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20062002

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Grid Tie Micro Inverter

Micro Inversor Inteligente Grid Tie (Conexão à Rede)

User Manual

Manual do Usuário



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Safety warning

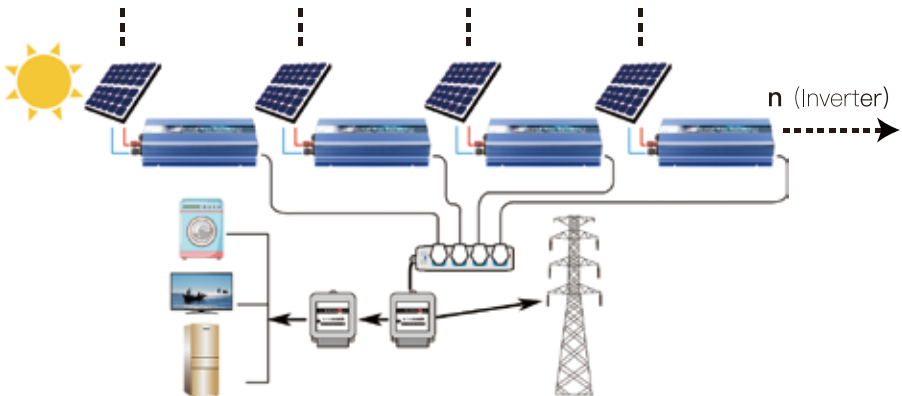
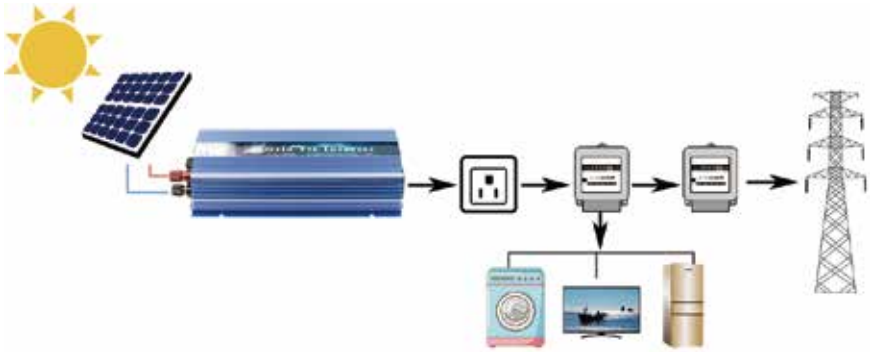
1. Please read carefully before using this product and keep this manual in a safe place.
2. Experienced engineers and technicians can install this inverter. The installation process must be carried out in strict accordance with the requirements of this manual.
3. This product should avoid long-term exposure to corrosive gas and moist environments.
4. It is recommended to ventilate the room and install it in the shelter. Never place this product in damp, rain, exposure to the sun, serious dust, vibration, corrosion and strong electromagnetic interference.
5. The inverter to operating personnel must be a range of electrical theory knowledge and practical experience of technical personnel, and strictly in accordance with relevant provisions of the manual steps and manner. Non-technical personnel should not disassemble the machine for repair.



Package



(Picture is for reference only but subject to the actual product.)





About micro inverter

1. Working principle

Smart grid tie inverter is a compact unit, which directly converts direct current into alternating current for powering appliances and office equipments and connecting to utility grid. The AC output from smart micro inverter is synchronized and in-phase with the utility grid. It is a key device of power generation systems such as PV power generation system, wind turbine power generation system.

2. Matching solar panels

Smart micro inverter specially optimized design to work with modularization of DC power supplies which includes the mainstream solar modules, 18V (36 cells), 24V (60 cells) and 36V (72 cells) monocrystalline and/or Polycrystalline solar panels, wind turbines. Smart micro inverters are stabilization, reliable and high conversion efficiency items. It is the best choice for PV power generation systems.

