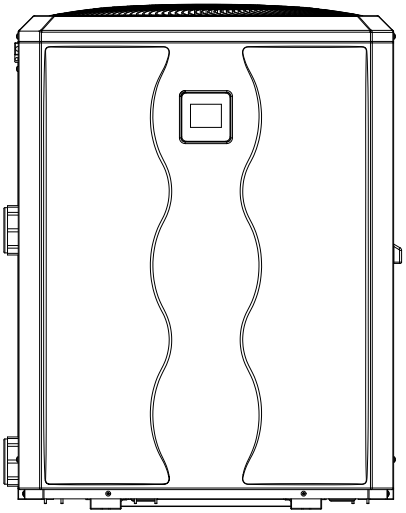
Installation&Operation Manual

Model: KSPF-035L3VUD3

Varminpool



Customer Service Email: varminpool_service@163.com

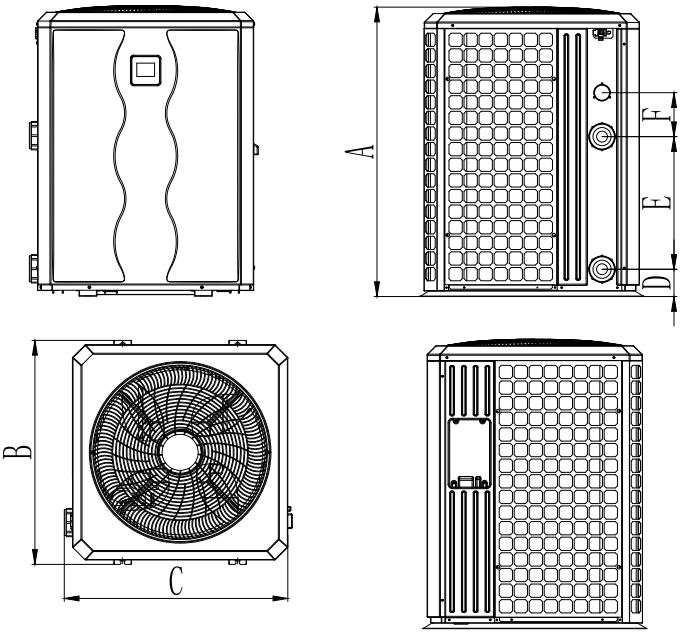
Customer Service Phone: (978) 736-6880
(Our customer service working hours are from 9 a.m. to 6 p.m. Eastern Time)

Thank you very much for purchasing our product, please keep this installation manual carefully and read this manual carefully before you install heat pump.

CATALOGUE

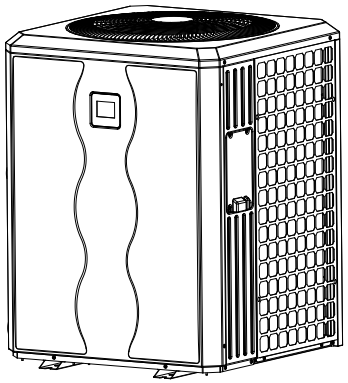
1.DESCRIPTION

1.1 Product Dimensions

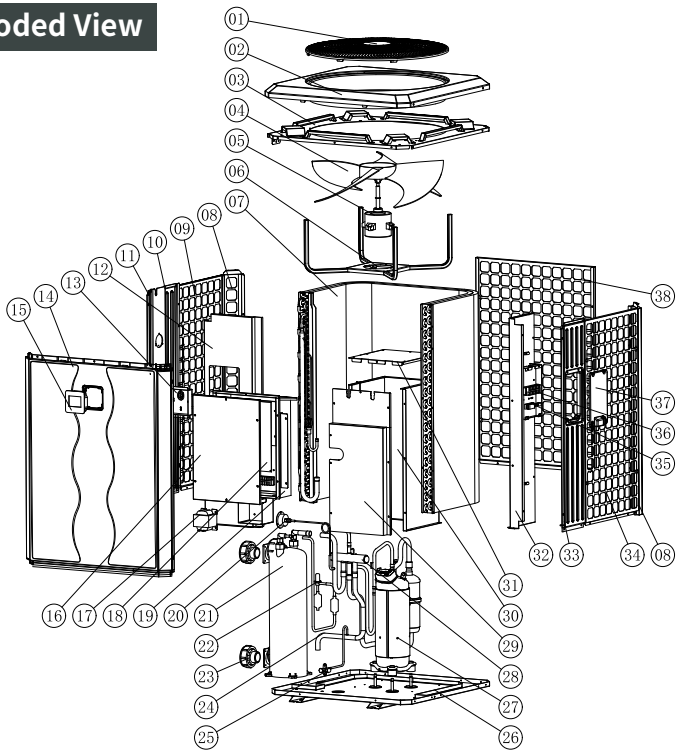


Dimensions：inch

Model	KSPF-035L3VUD3
A	38.60
B	28.70
C	28.70
D	3.64
E	17.72
F	5.82
Water Inlet	1.5"
Water Outlet	1.5"



