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AIR CONDITIONER

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SOLUTION

# Gree Photovoltaic Direct-driven Inverter Centrifugal Chiller

## Photovoltaic Direct-driven Inverter Centrifugal Chiller

Gree Photovoltaic Direct-driven Inverter Centrifugal Chiller is the world's first photovoltaic central HVAC system. This is the first time to seamlessly integrate power generation and power consumption together between clean energy and large central air conditioners. It provides you with a solution for energy-saving equipment, clean energy and intelligent management.

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# I. System Introduction

It is composed of 3 parts: photovoltaic system (BAPV), inverter centrifugal chiller, power generation and consumption integrated system with PV microgrid and HVAC group control (QK10). By utilizing PV electric current to directly drive the centrifugal chiller and by distributing power through the power generation and consumption integrated system, the utilization ratio of PV power is up to 99%. Besides, system's efficiency is 6%~8% higher than that of the solution combining grid-connected PV system and air conditioning system. According to the operation condition of PV system and centrifugal chiller, it can switch to 5 working modes as regards power generation and consumption. The switch between each mode takes less than 10ms. It is exceptionally energy saving, intelligent, adaptable and highly integrated. It could save much of the construction work as well as the installation place. It can be widely used in large office buildings, hospitals, schools, shopping malls and technical processes, or used to reconstruct the building installed with PV system and air conditioners so as to improve the operation efficiency.

## Main Features:

1. The first photovoltaic direct-driven inverter centrifugal chiller in the world

2. Distributed system in which power is self-generated, with excellent performance

3.Units are consistent with photovoltaic characteristics. Optical energy can be fully utilized to realize free electricity.

4. Excess power can be uploaded to power line to avoid power waste.

# II. System Composition

## Gree photovoltaic direct-driven inverter centrifugal chiller is composed of the following 3 parts:

### 1. Photovoltaic System BAPV

It is used to generate power for the PV centrifugal chiller. it can provide clean energy not only to the air conditioner but also to the power line through a current converter when air conditioner is not working or there is excess power left.

The PV system is closely related to the construction design. Therefore, at the beginning of construction, Gree will make the most suitable PV system plan for you according to local climate, building structure and the HVAC demands.

### Naming rules of the PV system:

| BA | PV | 0.4 |
|---|---|---|
| 1 | 2 | 3 |

| No. | Name | Options |
|---|---|---|
| 1 | BA | BA--building attached;<br>BI--building integrated. |
| 2 | PV | PV--Photovoltaic system |
| 3 | Installed capacity | Installed capacity, unit: MW |

### Common applications:

Floor

Rooftop

Integrated in the construction

Curtain wall

Sky dome

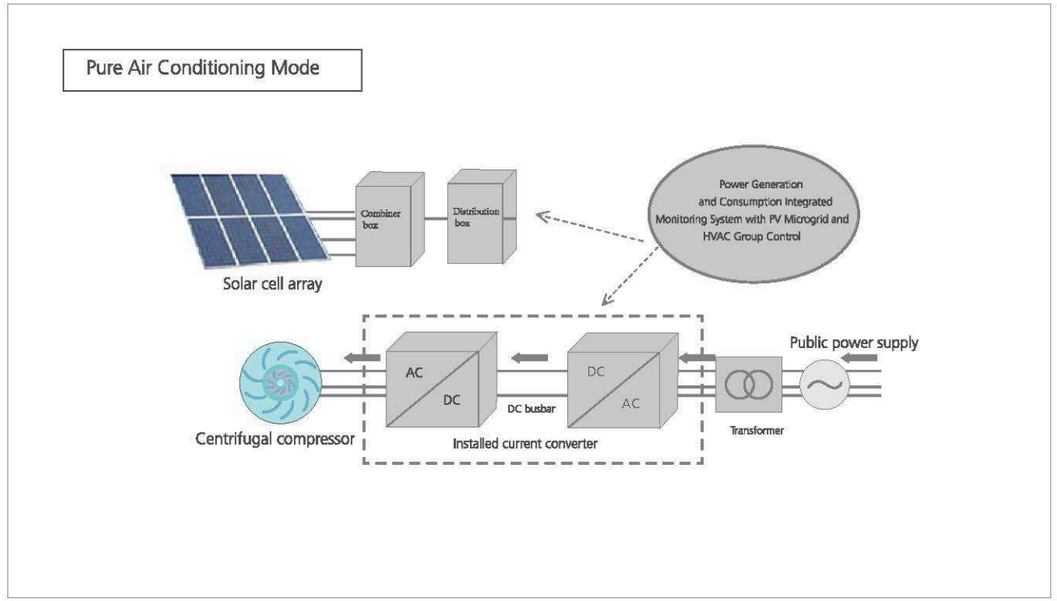
## 2. HVAC System: Photovoltaic Direct-driven Inverter Centrifugal Chiller

With the first-innovated ternary commutation technology and the PV converter function, Gree photovoltaic direct-driven centrifugal chiller is the only kind of central air conditioning equipment in the world that integrates power generation and consumption together in one system. It can switch to 5 working modes according to the condition of power generation and load demands. The switch between each mode takes less then 10ms, therefore, unit can realize a seamless connection with power line and maintain stable operation. It adopts the world's most sophisticated PMSM centrifugal chiller, whose IPLV is 11.68, ensuring high efficiency whether at full or partial load, saving more than 40% of energy compared to common centrifugal chillers. As power is supplied by the PV system, this centrifugal chiller is highly efficient and energy saving.

