



R290 HEAT PUMP

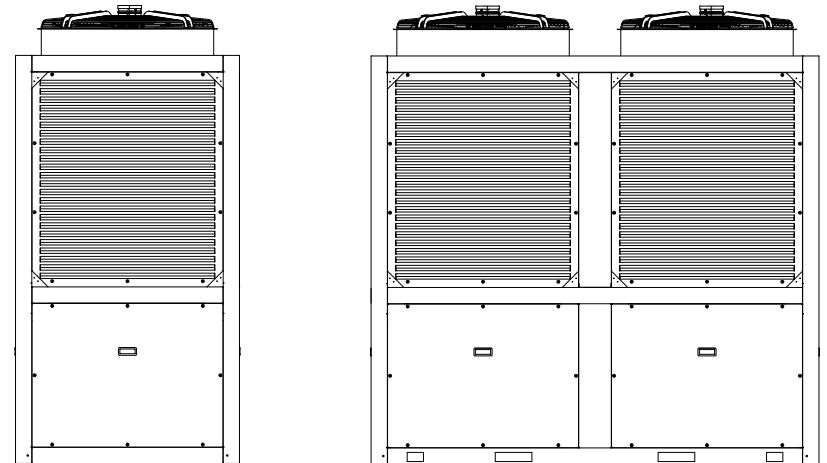
USER GUIDE

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USER MANUAL

Original instructions

DC INVERTER AIR TO WATER HEAT PUMP



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1. SAFETY PRECAUTIONS

The following safety precautions are categorized into distinct types. Each is crucial and must be adhered to without exception. Below is an explanation of the symbols DANGER, WARNING, CAUTION, and NOTE.

INFORMATION

1. Carefully review these guidelines prior to commencing installation. Store this manual in an accessible location for future consultation.
2. Improper installation or use of the equipment and accessories can lead to hazards such as electrical shocks, short circuits, leaks, fire, or other equipment damage. Always ensure the use of manufacturer-approved accessories specifically designed for this product and entrust installation to qualified professionals.
3. All tasks detailed in this manual should only be performed by certified technicians. During installation or maintenance, always wear appropriate personal protective equipment, such as safety gloves and goggles.
4. This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons and outdoor use only.



Caution: Risk of fire due to flammable materials

WARNING

Service activities must strictly follow the manufacturer's recommendations. Repairs or maintenance that require specialized expertise should only be carried out under the guidance of a professional trained in the handling of flammable refrigerants.

DANGER

This indicates an immediate hazard that, if not avoided, will result in severe injury or death.

WARNING

This highlights a potential danger that could result in serious injury or death if proper precautions are not taken.

CAUTION

This signifies a situation where minor to moderate injuries could occur if the warning is ignored. It may also serve as a reminder to avoid unsafe actions.

NOTE

This is used to indicate possible accidental damage to equipment or property without posing safety risks.

Explanation of Symbols Displayed on the Mono-Bloc

	WARNING	This symbol indicates the appliance uses flammable refrigerants. Leakage of refrigerants exposed to an external ignition source could cause a fire hazard.
	CAUTION	This symbol signifies that the operating manual must be thoroughly read.
	CAUTION	This symbol denotes that only trained personnel should handle this equipment, referring to the installation manual as a guide.
	CAUTION	This symbol indicates service technicians should use the installation manual as a reference while handling the equipment.
	CAUTION	This symbol signifies that information such as the installation or operating manual is available for consultation.

	Correct Disposal of this product This marking indicates that this product should not be disposed with other household wastes throughout the EU.To prevent possible harm to the environment or human health from uncontrolled waste disposal,recycle it responsibly to promote the sustainable reuse of material resources.To return your used device,please use the return and collection systems or contact the retailer where the product was purchased.They can take this product for environmental safe recycling.
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DANGER

1. Live parts may be accidentally exposed when service panels are removed; exercise extreme caution.
2. Always disconnect the unit's power supply before handling any electrical parts.
3. Ensure the power switch is turned off before handling any electrical terminal components.
4. During installation or maintenance, never leave the unit unattended with the service panel detached.
5. Avoid touching water pipes during or immediately after operation, as they may be extremely hot and cause burns. Allow them to cool or use protective gloves to prevent injury.
6. Refrain from operating switches with wet hands, as this could result in electrical shock.

WARNING

1. Installation must be carried out by certified professionals as per the manual's guidelines. DIY installation could lead to risks like water leaks, electrical shock, or fire.
2. Proper installation considering extreme conditions like hurricanes or earthquakes is crucial to prevent equipment damage or accidents.
3. Mount the unit on a structure capable of bearing its weight. Weak foundations may lead to equipment collapse and injuries.
4. Only use authorized parts and accessories during installation to prevent accidents such as equipment failure, fire, or water leakage.
5. Electrical work should comply with local codes and be performed by licensed personnel using a dedicated circuit. Improper wiring can result in fire or electrical shock.
6. A ground fault circuit interrupter must be installed according to local regulations to minimize risks of fire or electric shock.
7. Ensure wires are arranged so the front panel fits securely; improper panel placement can cause overheating, fire, or electrical hazards.
8. Secure all wiring connections, ensuring they are protected from moisture and external factors. Loose or exposed connections could lead to fire hazards.
9. After installation, check for refrigerant leaks and take corrective action if necessary.
10. Avoid direct contact with leaking refrigerants as they can cause severe frostbite. Always allow refrigerant pipes to normalize in temperature or wear protective gloves if immediate handling is needed.
11. Internal components such as pumps or heaters can retain extreme temperatures post-operation. Allow adequate cooling time or wear protective gloves when handling.
12. Safely discard packing materials such as nails or sharp objects to avoid accidental injuries.
13. Dispose of plastic packaging materials immediately to prevent suffocation hazards for children.
14. The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.