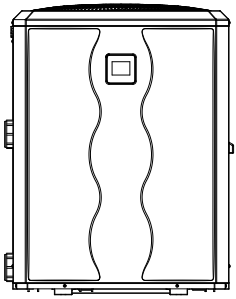
1.2 Exploded View



1.Fan Guard	9.Left Guard	17.Reactor	25.Check Valve	33.Front Right Panel
2.Top Cover	10.Front Left Panel	18.Driver Board	26.Chassis Welding Assembly	34.Right Guard
3.Top Frame Assembly	11.Temperature Probe Fixing Clip	19.Electrical Box	27.Compressor	35.Wire Clamp
4.Fan Blade	12.Front Left Stand Column	20.Manometer	28.4-Way Valve	36.Electrical Cover
5.Motor	13.Controller Waterproof box	21.Titanium Tube Heat Exchanger	29.Front Panel of Silencer Box	37.Terminal Block
6.Motor Bracket	14.Front Panel	22.EEV	30.Back Panel of Silencer Box	38.Back Guard
7.Evaporator Assembly	15.Controller	23.Pipe Union	31.Cover of Silencer Box	
8.Stand Column	16.Electrical Box Cover	24.Piping Assembly	32.Right Left Stand Column	

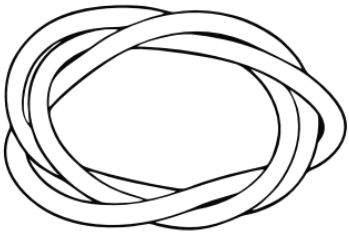
2.INSTALLATION

2.1 Package Listing

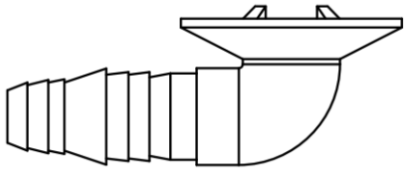


Heat Pump Unit(1 PCS)

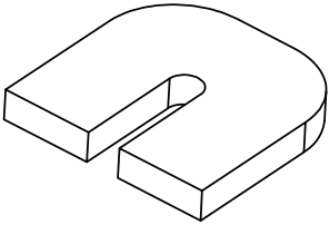
Instruction Guide(2 PCS)



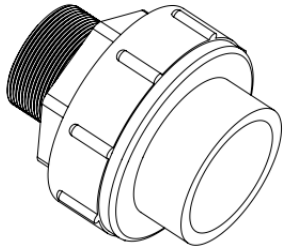
Condense Water Draining Hose(1 PCS)



Condense Water Draining Fitting(1 PCS)



Rubber Shock Absorption Pad(4 PCS)



PVC Pipe adapter(2 PCS)

2.2 Warning

WARNING:

This heat pump uses R32 refrigerant, which is flammable.
No work on the refrigerant circuit may be performed by unauthorized personnel.
The following safety measures must be implemented before servicing or repairing the refrigerant circuit to ensure safe execution.

2.2.1 Working procedure

1. Notify all personnel in the vicinity about the work being performed.
2. DO NOT work in confined spaces.
3. Clearly mark and secure the work area. Pay special attention to marking areas near potential ignition sources or open flames.

2.2.2 General work area

1. Before and during maintenance, you MUST use an appropriate refrigerant detector to verify the absence of flammable gas.
2. Ensure the leak detection system installed on the unit is:
Compatible with flammable refrigerants,Spark-free, and Sealed or intrinsically safe.

2.2.3 Refrigerant presence check

If any hot work on the refrigerant system or its components is required, fire extinguishing equipment must be immediately available. Place dry chemical or CO_2 fire extinguishers near the work area.

2.2.4 Fire extinguisher access

If hot work on the refrigerant system or its components is required, fire extinguishing equipment must be immediately available. Place dry chemical or CO_2 fire extinguishers near the work area.

2.2.5 Ignition source elimination

Before starting fire hazard elimination:
1. Survey the work area.
2. Display "NO SMOKING" signs prominently.

2.2.6 Ventilation protocol

Before starting system maintenance or hot work:
1. Confirm the work area is outdoors or well-ventilated.
2. Maintain adequate ventilation throughout the operation.

2.2.7 Flammable refrigerant system checks

When replacing electrical components:
- Use ONLY manufacturer-approved parts to ensure compatibility and safety.
- Consult manufacturer technical support if uncertain.

For systems using flammable refrigerant, perform these inspections:

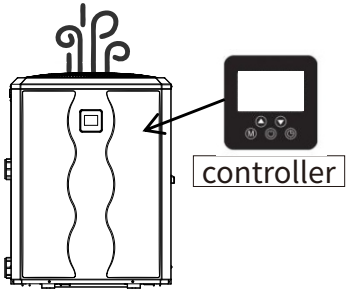
a. Confirm refrigerant charge suitability for the equipment installation room.
b. Verify ventilation openings and air vents are operational and unobstructed.
c. For indirect refrigeration circuits, inspect secondary circuits.
d. Equipment labels and safety markings MUST remain legible. Replace illegible labels.
e. Position refrigerant piping and components to avoid contact with corrosion-causing substances.