## 5 Working Modes:

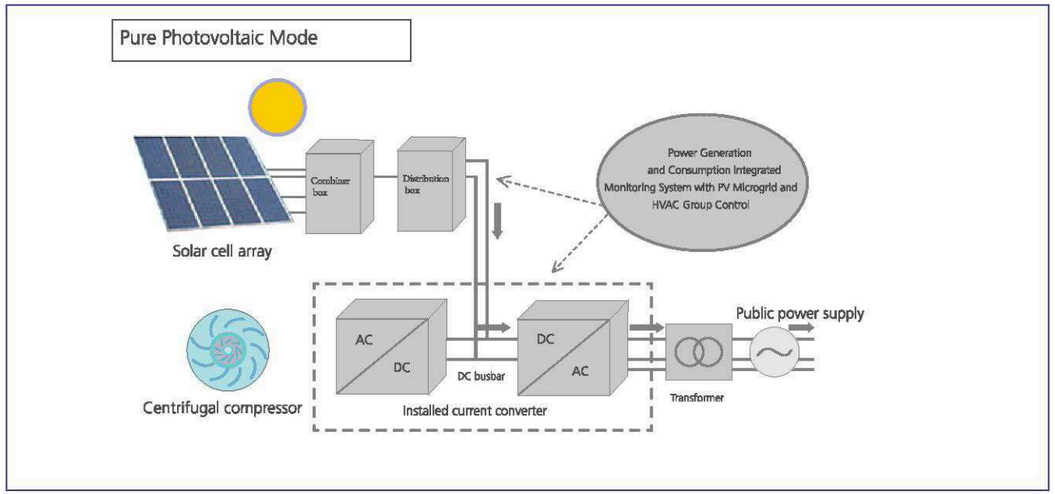
### A. Pure Air Conditioning Mode

It indicates the mode when unit draws power from power line instead of the PV system. In this mode, PV system doesn't work and unit is equal to a common inverter centrifugal chiller.



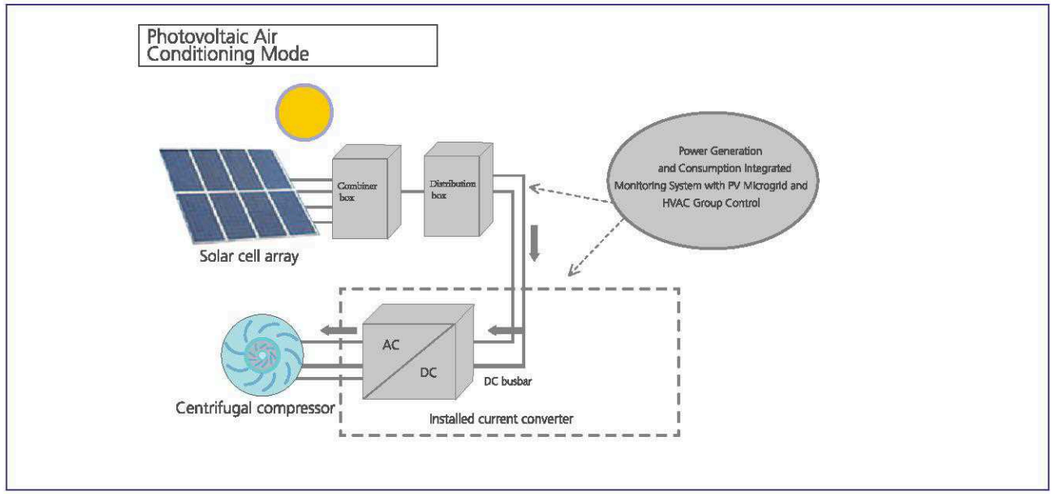

### B. Pure Photovoltaic Mode

It indicates the mode when unit is not working and the PV system is supplying all its power to the power line. In this mode, unit will function as a converter and system is equal to a PV power station.



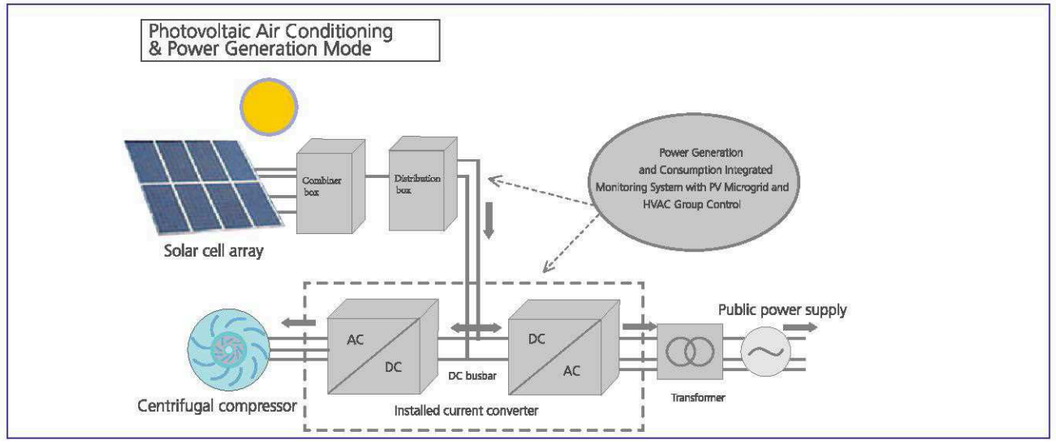

### C. Photovoltaic Air Conditioning Mode

It indicates the mode when all the power generated by the PV system is used for unit's operation. In this mode, power generated by the PV system is equal to the power consumed by the air conditioning equipment.



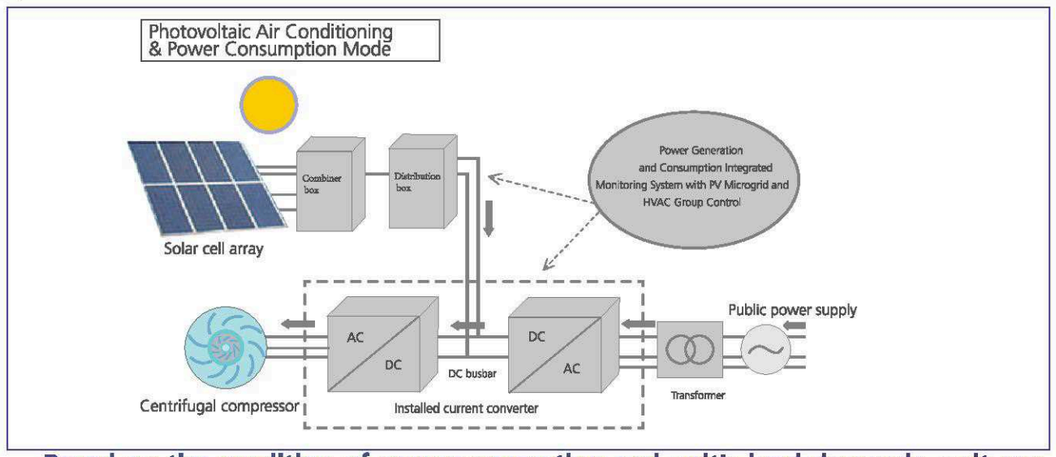
## D. Photovoltaic Air Conditioning & Power Generation Mode

It indicates the mode when power generated by the PV system is more than the power consumed by the air conditioning equipment. In this mode, some of the power supplied by the PV system is used for unit's operation while the excess power is supplied to the power line.




