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</table>
## MODELS LIST

<table>
<thead>
<tr>
<th>Nominal Capacity</th>
<th>Refrigerant</th>
<th>Model Name</th>
<th>Power Supply</th>
</tr>
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<tr>
<td>77</td>
<td>R22</td>
<td>LSLBG(R)F270M/A-M</td>
<td>3,380,50</td>
</tr>
<tr>
<td>115</td>
<td>R22</td>
<td>LSLBG(R)F405M/A-M</td>
<td>3,380,50</td>
</tr>
<tr>
<td>142</td>
<td>R22</td>
<td>LSLBG(R)F500M/A-M</td>
<td>3,380,50</td>
</tr>
</tbody>
</table>

### Model Signification Options
- **LS**: Water chiller
- **BLG**: Screw compressor
- **R**: Heat pump
- **F**: Air cooled
- **270**: Nominal Cooling Capacity
- **M**: Modular
- **A**: Design code
- **M**: Voltage

### Specific Model Specifications
- **LSBLG R F 270 M/A-M**
- **Options**
  - /
  - R-heat pump none-cooling only
  - /
3 FEATURES

3.1 Description
GREE modular air-cooled screw (heat pumps) chillers are such equipments which can be integrated together with the air handling units such as air-cooled packaged units and hydronic air handling units etc into various large-sized central air conditioning systems to provide chilled water in summer and hot water in winter. These air-cooled systems do not require the cooling tower, cooling water pump, and therefore are especially applicable to where there is insufficient water source. They are not restricted to be installed in the machine room but instead at the rooftop and outdoor floor etc. They are widely used for newly or refitted large and small industrial or civil buildings, such as hotels, apartments, restaurants, office buildings, shopping malls, cinemas, theaters, stadiums, hospitals, workshops, and especially where there are high requirements on noise and environment, or it is not allowed for the installation of boilers, or it is inconvenient for the installation of the cooling tower etc.

Composed of the high-efficiency dual-screw compressor, the low-noise axial flow fan, the high-accuracy electronic expansion valve and the advanced control system, GREE modular air-cooled screw (heat pump) chillers are the embodiment of GREE years’ design experience and multiple advanced technical achievements.

3.2 Standard Specifications
◆ Modular design
Modules of difference model and different cooling capacity can be combined together so as to extent the total cooling capacity.

◆ Free master module design
Any module can be taken as the master. That is, when one module fails, other modules will still work normally.

◆ Equilibrium control of compressors
Each compressor will operate based on the equilibrium accumulative runtime so as to extend their service life, lower the starting current, and reduce the impact fact upon the electric network.

◆ Compact structure design
The modular design enables the compact structure, which will facilitate the transportation and field installation.

◆ High energy efficiency
The high-efficiency dual-screw compressors can effectively eliminate leakage, and improve the operation performance. Moreover, these compressors can provide direct linkage with the motor and stepless control of the guide vane. Thanks to the hi-quality system and reliable control, the unit will run in high efficiency no matter at full load or at part load.

The world-known hi-accuracy electronic expansion valves are used to dynamically control the super-heating degree at the outlet of the evaporator, enhance the heat exchange efficiency and realize high-accuracy water temperature control.

The refrigerant will form a liquid film on the inner wall of the evaporator tubes designed based on the heat exchange mechanism and different flow media, which help enormously improve the heat exchange performance.
exchange efficiency, reduce the loss of flow pressure and energy consumption. The GREE unique sub-cooling tube design can immensely increase the sub-cooling degree and improve the cooling capacity. The GREE patented defrosting control logics are capable to judge when to perform defrosting and when not. Therefore, it will avoid unnecessary heat loss, and improve the stability of the hot water temperature and heating capacity.

◆ High reliability
As a specialized air conditioner manufacturer, GREE is always dedicated to technical reform and innovation, including: selecting the high-quality parts and components, stringently control each manufacturing procedures, adopting the finite element calculation method, further optimize the key parts and component to prevent pipelines breaking during transport. Each unit will undergo strict factory tests to guarantee their expected quality and performance. EMC test will ensure each unit is to be of high immunity from interference. Reliable technology for cooling the motor and oil return technology will lead the compressor to run normally and stably. GREE unique fin arrangement will prevent the bottom of the fined heat exchanger from being frozen up, improve the heating capacity at the ultra-low temperature, and enhance the operation reliability.

