DAYLIFF

HPW
All in One Heat Pump

HPW150

HPW200 & 300

Installation & Operating Manual

INDEX

Congratulations on selecting a Dayliff Heat Pump Hot Water Systems. They are manufactured to the highest standards and if installed and operated correctly will give many years of efficient and trouble free service. Careful reading of this Installation Manual is therefore important, though should there be any queries they should be referred to the equipment supplier.

1. SPECIFICATIONS

HPW150

HPW200 & 300

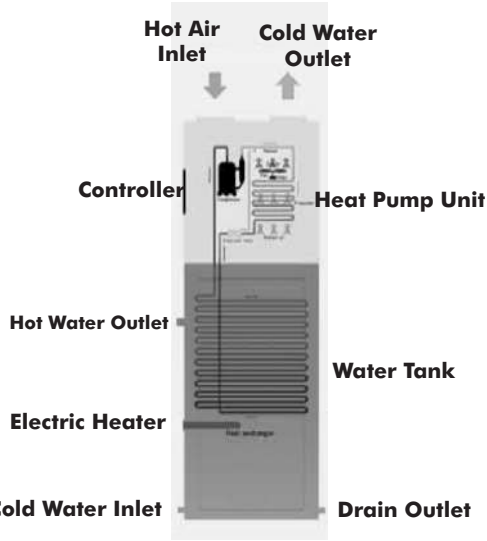
Dayliff HPW Heat Pump Hot Water Systems are designed for all domestic water heating applications that utilise the high efficiency benefits of heat pump technology. The integral systems combine a hot water storage tank with an efficient heat pump that generates heat from ambient air by utilising the natural heat generating phenomenon of the gas evaporation/condensation cycle. This is transferred to the stored water by circulation through a coil type heat exchanger in the tank. Tank construction is carbon steel with internal enamel coating and a magnesium anode is fitted for cathodic protection against corrosion. The tank is lined with high grade thermal insulation for heat retention. Particular features are:-

- HPW heat pumps work best under ambient temperature of between -7^{0}C to 43^{0}C
- High quality integral heat pump fitted on top of the hot water cylinder with quiet GMCC compressor that provides a Coefficient of Performance (COP) of up to 4.16 (at 20^{0}C Ambient temp, 15^{0}C Water temp) and settable hot water temperature of up to 75^{0}C. This provides up to 80% power savings compared to conventional element heaters.
- Tube type heat exchanger coiled externally around the water tank for performance and safety with inbuilt sterilising function
- Integral 2kW electric heating element for temperature boosting
- Digital controller for operational and timer settings and fault indication
- Supplied complete with ozone friendly R134A regrigerant gas for optimal performance

Dayliff HPW systems are high efficiency, high performance water heaters and are the ideal solution for all residential hot water supply requirements.

TECHNICAL SPECIFICATIONS

Model	HPW150	HPW200	HPW300
Water Tank Volume, Liters	150	200	300
Heating Capacity, kW	2.5		
Rated/Max Input Power, kW	0.6/3		
Fan Flow	Side	Top	
Rated/Max Current, A	2.7/15		
Inlet/Outlet	¾"		
Net Dimensions, mm	500x500x1670	620Diax1638	620Diax2038
Net Weight, kgs	92	105	130



2. SYMBOLS & WARNINGS

The unit should be reliably earthed before usage, otherwise might cause death or injury.

This is a household appliance and necessary protection against electric fault should be provided.

Do not remove any labels or parameter plate on instructions attached .

Installation, repair and maintenance should be carried out by a qualified professional in accordance with local regulation.

Any modification and improper repair is not advised as it may cause fire, electric shock and injury.

Ensure electrical supply is compatible with the Rated Current value should not be less than 10A and power.

Install the equipment in a cool dry place and that is well ventilated and away from children. The power plug should be installed about 1.8m above ground for safety

Do not install this equipment indoors. As it may cause overflow, noise or indoor temperature to drop drastically.

The place must have enough space for installation and maintenance.

Ensure that inlet or outlet airflow is not obstructed. Keep away from wind and combustible gases.

Install on a flat surface that can bear heat pumps weight and easy to install vertically. In addition, the surface should not increase noise or vibrations.

High temperature, saline conditions and long term exposure to harsh elements may decrease lifetime of products. Ensure proper maintenance for long life. Also avoid installing in sites with mineral oil, corrosive gases, strong vibrations and strong electromagnetic waves to extend equipment life.

Do not install in kitchens where there is cooking gas and oil spills and splatters

Do not touch fan with your hands or other objects else may result in injury.

Equipment is provided with complete isolation between water and electricity, without electric shock problem, more safety.

3. INSTALLATION

3.1 Equipment Contents

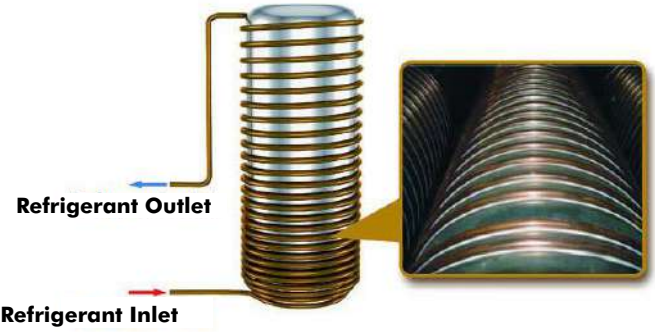


Fig 1: Single Coil Layout

- The condenser coil is wrapped around the stainless tank, and does, not come in to contact with water directly, providing more safety and health.
- The maximum outlet water temperature is 60°C.
- Flexible installation is achieved by varying air inlet and outlet duct piping as below;

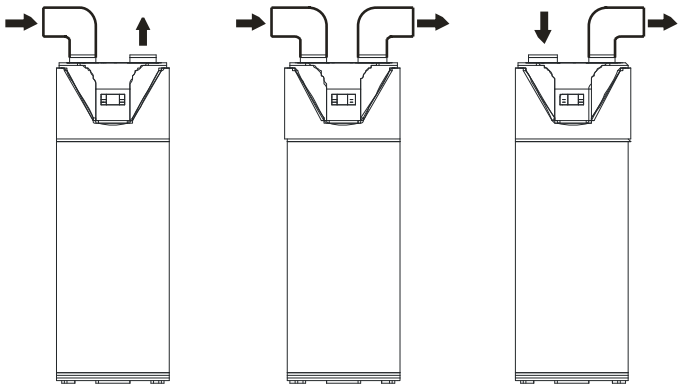


Fig 2: Inlet/Outlet Variations

- The unit is provided with automatic start-up and shutdown, automatic defrosting by by way of revising refrigerant cycle to save the extra operation.
- A non return valve must be installed on the cold water inlet.