## E. Photovoltaic Air Conditioning & Power Consumption Mode

It indicates the mode when power generated by the PV system is less than the power consumed by the air conditioning equipment. In this mode, unit needs to draw power from the power line in addition to the PV system.




**Based on the condition of power generation and unit's load demands, unit can switch among the above 5 modes. This ensures the full utilization of PV power and unit's stable operation.**



## 3. Power Generation and Consumption Integrated System (QK10)

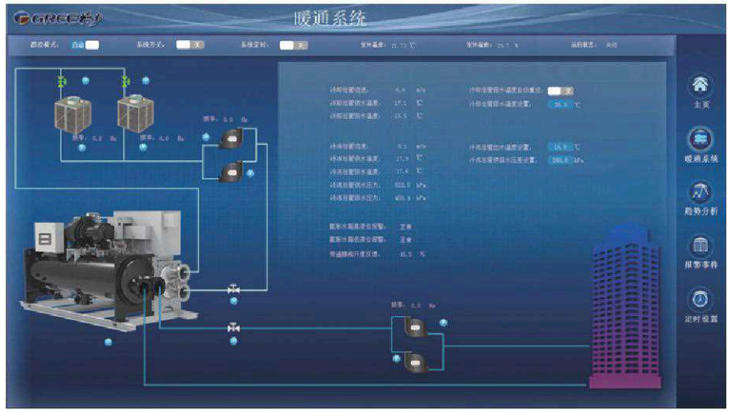

**Main Page**

This platform is designed especially for the photovoltaic direct-driven inverter centrifugal chiller. It's first developed by Gree that combines PV technology with CAC group control technology. It is not only professional in PV management but CAC power management as well. This platform is also capable of monitoring common PV system to achieve integrated intelligent management.

PV management refers to the management of PV system and the PV direct-driven inverter centrifugal chiller itself, including the management of PV load prediction, current optimizing control, distributed power supply control, etc. It can monitor every part relating to the PV system, such as the solar cell array, PV lightening prevention combiner box, DC power distribution box, AC power distribution box and countercurrent prevention device, as well as the 5 working modes of the centrifugal chiller.

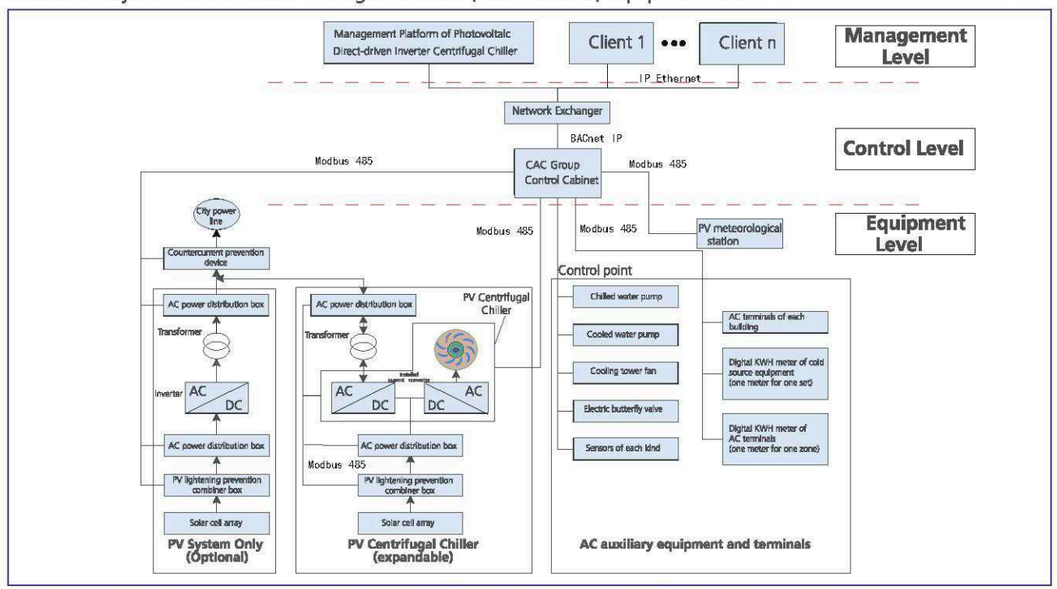
**Monitor Pictures of PV Management**

CAC power management can monitor the cold source system and all HVAC equipment, including chilled water pump, cooled water pump, cooling tower fan, electric butterfly valve, sensors, terminals of each building, power consumption, etc. This is a professional management solution, which can control the inverter water pump and inverter cooling tower fan according to PID calculation method with the help of HVAC group control technology. What's more, by adopting the control strategy that is based on PV power generation, it can control unit's load output so as to maximize the energy efficiency of the entire cold source system.



