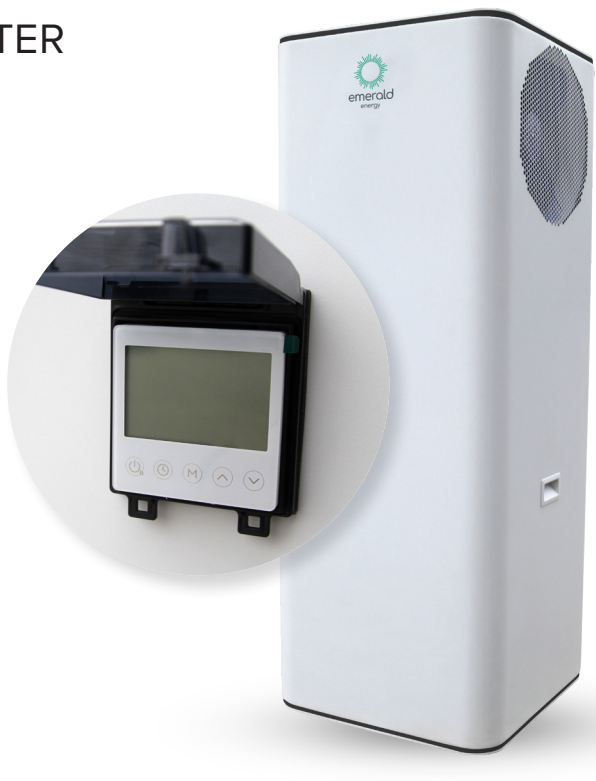
emerald energy

ALL-IN-ONE HEAT PUMP WATER HEATER
CONTROLLER USER MANUAL



MODEL NUMBERS:

Residential:
EE-HWS-A1-220 EE-HWS-A1-220E
EE-HWS-A1-270 EE-HWS-A1-270E

Commercial:
EE-HWS-A1-220-1/-2 EE-HWS-A1-220E-1/-2
EE-HWS-A1-270-1/-2 EE-HWS-A1-270E-1/-2

Thank you for choosing Emerald Energy.

This leaflet contains important information on the correct operation of your hot water heat pump's controller. Keep this manual in a handy for future reference.

CONTENTS

CONTROLLER INSTRUCTIONS

BUTTON INSTRUCTIONS

	On/Off Button	• Press this button for 3 seconds to unlock the controller; • Press this button for one second to turn ON/OFF system; • In Query status, press this button to return to the main interface; • In Setting status, press this button to return to the main interface
M	Running Mode	When the system is turned on press this button to select different running mode;
	Up & Down	• Press UP or DOWN button quickly at main interface to set target water temp. • Press UP or DOWN button for 3 seconds to enter the query state. • Under back end parameter setting status, press the UP or DOWN button to adjust setting value. • Under Timer or Clock setting status, press the UP or DOWN button to adjust setting value
	Clock & Timer Setting	• In the main interface, press this button shortly to enter the real clock setting, and press this button again shortly again to switch the real time setting area “hour” and “minute”. • In the main interface, press this button for 3 seconds to enter/exit the timer period setting or mode. • In the main interface, press this button for 3 seconds to enter/exit the timer period. • Under timer setting status, press this button shortly to switch the timer setting area “hour” and “minute”. • Under timer setting status, press this button for 3 seconds to cancel the timer setting. • Under clock setting status, press this button to activate/deactivate weekly function

ICON INSTRUCTIONS

SYMBOL	STATUS	DESCRIPTION
	Constantly Bright	System is under standard mode
+	Constantly Bright	System is under silent mode
+ +	Constantly Bright	System is under booster mode
	Constantly Bright	System is under defrost
	Constantly Bright	Service required
	Constantly Bright	Compressor is running
	Constantly Bright	Fan motor is running
	Constantly Bright	Electric heating element is on for heating (only for the models with element)
	Flashing	Electric heating element is on for sterilization (only for the models with element)
RT	Constantly Bright	Current water temperature in the tank
SET	Constantly Bright	Set target water temperature in the tank
88.8	Display	Display actual water temperature, set water temperature, and fault code
°C	Constantly Bright	Currently showing Celsius temperature
88:88	Display	Show clock time
	Display	Timer is on
ON	Display	Timer function is activated
OFF	Display	Timer function is deactivated
1	Constantly Bright / Extinguished	Timing period 1 set / Timer period 1 not set
2	Constantly Bright / Extinguished	Timing period 2 set / Timer period 2 not set
3	Constantly bright / Extinguished	Timing period 3 set / Timer period 3 not set
	Constantly Bright	The controller is locked
	Constantly Bright	The Wi-Fi is connected