CAUTION

1. Ensure the unit is properly grounded according to local codes and standards.
2. Verify that the power supply meets the unit's electrical requirements, including grounding, leakage prevention, and load capacity. Installation should not proceed until requirements are met.
3. Do not connect the ground wire to gas, water pipes, lightning rods, or telephone ground lines to avoid safety hazards.
 - **Gas pipes***: Leaks could result in fire or explosion.
 - **Water pipes***: Vinyl pipes are ineffective as grounding points.
 - **Lightning rods/telephone lines***: Risk of abnormal electrical surges during lightning strikes.
4. Follow proper safety protocols for refrigerant handling. Any leaks should be addressed in accordance with local safety regulations.
5. Keep the power cord at least 1 meter (3 feet) away from TVs, radios, or other electronics to reduce interference or noise. If interference persists, increase the distance.
6. Do not wash the unit with water; this could lead to fire or electrical shock. Follow national wiring regulations for installation.
7. If the power cord is damaged, it must be replaced by the manufacturer, authorized agents, or qualified personnel to prevent hazards.
8. Avoid installing the unit in environments with the following:
 - Mineral oil mist, oil sprays, or vapors, which may degrade plastic components and cause leaks.
 - Corrosive gases like sulfur compounds that can corrode copper pipes and result in refrigerant leakage.
 - Areas with electromagnetic interference, as it may disrupt the control system and cause malfunction.
 - Flammable gases, volatile substances, or environments prone to combustible dust, as these may cause fire.
 - High-salt air environments, such as coastal areas, which accelerate corrosion.
 - Locations with significant voltage fluctuations or unstable power supply.
9. Children under 8 years old and individuals with limited physical, sensory, or mental abilities should only operate the appliance under supervision. Children shall not play with the appliance. Cleaning and maintenance should not be performed by unsupervised children.
10. Dispose of the product responsibly, ensuring compliance with local waste management regulations. Incorrect disposal may release harmful substances into the environment.
11. Avoid installing the unit in areas frequently used for construction or heavy dust activity without protective measures.
12. Reinforce the installation if necessary to ensure stability, particularly in areas prone to strong winds or earthquakes.
13. Installation must allow sufficient servicing space and provide proper drainage to avoid water damage from leaks.
14. Check the installation area for hidden hazards such as water pipes, electrical wiring, or gas lines before proceeding.
15. Do not place heavy objects on top of the unit or allow individuals to climb, sit, or stand on it to prevent damage or accidents.
16. Ensure the unit is installed in well-ventilated areas, away from obstructions that may trap heat or interfere with air circulation.
17. When installing multiple air conditioners, ensure the power load is evenly distributed across all phases of a three-phase power system to prevent overloads.
18. Avoid placing the unit in workplaces or areas subject to heavy dust from construction activities unless protective covers are used.
19. Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
20. The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.)
21. Do not pierce or burn.
22. Be aware that refrigerants may not contain an odour.
23. Compliance with national gas regulations shall be observed.

NOTE

1. This unit uses propane gases. Refer to the label for quantities and adhere to national regulations.
2. Maintenance, servicing, and uninstallation must be performed by certified professionals.
3. For systems with leak detection mechanisms, inspections should occur annually, with proper records maintained.
4. Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
5. servicing shall be performed only as recommended by the manufacturer.
6. The appliance shall be stored so as to prevent mechanical damage from occurring.
7. The A-weighted sound pressure level of the product is below 70 dB.

2.INSTALLATION PRECAUTIONS

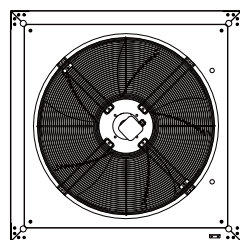
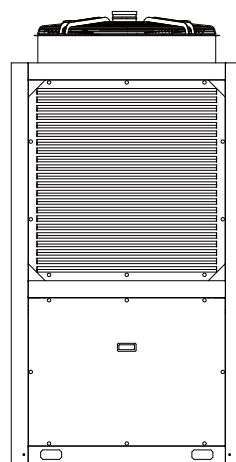
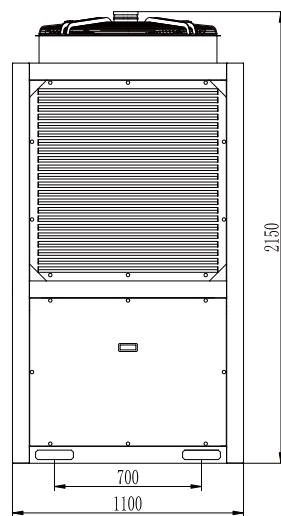
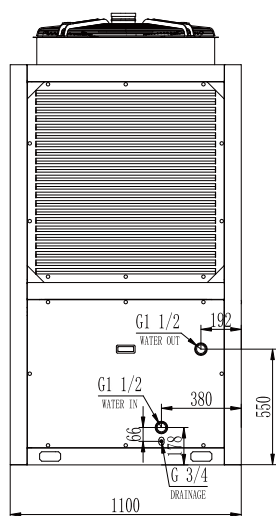
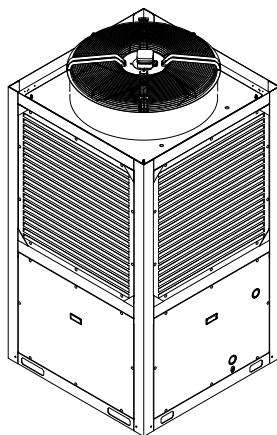
WARNING

1. Install the unit in a well-ventilated area to ensure proper airflow and reduce safety risks associated with flammable refrigerants. If installed indoors, follow EN378 standards by incorporating refrigerant detection and ventilation systems.
2. Select an installation site with sufficient space for maintenance activities and proper drainage to avoid water damage.
3. Avoid locations with flammable gases, corrosive substances, or frequent exposure to dust and particles that may impair the unit's functionality.
4. Ensure the surroundings are clear of debris and small animals to prevent operational malfunctions or potential hazards caused by nesting.
5. Protect the unit from strong winds that could lead to operational issues, such as short air circulation paths or pressure build-ups.
6. Install the unit in areas where rain exposure is minimized to protect the equipment.
7. Select an area that minimizes the risk of refrigerant leakage and complies with local safety regulations for leak prevention.
8. The site should ensure secure mounting to withstand operational vibrations and external impacts such as earthquakes or storms.
9. When exposed to strong winds, position the unit to avoid airflow disruptions that could lead to frost accumulation or high-pressure malfunctions.
10. When installing near coastal areas or in environments with high salt content, implement measures to prevent corrosion and prolong the unit's life.
11. Do not use the unit in explosive atmospheres or areas with volatile substances like paint thinner or gasoline.
12. Maintain a proper distance from neighboring structures to prevent heat recirculation and maintain cooling efficiency.
13. Do not install the unit on uneven ground; ensure a flat and stable surface to support its weight.
14. For multi-unit installations, verify that piping and wiring lengths are within allowable ranges to maintain efficiency and avoid malfunctions.
15. Keep the unit away from machinery emitting electromagnetic waves, as they could interfere with the unit's controls.
16. Instruct the customer to maintain a clean area around the unit and to periodically inspect the site for potential issues such as debris accumulation or nesting animals.
17. Avoid placing the unit in workplaces or areas subject to heavy dust from construction activities unless protective covers are used.
18. Ensure compliance with local laws regarding refrigerant safety precautions, particularly in high-risk areas.
19. Choose a location that allows adequate ventilation, does not disturb nearby residents, and can support the unit's weight and vibration.
20. Ensure that no objects are placed on top of the unit, and prevent direct physical contact to maintain safety and operational efficiency.