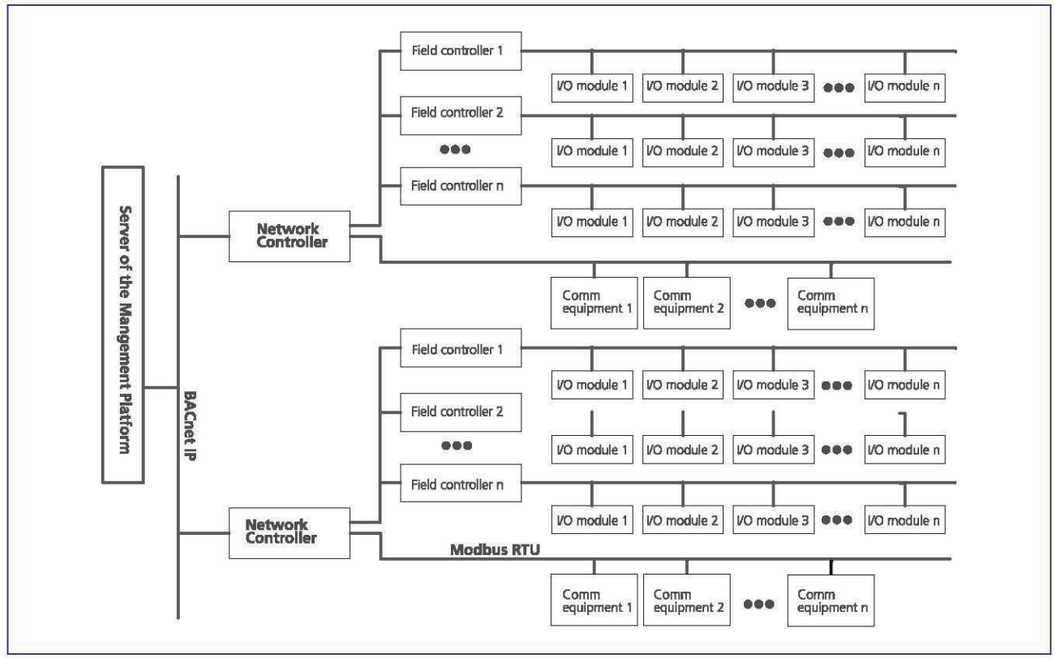

**Monitor Picture of CAC Power Management**

This management platform is made up of different control buses under a step-by-step control method, which divides the system into 3 levels: management level, control level, equipment level.




**Structure of the Management Platform**

Through a distributed control network, this power generation and consumption integrated management platform can realize central control over the PV system, PV centrifugal chiller, AC auxiliary equipment and terminals. This control method can respond to system changes quickly and improve system's stability.




**Control Network of the Mangement Platform**

This management platform adopts BACnet protocol, which provides a fine and complete method for data presentation and exchange. Except improving the platform's developmental features, this protocol can also greatly upgrade system's overall performance, expansion and integration.

Network controller functions as a router or a converter. It integrates the network of field controllers and 485 communication into a management network that is of higher level. It has strong computing capability and large memory space to interchange directly with server of the management platform. Network controller can build high-speed communication with the server through Ethernet interface, and long-distance communication with field controllers and 485 communication equipment through 485 bus interface.

This system is equipped with an open external interface, which can be connected with building intelligent management system or other LAN monitoring system.

# III. System Innovation

## 5 Core Technologies

### 1. Photovoltaic Direct-driven Inverter Centrifuge Technology

PV direct-driven inverter centrifugal chiller can incorporate PV direct current to the DC busbar of unit's installed current converter. In this way, the utilization ratio of PV power is up to 99%. Besides, system is 6%~8% more efficient than that of the traditional solution combining PV system and centrifugal chiller system, avoiding the energy waste of AC/DC exchange during power upload and power supply.

### 2. Ternary Commutation Technology

First presented by Gree, this technology enables the ternary current inversion among the PV system, centrifugal chiller and the power line. It takes less than 10ms to switch to any of the 5 working modes: pure air conditioning mode, pure photovoltaic mode, photovoltaic air conditioning mode, photovoltaic air conditioning & power generation mode, photovoltaic air conditioning & power consumption mode.

### 3. MPPT Technology

MPPT (Maximum Power Point Tracking) technology is raised to deal with the unstable voltage of PV power. With MPPT control and AC/DC commutation, system doesn't need the AC/DC constant voltage modulation that traditional PV air conditioner would need. Actually, it can track and control the real-time PV power generation to its maximum so that PV power can be best utilized by the centrifugal chiller.

### 4. PAWM Interleaving PMSM Driven Technology

PAWM (Pulse Amplitude and Width Modulation) Interleaving Large Power PMSM (Permasyn motor) Driven Technology is developed to deal with the dynamic features of centrifuge load. With this technology, unit can realize self-adaptive frequency and voltage modulation, which has ensured unit's stable operation.

### 5. Power Generation and Consumption Integrated Management Technology

Based on the DCS distributed control technology, Gree developed the power generation and consumption integrated management system that is integrated with PV Microgrid and HVAC Group Control. Through the analysis on the relationship between solar radiation and PV power generation and the potential matching relation between AC load and solar radiation, system can adjust the control strategy automatically, which means that system can adjust the PV power generation with the operation of HVAC equipment.



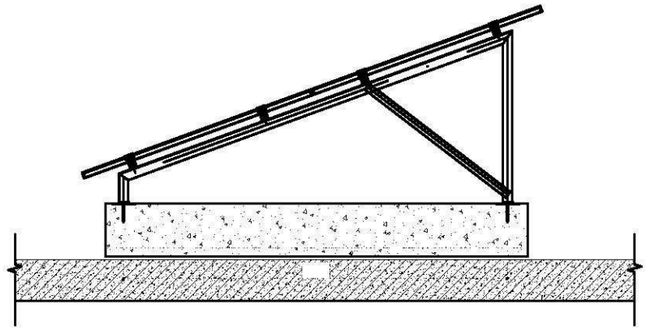
# IV. Project Implementation

**Procedures of project implementation:**

## Construction Example:

### 1. Installation of Solar Cell Array

Solar cell array can be installed in various ways, for example, on the rooftop, floor, curtain wall, sky dome or integrated with the building . If it is to be installed on the roof, many factors need to be considered, including the roof's bearing, openness, available area, and the array's direction, angle, arrangement, wind resistance, pressure resistance, etc. The installation diagram of solar cell array is shown below:



Installation Diagram of Sol ar Cell

Solar Cell Array

### 2. Power Supply and Distribution Room

The construction of power supply and distribution includes the building of cable bridge, laying of PV cable, installation of DC combiner box, DC power distribution box, interconnected transformer, AC power distribution box, etc. Generally, a corresponding room for power supply and distribution will be formed. The corresponding transformer, DC power distribution box and AC power distribution box will be provided with main unit. The diagram of the PV power distribution room is as shown below:

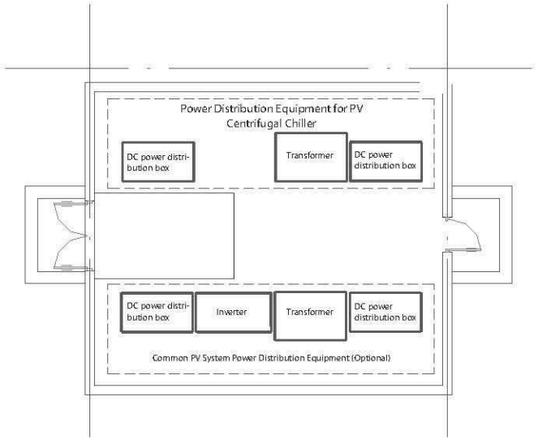



Diagram of the PV Power Distribution Room

PV Power Room

## 3. Unit Installation

### A. Installation Base and Surroundings

(1) Installation Surroundings

◆ The refrigerating unit should be away from fire source and inflammables. If it is installed near a boiler or other heat source, please pay full attention to the heat radiation impact.