◆ Low noise, Long service life
The compressor is composed of the high-efficiency double rotary gears designed with a service life of 10,000 hours. The dual shafts adopt the accurate positioning at both the axial and radial directions which will result in fast and stable compressing speed, low pressure fluctuation, low vibration and reliable operation.

◆ Easy installation, operation and service
Diluent cooling is used for the motor of the compressor so that the user is unnecessary to prepare the cooling or ventilating devices in the machine room. The oil cooler is not required as oil is cooled by the refrigerant circuit. Moreover, the unit has been lubricated in the factory and can be put into use only after piping and wiring work are finished. The display control can simplify greatly the operation, show the alarms, and realize the powerful connection (RS485 interface, allow the unit to be integrated into the building management system).

### 3.3 Advanced control
The user-friendly control panel can display the operating parameters clearly, which will simplify greatly the operation. Through the press buttons on the control, it is available to view the leaving/entering water temperature, ambient temperature, discharge temperature, suction temperature, high pressure, low pressure, current of the compressor etc.

Three start/stop modes are available, manual, timing and remote control. The control will calculate the load variation based on the water temperature difference and water temperature change rate so as to obtain the highest energy utilization efficiency. The system has complete protections. The password protection can prevent disoperation. Others include: high pressure protection, low pressure protection, high discharge protection, compressor overload protection, internal protection of the compressor, compressor over-current protection, phase reverse/loss protection, low oil level protection, water switch protection, low flow alarm, system differential pressure protection, high oil pressure difference protection, fan over-current protection, freeze protection, sensor failure protection, low discharge superheating degree protection etc.

Programmed with C++, the control system runs under the Windows operation system with high operation efficiency. The table-structured display mode is used to show the running status of the unit.
International RS485 communication is available and each computer port is allowed to connect up to 255 display controls which can control the operation of the unit, including:

1. Self-check. It helps the servicemen who are not familiar with the unit, the communication protocol and the unit model etc get a quick know of the whole air conditioning system and then realize the monitoring to the unit.

2. Viewing the running status. The servicemen are allowed to view the current running status and error records which then will be taken as the basis for service and maintenance.

3. Remote control: setting of the operating parameters of the air conditioning unit is allowed through the remote control but instead staying in the machine room in person at all times.

4. Timing control. Timing control is allowed through the BMS in accordance with the service time and operating requirements on the air conditioning unit by the user. For instance, if the service period of the air conditioning system is from 8:00-17:00 for an office building, the unit can automatically operate in this expected service period everyday as long as the timing control is set through the remote control software.

### 4 PRODUCT DATA

#### 4.1 Ratings

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity kW / kBTU/h</th>
<th>EER</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSBLG(R)F270M/A-M</td>
<td>270 / 921</td>
<td>3.00</td>
</tr>
<tr>
<td>LSBLG(R)F405M/A-M</td>
<td>405 / 1382</td>
<td>3.00</td>
</tr>
<tr>
<td>LSBLG(R)F500M/A-M</td>
<td>500 / 1706</td>
<td>3.09</td>
</tr>
</tbody>
</table>

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

#### 4.2 Unit Application Data

<table>
<thead>
<tr>
<th>Voltage Variation Min./Max. 380V-3Ph-50Hz</th>
<th>342/418</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Air on Condenser coil (Cooling)Min./Max.℃ (°F)</td>
<td>18/54 (65/129)</td>
</tr>
<tr>
<td>Ambient Air on Condenser coil (Heating)Min./Max.℃ (°F)</td>
<td>-15/24 (5/75)</td>
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</tbody>
</table>
4.3 Physical Data