3.SPECIFICATION

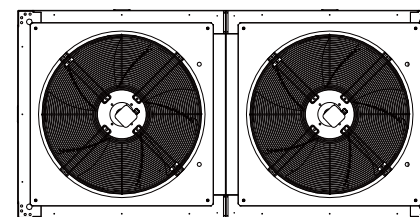
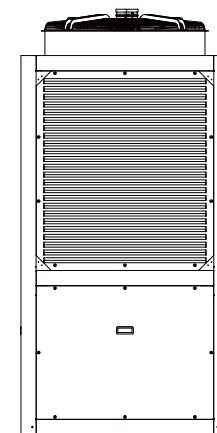
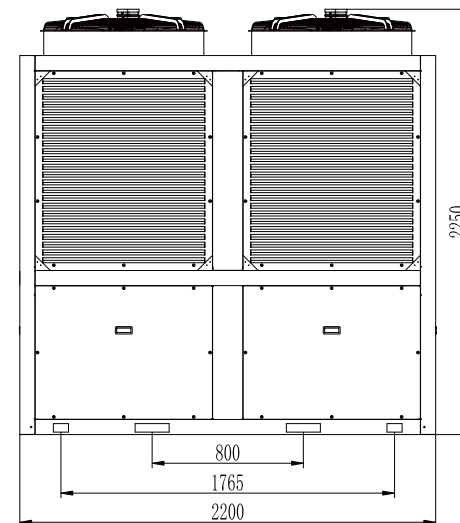
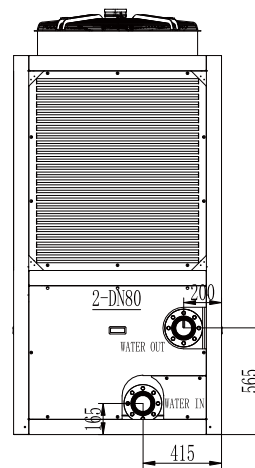
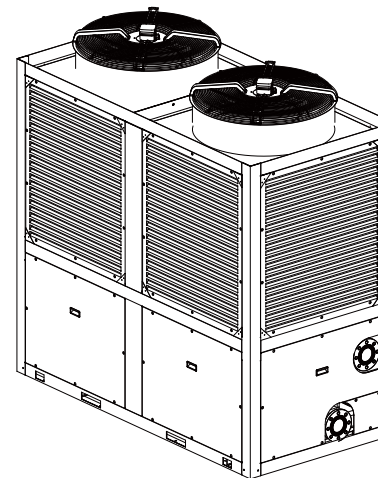
Model	AW-505CL2-SBHZ-SD	AW-760CL2-SBHZ-SD	AW-1050CL2-SBHZ-SD
Power Supply	380V~415V/3N/50Hz		
Nominal Heating (Max) (A7/6°C,W30/35°C)			
Heating Capacity (KW)	18.21~50.37	25.33~75.4	35.50 ~105.33
Power Input (KW)	3.85~13.95	5.47~21.06	7.75 ~ 29.92
COP1	4.73~3.61	4.63~3.58	4.58~3.52
Nominal Heating (Max) (A7/6°C,W47/55°C)			
Heating Capacity (KW)	13.35~46.50	19.58 ~ 67.27	26.85~ 93.45
Power Input (KW)	3.95~18.02	5.93~26.59	8.34~37.83
COP2	3.38~2.58	3.30~2.53	3.22~2.47
Nominal Cooling (Max) (A35/24°C,W12/7°C)			
Cooling Capacity (KW)	7.50~33.50	13.5~ 48.5	16.20~ 65.50
Power Input (KW)	2.94~17.18	5.47~22.77	6.48~ 32.11
Max Power Input (KW)	20	30	40
Max Current (A)	34	51	68
ERP level (35°C/55°C)	A+++/A++		
Maximun Allowable Pressure	3.2MPa	3.2MPa	3.2MPa
Electrical Shockproof	I	I	I
Refrigerant	R290/3.1Kg	R290/2*2.2Kg	R290/2*2.5Kg
Compressor Quantity	1	2	2
DC Fan Motor Quantity	1	2	2
Air Flow Direction	Vertical	Vertical	Vertical
Water Flow Volume (m³/h)	8.6	12.9	18.0
Water Pressure Drop	65kPa	75kPa	76kPa
Dimension (L*W*H) (mm)	1100*1100*2150	2200*1100*2255	2200*1100*2255
Packing (L*W*H) (mm)	1144*1144*2250	2260*1160*2385	2260*1160*2385
Working Temperature Range (°C)	-25~46		
Max. Noise (dB (A))	65	70	75
IP Class	IPX4	IPX4	IPX4
Net Weight (kg)	450	980	1150
Water Connection	G1-1/2	DN 65	DN 80

AW-505CL2-SBHZ-SD



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AW-760CL2-SBHZ-SD/AW-1050CL2-SBHZ-SD

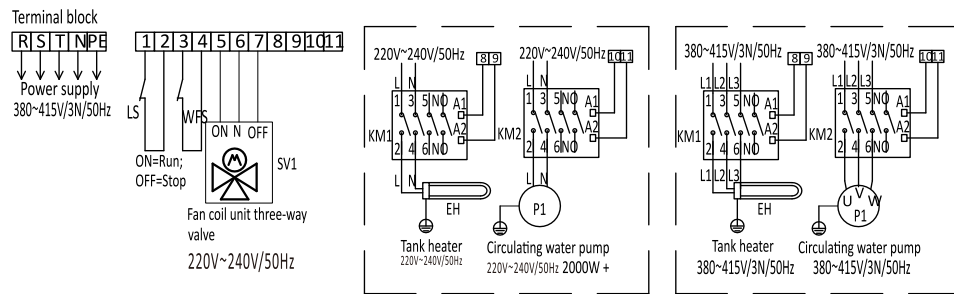
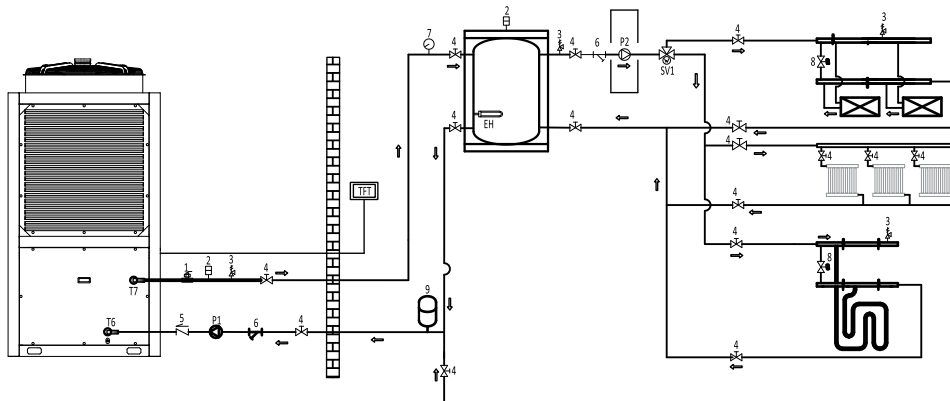