◆ Room temperature should be below 40℃ and the installation place should have good air circulation (because high temperature will cause malfunction and speed up corrosion). Relative humidity should be below 90%. Do not install or place unit outdoors.

◆ Please select a location where there is little dust (Dust is the cause of electric failure).

◆ The installation place should be well lighted for the convenience of check and maintenance.

◆ For the purpose of repair, check and clean the heat exchange tube of evaporator-condenser, please leave enough space around the unit (refer to the maintenance space diagram for specific dimensions).

◆ For the convenience of lifting and repairing unit, please install an overhead crane or a derrick car and make sure the installation room is high enough.

◆ Surroundings of the unit as well as the entire installation room shall be capable of complete drainage.

◆ Please avoid direct sunlight.

◆ Attention: If unit will be installed 1000 meters or more above sea level, please contact the manufacturer.

(2) Installation Base

Rotor of the centrifugal compressor has passed strict static balance and dynamic balance test, thus its dynamic load to the installation base is very small. Please see table "Unit Base Dimension". In order to prevent the footing of unit from being corroded, please be sure that there is good drainage around the unit and unit's steel baseplate is flat and smooth. Specifically:

◆ The height difference (levelness)between each base should be within 3mm.

◆ For the convenience of maintenance, the base should be 100mm above the floor.

◆ Set drain ditch around the unit.

◆ There shouldn't be any gap between the steel baseplate and unit's own bottom plate. Stuff some adjustment washer into the space between baseplate and the concrete base and adjust the baseplate to be level (Their height difference should be within 0.5mm per meter).

◆ Lift up the unit and place the damping washer on the steel baseplate. Then place the unit on the damping washer.

◆ Secure unit's steel baseplate and adjustment washer on their surroundings by a second-time mortaring.

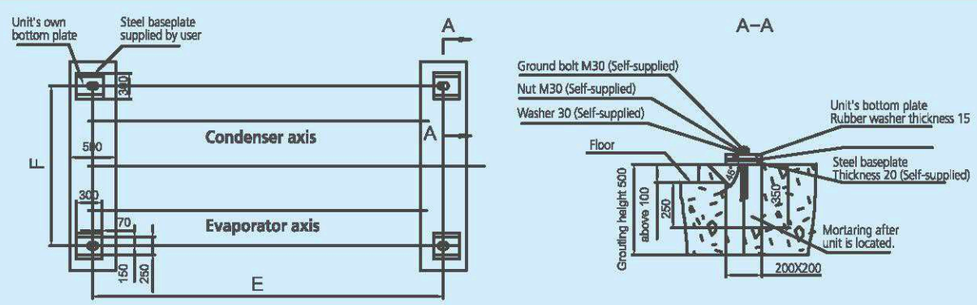



**Diagram of Unit Base Installation**

**Unit Base Dimension (in mm)**

| Model and Dimension | E | F | Model and Dimension | E | F |
|---|---|---|---|---|---|
| LSBLX450SVS | 3290 | 1670 | LSBLX750SVS | 3590 | 1960 |
| LSBLX500SVS | 3290 | 1670 | LSBLX800SVS | 3590 | 1960 |
| LSBLX550SVS | 3290 | 1670 | LSBLX850SVS | 3590 | 1960 |
| LSBLX600SVS | 3290 | 1770 | LSBLX900SVS | 3590 | 1960 |
| LSBLX650SVS | 3290 | 1770 | LSBLX950SVS | 3590 | 1960 |
| LSBLX700SVS | 3290 | 1770 | LSBLX1000SVS | 3590 | 1960 |

