GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI

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Note:
Gree is committed to continuously improving its products to ensure the highest quality and reliability standards, and to meet local regulations and market requirements.

All features and specifications are subject to change without prior notice.

GC-1809-03

Distributor information

AIR CONDITIONER

Gree Photovoltaic Direct-driven Inverter Multi VRF System

GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI

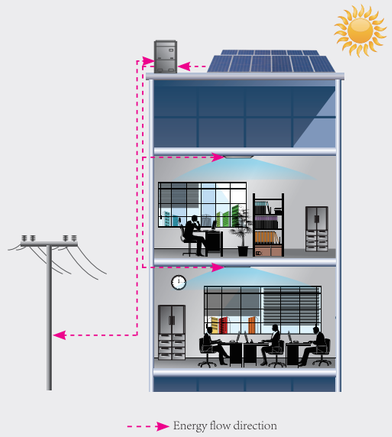
System Advantages

Zero Electricity Charge*--Photovoltaic Direct-driven Technology

Gree has been working on the research and reformation of air conditioning technology. Gree Photovoltaic Direct-driven Inverter Multi VRF System breaks through tradition, combining photovoltaic power generation with power consumption of air conditioner for the first time.

*Condition of zero electricity charge: photovoltaic generated power ≥ air conditioner consumption demand.
Zero electricity charge means when the power generated by solar power photovoltaic battery sub-assy completely meets the load of unit in operation, grid power is not needed, so there is no electricity charge.

1 Seamless Integration of PV Power and Air Conditioner, with Power Generation Function

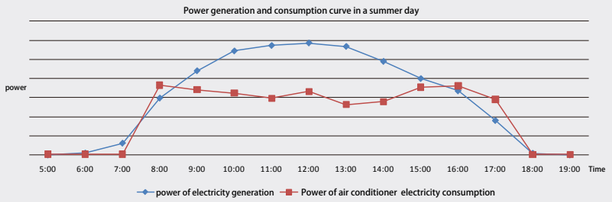


Energy flow direction

By adopting advanced photovoltaic direct-driven technology, the system can achieve power generation by utilizing solar power while consuming electricity and ensure utilization of photovoltaic power in priority; compared with traditional photovoltaic system, energy wastage during multiple commutation of alternating current and direct current is eliminated, with energy efficiency improved by 6%-8% and photovoltaic utilization ratio up to 99%; besides, the innovative MPPT(Maximum Power Point Tracking) technology can track and control the maximum power point status of photovoltaic power generation, so as to achieve maximum utilization of photovoltaic power.

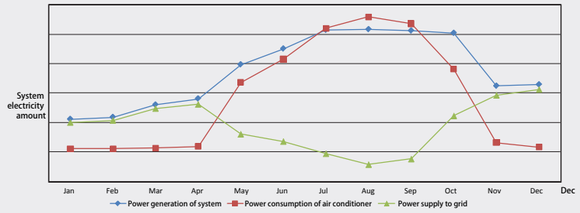
2 High Utilization Ratio

In summer, power consumption of air conditioner is large and photovoltaic power generation is relatively large as well. Gree Photovoltaic Direct-driven Inverter Multi VRF System, combining the characteristics of photovoltaic power, makes sure that the consumed electricity of units matches with the photovoltaic power generation so as to achieve zero electricity charge.



3 Zero Power Consumption from Grid

In rated engineering proportion, the power amount that Photovoltaic Direct-driven Inverter Multi VRF System gets from the grid is balanced with the power amount that the system delivers to the grid in each day, each month, each quarter and each year. Generally, power consumed from the grid is zero.

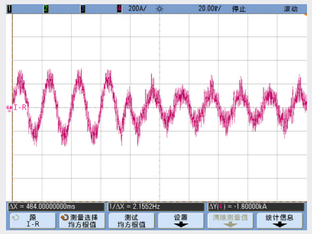


Zero Wastage--Ternary Converting Technology

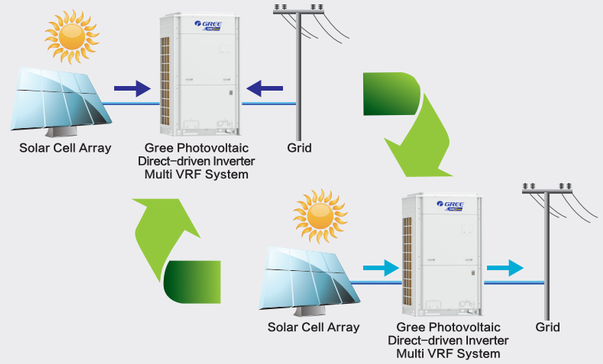
Gree Photovoltaic Direct-driven Inverter Multi VRF System can not only achieve zero electricity charge, but also generate power to the grid, benefiting energy conservation and emission reduction.

1 Instant Switchover for Punctual Power Generation

Ternary converting model, consisting of photovoltaic sub-assy, multi VRF system and grid, enables two-way flow and multiple-way integration of power at the direct current side. The switchover time among five operation modes is less than 10ms, avoiding power wastage due to switchover delay.