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4.INSTALLATION

4.1 Water system installation diagram and electrical wiring diagram

Application: Fan coil cooling/heating + Radiator heating + Floor heating



1		Water flow switch (WFS)	KM2	AC contactor: Circulating water pump
2		Automatic exhaust valve	KM1	AC contactor: Tank heater
3		Safety valve	LS	Linkage Switch
4		Stop valve	T6	Inlet water temp.
5		Check valve	T7	Outlet temp.
6		Y-type filter	EH	Buffer tank heater
7		Pressure gauge	SV1	Fan coil unit three-way valve
8		Differential pressure bypass valve	P1	Heat pump unit circulating water pump
9		Expansion tank	P2	Secondary water system circulating water pump

4.2 Selection of Heat Pump Unit

4.2.1 Evaluate the required cooling and heating capacity per square meter based on local climate conditions, construction characteristics, and insulation levels.

4.2.2 Calculate the total capacity needed for the entire building.

4.2.3 Select the appropriate model by referencing the heat pump specifications.

4.2.4 Details of type and rating of fuses are as below; The diameter of the cable selected shall be larger than that as required below, and the wiring shall comply with IEC 57.

Model	AW-505CL2-SBHZ-SD	AW-760CL2-SBHZ-SD	AW-1050CL2-SBHZ-SD
Power Supply	380-415V/3N/50Hz	380-415V/3N/50Hz	380-415V/3N/50Hz
Main Board	GH-DP-M001	GH-DP-M001	GH-DP-M001
Fuse	T; H;10A 250VAC;	T; H;10A 250VAC;	T; H;10A 250VAC;
Power Board	GH-DP-P001	GH-DP-P001	GH-DP-P001
Fuse	T; 3.15A L 300VAC;	T; 3.15A L 300VAC;	T; 3.15A L 300VAC;
Cable(mm ²)	3*10mm ² +2*4mm ²	3*25mm ² +2*10mm ²	3*25mm ² +2*10mm ²
Cable(AWG)	3*8AWG+2*12AWG	3*4AWG+2*8AWG	3*4AWG+2*8AWG

4.3 Installation Method

The heat pump can be mounted on a concrete base using expansion screws or on a steel frame equipped with rubber feet. It may be installed on the ground or rooftop. Ensure the unit is positioned horizontally.

4.4 Installation Location

Install the unit in an outdoor area capable of supporting heavy equipment, such as terraces, rooftops, or ground-level spaces.

Ensure the location is well-ventilated.

Avoid areas exposed to heat radiation or open flames.

Protect the heat pump with a cover during winter to prevent snow accumulation.

Maintain clear space around the air inlet and outlet to avoid obstructions.

Choose a site sheltered from strong winds.

Ensure proper drainage is available for condensate water.

Provide sufficient clearance for maintenance access.

Locate the unit away from operating or potential ignition sources, such as open flames, gas appliances, electric heaters, or other heat-producing devices.

⚠ WARNING

When the unit is installed on the roof of the building, it is easy to suffer from lightning strikes. Ensure to implement appropriate lightning protection measures!

4.5 Water Loop Connection

When connecting the water piping, adhere to the following guidelines:

Minimize water flow resistance within the piping.

Ensure the pipes are clean and free from debris or blockages. Perform a water leakage test before applying insulation.

Conduct pressure testing of the pipes independently; do not include the heat pump in the test.

Install an expansion tank at the highest point of the water loop, ensuring the water level is at least 0.5 meters above the loop's top point.

Verify that the flow switch within the heat pump is correctly wired and functioning, as controlled by the system's controller.

Prevent air entrapment in the water loop by installing air vents at the highest points.

Place thermometers and pressure gauges at the water inlet and outlet for easy operational inspection.

The heat pump unit can be installed as a standalone system or in combination with multiple units. When multiple units are installed, pay attention to their arrangement to ensure optimal performance and accessibility.

Figure 1 consists of four diagrams illustrating the required clearances for a fire engine in different fire engine access conditions. The diagrams are labeled as follows:

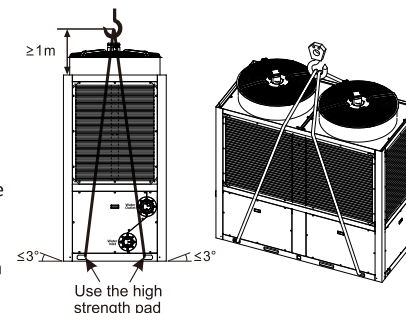
- Diagram 1 (Left):** Shows a fire engine with a turning radius of $>45^\circ$. The clearance on the left side is >1500 .
- Diagram 2:** Shows a fire engine with a turning radius of >1500 . The clearance on the left side is >1500 . The clearance on the right side is >1500 . The clearance on the bottom is 400 .
- Diagram 3:** Shows a fire engine with a turning radius of >1500 . The clearance on the left side is >1500 . The clearance on the right side is >1500 . The clearance on the bottom is 400 . The clearance on the top is $>1000 + h$.
- Diagram 4 (Right):** Shows a fire engine with a turning radius of >1500 . The clearance on the left side is >1500 . The clearance on the right side is >1500 . The clearance on the bottom is 400 . The clearance on the top is $>1000 + h$.

