REDWING

ROCKY HOT WATER HEAT PUMP

INSTALLATION AND OPERATION INSTRUCTIONS

Please read this user's manual carefully before operate the unit.

CONTENTS

WARNING:

1. *This unit must be installed by the professional person, dealer or authorized installation company. Or otherwise, accidents maybe possibly caused and usage effectiveness maybe affected.*
2. *Make sure that the unit is in the STOP operation when disconnecting the power supply to the unit .Disconnect all electric power supplies before servicing.*
3. *This appliance is not intended for use by people (including children) with reduced physical, or lack of experience and knowledge, unless they are been supervised or instruction concerning use of the appliance by a person responsible for their safety.*
4. *Children should be supervised to ensure that they do not play with the appliance.*
5. *If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard*

Rocky Hot Water Heat Pump – Save Up to 75% on Heating Your Water!

The Rocky hot water cylinder is powered by a heat pump which is integral to the unit and is located on top of the cylinder.

It works **up to 30%** more efficiently than Solar powered hot water panels and is significantly cheaper to purchase and install. In the process of heating water, it will de-humidify your bathroom, or kitchen.

The exhaust air which has a temperature of about 10 deg can be used to keep a pantry cool if the distance is not too great from the cylinder, otherwise it should be exhausted to the outside.

The Cylinder is available in sizes from 80L**, 150L, 190L, 260L and 300L.**

Key Advantages

- On average its performance is up to 30% better than solar, with significantly reduced installation and capital cost.
- The co efficiency of performance is 4:1 - this means that for every 1Kw of electricity input, it gives 4Kw output.
- When you are using the ambient air from a bathroom or kitchen, you are also de-humidifying the air from those rooms.
- The Exhaust air that is normally discarded, can provide cooling to a room.
- Stainless steel tank.
- 18 month warranty.

How it works

The heat pump uses the ambient air from the building. This air can be taken from a bathroom, kitchen or from the ceiling of a stairwell. A 150mm duct is used to bring the air to the cylinder and likewise to exhaust the air away from the cylinder.

When the heat pump is switched on, it extracts air from the rooms mentioned above and further compresses it to heat the water to 55deg by means of an internal coil down through the cylinder. The exhaust air which is now approximately 10 degrees needs to be discarded; this air can be exhausted through the roof, the wall, or can be directed to another room for cooling.

A. Important remarks and Information

- *Thank you for choosing our products. Before installation, it is strongly recommended to read the instructions first. This manual includes the information of installation, debugging, running and maintenance of the products.*
- *Every unit of product has passed strict tests to ensure safe and high efficiency in operation.*
- *The manufacturer of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, and unnecessary maintenance which is not in line with this manual.*
- *The installer should be an authorized technician, and install the system as per the diagrams of the equipment.*

Please notice the following information during installation:

1. In areas where there is hard water, it is recommended that a water softener be used.
2. Applied working temperature of heat pump: -7 ~ 43 degrees.
3. Check whether the power supply meets the required standard for the unit.
4. The appliance shall be installed in accordance with national wiring regulations.
5. When the system is connected to a fixed power supply, the fixed supply must 20A RCBO (30mA).
6. Do not install the system in a warehouse where flammable gas may leak out.
7. Do not insert hands or object into the vent of the heat pump.
8. To make the system operate at maximum efficiency, please install the main unit in a place with good ventilation.
9. Do not put (or install) the operating panel in a wet location.
10. When moving the cylinder, always keep up-right or no more than a 30 degree angle. Do not drop or up-end the unit.
11. Maintain the system by an authorized technician, and disconnect all power when servicing.
12. All the models come with a sterilization function. It starts every 14 days which turns on the electric element to heat the water to 70 degrees. If you want to turn off this function, you can enter the parameter settings and set F17 from “1” to “0”.

A. Important remarks and Information

Examination before trial run

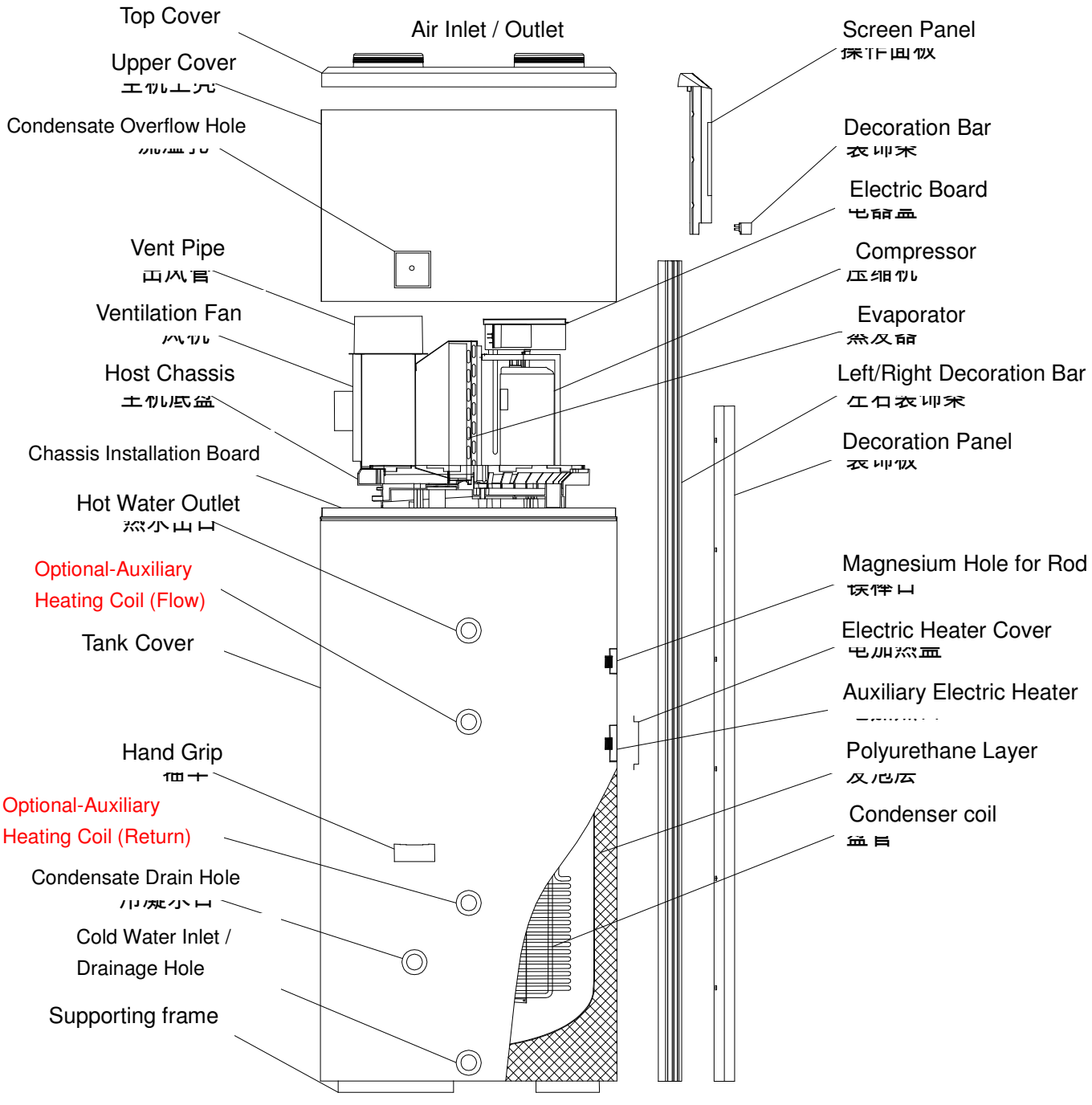
1. Check the water tank is filled with water, and open the water outlet tap till water flows out.
2. Check the water pressure is normal (1.5 - 7 bar).
3. Check the air inlet or outlet is well connected; and the air outlet pipe heat insulation is completed.
4. Check the power supply voltage is normal, according with the nameplate requirement. (Range + / - 10%).
5. Check whether the equipped parts are screwed /locked well.
6. Check whether the wirings is in line with the Circuit diagram, and the earth-wire is connected.
7. Check whether the wind inlet and outlet has been cleaned up and there are no obstacles.
8. Check whether the condensate drain pipe is connected and there are no blockages.
9. After power-ON, check the control panel display is normal.