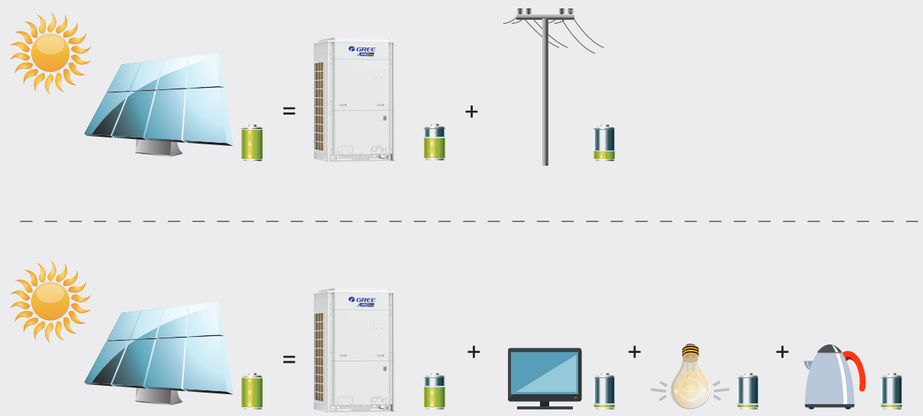


Oscillogram of instant switchover



2 No Wastage of Residual Power

If there is residual power after meeting air conditioner consumption demand, the system can deliver the residual power to the grid in real time, so as to realize complete utilization of photovoltaic power.



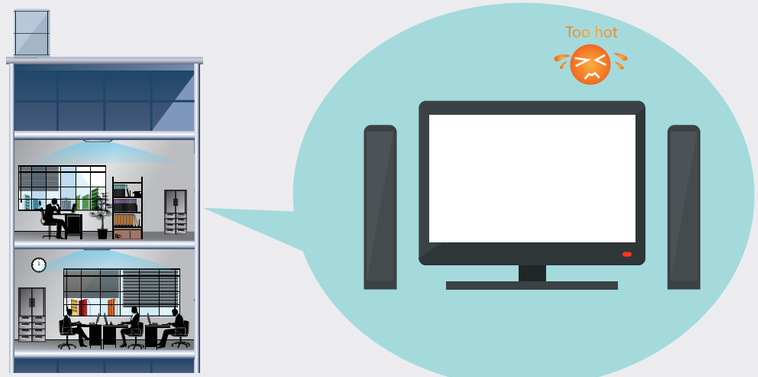
System Advantages

Green Inverter Technology

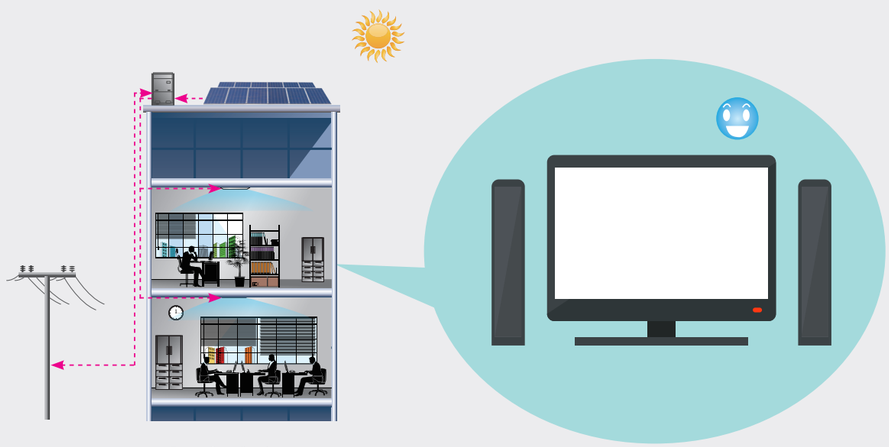
After many years of development and tests, Gree Photovoltaic Direct-driven Inverter Multi VRF System is capable of providing more reliable and more assured refrigeration service for its technological innovation.

1 No Interference from Other Electric Appliances in the Room

By adopting advanced photovoltaic direct-driven technology, the system can achieve power generation by utilizing solar power while consuming electricity and ensure utilization of photovoltaic power in priority; compared with traditional photovoltaic system, energy wastage during multiple commutation of alternating current and direct current is eliminated, with energy efficiency improved by 6%-8% and photovoltaic utilization ratio up to 99%; besides, the innovative MPPT(Maximum Power Point Tracking) technology can track and control the maximum power point status of photovoltaic power generation, so as to achieve maximum utilization of photovoltaic power.



Conventional system is applied



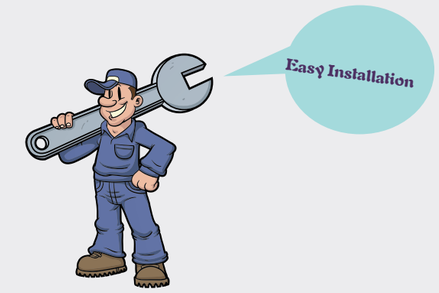
Four-quadrant commutation technology, low harmonic wave content and no interference

2 Easy Maintenance

Gree Photovoltaic Direct-driven Inverter Multi VRF System adopts low-voltage DC component instead of traditional high-voltage AC component, which effectively ensures safety and greatly reduces hazards of electric shock during operation and maintenance. Application of low-voltage DC component and DC loop topology greatly lowers arcing and fire hazards caused by circuit aging and improves EMC performance.