(Note: when $h > 3\text{m}$, take $h = 3\text{m}$)

The diagram illustrates a two-story building layout. The top floor has a total width of 1000 and a total depth of 1000. It contains five identical rooms, each with a width of 1000 and a depth of 1000. Each room is divided into two sections, each containing a circular table and two chairs. The bottom floor has a total width of 1000 and a total depth of 1000. It also contains five identical rooms, each with a width of 1000 and a depth of 1000. Each room is divided into two sections, each containing a circular table and two chairs. The diagram shows the arrangement of rooms, furniture, and the overall dimensions of the building.

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During transportation, the heat pump should be kept in an upright position. The unit must not be laid down, as this could cause damage to the internal components.



Alternatively, a forklift may be used, as the unit is packaged with a wooden chassis.

Do not touch the heat exchanger of the heat pump with fingers or other objects to avoid damage.

Check the indoor unit to ensure correct pipe connections and that the relevant valves are open.

Inspect the water loop to confirm the expansion tank has sufficient water, the water supply is normal, the loop is fully filled, and free from air. Ensure proper insulation for the water pipes.

Inspect the electrical wiring to confirm that the power voltage is correct, all screws are tightened, the wiring matches the provided diagram, and grounding is properly connected.

Check the heat pump unit, including all screws and components, to ensure they are in good condition. Upon powering on, observe the controller's indicator for any fault indications. A gas gauge can be connected to the check valve to monitor system pressures (high or low) during trial operation.

The controller's parameters are pre-set at the factory and must not be altered by the user.

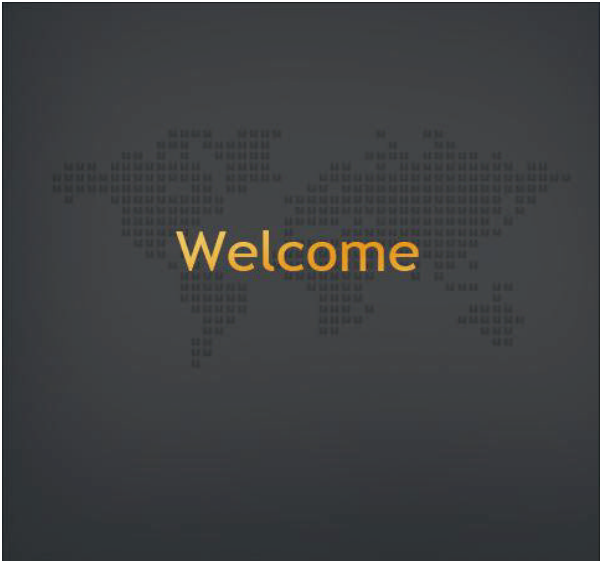
5.WIRE CONTROLLER OPERATION INSTRUCTIONS

5.1 Icons

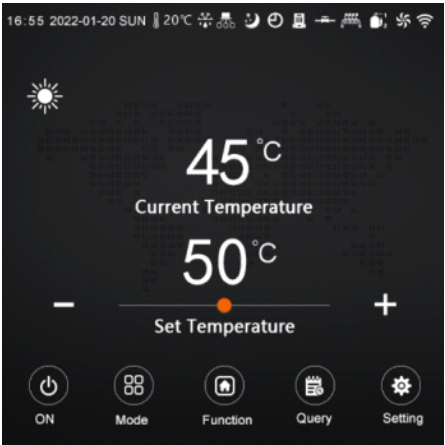
- Power
- Mode
- Function
- Check
- Set

5.2 Display Screen

5.2.1 After entering the system, the following page will be displayed. After 3s, if the communication is successful, it will enter the home page; Otherwise, it will stay in this page. Tapping the screen will trigger a button sound, and if no operation for 2mins, the screen will be lighted off. Tap the screen to wake it up.



5.2.2 Home Page



5.2.3. Icon Explanation

The top of the main interface, from left to right, shows the following information: Time, Day-Month-Year, Ambient temperature, Defrosting, Cascade, Silent Mode, Water Pump, Return Water Valve, Electric Heater, Compressor, Fan, WIFI;

Mode/Power-off: When the system is on, the current operating mode is displayed in the upper left of the home page. When off, no operating mode displayed.

	Heating
	Cooling

Fault: If a fault occurs, the “” icon will flash. Tap this icon to check current fault status or history. Entering the page of system time setting, click related Year-Month-Day and enter values through the keyboard. Finally tap “Enter” to save the setting.

Defrosting: When the unit enters defrosting mode, the “❄️” icon will continuously lighting. when reclaiming refrigerant, the icon will flash.

Cascade: When the unit is networked, the “🔗” icon will continuously lighting.

Silent Mode: When the unit is in silent mode, the “🌙” icon will continuously lighting.

Timer: When the timer function is enabled, the “🕒” icon will continuously lighting.

Water Pump: When the water pump is running, the “💧” icon will continuously lighting.

Return Water Valve: When the return water valve is on, the “🚰” icon will continuously lighting. If the valve is off but a return water timer is set, the icon will flash.

Electric Heater: When the electric heater is on, the “🔥” icon will continuously lighting. If it is off and Quick Heat is enabled, the icon will flash at 1Hz. If off but sterilization mode is enabled, it will flash at 0.5Hz.

Compressor: When the compressor is running, the “🏠” icon will continuously lighting.

Fan: When the fan is running, the “🌀” icon will continuously lighting.

WIFI: When the unit is connecting to WIFI, the “📶” icon will continuously lighting.

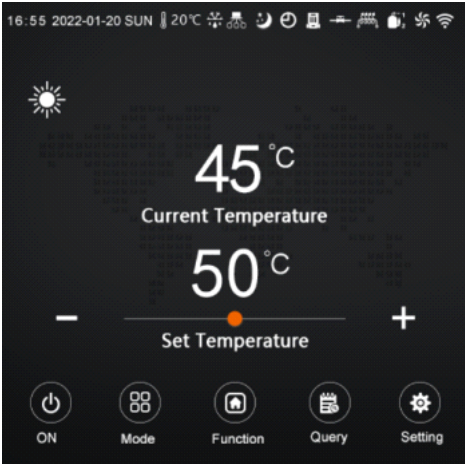
5.3. Controller Operation

5.3.1 Power: When the screen is active, tap the “🔌” icon to turn the unit on or off. When the system is on, “ON” is displayed below the icon, and the current mode is shown in the upper left. When off, “OFF” is displayed and the mode icon turns off.

5.3.2 Mode: When the screen is active, tap the “🔧” icon to enter the mode selection page. On this page, tap the corresponding mode to switch. Tap "Mode" in the upper left corner or "Main" in the upper right corner to return to the home page.