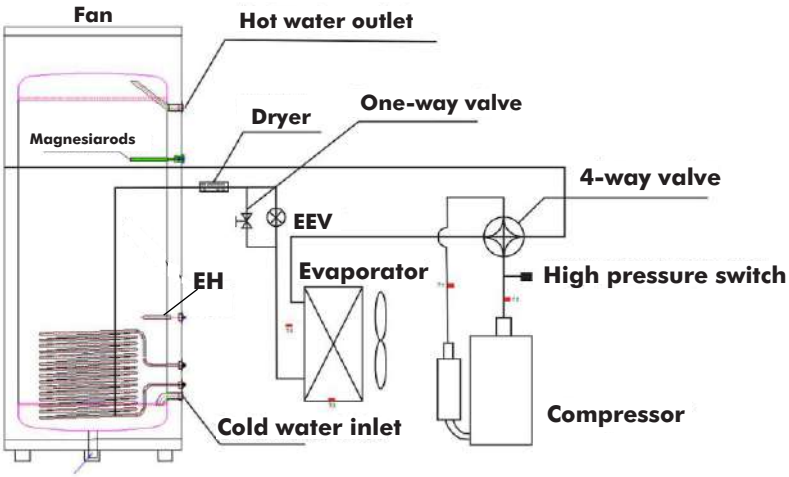


Fig 3: Heat Pump Component Layout

- **EEV:** Electronic expansion valve, the opening is regulated according to the discharge air temperature of compressor.
- **High Pressure Switch:** When the discharge pressure of compressor is 27 bar or higher, the protection switch will be triggered, and if the discharge pressure is down to 20 bar, the protection switch will be recovered
- **Fan:** Centrifugal fan with three speeds to draw in air.
- **Compressor:** Concentrates and increases heat to form a very hot gas which is passed to the heat exchanger to heat pool water.
- **Evaporator:** Copper tube with aluminium type heat exchanger that turns refrigerant into gas..
- **EH:** Electrical heater for temperature boosting.

This heat pump is heavy and needs atleast two people to move and install it. Also ensure to carry it at an angle no less than 75^0.

3.2 Siting

- Ensure to leave enough space for easy installation and maintenance

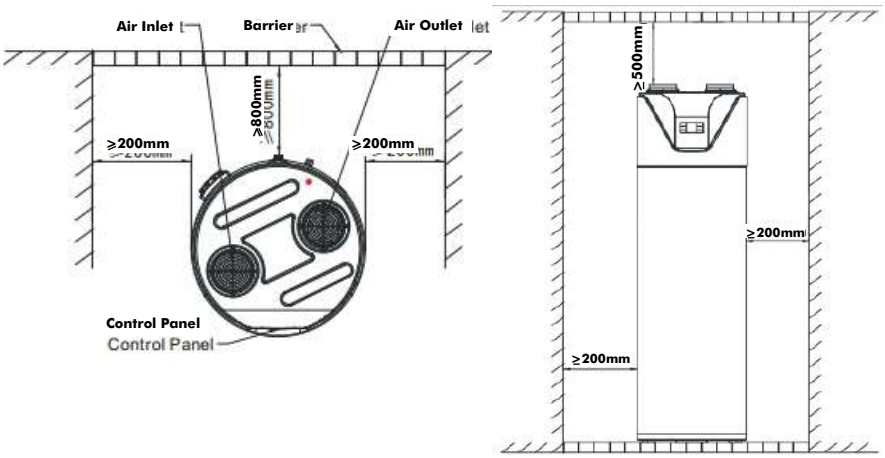


Fig 4: Installation Layout

- If heat pump is installed in the basement or indoor or other airtight spaces, ensure there is sufficient air circulation. The air duct total length should be equal or less than 6 meters, and the duct diameter should be equal or more than 150 mm.

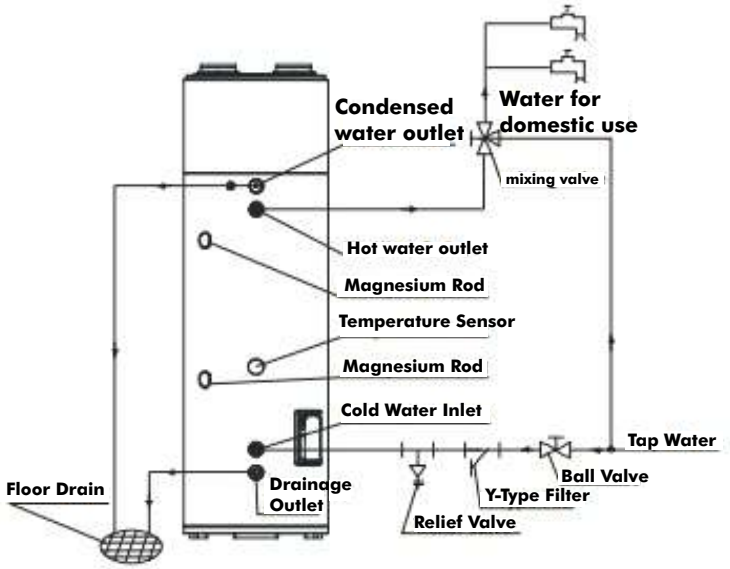
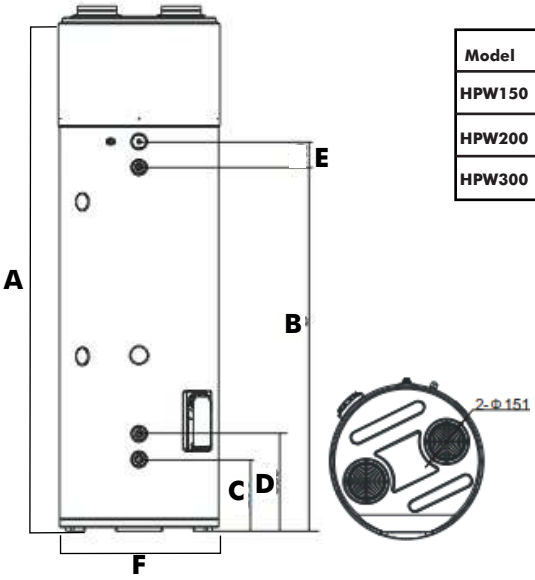


Fig 5: Pipe Line Connection Diagram



Model	A	B	C	D	E	F
HPW150	1670	1214	246	346	198	500
HPW200	1638	1013	280	380	100	620
HPW300	2038	1413	280	380	100	620

Fig 6: Connection Dimensions

3.3 Water Pipe Installation Instructions

WARNING

Do not use iron pipe to connect to heat pump, instead use CPVC pipe, PPR pipe or UPVC pipe

- Water pipes work life should not be less than heat pump's work life.
- Install relief valve of G1/2'', 8bar and ensure that the drainage pipe which connects with the relief valve, is not blocked.

NOTE

The relief valve needs to be descaled to remove calcium carbonate and ensure no obstacles. Outlet temperature of drainage port may be high and caution must be exercised.