3. MPPT technology

Smart micro inverter can be easily placed and attached to the rack underneath of PV module. No need spaces for independent installation and low voltage DC wire connects from the PV module to smart micro inverter can eliminate the risk of high DC voltage. Distributed modularization design philosophy for smart micro inverter insures the productiveness of the whole system and will not affect by a single point of failure. Each Smart micro inverter is individually connected to each PV module in the array. This unique configuration means that an individual Maximum Peak Power Point Tracker (MPPT) controls each PV modules and insures that the maximum power available from each PV module is exported to the utility grid regardless of the performance of the other PV modules in the array which may be affected by shadow, soiling, orientation or mismatch, etc. Smart micro inverter insures top performance for maximizing energy production from the whole PV system and gets return on investment in less time.



4. Advantages of smart micro inverter

- (1) Unique circuit design, choice of import industrial electronic components, higher efficiency, more stable performance.
- (2) Creative MPPT technology, efficiency more than 99%, faster and more sensitive reaction, more reliable.
- (3) Modular design, flexible combination and strong system expandability.
- (4) Adopting high–frequency isolation transformer type, high efficiency, and high security.
- (5) Perfect electrical protection function.
- (6) Aluminum alloy housing, not rust, heat–resisting and cold–resistant as well as anti–corrosion.
- (7) Getting electronic circuit design, appearance design and other core technology patents.

Important safety information

1. Danger and warning tips

This manual contains important instructions for use during installation and maintenance of the smart micro inverter. To reduce the risk of electrical shock, and to ensure the safe installation and operation of the smart micro inverter, the following safety symbols appear through out this document to indicate dangerous conditions and important safety instructions.



Danger! This indicates a hazardous situation, which if not avoided, will result in death or serious injury.



Warning ! This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.



Note: This note ID indicates that this information is particularly important for optimal system operation.



Warning! Only qualified electrical professionals can do the trouble shooting of the smart micro inverter system.



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Warning! Do not disconnect the micro inverter from its PV module when the inverter is still operating. Disconnect the inverter from the PV module during running may damage the micro inverter and bring electrical hazard to the person nearby.



Warning! Disconnect the AC grid first before disconnecting the inverter from the PV module.



Warning! Do not attempt to repair the smart micro inverter. This may bring electrical hazard to the person and it will also void the micro inverter warranty. If troubleshooting methods fail, please contact customer support to return the micro inverter and initiate for replacement process.

2. Safety instruction

- (1) Do not use smart micro inverter in a manner not specified by the manufacturer. Doing so may cause death or injury to persons, or damage to equipment.
- (2) Perform all electrical installations in accordance with all applicable local electrical codes.
- (3) Be aware that only qualified personnel should disassemble and repair the smart micro inverters and non-qualified personnel should not install and/or repair.
- (4) Do not attempt to repair the smart micro inverter; it contains no user-serviceable parts. If it fails, contact customer service to claim a return inverter authorization and start the replacement process. Tampering with or opening the smart micro inverter will void the warranty.
- (5) If the AC cable connector on the micro inverter is damaged or broken, do not install it.
- (6) Before installing or using the smart micro inverter, read all instructions and cautionary markings in the technical description and on the smart micro inverter system and the PV equipment.
- (7) Connect the smart micro inverter to the utility grid only after you have completed all installation procedures .
- (8) Be aware that the body of the smart micro inverter is the heat sink. Under normal operating conditions, the temperature is 15°C above ambient,

but under extreme conditions the micro inverter can reach a temperature of 75 ° C. To reduce risk of burns, use caution when working with micro inverters.

- (9) Our suggestion is that do NOT disconnect the PV module from the smart micro inverter without first removing AC power when smart micro inverter still operation because it may cause of components damaged.
- (10) Keep away from children, no touching, no playing so as not to electric shock when using.
- (11) Please install in place of low humidity and well-ventilated so as to avoid inverter overheating, as well as clear around the inflammable and explosive materials.
- (12) Please visual inspection for the LED operation status, red LED will turn off and green LED will flash or run when inverter connecting with DC power supply which input voltage is fit in with the range as specified and power grid properly. If still no power output when green LED flash or run, probably internal components are damaged, in such case, please turn the defective inverter back for further analyze.