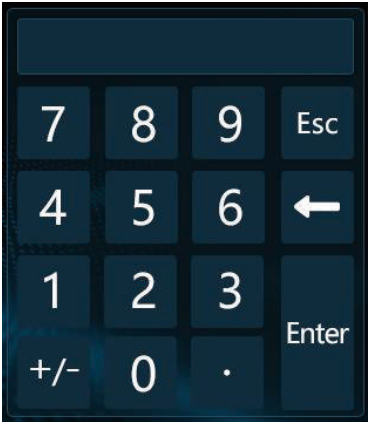


5.3.3 Temperature Setting



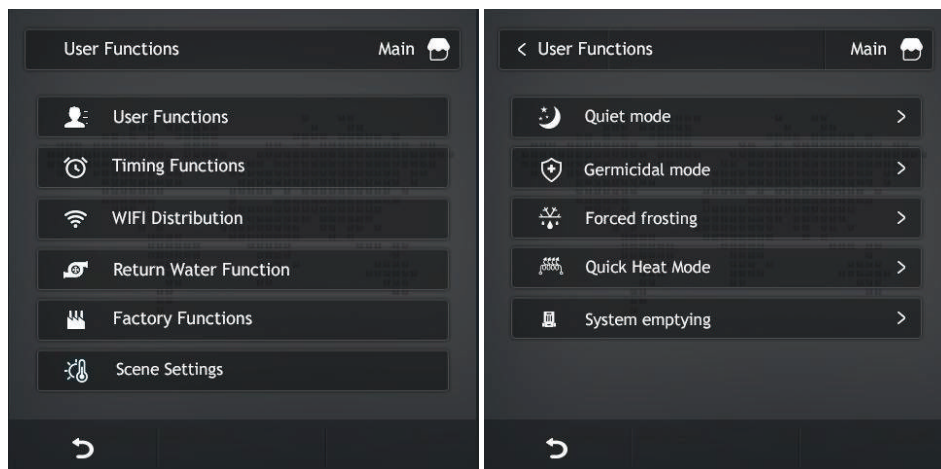
5.3.3.1 In Single Mode (heating, cooling, floor heating, hot water), tap the “+” or “-” icons to adjust the set temperature. Alternatively use the slider to adjust the set temperature or tap the set temperature value to input the desired temperature using the on-screen keyboard and tap "Enter" to confirm.

5.3.3.2 In Combined Mode, tap the temperature value, enter the desired temperature using the on-screen keyboard, and tap "Enter" to confirm.



5.3.4 Boost Mode, Silent mode, Sterilization mode, Forced defrosting, and System emptying

When the main screen is active, tap the “🏠” icon to enter the function selection page. Then tap “👤 User Functions” to access user functions. From top to bottom are Silent mode, Sterilization mode, Forced defrosting, Boost Mode, and System emptying. Tap the corresponding button to activate or deactivate each function.



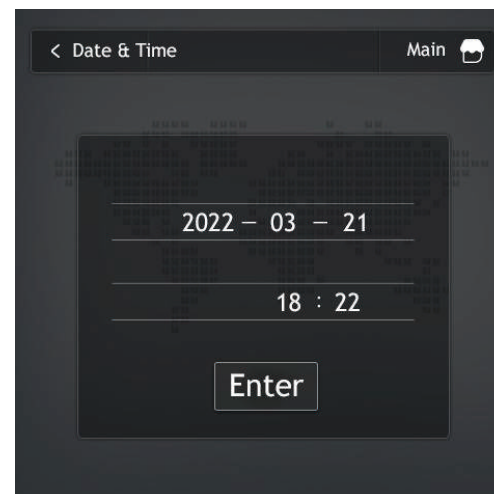
5.3.5 Fault Display

When a fault occurs, the "🔊" icon will flash. When the fault is resolved, the icon will turn off. Tap the icon to enter the fault query page; up to 20 real-time faults and 50 historical faults can be displayed. 00E03:00 represents the master unit, 02.03... represents the slave unit, and E03 is the fault code.



5.3.6 Time setting

When the screen is active tap the button  then tap "🕒 Date & Time" >



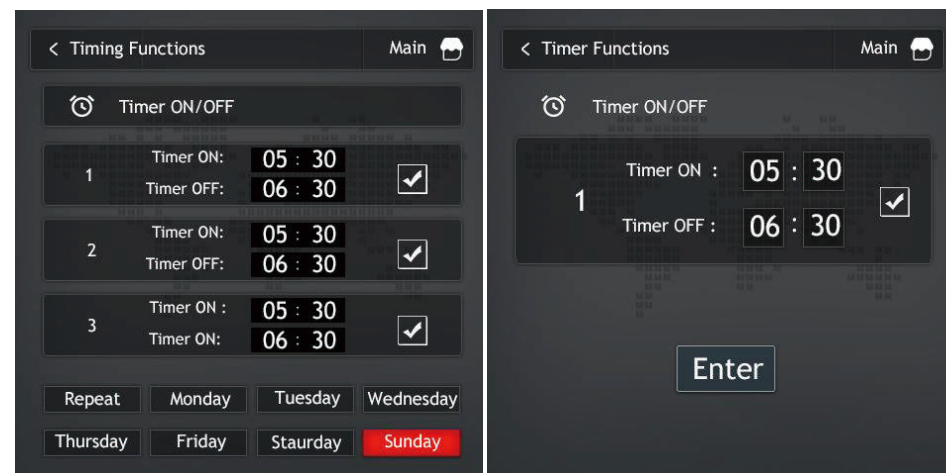
5.3.7 Timer on/off setting

When the screen is active, tap the button " "to enter the function selection page

Then tap "⌚ Timing Functions" > "to timer on/off setting page

If you need to enable weekly timer, you can tap any button from Monday to Sunday. Click on the time slot to enter the time setting and input the time using the keyboard.

Click the button of "", can enable/disable the timer for this period. After the setting finished, tap "Enter" to save the setting.



5.3.8 Return Water temperature setting

When the screen is active, tap the button " "to enter the function selection page

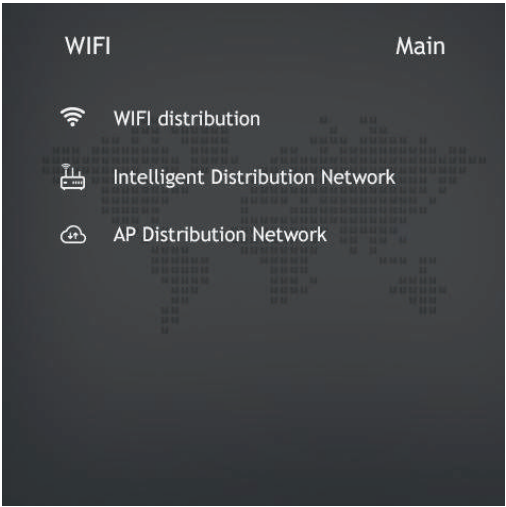
Then click “ Return Water Function >” to Return Water function setting page. The setting operation is similar to the power on/off timing.