CONTROLLER INSTRUCTIONS

OPERATION INSTRUCTIONS

CONTROLLER LOCK AND UNLOCK

1. In the locked state, press the button for 5 seconds, the buzzer will beep once, then the controller is unlocked;
2. The controller gets locked automatically when no operation for 60 seconds;

SELECT RUNNING MODE

STANDARD MODE:

- Press the M button to switch to Standard mode. Under this mode, the icon lights up;
- The setting range is optional with 15°C - 63°C for target water temperature;
- Heat pump would be running with the most efficient way;
- If the heat pump fails, the electric heating element would be automatically activated, and the water would be heated up to the target water temperature;

SILENT MODE:

- Press the M button to switch to Silent mode. Under this mode, the + + icons light up. The setting range is optional with 15°C - 60°C for target water temperature;
- Heat pump would be running with lower noise (lower running frequency)
- If the heat pump fails, the electric heating element would be automatically activated, and the water would be heated up to the target water temperature.
- This is a one shot function and will return to standard mode after one cycle.

3) BOOSTER MODE:

- Press the M button to select Booster mode. Under this mode, the + + icons light up.
- The setting range is optional with 15°C - 70°C for target water temperature for the model EE-HWS-A1-220E(-1) and EE-HWS-A1-270E(-1), and 15°C - 60°C for the model EE-HWS-A1-220(-1) and EE-HWS-A1-270(-1);
- Heat pump would be running with bigger heating capacity (bigger running frequency)
- If the target water temperature ≤60°C, both the heat pump and electric heating element work simultaneously during the entire heating cycle;
- If the heat pump fails, only the electric heating element heats the water up to the target water temperature.
- This is a one shot function and will return to standard mode after one cycle.

WATER TANK TEMPERATURE SETTING

In the case of power on and unlocking, press the or button on the main interface to adjust the water temperature setting value of the water tank.

REAL TIME CLOCK SETTING

1. In the main interface, press the button shortly to enter the real-time clock setting
2. In the real-time clock setting interface, press the key once, and the number of the hour part will flash. At this time, press the or button to set the hour of the real-time clock;
3. After setting the hour, press the button again, the number in the minute part flashes, press the button at this time or , the minute of the real-time clock can be set;
4. After the minute part is set, press the button again to confirm the current clock setting and return to the main interface;
5. In the real-time clock setting interface, if there is no operation for 60 seconds, confirm the current real-time clock setting value and return to the main interface;
6. 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.

LEGIONELLA CONTROL

For legionella control our systems heat at least 45% of the water tank to 60°C daily. This sterilisation process will occur daily regardless of any manual setting changes made to the controller.

OPERATION INSTRUCTIONS (CONTINUED)

TIMER SETTING

1. On the main interface, press the ⏲ button for 3 seconds to enter the setting interface of the timer periods;
2. At this time, press the ∧ or ∨ button to set the timing 1, 2, and 3 periods;
3. When the No. 1 segment is flashing regularly, press the ⏲ button to enter the setting interface of the hour part of the timing power-on of the timing period 1. The number in the hour part of the timing start time flashes, at this time press the ∧ or ∨ button, you can set time;
4. After setting the hour part of the timed start-up, press the ⏲ button again, it represents the minutes of the timed start-up time Part of the numbers flashes, at this time, press the ∧ or ∨ button to set the minutes of the timing 1 period;
5. After setting the minutes for the time 1 period to turn on, press the ⏲ button again to enter the hour setting for the time 1 period to turn off, the setting method is the same as above;
6. After setting the timing shutdown time, press the ⏲ button to confirm the current set timing shutdown time. Enter the power-on/off settings of the timing period 2, the setting method is the same as that of the timing period 1, and return to the main interface after the setting is completed;
7. If the fixed on and off times are set to be the same, the timing will be canceled;
8. In the timing interface, if there is no key operation for 60 seconds, confirm the current set timing and return to the main interface (It can be remembered when power off after timing);
9. In the timing interface, press the ⏲ button to confirm the current set timing and return to the main interface.