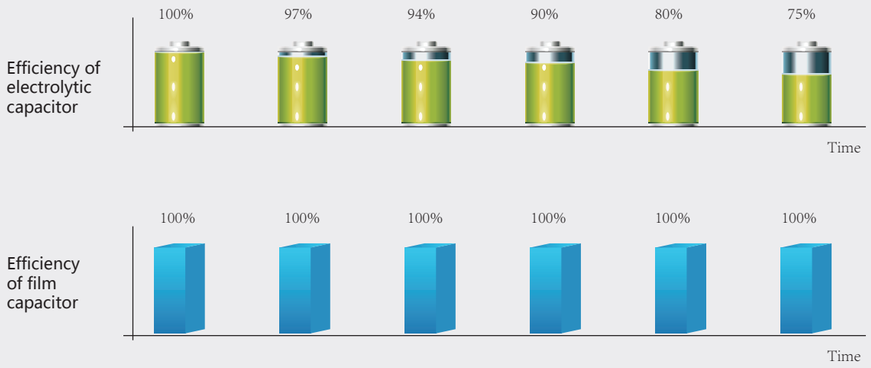
3 Easy Installation

The system applies low-voltage power distribution circuit and cancels neutral wire, which eliminate the impact of phase sequence and prevent wrong phase sequence connection and virtual connection of neutral, etc. Meanwhile, engineering adaptability of unit is extended and engineering installation cost is reduced.



4 Long Lifespan

Film capacitor has many advantages, such as high voltage resistance, no polarity, high impulse voltage endurance, etc. The system adopts film capacitor instead of electrolytic capacitor for longer lifespan.



Three Components

Gree Photovoltaic Direct-driven Inverter Multi VRF System consists of photovoltaic power generation system, photovoltaic direct-driven inverter multi VRF and intelligent management system. This system is with high density of integration, which is widely applicable for houses, office buildings, factories, hospitals, etc. Meanwhile, the building that is already equipped photovoltaic system and air conditioner can be integrated and reconstructed.

Zero Worry--Green Inverter Technology

Photovoltaic power generation system is the power generation element in Photovoltaic Direct-driven Inverter Multi VRF System. The clean energy provided by this power generation system will supply power to the main unit and deliver residual power to the grid through converter.

Photovoltaic power generation system is closely related to the installation site and user's building. Gree can design the most suitable photovoltaic power generation system for you according to local climate, user's building structure, cooling capacity demand and your special requirements.

Photovoltaic Power Generation System


Rooftop


Curtain wall


Floor


Building integration

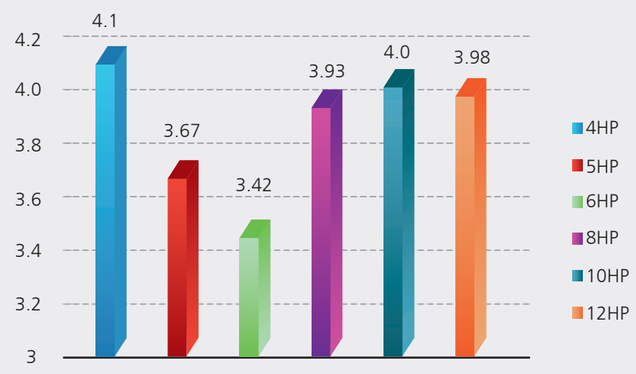

Canopy

Photovoltaic Direct-driven Inverter Multi VRF

1 Energy Saving in Priority. Greatly Reduce Electricity Charge

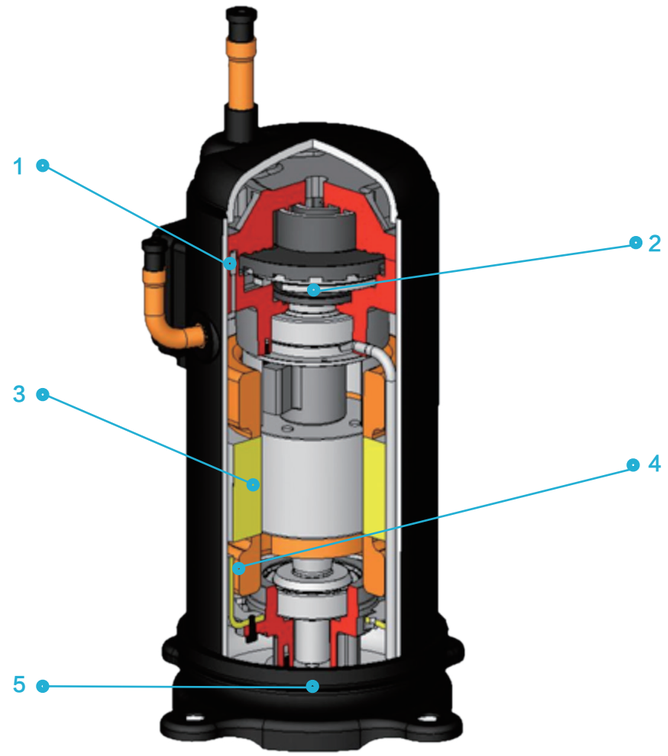
The multi VRF system in photovoltaic multi VRF system inherits the essence of multi VRF development in Gree for more than a decade. The system integrates the advanced 180° sine wave high-efficiency compressor driver technology, 1Hz PID capacity regulation technology, intelligent defrosting, precise refrigerant allocation technology, high-efficiency heating technology, quiet control technology and intelligent operation technology, etc. The system can be widely applied in various commercial places for providing energy-saving and comfortable air conditioning environment to global users.