<table>
<thead>
<tr>
<th>Model</th>
<th>LSBLGF_M/A-M</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>270</td>
</tr>
<tr>
<td>Cooling capacity kW</td>
<td>270</td>
</tr>
<tr>
<td>Heating capacity kW</td>
<td>/</td>
</tr>
<tr>
<td>Cooling Power Input kW</td>
<td>90</td>
</tr>
<tr>
<td>Heating Power Input kW</td>
<td>/</td>
</tr>
<tr>
<td>Rated Power Input kW</td>
<td>117</td>
</tr>
<tr>
<td>IPLV</td>
<td>3.73</td>
</tr>
<tr>
<td>Noise level</td>
<td>78</td>
</tr>
<tr>
<td>Power</td>
<td>380V 3Ph 50Hz</td>
</tr>
<tr>
<td>Operating control</td>
<td>Automatic microcomputer control, operating status display, error alarms</td>
</tr>
<tr>
<td>Safety protection</td>
<td>High pressure protection, low pressure protection, compressor over-load protection, compressor internal protection, compressor over-current protection, phase loss/reversal protection, low oil level protection, water flow switch protection, low flow alarm, differential pressure protection, high oil pressure difference protection, fan over-current protection, freeze protection, sensor protection, low discharge superheating degree protection.</td>
</tr>
<tr>
<td>Compressor type</td>
<td>Semi-hermetic screw compressor</td>
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<tr>
<td>Refrigerant</td>
<td>R22</td>
</tr>
<tr>
<td>Water system</td>
<td></td>
</tr>
<tr>
<td>Water flow m³/h</td>
<td>46.4</td>
</tr>
<tr>
<td>Pressure loss kPa</td>
<td>≤50</td>
</tr>
<tr>
<td>Heat exchanger type</td>
<td>Shell-and-tube heat exchanger</td>
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<tr>
<td>Max. bearing pressure Mpa</td>
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<td>Inlet/outlet tube diameter mm</td>
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<td>Connection mode</td>
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<tr>
<td>Air System</td>
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<tr>
<td>Fan rated power kW</td>
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<tr>
<td>Outline dimensions</td>
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</tr>
<tr>
<td>Width mm</td>
<td>4000</td>
</tr>
<tr>
<td>Depth mm</td>
<td>2250</td>
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<tr>
<td>Height mm</td>
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<tr>
<td>Package dimensions</td>
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</tr>
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<td>Operating weight kg</td>
<td>3993</td>
</tr>
<tr>
<td>Layer of stacking</td>
<td>/</td>
</tr>
</tbody>
</table>

NOTE: 1 mm = 0.0394 inch

Notes:
① The unit is designed, manufactured, inspected and tested in accordance with GB/T18430.1-2007.
② The cooling capacity is measured under the following conditions:
   Outdoor DB temperature: 35℃, Leaving water temperature: 7℃, Flow rate: 0.172m³/(h·kW)
   The heating capacity is measured under the following conditions:
   Outdoor DB temperature: 7℃, WB temperature: 6℃, Leaving water temperature: 45℃, Flow rate: 0.172m³/(h·kW)
③ Heating capacity and heating power and other heating related parameters are inapplicable to the cooling only unit.
④ The operating weight is about 110% of the net weight.
⑤ The operating power of the air conditioning unit is subject to change as the load and the ambient temperature varies. Therefore, the power cable and the transformer shall be sized as per the Rated Power Input.
⑥ Parameters on the nameplate always take precedence.
<table>
<thead>
<tr>
<th>Model</th>
<th>LSBLGRF_M/A-M</th>
<th>270</th>
<th>405</th>
<th>500</th>
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<tbody>
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<td>500</td>
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<tr>
<td>Heating capacity kW</td>
<td>305</td>
<td>435</td>
<td>535</td>
<td></td>
</tr>
<tr>
<td>Cooling Power Input kW</td>
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<td>135</td>
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<tr>
<td>Heating Power Input kW</td>
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<td>160</td>
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<tr>
<td>Rated Power Input kW</td>
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<td>IPLV</td>
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<tr>
<td>Noise level dB(A)</td>
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<td>79</td>
<td>80</td>
<td></td>
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<tr>
<td>Power</td>
<td>380V 3Ph 50Hz</td>
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<td></td>
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<tr>
<td>Operating control</td>
<td>Automatic microcomputer control, operating status display, error alarms</td>
<td></td>
<td></td>
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<tr>
<td>Safety protection</td>
<td>High pressure protection, low pressure protection, compressor over-load protection, compressor internal protection, compressor over-current protection, phase loss/reversal protection, low oil level protection, flow switch protection, low flow protection, differential pressure protection, high oil pressure difference protection, fan over-current protection, freeze protection, sensor protection, low discharge superheating degree protection.</td>
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<td>Compressor type</td>
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<td></td>
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<tr>
<td>Refrigerant</td>
<td>R22</td>
<td></td>
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<tr>
<td>Water system</td>
<td>Water flow m³/h</td>
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<td>Pressure loss kPa</td>
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<td></td>
<td>Heat exchanger type</td>
<td>Shell-and-tube heat exchanger</td>
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<td></td>
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<td></td>
<td>Max. bearing pressure Mpa</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>Inlet/outlet tube diameter mm</td>
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<tr>
<td>Outline dimensions</td>
<td>Width mm</td>
<td>4000</td>
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<td>6000</td>
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<td></td>
<td>Depth mm</td>
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<td>2250</td>
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<td>Height mm</td>
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<td>Gross weight kg</td>
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<td></td>
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<td></td>
<td>Layer of stacking</td>
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<td>1</td>
</tr>
</tbody>
</table>