MEMORY FUNCTION AND OTHER FUNCTIONS

1. The power-down memory function is on the chip of the remote controller;
2. The back light will be on when there is an operation, and after no operation, the back light will be off after 1 minute;
3. When there is a communication failure, the main board cannot work;
4. In the boot mode, only the current mode, water tank temperature, and time are displayed. When there is a load output, the corresponding symbol is displayed, and other unused functions are not displayed.

MANUAL STERILIZATION

ONLY AVAILABLE FOR THE MODELS WITH ELECTRIC HEATING ELEMENT

1. Press and hold the ⏻ + ⏲ + ∨ for 5 seconds to enter the manual disinfection state;
2. The symbol lights up, indicating that it has entered the disinfection state, start the electric heating to heat the water to 75°C and maintain the water temperature between 73°C - 75°C. After 30 minutes later, it will automatically exit the disinfection state, and the symbol will go out.

3) Only available for the models with electric heating element

FORCED DEFROSTING

1. In the power-on state, press the M + ∨ button for 5 seconds to enter the forced defrosting (the coil temperature must be lower than the exit defrosting temperature to enter the forced defrosting Enter), the icon lights up during forced defrosting.
2. When shutdown or forced defrosting reaches the set time or temperature, the system automatically exits forced defrosting and enters normal heating water status, the icon goes out during forced defrosting.

ELECTRIC HEATING ELEMENT CONTROL

ONLY FOR EE-HWS-A1-220E(-1/2) & EE-HWS-A1-270E(-1/2)

1. When defrosting, electric heating element is forced to be turned on if heating is required; The electric heating element is not allowed to be turned on within 60 seconds after the machine is powered on or after the electric heating element is turned off.
2. When the ambient temperature is ≤ -7°C, the heat pump will be not allowed to turned on, and the electric heating element is automatically activated to produce hot water. When the ambient temperature ≥ 5°C The electric heating is stopped.
3. When high pressure protection or exhaust high temperature protection occurs, the compressor will be locked off, and the electric heating element is automatically activated to produce hot water.
4. When exhaust temperature sensor failure, coil temperature sensor failure, gas return temperature sensor failure, the electric heating element will be automatically activated on above conditions, which is not restricted by the ambient temperature requirement;

CONTROLLER INSTRUCTIONS

CHECK HEAT PUMP SYSTEM RUNNING READINGS

1. In the main interface, press the ^ or the v button for 3 seconds to enter the running status query interface. The controller will show the code number and corresponding running value.
2. Press the ^ or the v button to check different running readings.
3. See below table about running readings.

CODE	DESCRIPTION	RANGE
1	Compressor running frequency	0~150Hz
2	Fan running frequency	0~999Hz
3	EEV opening	0~480P
4	AC input voltage	0~500V
5	AC input current	0~50.0A
6	Compressor phase current	0~50.0A
7	Compressor IPM temperature	-40~140°C
8	Ambient temperature T2	-40~140°C
9	Evaporator coil temperature T1	-40~140°C
10	Gas suction temperature T5	-40~140°C
11	Gas exhaust temperature T3	0~150°C
12	Tank water temperature T4	-40~140°C
13	4 way valve	0=OFF,1=ON
14	Electric heating element	0=OFF,1=ON
15	High pressure switch	0=OFF,1=ON