5.3.9 WIFI connection

When the screen is active, tap the button “” to enter the function selection page. Then click “ WIFI Distribution >” to WIFI connection page

Long press for 3s to enter the WIFI provisioning configuration mode. The corresponding button lights on.

The wifi provisioning time is 3 min, timeout exit.



5.3.10 Scene Settings

When the screen is active, tap the button “” to enter the function selection page.

When the screen is active, tap the button “” to enter the function selection page. Then click “ Scene Settings >” to scene settings.

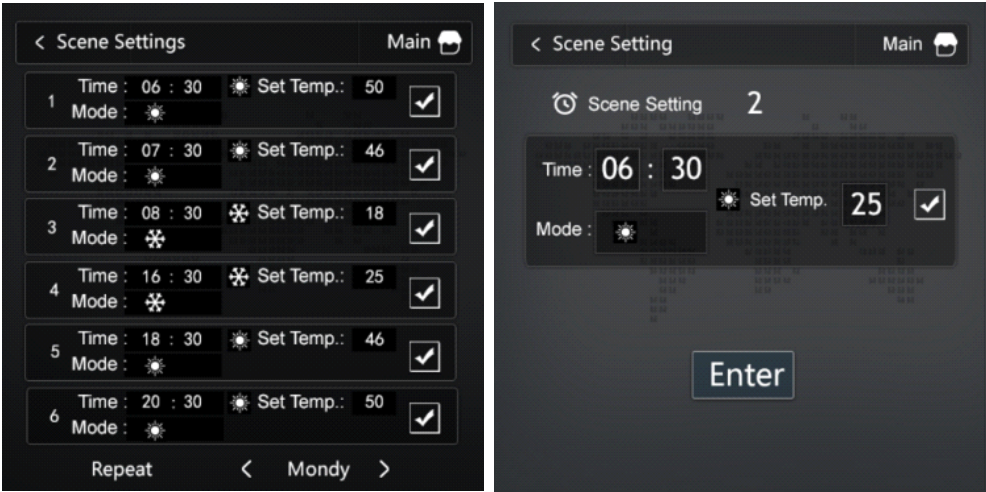
Total 6 time slots can be set each day, with options for daily scheduling and weekly cycle scheduling.

Click the button of “” can enable/disable the scene setting. Click on the scene segment you want to modify to enter the scene editing interface.

Click on the mode area “ ” can change the mode. Click on the corresponding value to modify it via keyboard.

Click the button of “” can enable/disable the scene setting. After the setting finished, tap “Enter” to save the setting.

Scene Operation: When the time reaches the set time, the operating mode and set temperature will automatically switch to the values defined in the scene, but the power on/off status will not be changed.



5.3.11 User Parameter Modification

Set temperature, return water temperature, Sterilization, and the temperature difference between set temperature and actual temperature.

When the screen is active, tap the button “” to enter the query page, click again to entering the page of user paramant list. Operation is similar as the factory parameter setting.

5.3.12 Power module parameter query

When the screen is active, tap the button “” to enter the power consumption information query. Can query the total power consumption, current power, voltage, and current parameters.

5.3.13 Temperature Curves query

When the screen is active, tap the button “” to enter the query page, click “ Temperature Curves >” again to enter the page of curve, can record the curve of water inlet, water outlet, compressor frequency and ambient temperature.

5.3.14 Temperature Curves Setting

When the screen is active, tap the button “” to enter the query page, then click “ Set Temperature Curves >” to enter the page of temperature curve setting.

Click “>” “<” to switch between different mode of curve setting. Click “< CL8 >” to select different curve control, and the specific parameters of the current curve will be displayed in the curve area.



5.3.15 Brightness settings

When the screen is active, tap the button “” to enter the query page,

Then click “ Display >” to enter the page of brightness setting page, slide the slider to adjust the brightness level.

5.3.16 Restore factory setting

When the screen is active, tap the button “” to enter the query page.

Click “ Restore Factory Settings >” to enter the page of restore factory setting page, then

click “” can restore to factory settings.

5.3.17 View program version

When the screen is active, tap the button “” to enter the query page.

Click “ About >” to enter the page of Restore factory setting page.

Can view the program version numbers of the display screen and the mainboard.

5.4.SG Ready

In the wiring connection terminal block, terminal 34 is for the SG signal, and terminal 35 is for the EVU signal. Both terminals are designed to connect to the PV inverter. The control logic for this function is detailed as follows:

Mode 1: When both the EVU and SG are active, it means free electricity is available. In this condition:

- 1) If the domestic hot water (DHW) mode is available, the unit switches to DHW+heating or DHW+cooling, with priority given to DHW mode, regardless of the previous operating mode.
- 2) Upon entering DHW mode, the set point is automatically adjusted to the sterilization temperature. The electric heater for DHW is activated, and the compressor runs in Boost mode.

Mode 2: When the EVU signal is active, but the SG signal is inactive, it means free electricity is available, though not as abundant as in Mode 1. In this condition:

- 1) When both the EVU and SG are active, it means free electricity is available. In this condition: If the domestic hot water (DHW) mode is available, the unit switches to DHW+heating or DHW+cooling, with priority given to DHW mode, regardless of the previous operating mode.
- 2) Upon entering DHW mode, the set point is automatically adjusted to the sterilization temperature. The electric heater for DHW is activated.

Mode 3: When the EVU signal is inactive and the SG signal is active, the unit operates in off-peak electricity situation. In this condition, the system operates according to normal logic.

Mode 4: When both the EVU and SG signals are inactive, the unit operates in peak electricity situation.

In this condition:

- 1) The DHW mode is disabled, the electric heater cannot be used during operation, and the sterilization function is deactivated.
- 2) Cooling and heating modes operate in ECO mode.
- 3) The antifreeze function remains available during standby.
- 4) After a 30-minute running in peak electricity situation, the unit shutdowns.

