

AIR-COOLED SCROLL CHILLER

(GC201108-I)

TER CONDITIONERS GREE MAKING BETTER CONDITIONERS GREE MAKING BETTER CONDITIONERS GREE MAKING BETTER CONDITIONERS

TECHNICAL SALES GUIDE-50Hz
CAPACITY RANGE:60~1216kW
SUPER HIGH AMBIENT OPERATION TO 46°C



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R410A



GREE ELECTRIC APPLIANCES INC.OF ZHUHAI

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1 MODELS LIST

| Nominal Capacity | Model | | Power Supply |
|------------------|-------------|---------------------------------------|--------------|
| TR | Refrigerant | Model Name | Ph, V, Hz |
| 17.8 | R410A | LSQWRF65MG/NaC-M LSQWF65MG/NaC-M | 3,380-415,50 |
| 20.3 | | LSQWRF80MG/NaC-M LSQWF80MG/NaC-M | 3,380-415,50 |
| 35.5 | | LSQWRF80MG/NaC-M LSQWF80MG/NaC-M | 3,380-415,50 |
| 40.7 | | LSQWRF160MG/NaC-M LSQWF160MG/NaC-M | 3,380-415,50 |
| 17.8 | | LSQWRF65MG/NaC-F LSQWF65MG/NaC-F | 3,220,60 |
| 20.3 | | LSQWRF80MG/NaC-F LSQWF80MG/NaC-F | 3,220,60 |
| 35.5 | | LSQWRF130MG/NaC-F LSQWF130MG/NaC-F | 3,220,60 |
| 40.7 | | LSQWRF160MG/NaC-F LSQWF160MG/NaC-F | 3,220,60 |

2 NOMENCLATURE

| LS QW R F 80 M G/Na C-F | | |
|-------------------------|--------------------------|--|
| Model | Model Description | Options |
| LS | Water Chiller | - |
| QW | Scroll Compressor | - |
| R | Heat Pump | Default- Cooling only R-Heat pump |
| F | Air Cooled | - |
| 80 | Nominal Cooling Capacity | 65=62.5kW= 17.8 TR 80=71.5kW= 20.3 TR 130=125kW=35.5 TR 160=143kW=40.7 TR |
| M | Module | - |
| G | Refrigerant | - |
| Na | Voltage | Na-R410A |
| C | Product number | - |
| F | Series number | F:220V 3N~ 60Hz M:380-415V 3N~ 50Hz |

3 FEATURES



3.1 Brief Introduction

The units with multi refrigerant circuits from 62.5 to 143 kW have outstanding benefits that make this product effective for a variety of applications. The units are shipped from the factory completely ready for installation and use. Each unit is pressure-tested, evacuated, and fully charged with R410A, and has an initial oil charge. After assembly, a complete operation test is performed with water flowing through the cooler to assure that the refrigeration circuit operates correctly.

The units can be installed on the rooftop, ground outside and so on instead of being equipped within a special machine room. It can be widely applied in new built or reconstructed industry and civil-building project, such as hotel, apartment, restaurant, office building, shopping mall, theater, gymnasium, hospital and so on, as well as supplies required cooling water for factories in technical process of producing, so it's especially suitable for some special locations around where there are high-level requirements for noise and environments and cooling tower are difficult to install.



3.2 Standard Specifications

◆ High Efficiency Full Load Operation

Utilizing new scroll compressor technology, the chillers meet or exceed the performance requirements of ASHRAE 90.1. All system components are selected for optimum performance, including the condenser coil areas and evaporator sizes.

◆ Excellent Part Load Performance

By using multi compressors on each chiller, unloading characteristics and part load performance are outstanding. Integrated part load value (IPLV) is a part load performance indicator as outlined in ARI Standard 550/590-1998. The IPLV rating compares the performance of different chillers under identical conditions. When the IPLV is listed in EER (Energy Efficiency Ratio), a higher EER will indicate that the chiller's overall performance is better.

◆ Compact Design with Small Footprint

The chillers have a reputation for a compact design and small footprint. A small footprint can save installation costs by minimizing the size of the concrete mounting pad or reduces the amount of structural steel if the unit is mounted on the rooftop.

◆ Quiet Operation

The chillers are designed with quiet scroll compressors. Fans are selected for good performance and lower sound levels. The attention to detail with sound is critical in the design. Small issues such as refrigerant piping, supports for piping, securing components to the structure are all important to making a quiet product. We proudly publish our sound performance.

◆ Superior Controls

GREE has provided the latest technology in controlling the chillers. The new controller provides a "user friendly" environment for the operator. The control logic is designed to provide maximum efficiency, to help provide continuing operation in unusual operating conditions through proactive controls, and to provide a history of conditions to aid in problem resolutions.

◆ Compressors

These rugged hermetic compressors are constructed with an integral cast iron frame, cast iron scrolls, three Teflon impregnated bearings, and three oil filtration devices for each compressor. One to thirty-two compressors can run, depending on the load of the system, resulting in excellent Part-load efficiency. Each refrigerant circuit has specially designed oil and gas equalization lines to control oil migration.

The design also offers radial and axial compliance, a large internal volume for liquid handling, a

removable suction screen, and a rotary dirt trap and oil screen. In addition, the compressor is self-compensating for wear, handles moderate liquid slugging, and inherently yields high efficiency.

This well protected compressor includes a solid-state motor protection module, 4 individual motor winding sensors, a patented internal discharge temperature probe, and a patented shutdown feature that prevents reverse rotation. An internal discharge check valve helps prevent shutdown noise and comes standard with high and low pressure taps with Schrader valves, a sight glass, an oil level adjustment valve, and an off cycle crankcase heater.

◆ Evaporator

The evaporator is direct expansion, shell-and-tube type with water flowing in the baffled shell side and refrigerant flowing through the tubes. Two independent refrigerant circuits within the evaporator serve the module's dual refrigerant circuits. The evaporator has a carbon steel shell and seamless high efficiency copper tubes roller expanded into a carbon steel tube sheet. Refrigerant heads are carbon steel with multi-pass baffles to provide oil return. For water removal, 10mm vent and drain plugs are provided on the top and bottom of the shell. An ambient air thermostat controls the heater cable. The fitted and glued in place insulation has a K factor of 0.28. The refrigerant side maximum working pressure is 4400 kPa. The water side working pressure is 1048 kPa.

◆ Condenser

Condenser coils have internally enhanced seamless copper tubes arranged in a staggered row pattern. The coils are mechanically expanded into flat aluminum fins with full fin collars. A variety of optional coil material and coatings are available for corrosive atmospheres.

Fans-The condenser fans are composed of corrosion resistant aluminum hub and glass-fiber-reinforced polypropylene composite blades molded into a low noise airfoil section. They are designed for maximum efficiency and are statically and dynamically balanced for vibration-free operation. They are directly driven by independent motors, and positioned for vertical air discharge. The fan guards are constructed of heavy-gauge, rust-resistant, coated steel. All blades are statically and dynamically balanced for vibration-free operation.

Motors-The fan motors are squirrel-cage type. They feature ball bearings that are double-sealed and permanently lubricated.



3.3 Standard Accessories

Unit on-off switch: ON-OFF switch is provided for manually switching the unit control circuit.

Indicator lights: LED lights indicate power on to unit, running state and fault indications due to safety devices.