- Keep the handle of safety valve free and ensure drainage port is kept free of debris.
- After setting up pipeline, open the valve both the cold and hot water valve to fill the water tank and close inlet valve when water overflows from water outlet. Inspect the pipeline and ensure that there is no water leakage.
- When intake pressure is below 1.5 Bar, a booster pump may be installed. When intake pressure is greater than 6.5 Bar a relief valve must be installed to protect the water tank from early failures.
- During operation, condensed water droplets may be formed, ensure proper drainage is provided as guided below

Fig 7: Drainage Layout

3.4 Sitting and Air Duct Installation Instructions

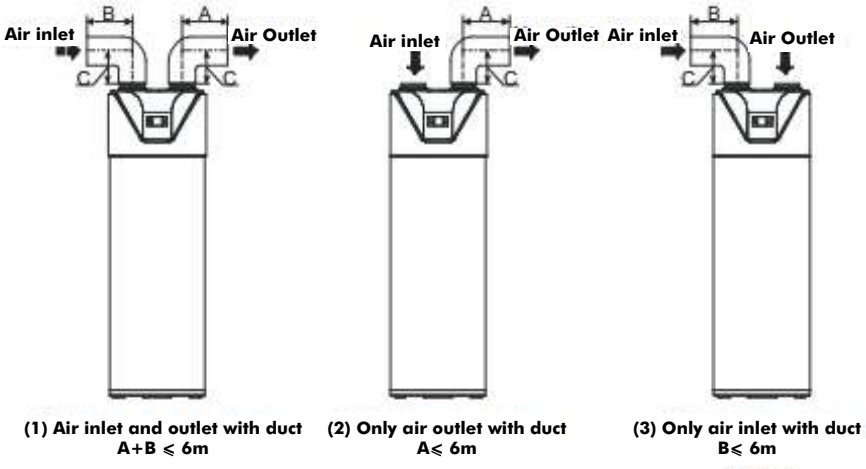


Fig 8: Inlet/ Outlet Duct Designs for HPW200/300

- As a rule, heat pumps should be installed outdoors. However by varying the design of air intake and outlet ducts, the heat pump can be used to condition cold air in the room.
- It is recommended to install the unit by only air outlet with duct (Scheme 2) in summer that could charge fresh cold air into room. (The heat pump is installed outdoor).
- Scheme 3 is preferable in winter where there is other heat source in the room. (The heat pump is installed outdoor).

Duct Description

Duct Description	Round Duct	Rectangle Duct	Other Shaped Duct
Dimensions (mm)	Φ150	150x150	Refer to above data
Straight-line pressure drop (Pa/m)	≤2	⩽2	
Straight-line length (m)	≤6	⩽6	
Bend pressure drop (Pa)	≤2	⩽2	
Bend's quantity	≤4	⩽4	

- The resistance of duct will decrease air-flow-rate,which will lead to decreased capacity of unit. The duct length should be no more than 6m or the maximum static pressure should be within 20Pa, and the quantity bending should be no more than 3.
- For air outlet with duct, when unit is operating, condensate will be generated outside of the duct, ensure proper drainage. It is recommend to insulate the duct to conserve heat.
- The unit should be protected from rain, hailstorm and other extreme weather.

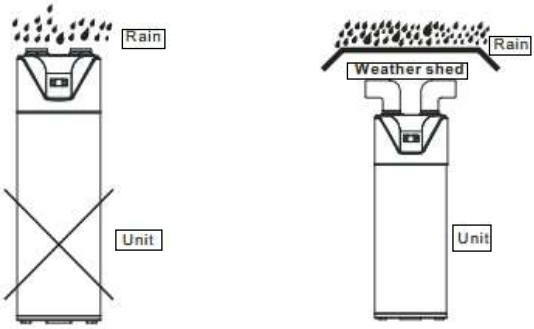


Fig 9: Locational Installation

- If installed outdoors, reliable water-resistant measures must be taken to protect unit from water and debris ingress.
- An air filter should be installed at the inlet to trap air debris

Model	Power Supply	Min. Cable diameter (mm^2)		Manual Switch (A)		Leakage Protection Device
		Size (continous length <30m)	Ground Wire	Capacity	Fuse	
HPW150	220V/50Hz	≥2.5	≥ø1.0mm	≥20	20	Below 30mA 0.1 sec

Model	Power Supply	Min. Cable diameter (mm2)		Manual Switch (A)		Leakage Protection Device
		Size (continous length <30m)	Ground Wire	Capacity	Fuse	
HPW200/300	220V/50Hz	≥2.5	≥ø1.0mm	≥20	20	Below 30mA 0.1 sec

NOTE

Directly connect power supply wire with hplug when using the heat pump

Leakage Protection

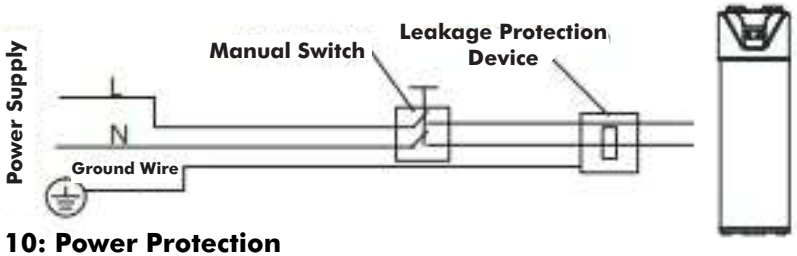
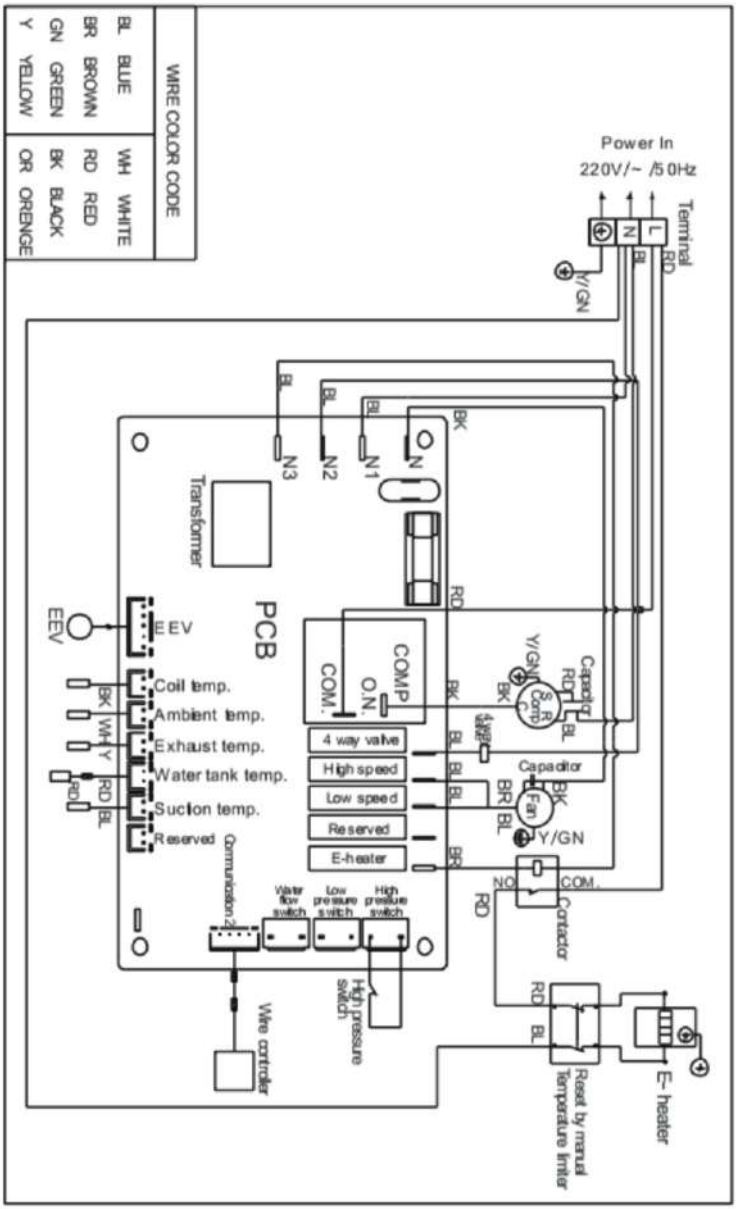