Trial running

1. After the machine starts, determine whether the machine is working properly if there is an abnormal sound during operation stop the unit immediately and check for problems until there is no abnormal sound to continue operation.
2. For the first time power on, the compressor will have 3 minutes delay protection function.
3. For the first time discharge of hot water or the unit starts after a long period off, muddy water may flow from the water tap of the outlet pipe, this is a normal phenomenon, continue to drain for a period of time till it runs clearly.
4. After a long period of been off, there may have condensation water around the air outlet or pipe (especial in humidity weather), this is a normal phenomenon, use a dry washcloth to clean it or air dr

B. Description of water cylinder

Unit constructions (outside):



Remarks:

1. The above drawing is for reference to identify the names of each part of the unit.
2. The drawing of the auxiliary heating coil is optional and is not available with all models.
3. The function of the magnesium rod is to prevent the outside steel shell from rusting and corroding it is recommended to change this rod every 2-3 years.

C. Installation instruction

How it's works

The heat pump uses ambient air temperature from the building and this can be taken from a bathroom or kitchen etc.

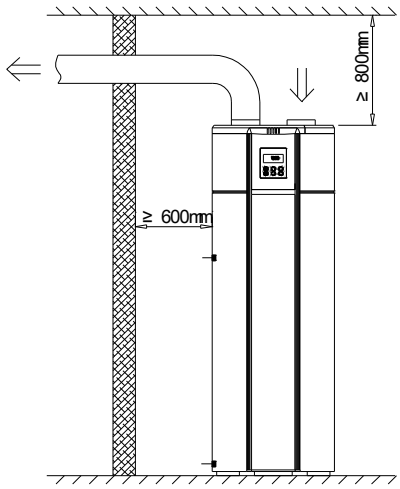
The pump takes the heat from the air, compresses it to a higher temperature and transfers this heat directly into the water.

The exhaust air which is now approximately 10 degrees needs to be discarded; this air can be exhausted through the roof or wall of the dwelling, or can provide cooling for another room (e.g. pantry).

Installation notes:

1. The cylinder can be installed anywhere within the building provided the intake and exhaust air ducts can be installed without having to run the pipes too far or having to fit too many bends on the run.
2. The heat pump is best located with the air intake coming from an area with excess heat e.g. a bathroom or kitchen (minimum of 120 cubic meters).
3. The air inlet and outlet are at the top of the cylinder.
4. The cylinder should not be placed in the open air.
5. Avoid debris entering the vents.
6. The air inlet and outlet ducts are 150mm dia.

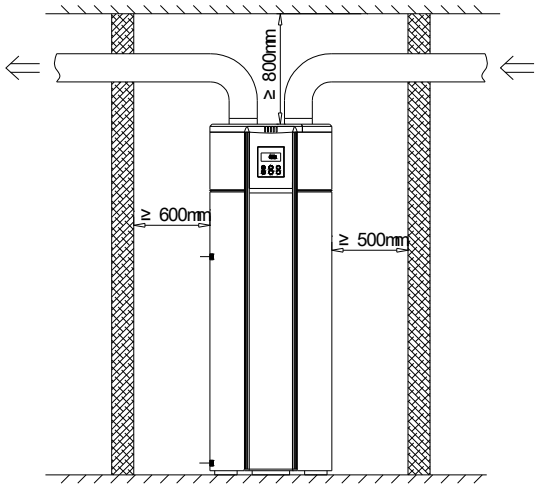
Exhaust air to another room



Ambient air from the same room

(Fig.1)

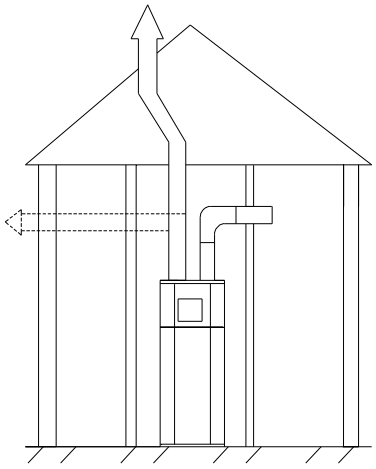
Exhaust air to another room



(Fig.2)

7. Fig 1 shows the inlet air coming from the same room (no need for duct to be used here). The exhaust air is shown ducted into another room.
8. Fig 2 shows the inlet air duct taking air in from another room and the exhaust air is shown ducted into another room.

