



Owner's Manual

Original Instructions 
Commercial Air Conditioners

Mini Chiller

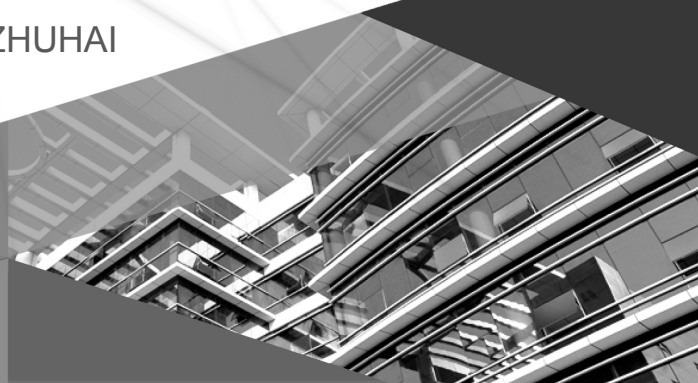
Models:

HLR8Pd/Na-K HLR10Pd/Na-K
HLR12Pd/Na-M HLR14Pd/Na-M

Thank you for choosing commercial air conditioners. Please read this Owner's Manual carefully before operation and retain it for future reference.

If you have lost the Owner's Manual, please contact the local agent or visit www.gree.com or send an email to global@gree.com.cn for the electronic version.

GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI



To Users


Thank you for selecting Gree's product. Please read this instruction manual carefully before installing and using the product, so as to master and correctly use the product. In order to guide you to correctly install and use our product and achieve expected operating effect, we hereby instruct as below:


- (1) This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- (2) This product has gone through strict inspection and operational test before leaving the factory. In order to avoid damage due to improper disassembly and inspection, which may impact the normal operation of unit, please do not disassemble the unit by yourself. You can contact with the special maintenance center of our company if necessary.
- (3) For personal injury or property loss and damage caused by improper operation such as improper installation and debugging, unnecessary maintenance, violation of related national laws and rules and industrial standard, and violation of this instruction manual, etc, we will bear no liability.
- (4) When the product is faulted and cannot be operated, please contact with our maintenance center as soon as possible by providing the following information.
 - Contents of nameplate of product (model, cooling/heating capacity, product No, ex-factory date).
 - Malfunction status (specify the situations before and after the error occurs).
- (5) All the illustrations and information in the instruction manual are only for reference. In order to make the product better, we will continuously conduct improvement and innovation. We have the right to make necessary revision to the product from time to time due to the reason of sales or production, and reserve the right to revise the contents without further notice.
- (6) The final right to interpret for this instruction manual belongs to Gree Electric Appliances Inc. of Zhuhai.


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Safety Notices (Please be sure to abide)


 **WARNING:** If not abide strictly, it may cause severe damage to the unit or the people.


 **NOTE:** If not abide strictly, it may cause slight or medium damage to the unit or the people.

 This sign indicates that the operation must be prohibited. Improper operation may cause severe damage or death to people

 This sign indicates that the items must be observed. Improper operation may cause damage to people or property.

◆ Safety Notices for On-site Installation

 WARNING
<ul style="list-style-type: none"> • When refrigerant leaks, take corrective measures as soon as possible to prevent oxygen depletion by increased refrigerant concentration. • The outdoor unit should be installed where it is flat and the foundation should be strong enough to support the weight of the unit. When the foundation is not strong enough or fixing is not secure enough, it would lead to leakage or turnover. • The indoor unit should be installed where it is strong enough to support the weight of the unit, otherwise the unit would fall off which then would lead to injury or death. Care always should be exercised to installing supports put into use for long time. • When installation is finished, please check for the drainage lines, pipelines, and electric lines to prevent water leakage, electrocution or fire hazards. • This equipment should be installed where the drainage system can work well. Never block the drain hole. Improper drainage system would lead to drainage difficulty and make the unit suffer from malfunctions. • When there is something unusual (like stinky smell) during installation or commissioning, please cut off the main power at once and then contact the after-sales service center. This ongoing unusual condition will damage the air conditioning unit and lead to electrocution or fire hazards.

 CAUTION
<ul style="list-style-type: none"> • Do not install the unit where there would be leaked inflammable gas, as it would lead to fire hazards. • The outer casing of the unit should be grounded. Do not connect the grounding line to the gas line, water line, lightning rod or communication line, otherwise it would lead to. • Do not step on the air conditioning or place objects at the air inlet or outlet. • Do not insert fingers or other objects into the outlet grill to prevent damage to the unit or personal injury or death. • Do not start or stop the unit by inserting or drawing out the power plug. • Do not let children play with this unit. • The unit should be equipped with the leakage protector which should be installed in accordance with electric technical standards. Uninstallation or incorrect installation would lead to electrocution. Do electric leakage detection after electric installation is finished. • Volatile liquid like thinner or gasoline would damage appearance of the unit. (Only clean the outer casing with of the unit with soft dry cloth or wet cloth with neutral detergent.



- Do not install the unit where conditions are severe, where it is close to the hot spring, coast or oil field, as it would lead to corrosion, electrocution or fire hazards.
- Do not start the compressor by manually closing the AC contactor, otherwise it would lead to electrocution or fire hazard.
- Do not misuse refrigerant, as it would lead to normal operation failure, unsatisfactory performance, fire hazards or even explosion etc.



- Installation should be done in accordance with this manual. Please read it manually prior to startup or troubleshooting.
- Installation should be done by qualified servicemen, as incorrect installation would lead to water leakage, electrocution or fire hazards etc.
- Before installation, check for all power supplies with the nameplate and check for its safety.
- The unit should be grounded and there should be specialized grounding line for the power socket to avoid of electrocution. Do not connect the grounding line to the gas tank, water line, lightning rod, or telephone line.
- Only specialized accessories and parts are allowed for installation, otherwise it would lead to water leakage, electrocution or fire hazards etc.
- Size of the power lines should be large enough. Only specialized power lines are allowed for replacing the damaged ones.
- When power lines have been connected, install the electric box as well to avoid of any safety problems.
- After all installation has been finished, take an overall check to the unit before powering it on.

◆ Safety Precautions for Usage and Maintenance



- When there is something unusual (like burnt smell), cut off the power supply at once and contact the sales agent. The ongoing unusual condition would lead to malfunctions, electrocution or fire hazards.
- When refrigerant leaks, take corrective measures to prevent oxygen depletion by increasing refrigerant concentration.
- Do not use or place inflammable or explosive substances near the unit.
- Do not do troubleshooting personally, as incorrect troubleshooting would lead to electrocution or fire hazards. Instead, please contact GREE after-sales service center.



- Do not let the unit out of the designed application range; otherwise it would cause the heat exchanging tube cracking, refrigerant leakage or even explosion.
- Only qualified circulating water is allowed to be used. Unsatisfactory circulating water would lead to degradation of water quality, shortened service life or even malfunction of the unit.
- Do not let the cold/heat source directly act on the stored foods, plants, animals, precision instruments, and curiosities, otherwise their quality would be degraded.
- When the unit has been put into use for some time, check for security of the installation foundation. Unstable foundation would lead to deformation or even safety accident.



- Do not use the fuse out of the normal range or replace it with wire conductor, otherwise it would lead to safety problem to the unit or fire hazard.
- Do not start or stop the unit directly by the power switch, as it would be likely to cause electrocution or fire hazards.
- Do not change settings of safety devices; otherwise it would lead to fire hazards and explosion.
- Do not operate the unit with wet hands.
- Do not clean the unit without cutting off the power supply, as it would lead to electrocution or personal injury.



- Do operate the unit in accordance with this manual and read it carefully before startup or troubleshooting.
- Do not let children pull power lines or climb the unit to prevent of electrocution or other dangers.

◆ Safety Precaution for Handling of the Unit

(1) Precautions for Handling of the Unit

 **WARNING**

- During installation or handling, do not let foreign matters mixed with refrigerant and do not air trapped inside the pipe, as it would lead to increased system pressure or explosion of the compressor.
- Do not charge refrigerant of other type into the unit during installing or moving. Otherwise, it may cause poor operation, malfunction, mechanical failure, or even serious safety accident.
- If the refrigerant shall be recycled during moving or maintaining, pressure meter must be used. Set the unit in cooling mode and close the valve at high pressure side (liquid valve) completely. When the reading of pressure meter ranges 0~0.05MPa (about 30s~40s), close the valve at high pressure side (gas valve) completely, turn off the unit and cut off power supply.
- During recycling refrigerant, make sure the liquid valve and gas valve are closed completely, and the power supply is cut off before disassembling the connection pipe. If connection pipe is disassembled when the compressor is still operating, air may get into the system. In this case, system pressure will increase and compressor will be damaged.
- During installing the unit, make sure the connection pipe is connected properly before starting the compressor. If the compressor is started before finishing connection of connection and when the cut-off valve is opened, air may get into the system. In this case, system pressure will increase and compressor will be damaged.
- The indoor unit and outdoor unit shall be connected properly with required wire. The wiring terminal shall be secured properly without affecting by exterior force directly. If the wire is not connected properly or the wiring terminal is not secured properly, fire hazard may be caused.
- Connection between two ends of the power lines is not allowed. When its length is not enough, please contact the after-sales service center for customizing another one long enough.

(2) Precautions for Refrigerant Charging

 **WARNING**

- When charging is interrupted or finished, reinspect the unit but do not let the compressor run into operation.

 **CAUTION**

- Do not use mixture of refrigerant vapor and air or oxygen for pressurizing for fear of explosion.

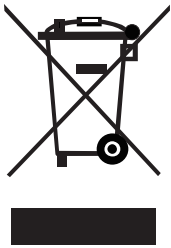
1 Instruction to Users

Thank you for choosing our mini chillers. Please read this manual carefully before installation and use the unit correctly according to the following procedure.

- (1) After receipt of the unit, check it for appearance, unit model compared with your desire and attachments.
- (2) For proper installation and future maintenance please read this Instruction and keep it carefully.
- (3) Design and installation work of the unit must be performed by authorized personnel according to applicable laws and regulations and this Instruction.
- (4) After installation work, the unit cannot be energized unless there is not any problem in check.
- (5) Ensure periodical clean and maintenance of the unit after normal operation of the unit for longer life and reliable operation.
- (6) For improvement of products, there should be not additional notice of amendment of the contents.

 **Notice!**

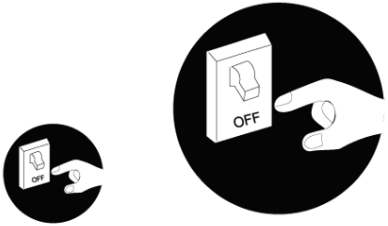
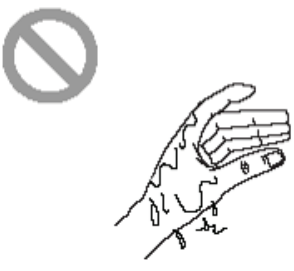


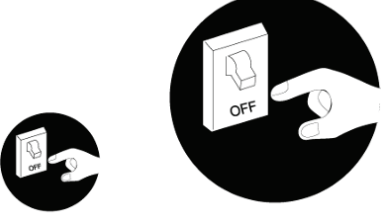


- (a) If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- (b) The appliance shall be installed in accordance with national wiring regulations.

	Correct Disposed of this product
	<p>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.</p>

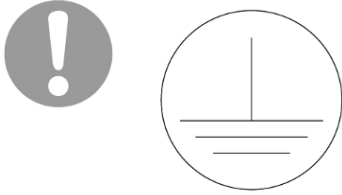
R410A(R32/125:50/50):2087.5

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

2 Safety Considerations

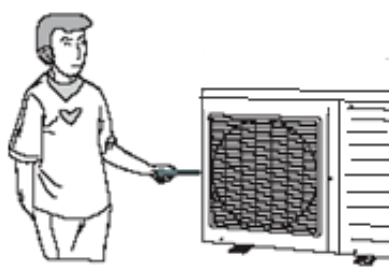
Please read the following contents carefully before operating.		
WARNING		
<p>■ Once abnormality like burning smell occurs, please cut off the power supply immediately and then contact with service center.</p>  <p>If the abnormality still exists, the unit may be damaged and electric shock or fire may result.</p>	<p>■ Don't operate the unit with wet hands.</p>  <p>Otherwise, it may cause electric shock.</p>	<p>■ Before installation, please see if the voltage of local place accords with that on nameplate of unit and capacity of power supply, power cord or socket is suitable for input power of this unit.</p> 
<p>■ Special circuit must be adopted for power supply to prevent fire.</p>  <p>Do not use octopus multipurpose plug or mobile terminal board for wire connection.</p>	<p>■ Be sure to pull out the power plug and drain the unit when unit is not in use for a long time.</p>  <p>Otherwise, the accumulated dust may cause overheating, fire or freeze of the plate heat exchanger in winter.</p>	<p>■ Never damage the electric wire or use the one which is not specified.</p>  <p>Otherwise, it may cause overheating or fire.</p>
<p>■ Before cleaning please cut off the power supply.</p>  <p>Otherwise, it may cause electric shock or damage.</p>	<p>■ The power supply must adopt special circuit with leakage switch and enough capacity.</p>	<p>■ User can not change power cord socket without prior consent. Wiring working must be done by professionals. Ensure good earthing and don't change earthing mode of unit.</p>

- **Earthing: the unit must be earthed reliably ! The earthing wire should connect with special device of buildings.**



If not, please ask the qualified personnel to install.
Furthermore, don't connect earth wire to gas pipe, water pipe, drainage pipe or any other improper places which professional does not recognize.

- **Never insert any foreign matter into unit to avoid damage . And never insert your hands into the air outlet of the unit.**



- **Don't attempt to repair the unit by yourself.**



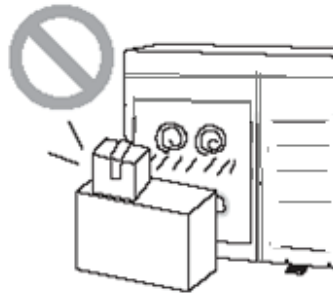
Improper repair may cause electric shock or fire, so you should contact the service center to repair.

- **Don't step on the top of the unit or place anything on it.**



There is the danger of fall of things or people.

- **Never block the air inlet and outlet of unit.**



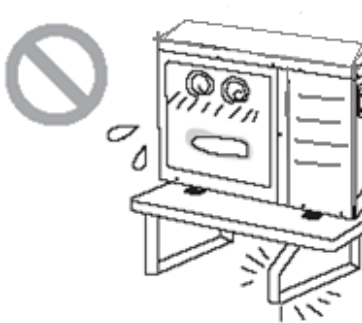
It may reduce efficiency or cause stop of the unit and even fire.

- **Keep pressurized spray, gas holder and so on away from the unit above 1m .**



It may cause fire or explosion.

- **Please note whether the installation stand is firm enough or not.**



If damaged, it may cause fall of the unit and injury of people.