NO open flames within the unit.

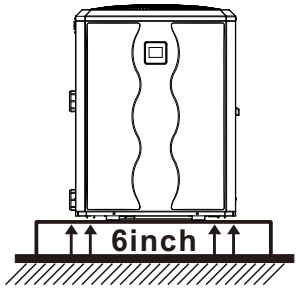
Use the heat pump in an open environment.

2.3 Installation Instructions

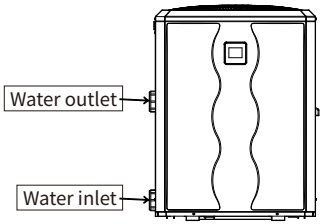
2.3.1 Heat pump unit installation



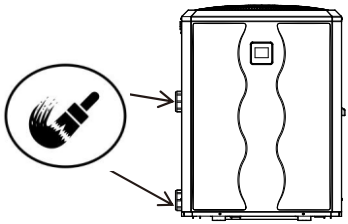
The heat pump has 25-inch of unobstructed surroundings and 60-inch of unobstructed air outlets



The heat pump shall be mounted on a 6-inch elevated base with rubber anti-vibration pads installed between all unit feet and foundation.

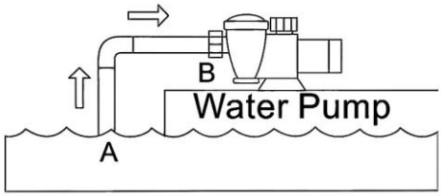


Install adapters at the inlet and outlet of the back of the heat pump.

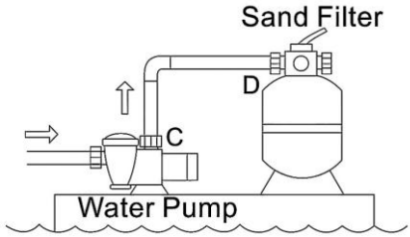


Brush the connecting tube with sealing glue and connect it to the adapter.

2.3.2 Swimming pool system installation



Step 1: Connect the swimming pool and water pump with a water pipe, with water flow direction A to B.



Step 2: Connect the water pump outlet to the sand filter inlet, with water flow direction C to D.

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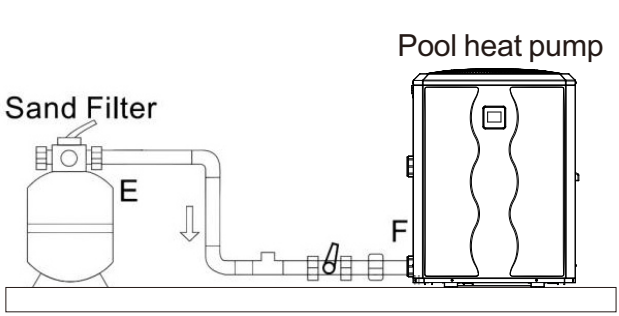
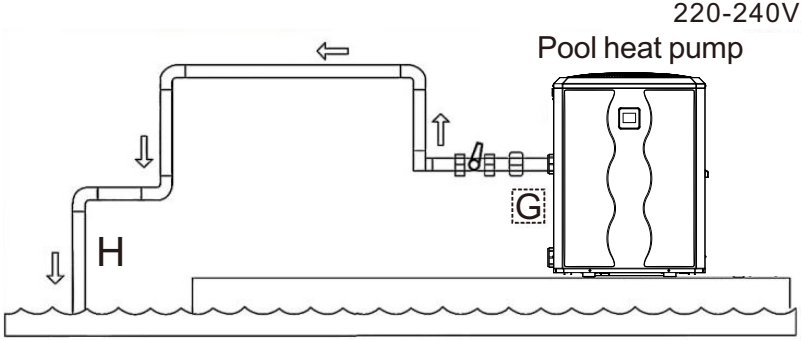
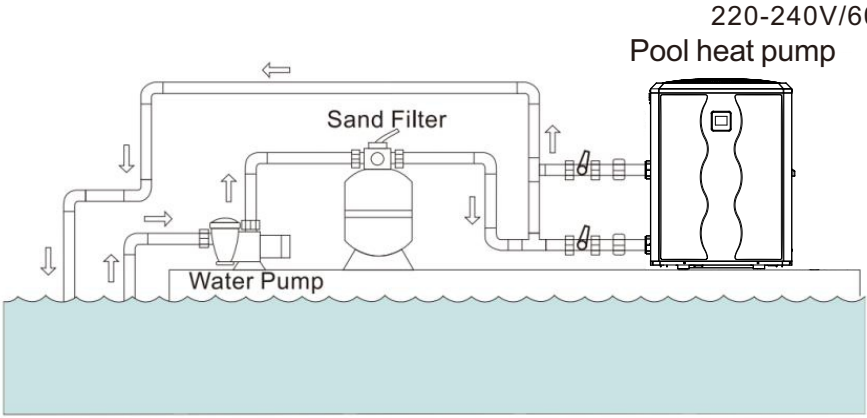


Step 3: Connect the outlet of the sand filter to the inlet of the swimming pool heat pump. The direction of water flow is from E to F.