Filter: Refrigerating circuits are kept free of sludge, acid and oil contamination with it.



3.4 Standard Control & Safety Devices

The chiller's Unit Control Module is an innovative, modular microprocessor control design. It coordinates the actions of the chiller in an efficient manner and provides stand-alone operation of the unit. A Human Interface Panel is a standard component of the Chiller. Access to all unit controls is via the Human Interface Panel.

Compressor In-built protection device: Motor winding temperature, discharge gas temperature and phase reversal for direction of rotation.

Crankcase heaters: Protects the unit against refrigerant migration, oil dilution and potential compressor failure.

High pressure switch: Provides protection in case of excessive discharge pressure.

Low pressure switch: Provides protection in case of unsafe low suction pressure.

4 PRODUCT DATA

➔ 4.1 Ratings

| Model Name | KW/TR | EER |
|---------------------------------------|-------------|-----|
| LSQWRF65MG/NaC-M LSQWF65MG/NaC-M | 62.5 / 17.8 | 8.6 |
| LSQWRF80MG/NaC-M LSQWF80MG/NaC-M | 71.5 / 20.3 | 9.1 |
| LSQWRF130MG/NaC-M LSQWF130MG/NaC-M | 125 / 35.5 | 8.6 |
| LSQWRF160MG/NaC-M LSQWF160MG/NaC-M | 143 / 40.7 | 9.1 |
| LSQWRF65MG/NaC-F LSQWF65MG/NaC-F | 62.5 / 17.8 | 8.6 |
| LSQWRF80MG/NaC-F LSQWF80MG/NaC-F | 71.5 / 20.3 | 9.1 |
| LSQWRF130MG/NaC-F LSQWF130MG/NaC-F | 125 / 35.5 | 8.6 |
| LSQWRF160MG/NaC-F LSQWF160MG/NaC-F | 143 / 40.7 | 9.1 |

EER=Energy Efficiency Ratio at full load-the cooling capacity in Btu's per hour(Btu/h) divided by the power input in watts, expressed in Btu/h per watts((Btu/h)/watt).

➔ 4.2 UNIT APPLICATION DATA

| | |
|---|--------------------------------|
| Voltage Variation Min./Max. | 342/420(50Hz) 198/242(60Hz) |
| Ambient Air on Condenser coil Min./Max.°C (°F) | -15/46 (41/115) |



4.3 SPECIFICATION

| Model | | LSQWF_MG/NaC-M | | | | LSQWRF_MG/NaC-M | | | | |
|---------------------------|---|--|--|-------|-------|----------------------------|-------|-------|-------|-------|
| | | 65 | 80 | 130 | 160 | 65 | 80 | 130 | 160 | |
| Rated cooling capacity | kW | 62.5 | 71.5 | 125 | 143 | 62.5 | 71.5 | 125 | 143 | |
| Input power for cooling | kW | 24.8 | 26.7 | 49.6 | 53.4 | 24.8 | 26.7 | 49.6 | 53.4 | |
| Rated heating capacity | kW | / | / | / | / | 70 | 80 | 140 | 160 | |
| Heating input power | kW | / | / | / | / | 24.1 | 26.7 | 48.1 | 53.3 | |
| Noise | dB(A) | 67 | 68 | 69 | 70 | 67 | 68 | 69 | 70 | |
| Power supply | - | 380-415V 3N~50Hz | | | | | | | | |
| Operating control | - | Microcomputer control, operating status display and abnormal status alarm | | | | | | | | |
| Safeties | - | High-low pressure protection, discharge temp. protection, motor overload protection, anti-freeze, water flow protection, phase-sequence protection, compressor overload protection | | | | | | | | |
| Compressor | Type | - | Hermetic Scroll | | | | | | | |
| | Starting mode | - | Direct starting | | | | | | | |
| Refrigerant | Type | - | R410A | | | R410A | | | | |
| | Control | - | Electronic expansion valve | | | Electronic expansion valve | | | | |
| Water side heat exchanger | Type | - | High-efficient shell and tube heat exchanger | | | | | | | |
| | Water flow | m ³ /h | 10.8 | 12.3 | 21.5 | 24.6 | 10.8 | 12.3 | 21.5 | 24.6 |
| | Water resistance loss | kPa | 30 | 35 | 30 | 35 | 30 | 35 | 30 | 35 |
| | Maximum bearing pressure | MPa | 1 | | | | | | | |
| | Water In/Outlet Pipe Flange Specification | mm | DN 50 | | DN 50 | | DN 50 | | DN 50 | |
| Air side heat exchanger | Type | - | High-efficient fin tube type heat exchanger | | | | | | | |
| | Fan Motor input power | kW | 0.7*3 | 0.7*3 | 0.7*6 | 0.7*6 | 0.7*3 | 0.7*3 | 0.7*6 | 0.7*6 |
| Outline dimension | Width | mm | 1100 | 1100 | 2200 | 2200 | 1100 | 1100 | 2200 | 2200 |
| | Depth | mm | 2265 | 2265 | 2265 | 2265 | 2265 | 2265 | 2265 | 2265 |
| | Height | mm | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 |
| Package dimension | Width | mm | 1130 | 1130 | 2230 | 2230 | 1130 | 1130 | 2230 | 2230 |
| | Depth | mm | 2295 | 2295 | 2295 | 2295 | 2295 | 2295 | 2295 | 2295 |
| | Height | mm | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 |
| Net weight | kg | 900 | 1000 | 1780 | 1980 | 950 | 1050 | 1880 | 2080 | |
| Gross weight | kg | 910 | 1010 | 1800 | 2000 | 960 | 1060 | 1900 | 2100 | |

| Model | | LSQWF_MG/NaC-F | | | | LSQWRF_MG/NaC-F | | | | |
|---------------------------|--------------------------|--|--|-------|-------|----------------------------|-------|-------|-------|-------|
| | | 65 | 80 | 130 | 160 | 65 | 80 | 130 | 160 | |
| Rated cooling capacity | kW | 62.5 | 71.5 | 125 | 143 | 62.5 | 71.5 | 125 | 143 | |
| Input power for cooling | kW | 24.8 | 26.7 | 49.6 | 53.4 | 24.8 | 26.7 | 49.6 | 53.4 | |
| Rated heating capacity | kW | / | / | / | / | 70 | 80 | 140 | 160 | |
| Heating input power | kW | / | / | / | / | 24.1 | 26.7 | 48.1 | 53.3 | |
| Noise | dB(A) | 67 | 68 | 69 | 70 | 67 | 68 | 69 | 70 | |
| Power supply | - | 220V 3N~60Hz | | | | | | | | |
| Operating control | - | Microcomputer control, operating status display and abnormal status alarm | | | | | | | | |
| Safeties | - | High-low pressure protection, discharge temp. protection, motor overload protection, anti-freeze, water flow protection, phase-sequence protection, compressor overload protection | | | | | | | | |
| Compressor | Type | - | Hermetic Scroll | | | | | | | |
| | Starting mode | - | Direct starting | | | | | | | |
| Refrigerant | Type | - | R410A | | | R410A | | | | |
| | Control | - | Electronic expansion valve | | | Electronic expansion valve | | | | |
| Water side heat exchanger | Type | - | High-efficient shell and tube heat exchanger | | | | | | | |
| | Water flow | m ³ /h | 10.8 | 12.3 | 21.5 | 24.6 | 10.8 | 12.3 | 21.5 | 24.6 |
| | Water resistance loss | kPa | 30 | 35 | 30 | 35 | 30 | 35 | 30 | 35 |
| | Maximum bearing pressure | MPa | 1 | | | | | | | |
| Air side heat exchanger | Type | - | High-efficient fin tube type heat exchanger | | | | | | | |
| | Fan Motor input power | kW | 0.7*3 | 0.7*3 | 0.7*6 | 0.7*6 | 0.7*3 | 0.7*3 | 0.7*6 | 0.7*6 |
| Outline dimension | Width | mm | 1100 | 1100 | 2200 | 2200 | 1100 | 1100 | 2200 | 2200 |
| | Depth | mm | 2265 | 2265 | 2265 | 2265 | 2265 | 2265 | 2265 | 2265 |
| | Height | mm | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 |
| Package dimension | Width | mm | 1130 | 1130 | 2230 | 2230 | 1130 | 1130 | 2230 | 2230 |
| | Depth | mm | 2295 | 2295 | 2295 | 2295 | 2295 | 2295 | 2295 | 2295 |
| | Height | mm | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 | 2214 |
| Net weight | kg | 900 | 1000 | 1780 | 1980 | 950 | 1050 | 1880 | 2080 | |
| Gross weight | kg | 910 | 1010 | 1800 | 2000 | 960 | 1060 | 1900 | 2100 | |