- **Unit should be installed at the place with good ventilation to save energy.**

- **When there is not water in the unit, never power the unit on to run.**

NOTE

- Before installation, please check if the adopted power is accordance with that listed on nameplate, and check the safety of power.
- Before using, please check and confirm if wires and water pipes are connected correctly to avoid water leakage, electric shock or fire etc.
- Don't operate the unit with wet hands, and don't allow children to operate the unit.
- ON/OFF in this manual indicates the ON/OFF of the control; power cut-off means to stop supplying power to the unit.
- Don't directly expose the unit under the corrosive ambient with water or dampness.
- The air inlet/outlet of the unit cannot be blocked by other objects.
- Water in the unit and pipeline should be discharged when the unit is not in use to prevent the pipeline and water pump from frost-cracking.
- Never press the button with sharp objects to protect manual controller. Never use other wires instead of special communication line of the unit to protect control elements. Never clean the manual controller with benzene, thinner or chemical cloth to avoid fading of surface and failure of elements. Clean the unit with the cloth soaked in neutral eradicator. Slightly clean the display screen and connecting parts to avoid fading.
- The power cord must be separated with the communication line.
- Maximum and minimum water operating temperatures:

	Minimum water operating temperatures	Maximum water operating temperatures
Cooling	7 °C	25 °C
Heating	25 °C	60 °C

Maximum and minimum water operating pressures:

	Minimum water operating pressures	Maximum water operating pressures
Cooling Heating	0.05 MPa	0.25 MPa

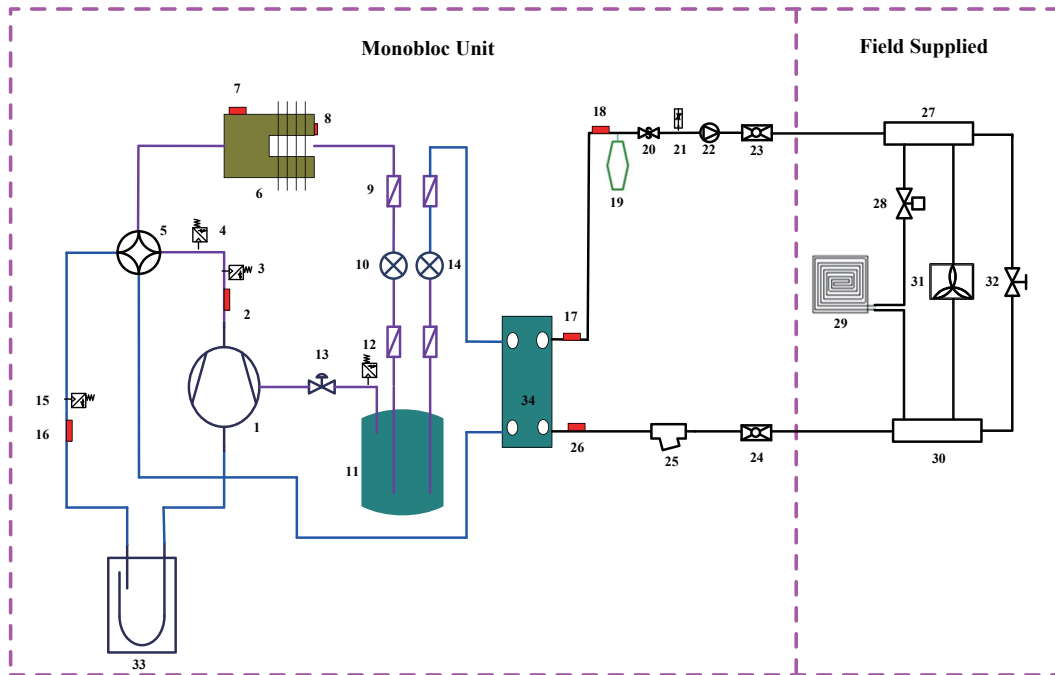
Maximum and minimum entering water pressures:

	Minimum entering water pressures	Maximum entering water pressures
Cooling Heating	0.05 MPa	0.25 MPa

The range of external static pressures at which the appliance was tested (add-on heat pumps, and appliances with supplementary heaters,only); If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

If there is any question, please contact with local dealer, authorized service center, agencies or our company directly.

3 Diagram of the Operating Principle



No.	Name	No.	Name	No.	Name	No.	Name
1	Inverter compressor	10	EXV 1	19	Expansion tank	28	2-way valve
2	Discharge temperature sensor	11	Flasher	20	Safety valve	29	Floor radiator
3	High-pressure switch	12	Pressure sensor	21	Flow switch	30	Water collector
4	High pressure sensor	13	Solenoid valve	22	Water pump	31	FCU
5	4-way valve	14	EXV 2	23	Outlet pipe connector	32	By-pass valve
6	Finned heat exchanger	15	Pressure sensor	24	Inlet pipe connector	33	Vapor liquid separator
7	Environment temperature sensor	16	Suction temperature sensor	25	Filter	34	Plate heat exchanger
8	Defrosting temperature sensor	17	Outlet water temperature sensor (plate heat exchanger)	26	Inlet temperature sensor (plate heat exchanger)		
9	Filter	18	Outlet temperature sensor (auxiliary heater)	27	Water separator		

4 Operating Principle of the Unit

The Mini chiller is composed of the monobloc unit. Operation functions include:

- (1) Cooling;
- (2) Heating;
- (3) Emergency mode;
- (4) Holiday mode;
- (5) Forced Operation Mode;
- (6) Quiet mode;
- (7) Weather-dependent Operation;
- (8) Floor debugging;
- (9) Air removal of the water system;
- (10) Operation of backup heat source.

Cooling: in cooling mode, refrigerant is condensed in the aluminum fin-copper tube and evaporated in the plate heat exchanger. Via heat exchange with water in the plate heat exchanger, the temperature of water decreases and it releases heat while the refrigerant absorbs heat and evaporates. With the help of the wired controller, the outflow temperature can meet the user's requirement. Through control of valves, the low-temperature water in the system can reach the indoor fan coil and underground pipes, and exchanges heat with the indoor air so that the indoor temperature decreases to the required range.

Heating: in heating mode, refrigerant evaporates in the aluminum fin-copper tube and is condensed in the plate heat exchanger. Via heat exchange with water in the plate heat exchanger, the water absorbs heat and its temperature increase while the refrigerant releases heat and is condensed. With the help of the wired controller, the outflow temperature can meet the user's requirement. Through the control of valve, the high-temperature water in the system can reach the indoor fan coil and underground pipes, and exchanges heat with the indoor air so that the indoor temperature increases to the required range.

Emergency mode: this mode is only available for heating. When the monobloc unit stops due to malfunction, it will enter the corresponding emergency mode; At the heating mode, after entering the emergency mode, only when the electric heater has been installed, can heating be available, otherwise heating fails. When the setting outflow temperature or indoor temperature is reached, the electric heater will stop running.

Holiday mode: this mode is only available for heating mode. This mode is set to keep indoor temperature or leaving water temperature in a certain range so as to prevent water system of the unit from freezing or protect certain indoor articles from freezing damage. When the monobloc unit stops due to malfunction, two e-heaters (once installed) of the unit will run.

Forced Operation Mode: this mode is only used for refrigerant recovery and debugging for the unit.

Quiet mode: it is available in cooling and heating. In this mode, the monobloc unit will reduce the running noise via automatic control.

Weather-dependent Operation: this mode is available for cooling and heating. In weather-dependent mode, the setting value (remote room air temperature or leaving water temperature) is detected and controlled automatically when the outdoor air temperature is changed.

Floor debugging: this function is intended to preheat the floor periodically for the first use.

Air removal of the water system: this function is intended to replenish water and remove air in the water system to make the equipment run at the stabilized water pressure.

Operation of backup heat source: in this mode, when the outdoor temperature is lower than the triggering temperature of the backup heat source and the unit stops owing to some malfunction or protection which remains after the compressor has stopped for three minutes, then the heat source will function to supply heat for the room.

5 Nomenclature

HL	R	12	Pd	/	Na	-	M
1	2	3	4		5		6

NO.	Description	Options
1	Air-cooled Mini Chiller	-
2	Heat Pump	-
3	Nominal Heating Capacity	8=8kW;10=10kW; 12=12kW; 14=14kW
4	Compressor Style	Pd=DC Inverter; Default=On/Off
5	Refrigerant Type	Na- R410A
6	Power Supply	K=220V-240V,1Ph,50Hz; M=380V-415V,3Ph,50Hz; H=380, 3Ph; 60Hz

Model Line-Up

Model Name	Capacity		Power supply
	Heating ¹ ,kW	Cooling ² ,kW	
HLR8Pd/Na-K	8	6.2	220-240V,1Ph,50Hz
HLR10Pd/Na-K	10	7.5	
HLR12Pd/Na-M	12	9.5	380-415V,3Ph,50Hz
HLR14Pd/Na-M	14	11	

Notes:

¹Capacities and power inputs are based on the following conditions:

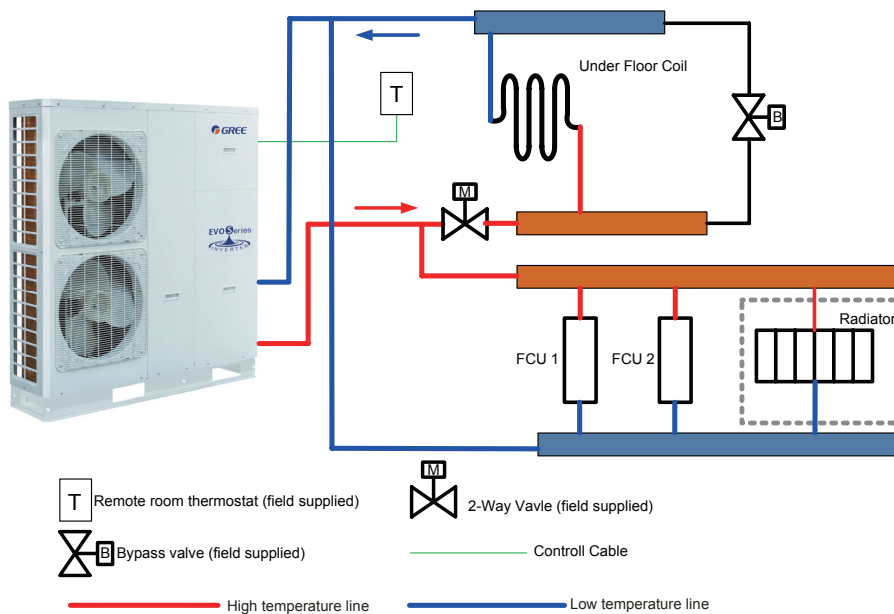
Indoor Water Temperature 40°C/45°C, Outdoor Air Temperature 7°C DB/6°C WB;

²Capacities and power inputs are based on the following conditions:

Indoor Water Temperature 12°C/7°C, Outdoor Air Temperature 35°C DB/-.

6 Installation Example

CASE 1: Connection of Terminals for Heating and Cooling (Under floor Loop, Fan Coil Unit, and Radiator)



Notes:

- (a) The two-way valve is very important to prevent dew condensation on the floor and radiator while cooling mode;
- (b) Type of thermostat and specification should be complied with installation of this manual;
- (c) The by-pass valve must be installed to secure enough water flow rate, and should be installed at the collector.

CASE 2: Connection between the Electric Heater and the Main Unit

Two groups of electric heaters are available, as well as control terminals for two groups of auxiliary electric heaters. These two groups of electric heaters can be activated at the same time. When only one group of the electric heater is installed, please follow the wiring of any group of the diagram shown below.

- (1) See the following statement for installation of two groups of auxiliary electric heaters, including wiring of the AC contactor, the thermostat and the tank-type electric heater.

- Wiring of the AC Contactor

L1, L2 and L3 are three-phase input terminals. T1, T2 and T3 are three-phase output terminals. A1 and A2 are terminals of input and output signals which are used to control the AC contactors. NO and NC are normally open and closed terminals of the AC contactors.

The tank-type electric heater and AC contacts should be selected according to the selection instructions and the thermostat and its upper limit should be decided by the protection function of the electric heater.

In order to ensure product quality and service life, it is unallowable to do wiring directly at the main board by the user themselves to prevent the main board from being damaged. The AC contactor control signal input terminal X17 (AC contactor 1) and X18 (AC contactor 2) of the main board AP1 should be connected to terminal 7 and terminal 8 of the electric box. The single pins of terminal CN26 (AC contactor 1) and CN27 (AC contactor 2) should be connected to terminal 35 and 36 of the electric box. Besides, other two pins of CN26 and CN27 both should be connected to XT2 (see the diagram below for more details).

Only qualified cables are allowed and see the table below for the corresponding wiring terminals.

No.	Wiring Terminal
AC Contactor 1	7—A1
	35—2T1
AC Contactor 2	8—A1
	36—2T2

- Wiring of the Thermostat

The proper limit of the thermostat should be selected based on the protection function of the electric heater.

Firstly, short-circuit the ON/OFF control signal output terminals of AC contactor 1 and AC contactor 2, and then connect them with the thermostat in series. Do not let the temperature of the external wall of the tank-type electric heater too high (see the diagram below for more details). After that, apply heat-conducting paste on the sensing probe and then insert it to the sensing hole to sense the temperature of the external wall of the tank-type electric heater.

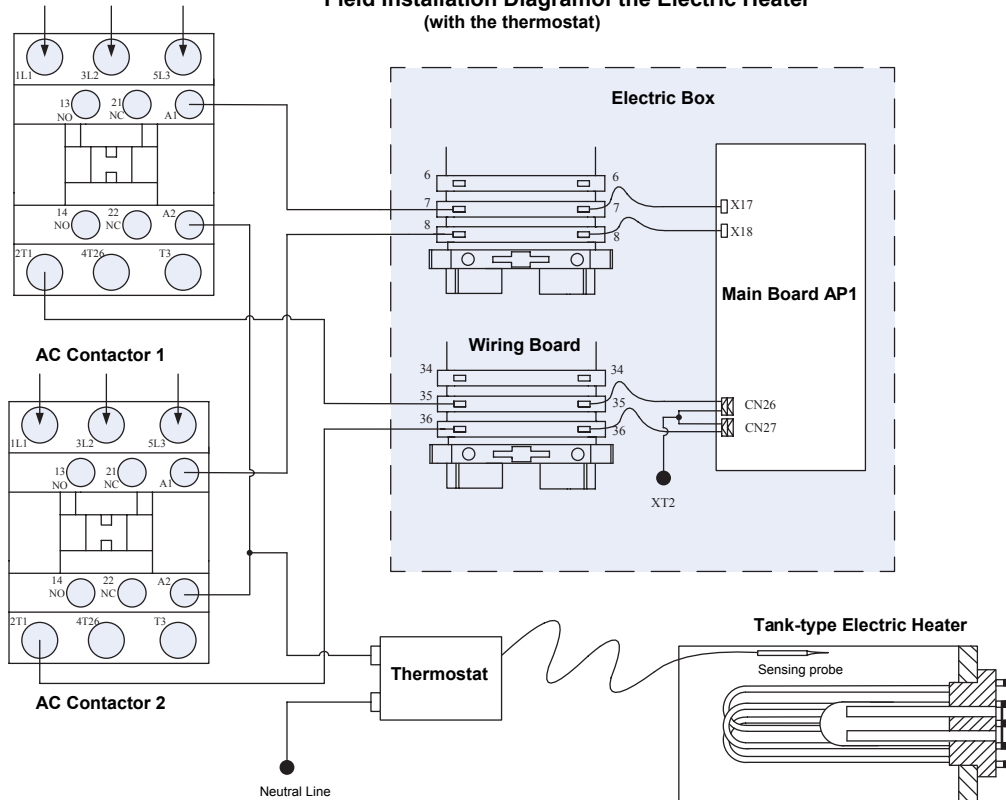
- Wiring of the Tank-type Electric Tank

The tank-type electric heater with proper power output should be used and the heating pipe should be installed at the water inlet side of the unit.