Photovoltaic Direct-driven Inverter Multi VRF



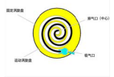
Note: Above data is EER value.

High-efficiency All DC Inverter Compressor



1. Asymmetrical Vortex Line

Asymmetrical vortex line is adopted to reduce leakage loss and invalid suction overheating.

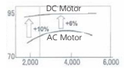


2. Non-Contact Oil Seal

Axial direction and radial direction of compression cavity adopts non-contact oil seal to reduce attrition and improve efficiency and reliability.

3. Permanent Magnet Synchronous DC Motor

Rare earth is adopted in the rotor and the shape is optimized, so as to achieve wide frequency, high efficiency and low noise.

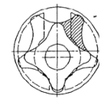


4. 180° Sine Wave DC Inverter Driver

Stepless sine wave output by inverter drives DC inverter to achieve high-efficiency stepless DC frequency conversion, which improves motor efficiency.

5. Positive-DC Displacement Gear Oil Pump

Positive-displacement gear oil pump ensures necessary oil supply in high&low frequency and high reliability of compressor.



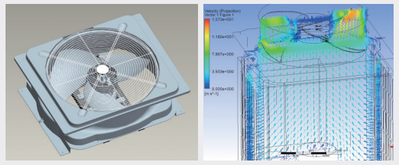
Three Components

2 Quiet Control for Building High-Quality Life

Gree Photovoltaic Direct-driven Inverter Multi VRF System sufficiently considers people's demand for comfort, upgrading comfort with user-friendly technology. The system is capable of wider operation range and lower operation noise.

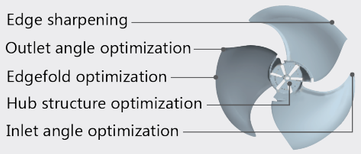
Optimized River Diversion Shell Design

After tens of thousands times of CFD simulation, new fan river diversion shell structure is developed to reduce vibration of river diversion ring in high-speed operation of fan. Compared with conventional design, noise value can be reduced by 3dB(A).



High-Efficiency 3D Axial Blade

The new high-efficiency axial blade is designed with optimized blade outline and better edge curve. Compared with conventional blade, it can increase air volume by 12%, improving efficiency as well as lowering noise.



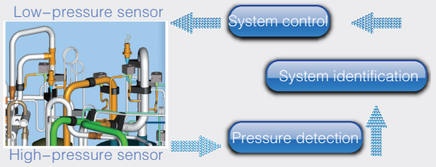
High-efficiency Blade

3 Excellent Performance Ensured by Advanced Technology

Gree Photovoltaic Direct-driven Inverter Multi VRF System provides reliable performance through several mature technologies such as two-stage oil separation control technology, oil return control technology, oil balance control technology and sub-cooling control technology.

Pressure Sensor Detection Control Technology

Pressure sensor can precisely detect system high pressure and low pressure, and adjust output of fan and compressor, so as to make sure the system can work under the most energy-saving pressure condition.



Temperature Sensor Detection Control

Various temperature sensors are equipped to detect ambient temperature, indoor temperature and refrigerant's evaporating temperature, from which the operation status can be measured to ensure stable operation.

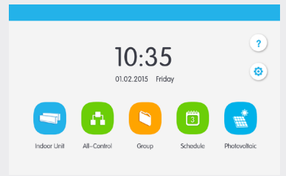
Intelligent Management System

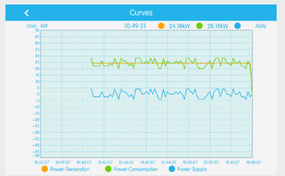
The centralized controller for power generation and consumption management is the brain of Photovoltaic Direct-driven Inverter Multi VRF System. It adopts the perfect combination of multi VRF intelligent network system and power generation and consumption management system based on CAN communication technology, so as to achieve intelligent management of multi VRF system.