The operation weight of the unit is equal to 110% of its net weight.

5 PERFORMANCE CORRECTION

| Performance Correction Value | | | | | |
|---------------------------------|-------------------------------|--------|--------|---------|---------|
| Leaving Chilled Water (°C / °F) | Ambient Temperature (°C / °F) | | | | |
| | 25(77) | 30(86) | 35(95) | 40(104) | 45(113) |
| 5(41.0) | 1.07 | 1.00 | 0.94 | 0.84 | 0.81 |
| 6(42.8) | 1.10 | 1.03 | 0.97 | 0.87 | 0.83 |
| 7(44.6) | 1.14 | 1.07 | 1.00 | 0.91 | 0.86 |
| 8(46.4) | 1.17 | 1.10 | 1.03 | 0.94 | 0.88 |
| 9(48.2) | 1.20 | 1.13 | 1.06 | 0.98 | 0.91 |
| 10(50.0) | 1.23 | 1.16 | 1.09 | 1.01 | 0.93 |
| 11(51.8) | 1.27 | 1.19 | 1.12 | 1.04 | 0.96 |
| 12(53.6) | 1.31 | 1.23 | 1.15 | 1.07 | 0.99 |
| 13(55.4) | 1.34 | 1.26 | 1.17 | 1.09 | 1.01 |
| 14(57.2) | 1.37 | 1.29 | 1.20 | 1.12 | 1.03 |
| 15(59.0) | 1.41 | 1.32 | 1.23 | 1.14 | 1.06 |

| Performance Correction Value | | | | | | |
|------------------------------|-------------------------------|--------|-------|-------|--------|--------|
| Hot Water Outlet (°C / °F) | Ambient Temperature (°C / °F) | | | | | |
| | -10(14) | -5(23) | 0(32) | 5(41) | 10(50) | 15(59) |
| 40(104) | 0.67 | 0.75 | 0.85 | 0.95 | 1.06 | 1.18 |
| 45(113) | 0.66 | 0.74 | 0.84 | 0.95 | 1.05 | 1.18 |
| 50(122) | 0.64 | 0.74 | 0.84 | 0.94 | 1.05 | 1.17 |

| Water side | | | Air side |
|------------|-------------------------|--|-----------------------|
| Item | Outlet water temp. (°C) | Difference of the in/outlet water temp. (°C) | Ambient temp. DB (°C) |
| Cooling | 5~15 | 2.5~8 | 5~46 |
| Heating | 40~50 | 2.5~8 | -15~24 |

6 ANTIFREEZE

◆ Ethylene Glycol Factors

The units can operate with a leaving chilled fluid temperature from of 41 °F to 59 °F (5°C ~15°C) A glycol solution is required when leaving chilled fluid temperature is below 4.5°C .The use of glycol will reduce the performance of the unit depending on concentration.

| % by Weight | 10 | 20 | 30 | 40 | 50 |
|------------------------------------|----------|----------|----------|-----------|------------|
| Freezing Point (°C / °F) | -3.3(26) | -7.8(18) | -13.9(7) | -21.7(-7) | -33.3(-29) |
| Ambient Temperature (°C / °F) | 8.3(47) | -1.7(29) | -6.7(20) | -16.7(2) | -26.7(-16) |
| Cooling Capacity Correction Factor | 0.998 | 0.993 | 0.987 | 0.980 | 0.973 |
| Water flow Correction Factor | 1.036 | 1.060 | 1.092 | 1.132 | 1.182 |
| Pressure Drop Correction Factor | 1.07 | 1.10 | 1.18 | 1.24 | 1.30 |

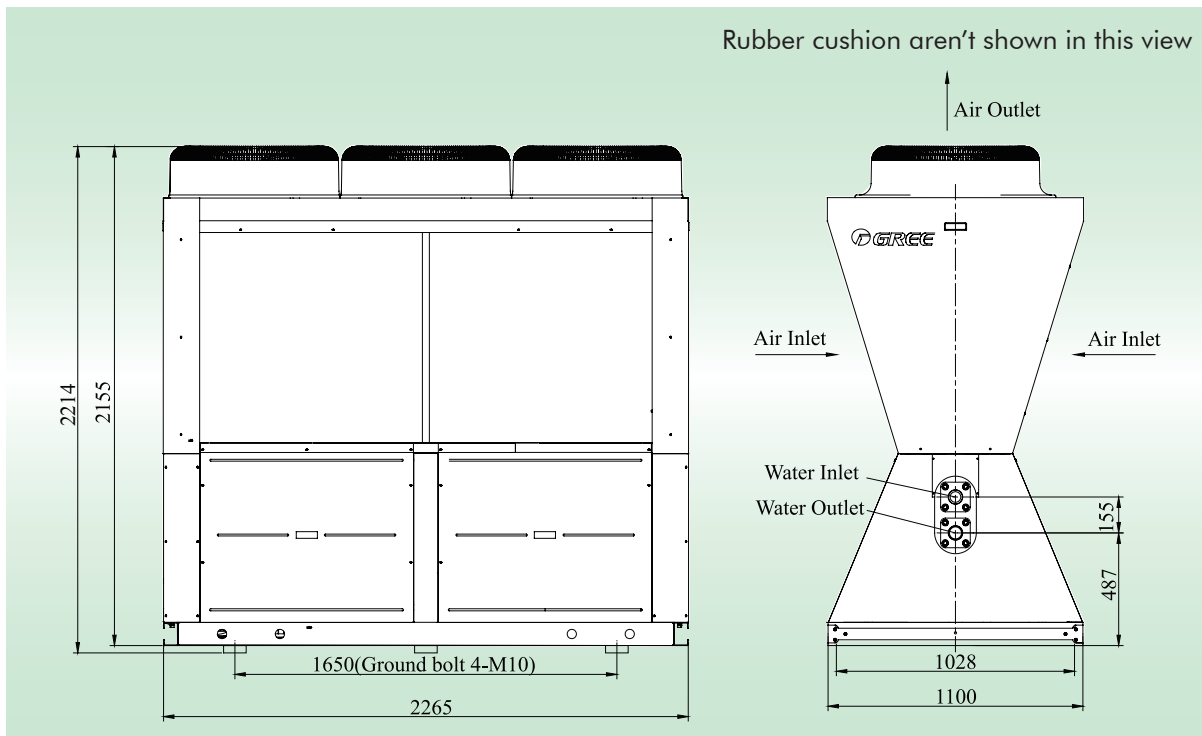
NOTE: Ethylene and propylene glycol ratio is the scope of Standard ARI 550/590-98 certification program.

