improve the heat output of the heat pump.

Daily Timers

Timers ON/OFF -

This activates the heat pump timer function - make sure the clock is set.

Start Heating Time -

Set the time of day when the heat pump turns on. The heat pump relay (optional) is activated whenever heat is ON.

Stop Heating Time -

Set the time of day when the heat pump turns off.

Start Pump Time -

Function only available if using pump relay (optional). Set the time of day when the pool pump turns on.

Stop Pump Time -

Function only available if using a pump relay (optional). Set the time of day when the pool pump turns off.

Set Clock Time -

Allows user to set clock time (Must be done every time the power is cut to the unit).

Settings

Min Outside Temp -

Allows the user to set the minimum outside temperature that the heat pump will turn on. This allows users to save energy by not heating on days when temperatures are too low or avoids heating at night. Note that this setting may prevent the pool from reaching set temperature at certain times of the year.

Fahrenheit or Celsius -

Select temperature units - Fahrenheit or Celsius.

Change Language -

Set display language.

Defrosting Mode -

Defrosting is a normal cycle that takes a few minutes. During this process, the fan will be working while the compressor will be turned off.



WARNING: Improper installation, adjustment, service, maintenance or use can cause fire, electrical shock or other conditions which may cause injury or property damage. Consult a qualified technician, your installer or 1300 HENDEN for information or assistance. All service calls under warranty should be authorised by Henden.



Image 4



Image 5

2.7 FIL Mode (optional)

This option allows for the pool pump to be powered by the Henden heat pump.

FIL mode OFF: This is the factory default setting and is used when the Henden heat pump does not power the pool pump.

FIL mode ON: This option allows for the pool pump to be powered by the Henden heat pump. It requires the installation of a contactor in the Henden heat pump's electrical box and wiring to your pool pump.

How to programme the FIL Mode timer:

FIL mode timer uses the same timer described in Settings (Daily Timers).



WARNING: The electrical connection should be done by a qualified electrician according to national, state and local city codes and standards.

The contactor must be connected to the PUMP connectors on the control board (see Image 6).

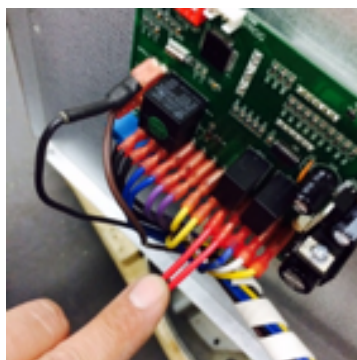


Image 6

Use terminals L1-L2 on the control board to power the breaker (see Image 7).



Image 7

The pool pump can then be wired to the other side of the contactor (see Image 8).

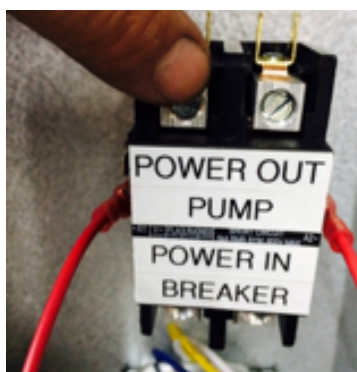


Image 8

3. BEFORE START-UP

- Inspect the unit to ensure it is in good operating condition ☐
- Clean the swimming pool filter ☐
- Ensure water is balanced to recommended levels in water quality section of this manual (Section 6) ☐
- Ensure all Henden heat pump water inlets and outlets are correctly connected ☐
- Turn on the circuit breaker, or isolation switch ☐

4. WINTERISING

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 Henden heat pump.

1. Turn off the circuit breaker, or isolation switch;
2. Drain the Henden heat pump. Loosen all water connections;
3. 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. Tilt the unit towards the back to remove all water from the unit.



WARNING: All water connections to the pool should be disconnected for winter to allow complete drainage of the Henden heat pump. The winterising must be done before air temperatures reach freezing point.



WARNING: The Henden heat pump should never be tilted more than 30-35°, even during transportation. Should this occur, allow the Henden heat pump to sit for 4 hours before turning on.

- Block water inlet and outlet with a cloth or plastic to prevent mice, or other animals from entering the unit.

5. MAINTENANCE

5.1 Safety instructions

Always disconnect the Henden heat pump before:

- Opening the access door;
- Cleaning the cabinet, or evaporator.

To avoid the risk of injuries, or damage to the unit, never:

- Sit on the Henden heat pump, or place a heavy object on it;
- Put objects in, or on the protective grid.

The Henden heat pump requires professional maintenance and repair. Any "do-it-yourself" repairs on a unit within warranty period, may void the remainder of the manufacturer's warranty. Maintenance, or adjustments other than those recommended in this owner's manual should not be attempted. Contact Henden for any questions, or problem you may have with your unit.