### B. Diagram of Components

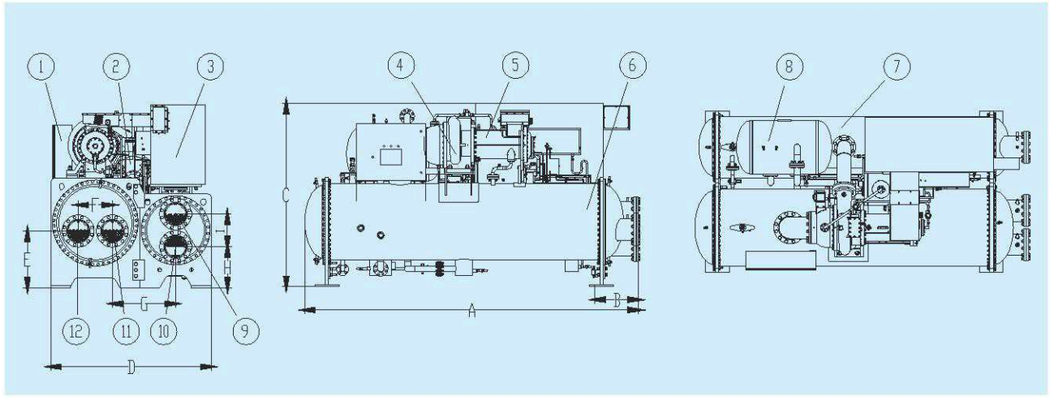


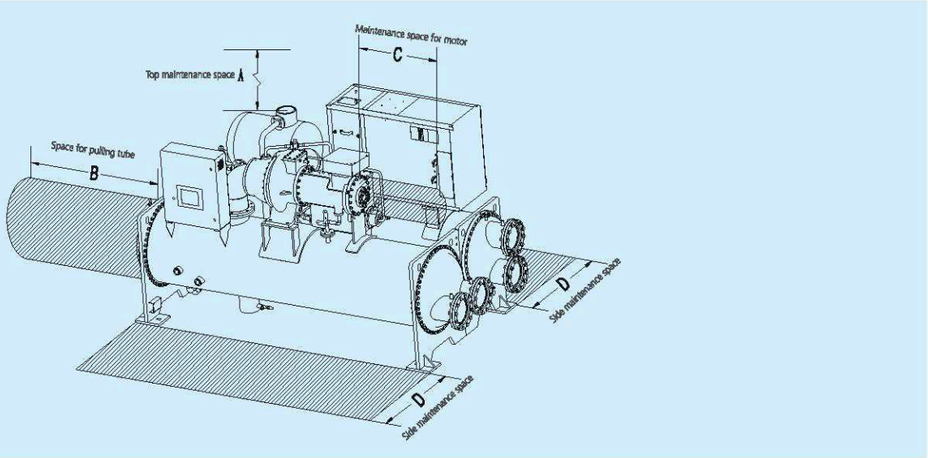

**Diagram of Components and Outline Dimension**

| No. | Name | No. | Name |
|---|---|---|---|
| ① | Electric control cabinet | ⑦ | Condenser |
| ② | Oil tank | ⑧ | Flash type evaporator |
| ③ | Converter | ⑨ | Cooled water outlet |
| ④ | Compressor | ⑩ | Cooled water inlet |
| ⑤ | Motor | ⑪ | Chilled water inlet |
| ⑥ | Evaporator | ⑫ | Chilled water outlet |

**Installation Dimension and Maintenance Space (in mm)**

| Model | A | B | C | D | E | F | G | H | I | Chilled water port | Cooled water port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LSBLX450SVS | 4200 | 600 | 2250 | 1920 | 665 | 430 | 770 | 455 | 415 | 250 | 250 |
| LSBLX500SVS | 4200 | 600 | 2250 | 1920 | 665 | 430 | 770 | 455 | 415 | 250 | 250 |
| LSBLX550SVS | 4200 | 600 | 2250 | 1920 | 665 | 430 | 770 | 455 | 415 | 250 | 250 |
| LSBLX600SVS | 4200 | 600 | 2250 | 2020 | 715 | 430 | 795 | 510 | 430 | 250 | 250 |
| LSBLX650SVS | 4200 | 600 | 2250 | 2020 | 715 | 430 | 795 | 510 | 430 | 250 | 250 |
| LSBLX700SVS | 4200 | 600 | 2250 | 2020 | 715 | 430 | 795 | 510 | 430 | 250 | 250 |
| LSBLX750SVS | 4580 | 605 | 2430 | 2210 | 815 | 470 | 870 | 550 | 470 | 300 | 300 |
| LSBLX800SVS | 4580 | 605 | 2430 | 2210 | 815 | 470 | 870 | 550 | 470 | 300 | 300 |
| LSBLX850SVS | 4580 | 605 | 2430 | 2210 | 815 | 470 | 870 | 550 | 470 | 300 | 300 |
| LSBLX900SVS | 4580 | 605 | 2430 | 2210 | 815 | 470 | 870 | 550 | 470 | 300 | 300 |
| LSBLX950SVS | 4580 | 605 | 2430 | 2210 | 815 | 470 | 870 | 550 | 470 | 300 | 300 |
| LSBLX1000SVS | 4580 | 605 | 2430 | 2210 | 815 | 470 | 870 | 550 | 470 | 300 | 300 |

## C. Space Dimension for Installation and Dimension




### Installation Dimension and Maintenance Space (in mm)

| Model | A | B | C | D |
|---|---|---|---|---|
| LSBLX450SVS | 1500 | 3500 | 1500 | 1220 |
| LSBLX500SVS | 1500 | 3500 | 1500 | 1220 |
| LSBLX550SVS | 1500 | 3500 | 1500 | 1220 |
| LSBLX600SVS | 1500 | 3500 | 1500 | 1220 |
| LSBLX650SVS | 1500 | 3500 | 1500 | 1220 |
| LSBLX700SVS | 1500 | 3500 | 1500 | 1220 |
| LSBLX750SVS | 1500 | 3800 | 1650 | 1320 |
| LSBLX800SVS | 1500 | 3800 | 1650 | 1320 |
| LSBLX850SVS | 1500 | 3800 | 1650 | 1320 |
| LSBLX900SVS | 1500 | 3800 | 1650 | 1320 |
| LSBLX950SVS | 1500 | 3800 | 1650 | 1320 |
| LSBLX1000SVS | 1500 | 3800 | 1650 | 1320 |

## 4. System Debugging

**System debugging means the debugging of PV power system, centrifugal chiller system, management platform of power generation and consumption integrated system.**

Debugging of PV power system refers to the solar cell array test, wire check, electric equipment test, debugging of the power generation system, etc. whereas debugging of the centrifugal chiller includes the debugging of the joint and identification of different modules, debugging of the 5 working modes, debugging of system protection, system data flow, control orders, debugging of electric control system, etc. On the other hand, debugging of the management platform indicates the debugging of PV system equipment's communication interface, HVAC system equipment's communication interface, HVAC system's energy-saving logic, PV power monitor, PV power distribution to the centrifugal chiller, etc.

We will provide you with turnkey service and a specialized integrated solution from design to execution.