7 INSTALLATION

7.1 Dimensions

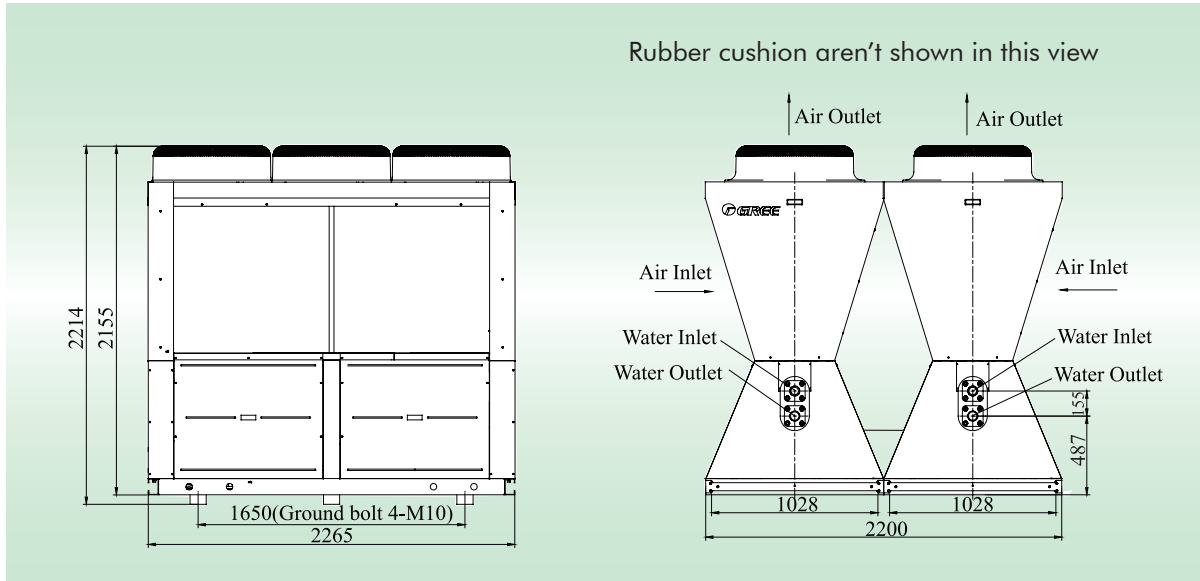
◆ Graph for the shape and dimensions for

LSQWRF65MG/NaC-M、LSQWF65MG/NaC-M、LSQWRF80MG/NaC-M、LSQWF80MG/NaC-M
MLSQWRF65MG/NaC-F、LSQWF65MG/NaC-F、LSQWRF80MG/NaC-F、LSQWF80MG/NaC-F



◆ Graph for the shape and dimensions for

LSQWRF130MG/NaC-M、LSQWF130MG/NaC-M、LSQWRF160MG/NaC-M、LSQWF160MG/NaC-M
 LSQWRF130MG/Na-F、LSQWF130MG/NaC-F、LSQWRF160MG/NaC-F、LSQWF160MG/NaC-F



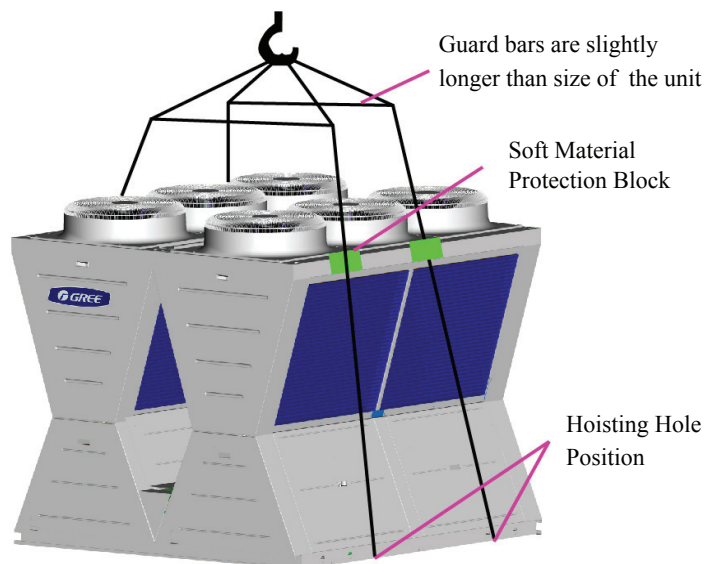
7.2 Rigging Instruction

◆ Caution

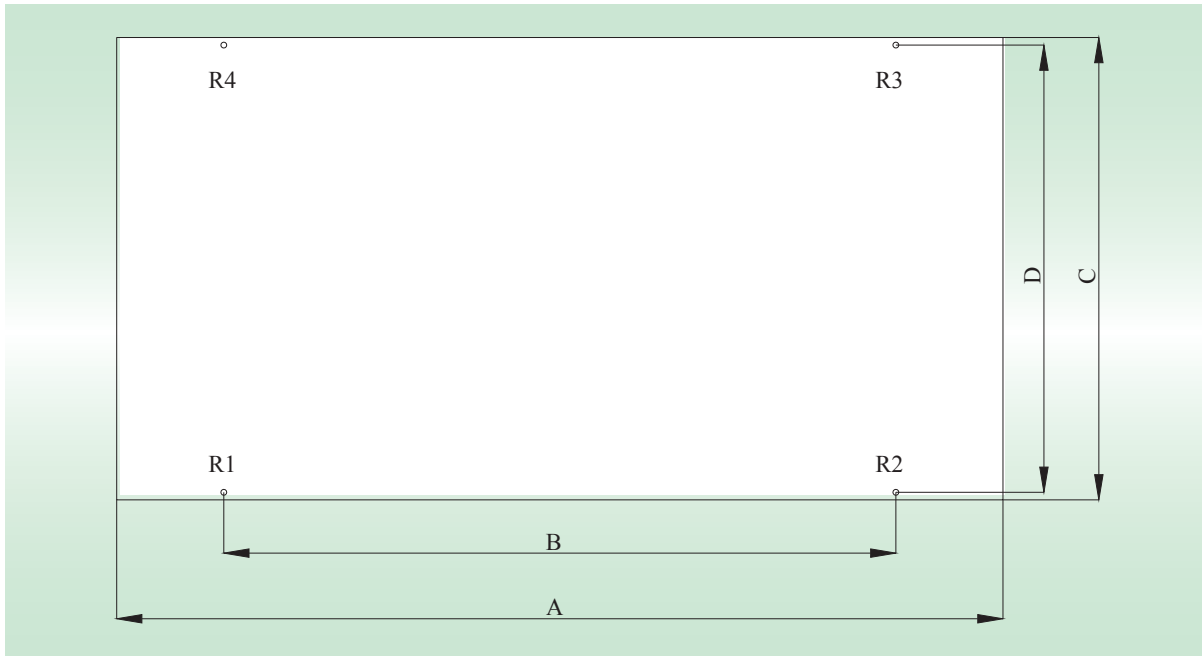
Strict inspection and test have been made to every unit before it is delivered out of factories to ensure the performance and quality. Therefore, please be careful during assembly and mobilization. Don't damage control system and pipe components.