NOTE: 1 mm=0.0394 inch

Notes:
① The unit is designed, manufactured, inspected and tested in accordance with GB/T18430.1-2007.
② The cooling capacity is measured under the following conditions:
   Outdoor DB temperature: 35℃, Leaving water temperature: 7℃, Flow rate: 0.172 m³/(h·kW)
   The heating capacity is measured under the following conditions:
   Outdoor DB temperature: 7℃, WB temperature: 6℃, Leaving water temperature: 45℃, Flow rate: 0.172 m³/(h·kW)
③ Heating capacity and heating power and other heating related parameters are inapplicable to the cooling only unit.
④ The operating weight is about 110% of the net weight.
⑤ The operating weight of the air conditioning unit is subject to change as the load and the ambient temperature varies. Therefore, the power cable and the transformer shall be sized as per the Rated Power Input.
⑥ Parameters on the nameplate always take precedence.
5 PERFORMANCE CORRECTION

5.1 Dimension

---

Images showing performance correction charts for different models of Modular Air-cooled Screw Chillers.
6 ANTI-FREEZE

Ethylene Glycol Factors

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

<table>
<thead>
<tr>
<th>% by Weight</th>
<th>Freezing Point °C (°F)</th>
<th>Cooling Capacity Correction Factor</th>
<th>Water Flow Correction Factor</th>
<th>Pressure Drop Correction Factor</th>
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</thead>
<tbody>
<tr>
<td>10</td>
<td>-3.6 (26)</td>
<td>0.990</td>
<td>1.015</td>
<td>1.06</td>
</tr>
<tr>
<td>20</td>
<td>-7.9 (18)</td>
<td>0.980</td>
<td>1.040</td>
<td>1.12</td>
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<tr>
<td>30</td>
<td>-14 (7)</td>
<td>0.970</td>
<td>1.080</td>
<td>1.18</td>
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<tr>
<td>40</td>
<td>-22.3 (-8)</td>
<td>0.965</td>
<td>1.135</td>
<td>1.24</td>
</tr>
</tbody>
</table>

NOTE: Ethylene and propylene glycol ratings are outside the scope of ARI Standard 550/590-98 certification program.

7 INSTALLATION

7.1 Dimensions

![Diagram of dimensions](image)

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>tube diameter</th>
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<tr>
<td>LSBLG(R)F270M/A</td>
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<td>2550</td>
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<td>1080</td>
<td>530</td>
<td>DN100</td>
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<tr>
<td>LSBLG(R)F405M/A</td>
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<td>2250</td>
<td>2550</td>
<td>4000</td>
<td>2140</td>
<td>2172</td>
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<td>2140</td>
<td>2745</td>
<td>1280</td>
<td>550</td>
<td>DN125</td>
</tr>
</tbody>
</table>
7.2 Rigging Instruction

Attention to Riggers
The center of gravity is not along unit center line. Ensure that the center of gravity aligns with the main lifting point before lifting. Use spreader bar when rigging, to prevent the slings during the unit.

Caution

Notes:
① The stay bars are required during lifting.
② Use the marked lifting holes during lifting.
③ During lifting, be sure there is an angle less than 15° between the bottom surface of the unit and the horizontal plane.
④ The quantity of the fans may differ but the lifting method keeps the same.
⑤ Replace the skids with rubber pads in the accessories bag prior to the filed installation.