Step 4: Connect the outlet of the pool heat pump to the pool. The direction of water flow is from G to H.



As shown in the above figure, the installation has been completed.

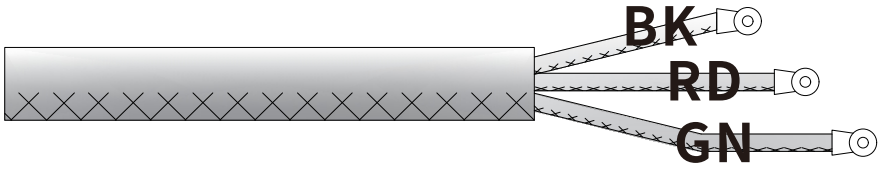
2.4 Electrical Installation

WARNING:

Please connect the heat pump to the electrical system according to the following instructions. The heat pump should be connected to D-type circuit breaker (see table-1) . Comply with the current standards and regulations of the country where the system is located.Power cables must be selected based on the unit's rated power and the cable length required for installation (see table below). Additionally, cables must be suitable for outdoor use.

Model	Power supply	Max-current	Cable diameter	Earth Leakage Circuit Breaker	FUSE
KSPF-035L3VUD3	220-240V/60Hz	30A	3*10AWG	40A	30A

Step 1: Remove the electrical side panel with a screwdriver to access the terminal block.
Step 2: Connect the power cables to the heat pump according to the terminal labels provided with the unit (BK-L1, RD-L2, GN-G).
Step 3: Connect the power cables to the terminal block as shown in the figure below.



Step 4: Close the electrical side panel of the heat pump.

CAUTION: The interlock control wiring for the circulation pump.must be coordinated with the manufacturer's technicians based on the installation type.Ensure outdoor electrical components are waterproof.

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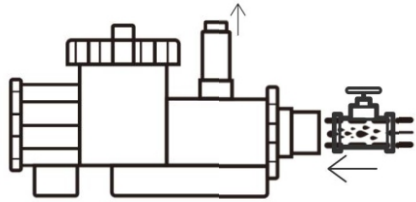
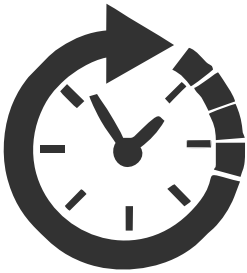
2.5 Start-up And Initialization Issues

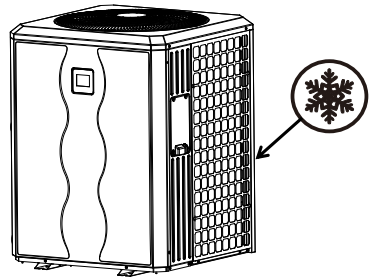
To improve swimming pool heating efficiency,adding a thermal cover is recommended.



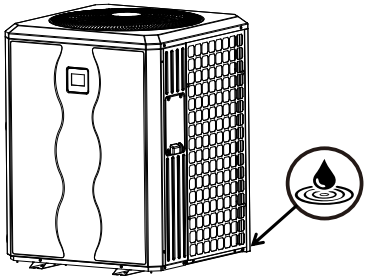
To enhance swimming pool heating efficiency,it is recommended to install a manual isolation valve on the pump suction line, with a pump flow rate maintained at 5200-6200 GPH.



The initial heating process requires 48-72 hours.Please allow normal operation during this period and refrain from turning off the unit.



Frost may form on the unit during heating operation. This is normal. The unit will automatically initiate the defrost cycle. Do not power off the unit.



During heating operation, condensate will form.
Ensure the condensate drain line is properly connected.