Mobilize the unit to the nearest assembly location before removing the package. Keep the unit upward, carry the removed unit and assemble according to the following approach:

- a. Move the unit with roller rod: Put three roller rods with the same size at the bottom of the unit. Each of the rods shall be 1/5 longer than the width of the unit. Keep balance.
- b. Lifting (reference to the following Graph).



7.3 Mounting Location

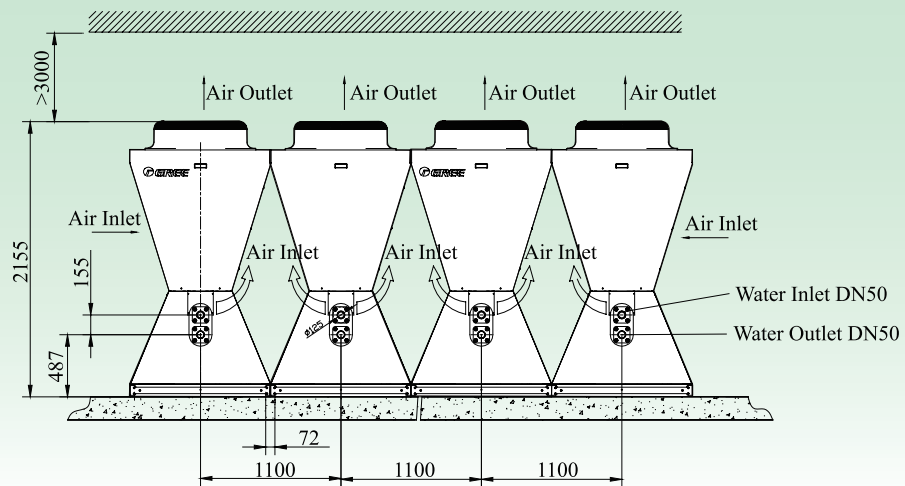


| Model Name | A | B | C | C |
|---------------------------------------|------|------|------|------|
| LSQWRF65MG/NaC-M LSQWF65MG/NaC-M | 2265 | 1650 | 1100 | 1028 |
| LSQWRF80MG/NaC-M LSQWF80MG/NaC-M | 2265 | 1650 | 1100 | 1028 |
| LSQWRF130MG/NaC-M LSQWF130MG/NaC-M | 2265 | 1650 | 2200 | 2128 |
| LSQWRF160MG/NaC-M LSQWF160MG/NaC-M | 2265 | 1650 | 2200 | 2128 |
| LSQWRF65MG/NaC-F LSQWF65MG/NaC-F | 2265 | 1650 | 1100 | 1028 |
| LSQWRF80MG/NaC-F LSQWF80MG/NaC-F | 2265 | 1650 | 1100 | 1028 |
| LSQWRF130MG/NaC-F LSQWF130MG/NaC-F | 2265 | 1650 | 2200 | 2128 |
| LSQWRF160MG/NaC-F LSQWF160MG/NaC-F | 2265 | 1650 | 2200 | 2128 |

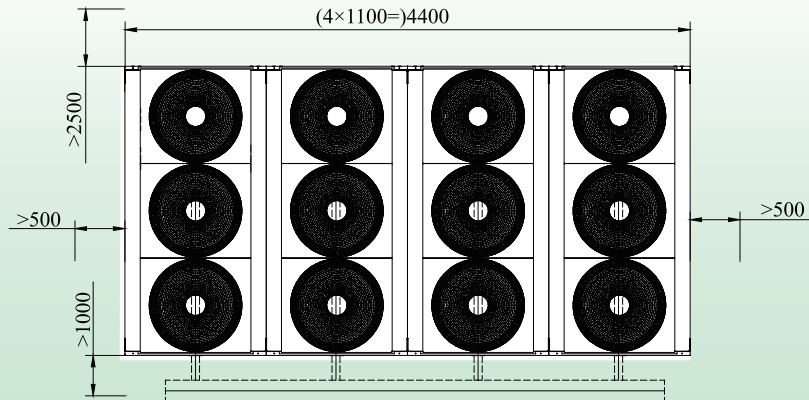


7.4 Installation Interspace

Room for unit assembly shall be open with free ventilation and without short circuit of air flow. Specific assembly sizes are shown in the graph with unit of mm.



Rubber cushion pad shall be attached under the unit base which shall be fixed on the foundation with bolts.



Mounting Dimension Diagram

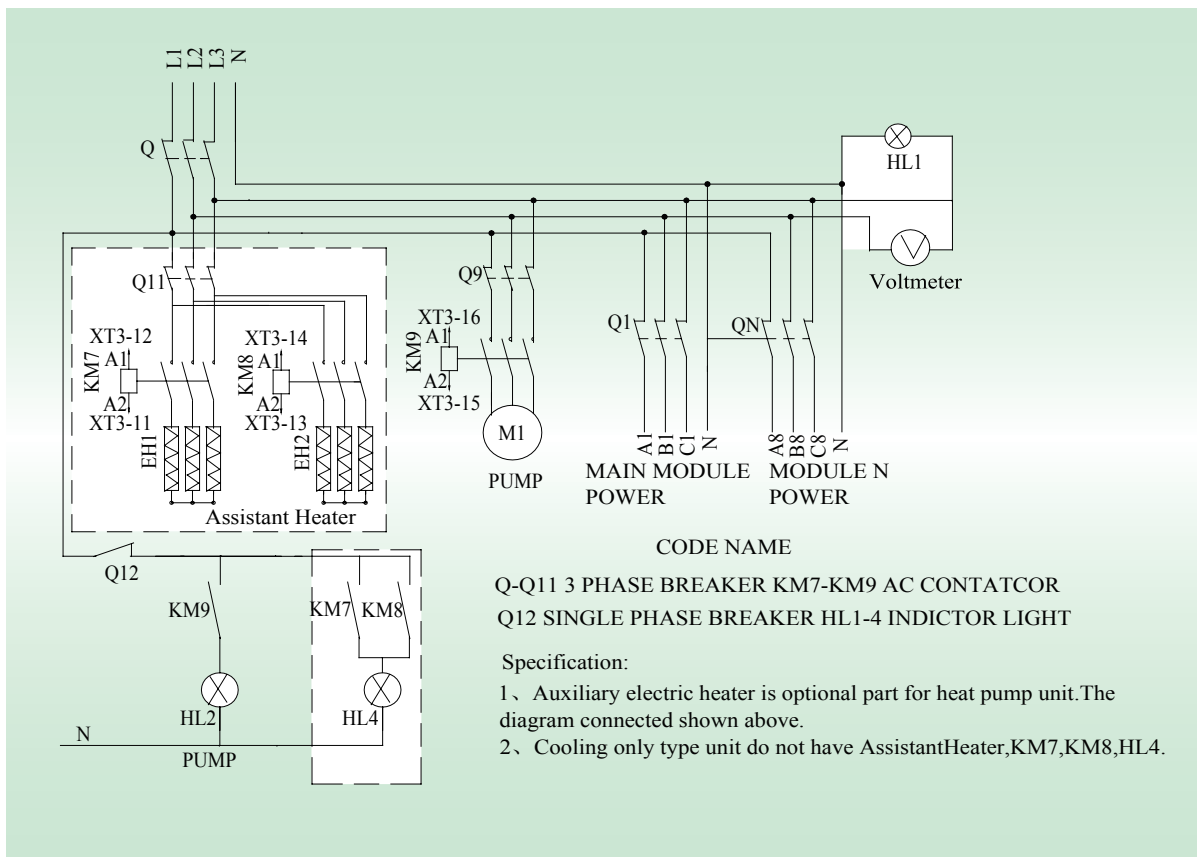
8 ELECTRICAL DATA

Power cable specifications and air switch types in the following list are recommended for selection.