C. Installation instruction



(Fig. 3)

Option 1: Exhaust air to outside through the roof, ambient air from another room.
Option 2: Exhaust air to outside through the wall, ambient air from another room.

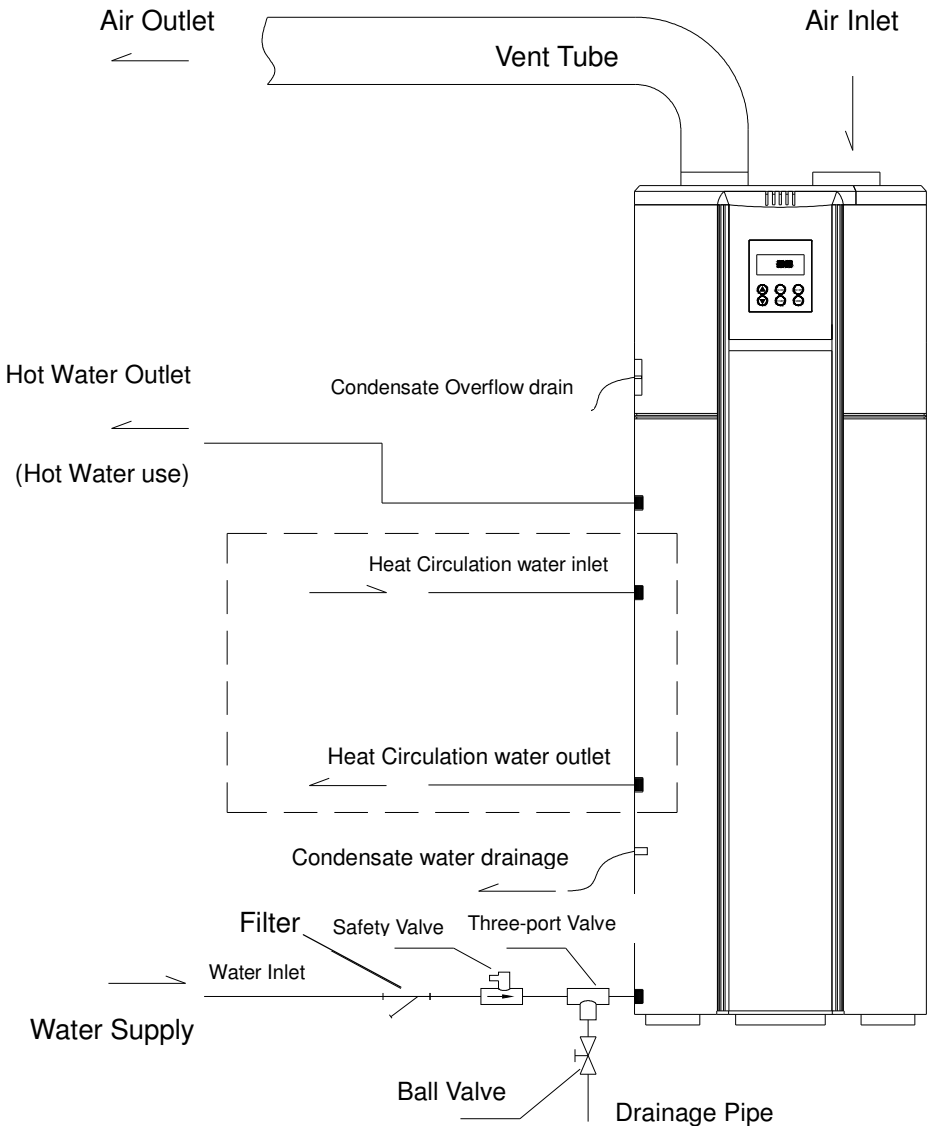
9. Fig 3 shows the inlet air duct taking air from another room and the exhaust air being dumped outside either through the roof or external wall.
10. Because the air outlet comes with cooling air, the surface of the pipe may have condensation water, it's necessary to insulate the indoor outlet pipe to prevent water leakage.
11. Heat pump water heater unit must be placed upright, and installed on a solid surface that can be able to withstand a weight of over 700kgs. Supporting surface should be level.
12. In operation the unit should be located in a well-ventilated location and with nothing blocking the air vent, so that the machine can be able to inhale and exhaust enough air, to achieve hot water supply function.
13. The appliance can work without an air duct.
14. There should be a drain around the system unit for drainage. And the surrounding area of the tank should have enough space for maintenance. Because the top cover can be opened, at the top side of the unit, there should be at least 800mm space for maintenance at the top.
15. Nearby the system unit, there should be a reserved water supply pipe and hot water pipe interface equipped with valves, the water inlet pipe should have a filter (for cleaning).
16. For waterway connection of this integrated unit, please refer to the "Waterway installation diagram" (Fig.4 pg7).
17. On the system unit, there should be a three-port valve, a safety valve and a filter installed. Connect them to the water inlet and outlet of the unit.

C. Installation instruction

18. The working pressure of this water heater tank must be ≤7 bar. The water inlet must be connected to the safety valve with an operating pressure of 7 bar.
19. Water inlet pressure should be greater than 1 bar, if the pressure is lower than this connect the pressure pump on inlet pipe to get a higher water flow.
20. **Ensure the water tank is fully filled with water before turning on the system:** First, open the valve on the water supply inlet, then switch on either valve of the water outlet, and then you can pour water to the tank until the water overflow the water outlet valve. After which you can turn off the water outlet valve and check for leaks. (Make sure there is no water leaking).
21. If the system is switched off for a long period through the winter, the water tank should be drained to prevent frost damage.
22. If connecting to a pressurised system or mains water always use a pressure vessel for expansion.
23. If the water heater is equipped with an optional auxiliary heating coil at the bottom of the tank. This coil can be connected to solar panels, solid fuel back boilers, oil or gas boilers. This option is generally only used as a backup system.
24. If the water heater is equipped with an optional coil at the top of the tank, this coil can be used for heating a small underfloor area, a few radiators or a couple of towel rails which would avoid having to turn on the main system in the Summer time to heat the bathroom.
25. There should always be enough space around the system for maintenance.