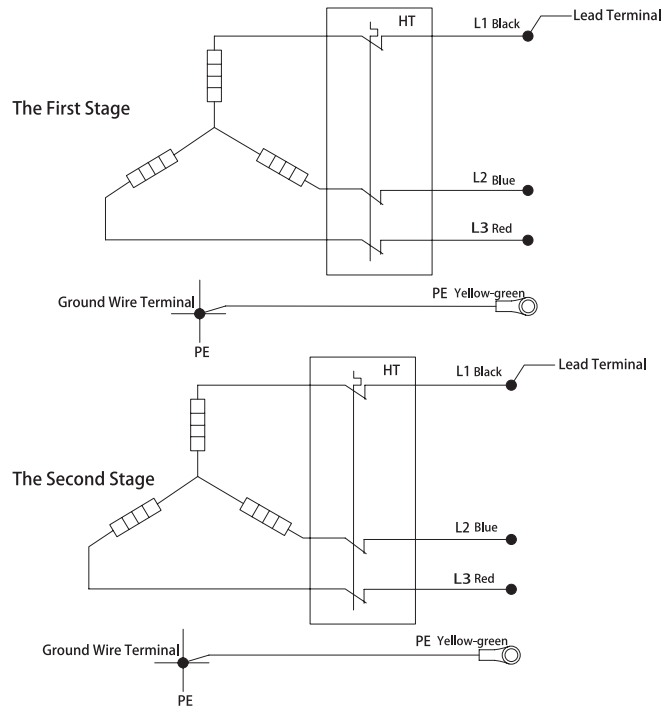
Three-phase wiring for the electric heater should be supplied by the user themselves. A new electric box is recommended to be used. See the diagram below for more details.

When protection function of the thermostat is required, the sensing probe applied with heat-conducting paste should be inserted into the sensing hole after wiring of the electric heater has been finished.

**Field Installation Diagram of the Electric Heater
(with the thermostat)**



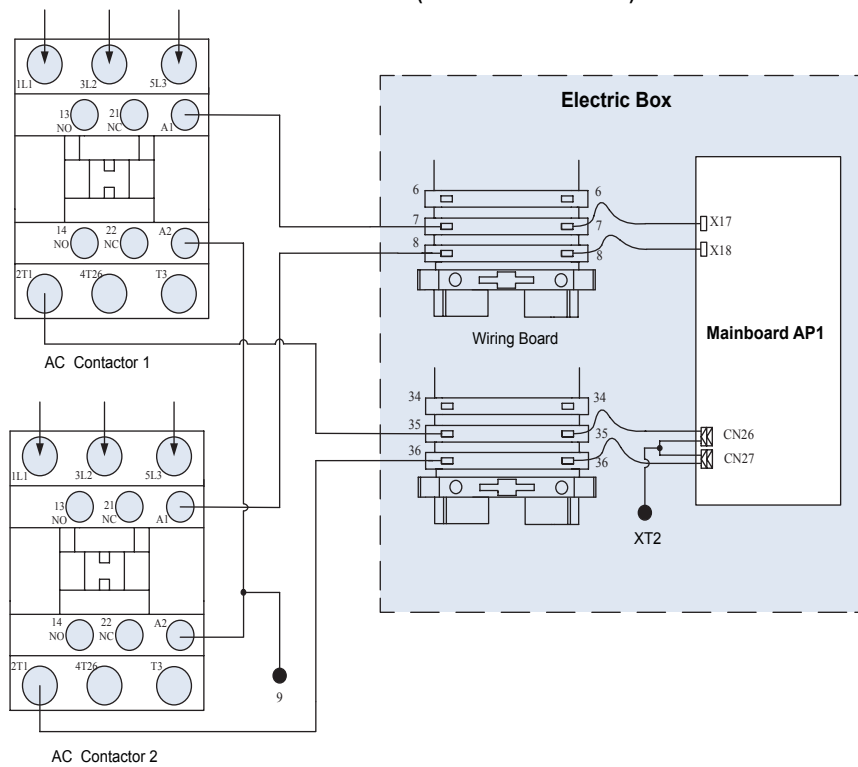
Electric Wiring Diagram of the Electric Heater



(2) See the following statement for installation of two groups of auxiliary electric heaters, including wiring of the AC contactors and the tank-type electric heater.

- Wiring of the AC contactors is the same as that stated above.
- When the thermostat is not required, do the wiring as shown in the diagram below. The output terminal used to control the thermostat should be short-circuited and then be connected to terminal 9 (it is the terminal for the neutral line).
- Wiring of the tank-type electric heater is the same as that stated above.

Field Instalaltion Diagram of the Electric Heater (without the thermostat)



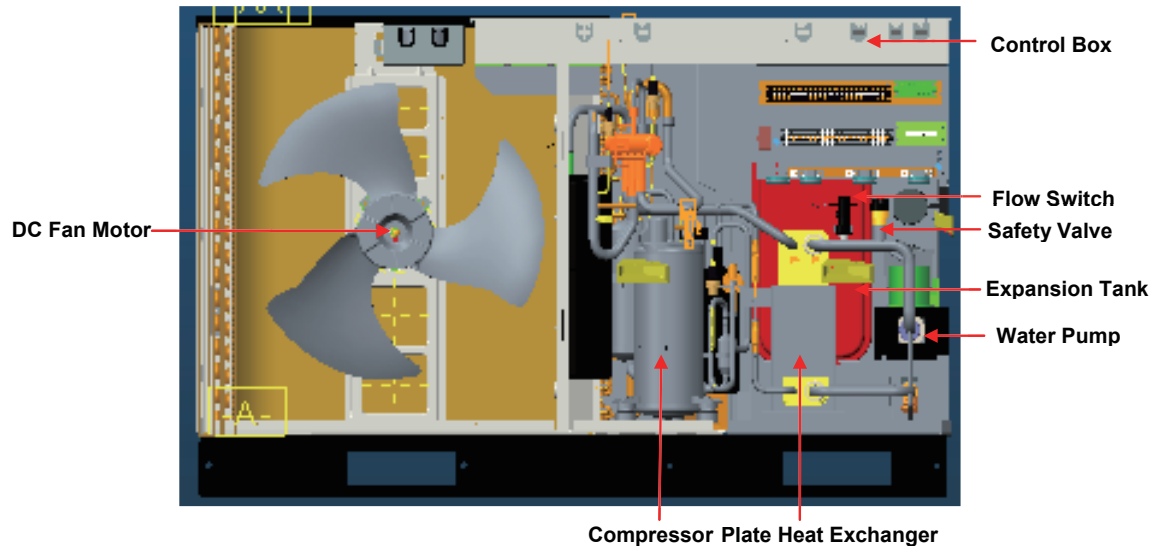
Notes:

- (a) During installation, the electric heater should be supplied with three-phase power separately. When only one group of the electric heater is installed, please follow the wiring of any group of the diagram shown above.
- (b) Quantity of the AC contactors should match with that of the electric heater installed. Proper AC contactors which meet the actual demands should be adopted.
- (c) The wiring mode depends on if the tank-type electric heater is equipped with a thermostat or not.
- (d) Proper power lines should be used and those that do not meet actual demands should be avoided.
- (e) Never open the electric box for wiring of the mainboard by the user themselves.

7 Main Components

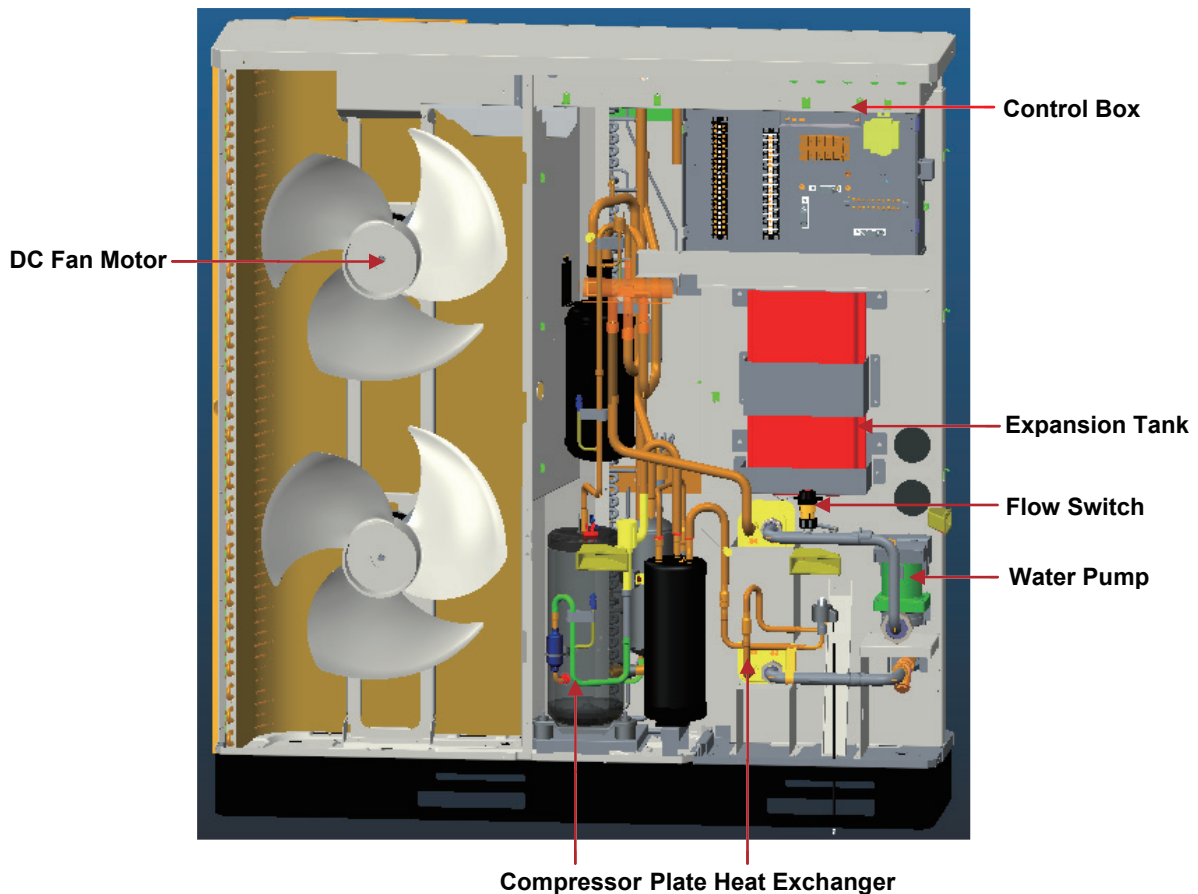
- (1) HLR8Pd/Na-K, HLR10Pd/Na-K





(2) HLR12Pd/Na-M, HLR14Pd/Na-M





8 Installation Guideline of the Unit

8.1 Instruction to installation

- (1) Installation of the unit must be in accordance with national and local safety codes.
- (2) Installation quality will directly affect the normal use of the air conditioner unit. The user is prohibited from installation. Please contact your dealer after buying this machine. Professional installation workers will provide installation and test services according to installation manual.
- (3) Do not connect to power until all installation work is completed.

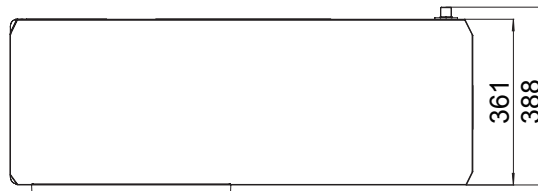
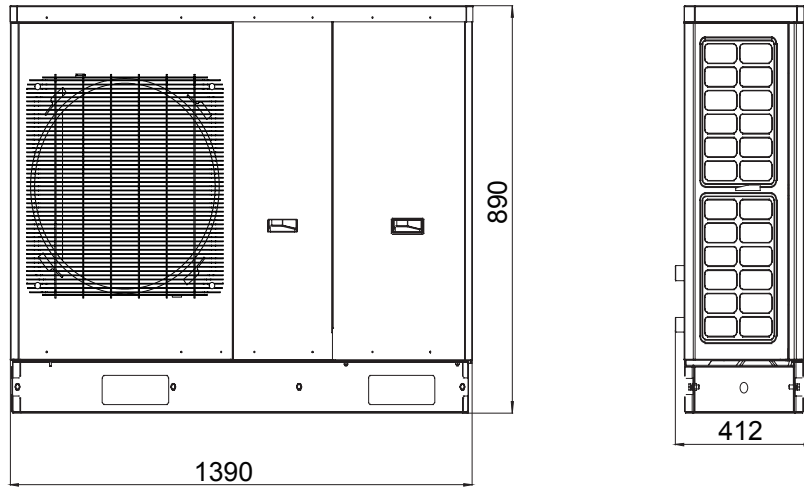
8.2 Installation of the Monobloc Unit

8.2.1 Selection of the Installation Location of the Monobloc Unit

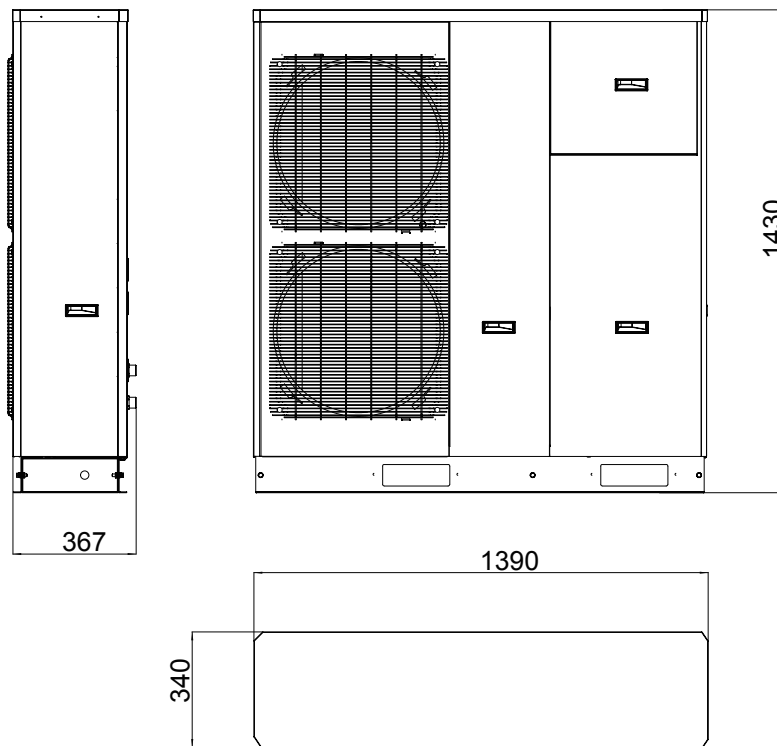
- (1) The monobloc unit must be installed on a firm and solid support.
- (2) Avoid placing the monobloc unit under window or between two constructions, hence to prevent normal operating noise from entering the room.
- (3) Air flow at inlet and outlet shall not be blocked.
- (4) Install at a well-ventilated place, so that the machine can absorb and discharge sufficient air.
- (5) Do not install at a place where flammable or explosive goods exist or a place subject to severe dust, salty fog and polluted air.