| Model Name | Air switch capacity | Min. sectional area of grounding cable | Min. sectional area of power cable |
|--|---------------------|--|------------------------------------|
| | (A) | (mm ²) | (mm ²) |
| LSQWR(F)65MG/NaC-M LSQWR(F)65MG/NaC-F | 63 | 16 | 25 |
| LSQWR(F)80MG/NaC-M LSQWR(F)80MG/NaC-F | 100 | 25 | 50 |
| LSQWR(F)130MG/NaC-M LSQWR(F)130MG/NaC-F | 125 | 35 | 70 |
| LSQWR(F)160MG/NaC-M LSQWR(F)160MG/NaC-F | 180 | 50 | 95 |

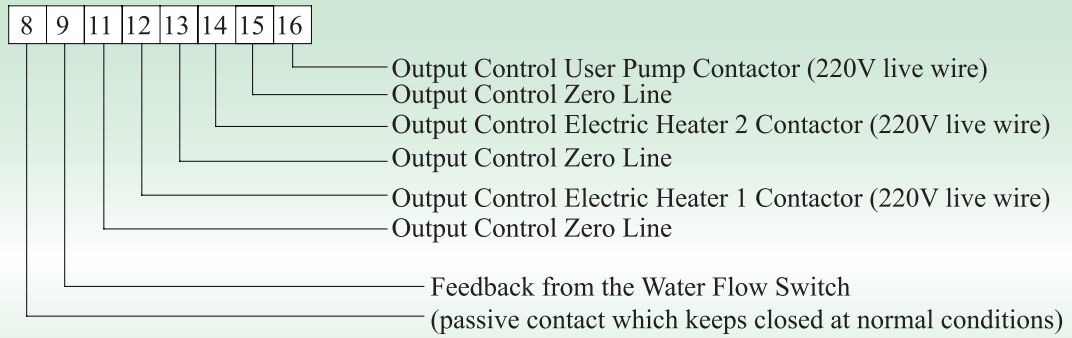
9 FIELD WIRING DIAGRAM

9.1 FIELD WIRING DIAGRAM





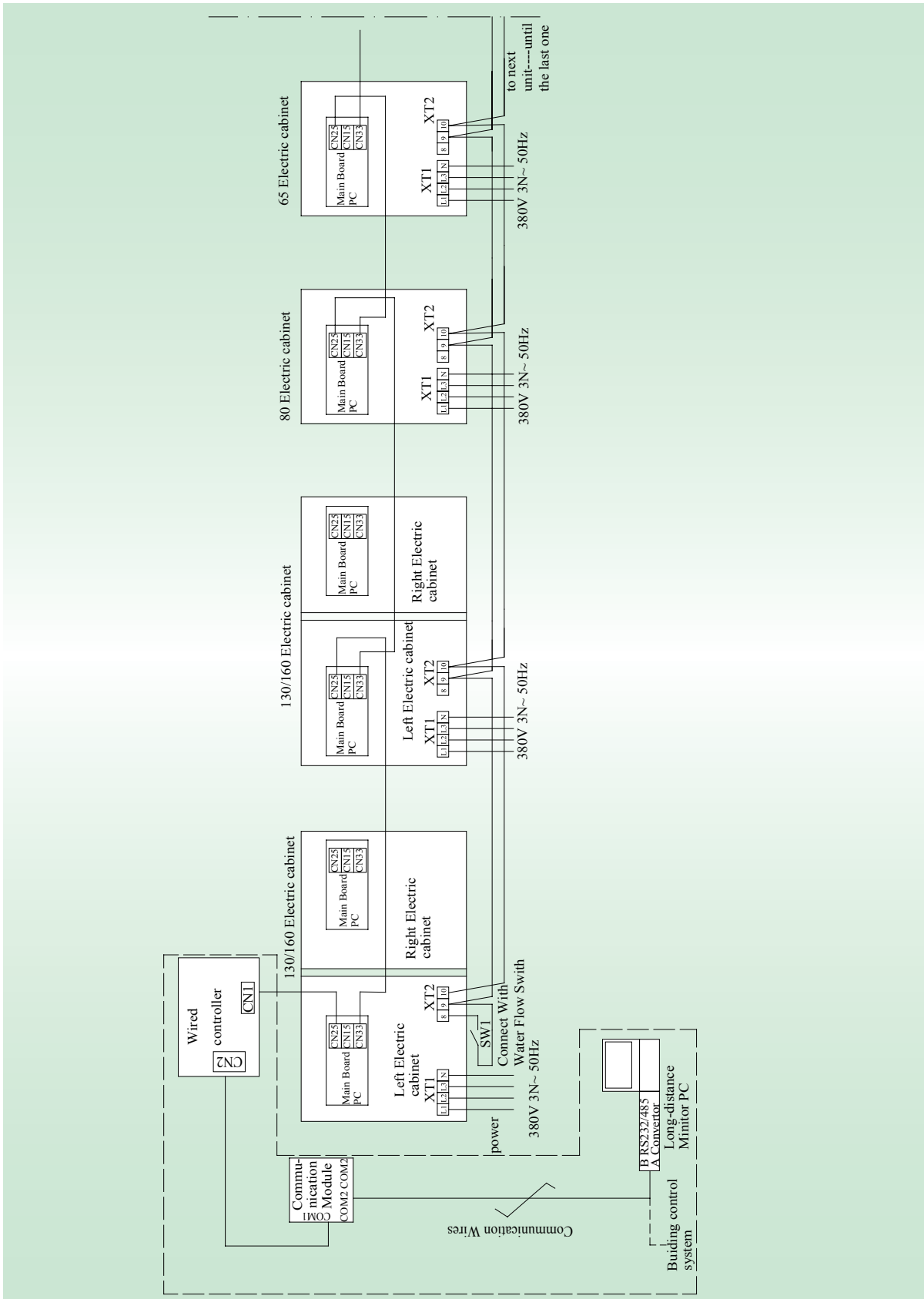
9.2 WIRING FOR EXTERNAL CONTROL USERS



Remarks:

- 1、 Auxiliary electric heater 1 and 2 and AC contactor output control line of user's pump can be connected to 11, 12, 13, 14, 15 and 16 of the terminal (XT3) of any module.
- 2、 The water flow switch is allowed to be wired to terminal (XT2) 8 and 9 on the terminal block of any module.