6.ERROR CODE

Code	Description	Troubleshooting
E01	Wrong phase failure	Power supply phase sequence error
E02	Phase loss failure	Power supply phase loss
E03	Water flow switch failure	1. Check if the circulating water pump is normal, check if the water system is blocked 2. Check if the installation of the water flow switch is correct 3. Check the wire connection of the water flow switch is correct 4. Check the lift of the water pump is enough for the system 5. Check the installation of the water pump is correct
E05	High pressure switch protection	1. Check if the high pressure switch is damaged, check if the wiring is correct 2. Too much refrigerant in the system 3. Check the fan motor is working correctly, check the water flow is normal 4. Check if any air in the refrigerant system, or any block in the system 5. Check if the water side heat exchanger has too much dirt
E06	Low pressure switch protection	1. Check if the low pressure switch is damaged, check if the wiring is correct 2. Shortage of refrigerant in the system 3. Check the fan is working correctly 4. Check if any block in the system
E09	Controller and main board communication failure	Check the wiring between control and main board
E12	Exhaust temperature too high failure	1. Check if any block in the system 2. Shortage of refrigerant in the system 3. Sensor damaged
E15	Water inlet temperature sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged

E16	Coil temperature sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E18	Exhaust temperature sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E21	Environmental sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E22	User return water temperature sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E23	Cooling temperature too low protection	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E24	Plate heat exchanger water out temperature failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E26	Plate heat exchange anti-freeze temperature sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E27	Water outlet temperature failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E29	Suction temperature sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E33	High pressure sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E34	Low pressure sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged

E37	Inlet and outlet water temperature difference is too big protection	1. Water inlet/outlet sensor damaged 2. Water inlet/outlet sensor put on wrong position 3. Water flow too small
E38	DC fan 1 failure	Fan driver or fan damaged
E39	DC fan 2 failure	Fan driver or fan damaged
E42	Cooling coil temperature sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E44	Ambient temperature too low protection	When the temperature returns to the normal range, the fault will automatically clear
E47	EVI plate heat exchanger inlet sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E49	EVI plate heat exchanger outlet sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
E51	High pressure too high protection	1. Check if the high pressure switch is damaged, check if the wiring is correct 2. Too much refrigerant in the system 3. Check the fan motor is working correctly, check the water flow is normal 4. Check if any air in the refrigerant system, or any block in the system 5. Check if the water side heat exchanger has too much dirt
E52	Low pressure too low protection	1. Check if the low pressure switch is damaged, check if the wiring is correct 2. Shortage of refrigerant in the system 3. Check the fan is working correctly Check if any block in the system
E80	Power supply error	There has three phase signal for single phase unit
E88	Compressor driver protection	1. Compressor damaged 2. Compressor driver damaged Please check the error table 1

E96	Compressor driver 1 and main PCB board communication abnormal	1. Check the wiring of the signal wire 2. The electronic components on the main board damaged or damped 3. The electronic components on the compressor driver board damaged or damped 4. No power for the compressor driver board
E98	Fan driver 1 and main PCB board communication abnormal	1. Check the wiring of the signal wire 2. The electronic components on the main board damaged or damped 3. The electronic components on the compressor driver board damaged or damped 4. No power for the compressor driver board
E99	Fan driver 2 and main PCB board communication abnormal	1. Check the wiring of the signal wire 2. The electronic components on the main board damaged or damped 3. The electronic components on the compressor driver board damaged or damped 4. No power for the compressor driver board
EA0	Plate heat exchanger temperature failure	
EA1	Network model error	Different series do no allow to cascade
EA5	Total water outlet sensor failure	1. Sensor damaged 2. Connection of the sensor short-circuit or disconnected 3. The terminal of main board damaged
EC1	Gas leakage	1. Refrigerant leak in the system 2. Refrigerant sensor damaged

E88/E89	P1	IPM overcurrent/IPM module protection
	P2	Compressor drive failure
	P3	Bit0: Compressor overcurrent
	P4	Input voltage shortage of phase
	P5	IPM current sampling failure
	P6	Power component overheating shutdown.
	P7	Pre-charge failure
	P8	DC bus over-voltage
	P9	DC bus shortage of voltage
	P10	AC input shortage of voltage
	P11	AC input overcurrent
	P12	Input voltage sampling failure
	P13	DSP and PFC communication failure
	P14	Heat sink temperature sensor failure
	P15	Communication failure between DSP and communication board
	P16	Abnormal communication with main PCB board
	P17	Compressor over current alarm
	P18	Compressor weak magnetic protection alarm
	P19	PIM overheat alarm
	P20	PFC overheat alarm
	P21	AC input overcurrent alarm
	P22	EEPROM failure alarm
	P24	EEPROM refresh completed
	P25	Temperature sensing fault frequency limit.
	P26	AC undervoltage frequency limit protection alarm
	P33	IPM module overheating shutdown
	P34	Compressor shortage of phase
	P35	Compressor overload
	P36	Input current sampling failure
	P37	PIM supply voltage failure
	P38	Pre-charge circuit voltage failure
	P39	EEPROM failure
	P40	AC input overvoltage failure
	P41	Microelectronics failure
	P42	Compressor type code failure
	P43	Current sampling signal overcurrent

7.ANNEX I: Refrigerant Handling Instructions

1.1 Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

1.2 Work procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

1.3 General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

1.4 Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. nonsparking, adequately sealed or intrinsically safe

1.5 Presence of fire extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.

1.6 No ignition sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

1.7 Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

1.8 Checks to the refrigeration equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using flammable refrigerants:

- the charge size is in accordance with the room size within which the refrigerant containing parts are installed;
- the ventilation machinery and outlets are operating adequately and are not obstructed;
- if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

7.ANNEX I: Refrigerant Handling Instructions

– refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

1.9 Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include:

- that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- that no live electrical components and wiring are exposed while charging, recovering or purging the system
- that there is continuity of earth bonding.

2 Repairs to sealed components

2.1 During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

2.2 Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Ensure that apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in NOTE The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

3 Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

4 Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of ageing or continual vibration from sources such as compressors or fans.

5 Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

6 Leak detection methods

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

7.ANNEX I: Refrigerant Handling Instructions

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

7 Removal and evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- remove refrigerant;
- purge the circuit with inert gas;
- evacuate;
- purge again with inert gas;
- open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be “flushed” with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipework are to take place. Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

8 Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.

Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

9 Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

7.ANNEX I: Refrigerant Handling Instructions

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- c) Before attempting the procedure ensure that:
 - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - all personal protective equipment is available and being used correctly;
 - the recovery process is supervised at all times by a competent person;
 - recovery equipment and cylinders conform to the appropriate standards.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with manufacturer's instructions.
- h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

10 Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

11 Recovery

- a) When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- b) When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- c) The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- d) The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
- e) If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.



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