8.2.2 Outline Dimensions of the Monobloc Unit

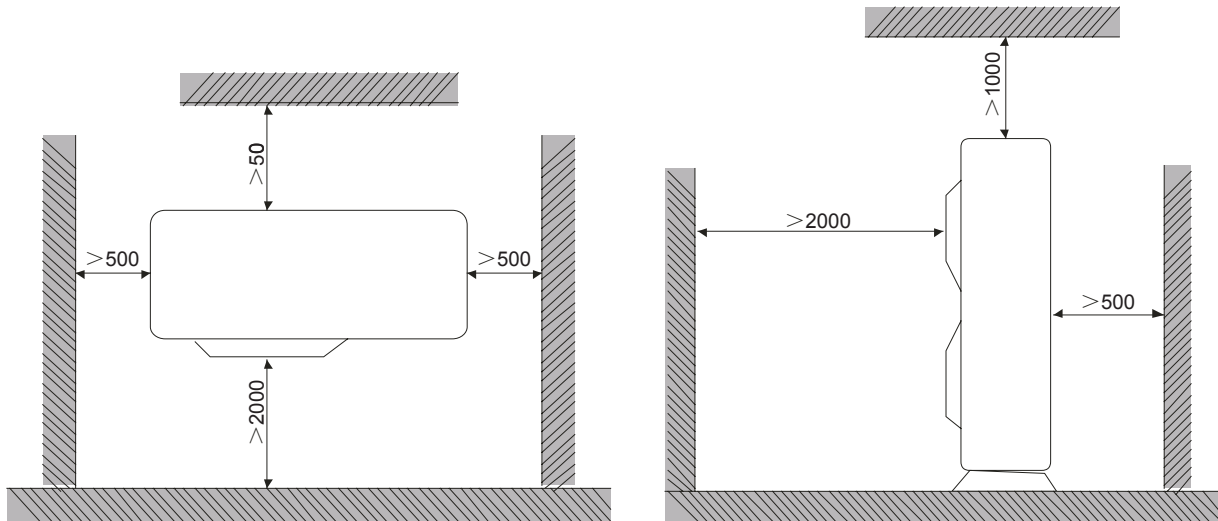
(1) HLR8Pd/Na-K, HLR10Pd/Na-K



(2) HLR12Pd/Na-M, HLR14Pd/Na-M



8.2.3 Space Requirements for Installation



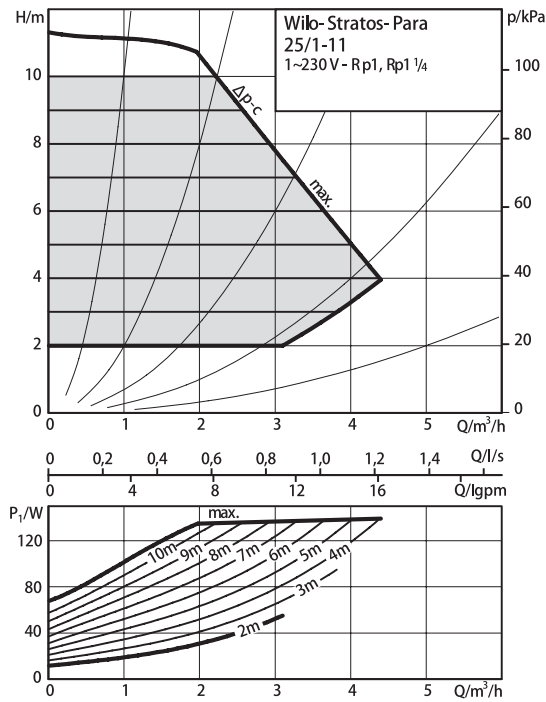
8.2.4 Precautions on installation of the Monobloc Unit

- (1) When moving the monobloc unit, it is necessary to adopt 2 pieces of long enough rope to hand the unit from 4 directions. Included angle between the rope when hanging and moving must be 40° below to prevent center of the unit from moving.
- (2) The monobloc unit should be installed on concrete base that is 10cm height.
- (3) Requirements on installation space dimension of unit's bodies are shown in following drawing.
- (4) The monobloc unit must be lifted by using designated lifting hole. Take care to protect the unit during lift. To avoid rusting, do not knock the metal parts.

8.3 Water Volume and Pump Capacity (with pump)

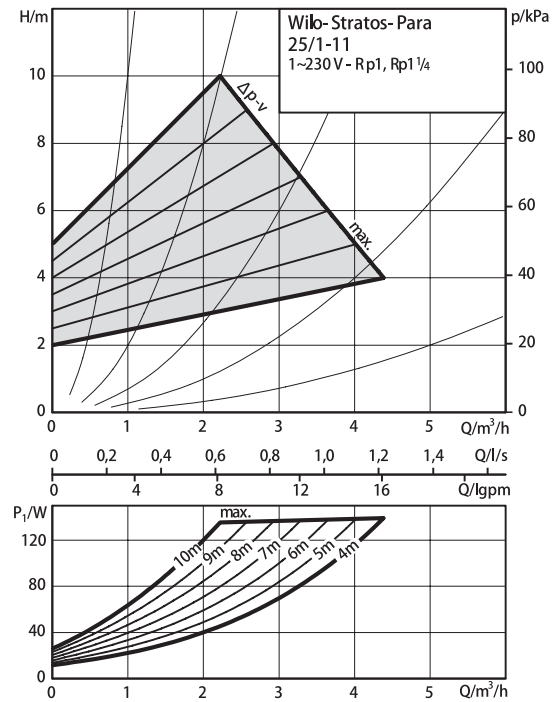
Wilco-Stratos PARA 25/1-11

Δp -c (constant)



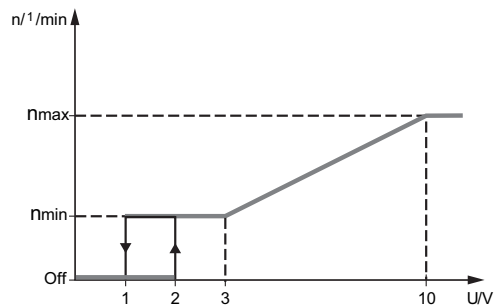
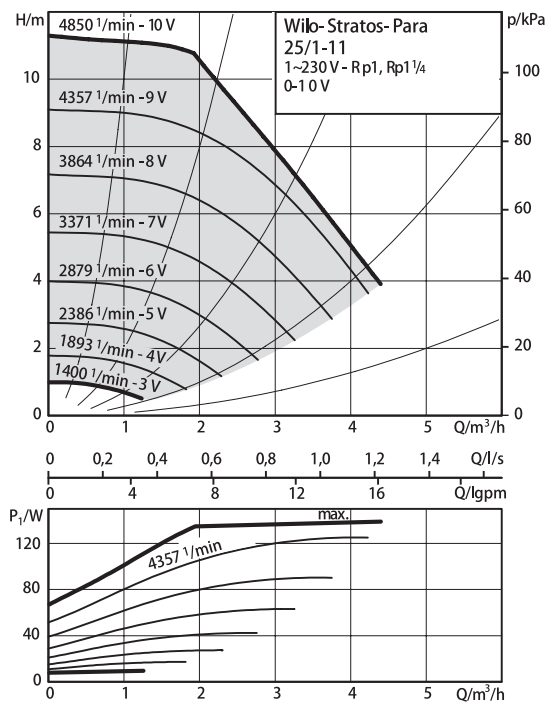
Wilco-Stratos PARA 25/1-11

Δp -v (variable)



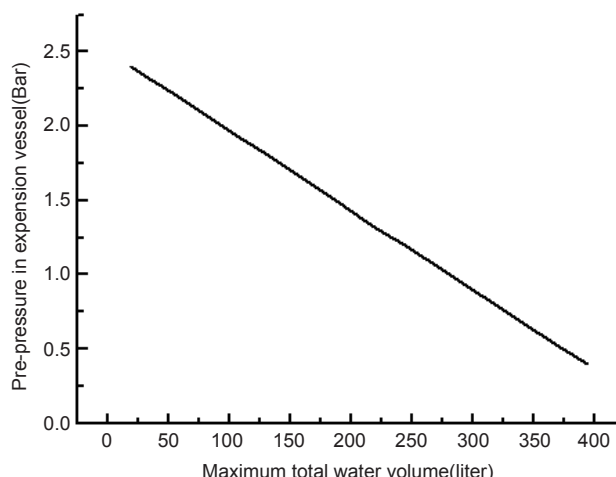
Wilco-Stratos PARA 25/1-11

External control mode via Analog-In 0-10 V



Note: during operation, the water pump will adjust its output based on the actual load.

8.4 Water Volume and Expansion Vessel Pressure



Notes:

- (a) The expansion vessel is 10 liter and 1bar pre-pressurized;
- (b) Total water volume of 280 liter is default; if total water is changed because of installation condition, the pre-pressure should be adjusted to secure proper operation;
- (c) Minimum total water volume is 20 liter;
- (d) To adjust pre-pressure, use nitrogen gas by certificated installer.

8.5 Selection of Expansion Vessels

Formula:

$$v = \frac{c \cdot e}{1 - \frac{1 + p_1}{1 + p_2}}$$

V--- Volume of expansion vessel

C--- Total water volume

P₁--- Pre-set pressure of expansion vessel

P₂-- The highest pressure during running of the system (that is the action pressure of safety valve.)

e---The expansion factor of water (the difference between the expansion factor of the original water temperature and that of highest water temperature.)

Water expansion factor in different temperature	
Temperature(°C)	Expansion factor e
0	0.00013
4	0
10	0.00027
20	0.00177
30	0.00435
40	0.00782
45	0.0099
50	0.0121
55	0.0145
60	0.0171
65	0.0198
70	0.0227
75	0.0258
80	0.029
85	0.0324
90	0.0359
95	0.0396
100	0.0434

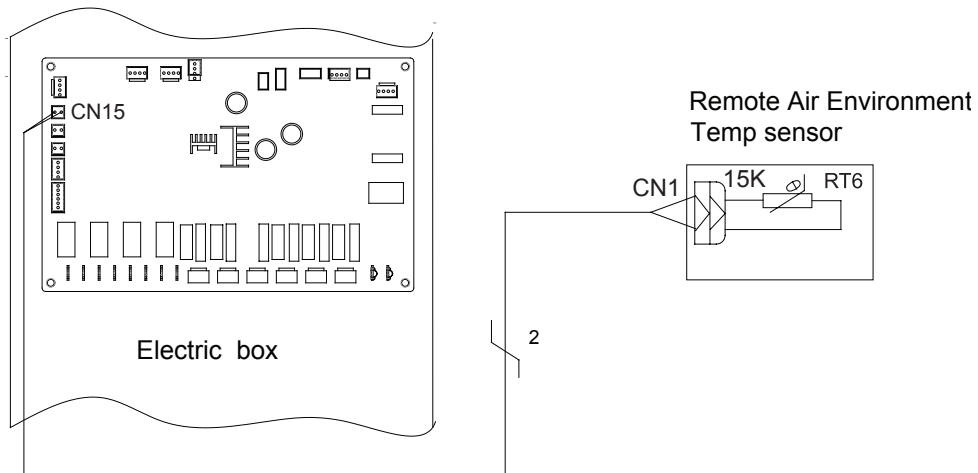
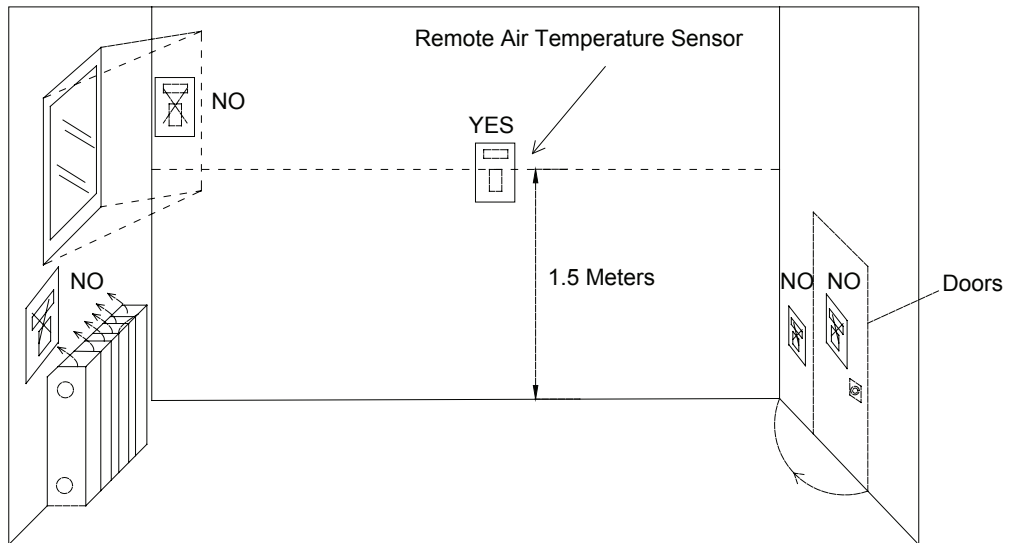
9 Remote Air Temperature Sensor



Front side



Back side

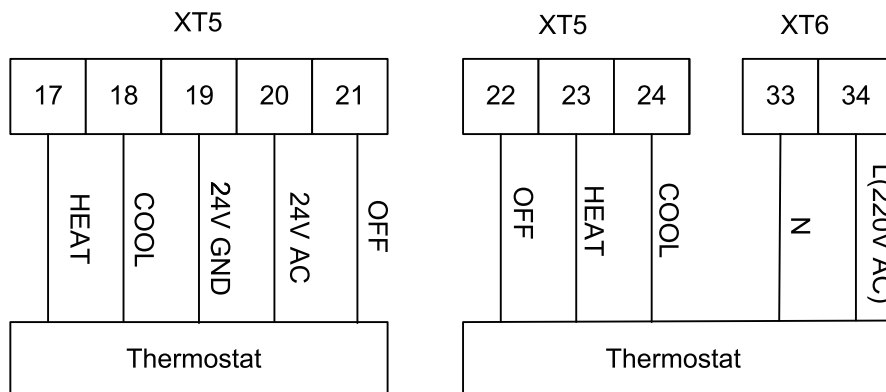


Notes:

- Distance between the monobloc unit and the remote air temperature sensor should be less than 15 meters due to length of the connection cable of remote air temperature sensor;
- Height from floor is approximately 1.5 meters;
- Remote air temperature sensor can not be located where the area may be hidden when door is open;
- Remote air temperature sensor can not be located where external thermal influence may be applied;
- Remote air temperature sensor should be installed where space heating is mainly applied;
- After the remote air temperature sensor is installed, it should be set to "With" through the wired controller so as to set the remote air temperature to the control point.

10 Thermostat

Installation of the thermostat is very similar to that of the remote air temperature sensor.



How to Wire Thermostat

- (1) Uncover the front cover of the monobloc unit and open the control box.
- (2) Identify the power specification of the thermostat, if it is 230V , find terminal block XT5 as NO.22~24 and block XT6 as NO.33~34; Otherwise, if it is 24V, find terminal block XT5 as NO.17~21;
- (3) If it is the heating/cooling thermostat, please connect wire as per the figure above;

CAUTION!