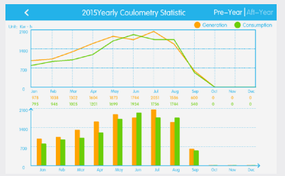
CE55-24 F(C) (optional)

Centralized Controller for Power Generation and Consumption Management: One Screen for Convenient Operation

Centralized controller for power generation and consumption management combines photovoltaic power generation, unit power consumption and grid power supply for power management with centralized control of unit, achieving intelligent management of multi VRF system. Photovoltaic parameter inquiry and real-time display of power generation and consumption data are available. You can see photovoltaic power generation, unit power consumption, monthly electricity consumption and yearly electricity consumption. Power curve of the system is shown in real time and updated dynamically.







Reliable Multi VRF Intelligent Network System Based on CAN Bus Technology

The multi VRF intelligent network system adopts Gree patented multi VRF CAN non-polar bus communication technology, which features high stability, convenient networking and high communication efficiency.

Intelligent Management of Air Conditioning System for Centralized Management and Convenience

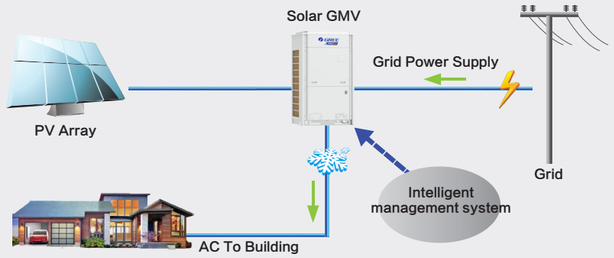
Centralized controller for power generation and consumption management provides intelligent control management of the air conditioner of photovoltaic multi VRF system, with complete functions and convenient operation.

Five Working Modes

The system can realize real-time switchover for five working modes according to the actual status of photovoltaic power generation system and operation of multi VRF system.

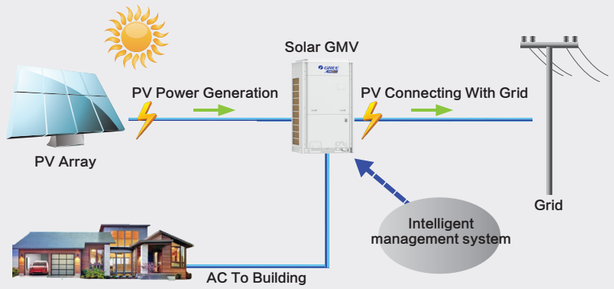
1 Air Conditioning Mode

When photovoltaic power generation system doesn't work, the system is powered by commercial power. In this case, the system equals to an inverter VRF system.



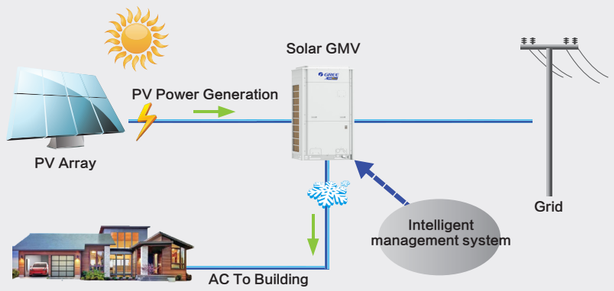
2 Photovoltaic Power Generation Mode

When the air conditioner stops operation, the power generated by the photovoltaic power generation system is sent to the grid. In this case, the system equals to a power station.



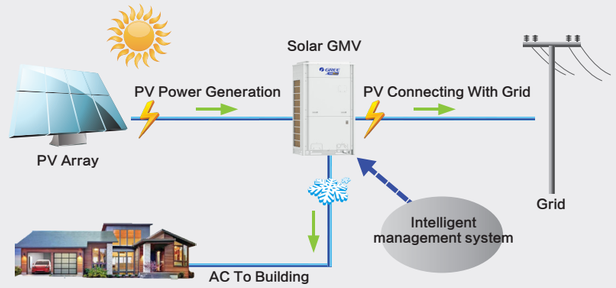
3 Photovoltaic Air Conditioning Mode

When photovoltaic generated power is equal to the air conditioner consumption demand, the air conditioner consumes photovoltaic power only.



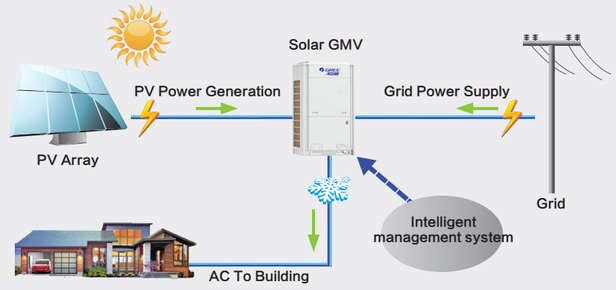
4 Photovoltaic Air Conditioning & Power Generation Mode

When photovoltaic generated power is more than air conditioner consumption demand, photovoltaic power will give priority to the air conditioner, and then the residual power will be sent to the grid.



5 Photovoltaic Air Conditioning & Power Consumption Mode

When photovoltaic generated power is less than the air conditioner consumption demand, air conditioner will draw power from the grid in addition to the photovoltaic power generation system.



Gree Photovoltaic Direct-driven Inverter Multi VRF System can realize real-time switchover for five working modes according to the actual status of photovoltaic power generation system and operation of multi VRF system for ensuring high-efficiency utilization of photovoltaic power and reliable operation.