C. Installation instruction

Installation Diagram:



(Fig.4)

Remarks:

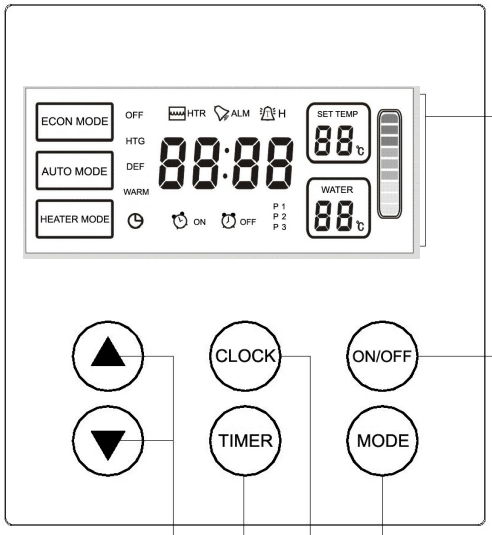
1 For, first time use, ensure the water tank have been filled with water before starting to prevent burn out.

2 Before installation, it's better to reserve a water supply pipe interface, hot water outlet pipe interface and drainage pipe interface. Among them, the water supply pipe and hot water outlet pipe should be used in line with standards for drinking water pipes. (E.g. PPR pipe or stainless steel pipe, etc.), can't use iron pipe or the rubber hose with odor for installation.

3 If using in a place below 0 degrees, make sure to insulate the water pipes to prevent freezing.

4 Air inlet /outlet can connect Φ150mm vent tube, but pipes shouldn't be too long.

D. Operation (Panel Instruction 1)



DISPLAY SCREEN

Display the working mode, status, water temperature, time etc.

ON/OFF BUTTON

Turn ON or OFF the unit by this button.

When the unit is turn ON, display screen shows "HTG" (heating), "DEF" (defrost) or "Warm" (keep warm).

When the unit is turn OFF, display screen shows " OFF ".

MODE BUTTON

Press this button can be switched to ECON MODE (Economic mode), AUTO MODE (Automatic mode) or HEATER MODE.
ECON MODE can only be set during selected the timer period to control the unit working, other times will not control the unit.
AUTO MODE is according to the setting water temperature to control the unit working.
HEATER MODE is according to the setting water temperature (with auxiliary heater function) to control the unit working.
* HEATER MODE can be selected and displayed only for the unit with Auxiliary heater models.

CLOCK BUTTON

Press this button can adjust the clock, use ▲▼ button to adjust;
when the corresponding time Hour or Minute flashing, use ▲▼ button to adjust.

TIMER BUTTON

Press this button for 2 seconds, enter temperature setting, when temp. value flashing, use ▲▼ button to adjust setting temperature.
Press this button, enter "ECON MODE" timer period for time setting status, There have 3 timer periods beginning and ending for setting, when the time hour or minute value flashing, use ▲▼ button to adjust corresponding time.
NOTE: Timer period setting only available under "ECON MODE".

UP /DOWN BUTTON

In peacetime, press ▲ (up) can check the ambient temperature of the unit; press ▼ (down) to check the condenser coil temperature.
Under the corresponding operation, use ▲▼ to adjust the water temperature, clock, timer or parameter data etc..

REMARK:

1. Set water temperature
Press "TIMER" for over 2 seconds, enter water temp. setting status, when the setting temp. value flashing, use ▲▼ button to set water temp.

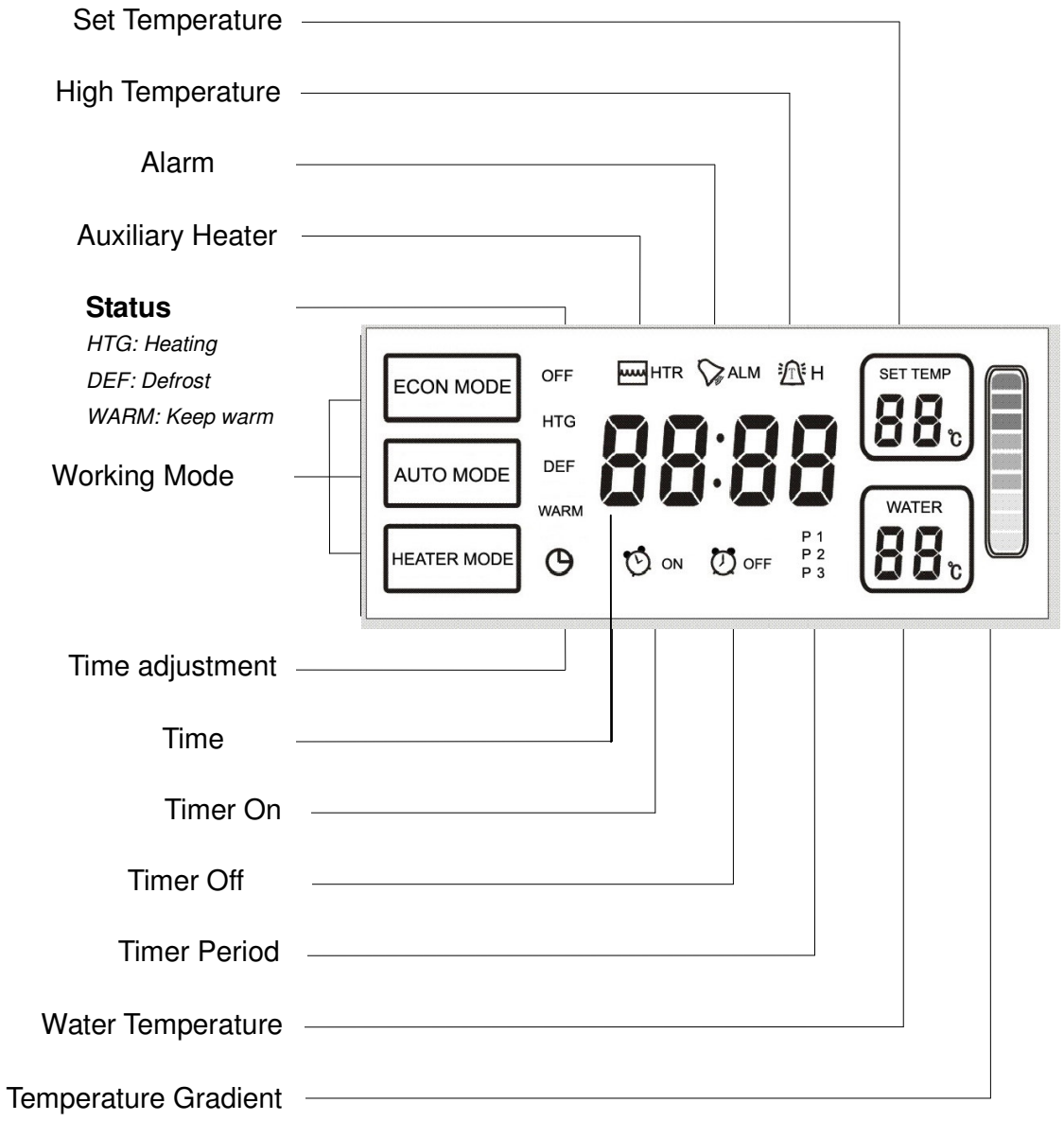
2. ECON MODE (Timer heating)
There are 3 timer periods (P1, P2, P3) available for setting, they can only be set under "ECON MODE".