3. Warranty

- (1) Warranty Period: 1 year limited warranty period.
- (2) Warranty Evidence: Proforma Invoice(PI) or Order number on aliexpress, Amazon, JD etc. and a completed warranty card.
- (3) We grant an implied warranty of 1 year to the inverter from date of purchase for repair or replace the defective product free of charge includes freight cost. Warranty claims are excluded for:
 - Alterations or repairs to the unit without prior authorization.
 - Improper use or operation of device.
 - Improper and non-standard installation.
 - Operating the equipment with defective safety devices.
 - Impact of foreign objects and force majeure (lightning, surge, storm, fire).
 - Inadequate or nonexistent ventilation of the device.
 - Disregarding of safety regulations shipping damage.
 - The Product has been improperly stored or was damaged while in ossession of the Dealer or end user.



Technical Parameters

Model	300W	500W	600W	800W	1000W	1200W	1300W	1400W
Suggest Solar	>360W	>600W	>720W	>960W	>1200W	>1400W	>1500W	>1700W
Max Output	300W	500W	600W	800W	1000W	1200W	1300W	1400W
Input Data								
DC input	Vmp@18V(10.5–30VDC)/Solar cells=36 PCS per solar panel / MPPT Voltage: 18–21VDC;							
	Vmp@36V(20–50VDC)/Solar cells=60/72 PCS per solar panel / MPPT Voltage: 24–45VDC							
Max Current	@18V 18.7A	@36V 12.5A	@18V 31A	@36V 20A	@18V 37A	@36V 25A	@18V 50A	@36V 30A
Output Data								
Rated voltage	@120V(90–140VAC); @230V(190–260VAC)							
	Auto match frequency: 50/60Hz(48–65Hz)							
Rated current	@120V	@230V	@120V	@230V	@120V	@230V	@120V	@230V
	2.7A	1.4A	4.5A	2.3A	5.5A	2.7A	7.3A	3.6A
Output Efficiency	@120VAC Version							
	Efficiency							
Peak Efficiency	@18V	@36V	@18V	@36V	@18V	@36V	@18V	@36V
	85%	88%	85%	88%	85%	88%	85%	88%
Stable Efficiency	@18V	@36V	@18V	@36V	@18V	@36V	@18V	@36V
	82%	85%	82%	85%	82%	85%	83%	86%

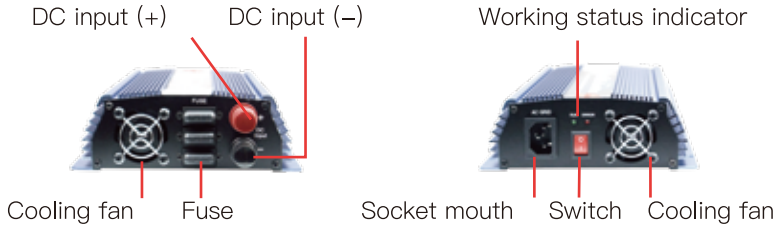
@230VAC Version												
Efficiency	@18V	@36V	@18V	@36V	@18V	@36V	@18V	@36V	@18V	@36V	@18V	@36V
Peak Efficiency	85%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
Stable Efficiency	83%	85%	83%	85%	83%	85%	83%	86%	83%	86%	83%	86%
Stand-by Power	<1W											
Feature												
Power Transmission	Reverse transfer, load priority											
Protection	1. Islanding; 2. Short-circuit; 3. DC & AC low voltage; 4. DC & AC over voltage; 5. High temperature											
Grid disturbance	EN 50178/ EN 62109-1 / VDE 0126-1-12											
EMC	EN 61000-6-3:2007 / EN 61000-6-1:2007											
Grid detection	DIN VDE 1026/UL1741											
Certificate	CE, ROHS, FCC											
Exterior												
Operation	- 20°C to +65°C											
Humidity	0% to 90% Non-condensing											
Waterproof	IP23(Indoor design)											
Showing	Luminous diode(LED)											
Cooling	Electric fan(>45°C)											
Net Weight	@300W	@500W	@600W	@800W	@1000W	@1200W	@1300W	@1400W				
	0.77KGS	1.3KGS	1.3KGS	2.0KGS	2.1KGS	2.1KGS	2.2KGS	2.2KGS				
Gross Weight	1.15KGS	1.8KGS	1.8KGS	2.7KGS	2.6KGS	2.6KGS	2.7KGS	2.7KGS				
Size (LxWxH)	27.5x18x8CM			31.5x19x9 CM			39.5x21x11.5CM			39.5x21x11.5CM		