Fig 10: Power Protection

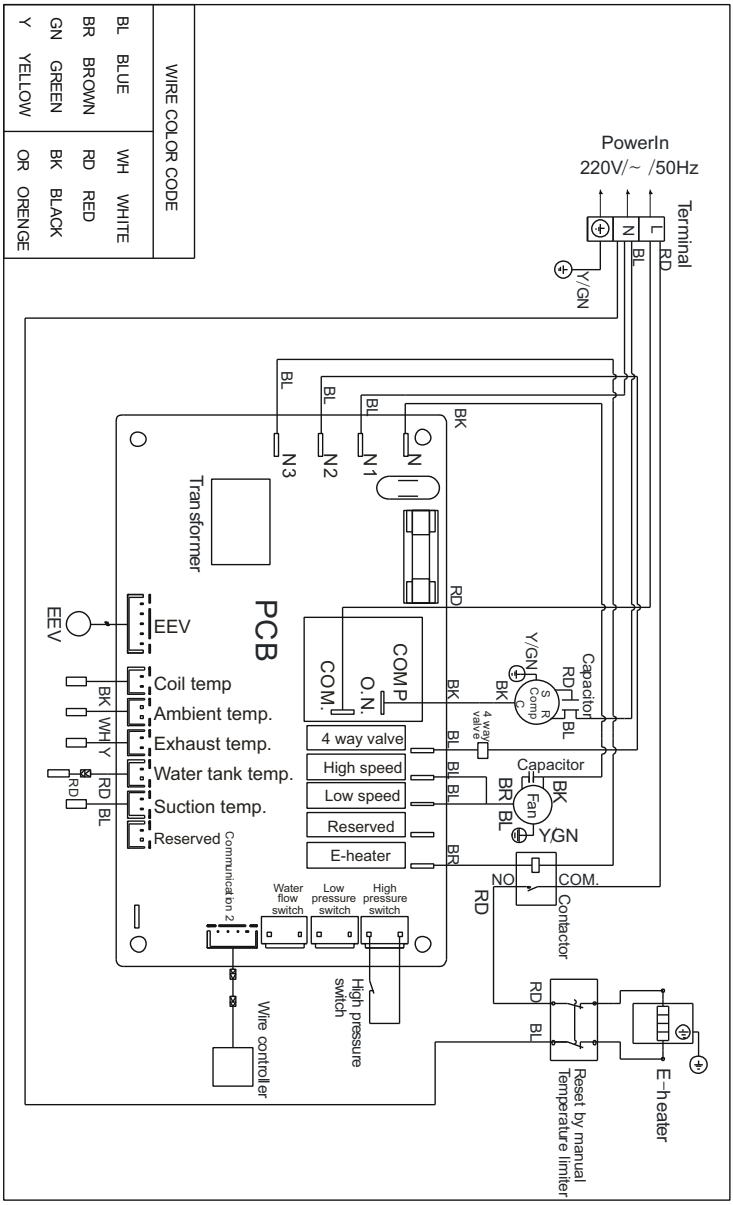
WARNING

The external power supply box must be installed with protection.

Electric Wiring Diagram



HPW150

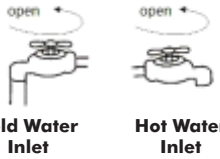

WIRE COLOR CODE
BL BLUE
BR BROWN
GN GREEN
Y YELLOW
WH WHITE
RD RED
BK BLACK
OR ORENGE
PowerIn
220V/~ /50Hz
Terminal
L
N
Y/GN
RD
BL
BK
N3
N2
N1
N
Transformer
PCB
EEV
Coil temp
Ambient temp.
Exhaust temp.
Water tank temp.
Suction temp.
Reserved
Communication 2
COMP
O.N.
COM.
Capacitor
Comp
4 way valve
High speed
Low speed
Reserved
E-heater
Fan
Capacitor
Water flow switch
Low pressure switch
High pressure switch
NO
COM.
Contactor
Wire controller
High pressure switch
Reset by manual Temperature limiter
E-heater

HPW200/300

First Time Operation

Feeding water: when using the unit for the first time (or reuse it after the tank is empty), before connecting the unit with power, ensure that the tank is full of water and open both cold water in and hot water out as below

- Open the cold water inlet valve and hot water outlet valve



Feeding Water

- When there is water flowing out from the outlet, the tank is full with water. Close the hot water outlet valve and the water filling is finished.

WARNING

Operating without water in water tank may result in the damage of auxiliary E-heater

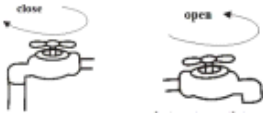
Plug in to connect the unit with power. The LCD screen will light up and is ready to receive commands. The user can now program as desired.

DANGER

Water temperature over 50°C can cause severe burns instantly or death from scalds. Children, disabled and elderly are at high risk and must be protected. Water temperature limiting valves are recommended.

- Water draining: before cleaning or moving the unit, drain out the water in the water heater, as in below picture

- Close the inlet valve, Open the outlet valve,Open the draining valve



Draining Water

- After the draining , screw the nut of the drainage outlet; the water draining is finished.

4. OPERATION

4.1 Control System Specifications

(1) Operating condition

- Voltage:220V ~ ±10%,50Hz±1Hz.
- Ambient temperature: -7 ~ +43℃
- Storage temperature: -20 ~ +75℃
- Relative humidity: 0 ~ 95%RH
- Temperature accuracy: ±1℃

(2) Main function

- Displays the temperature and setting temperature, and also can query the coil temperature, ambient temperature exhaust temperature and so on.
- Power cut memory function. When power is cut, the clock will still work.
- Timing on/off.
- Automatic defrosting.
- Forced defrost.
- The error code display and query
- Key-Lock Function
- Anti-freezing function
- In the absence of a wire controller or if faulty, the system will run automatically.