Frequently Asked Questions	Root Cause Analysis	Troubleshooting Solutions
OUT Blinking	Incorrect Startup Sequence	1.Start the circulation pump first. 2. Confirm water flow from the pool return line. 3. ONLY THEN power on the heat pump.
	Water Circuit Restriction Detected	1. Verify water circuit valves are fully open. 2. Confirm normal water intake at the pool. 3. Check proper water discharge operation.
	Water Circuit Reversed Flow	Verify correct water flow direction. Refer to Section 2.3.
Frost accumulation detected on the blue evaporator of the heat pump.	Normal phenomenon	Maintain power supply - The unit features intelligent defrost control. Contact manu facturer technical support if frost persists beyond 120 minutes.
The wired controller for no display or indicator lights immediately after power-on.	Verify no power output from the power supply unit.	Check the Power Supply Unit for abnormal conditions.
circuit breaker tripped	Installation on a shared circuit with other equipment risks over loading. Provide a dedicated branch circuit immediately.	Verify the air source heat pump connects exclusively to a dedicated circuit breaker with no other loads.
	The circuit fails to meet the unit's maximum current requirements due to undersized wiring or incompatible circuit breaker ratings.	Upgrade wiring and breaker to meet the unit's maximum current requirements
The heat pump prolong heating time and reduce heating capacity.	Heating cycles abnormally short	The initial heating period for a newly filled pool typically requires 48 to 72 hours when using a heat pump system.
	Excessive heat loss occurs in the pool due to lack of insulation, specifically from being left uncovered	Procure a high-efficiency thermal cover.
	The pump flow rate exceeds design specifications, resulting in excessive flow velocity.	Reduce the flow rate of the water pump, Decrease the flow rate of the water pump, Recommend a flow rate of 5200-6200GPH.
	The environmental humidity is too high and there is frequent frosting	Place the heat pump in a dry place.
	The swimming pool is too large, but the heat pump is too small.	Be patient and reduce the pool water volume.
	The ambient temperature is too low, resulting in a decrease in the heating performance of the heat pump.	Be patient and reduce the pool water volume.
Water is overflowing from the bottom	Normal phenomenon	Inspect the water leakage location. Note that condensate forms normally during unit heating operation.

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3.USE

3.1 Controller Introduction

3.1.1 Function icon definition

Icon	Definition	Operation
⏻	ON/OFF	1. Press and hold for 1 second to turn ON/OFF. 2. In query mode, press this button to return to the home screen. 3. In settings mode, press this button to return to the home screen. 4. After 60 seconds of inactivity, the controller will automatically return to the home screen, turn off the display, and lock the screen. 5. When on the home screen with the lock activated, press and hold for 3 seconds to unlock first.
🕒	CLOCK	1. On the home screen, press to enter Clock Setting mode; press again to toggle between adjusting "Hours" and "Minutes". 2. On the home screen, press and hold for 5 seconds to enter "Timer Setting" mode. 3. In Timer Setting mode, press to switch between setting "Hours" and "Minutes". 4. In Timer Setting mode, press and hold for 5 seconds to cancel the timer function.
Ⓜ	MODE	1. On the home screen, press and hold for 10 seconds to access the master control system parameter table (entering system parameters P06-P28). 2. When the unit is on, press to cycle through 7 operating modes.

		Heating ; Boost Heating + ; Silent Heating + ; Cooling ; Boost Cooling + ; Silent Heating + ; AUTO MODE 3. In Parameter Query Mode, parameters can be accessed and saved.
	UP	1. On the home screen with the unit powered on, press to enter temperature setting. 2. On the home screen, press and hold for 3 seconds to access User Parameters (User Parameters P01–P05) query mode. 3. In Query mode, press to switch between status query indexes. 4. In Parameter Setting mode, press in conjunction with the Mode (M) button to modify parameters. 5. Timer and clock value adjustment.
	DOWN	1. On the home screen with the unit powered on, press to enter temperature setting mode. 2. On the home screen, press and hold for 3 seconds to access unit operation status query (Maintenance Status: displays AUTO). 3. In Query mode, press to switch between status query indexes. 4. In Parameter Setting mode, press the Mode (M) button to modify parameters. 5. Timer and clock value adjustment.
+	WIFI Match	Press and hold for 5 seconds to enter manual smart network configuration mode.
+	Toggle℃/℉	Press and hold for 5 seconds on the unlocked and powered-on home screen to switch between Fahrenheit and Celsius temperature units.
+	Manual Defrost	Press and hold for 5 seconds on the powered-on home screen to toggle the Manual Defrost function ON or OFF.
+	Restore Factory Settings	Press and hold for 5 seconds **while powered off** and **within 5 minutes after power-on** to restore all parameters to factory defaults.

3.1.2 Display Icon definition

Icon	Status	Definition
	Steady On	Operating in Heating Mode
	Steady On	Operating in Cooling Mode
	Steady On	Operating in AUTO Mode
	Steady On	Silent Mode
	Steady On	Boost Mode
	Blinking	Wi-Fi Setup Status
	Steady On	Wi-Fi Connected
IN	Steady On	Indicates Water Inlet
OUT	Steady On	Indicates Water Outlet
SET	Steady On	Indicates Setting in Progress
	Steady On	Indicates ℃
	Steady On	Indicates °F
MIN	Steady On	Indicates Minutes
	Steady On	Indicates Actual Value / Set Value
	Steady On	Frost Protection Mode
	Steady On	Circulation Pump: Normal Operation
AUTO	Steady On	Maintenance Mode: View unit operation status.
	Steady On	Defrost Status
	Steady On	Fault Alarm
	Steady On	Locked State
	Steady On	Compressor Operation Status
FAN	Steady On	Fan Operation Status
	Displayed	Displays: Real-time Clock, Fault Codes, Parameter Numbers
	Steady On	Timer Operation Mode
ON	Displayed	Timer Operational Periods
ON	Blinking	Setting Timer Operational Periods
OFF	Displayed	Timer Non-Operational Periods
OFF	Blinking	Setting Timer Non-Operational Periods
1 3 2 4	Steady On/Off	Timer Function Indicator: Illuminates steadily when the timer function is enabled; remains off in all other conditions.