5.2 Regular maintenance

- ☐ Inspect and clean the pool filter regularly to ensure adequate water flow to the Henden heat pump.
- ☐ Inspect the evaporator and rinse it using a garden hose. Wash, with a stream of water from top to bottom to remove any grass, leaves or other objects that could obstruct the evaporator.
- ☐ Clean the Henden heat pump casing with a mild soap (dishwashing liquid). Do not use abrasives, or bleach. Inspect the pool skimmer basket regularly. Never use the skimmer to add pool chemicals.
- ☐ Ensure water is balanced to recommended levels in water quality section of this manual (Section 6). Chemical balance outside of recommended levels could result in damage to your unit and risks voiding warranty.



WARNING: To prevent injuries, death, or property damage, read and follow all instructions and warnings.

6. WATER QUALITY

RECOMMENDED POOL WATER CHEMISTRY					
POOL WATER BALANCING	Free Chlorine (ppm)	pH	Total Alkalinity TA (ppm)	Calcium Hardness (ppm)	Stabiliser – Cyanuric Acid (ppm)
Ideal Reading / Range	1 – 3	Concrete & Tiled Pools: 7.4-7.6 Other Surfaces: 7.2-7.4	Concrete & Tiled Pools: 80-120. Other Surfaces: 125-150	Concrete & Tiled Pools: 200-275. Other Surfaces: 100-225	25 – 50
To Increase	Increase output of chlorinator. Add chlorine. Increase filtration time.	Add buffer or soda ash (Sodium Carbonate)	Add Sodium Bicarbonate	Add Calcium Chloride	Add Cyanuric Acid
To Decrease		Add Muriatic Acid	Add Muriatic Acid or Dry Acid	Partially drain & refill pool with lower hardness water to dilute	Partially drain & refill pool to dilute
Frequency of Testing	Weekly	Weekly	Weekly	Weekly	Regularly

Table 4

7. TROUBLESHOOTING

PROBLEM	CAUSE(S)	WHAT TO do
WATER FLOW ERROR CHECK WATER FLOW INSIDE HEAT PUMP	<ul style="list-style-type: none"> The water flow inside the Henden heat pump is insufficient; The bypass valves are in the wrong position; There is no water circulation inside the heat pump; The flow switch is faulty. 	<ul style="list-style-type: none"> Make sure that the pool pump works; Make sure the bypass valves are properly positioned; Check the pool skimmer (no obstruction).
DEFROST MODE	<ul style="list-style-type: none"> The heat pump is in de-icing mode. This is normal if outside temperatures are low 	<ul style="list-style-type: none"> Wait until the end of the de-icing cycle. The heat pump will restart automatically.
ERROR LOW REFRIGERANT PRESSURE	<ul style="list-style-type: none"> Ventilation on the evaporator is insufficient; The fan does not work; Refrigerant leak; The outside temperature is too low. 	<ul style="list-style-type: none"> Check the evaporator is not obstructed by pollen, grass, leaves etc. Refer to Section 5 for safety instructions; Be sure there is enough free space around the Henden heat pump. Refer to Section 2; Check that the fan is powered ON.
LOW PRESSURE FAILED 3 TIMES IN 1 HOUR RESET THE BREAKER	<ul style="list-style-type: none"> The heat pump low switch has cut off three (3) times in the same hour for one of the reasons above. (code LP). 	<ul style="list-style-type: none"> The heat pump will not re-start after one of the protection devices shuts it down for the third time in the same hour; Close the circuit breaker to reset the heat pump.
ERROR HIGH REFRIGERANT PRESSURE	<ul style="list-style-type: none"> The flow inside the Henden heat pump is insufficient; The bypass valves are in the wrong position; The water exit is blocked; There is an obstruction in the refrigeration circuit (piping blocked). 	<ul style="list-style-type: none"> Check whether there is adequate water circulation inside; Check that the bypass valves are properly positioned; Check if there is an object obstructing the water hose.
HIGH PRESSURE FAILED 3 TIMES IN 1 HOUR RESET THE BREAKER	<ul style="list-style-type: none"> The heat pump high pressure switch has cut off three (3) times in the same hour for one of the reasons above (code HP). 	<ul style="list-style-type: none"> The heat pump will not re-start after one of protection devices shuts it down for the third time in the same hour; Close the circuit breaker to reset the heat pump.
NO CONNECTION	<ul style="list-style-type: none"> The display and main boards are not communicating. 	<ul style="list-style-type: none"> Close the breaker switch and reopen it. If the problem is not resolved, the digital control will have to be changed. In this case, call your installer or 1300 HENDEN (1300 436 336).
DEFROST TEMPERATURE PROBE OPEN	<ul style="list-style-type: none"> The de-icing sensor is not properly connected or is not receiving power. 	<ul style="list-style-type: none"> Call your Installer or 1300 HENDEN (1300 436 336).
DEFROST PROBE SHORT CIRCUIT	<ul style="list-style-type: none"> The de-icing sensor is defective. 	<ul style="list-style-type: none"> Call your Installer or 1300 HENDEN (1300 436 336).
WATER TEMPERATURE PROBE OPEN	<ul style="list-style-type: none"> The water temperature sensor is not properly connected or is not receiving power. 	<ul style="list-style-type: none"> Call your Installer or 1300 HENDEN (1300 436 336).
WATER TEMPERATURE PROBE SHORT CIRCUIT	<ul style="list-style-type: none"> The water temperature sensor is defective. 	<ul style="list-style-type: none"> Call your Installer or 1300 HENDEN (1300 436 336).
AIR TEMPERATURE PROBE OPEN	<ul style="list-style-type: none"> The air temperature sensor is not properly connected or is not receiving power. 	<ul style="list-style-type: none"> Call your Installer or 1300 HENDEN (1300 436 336).
AIR TEMPERATURE PROBE SHORT CIRCUIT	<ul style="list-style-type: none"> The air temperature sensor is defective. 	<ul style="list-style-type: none"> Call your Installer or 1300 HENDEN (1300 436 336).
The fan is functioning, no code is displayed and the compressor does not start	<ul style="list-style-type: none"> Electrical problem in the compressor circuit; Capacitor defective; Compressor defective. 	<ul style="list-style-type: none"> Call your Installer or 1300 HENDEN (1300 436 336).