- (a) Never use 230V AC and 24V AC thermostat at the same time, otherwise, it will cause short circuit and power cut-off by the circuit breaker;
- (b) Setting temperature by the thermostat(heating or cooling) should be within the temperature range of the product ;
- (c) For other constrains, please refer to previous pages about the remote air temperature sensor;
- (d) Do not connect external electric loads. Wire 220V AC(24V AC) and 220V GND(24V GND) should be used only for the electric thermostat.
- (e) Never connect external electric loads such as valves, fan coil units, etc. If connected, the mainboard of the unit can be seriously damaged.
- (f) Installation of the thermostat is very similar to that of the remote air temperature sensor.

11 2-Way Valve

The 2-way valve is required to control water flow for cooling operation. The role of 2-way valve is to cut off water flow into the underfloor loop when the fan coil unit is equipped for cooling operation.

General Information

Type	Power	Operating Mode	Supported
NO 2-wire	230V 50Hz 1Ph AC	Closing water flow	Yes
		Opening water flow	Yes
NC 2-wire	230V 50Hz 1Ph AC	Closing water flow	Yes
		Opening water flow	Yes

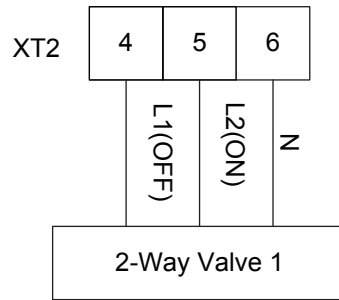
- (1) Normal Open type. When electric power is NOT supplied, the valve is open. (When electric power is supplied, the valve is closed.)
- (2) Normal Closed type. When electric power is NOT supplied, the valve is closed. (When electric power is supplied, the valve is open.)

How to Wire 2-Way Valve:

Follow steps below to wire the 2-way valve.

Step 1. Uncover the front cover of the unit and open the control box.

Step 2. Find the terminal block and connect wires as below.



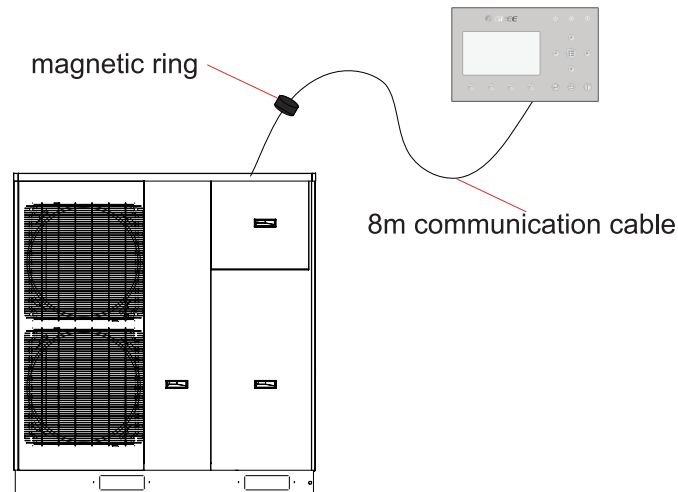
⚠ WARNING

- Normal Open type should be connected to wire (ON) and wire (N) for valve closing in cooling mode.
- Normal Closed type should be connected to wire (OFF) and wire (N) for valve closing in cooling mode.

(ON) : Line signal (for Normal Open type) from PCB to 2-way valve
 (OFF) : Line signal (for Normal Closed type) from PCB to 2-way valve
 (N) : Neutral signal from PCB to 2-way valve

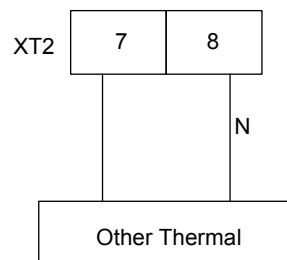
12 Wired Controller

Wired controller wiring guidance:



13 Other Auxiliary Heat Sources

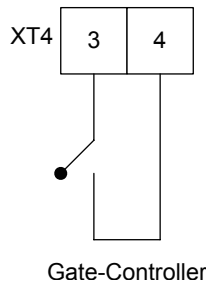
Other auxiliary heat sources are allowed for the equipment and controlled in such a way that the mainboard will output 230V when outdoor temperature is lower than the set point for startup of the auxiliary heat source.



14 Gate-controller

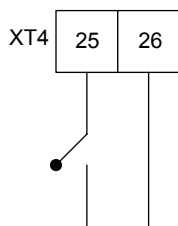
If there is gate control function, installation guide follow as:

- (1) HLR8Pd/Na-K, HLR10Pd/Na-K



Gate-Controller

- (2) HLR12Pd/Na-M, HLR14Pd/Na-M

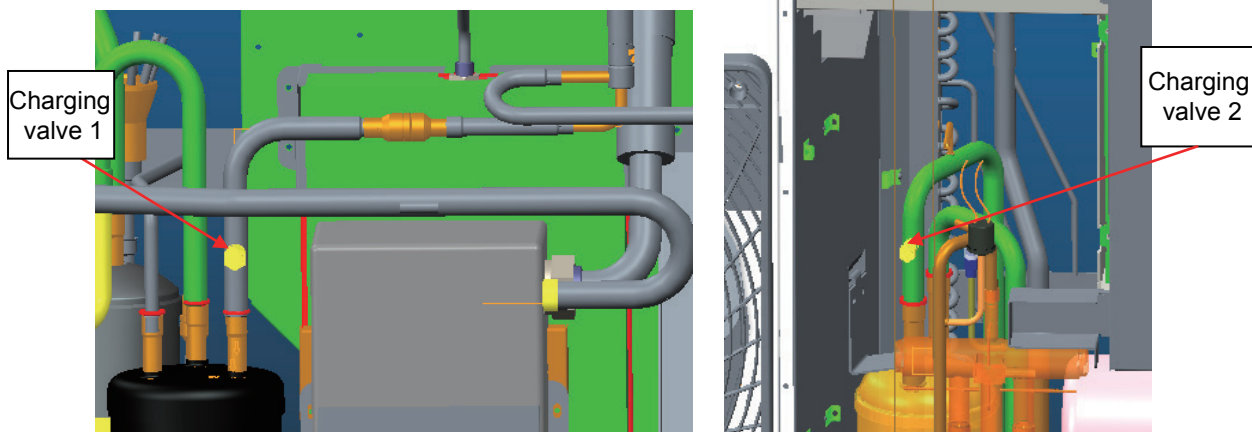


Gate-Controller

15 Charging and Discharging of Refrigerant

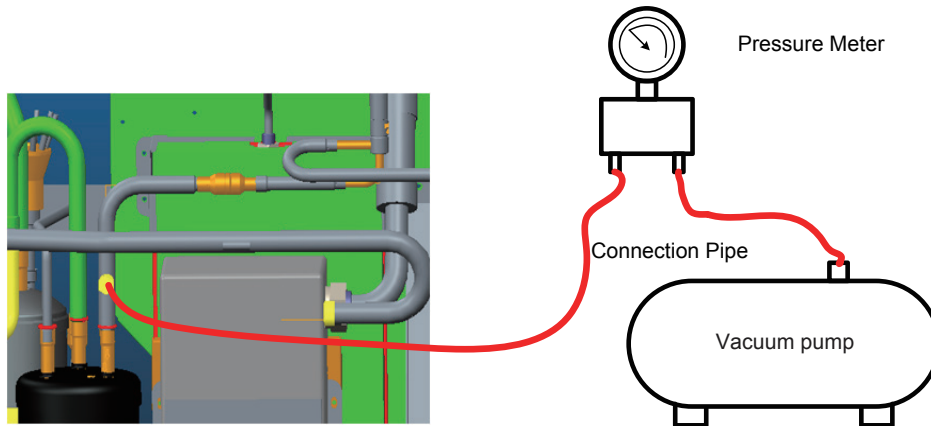
The unit has been charged with refrigerant before delivery. Overcharging or undercharging will cause the compressor to run improperly or be damaged. When refrigerant is required to be charged or discharged for installation, maintenance and other reasons, please follow steps below and nominal charged volume on the nameplate.

- (1) Discharging: remove metal sheets of the outer casing, connect a hose to the charging valve and then discharge refrigerant.



Notes:

- (a) Discharge is allowed unless the unit has been stopped. (Cut off the power and repower it 1 minutes later)
 - (b) Protective measures should be taken during discharging to avoid frost bites.
 - (c) When discharging is finished, if vacuuming cannot be done immediately, remove the hose to avoid air or foreign matters entering the unit.
- (2) Vacuuming: When discharging is finished, use hoses to connect the charging valve, manometer and vacuum pump to vacuum the unit.



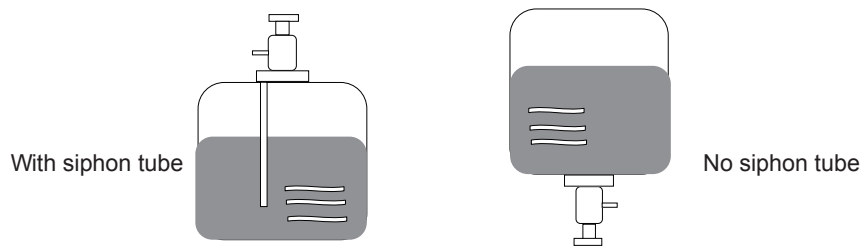
Note: when vacuuming is finished, pressure inside the unit should be kept lower than 80Pa for at least 30 minutes to make sure there is no leak. Either charging valve 1 or charging valve 2 can be used for vacuuming.

(3) Charging: when vacuuming is finished and it is certain that there is no leak, charging can be done.

- Be sure to charge the specified amount of refrigerant in liquid state.

Since this refrigerant is a mixed refrigerant, adding it in gas form may cause the refrigerant composition to change, preventing normal operation.

- Before charging, check whether the refrigerant cylinder is equipped with a siphon tube or not.



16 Electric Wiring

16.1 Wiring Principle

General principles

- (1) Wires, equipment and connectors supplied for use on the site must be in compliance with provisions of regulations and engineering requirements.
- (2) Only certificated electricians are allowed to perform wire connection on the site.
- (3) Before connection work is started, the power supply must be shut off.
- (4) Installers shall be responsible for any damage due to incorrect connection of the external circuit of the unit.
- (5) Caution --- only copper wires are allowed to be used.

Connection of power cable to the electric cabinet of the unit

- (1) Power cables should be laid out through cabling trough, conduit tube or cable channel.
- (2) Power cables to be connected into the electric cabinet must be protected with rubber or plastic to prevent scratch by edge of metal plate.
- (3) Power cables close to the electric cabinet of the unit must be fixed reliably to make the power terminal in the cabinet free from an external force.
- (4) Power cable must be grounded reliably.

16.2 Specification of Power Supply Wire and Leakage Switch

Power cable specifications and Leakage switch types in the following list are recommended.

Model	Power Supply	Leakage Switch	Minimum Sectional Area of Earth Wire	Minimum Sectional Area of Power Supply Wire
	V,Ph,Hz	(A)	(mm ²)	(mm ²)
HLR8Pd/Na-K	220-240V,1Ph,50Hz	20	2.1	3×2.1
HLR10Pd/Na-K		20	2.1	3×2.1
HLR12Pd/Na-M	380-415V,3Ph,50Hz	13	1.3	5×1.3
HLR14Pd/Na-M		13	1.3	5×1.3

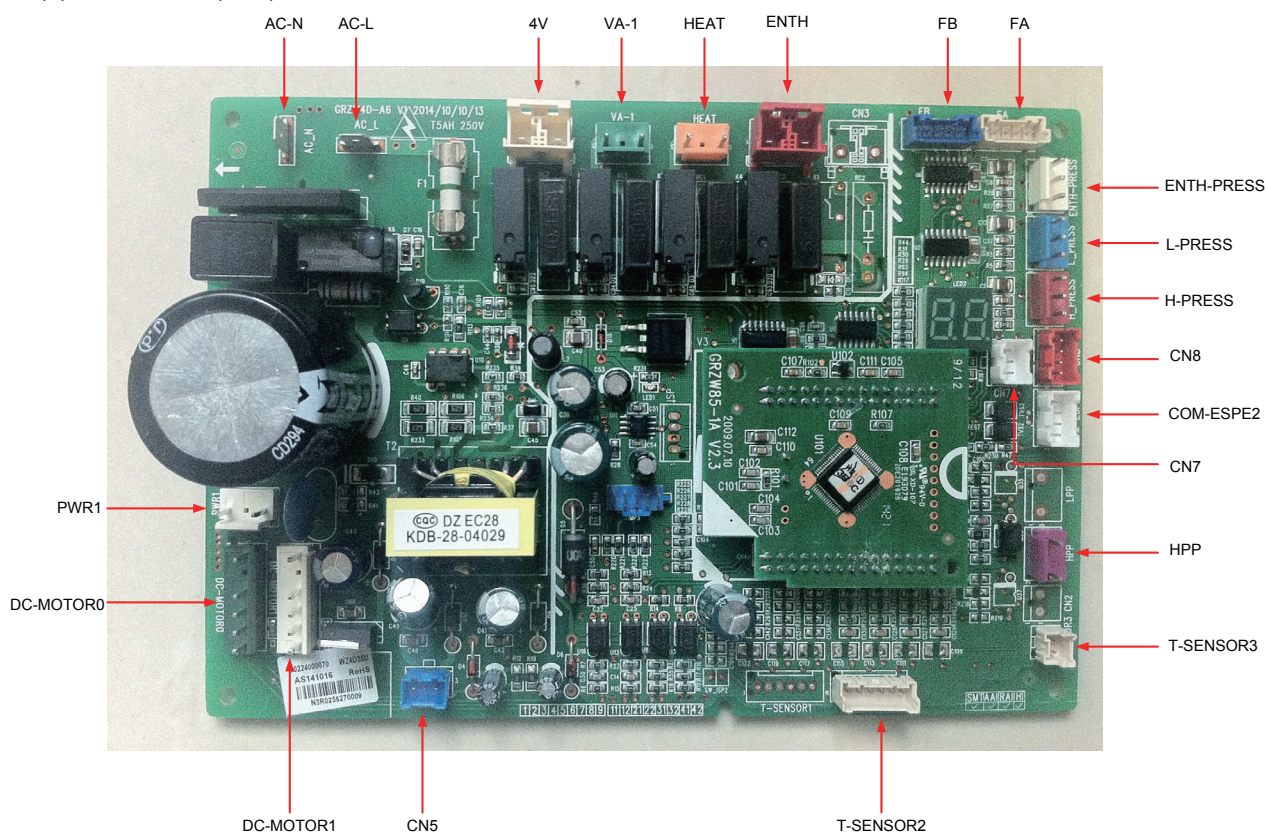
Notes:

- (a) The leakage switch is necessary for additional installation. If circuit breakers with leakage protection are in use, action response time must be less than 0.1 second, leakage circuit must be 30mA.
- (b) The above selected power cable diameters are determined based on assumption of distance from the distribution cabinet to the unit less than 75m. If cables are laid out in a distance of 75m to 150m, diameter of power cable must be increased to a further grade.
- (c) The power supply must be of rated voltage of the unit and special electrical line for air-conditioning.
- (d) All electrical installation shall be carried out by professional technicians in accordance with the local laws and regulations.
- (e) Ensure safe grounding and the grounding wire shall be connected with the special grounding equipment of the building and must be installed by professional technicians.
- (f) The specifications of the breaker and power cable listed in the table above are determined based on the maximum power (maximum amps) of the unit.
- (g) The specifications of the power cable listed in the table above are applied to the conduit-guarded multi-wire copper cable (like, YJV XLPE insulated power cable) used at 40°C and resistible to 90°C(see IEC 60364-5-52). If the working condition changes, they should be modified according to the related national standard.
- (h) The specifications of the breaker listed in the table above are applied to the breaker with the working temperature at 40°C. If the working condition changes, they should be modified according to the related national standard.