PS: FAN **Steady On:** Indicates Fan Operation.

IN **Steady On:** Indicates Water Inlet Temperature Display (shows inlet temperature for 5 seconds).

OUT **Steady On:** Indicates Water Outlet Temperature Display (shows outlet temperature for 5 seconds). When Water Flow Fault Occurs " OUT "Blinking.

3.2 Time Setting

3.2.1 Clock Settings

Enter Clock Settings: Controller powered on, press"  "button, The clock area blinks to indicate that Clock Settings mode has been entered.

Clock Setting Operation: Clock Settings Mode Entered, press"  " button to toggle between setting hours and minutes; the selected value blinks during adjustment. Press"  "or"  "button, Modify the corresponding value. After setting the minute value, press the"  "button or wait 60 seconds without any key operation to automatically save the current settings and exit.

3.2.2 Configure Timer On/Off Settings

The system provides 3 timer groups (Group 1-3).Each group can be set to "Scheduled Startup", "Scheduled Shutdown", or defaults to "Inactive" status.

On the home screen, press and hold the "  " button for 5 seconds to enable or disable the timer function.

Cancel Timer Settings: Timer Setting Mode,press and hold the "  " button for 5 seconds to exit and cancel the timer configuration.

To Set Timer Group 1 Startup:

1. Briefly press the "  "button.The icons "1" and "ON" will appear in the lower left corner of the screen, and the hour digits will blink, indicating that you have entered the "Timer Group 1 Startup" setting mode.

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2. With the hour digits blinking, press the "  " or "  " button to adjust the value.
3. Press the"  " button again to confirm the hour setting and proceed to minute setting. The minute digits will now blink.
4. Press the "  " or "  " button to adjust the minutes.
5. Press the "  " button again to confirm the minute setting.
6. The display will then automatically switch to Timer Group 1 Shutdown setting ("1" and "OFF" icons displayed).
7. Repeat steps 2-5 to set the shutdown time (blinking hours -> confirm -> blinking minutes -> confirm).
8. After confirming the shutdown time, the settings for Timer Group 1 will be activated, and the interface will automatically advance to the settings for Timer Group 2. The procedure for setting Groups 2 and 3 is identical.

Exit Timer Setting:

While in Timer Setting mode, press the "  " **button** or refrain from any button operation for **60 seconds** to **discard the current timer segment** and exit the setting mode.

Timer Display:

After settings are confirmed, the clock and timer status update immediately. The unit will power ON if the current time falls within any scheduled operational period, and power OFF if outside all periods. This is a one-time execution based on the schedule.

During OFF periods: The "  " and "OFF" icons are displayed.

During ON periods: The "  " icon, the number of the active timer group (1, 2, or 3), and the "ON" icon are displayed.

4.REPAIRS

When a unit fault occurs, the error code is displayed in the timer area, cycling through all active fault codes. The fault indicator icon will blink simultaneously. Once the fault is cleared, the display returns to normal. For detailed fault code descriptions, please refer to the appendix.

Code	Description	Reason&Solution
OUT	Flow Failure	1. Clogged water filter. Clean water circuit. 2. Insufficient pump head. Replace pump flow . 3. Incorrect pump wiring/direction. Verify rotation and electrical connections. 4. Flow switch directional error. Align arrow with flow direction. 5. Intermittent/disconnected flow switch wiring. Secure terminal connections.
	Frost Protection	The heater will not start up when ambient temperature is too low. This is a normal protective function.
E05	High Pressure Protection	1. The wiring of the high-pressure switch is either loose or incorrect. 2. There is too much refrigerant in the system, fill according to the nameplate requirements. 3. The unit has no water flow or low flow rate. Check the water pump and water flow. 4. Air is introduced into the fluorine circuit system. Vacuumize and refill with refrigerant. 5. There is a blockage in the filter and throttle valve on the refrigerant side. 6. There is scaling phenomenon in the water side heat exchanger. Clean the scale.
E06	Low Pressure Protection	1. The wiring of the low-pressure switch is either loose or incorrect. Correct the wiring. 2. Lack of refrigerant or complete leakage of refrigerant. Check for leaks and refill refrigerant. 3. The fan is damaged and the unit is severely frosted. Check the fan wiring or replace the fan. 4. The refrigerant side filter or throttle valve is clogged. Replace accessories.
E09	Mainboard – Controller Communication Fault	1. Verify any poor connection in the communication wiring between the Controller and Mainboard. 2. If the model of the Mainboard and Controller are