ERROR CODE LIST

ERROR CODE	DESCRIPTION
E05	High pressure switch failure
E09	Communication failure between controller and main board
E12	Gas exhaust temperature too high
E15	Water tank temperature sensor failure
E16	Evaporator coil temperature sensor failure
E18	Gas exhaust temperature sensor failure
E21	Ambient temperature sensor failure
E29	Gas suction temperature sensor failure
E35	Compressor current over high protection
E38	Fan motor failure
E44	Low ambient temperature protection
E88	Compressor driver board failure (See appendix 1)
E96	Communication failure between compressor driver board and main board (detected by main board)
E98	Communication failure between fan driver board and main board (detected by main board)

APPENDIX 1: COMPRESSOR DRIVER BOARD FAILURE

The system will stop running immediately once the driver board fails. The error code E88 and below code would appear.

P1	Bit0: IPM over current/IPM module protection
P2	Bit1: Compressor fails to be driven/Software control abnormal/Compressor out of step
P3	Bit2: Compressor over current
P4	Bit3: Input power supply lack of phase(not for single phase)
P5	Bit4: IPM current detection failure
P6	Bit5: Power component overheat to lead system shutdown
P7	Bit6: Pre-charge failure
P8	Bit7: DC bus over voltage
P9	Bit8: DC bus under voltage
P10	Bit9: AC input under voltage
P11	Bit10: AC input over current
P12	Bit11: AC input detection failure
P13	Bit12: Communication failure between DSP and PFC
P14	Bit13: Radiator temperature sensor failure for
P15	Bit14: Communication failure between DSP and communication board
P16	Bit15: Communication failure between main board and driver board
P17	Bit0: Compressor over current alarm
P18	Bit1: Compressor weak magnetic alarm
P19	Bit2: PIM overheat alarm
P20	Bit3: PFC overheat alarm
P21	Bit4: AC input over current alarm
P22	Bit5: EEPROM alarm;
P23	Bit6: NA
P24	Bit7: EEPROM refresh complete (disappear after restart);
P25	Bit8: Temperature sensor failure to lead frequency limit
P26	Bit9: AC under voltage alarm to lead frequency limit
P27	Bit10~Bit15:NA
P28	Bit0: IPM overheat to lead system shutdown
P29	Bit1: Compressor lack of phase
P30	Bit2: Compressor overload
P31	Bit3: Input current detection failure
P32	Bit4: PIM supply voltage failure
P33	Bit5: Pre-charge voltage failure
P34	Bit6: EEPROM failure
P35	Bit7: AC input over voltage failure
P36	Bit8: Micro electronic parts failure
P37	Bit9: Compressor model code failure
P38	Bit10: Bit11~Bit15: NA Over current detection (hardware detection)

NO.	DESCRIPTION	CAUSES
1	High pressure protection	1. Refrigerant over filling; 2. Blockage or air mixed in the refrigerant 3. Pressure switch failure 4. Fan doesn't work normally
2	Gas exhaust temp protection	1. Sensor failure or sensor connection wire failure 2. Lack of refrigerant or air mixed in the refrigerant 3. EEV opening abnormal 4. Fan doesn't work normally
3	Coil temp sensor failure	1. Sensor failure or sensor connection wire failure 2. Main board failure
4	Ambient temp sensor failure	Same as No.3
5	Return water temp failure	Same as No.3
6	Exhaust temp sensor failure	Same as No.3
7	Outlet water temp sensor failure	Same as No.3
8	Gas return temp sensor failure	Same as No.3

AFTER SALES SERVICE

If your hot water heater can not operate normally, turn off the unit and cut off the power supply at immediately.

Contact your service center or technical department.

WARRANTY INFORMATION

Emerald Energy Pty Ltd warrants this heat pump to the original purchaser.

Emerald Energy Pty Ltd warrants each new heat pump is free from defects in material and workmanship under normal use and service from the date of purchase. 5 years tank and heat pump, 2 years labour. *Subject to terms and conditions.

This warranty does not cover damage resulting from accident, misuse or abuse or lack of reasonable care of the product.

In no case shall Emerald Energy Pty Ltd be liable for any incidental or consequential damages for breach of this or any other warranty express or implied whatsoever.

For full warranty details visit our website emeraldenergy.com.au

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