17 Wiring Diagram

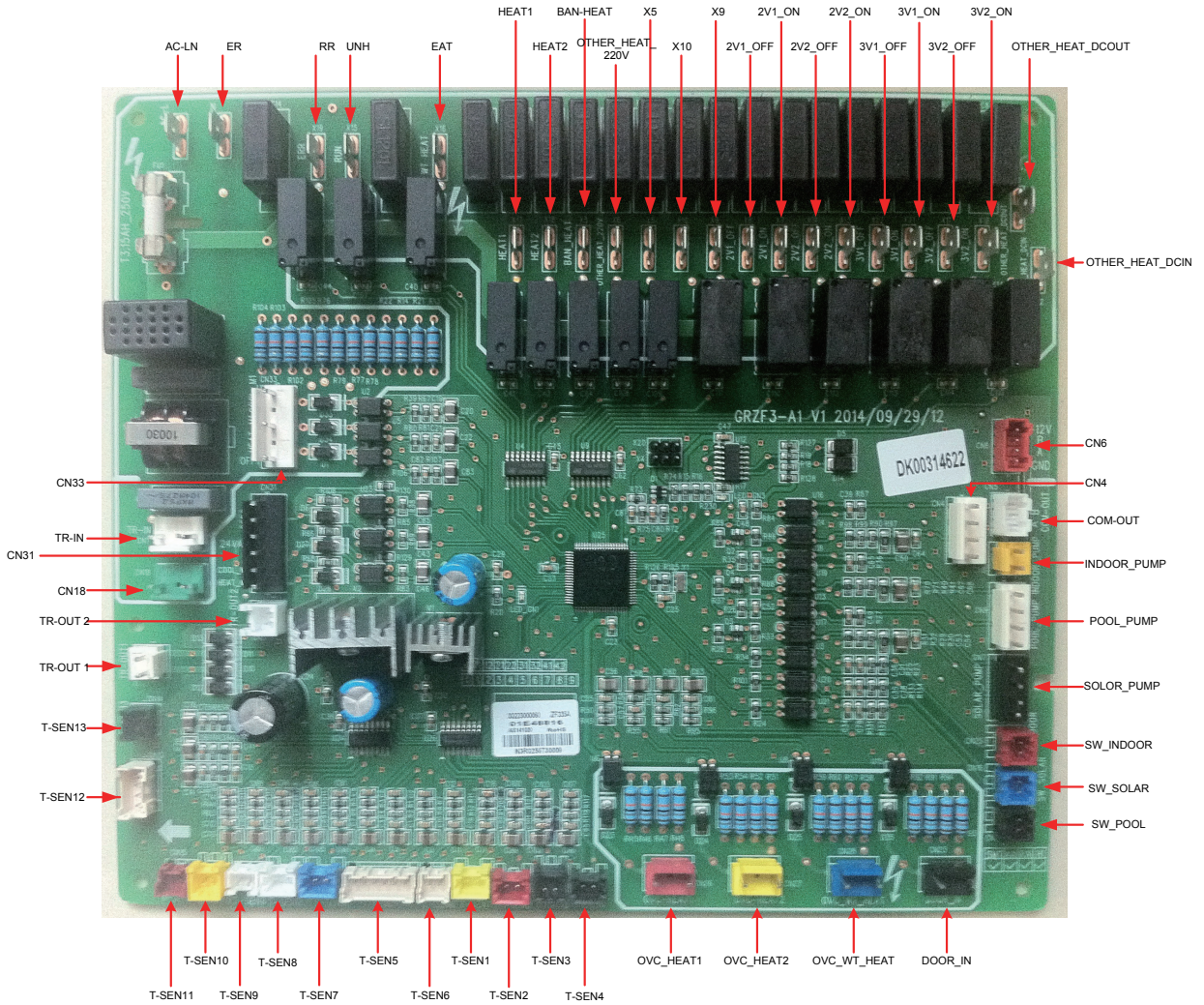
17.1 Control Board

(1) Main Board (AP2):HLR8Pd/Na-K,HLR10Pd/Na-K,HLR12Pd/Na-M, HLR14Pd/Na-M



Silk Screen	Specification
AC_N	Neutral wire input of power supply
AC_L	Live wire input of power supply
4V	4-way valve
VA-1	E-heater of chassis
HEAT	Electric heating tape
ENTH	Solenoid valve
FB	To EXV2,pipe electric expansion valve,1-4 pin: driving impulse output; 5 pin: +12V;
FA	To EXV1,pipe electric expansion valve,1-4 pin: driving impulse output; 5 pin: +12V;
ENTH-PRESS	Signal input of pressure sensor 1 pin: GND; 2 pin: signal input; 3 pin: +5V;
L-PRESS	Signal input of pressure sensor 1 pin: GND; 2 pin: signal input; 3 pin: +5V;
H-PRESS	Signal input of pressure sensor 1 pin: GND; 2 pin: signal input; 3 pin: +5V;
CN8	To the wired controller, communication cable: 1 pin earthed, 2 pin B, 3 pin A, 4 pin+12power supply;
CN7	Communication between AP1 and AP2;communication cable 2 pin B, 3 pinA
COM-ESPE2	Pin for communication with the drive
HPP	High pressure switch
T-SENSOR3	1 hole: +3.3V 2 hole: detection ; suction temperature sensor
T-SENSOR2	1, 2 hole: pipe temperature; 3, 4 hole: environment; 5, 6 hole: exhaust
CN5	Supply 18V DC power to the drive.
DC-MOTOR1	DC fan 1 pin: strong power supply; 3 pin: fan GND; 4 pin: +15V; 5 pin: control signal; 6pin:feedback signal;
DC-MOTOR0	DC fan 1 pin: strong power supply; 3 pin: fan GND; 4 pin: +15V; 5 pin: control signal; 6pin:feedback signal;
PWR1	Supply 310V DC power to the drive.

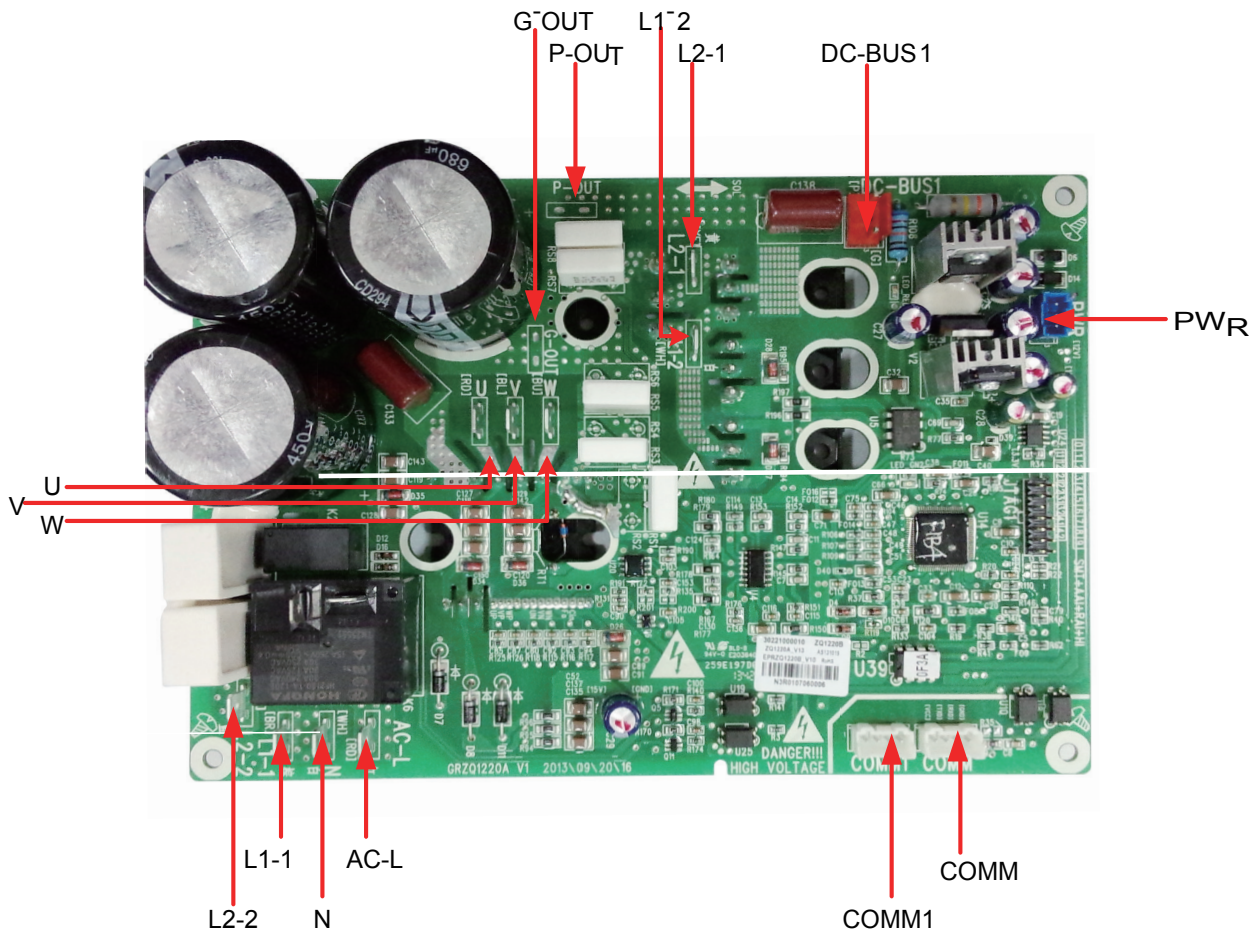
(2) Main Board (AP1):HLR8Pd/Na-K, HLR10Pd/Na-K, HLR12Pd/Na-M, HLR14Pd/Na-M



Silk Screen	Location	Introduction
AC-L	-	Live wire of power supply
N	-	Neutral wire of power supply
ERR	X19	Error indicator
RUN	X15	Running indicator
HEAT1	X17	E-heater 1
HEAT2	X18	E-heater 2
BAN_HEAT	X3	Antifreeze heater for the heat exchanger
OTHER_HEAT_220V	X6	Assistant heat by 220VAC
X5	X5	Reserved
X10	X10	Reserved
X9	X9	Reserved
2V1_OFF	X8	Electric magnetic 2-way valve1 is normally closed.
2V1_ON	X7	Electric magnetic 2-way valve1 is normally open.
OTHER_HEAT_DCOUT	X1	The dc output of auxiliary heat
OTHER_HEAT_DCIN	X2	The dc input of auxiliary heat
COM-OUT	CN5	Connect to AP2
CN6	CN6	Connect the wired controller

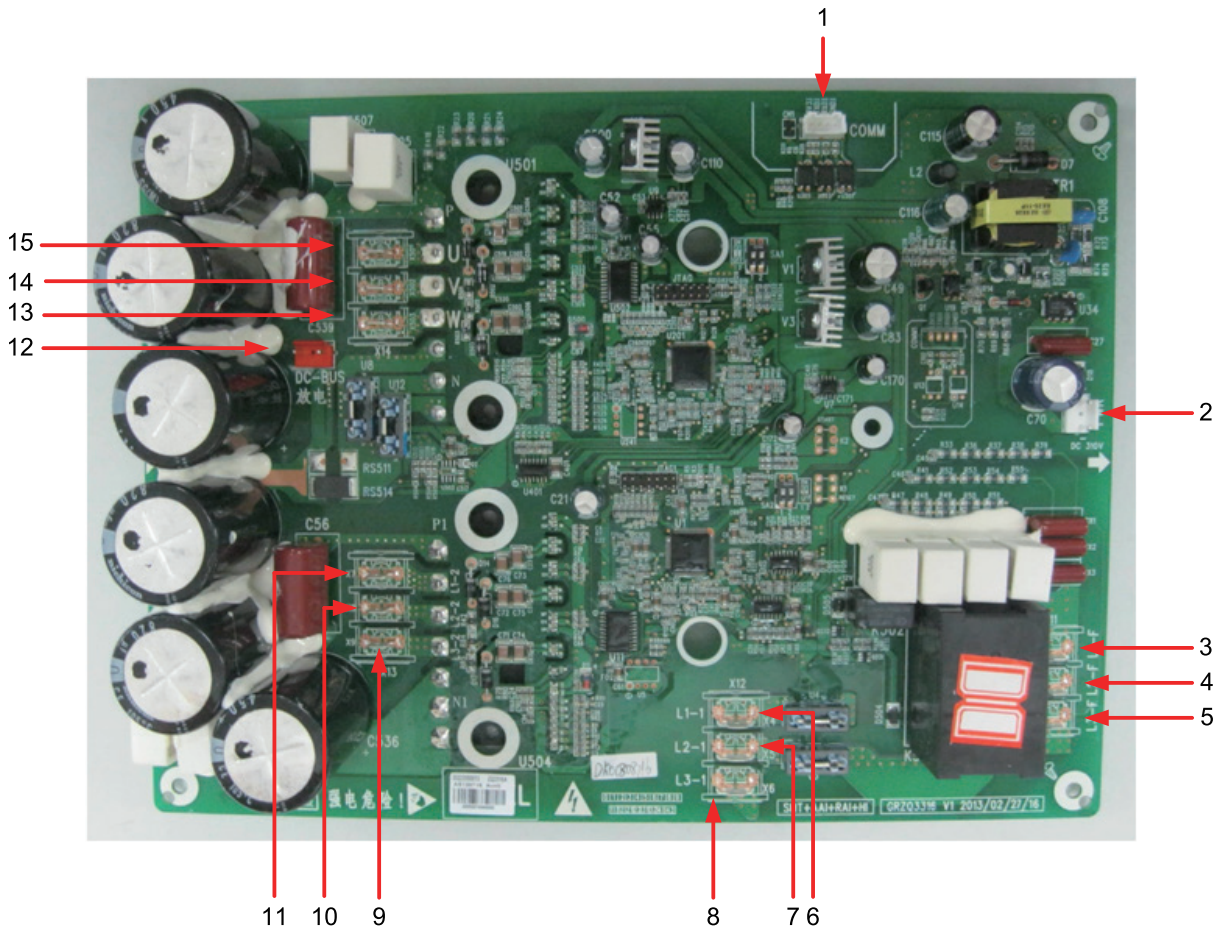
INDOR_PUMP	CN4	Control and feedback of the water pump for the main unit
CN8	CN8	Feedback of the water pump for the main unit
SW_INDOOR	CN25	Detection input of water flow switch for indoor
SW_POOL	CN17	Detection input of water flow switch for pool
DOOR_IN	CN23	Door detection input
OVC-HEAT1	CN26	E-heater of unit1 adhesion-proof protection detector
OVC-HEAT2	CN27	E-heater of unit2 adhesion-proof protection detector
T-SEN4	CN20	Terminal of temperature sensor4
T-SEN3	CN22	Terminal of temperature sensor3
T-SEN2	CN21	Terminal of temperature sensor2
T-SEN1	CN11	Terminal of temperature sensor1
T-SEN6	CN12	Terminal of temperature sensor6
T-SEN5	CN10	Terminal of temperature sensor5
T-SEN7	CN29	Terminal of temperature sensor7
T-SEN8	CN32	Terminal of temperature sensor8
T-SEN9	CN30	Terminal of temperature sensor9
T-SEN10	CN24	Terminal of temperature sensor10
T-SEN11	CN15	Terminal of temperature sensor11
T-SEN12	CN13	Terminal of temperature sensor12
T-SEN13	CN14	Terminal of temperature sensor13
TR-OUT1	CN2	Transformer output 1 (12V)
TR-OUT2	CN3	Transformer output 2 (24V)
CN18	CN18	Power supply interface of the thermostat (220~240V)
TR-IN	CN1	220V input of transformer
CN31	CN31	Power supply interface and control signal of the thermostat (24V)
CN33	CN33	Control signal of the thermostat