7.3 Mounting Location
1) The installation base shall be designed by the qualified designer in accordance with the actual field conditions.

2) The installation base shall be constructed of cement or steel and capable of withstanding the operating weight of the unit. Additionally, the surface of the base shall be flat and smooth.

3) As shown in the figure above, place a sheet of steel plate and a sheet of rubber pad on the base. After the unit is fixed with the anchor bolts, take the second grouting. Generally, the anchor bolts will be 60mm above the installation surface.

4) Enough space shall be left for installation, operation and service.

5) It is highly recommended not to locate the unit where it would be affected by fire, inflammable or corrosive gas, or waste gas. Besides, sufficient ventilation space shall be kept and effective measures should be taken against vibration and noise.

### 7.4 Installation Interspace

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSBLG(R)F270M/A-M</td>
<td>2970</td>
<td>2140</td>
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<td>LSBLG(R)F405M/A-M</td>
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<td>2140</td>
</tr>
<tr>
<td>LSBLG(R)F500M/A-M</td>
<td>5000</td>
<td>2140</td>
</tr>
</tbody>
</table>
LSBLGF270M/A-M
LSBLGF500M/A-M
LSBLGRF500M/A-M
9 SCHEMATIC WIRING DIAGRAM

Dimensions

Typical control box locations and field wiring

Field control wiring connection

Main power wiring connection
As shown in the figure below, the 4-position DIP switch is used to set the address of each module, “1” the least significant bit and “4” the highest.

**10 WIRED CONTROLLER**

Dimension
① **POWER**
- It lights up when the display is energized.

② **ERROR**
- It lights up when some errors occur.

③ **RUN**
- It lights up when the Module starts running.

④ **ON/OFF**
- It is used to start or stop the Module by a five seconds press.

⑤ **MENU**
- It is used to open the Menu Page.

⑥ ▲
- It is used to move the cursor upward to the desired option or increase the setting value. A long press on it can make a continuous increment.

⑦ ▼
- It is used to move the cursor downward to the desired option or decrease the setting value. A long press on it can make a continuous decrement.

⑧ **ENTER**
- It is used to confirm the selection or remove the cursor during parameter modification.

⑨ **EXIT**
- It is used to quit the current operation.

⑩ **Status Bar**
- It is used to display the detailed information of the current operation.

---

**Accessories**

<table>
<thead>
<tr>
<th>Accessories Name</th>
<th>Cooling only</th>
<th>Heat pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Unit</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Four-core control connection cord (8 meters)</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Water flow switch and water flow switch control board</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Display board</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Auxiliary electric heater</td>
<td>\</td>
<td>F</td>
</tr>
<tr>
<td>Electric control box</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Power connection wire</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Control connection cord</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Flexible joint</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Thermometer</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Pressure gauge</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Water tank</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>
11 MICROPROCESSOR CONTROLLER

11.1 Microprocessor Control

The microprocessor controls overall unit operation and controls a number of processes simultaneously. These processes include internal timers, reading inputs, analog to digital conversions, fan control, display control, diagnostic control, output relay control, demand limit, capacity control, head pressure control, and temperature reset. Some processes are updated almost continuously, others every 2 to 3 seconds, and some every 30 seconds. The microprocessor routine is started by switching the Emergency ON-OFF switch to ON position. Pump control of.

External pumps (where configured) will energize the cooler pump to the input occupied signal from external system. When the unit receives a call for cooling, the unit stages up in capacity to maintain the cooler fluid set point. The first unit starts 1 to 3 minutes after the call for cooling.

The microprocessor controls the capacity of the chiller and the loading capacity to satisfy actual dynamic load conditions. The control maintains leaving-fluid temperature set point shown on the panel interface through intelligent positioning of the slide valve and compressor cycling. Accuracy depends on loop volume, loop flow rate, load, and outdoor-air temperature. No adjustment for cooling range or cooler flow rate is required, because the control automatically compensates for cooling range by measuring both return-fluid temperature and leaving-fluid temperature. This is referred to as leaving-fluid temperature control with return-fluid temperature compensation. The basic logic for determining when to add or remove capacity is a time band integration of deviation from set point plus rate of change of leaving-fluid temperature.