Wire Controller and Operation

HPW150

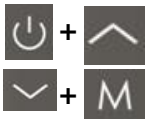
HPW200/300

Symbol	Status	Meaning
	Constantly bright	Heat pump is on
	Extinguished	Heat pump is off
	Constantly bright	At cooling mode
	Constantly bright	At heating mode
	Constantly bright	Needs repair
	Constantly bright	On AUTO mode
	Extinguished	Currently in the manual set temperature state
	Constantly bright	This unit is a water connection heat pump
	Extinguished	This unit is a refrigerant heat pump
	Constantly bright	Heat pump is on and on defrosting mode
	Flashing	Heat pump is on and on defrosting delay
	Flashing	Heat pump is off and on refrigerant recovery status
	Constantly bright	Electric heater is on for quick heating
	Flashing	Electric heater is on for disinfection
	Constantly bright	Current water temperature in the tank
	Constantly bright	Set water temperature in the tank
	Constantly bright	Current outlet water temperature
	Constantly bright	Current inlet water temperature
	Display	Display actual water temperature, set water temperature and fault code
	Constantly bright	Current showing celsius temperature
	Display	Shows real time
	Display	Timer function is on
	Display	Currently in the on time working hours
	Flashing	Set start time for working time
	Display	Currently off, non working time
	Flashing	End time of current set working time
1	Constantly bright/ Extinguished	Timed working period 1, always on when set, and other conditions are off.
2	Constantly bright/ Extinguished	Timed working period 2, always on when set, and other conditions are off.
3	Constantly bright	Timed working period 3, always on when set, and other conditions are off.

Symbol	Status	Meaning
	Constantly bright	Start timing water return function
	Flashing	Start manual water return function
	Extinguished	Turn off water return (timing/manual) function
ON	Display	Currently the return water is in regular timing working period
ON	Flashing	Currently set start time of backwater working time
OFF	Display	Currently the return water is in the non-working hours
OFF	Flashing	Currently set end time of water return period
1	Constantly bright/ Extinguished	Timing zero cold water period 1, always on when setting, at other conditions are off
2	Constantly bright/ Extinguished	Timing zero cold water period 2, always on when setting, at other conditions are off
	Constantly bright	The button is locked
	Constantly bright	The controller is connected to the router

Instruction of the Buttons

	Button		Instruction
1	Power/ Exit Button		1. Press and hold for 1 second to turn on/off 2. In the query state, click once to return to the main interface
2	Up		1. Press at main interface to set the temperature. 2. Press and hold for 3 seconds in the power on/off state to enter the query state. 3. In the query status, press and check status. 4. At parameter set status, press to modify parameters
3	Down		1. Press at main interface to set the temperature. 2. Press and hold for 3 seconds in the power on/off state to enter the query state. 3. In the query status, click to status query. 4. Under parameter settling state, click parameter to modify
4	Mode Button		1. In the main interface, press and hold for 3 seconds to start (and enter zero cold water time setting)/ turn off the timing zero cold water function; (when parameter 64＝1) 2. In the main interface, short press for more than 1 second to cancel the zero cold water function in this period; (when parameter 64＝1) 3. In the main interface, short press within 1 second to activate/deactivate the manual zero cold water function. (when parameter 64＝1) 4. Under the main interface, click to switch between heating and cooling operation status (when parameter 64＝0)
5	Time		1. In the main interface, press to enter the clock setting, and press to switch between “hour” and “minute”. 2. In the main interface, press and hold for 3 seconds to start (and enter or turn off the programmed time setting).

	Button		Instruction
6	Set		1. Under the main interface, press to switch between automatic/manual temperature control mode. "AUTO" is displayed in the automatic mode and is not displayed when manual 2. In the main interface, press and hold for 3 seconds to enter the parameter interface.
7	Button combination		At main interface when ON, press and hold for 3 seconds to turn on/off quick heating
			At main interface when ON, press and hold for 3 seconds to turn on/off defrosting
			Within 5 minutes after power-on, at the main interface of shutdown, press and hold for 10 seconds to enter/exit refrigerant charging or recycling mode.
			Under the main interface, press and hold for 10 seconds to turn on/off the "sterilization" function manually (Parameter 66=1 is valid)
			Within 5 minutes after power-on, press and hold for 5 seconds to restore the factory parameter settings.

4.2 Operation Instructions

Turn ON/OFF the heat pump

- When the controller is in the normal display state, press " ⏻ " button for more than 1 second to switch the controller to the power on or off state.
- When heat pump is ON,"⏻" lights up and is normally controlled.
- When heat pump is off," ⏻ "does not light up and the controller stops controlling output.
- When the controller is powered on for the first time, it is in the off state. Then from the 2nd time, the state will be same as last time before power off.

Set the temperature control mode:

- When the controller is in normal display state, press the "M" key to switch between manual temperature control mode and automatic temperature control mode.
- The "AUTO" symbol lights up in the automatic temperature control mode and not in the manual mode.
- In the manual mode, the heating/cooling water temperature is controlled according to the manual temperature setting value;
- In the automatic mode, the hot water temperature is automatically adjusted according to the ambient temperature for control.

4.3 Set the water temperature:

- In manual mode, press"∧" or "∨" key to enter the water temperature setting state. Then starts to display the setting symbol and display the corresponding water temperature set according to the current cooling or heating mode.
- When the water temperature is set, press the "∧" or "∨" button to increase or decrease the water temperature setting value; Press and hold the "∧" or "∨" button for more than 1 second to quickly increase or decrease the water temperature setting.
- Press and release the "⏻" button immediately or no button operation in 5 seconds, controller will exit the modification window and return to the normal display state.
- When the parameter value is modified, it will flash for 2 seconds and then return to the normal display state.
- In the automatic mode, press the "∧" or "∨" key to enter the automatic temperature adjustable parameter setting.
- Then display the symbol and corresponding deviation setting value.
- Press "∧" or "∨" to increase or decrease the value.
- Press "∧" or "∨" for more than 1 second to quickly adjust or decrease the setting value; Press and Immediately release the "⏻" button to exit the modification and return to the normal display state. When the parameter value is modified, it flashes for 2 seconds and then returns to the normal display state.

4.4 Real time clock settings

- In the main interface, click the "🕒" button to enter the real-time clock setting interface. Press the "🕒" button, the hour part of the number will flash, press " ∧ " or "∨ ", to set the hour on the clock.
- Press the "Time" button again and set minutes by pressing " ∧ " or " ∨ "
- After the minutes are set, press the "🕒" button again to confirm the time setting and return to the main interface;
- In the real-time clock setting interface, press the " ⏻" button to confirm the current real-time clock setting value and return to the main interface.
- In the real-time clock setting interface, if there is no button operation for 5 seconds, the current real-time clock setting value is confirmed, and the main interface is returned.