		incompatible, replace the Controller.
E10	Mainboard- Drive Board Communication Fault	1. Verify any poor connection in the communication wiring between the Drive Board and Mainboard.
E12	High Exhaust Temperature	1. Refrigerant System Blockage 2. Insufficient Refrigerant Charge or Faulty Sensor in the refrigerant circuit.
E15	Water Inlet Temperature Sensor Fault	1. Sensor wiring disconnected or short-circuited 2. Failed sensor 3. Damaged mainboard port
E16	Coil Temperature Sensor Fault	1. Sensor wiring disconnected or short-circuited 2. Failed sensor 3. Damaged mainboard port
E18	Exhaust Temperature Sensor Fault	1. Sensor wiring disconnected or short-circuited 2. Failed sensor 3. Damaged mainboard port
E20	Inverter Module Abnormality Protection	View Table 4-1
E21	Ambient Temperature Sensor Fault	1. Sensor wiring disconnected or short-circuited 2. Failed sensor 3. Damaged mainboard port
E23	Chilled Water Outlet Temperature Too Low	1. Insufficient water flow → Check for blockages in the water circuit or verify that the water pump is operating normally. 2. Loose or detached inlet/outlet temperature probe → Reinstall the temperature probe securely in the correct position.
E27	Outlet Water Temperature Sensor Fault	1. Sensor wiring disconnected or short-circuited 2. Failed sensor 3. Damaged mainboard port
E29	Suction Temperature Sensor Fault	1. Sensor wiring disconnected or short-circuited 2. Failed sensor 3. Damaged mainboard port
E32	Vast Temperature Variations Between Inlet And	1. Check for blockages in the water circuit or verify normal pump operation if water flow is insufficient. 2. Reposition any loose or dislodged inlet/outlet

	Outlet	Temperature Sensors.
E33	Refrigeration Outer Coil Overtemperature	1.Poor Heat Dissipation 2.Refrigeration System Problems 3.System Blockage 4.Four-Way Valve Failure
E42	Indoor Coil Temperature Sensor Fault (Cooling Coil)	1. Sensor Wiring Disconnected Or Short-Circuited. 2. Failed Sensor. 3. Damaged Mainboard Port.
Er46	DC Fan 1 Fault	Fan Drive Board or Motor Failure

Fault E20 Display Logic:

When fault E20 is active, the following associated fault codes will be displayed sequentially, cycling every 3 seconds.

Faults numbered **1–128 have priority** and are displayed first. Faults numbered **257–384 will only be displayed if no faults from the 1–128 range are present.**

If **two or more faults with the same priority** occur simultaneously, the displayed code will be the **sum of their individual numbers.**

*For example: If fault 16 and fault 32 occur together, the displayed code will be 48.