11.2 Control Sequence

Start-up After control circuit switches on, the pre-start process takes place, then microprocessor checks itself, starts pump and waits for temperature to stabilize. The controlled pull down feature limits compressor loading on start-up to reduce demand on start-up and unnecessary compressor usage.

Capacity control On the first call for cooling, the microprocessor starts compressor and fan. The Main Base Board (MBB) responds to the supply chilled water temperature to cycle the compressors to match cooling load requirements. The Minimum Load control valve is energized by the MBB. The valve allows hot gas to pass directly into the cooler circuit on the initial step of unloading, permitting the unit to operate at lower loads with less compressor cycling.

Stage on lead unit. As additional cooling is required, the capacity of the compressor is increased by changing the position of the slide valve. As the load increases above the compressor’s capacity, another unit’s compressor is started and both staged together. The speed at which capacity is added or reduced is controlled by temperature deviation from set point and rate of temperature change of chilled fluid.

11.3 Sensors

Thermistors are used to control temperature-sensing inputs to the microprocessor. No additional thermistor sensors are required for optional leaving chilled water temperature, return water, or outdoor air.

Two refrigerant pressure transducers are used for sensing suction and discharge pressure. The microprocessor uses these inputs to control capacity and fan cycling.
12 LONG-DISTANCE MONITORING SYSTEM

12.1 Introduction to Long-distance Monitoring System

As the development and improvement of manufacturing technology and in order to solve the problems of complex distribution of the central AC in the buildings and difficult control and maintenance of them, an platform easy and reliable to operate must be provided to the users for daily management and maintenance. So this long-distance monitoring system combining electronic communication and computer technologies is developed to collect the running state of the units and to monitor and control the units from a long distance.

12.2 Installation and Selection

Notice
1. The address code of the module groups should not be conflicted in one project.
2. Optoelectronic Isolated Repeater: every 800m of communication distance equipped needs one and every 30 module groups equipped needs one.
3. The communication cable and heavy-current wire should be separated and the distance between them cannot be below 15cm.
4. Line A and line B of Bus 485 should respectively correspond with line A and line B.

### 12.3 Scope of Supply

<table>
<thead>
<tr>
<th>Scope of Supply</th>
<th>Type Selection</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>F</td>
<td>CPU: Pentium 4 or above&lt;br&gt;Memory: 512M or above&lt;br&gt;Hard Disc: 30G or above&lt;br&gt;Serial Port: 1 or above&lt;br&gt;Operation System: Windows XP/ Windows 2003/ Windows Vista/ Windows 7</td>
</tr>
<tr>
<td>Long-distance Monitoring System set FE30-00/A(M)</td>
<td>S</td>
<td>Including CD and optoelectronic isolated converter RS232- RS485</td>
</tr>
<tr>
<td>Optoelectronic isolated repeater RS485</td>
<td>O</td>
<td>One every 800m of communication distance equipped with one and One every 30 module groups equipped with one.</td>
</tr>
<tr>
<td>2-core Type-V twisted pair wire</td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

### 12.4 Confirmation of Quantity of Parts

<table>
<thead>
<tr>
<th>Types</th>
<th>Long-distance Monitoring System</th>
<th>Optoelectronic Isolated Repeater</th>
</tr>
</thead>
<tbody>
<tr>
<td>All type</td>
<td>1 Long-distance Monitoring System set FE30-00A/(M)</td>
<td>One every 800m of communication distance equipped with one.</td>
</tr>
<tr>
<td></td>
<td>One every 30 module groups equipped with one</td>
<td></td>
</tr>
</tbody>
</table>

### 12.5 Selection Example

As shown in the following example (LSBLG(R)F270M/A-M) which is equipped with six module groups, one repeater is necessary as the communication distance is more than 800m, as follow:

<table>
<thead>
<tr>
<th>Project Requirements</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty (set)</td>
<td>6 module groups(24LSBLG(R)F270M/A-M)</td>
</tr>
<tr>
<td>Long-distance Monitoring System set FE30-00/A(M)</td>
<td>1</td>
</tr>
<tr>
<td>Repeater</td>
<td>1</td>
</tr>
</tbody>
</table>
12.6 Wiring Diagram