3. AUTO MODE
According to the setting water temperature value to control the unit ON/OFF. Timer period setting is invalid under this mode.

4. HEATER MODE
According to the setting water temperature value to control the unit ON/OFF (Auxiliary heater forced to operation). Timer period setting is invalid under this mode.

5. Delay protection
When the machine restart power on, there have 3 minutes time delay protection, it's 3 minutes interval between the unit start and stop. At this time, on the screen it will display " HTG " and flashing until the unit starts operation.

2. Panel - Display:



Note: If the water temp exceeds 55 degrees, the indicator light H will be shown on the display.

D. Operation panel instruction

3. Parameter Setting:

Press “MODE” button for 5 seconds; enter the Parameter setting status, the main parameter code as below sheet:

Type	Code	Parameter Name	Setting Range	Factory Setting	Unit	Remark
Temperature Control	F11	Setting temperature	5-70	55	°C	
	F12	Difference in Temp.	1 - 30	5	°C	
	F13	Determine Heat pump stop ambient temp.	-10 – 5	-7	°C	
	F14	Highest temp. for heat pump	40 – 60	55	°C	
	F15	Turn on or off electric heater mode	0 - 1	1	-	
	F16	Ambient temp. for start electric heating	-10 - 20	0	°C	
	F17	Turn on or off electric heater for sterilization function	0-1	1		
	F18	Sterilization cycle	1-990	336	hour	
	F19	Water thermal sensor temp. amendment	-5 – 5	0	°C	
Compressor	F21	Compressor start delay	0 – 10	3	minute	
Defrost	F31	Defrost start temp.	-20 – 20	-2	°C	
	F32	Defrost finish temp.	0 – 50	25	°C	
	F33	Defrost start time	1 – 999	45	minute	
	F34	Max. defrost time	Off, 1 – 99	10	minute	
Alarm	F50	Low pressure alarm mode	0 - 2	2	-	
	F51	Auto resume times of low pressure alarm	0 – 10	3	time	
	F52	Reset time of external alarm auto resume times	0 – 999	60	minute	
	F54	Electric heater overheat protection	0 - 2	2	-	
	F55	Overheat resume time	0-10	3	-	
	F56	Alarm resume time	0-999	60	°C	
	F57	Exhaust temp. protection mode	0 – 2	1	-	
	F58	Exhaust protect temp.	50 – 125	110	°C	
	F59	Exhaust temp. protection Return difference	1 – 30	10	°C	
Function Setting	F61	Memory status when power off	Yes/No	Yes	-	
	F69	Communication baud	24/48	24	-	
System Setting	F80	Password	OFF 0001 -- 9999	4321	-	“OFF” means no password. Set “0000” to clear password.
	F85	Display sterilization total time	-	-	hour	
Testing	F98	Force defrosting (refrigeration)	Control panel display “AdF”		Start compressor, 4-way valve and fan motor. Press any key to exit or 20 minutes it will exit automatic.	

Remarks: When entering Parameter setting status, press “up” or “down” to choose parameter code; after choose one, press “Timer” button to show this code’s setting value, and press “up” or “down” can set the value; After finish setting, press “Timer” button to confirm and return to Parameter code status.

D. Operation panel instruction

4. Error Handling:

ERROR CODE	ERROR STATUS	REASONS	ERROR HANDLING
A1	Thermal sensor alarm	Water temp. sensor open circuit or short circuit.	1. Check the water temp. sensor connection. 2. Change the water temp. sensor.
A2	Condenser coil sensor alarm	Condenser coil temp. sensor open circuit or short circuit.	1. Check the condenser coil temp. sensor connection. 2. Change the coil sensor.
A3	Exhaust sensor alarm	Exhaust temp. sensor open circuit or short circuit.	1. Check the exhaust temp. sensor connection. 2. Change the exhaust temp. sensor.
A4	Ambient temp. sensor alarm	Ambient temp. sensor open circuit or short circuit.	1. Check the Ambient temp. sensor connection. 2. Change the ambient temp. sensor.
A5	Low /High pressure alarm	1.1. High pressure protection switch off. 1.2. Ambient temp. too high or water heat exchanger dirty block. 2.1. Low pressure protection switch off. 2.2. Leakage of refrigerant.	1.1Check or change the high pressure protector. 1.2. Check if the surround temp. is too high, or clean the heat exchanger of water tank. 2.1. Check or change the low pressure protector. 2.2. Supply refrigerant and check if there is any leakage.
A6	(Auxiliary) electric heater protection overheat alarm	1. Electric heater protection switch off. 2. Tank water temp. too high.	1. Check if the water temp. is as LCD display, or if water temp. is too high. 2. Change the Electric heater.
A7	Exhaust temperature too high	1. Lack of refrigerant. 2. Mix with air in system. 3. Lack of lubricating oil.	1. Supply refrigerant. 2. Re-vacuumizing, and fill in refrigerant. 3. Change the lubricating oil of compressor.
- -	Screen no display or display insufficiency	1. No plug in power. 2. Mainboard and operation panel communication break off.	1. Check the power line and voltage. 2. Reconnect the line of the mainboard and operation panel. 3. Change the mainboard or operation panel.