# Appendix: Unit Specifications

### Specification Sheet in National Standard Working Conditions:

| Model LSBLX □□ SVS | | | 450 | 500 | 550 | 600 | 650 | 700 |
|---|---|---|---|---|---|---|---|---|
| Cooling capacity | | kW | 1582 | 1758 | 1934 | 2110 | 2285 | 2461 |
| | | RT | 450 | 500 | 550 | 600 | 650 | 700 |
| Power input | | kW | 250 | 275 | 298 | 320 | 337 | 362 |
| COP | | - | 6.33 | 6.39 | 6.49 | 6.59 | 6.78 | 6.80 |
| IPLV | | - | 8.89 | 8.99 | 9.11 | 9.28 | 9.54 | 9.56 |
| Configuration power | | kW | 279 | 306 | 332 | 356 | 374 | 402 |
| Refrigerant charge volume | | kg | 550 | 575 | 600 | 625 | 650 | 675 |
| Chilled oil charge volume | | L | 45 | 45 | 45 | 45 | 45 | 45 |
| Evaporator | Water flow | $m^3/h$ | 272 | 302 | 333 | 363 | 393 | 423 |
| | Pressure drop | kPa | 75 | 75 | 75 | 90 | 90 | 90 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 250 | 250 | 250 | 250 | 250 | 250 |
| Condenser | Water flow | $m^3/h$ | 340 | 378 | 416 | 454 | 492 | 529 |
| | Pressure drop | kPa | 70 | 70 | 70 | 85 | 85 | 85 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 250 | 250 | 250 | 250 | 250 | 250 |
| Outline dimension | W | mm | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 |
| | D | mm | 1920 | 1920 | 1920 | 2020 | 2020 | 2020 |
| | H | mm | 2250 | 2250 | 2250 | 2250 | 2250 | 2250 |
| Weight | Net weight | kg | 7000 | 7100 | 7200 | 8300 | 8400 | 8500 |
| | Operating weight | kg | 8100 | 8300 | 8600 | 9800 | 9900 | 10200 |

| Model LSBLX □□ SVS | | | 750 | 800 | 850 | 900 | 950 | 1000 |
|---|---|---|---|---|---|---|---|---|
| Cooling capacity | | kW | 2637 | 2813 | 2989 | 3164 | 3340 | 3516 |
| | | RT | 750 | 800 | 850 | 900 | 950 | 1000 |
| Power input | | kW | 397 | 419 | 439 | 476 | 497 | 506 |
| COP | | - | 6.64 | 6.71 | 6.81 | 6.65 | 6.72 | 6.95 |
| IPLV | | - | 9.34 | 9.43 | 9.57 | 9.34 | 9.44 | 9.78 |
| Configuration power | | kW | 442 | 467 | 488 | 530 | 553 | 557 |
| Refrigerant charge volume | | kg | 725 | 750 | 775 | 900 | 925 | 950 |
| Chilled oil charge volume | | L | 50 | 50 | 50 | 50 | 50 | 50 |
| Evaporator | Water flow | $m^3/h$ | 454 | 484 | 514 | 544 | 574 | 605 |
| | Pressure drop | kPa | 90 | 90 | 90 | 115 | 115 | 115 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 300 | 300 | 300 | 300 | 300 | 300 |
| Condenser | Water flow | $m^3/h$ | 567 | 605 | 643 | 681 | 718 | 756 |
| | Pressure drop | kPa | 85 | 85 | 85 | 100 | 100 | 100 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 300 | 300 | 300 | 300 | 300 | 300 |
| Outline dimension | W | mm | 4580 | 4580 | 4580 | 4580 | 4580 | 4580 |
| | D | mm | 2210 | 2210 | 2210 | 2210 | 2210 | 2210 |
| | H | mm | 2430 | 2430 | 2430 | 2430 | 2430 | 2430 |
| Weight | Net weight | kg | 9200 | 9350 | 9500 | 10000 | 10150 | 10500 |
| | Operating weight | kg | 11000 | 11200 | 11400 | 12000 | 12200 | 12700 |

Note:
1. Above selections are applicable when chilled water outlet temperature is 7℃ and cooled water inlet temperature is 30℃ .
2. Standard water side bearing pressure is 1.0MPa while 1.6MPa is optional.
3. Fouling factor of chiller and cooled water.
4. For product improvement, product specifications are subject to change without prior notice. Please refer to product nameplate for actual parameters.

## Specification Sheet in 7℃ /32℃

| Model LSBLX □□ SVS | | | 450 | 500 | 550 | 600 | 650 | 700 |
|---|---|---|---|---|---|---|---|---|
| Cooling capacity | | kW | 1582 | 1758 | 1934 | 2110 | 2285 | 2461 |
| | | RT | 450 | 500 | 550 | 600 | 650 | 700 |
| Power input | | kW | 265 | 292 | 316 | 339 | 357 | 383 |
| COP | | - | 5.97 | 6.02 | 6.12 | 6.22 | 6.40 | 6.43 |
| Configuration power | | kW | 279 | 306 | 332 | 356 | 374 | 402 |
| Refrigerant charge volume | | kg | 550 | 575 | 600 | 625 | 650 | 675 |
| Chilled oil charge volume | | L | 45 | 45 | 45 | 45 | 45 | 45 |
| Evaporator | Water flow | $m^3/h$ | 272 | 302 | 333 | 363 | 393 | 423 |
| | Pressure drop | kPa | 75 | 75 | 75 | 90 | 90 | 90 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 250 | 250 | 250 | 250 | 250 | 250 |
| Condenser | Water flow | $m^3/h$ | 340 | 378 | 416 | 454 | 492 | 529 |
| | Pressure drop | kPa | 70 | 70 | 70 | 85 | 85 | 85 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 250 | 250 | 250 | 250 | 250 | 250 |
| Outline dimension | W | mm | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 |
| | D | mm | 1920 | 1920 | 1920 | 2020 | 2020 | 2020 |
| | H | mm | 2250 | 2250 | 2250 | 2250 | 2250 | 2250 |
| Weight | Net weight | kg | 7000 | 7100 | 7200 | 8300 | 8400 | 8500 |
| | Operating weight | kg | 8100 | 8300 | 8600 | 9800 | 9900 | 10200 |
| Model LSBLX □□ SVS | | | 750 | 800 | 850 | 900 | 950 | 1000 |
| Cooling capacity | | kW | 2637 | 2813 | 2989 | 3164 | 3340 | 3516 |
| | | RT | 750 | 800 | 850 | 900 | 950 | 1000 |
| Power input | | kW | 421 | 445 | 465 | 504 | 527 | 536 |
| COP | | - | 6.26 | 6.32 | 6.43 | 6.28 | 6.34 | 6.56 |
| Configuration power | | kW | 442 | 467 | 488 | 530 | 553 | 557 |
| Refrigerant charge volume | | kg | 725 | 750 | 775 | 900 | 925 | 950 |
| Chilled oil charge volume | | L | 50 | 50 | 50 | 50 | 50 | 50 |
| Evaporator | Water flow | $m^3/h$ | 454 | 484 | 514 | 544 | 574 | 605 |
| | Pressure drop | kPa | 90 | 90 | 90 | 115 | 115 | 115 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 300 | 300 | 300 | 300 | 300 | 300 |
| Condenser | Water flow | $m^3/h$ | 567 | 605 | 643 | 681 | 718 | 756 |
| | Pressure drop | kPa | 85 | 85 | 85 | 100 | 100 | 100 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 300 | 300 | 300 | 300 | 300 | 300 |
| Outline dimension | W | mm | 4580 | 4580 | 4580 | 4580 | 4580 | 4580 |
| | D | mm | 2210 | 2210 | 2210 | 2210 | 2210 | 2210 |
| | H | mm | 2430 | 2430 | 2430 | 2430 | 2430 | 2430 |
| Weight | Net weight | kg | 9200 | 9350 | 9500 | 10000 | 10150 | 10500 |
| | Operating weight | kg | 11000 | 11200 | 11400 | 12000 | 12200 | 12700 |