GMV5 Solar

Gree GMV5 Solar adopts inverter compressor technology, with capacity range from 8HP to 12HP. It has a broad product lineup and is widely applicable to places such as residential houses, apartments and office buildings.

8/10 HP

12 HP

XK46

YAP1F

All DC inverter technology

Energy saving function

Quiet function

Long connection pipe design

Wide operation range

Comprehensive protection

- With LAN reverse power control technology; efficiency of PV power generation/consumption is more than 99%.
- Active grid configuration, automatically indentifying 208V/230V/380V/415V and 50Hz/60Hz and other global power supply type.
- Adopt innovative multi-level topology; grid harmonic is as low as 2%.
- Adopt high-efficiency DC inverter compressor for realizing broadband operation, high efficiency and low noise.
- Adopt all new aluminum plastic design, with stronger heat dissipation capability and longer service life (components).
- Adopt modular design concept for the unit's structure to realize fast-assembly as well as fast-disassembly for all parts.
- The build-in smart energy control module can freely connects to Gree self-developed Information Energy Management System (IEMS) for smart energy distribution.
- Can connect with GreePower power storage unit for power supply at night.

Note:This electric cabinet must be with bidirectional rectification function.

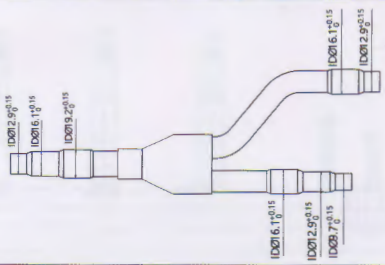
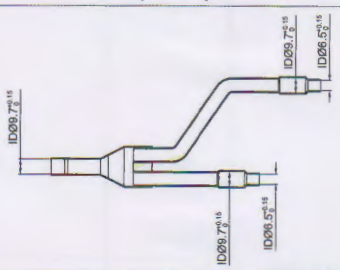
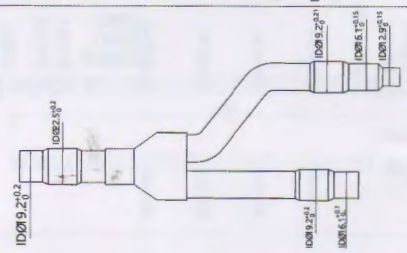
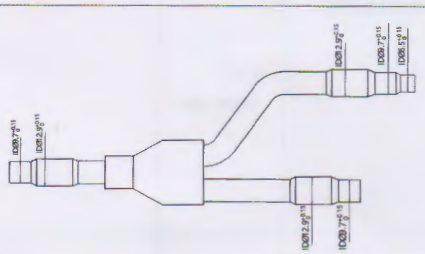
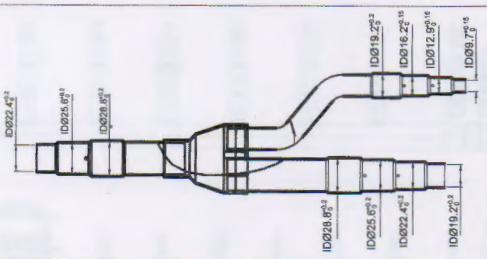
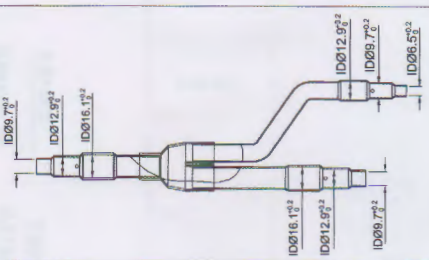
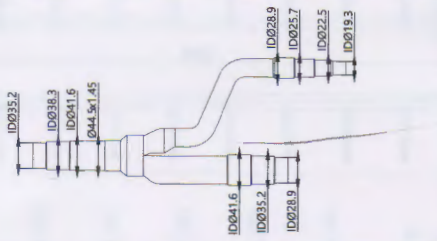
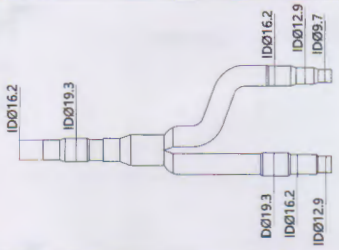
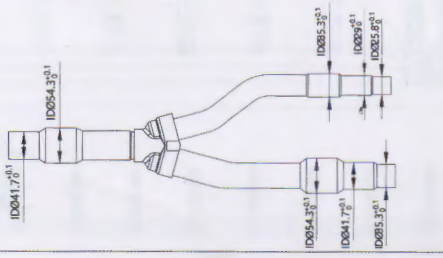
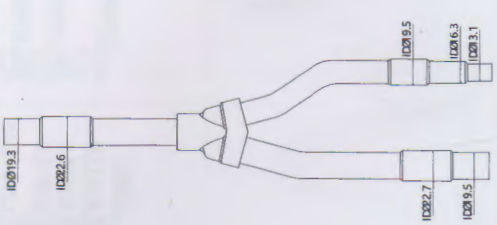
Specifications