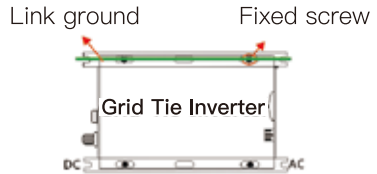
How to connect your system

1. Installation steps

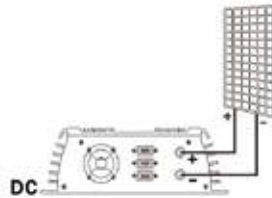
(1) Diagrammatize DC input and AC output terminals;



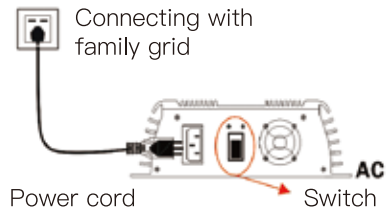
(2) Attach the smart micro inverter to the rack or fix on the wall;



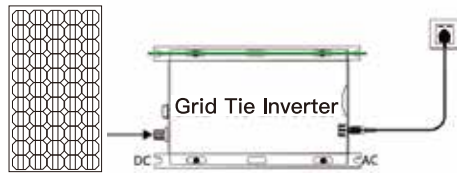
(3) Properly connect the positive and negative of solar panel and smart micro inverter;



(4) AC power cable connects with smart micro inverter and residential power grid which refers to low voltage civilian single-phase power grid;

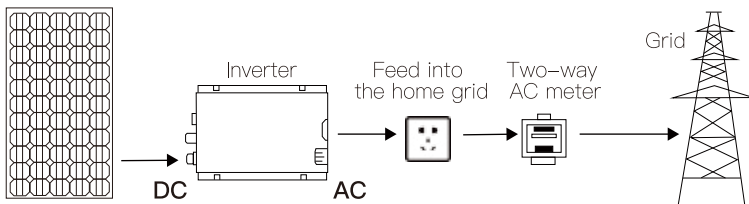


(5) Switch on power grid after check for input and output connections are correct and then switch on the smart micro inverter. The red/green LED lights up at the same time and then red LED lights off follow on and green LED flash fast, it is means that smart micro inverter is run for MPPT operation. When green LED long light and it is means that maximum power point lock-in, smart micro inverter proper functioning and output steady.

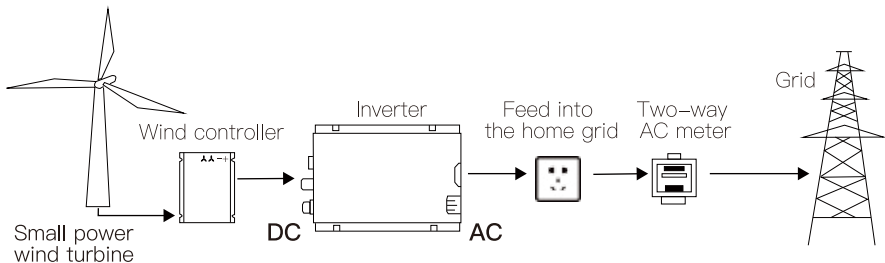


2. Grid-connecting of different power systems diagram

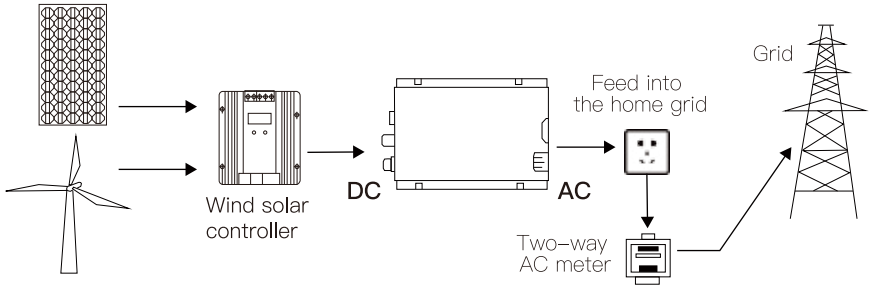
(1) Grid-connecting in PV power system.