Before placing a service call

There is always a possibility of condensation, especially on days with a high humidity level. If you see water near the heat pump, there's a good chance it comes from condensation. To make sure it is water from condensation you can shut the heat pump off, leaving the pool pump running. Within a few hours, if you see that the water around the unit is drying up, it is indicative of normal condensation.

Before calling your installer or 1300 HENDEN (1300 436 336), follow the steps below;

1. Make sure the circuit breaker or isolation switch is ON, the fuses are functional and the heat pump is connected properly (green light on the unit).
2. Make sure that the pool pump is running at full capacity, has sufficient flow, and that the filter is clean.
3. Make sure that the water inlet and outlet are open and bypass valve is closed.
4. Check whether the temperature set is higher than the actual pool temperature.
5. Check that the plumbing is positioned in a way to enable sufficient water flow.
6. Check that the evaporator is not obstructed by pollen, leaves, grass, etc. (see maintenance for washing instructions).
7. When the temperature goes down to about 7°C, the heat pump may switch to de-icing mode; it will then start a cycle that stops the compressor while letting the fan continue running. Once the cycle is complete, it will resume normal operation.
8. Frost may appear on the evaporator during cold weather and this is normal; however, if there is 12mm of ice or more on the evaporator, contact Henden immediately.

If your heat pump does not operate properly after following these steps, contact your installer or 1300 HENDEN (1300 436 336).

All replacements must be made using Henden parts to maintain your heat pump performance, durability and safety, as well as keeping your warranty valid.



WARNING DO NOT modify or remove a safety device. The manufacturer disclaims all responsibility if installation or maintenance instructions are not followed or if electrical or mechanical components and/or safety devices have been modified in any way.

8. HENDEN™ REPAIR OR REPLACEMENT GUARANTEE

Henden Guarantee Period

Parts - Three Years

Compressor - Five Years

Titanium Heat Exchanger Coil - Ten Years

Cabinet - Fifteen Years

Our goods come with guarantees that cannot be excluded under the Australian 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.

Should you experience any difficulties with your Henden by Nirvana product, we suggest in the first instance that you contact the installer of the product or call 1300 HENDEN.

Alternatively you can phone Henden. On receipt of your claim, Henden will seek to resolve your difficulties if the product is faulty or defective, advise you on how to have your Henden product repaired, obtain a replacement or a refund.

Henden does not cover normal wear or tear, 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 unauthorised persons attempting repairs. Where applicable, your Henden product must only be connected to the voltage shown on the nameplate.

Henden 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 making a claim.

Henden 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 Henden products.

Should your Henden by Nirvana product require repair or service; contact the installer or phone the number below.

TECHNICAL AND AFTER SALES SUPPORT:

1300 HENDEN (1300 436 336)

MAILING/MANUFACTURER ADDRESS:

Davey Water Products

6 Lakeview Drive, Scoresby,

Victoria, 3179

NOTES

henden™