Model			GMV-Y224WM/C-X*	GMV-Y280WM/C-X*	GMV-Y335WM/C-X*
Capacity range		HP	8	10	12
Capacity	Cooling	kW	22.40	28.00	33.50
	Heating	kW	25.00	31.50	37.50
Cooling power input		kW	5.7	7.0	8.41
Heating power input		kW	5.5	7.3	9.0
EER/COP		kW/kW	3.93/4.24	4.00/4.32	3.98/4.17
Air flow volume		m^3/h	11400	11400	14000
Power supply		V/Ph/Hz	380-415V-3Ph~50/60Hz		
Range of allowable open circuit input voltage		V	1000	1000	1000
Range of input operating voltage		V	560~780	560~780	560~780
Max. solar short circuit current		A	39	39	39
Recommended quantity of PV module base on Gree Module GIE-M60/290		/	22/44/66/88	22/44/66/88	22/44/66/88
Maximum drive IDU NO.		unit	13	16	19
Refrigerant charge volume		kg	5.9	6.7	11.3
Sound pressure level		dB(A)	60	61	63
Connecting pipe	Liquid	inch(mm)	Φ3/8(9.52)	Φ3/8(9.52)	Φ3/8(12.7)
	Gas	inch(mm)	Φ3/4(19.05)	Φ7/8(22.2)	Φ1(25.4)
Dimension (WxDxH)	Outline	mm	930×765×1605	930×765×1605	1340×765×1605
	Package	mm	1010×840×1775	1010×840×1775	1420×840×1775
Net weight/Gross weight		kg	266/278	266/278	340/355
Loading quantity	40' GP	set	24	24	16
	40' HQ	set	24	24	16

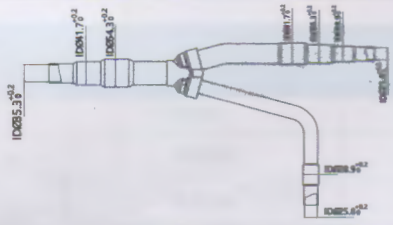
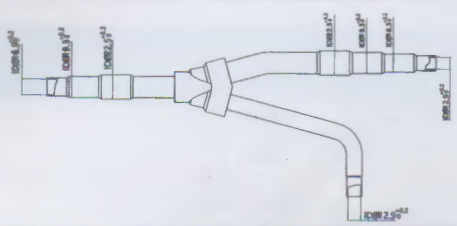
Note: * This product is under development. Please confirm the final specifications with sales representatives.

Branching Joint

For Indoor Units

Model	Total Capacity (xkW)	Appearance	
		Gas Pipe	Liquid Pipe
FQ01A/A	X<20		
FQ01B/A	20≤X≤30		
FQ02/A	30<X≤70		
FQ03/A	70<X≤135		
FQ04/A	135<X		

For Outdoor Units

Model	Appearance	
	Gas Pipe	Liquid Pipe
ML01/A		

NEW

CanadianSolar

MAXPOWER
CS6U-315|320|325|330P

Canadian Solar's modules use the latest innovative cell technology, increasing module power output and system reliability, ensured by 15 years of experience in module manufacturing, well-engineered module design, stringent BOM quality testing, an automated manufacturing process and 100% EL testing.

25 years linear power output warranty

10 years product warranty on materials and workmanship

KEY FEATURES

- Excellent module efficiency of up to 16.97 %
- Cell efficiency of up to 20.0 %
- Outstanding low irradiance performance: 96.0 %
- No.1 PTC — High PTC rating of up to 91.55 %
- IP67 — IP67 junction box for long-term weather endurance
- Heavy snow load up to 5400 Pa, wind load up to 2400 Pa

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2008 / Quality management system
ISO 14001:2004 / Standards for environmental management system
OHSAS 18001:2007 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730: VDE / CE / CQC / MCS
UL 1703 / IEC 61215 performance: CEC listed (US)
UL 1703: CSA / IEC 61701 ED2: VDE / IEC 62716: VDE / Take-e-way
UNI 9177 Reaction to Fire: Class 1

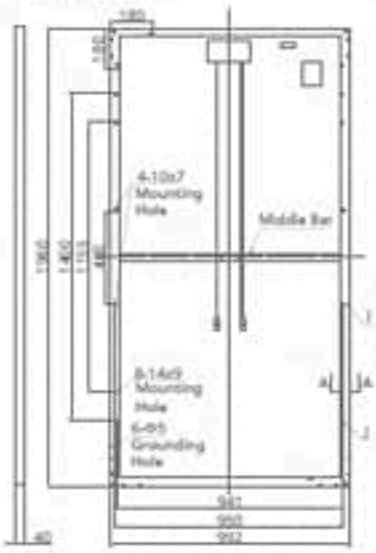
* As there are different certification requirements in different markets, please contact your local Canadian Solar sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

CANADIAN SOLAR INC. is committed to providing high quality solar products, solar system solutions and services to customers around the world. As a leading PV project developer and manufacturer of solar modules with over 15 GW deployed around the world since 2001, Canadian Solar Inc. (NASDAQ: CSIQ) is one of the most bankable solar companies worldwide.