Description of above communication cables

<table>
<thead>
<tr>
<th>Cable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Both XH 4-core pin connector (4-core Type-V twisted pair wire)</td>
</tr>
<tr>
<td>D2</td>
<td>Both XH 4-core pin connector (4-core Type-V twisted pair wire)</td>
</tr>
<tr>
<td>H2</td>
<td>Both 9-core head (Standard parts)</td>
</tr>
</tbody>
</table>
13 CENTRAL AC BMS INTERFACE

13.1 Introduction to BMS interface of Gree Central AC

BMS interface of Gree Central AC is only for Gree central AC devices. There is BMS interface or multifunctional gateway in the hardware and standard communication protocol and BMS software plug-in in the software. Gree central AC can be centrally monitored and managed through BMS interface together with other devices in the building.

13.2 Installation and Selection

BMS interface of Gree Central AC is only for Gree central AC devices. There is BMS interface or multifunctional gateway in the hardware and standard communication protocol and BMS software plug-in in the software. Gree central AC can be centrally monitored and managed through BMS interface together with other devices in the building.

Notice

1. The air conditioners could be connected with the BMS system with every different model, or several models together, below wiring diagram shows the connection way of single unit, just for easy drawing.

(2.3.4.5.6) Please check 13.2)
◆ Scope of Supply

<table>
<thead>
<tr>
<th>Scope of Supply</th>
<th>Type Selection</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>File of protocol</td>
<td>S</td>
<td>Modbus protocol is used for user to integrate with BMS system.</td>
</tr>
<tr>
<td>Optoelectronic isolated converter RS232-RS485</td>
<td>O</td>
<td>It is needed when the interface protocol of BMS system is RS232.</td>
</tr>
<tr>
<td>Optoelectronic isolated repeater RS485</td>
<td>O</td>
<td>One every 800m of communication distance equipped with one and one every 30 module groups equipped with one.</td>
</tr>
<tr>
<td>2-core Type-V twisted pair wire</td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

◆ Confirmation of Quantity of Parts

<table>
<thead>
<tr>
<th>Types</th>
<th>Optoelectronic isolated converter</th>
<th>Optoelectronic Isolated Repeater</th>
</tr>
</thead>
<tbody>
<tr>
<td>All type</td>
<td>One if BMS COM is RS232</td>
<td>One every 800m of communication distance equipped with one.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>One every 30 module groups equipped with one.</td>
</tr>
</tbody>
</table>

◆ Selection Example

BMS COM is RS232, one converter is needed. As shown in the following example (LSBLG(R)F270M/A-M) which is equipped with six module groups, one repeater is necessary as the communication distance is more than 800m, as follow:

<table>
<thead>
<tr>
<th>Project Requirements</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty(set)</td>
<td>6 module groups/24 LSBLG(R)F270M/A-M</td>
</tr>
<tr>
<td>Repeater</td>
<td>1</td>
</tr>
<tr>
<td>Optoelectronic Isolated Converter</td>
<td>1</td>
</tr>
</tbody>
</table>
**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 at ground level.
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 equipment. Operating weights are given in the 4.3 Physical Data. 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 fenced-in 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 discharges into the cooler. The inlet and outlet cooler liquid connections are given in Dimension.

◆ Delivery and Handling
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 contact 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:
Chiller ratings and performance data pertain to cooling temperature rise of 10 °F. Chillers maybe suitable for operation in a range from 5.4 to 14.5 °F temperature rise without adjustment, provided flow limits are not exceeded. High flow rate is limited by pressure drop that can be tolerated (for any high flow rate value larger than values in performance tables, please contact GREE factory).

Minimum Cooler Flow: Minimum cooler flow will be based on the maximum permissible AT across the cooler 14.5 °F.

Maximum Cooler Flow: It will be based on Minimum permissible AT across the cooler 5.4 °F.

◆ 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 re-circulation or coil starvation.

Minimum required operational and maintenance clearances around the unit are shown in the figure below.

◆ High Ambient Temperature
High outdoor ambient chiller start-up and operation are possible for chillers at ambient temperatures up to 125 °F 52 °C) at nominal voltage (for standard units). For higher ambient temperature please contact GREE factory.
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.