NOTE:

1. When the unit has an error, the buzzer of the operation panel will make an alarm sound, and an “Alarm” will be shown on the screen panel.
2. Alternately an “ERROR CODE” will be shown on temperature display.
3. Part of the error alarm can be automatically restored (resumed). The appeared alarm can be eliminated by an electronically controlled self-test.
4. An error alarm can be caused by a large fluctuation of external power, in this case, just power off and restart the unit to clear the error.
5. When the machine has an error alarm and restarting the unit still can not eliminate the error, please contact the after service as soon as possible for a solution.

E. Maintenance and service

Maintenance and service

1. For, first time installation or moving of installation, and connecting of water pipes and filling the tank with water. The machine should be allowed to rest for 1-2 hours before starting trial run.
2. The water heater inlet filter needs to be cleaned every 3 months. At the same time, we suggest draining all the storage water and repeatedly wash for 2-3 times to remove the dirt and sediment.
3. To clean the fin heat exchanger, use a hard nylon brush to clean it or the dustproof filter-net. Be careful not to damage the copper tube. If there is compressed air, use a high pressure air tube to clean the fin heat exchanger. Every 2-3 months.
4. When cleaning the water tank or heat exchanger the machine and power supply must be turned off.
5. If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified pers

E. Maintenance and service

Heat Pump main unit disassembly

To check and maintain the top main parts of the unit, to disassembly the cover of the unit follow the steps below (Fig.5, 6)