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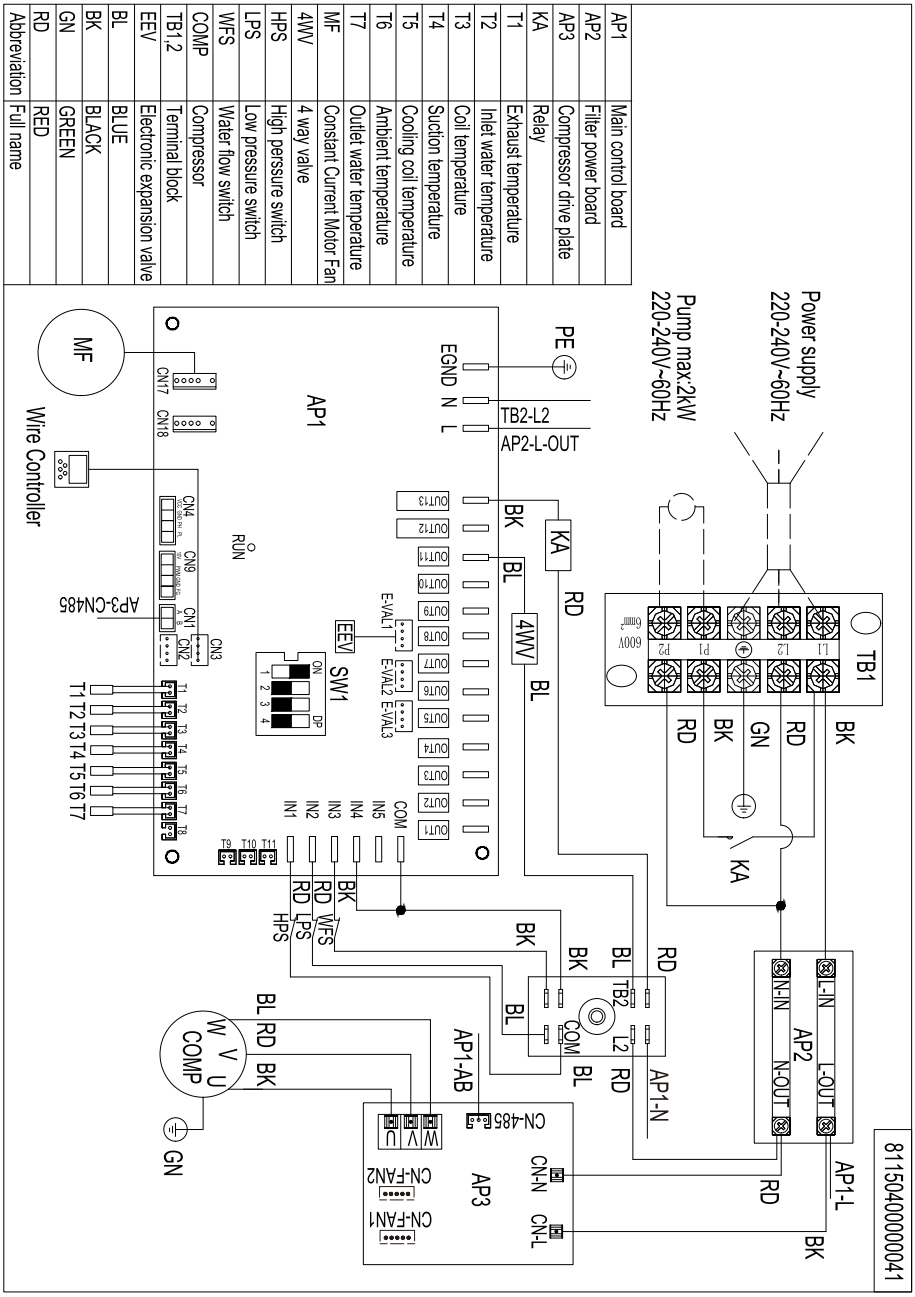
NO.	Definition	Description	Solution
8	Compressor Output Phase Loss	1. Compressor Wiring Open Circuit 2. Poor Electrical Contact	Inspect Compressor Input Power Lines.
16	Low DC Bus Voltage	Low Input Voltage or PFC Module Failure	1. Check Input Voltage 2. Replace the PFC Module.
32	High DC Bus Voltage	High Input Voltage or PFC Module Failure	Replace Inverter Module.
64	Heat Sink Overtemperature	Unit Fan Failure or Air Duct Blockage	Check fan and air ducts.
128	Heat Sink Temperature Fault	Heat Sink Sensor Short Circuit or Open Circuit	Replace inverter module.
257	Communication Fault	Inverter Module Did Not Receive Command from Main Controller	Check communication wiring between main controller and inverter module.
258	AC Input Phase Loss	Input Phase Loss	Check input power lines.
260	AC Input Overcurrent	Input Three-Phase Imbalance	Check three-phase input voltage (phase-to-phase).
264	AC Input Low Voltage	Input Voltage Too Low	Check input voltage.
288	IPM Overtemperature	Unit Fan Failure or Air Duct Blockage	Check fan and air ducts.
320	Compressor Peak Overcurrent	Compressor Line Overcurrent	Replace inverter module.
384	PFC Module Overtemperature Protection	PFC Module Overtemperature	Check PFC Module.

Table 4-1

5. SCHEMATIC DIAGRAM



AP1	Main control board
AP2	Filter power board
AP3	Compressor drive plate
KA	Relay
T1	Exhaust temperature
T2	Inlet water temperature
T3	Coil temperature
T4	Suction temperature
T5	Cooling coil temperature
T6	Ambient temperature
T7	Outlet water temperature
MF	Constant Current Motor Fan
4WV	4 way valve
HPS	High perssure switch
LPS	Low pressure switch
WFS	Water flow switch
COMP	Compressor
TB1,2	Terminal block
EEV	Electronic expansion valve
BL	BLUE
BK	BLACK
GN	GREEN
RD	RED
Abbreviation	Full name

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6. PARAMETER TABLE

Air-source Swimming Pool Heat Pump		
Model		KSPF-035L3VUD3
80°F Air 80°F Water 63%RH	Heating capacity(Btu/h)	34120~140000 Btu/h
	Power input(Btu/h)	4572~22250 Btu/h
	COP	5. 60~12. 80
50°F Air 80°F Water 63%RH	Heating capacity(Btu/h)	26950~119425 Btu/h
	Power input(Btu/h)	3925~22860 Btu/h
	COP	4. 80~6. 70
Power supply		220-240V~ 60Hz
Max power input(Btu/h)		22950Btu/h
Max current(A)		30. 0 A
Setting temperature range(Heating)		46°F ~104°F
Setting temperature range(Cooling)		46°F ~82°F
Running(Air)temperature range		5°F ~110°F
Refrigerant type/quantity (Oz)		R32/67. 5 Ozs
Air side heat exchanger		Hydrophilic fin exchanger
Water side heat exchanger		Titanium tube heat exchanger
Water flow(gpm)		79. 3
Net dimension L×W×H (inch)		28.7X28.7X38.6
Packing dimension L×W×H (inch)		31.5X32.7X46.1
Net weight (Ibs)		275
Packing weight(Ibs)		363.8
Maximum working pressure of heat exchanger		4. 4 MPa
Maximum working pressure of exhaust side		2. 5 MPa
Maximum working pressure of suction side		4. 4 MPa
Waterproof grade		IPX4
Noise		47~59 dB (A)