4.5 Programmed Function Settings

It is also possible to schedule working sequence for the heat pump by selecting three pre determined time spans as follows;

- When enabled, enter the duration of timed operation setting.
- Press and hold the "🕒" button for 3 seconds in the main interface to enable or disable the working mode.
- Press and release "🕒" to switch between the hour and minute of the start/end time of the three time slots in sequence., The value will flash when switching to the corresponding value of the certain time slot.
- At the same time, "ON" or "OFF" symbol will flash, Press "∧ " or "∨" to increase or decrease the corresponding value. After setting the timed period, press and immediately releasing the "switch" button , the changes will be saved and the panel returns to normal display state.

- The three time slots are as follows; 05:00-07:00; 16:00-18:00; and 20:00-00:00.
- When the timing control mode is enabled, the corresponding symbols are displayed in the working period (ON) and the non-working period (OFF) respectively.
- In the power-on state, heating/cooling is performed only during the programmed period, and the rest of the time , the unit is not heating/cooling.
- When the start time and end time of a certain working period are the same, it cancels out the scheduled period.
- When all timed periods are cancelled, the unit considered to be working throughout the day.
- If the start time of a certain working period is greater than the end time, the end time is considered to be the next day.

4.6 Set the cooling/heating mode

- With the controller in normal display, press "  " to switch between cooling or heating mode.
- When switching to the cooling or heating mode, the corresponding symbol will flash quickly for 3 seconds and then return to the normal display state.
- When switching to the cooling mode, the temperature judgment automatically selects "manual mode", and the water temperature can be set (For Domestic Hot Water - 25 - at this time).
- When the cooling/heating mode is switched, the compressor is allowed to start running after at least 3 minutes of stopping.

4.7 Forced speed heating

- When the controller is in normal display state and heat pump is in the power-on state at the same time the heat pump needs to be in the working period after the timing control is enabled.
- The current heating mode is met and the temperature condition for continued heating is satisfied, No other alarms that do not allow "speed heating" occur.
- Press"M" + "∧" button at the same time for more than 5 seconds, to active/deactivate the "speed heating" function. When the "speed heating" mode is on, the symbol lights up.
- When the heat pump is in cooling mode, "speed heating"is not allowed.

4.8 Forced defrosting

- When the controller is in normal display state and heat pump is in the power-on state. heat pump needs to be in the working period after the timing control is enabled.
- The current heating mode is set and the defrosting time set above zero and the temperature condition of the defrosting is continued, No other alarms that do not allow "frost" occur.
- Press"M" + " ∨" button at the same time for more than 5 seconds to activate or deactivate the "Defrost" function. The symbol is illuminated when the "Defrost" is running. If heat pump is in cooling mode, "defrosting" operation is not allowed.

4.9 Forced sterilization

- If the controller is in the normal display state and it is currently in the heating mode, press the "M"+" ∧"+" ∨" button at the same time for more than 5 seconds to activate or deactivate the "sterilization" function.
- The flashes at this manual "sterilization" operation.
- When heat pump is in cooling mode, "sterilization" operation is not allowed.

4.10 Return time setting: (Fluorine cycle unit is valid; parameter 64=1)

- Press and hold the "" button for 3 seconds in the main interface to enable/disable the timed water return mode.
- When the timed water return mode is enabled, the timed return time setting is entered.Press"" to switch the start time of the two time slots in turn, the hour part, the minute part, the hour part of the end time.
- The corresponding parts are flashed when the corresponding value is switched. The corresponding time period is displayed and the"ON" or"OFF" symbol is flashing.
- Press " ∧" or " ∨" i.e up or down to display the corresponding value.
- After setting the timed period, press and immediately release the " " button , the changes can be saved and returned to the normal state.
- When the timing control mode is enabled, the corresponding symbols are displayed separately during the working period and the non-working period.
- In the power-on state, the water is automatically returned only during the set working period.
- When the start time and end time of a certain working period are the same, it is regarded as canceling the timing period.
- When all timed periods are cancelled, it is considered to be in an untimed return time period throughout the day.
- If the start time of a certain working period is greater than the end time, the end time is considered to be the next day. The factory default return water time is as follows:
  A, time period 1 opening time: 6:30
  B, time period 1 closing time: 7:30
  C, time period 2 opening time: 18:30
  D, time 2 closed time: 22:30

4.11Query running status:

- When the main interface of the power on or off is displayed, press and hold the "∧" or "∨" button for more than 3 seconds to enter the running status query interface. Press and immediately release the "∧" or "∨" button to check each operating condition. Press and immediately release the " " button or automatically return to the normal display state without any button operation in 30 seconds.
- After entering the view mode, the last viewed data code (the default is "00" after power-on) and its corresponding value are displayed.
- After each press and immediately release the "∨" button, the following status can be displayed .

Name	Code	Remark
Fluorine cycle/water cycle heat pump	00	0=water cycle; 1=fluorine cycle
High pressure switch	01	0=disconnect; 1=close
Low pressure switch	02	0=disconnect; 1=close
Water flow switch	03	0=disconnect; 1=close
EEV Value	04	Measured value
Evaporator coil sensor	05	Measured value
Ambient temperature sensor	06	Measured value
Absorption temperature sensor	07	Measured value
Exhaust temperature sensor	08	Measuredvalue
Inlet water temperature (tank water temperature)	09	Display value=measured value + compensation value
Outlet water temperature (return water temperature)	10	Display value=measured value +compensation value
Compressor	11	0=stop; 1=running
4-way valve	12	0=stop; 1=running
High speed fan	13	0=stop; 1=running
Low speed fan	14	0=stop; 1=running
Circulation water pump	15	0=stop; 1=running
Electric Heater	16	0=stop; 1=running

Key Lock

When the controller is in the normal display state, the button is locked when there is no button operation for more than 60 seconds. Press any button at this time to unlock.

4.12 Control Output

Water temperature control

- Normal water temperature control can be performed when the controller is turned on.

Heating and cooling:

- When the water tank (inlet water) temperature ≤ set temperature –return difference, heating begins. When the water tank (inlet water) temperature ≥ the set temperature, the heating is stopped;

Cooling mode:

- When the water tank (inlet water) temperature ≥ set temperature + return difference, the cooling starts. When the water tank (inlet water) temperature ≤ the set temperature, the cooling stops.

Electric heater control:

- At heating mode, when the water tank temperature ≤ set temperature -20 °C, electric heater starts, and the symbol  lights up.
- When the water tank temperature ≥ the set temperature, the electric heater is turned off and the symbol is extinguished.

Circulating pump control (water circulation heat pump):

- When defrosting, water pump is forced to run.
- When cooling or heating, it is turned on 10 seconds before the compressor and stops 30 seconds after the compressor.