(3) Drive Board (AP4):HLR8Pd/Na-K, HLR10Pd/Na-K



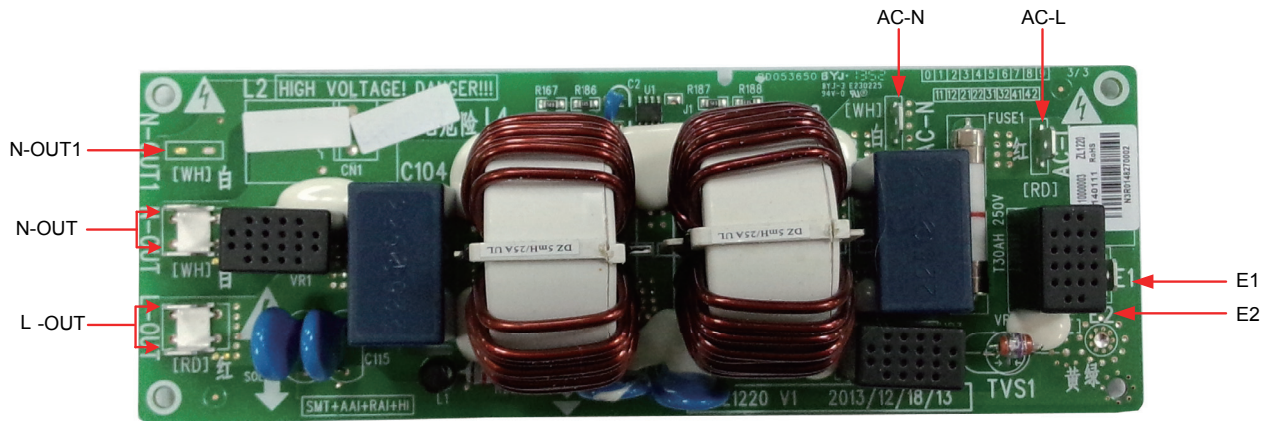
Silk Screen	Introduction
AC-L	Live line input of the drive board
N	Neutral line input of the drive board
L1-1	To PFC inductor brown line
L1-2	To PFC inductor white line
L2-1	To PFC inductor white line
L2-2	To PFC inductor blue line
U	To compressor phase U
V	To compressor phase V
W	To compressor phase W
DC-BUS1	Pin for electric discharge of the high-voltage bar during test.
P-OUT	Reserved
G-OUT	Reserved
COMM COMM1	Communication interface[1-3.3V,2-TX,3-RX,4-GND]
PWR	Power input of the drive board [1-GND,2-18V,3-15V]

(4) Drive Board (AP4):HLR12Pd/Na-M, HLR14Pd/Na-M



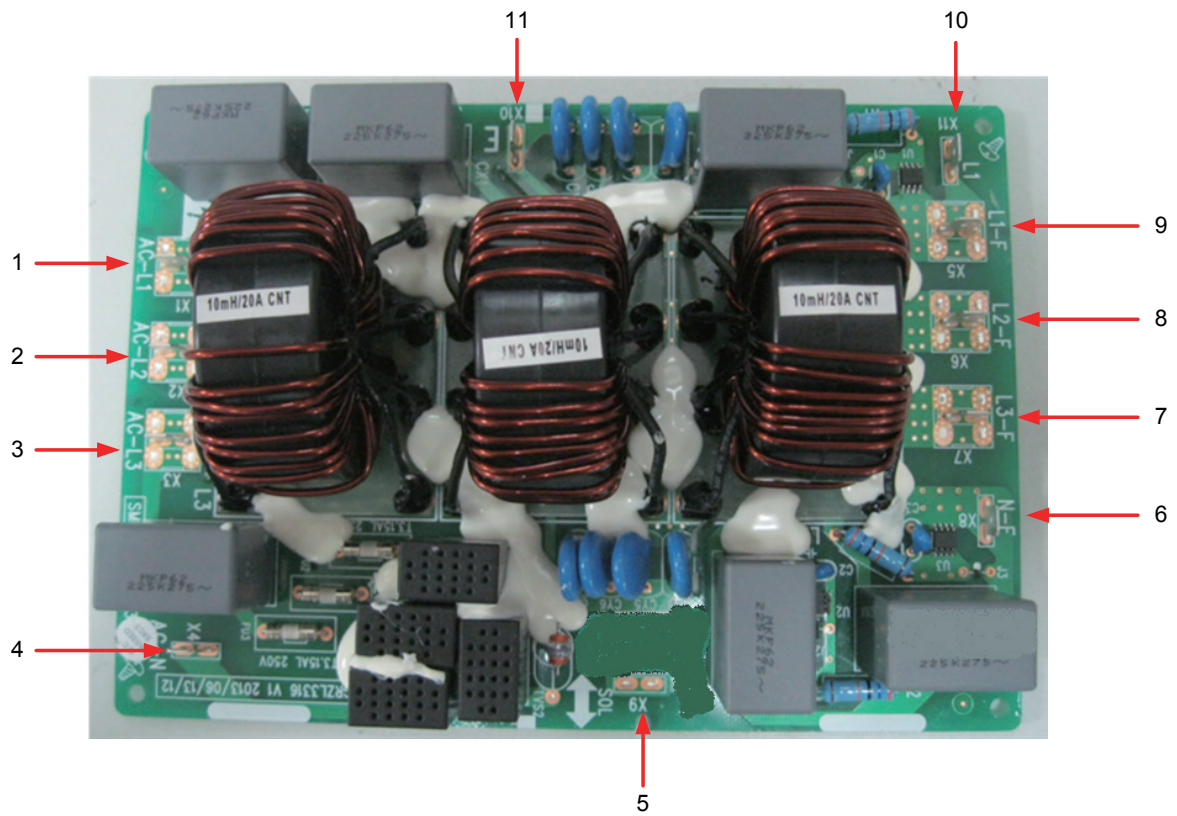
No	Silk Screen	Introduction
1	COMM	Communication interface [1-3.3V, 2-TX, 3-RX, 4-GND]
2	PWR	Switch power interface [1-310VDC, 3-GND]
3	X1	Connector to filter L1-F
4	X2	Connector to filter L2-F
5	X3	Connector to filter L3-F
6	X4	Connector to L1-1 OF PFC reactor 1
7	X5	Connector to L2-1 OF PFC reactor 2
8	X6	Connector to L3-1 OF PFC reactor 3
9	X9	Connector to L3-2 of PFC reactor 3
10	X8	Connector to L2-2 of PFC reactor 2
11	X7	Connector to L1-2 of PFC reactor 1
12	DC-BUS	Pin for electric discharge of the high-voltage bar during test.
13	X501	Connector to the compressor phase-U
14	X502	Connector to the compressor phase-V
15	X503	Connector to the compressor phase-W

(5) Filter Board (AP3): HLR8Pd/Na-K, HLR10Pd/Na-K



Silk Screen	Introduction
AC-N	Neutral line of the power supply for the main unit
AC-L	Live line of the power supply for the main unit
N-OUT	Neutral line output of the filter board (to the drive board)
	Neutral line output of the filter board (to the main board)
N-OUT1	Reserved
L-OUT	Live line output of the filter board (to the drive and main boards)
E1	To the grounding line of the main unit
E2	Reserved

(6) Filter Board (AP3):HLR12Pd/Na-M, HLR14Pd/Na-M



No	Silk Screen	Introduction
1	X1	Connector to power supply output line AC-L1
2	X2	Connector to power supply output line AC-L2
3	X3	Connector to power supply output line AC-L3
4	X4	Connector to power supply neutral line AC-N
5	X5	Connector to power supply output line L1-F (drive board L1-F and AC-L)
6	X6	Connector to power supply output line L2-F (drive board L2-F)
7	X7	Connector to power supply output line L3-F (drive board L3-F)
8	X8	Connector to power supply neutral line N-F (mainboard AC-N)
9	X9	Connector to the grounding line E , reserved
10	X10	Connector to the grounding line E

17.2 Electric Wiring

17.2.1 Wiring Principle

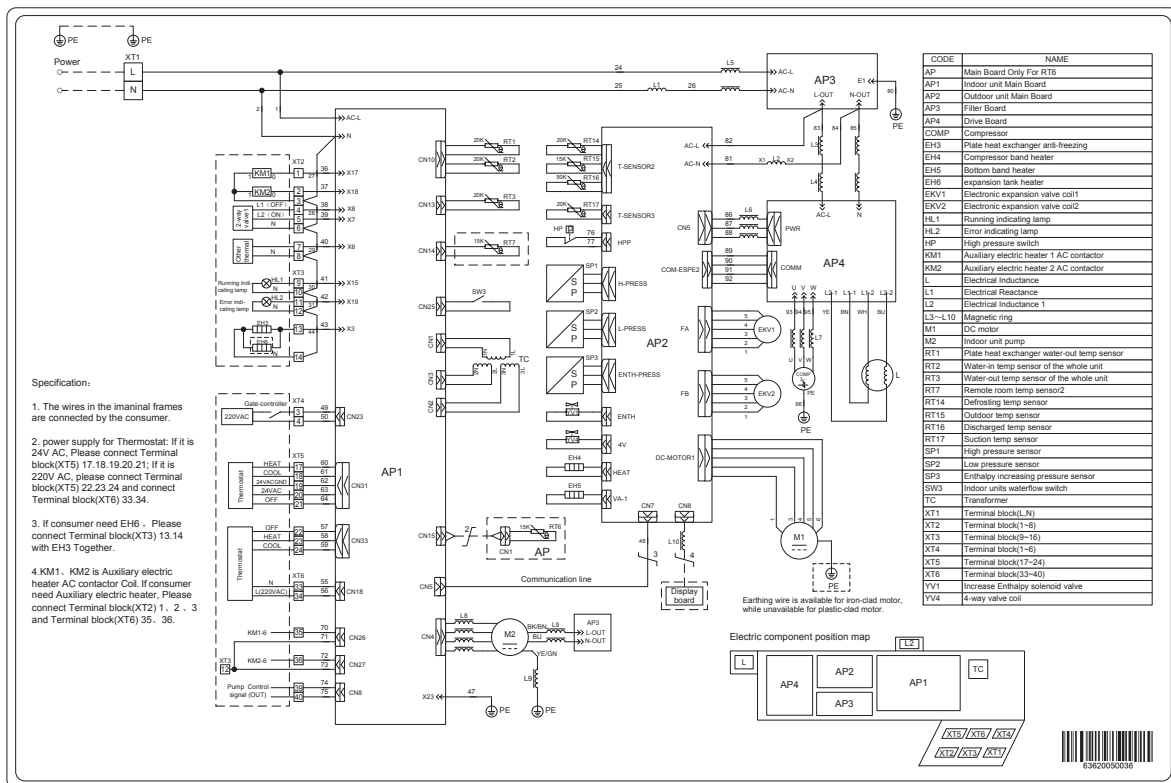
Refer to Section 15.1.

17.2.2 Electric Wiring Design

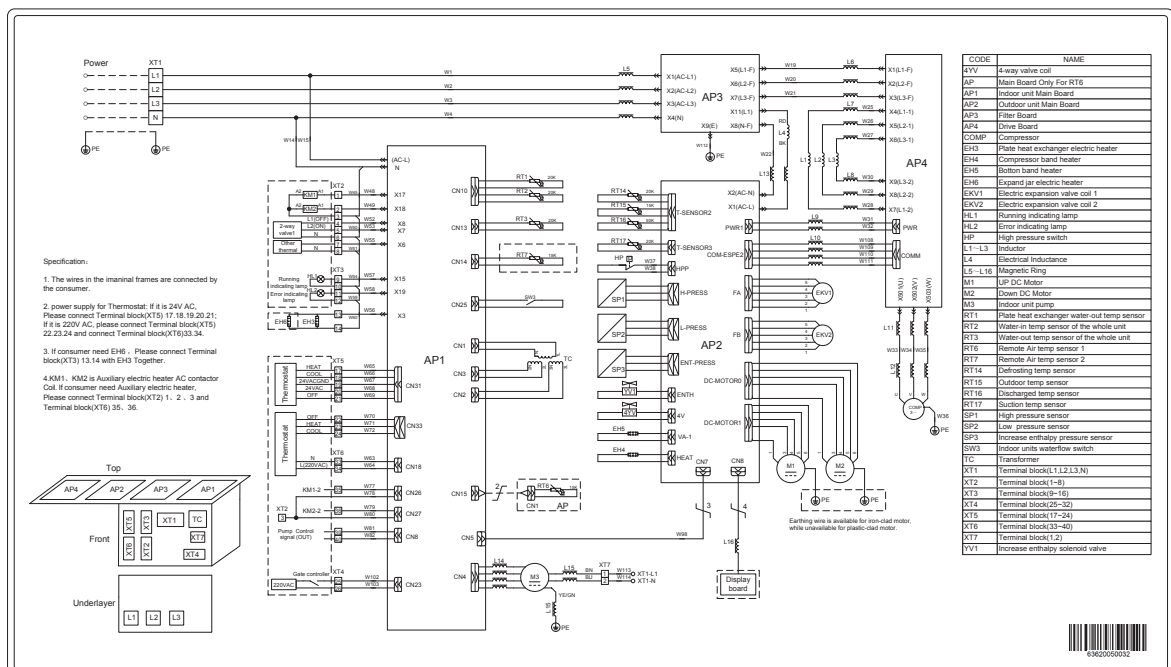
The wiring diagram stuck to the unit always prevails.

Wiring diagram: monobloc unit.