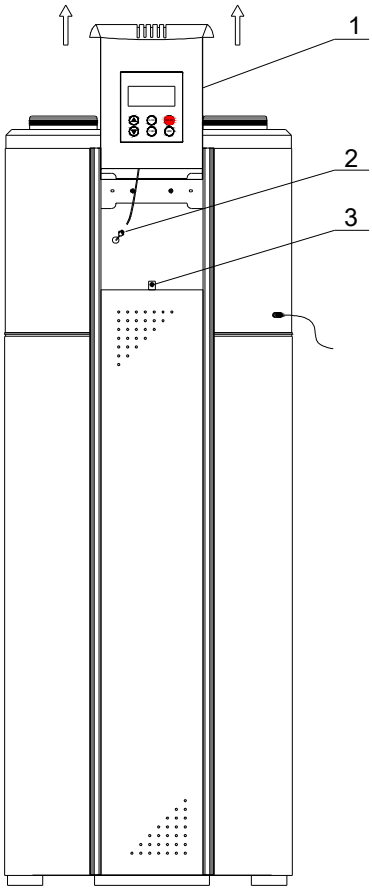


Fig.5

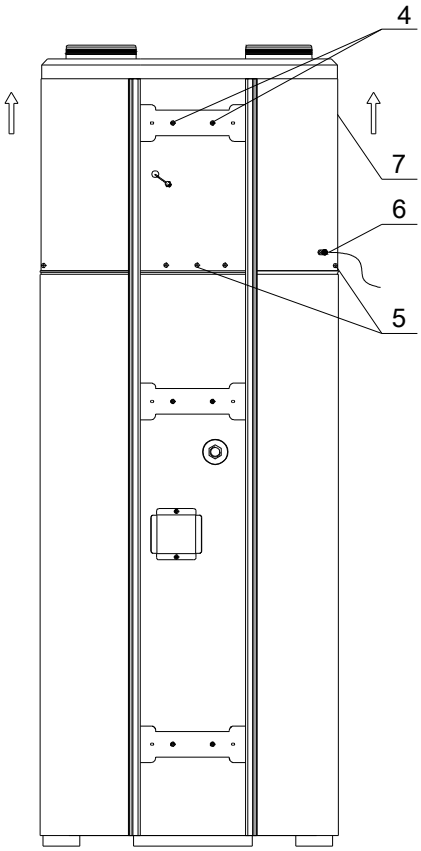


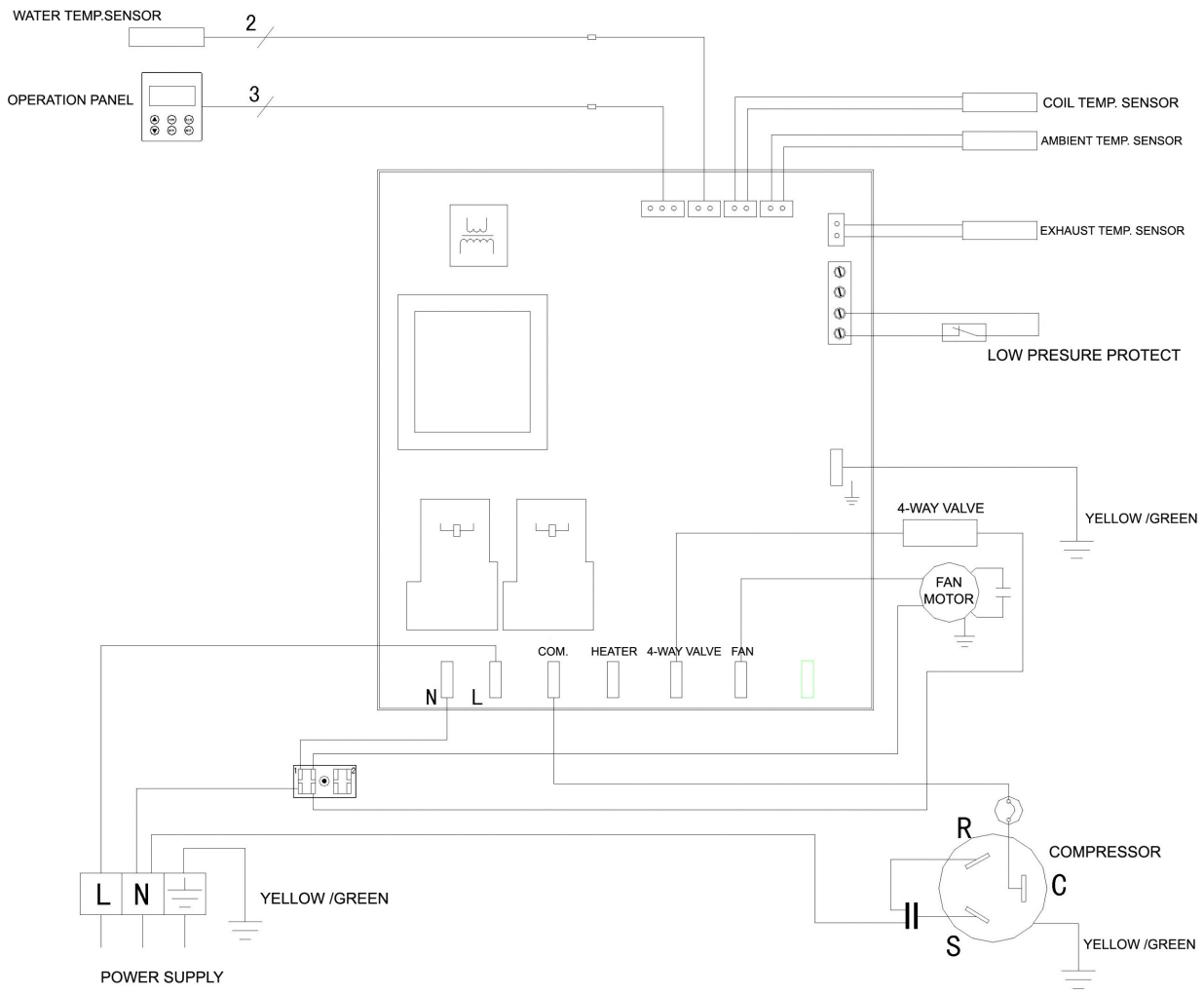
Fig.6

1. Move up the Control panel along the slot until exposed control panel terminal docking connector.
2. Loosen the cable terminal docking, may be continue to move up the control panel completely.
3. Unfasten the decorative plate screw, pull out a small angle (about 10°), then move up to take the whole decorative plate out.
4. Take down the top section of a decorative fixed plate by loosing screws.
5. Loosen the bottom screws of the top cover.
6. Release the power line from the top cover of fixed terminal, to prevent the power line stuck when move up the top cover.
7. Finally, remove the block objects (e.g. air ducts etc.) from the air inlet / outlet holding both sides of the top cover and move it up.

F. Unit circuit diagram

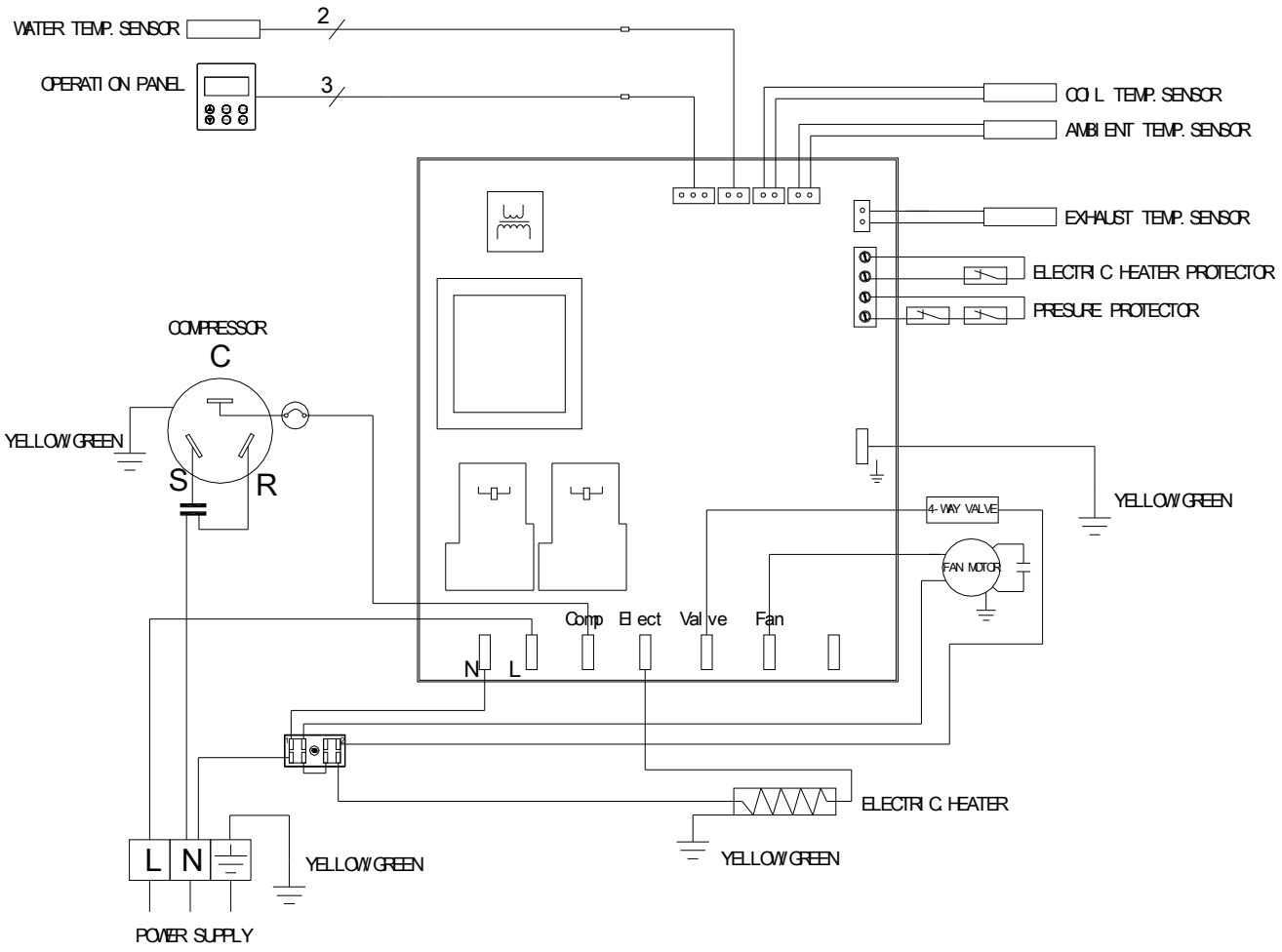
The following is a unit circuit diagram (for user's reference); the unit practical connection should be as the circuit / wiring diagram on the machine.