Antifreeze mode:

- When the controller is powered on, whether heat pump is off or on, when the ambient temperature is too low, water pump will enter antifreeze mode to prevent the circulation line or the water tank from freezing.
- The specific conditions for enabling and disabling the environment for low temperature antifreeze are as follows:
  - When the ambient temperature is ≤ 2 ° C, and the duration of the circulating water pump is off for more than 30 minutes, the circulating water pump is forcibly started for 60 seconds;
  - When the ambient temperature rises to ≥4 °C, the antifreeze mode is disabled.
  - When the ambient temperature sensor is faulty, it is mandatory to start the circulating water pump periodically, and run for 60 seconds every 30 minutes.

Circulation pump control (optional: fluorine cycle heat pump)

Manual water circulation

- When the controller is in the normal display state, click the "  " button to start the manual water circulation function. At this time, the "Back Pump" icon flashes.

The manual return water control is as follows:

No pipe temperature sensor

- When the manual return water function is activated, the water pump is started. After 30 seconds, the buzzer sounds three times, prompting the user to use the hot water; after 30 seconds, the "  " All In One Heat Pump For Domestic Hot Water - 28 - icon flashes 3 times and the buzzer sounds for 3 seconds.
- Turn off the water pump and the "  " icon goes out (if the timed water is set before, the "Back Pump" and "Timer" icons are displayed).
- During this process, press and hold the "cold and hot" button for 1 second to manually cancel the manual water return function.

Pipe temperature sensor installed

- When the manual return water function is activated, if the return water pipe temperature is <35℃ (default 35℃), and the current water tank temperature ≥ return water set temperature + return water temperature difference, return water pump will starts. If the return water pipe temperature ≥ back water set temperature + return water temperature difference for 5 seconds or temperature control return water time ≥ 2 minutes, the buzzer sounds three times, prompting the user to use hot water; after 30 seconds, the " " icon flashes 3 times, buzzing the device will beep for 3 seconds, the water pump will be turned off, and the " " icon will be off (if the timed water is previously set, the "Back Pump" and "Timer" icons will be displayed).

- During this process, press and hold the “cold and hot” button for 1 second to manually cancel the manual water return function.

Timed return water:

- When the controller is in the normal display state, press and hold the “ ” button for 3 seconds to start or turn off the timed water return function; the “ ” icon lights up when it is turned on, and the “ ” icon turns off when it is turned off.

The timing return control is as follows:

No return water temperature sensor

When the timing water returned function is activated and the timed start time is reached, the water pump is started. After 30 seconds, the water pump is turned off, and the buzzer sounds three times, prompting the user to use the hot water; After 15 minutes, the water pump is started again and the cycle is repeated.

If press and hold the "cold hot" button for 1 second or the timed return water close time is reached in this process, the timed water return function will be turned off (the return water function is still valid for next time, unless the timed return function is turned off).

Return water temperature sensor intalled

When the timing return water starts, and the start time reaches, if the return water pipe temperature $<$ return water set temperature, and the current water tank temperature $\geq$ return water set temperature $+$ return water temperature difference, the return water pump will start.

If backwater pipe temperature $\geq$ return water set temperature $+$ return water temperature difference for 5 seconds or temperature control return water time $\geq$ 2 minutes, the water pump will turn off.

The buzzer sounds three times, prompting the user to use hot water; When the pipe temperature $<$ return water set temperature, the water return pump is started again and the cycle is repeated.

If press and hold the "cold hot" button for 1 second or the timed return water close time is reached in this process, the timed return function will be turned off (the return water function is still valid for next time, unless the timed return function is turned off).

When the return water temperature is faulty, it will automatically switch to the “no return water temperature sensor” mode.

Anti-fouling function

Sometimes the return pump/circulation pump stops for a long time, the pump will be rusted or scaled, and the pump needs to be started periodically.

After the pump has been on standby for 12 hours, it is forced to run for 1 minute.

High temperature sterilization control for Electric heater

Manual sterilization mode:

While the controller is in normal display state, press and hold the “M”+“∧”+“∨” button for more than 5 seconds at the same time, the heater symbol flashes to indicate that it enters the manual sterilization mode.

- At this time, the electric heater is started to heat the water to 75℃ and the water temperature is maintained at 70 to 75℃ for 30 minutes, then the sterilization mode will be automatically exited.
- After starting the manual sterilization function, press and hold the "M" + "∧" + "∨" button for 5 seconds or more at the same time to exit the manual sterilization mode. When the water temperature setting value is ≥75℃, the sterilization function is not activated.

Automatic sterilization mode:

- If the water temperature setting value is <75 ℃, the controller operation time reaches 7 days, the controller enters the automatic sterilization mode.
- Once the automatic sterilization mode exits, time begins from zero.When the ambient temperature is ≥ 20℃, the electric heater is started at 1:00 am to start sterilization.
- When the ambient temperature is <20℃, the electric heater is started at 15:00 pm to start sterilization.
- After the automatic sterilization function is activated, the sterilization symbol flashes. At this time, the electric heater is started to heat the water to 75℃.
- And the water temperature is maintained at 70 to 75℃ for 30 minutes, then the sterilization mode will be automatically exited.
- When the water temperature setting value is ≥75℃, the sterilization function is not activated.

The Alarm

Low pressure fault

- After the compressor running for 5 minutes, if the low-pressure switch is detected to be in the off state for 10 consecutive seconds, the compressor immediately stops running. At this time, the controller displays the low-pressure fault alarm code "04E". If the low-pressure switch is restored, error code does not occur.
- If no other protection or locking occurs, the compressor is restarted after 3 minutes.
- If low-pressure fault protection appears 3 times within 1 hour, the controller will lock the protection and the compressor will lock in the shutdown protection state.
- At this time, only the shutdown and restarting can unlock the compressor.

The low-pressure switch is not detected during the defrosting.

High pressure failure

- After the compressor is started, if the high-pressure switch is detected to be in the off state for 10 seconds, the compressor immediately stops running.
- At this time, the controller displays the high-pressure fault alarm code "03E". If the high-pressure switch is restored, error code will not occur.
- And if no other protection or locking occurs, the compressor is restarted after 3 minutes.
- If high-pressure fault protection appears 3 times within 1 hour, the controller will lock the protection, and the compressor will be locked in the shutdown protection state. At this time, only the shutdown and restarting can unlock the compressor.

High exhaust temperature failure:

- After the compressor starts running for 1 minute, when the exhaust gas temperature is detected to be higher than or equal to the exhaust high temperature protection value by 110℃ for 10 consecutive seconds, an high exhaust temperature alarm occurs and the compressor stops.
- At this time, controller shows high temperature fault alarm code "02E". When the exhaust temperature drops back to 90℃, the alarm is released and the normal temperature control function is restored.
- If high temperature fault protection appears 3 times within half an hour, the controller will lock the protection and the compressor will be locked in the shutdown protection state. At this time, only the shutdown and restarting can unlock the compressor.