➔ **9.3. The Modules are connected as follow:**



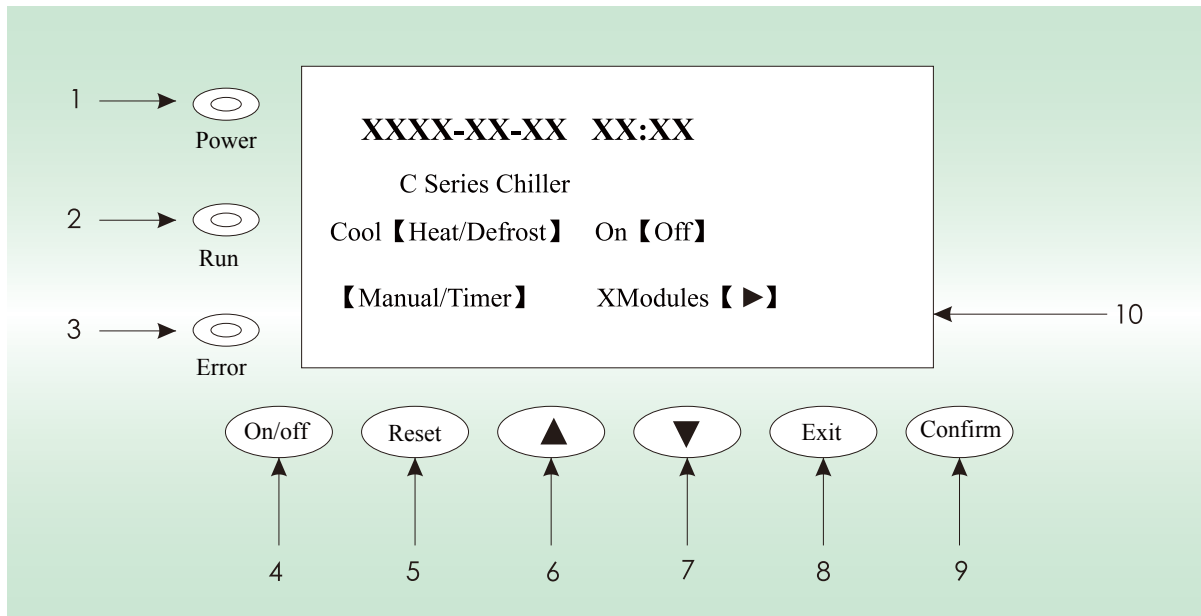
1. Use the 4-core communication wires to connect each module between CN33, CN25. Use a 3-core ($2 \times 1\text{mm}^2$) signal wires to connect the terminal 9, 10 between each modules. Refer to the diagram shown above.
2. Use a 3-core ($2 \times 1\text{mm}^2$) signal wires to connect the Water Flow Switch with the terminal 8, 9 in one of the units.
3. Use a 4-core ($4 \times 25\text{mm}^2 \sim 95\text{mm}^2$) wires to connect each module terminal XT1 L1,L2,L3,N together. Refer to the diagram shown above.
4. 130/160 means:
 - LSQW(R)F130MG/NaC-M, LSQW(R)F160MG/NaC-M, LSQW(R)F130MG/NaC-F, LSQW(R)F160MG/NaC-F; (two modules in each one).
 - 80 means: LSQW(R)F80MG/NaC-M, LSQW(R)F80MG/NaC-F; (One module in each one).
 - 65 means: LSQW(R)F65MG/NaC-M, LSQW(R)F65MG/NaC-F; (One module in each one).

10 MICROPROCESSOR CONTROLLER

1. Automatic control of compressor start/stop, condenser fans, evaporator pump, evaporator heater, unit alarm contacts, and chiller operation from 5°F to 115°F (-15°C to 46°C) ambient. Automatic reset to normal chiller operation after power failure.
2. Software stored in non-volatile memory.
3. Liquid Crystal Display, descriptions in English, numeric data in Metric unit. Sealed keypad with sections for On/Off Switch, Reset, Up, Down, Exit and Entry.
4. Programmable set-points (within Manufacturer limits): chilled liquid temperature set-point and range, evaporate heater on/off temperature set-point and range, daily schedule/holiday for start/stop.
5. Display Data: Return and leaving liquid temperatures, outdoor air temperature, discharge temperature, suction temperature, compressor run status, fan run status, day, date and time, compressor starts/operating hours.
6. System Safeties: Shall cause individual compressor systems to perform auto shut down. Manual reset required after the third trip of low pressure switch in 60 minutes. Manual reset required after every trip. Includes: high discharge temperature, high pressure switch. Compressor motor protector shall protect against damage due to high input current or thermal overload of windings.
7. Unit Safeties: Shall be automatic reset and cause compressors to shut down if low leaving chilled liquid temperature, and flow switch operation. Contractor shall provide flow switch and wiring per chiller manufacturer requirements.
8. Alarm Contacts: low leaving chilled liquid temperature, high discharge temperature, high pressure, low pressure.