1). Heat pump without auxiliary electric heater:



F. Unit circuit diagram

2). Heat pump WITH auxiliary electric heater:



G. Specification and Dimensions

Hot water cylinder (Air Ducts on Top)
Diameter 568mm

Model	Rocky 80L-E-3.6
Rated Input Power	0.80 KW
Rated Heating Capacity	3.6 KW
Heating ampere	4.0A
Power Supply	220V~50Hz
Outlet water temperature	55 degrees
Water output capacity	77L/H
Capacity of Water Tank	80L
Heating cycle time	1H
Electric Heater Power	2KW
Auxiliary heater ampere	9.1A
Electricity Water capacity	41L/H
Refrigerant	R417A
Compressor	Panasonic
Condenser	Stainless steel coil
Evaporator	High efficiency finned heat exchanger (370mmX39mmX295mm)
Expansion valve	Thermostatic expansion valve
Size(mm)	568X1270
Net Weight (Kg)	60
Noise (dB)	48
Water connection	DN20

***Testing at 15 degrees, 60% relative humidity air, and water heated from 15 degrees to 55 degrees.**
Feature: Safe, durable, convenient and energy saving. Easy to install and operate.
Test Conditions: Ambient temperature at 20 degrees Dry bulb and 15 degrees wet bulb, initial water temperature 20 degrees, final water temperature 55 degrees.
Range of Operation: Ambient temperature at -10 degrees to 43 degrees.
Specifications are subject to changes due to any improvement of the product

G. Specification and Dimensions

Hot water cylinder (Air Ducts on Top)
Diameter 650mm

Model	Rocky 150L-E-3.6	Rocky 190L-E-3.6
Rated Input Power	0.88KW	0.88KW
Rated Heating Capacity	3.6KW	3.6KW
Heating ampere	4.0A	4.0A
Power Supply	220V-50Hz	220V-50Hz
Outlet water temperature	55 degrees	55 degrees
Water output capacity	77L/H	77L/H
Capacity of Water Tank	150L	190L
Heating cycle time	1.9H	2.5H
Electric Heater Power(EHP)	2KW	2KW
Auxiliary heater ampere	9.1A	9.1A
Electricity Water capacity	41L/H	41L/H
Refrigerant	R417A	R417A
Compressor	Panasonic 2P17S225ANQ	
Condenser	Stainless steel coil	
Evaporator	High efficiency finned heat exchanger (370mmx39mmx379mm)	
Expansion valve	Electronic expansion valve	
Size(mm)	650X1350	650X1485
Net Weight (Kg)	72	98
Noise (dB)	46	46
Water connection	DN20	DN20

***Testing at 15 degrees, 60% relative humidity air, and water heated from 15 degrees to 55 degrees.**
Feature: Safe, durable, convenient and energy saving. Easy to install and operate.
Test Conditions: Ambient temperature at 20 degrees Dry bulb and 15 degrees wet bulb, initial water temperature 20 degrees, final water temperature 55 degrees.
Range of Operation: Ambient temperature at -10 degrees to 43 degrees.
Specifications are subject to changes due to any improvement of the product.

G. Specification and Dimensions

Hot water cylinder (Air Ducts on Top)
Diameter 650mm

Model	Rocky 260L-E-4.2	Rocky 300L-E-4.2-2C
Rated Input Power	1.2 KW	1.2 KW
Rated Heating Capacity	4.2 KW	4.2 KW
Heating ampere	5.5A	5.5A
Power Supply	220V-50Hz	
Outlet water temperature	55 degrees	
Water output capacity	90L/H	90L/H
Capacity of Water Tank	260L	300L
Heating cycle time	2.9H	3.4H
Electric Heater Power(EHP)	2KW	2KW
Auxiliary heater ampere	9.1A	
Electricity Water capacity	41 L/H	
Refrigerant	R417A	
Compressor	Panasonic 2K22S225B	
Condenser	Stainless steel coil	
Evaporator	High efficiency finned heat exchanger (370mm x 39mm x 379mm)	
Expansion valve	Electronic expansion valve	
Size(mm)	650X1760	650X1890
Net Weight (Kg)	98	110
Noise (dB)	50	50
Water connection	DN20	DN20

***Testing at 15 degrees, 60% relative humidity air, and water heated from 15 degrees to 55 degrees.**
Feature: Safe, durable, convenient and energy saving. Easy to install and operate.
Test Conditions: Ambient temperature at 20 degrees Dry bulb and 15 degrees wet bulb, initial water temperature 20 degrees, final water temperature 55 degrees.
Range of Operation: Ambient temperature at -10 degrees to 43 degrees.
Specifications are subject to changes due to any improvement of the product.

G. Specification and Dimensions

Hot Water Cylinder (Air Ducts on Top)

Model	80L-E-3.6	150L-E-3.6	190L-E-3.6	260L-E-4.2	300L-E-4.2-2C
Rated input power	.88KW			1.2KW	
Rated Heat capacity	3.6KW			4.2KW	
Outlet Water Temperature	55 degrees				
Capacity of Water Tank (Litres)	80L	150L	190L	260L	300L
Heating Cycle Time (Hours)	1H	1.9H	2.5H	2.9H	3.4H
Air Duct Sizes (mm)	150				
Size (mm)	568 X 1270	650 X1350	650 X 1485	650 X 1760	650X 1890

H. Warranty

The rocky heat pump comes with an 18 month warranty. The warranty begins from the day of purchase.

During the warranty period, if the heat pump has quality problems, please provide the barcode number of the unit. (There is a barcode in each unit).

Under the following circumstances your warranty does not cover the cost of repair.

- The damage is caused by not following the user manual of installation, maintenance and proper care of the heat pump.
- The damage is caused by incorrect operation, abnormal state of electric source, improper carry and breakage.
- Damage done by private disassembly.
- The water system is not maintained / cleaned as per guidelines set out in the manual.
- An irresistible force. (Lighting, Fire, Flood…….etc.).
- The damage caused by contingency

Spare parts list

Safety valve
4-way valve
Control panel
PCB
Ventilation fan
Compressor
Electric heater
Capacitor
Magnesium rod
Water temp sensor
Coil temp sensor
Exhaust temp sensor

Important: Please read the user's manual carefully before operating the unit

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