Water flow failure (water cycle model):

- After the circulating water pump starts, it detects that the water flow switch is in the off state for 10 seconds, then heat pump stops.
- At this time, the controller displays the water flow switch fault alarm code "01E".Periodically (1 minute) restarts the water pump and 10 seconds later, the flow switch is detected.
- If water flow switch is closed, heat pump will goes to normal running.
- If the fault occurs 3 times within 1 hour, the fault is locked and heat pump will not starts.

Water temperature too low protection at cooling mode(water cycle heat pump)

- In the cooling mode with compressor running for 5 minutes, if detects that the outlet water temperature is <5 °C for continuous 5 seconds, heat pump enters sub cooling protection.
- The compressor and the fan stop running, And the water pump operates normally. When the outlet water temperature is detected to be ≥ 7 °C, heat pump exits the sub cooling protection and enters normal operation.

Water temperature too high protection at heating mode (water cycle heat pump)

- In the heating mode, after compressor running for 5 minutes, if the water temperature is detected by continuous 5S ≥ 65 °C, it is judged that the outlet water temperature is too high.
- It will shutdown heat pump for protection and when the outlet water temperature is detected to be ≤ 60 °C, the protection is withdrawn.

Temperature sensor failure:

- Heat pump will stop once the water tank temperature sensor or outlet water temperature sensor or ambient temperature sensor is faulty.
- When absorb or exhaust or evaporator coil or water return temperature sensor is faulty, electric heater is allowed to operate.
- When the return water temperature sensor fails, the return pump is allowed to run (do not judge the return water temperature)

- When the water tank or ambient temperature sensor are faulty, electric heating operation is not allowed. “11E”, “12E”, “13E” ", "14E", "15E", "17E", "18E", "19E". are correspondingly displayed when the coil temperature sensor, ambient temperature sensor, exhaust temperature sensor, inlet water temperature sensor/tank temperature sensor, absorb temperature sensor, and outlet water temperature sensor/return water temperature sensor are faulty.
- “09E” is displayed when the communication between the main control board and the wire controller is abnormal or the data line is not connected normally. “--:--” is displayed when the valid clock cannot be obtained.
- The communication indicator of the main control board flashes.
- The buzzer sounds when an alarm occurs.
- Press any key to silence the alarm.

The fault code table is as follows:

Error Code	Name
01E	Water flow switch disconnected (water cycle heat pump)
02E	Exhaust temperature too high
03E	High pressure switch failure
04E	Low pressure switch failure
09E	Communication failure
11E	Evaporator coil temperature sensor failure
12E	Ambient temperature sensor failure
13E	Exhaust temperature sensor failure
14E	Water inlet temperature sensor failure
15E	Tank temperature sensor failure
17E	Absorb temperature sensor failure
18E	Water outlet temperature sensor failure
19E	Return water temperature sensor failure
20E	Outlet water temperature too high protection (water cycle heat pump)
21E	Outlet water temperature too low protection (water cycle heat pump)

5. MAINTENANCE

Pilot run of heat pump

Confirm the followings before pilot run of heat pump
1. The heat pump has been finished well;
2. Assemble pipe and wire are all correct;
3. Drainage of water is provided for
4. Insulation materials are complete;
5. Ground wire is installed well;
6. Power voltage is equivalent to rated voltage of heat pump;
7. Inlet and outlet air port have no obstacle.
8. Any air pocket in the water pipe is expelled,and all valves are opened;
9. Leakage protection device works well.
10. Input water pressure is less than 6 bar for HPW200/300 and 4 bar for HPW150.

Maintenance

- Frequently check power plug and sockets to make sure both of them have been connected well and reliably, grounded and have no over-heating effect.
- When not used for a long time, drain out water filled in the water tank to prevent damaging inner tank.
- To ensure heat pump works a long-term and with high efficiency, clean inner tank every half a year to remove accumulated sediment, observe the following rules while cleaning the inner tank:
  - Turn off power supply of heat pump.
  - Turn off cold water inlet valve, and open up hot water tap water.
  - Connect drainage water with drain outlet through a pipe.
  - Turn on drainage water port of heat pump, clean water tank attached to inner tank until it is clear of sediment.
  - Turn off drainage water port, re-fill water into inner tank and reconnect to power supply.
- Each device has been matched with one anode rod, and anode rod will be slowly consumed during the process of protecting inner tank and extending use life. Under some water circumstance, anode rod and water can rise reaction, hot water will be quickly corroded and rise leakage when anode rod has been used up. It's a rule, check insulation materials every year, if anode rod is used up, replace with new one
- Filter should be cleaned up every one month to ensure effective heating.

6. TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
The outlet water is cold; The screen is dark	The unit is not plugged properly	Plug in properly
	The temperature controller is on the lowest temperature control state	Set the temperature of the controller in higher state
	The temperature controller is damaged	Contact Dayliff retailer
	The circuit board of the indicator lamp is damaged	
No output from the hot water outlet	The tap water is cut off	Wait for the restoration of the tap water
	The water pressure is too low	Wait and use when the water pressure is raised
	The tap water inlet valve is closed	Open the tap water inlet valve
Water leakage	tightness in the connecting points between pipes	Reduce the tightness of the connecting points

7. TERMS OF WARRANTY

I) General Liability

- In lieu of any warranty, condition or liability implied by law, the liability of Dayliff (hereafter called the Distributor) in respect of any defect or failure of equipment supplied **is limited to making good by replacement or repair** (at the Distributors discretion) defects which under proper use appear therein and arise solely from faulty design, materials or workmanship within a specified period. This period commences **immediately after the equipment has been delivered to the customer** and at its termination all liability ceases. Also the warranty period will be assessed **on the basis of the date that the Distributor is informed of the failure.**
- This warranty applies solely to equipment supplied and **no claim for consequential damages,** however arising, will be entertained. Also the warranty specifically excludes defects caused by fair wear and tear, the effects of careless handling, lack of maintenance, faulty installation, incompetence on the part of the equipment user, Acts of God or any other cause beyond the Distributors reasonable control. Also, any repair or attempt at repair carried out by any other party **invalidates all warranties.**

ii) Standard Warranty

General Terms

If equipment failure occurs in the normal course of service having been competently installed and when operating within its specified duty limits warranty will be provided as follows:-

- **Up to three years - The item will be replaced or repaired at no charge.**
- **Over three years, less than five years - The item will be replaced or repaired at a cost to the customer of 50% of the Davis & Shirtliff market price.**

The warranty on equipment supplied or installed by others is conditional upon the defective unit **being promptly returned free to a Davis & Shirtliff office** and collected thereafter when repaired. No element of site repair is included in the warranty and any site attendance costs will be payable in full at standard chargeout rates. Also proof of purchase including the purchase invoice must be provided for a warranty claim to be considered.

DAYLIFF is a brand of **Davis & Shirtliff**

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