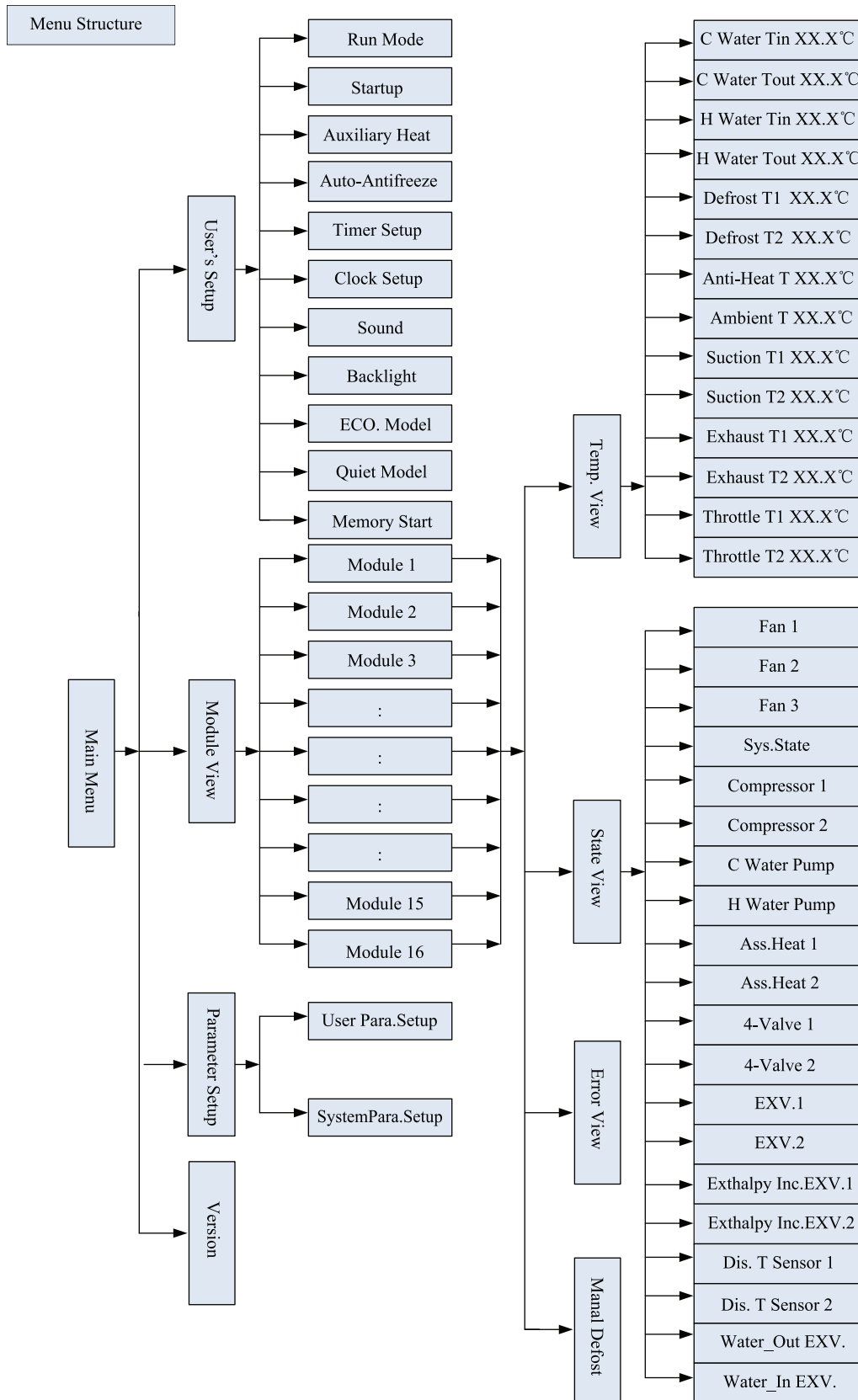
11 WIRED CONTROLLER

11.1 Operation View



1. Power indicator(red): the indicator is on when the wired controller is powered on, or otherwise it is off.
2. Run indicator (green): the indicator is on when the wired controller is started, or otherwise it is off.
3. Error indicator (red): The indicator is on when the unit is at fault, or otherwise it is off.
4. On/Off button: For controlling unit conversion between start and stop, press the button (for 3 seconds) in stop state to start the unit and press the button (for 3 seconds) in operation state to stop the unit.
5. Reset button: Press the button to clear fault and relieve the air discharge temperature sensor locking.
6. Up selection button: in menu selection, press the button to move the cursor upward or leftward; and in data modification mode, press the button to increase the value.
7. Down selection button: In menu selection, press the button to move the cursor downward or rightward; and in data modification mode, press the button to decrease the value.
8. Exit button: Press the button to go back to the previous menu.
9. Confirm button: In menu selection, press the button to confirm the selected item; and in data modification mode, press the button to confirm the parameter and move the cursor.
10. LCD: Information display zone.

➔ 11.2 Menu Structure of Controller



12 ACCESSORIES

F=Field supply

S=Standard

O=Optional

| Model | Accessories Name | Cooling only | Heat pump |
|-------|--|--------------|-----------|
| 1 | Module unit | S | S |
| 2 | wired controller (necessary) | O | O |
| 3 | Four-core control connection cord (3 meters) | S | S |
| 4 | Three-core signal cable (3 meters) | F | F |
| 5 | Water flow switch | S | S |
| 6 | Electric control box | F | F |
| 7 | Auxiliary electric heater | ---- | O |
| 8 | Power connection wire | F | F |
| 9 | Control connection cord | F | F |
| 10 | Flexible joint | F | F |
| 11 | Thermometer | F | F |
| 12 | Pressure gauge | F | F |
| 13 | Water tank | F | F |

13 APPLICATION DATA

◆ Unit Location

The chillers are designed for outdoor installation. When selecting a site for installation, be guided by the following conditions:

1. For outdoor locations of the unit, select a place having an adequate supply of fresh air for the condenser.
2. Avoid locations beneath windows or between structures where normal operating sounds may be objectionable.
3. Installation sites may be either on a roof, or on the ground.
4. The condenser fans are the propeller-type, and are not recommended for use with duct work in the condenser air stream.
5. When it is desirable to surround the unit(s), it is recommended that the screening be able to pass the required chiller CFM without exceeding 0.1" of water external static pressure.
6. Recommended clearances for units are given in DIMENSIONS. When the available space is less, the unit(s) must be equipped with the discharge pressure transducer option to permit high pressure unloading in the event that air recirculation were to occur.

◆ Foundation

The unit should be mounted on a flat and level foundation, ground or roof, capable of supporting the entire operating weight of the unit.. Operating weights are given in the Dimensions.

For ground level installations, precautions should be taken to protect the unit from being tampered by or injuring to unauthorized persons. Screws on access panels will prevent casual tampering; however, further safety precautions, such as unit enclosure options, a fencedin enclosure, or locking devices on the panels may be advisable. Check local authorities for safety regulations.

◆ Chilled Liquid Piping

The chilled liquid piping system should be laid out so that the circulating pump dis ch arges into the cooler. The inlet and outlet cooler liquid connections are given in Dimensions.

◆ Delivery and Handling

- A. Unit shall be delivered to job site fully assembled, and charged with refrigerant and oil by the Manufacturer.
- B. Unit shall be stored and handled according to the Manufacturer’s instructions.

◆ Leveling Unit

Unit must be leveled when installed to ensure proper oil return to the compressors.

◆ Fluid Temperature

Maximum leaving chilled fluid temperature for unit is 59 °F (15°C). For continuous operation, it is recommended that inlet fluid temperature does not exceed 86 °F (30°C) (If continuous operation is required for inlet water temperature above 86 °F (30°C), please refer to GREE factory).

Minimum leaving chilled fluid temperature for standard unit is 38 °F (3.3°C) (For lower leaving temperature contact GREE factory).

◆ Cooler Flow Range

The cooler can operate with a leaving chilled fluid temperature from of 42 °F to 60 °F (5°C ~16°C).

◆ Maximum Cooler Flow

It Will be based on Minimum permissible AT across the cooler 5.4 °F (-15°C).

◆ Cooler protection

A protection against low ambient freeze-up is required for ambient temperatures below 32 °F (0°C) . Protection should be in the form of: Inhibited ethylene glycol or any other suitable glycol .

◆ Condenser Airflow

Any restrictions on units fan airflow will affect unit capacity, condenser head pressure, and compressor

power input. Such restrictions (i.e. not providing vertical clearance or lateral clearance, insufficient unit-to-unit clearance) will cause warm air recirculation or coil starvation. Minimum required operational and maintenance clearances around the unit are shown in the figure below.

Gree Electric Appliance, Inc. of Zhuhai, founded in 1991, is the world's largest air conditioner enterprise integrating R&D, manufacturing, marketing and services. Technology Innovation and quality are always our priority. With efforts of thousands of Gree's engineers, we own more than 3500 patents for our products. Nowadays, we have 7 production bases in Zhuhai, Chongqing, Hefei and Zhengzhou(China), as well as Brazil, Pakistan and Vietnam, with annual production capacity of 30 million sets of residential air conditioners and 4 million sets of commercial air conditioners.

With the installation of Gree commercial air conditioners in important projects at home and abroad like Media Village for 2008 Beijing Olympic Games, Stadiums for 2010 World Cup in South Africa, as well as India Telecom base station, Gree commercial air conditioners are ready to develop steadily to every corner in the world, to present a more comfortable and harmonious working environment and family atmosphere.



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For continuous improvement in the products, Gree reserves the right to modify the product specification and appearance in this manual without notice and without incurring and obligations.

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