Note:
1. Above selections are applicable when chilled water outlet temperature is 7℃ and cooled water inlet temperature is 32℃ .
2. Standard water side bearing pressure is 1.0MPa while 1.6MPa is optional.
3. Fouling factor of chiller and cooled water.
4. For product improvement, product specifications are subject to change without prior notice. Please refer to product nameplate for actual parameters.

## Specification Sheet in ARI XC

| Model LSBLX □□ SVS | | | 450 | 500 | 550 | 600 | 650 | 700 |
|---|---|---|---|---|---|---|---|---|
| Cooling capacity | | kW | 1582 | 1758 | 1934 | 2110 | 2285 | 2461 |
| | | RT | 450 | 500 | 550 | 600 | 650 | 700 |
| Power input | | kW | 253 | 278 | 301 | 323 | 340 | 365 |
| COP | | - | 6.25 | 6.32 | 6.43 | 6.53 | 6.72 | 6.74 |
| IPLV | | - | 10.43 | 10.55 | 10.69 | 10.88 | 11.20 | 11.22 |
| Configuration power | | | 279 | 306 | 332 | 356 | 374 | 402 |
| Refrigerant charge volume | | kg | 550 | 575 | 600 | 625 | 650 | 675 |
| Chilled oil charge volume | | | 45 | 45 | 45 | 45 | 45 | 45 |
| Evaporator | Water flow | $m^3/h$ | 245 | 272 | 299 | 327 | 354 | 381 |
| | Pressure drop | kPa | 60 | 60 | 60 | 75 | 75 | 75 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 200 | 250 | 250 | 250 | 250 | 250 |
| Condenser | Water flow | $m^3/h$ | 308 | 342 | 376 | 410 | 444 | 478 |
| | Pressure drop | kPa | 55 | 55 | 55 | 70 | 70 | 70 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 200 | 250 | 250 | 250 | 250 | 250 |
| Outline dimension | W | mm | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 |
| | D | mm | 1920 | 1920 | 1920 | 2020 | 2020 | 2020 |
| | H | mm | 2250 | 2250 | 2250 | 2250 | 2250 | 2250 |
| Weight | Net weight | kg | 7000 | 7100 | 7200 | 8300 | 8400 | 8500 |
| | Operating weight | kg | 8100 | 8300 | 8600 | 9800 | 9900 | 10200 |
| Model LSBLX □□ SVS | | | 750 | 800 | 850 | 900 | 950 | 1000 |
| Cooling capacity | | kW | 2637 | 2813 | 2989 | 3164 | 3340 | 3516 |
| | | RT | 750 | 800 | 850 | 900 | 950 | 1000 |
| Power input | | kW | 401 | 424 | 443 | 481 | 502 | 510 |
| COP | | - | 6.58 | 6.63 | 6.75 | 6.58 | 6.65 | 6.89 |
| IPLV | | - | 10.95 | 11.06 | 11.23 | 10.95 | 11.08 | 11.68 |
| Configuration power | | | 442 | 467 | 488 | 530 | 553 | 557 |
| Refrigerant charge volume | | kg | 725 | 750 | 775 | 900 | 925 | 950 |
| Chilled oil charge volume | | | 50 | 50 | 50 | 50 | 50 | 50 |
| Evaporator | Water flow | $m^3/h$ | 408 | 435 | 463 | 490 | 517 | 544 |
| | Pressure drop | kPa | 75 | 75 | 75 | 100 | 100 | 100 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 300 | 300 | 300 | 300 | 300 | 300 |
| Condenser | Water flow | $m^3/h$ | 513 | 547 | 581 | 615 | 649 | 684 |
| | Pressure drop | kPa | 70 | 70 | 70 | 85 | 85 | 85 |
| | Number of passs | - | 2 | 2 | 2 | 2 | 2 | 2 |
| | Connection pipe | mm | 300 | 300 | 300 | 300 | 300 | 300 |
| Outline dimension | W | mm | 4580 | 4580 | 4580 | 4580 | 4580 | 4580 |
| | D | mm | 2210 | 2210 | 2210 | 2210 | 2210 | 2210 |
| | H | mm | 2430 | 2430 | 2430 | 2430 | 2430 | 2430 |
| Weight | Net weight | kg | 9200 | 9350 | 9500 | 10000 | 10150 | 10500 |
| | Operating weight | kg | 11000 | 11200 | 11400 | 12000 | 12200 | 12700 |

1. Above selections are applicable under ARI working condition: chilled water outlet temperature is 6.7℃ and cooled water inlet temperature is 29.4℃ .
2. Standard water side bearing pressure is 1.0MPa while 1.6MPa is optional.
3. Fouling factor of chiller and cooled water is 0.086m2·℃ /kW.
4. For product improvement, product specifications are subject to change without prior notice. Please refer to product nameplate for actual parameters.

Operation Range:

| Chilled water | | Cooled water | |
|---|---|---|---|
| Outlet temp | Temp difference between inlet and outlet | Inlet temp | Temp difference between inlet and outlet |
| 5~15 | 2.5~8 | 16~35 | 3.5~8 |

Note

Note

# GREE CENTRAL AIR CONDITIONER

## For Clearer Sky and Greener Earth

For product improvement, Gree reserves the right to change the specifications without prior notice. Please refer to actual products.

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