◆ HLR8Pd/Na-K, HLR10Pd/Na-K

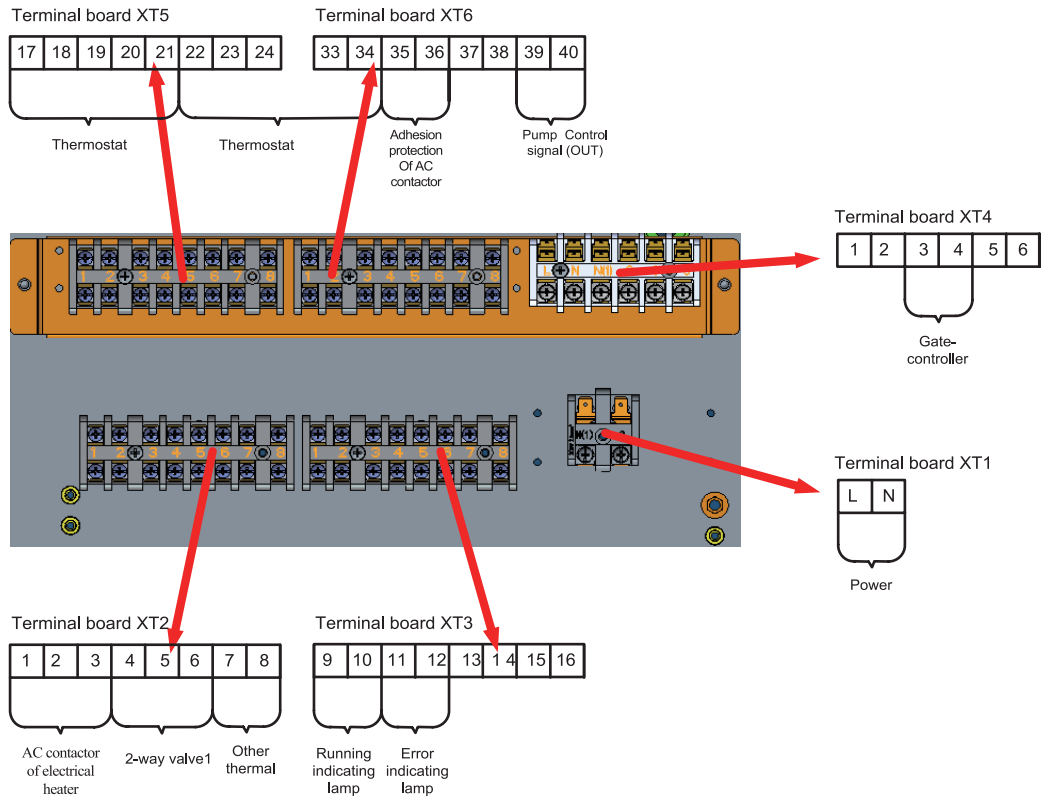


◆ HLR12Pd/Na-M, HLR14Pd/Na-M

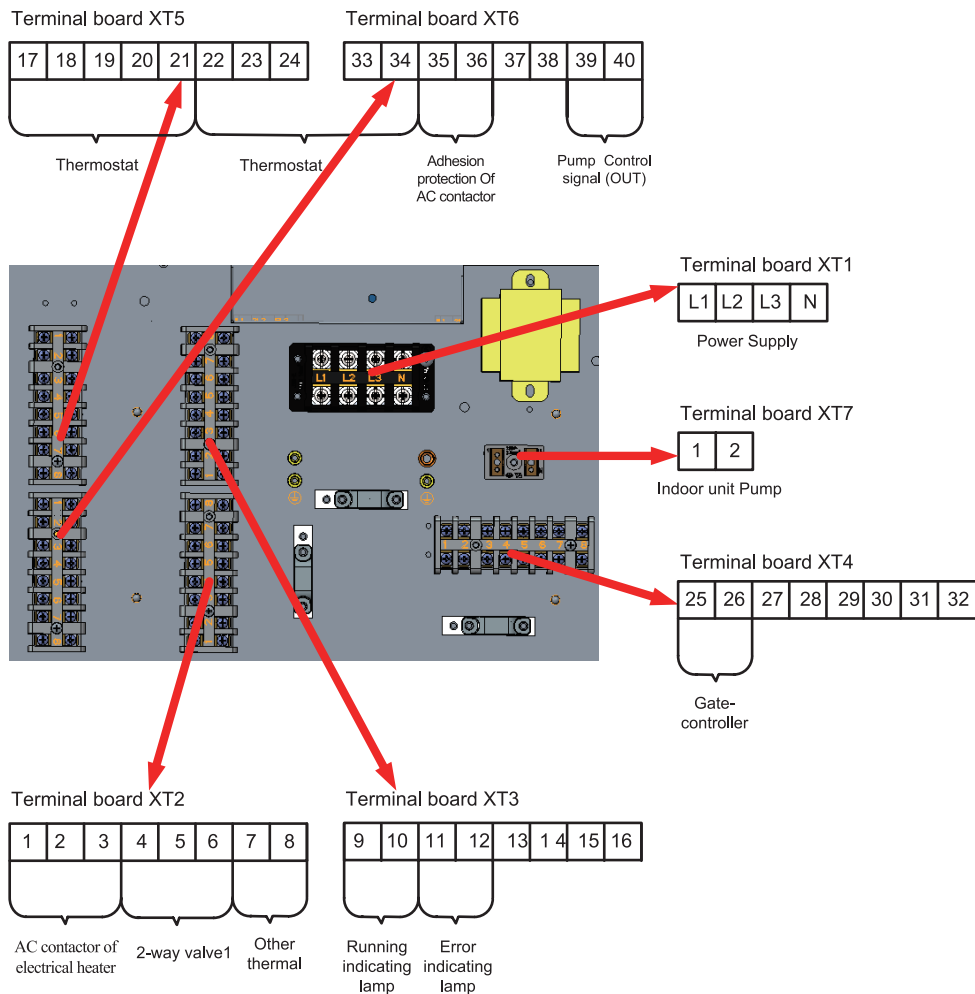


17.2.3 Terminal Board

(1) HLR8Pd/Na-K, HLR10Pd/Na-K



(2) HLR12Pd/Na-M, HLR14Pd/Na-M



18 Commissioning

18.1 Check before startup

For safety of users and unit, the unit must be started up for check before debugging. The procedures are as below:

The following items shall be performed by qualified service men.		
Confirm together with the sales engineer, dealer, installing contractor and customers for the following items finished or to be finished.		
No.	Confirmation of Installation	√
1	If the contents of Application for Installation of this Unit by Installer are real. If not, debugging will be refused.	<input type="checkbox"/>
2	Is there written notice in which amendment items are shown in respect of unqualified installation?	<input type="checkbox"/>
3	Are Application for Installation and Debugging list filed together?	<input type="checkbox"/>
No.	Pre-check	√
1	Is appearance of the unit and internal pipeline system ok during conveying, carrying or installation?	<input type="checkbox"/>
2	Check the accessories attached with the unit for quantity, package and so on.	<input type="checkbox"/>
3	Make sure there are drawings in terms of electricity, control, design of pipeline and so on.	<input type="checkbox"/>
4	Check if installation of the unit is stable enough and there is enough space for operation and repair.	<input type="checkbox"/>
5	Completely test refrigerant pressure of each unit and perform leakage detection of the unit.	<input type="checkbox"/>
6	Does power supply accord with the nameplate? Do power cords conform to applicable requirements?	<input type="checkbox"/>
7	Is power supply and control wiring connected properly according to wiring diagram? Is earthing safe? Is each terminal stable?	<input type="checkbox"/>
8	Are connection pipe, water pump, manometer, thermometer, valve etc. are installed properly?	<input type="checkbox"/>
9	Is each valve in the system open or closed according to requirements?	<input type="checkbox"/>
10	Confirm that the customers and inspection personnel of Part A are at site.	<input type="checkbox"/>
11	Is Installation Check-up Table completed and signed by the installation contractor?	<input type="checkbox"/>
Attention: If there is any item marked with ×, please notify the contractor. Items listed above are just for reference.		
Confirmed Items after pre-checking	General Evaluation: Debugging <input type="checkbox"/> Amendment <input type="checkbox"/>	
	Judge the following items (if there is not any filling, qualification will be regarded.)	
	a: Power supply and electric control system	b: Loading calculation
	c: Heating problems of Unit	d: Noise problem
	e: Pipeline problem	f: Others
	Normal debugging work can't be performed unless all installation items are qualified. If there is any problem, it must be solved firstly. The installer will be responsible for all costs for delay of debugging and re-debugging incurred by any problem which is not solved immediately.	
	Submit schedule of amending reports to installer.	
	Is the written amending report which should be signed after communication provided to installer?	
	Yes () No ()	

18.2 Test run

Test run is testing whether the unit can run normally via preoperation. If the unit cannot run normally, find and solve problems until the test run is satisfactory. All inspections must meet the requirements before performing the test run. Test run should follow the content and steps of the table below:

The following procedure should be executed by experience and qualified maintenance men.	
No.	Start up the pretest procedure
Notice: before test, ensure that all power must be cut off, including the far- end power switch, otherwise, it may cause casualty.	
1	Ensure that the compressor of the unit is preheated for 8h.
⚠Caution: heat the lubricating oil at least 8h in advance to prevent refrigerant from mixing with the lubricating oil, which may cause damage to the compressor when starting up the unit.	
2	Check whether the oil temperature of the compressor is obviously higher than the outdoor ambient temperature.
⚠Caution: if the oil temperature of the compressor is obviously higher than the outdoor ambient temperature, it means that the heating tape of compressor is damaged. In that case, the compressor will be damaged easily. Therefore, repair the heating tape before using the unit.	
3	Check whether the phase sequence of the main power supply is correct. If not, correct the phase sequence firstly.
⚠Recheck the phase sequence before start-up to avoid reverse rotation of the compressor which may damage the unit.	
4	Apply the universal electric meter to measure the insulation resistance between each outdoor phase and earth as well as between phases.
⚠Caution: defective earthing may cause electric shock.	
No.	Ready to start
1	Cut off all temporary power supply, resume all the insurance and check the electricity for the last time.
	Check the power supply and voltage of the control circuit; _____V must be $\pm 10\%$ within the range of rated operating power.
No.	Start up the unit
1	Check all the conditions needed to start up the unit: oil temperature, mode, required load etc.
2	Start up the unit, and observe the operation of compressor, electric expanding valve, fan motor and water pump etc.
	Note: the unit will be damaged under abnormal running state. Do not operate the unit in states of high pressure and high current.
Others:	
Items for acceptance after debugging	Estimation or suggestion on the general running situation: good, modify
	Identify the potential problem (nothing means the installation and debugging are in accordance with the requirements.)
	a. problem of power supply and electric control system: b. problem of load calculation:
	c. outdoor refrigerant system: d. noise problem:
	e. problem of indoor and piping system: h. other problems:
	During operation, it is needed to charge for the maintenance due to non-quality problems such as incorrect installation and maintenance.
	Acceptance
Is the user trained as required? Please sign. Yes() No()	

19 Daily Operation and Maintenance

In order to avoid damage of the unit, all protecting devices in the unit had been set before delivery, so please do not adjust or remove them.

For the first startup of the unit or next startup of unit after long-period stop (above 1 day) by cutting off the power, please electrify the unit in advance to preheat the unit for more than 8 hours.

Never put sundries on the unit and accessories. Keep dry, clean and ventilated around the unit.

Remove the dust accumulated on the condenser fin timely to ensure performance of the unit and to avoid stop of the unit for protection.

In order to avoid protection or damage of the unit caused by blockage of the water system, clean the filter in water system periodically and frequently check water replenishing device.

In order to ensure anti-freezing protection, never cut off the power if ambient temperature is below zero in winter.

In order to avoid frost crack of the unit, water in the unit and pipeline system not used for a long period should be drained.

Never frequently make the unit on/off and close the manual valve of the water system during operation of the unit by users.

Ensure frequent check to the working condition of each part to see if there is oil stain at pipeline joint and charge valve to avoid leakage of refrigerant.

If malfunction of the unit is out of control of users, please timely contact with authorized service center.

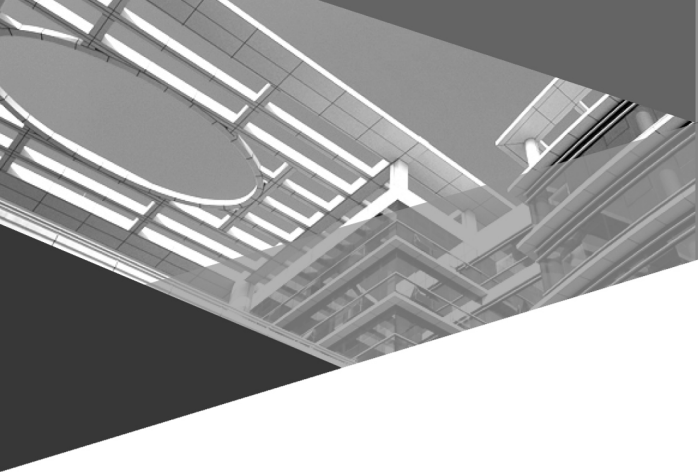
Notes:

The water pressure gage is installed in the returning water line in the unit. Please adjust the hydraulics system pressure according to next items:

- (a) If the pressure is less than 0.5 bar, please recharge the water immediately;
- (b) When recharging, the hydraulics system pressure should be not more than 2.5 Bar.

Troubleshooting

Malfunctions	Reasons	Troubleshooting
Compressor does not start up	<ul style="list-style-type: none"> • Power supply has problem. • Connection wire is loose. • Malfunction of mainboard. • Malfunction of compressor. 	<ul style="list-style-type: none"> • Phase sequence is reverse. • Check out and re-fix. • Find out the reasons and repair. • Replace compressor.
Heavy noise of fan	<ul style="list-style-type: none"> • Fixing bolt of fan is loose. • Fan blade touches shell or grill. • Operation of fan is unreliable. 	<ul style="list-style-type: none"> • Re-fix fixing bolt of fan. • Find out the reasons and adjust. • Replace fan.
Heavy noise of compressor	<ul style="list-style-type: none"> • Liquid slugging happens when liquid refrigerant enters into compressor. • Internal parts in compressor are broken. 	<ul style="list-style-type: none"> • Check if expansion valve is failure and temp. sensor is loose .If that, repair it. • Replace compressor.
Water pump does not run or runs abnormally	<ul style="list-style-type: none"> • Malfunction of power supply or terminal. • Malfunction of relay. • There is air in water pipe. 	<ul style="list-style-type: none"> • Find out the reasons and repair. • Replace relay. • Evacuate.
Compressor starts or stops frequently	<ul style="list-style-type: none"> • Poor or excess refrigerant. • Poor circulation of water system. • Low load. 	<ul style="list-style-type: none"> • Discharge or add part of refrigerant. • Water system is blocked or there is air in it. Check water pump, valve and pipeline. Clean water filter or evacuate. • Adjust the load or add accumulating devices.
The unit does not heat although compressor is running	<ul style="list-style-type: none"> • Leakage of refrigerant. • Malfunction of compressor. 	<ul style="list-style-type: none"> • Repair by leakage detection and add refrigerant. • Replace compressor.
Poor efficiency of hot water heating	<ul style="list-style-type: none"> • Poor heat insulation of water system. • Poor heat exchange of evaporator. • Poor refrigerant • Blockage of heat exchanger at water side. 	<ul style="list-style-type: none"> • Enhance heat insulation efficiency of the system. • Check if air in or out of unit is normal and clean evaporator of the unit. • Check if refrigerant of unit leaks. • Clean or replace heat exchanger.



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