CANADIAN SOLAR INC.
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada, www.canadiansolar.com, support@canadiansolar.com

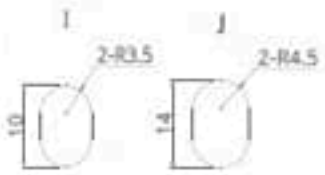
ENGINEERING DRAWING (mm)

Rear View

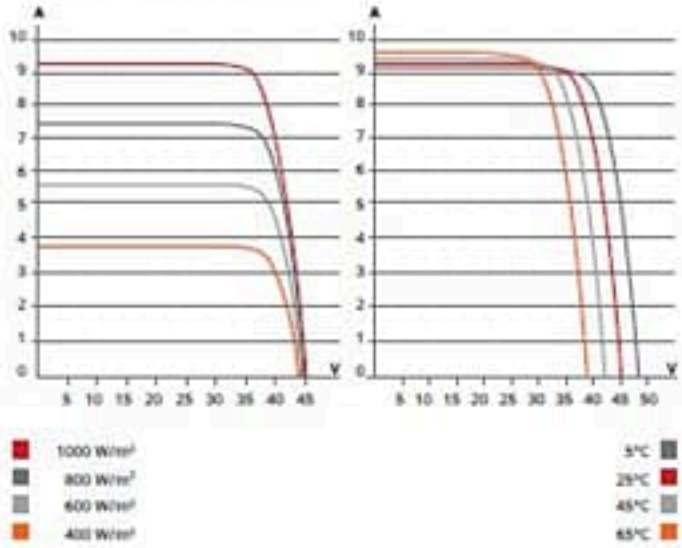


Frame Cross Section A-A

Mounting Hole



CS6U-320P / I-V CURVES



ELECTRICAL DATA | STC*

CS6U	315P	320P	325P	330P
Nominal Max. Power (Pmax)	315 W	320 W	325 W	330 W
Opt. Operating Voltage (Vmp)	36.6 V	36.8 V	37.0 V	37.2 V
Opt. Operating Current (Imp)	8.61 A	8.69 A	8.78 A	8.88 A
Open Circuit Voltage (Voc)	45.1 V	45.3 V	45.5 V	45.6 V
Short Circuit Current (Isc)	9.18 A	9.26 A	9.34 A	9.45 A
Module Efficiency	16.20%	16.46%	16.72%	16.97%
Operating Temperature	-40°C ~ +85°C			
Max. System Voltage	1000 V (IEC) or 1000 V (UL)			
Module Fire Performance	TYPE 1 (UL 1703) or CLASS C (IEC 61730)			
Max. Series Fuse Rating	15 A			
Application Classification	Class A			
Power Tolerance	0 ~ + 5 W			

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

ELECTRICAL DATA | NOCT*

CS6U	315P	320P	325P	330P
Nominal Max. Power (Pmax)	228 W	232 W	236 W	239 W
Opt. Operating Voltage (Vmp)	33.4 V	33.6 V	33.7 V	33.9 V
Opt. Operating Current (Imp)	6.84 A	6.91 A	6.98 A	7.05 A
Open Circuit Voltage (Voc)	41.5 V	41.6 V	41.8 V	41.9 V
Short Circuit Current (Isc)	7.44 A	7.50 A	7.57 A	7.66 A

* Under Nominal Operating Cell Temperature (NOCT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	Poly-crystalline, 6 inch
Cell Arrangement	72 (6 × 12)
Dimensions	1960 × 992 × 40 mm (77.2 × 39.1 × 1.57 in)
Weight	22.4 kg (49.4 lbs)
Front Cover	3.2 mm tempered glass
Frame Material	Anodized aluminium alloy
J-Box	IP67, 3 diodes
Cable	4 mm² (IEC) or 4 mm² & 12 AWG 1000V (UL), 1160 mm (45.7 in)
Connector	T4 series or PV2 series
Per Pallet	26 pieces, 635 kg (1400 lbs)
Per container (40' HQ)	624 pieces

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.41 % / °C
Temperature Coefficient (Voc)	-0.31 % / °C
Temperature Coefficient (Isc)	0.053 % / °C
Nominal Operating Cell Temperature	45±2 °C

PERFORMANCE AT LOW IRRADIANCE

Outstanding performance at low irradiance, average relative efficiency of 96.0 % from an irradiance of 1000 W/m² to 200 W/m² (AM 1.5, 25°C).

The specification and key features described in this datasheet may deviate slightly and are not guaranteed. Due to on-going innovation, research and product enhancement, Canadian Solar Inc. reserves the right to make any adjustment to the information described herein at any time without notice. Please always obtain the most recent version of the datasheet which shall be duly incorporated into the binding contract made by the parties governing all transactions related to the purchase and sale of the products described herein.

Caution: For professional use only. The installation and handling of PV modules requires professional skills and should only be performed by qualified professionals. Please read the safety and installation instructions before using the modules.

PARTNER SECTION