(2) Wind-controller connection method.

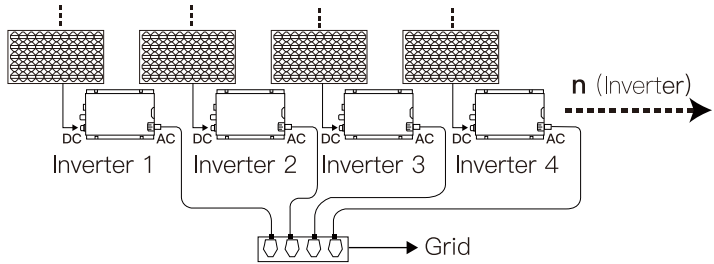


3. Grid-connecting in hybrid wind solar power system

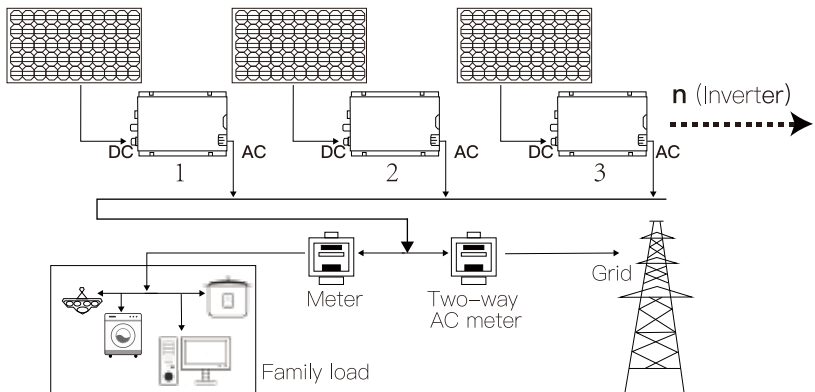


4. Smart micro inverter stack wiring diagram

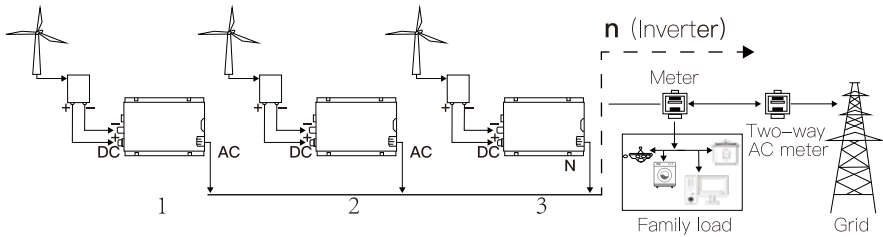
(1) Parallel stacking in PV system



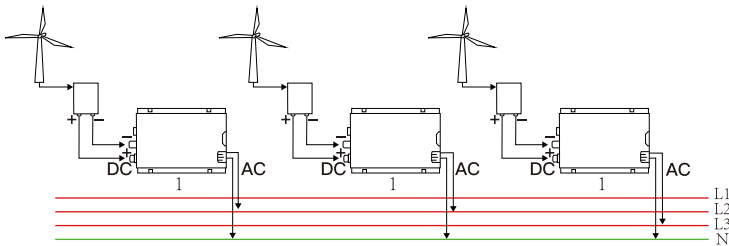
(2) Grid-connected way of selling electricity in PV system



(3) Grid-connected way of selling electricity in wind power system



(4) Connect with 3 phases grid net



Troubleshooting

1. System halted and /or without power output

- (1) Check if switch of smart micro inverter is turn on or not.
- (2) Check if the DC connection to smart micro inverter are correct or not.
- (3) Check if any reverse DC connection for positive or negative or not.
- (4) Check if DC input voltage is within the range of the smart micro inverter or not.
- (5) Check if the utility grid voltage and frequency are fit in with the serviceable range of smart micro inverter or not.
- (6) Check if fuses of DC side are fusing or not.
- (7) Check if utility grid voltage properly connecting to smart micro inverters or not.

2. DC power supply is normal but AC no power output:



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- (1) Check if utility grid voltage is connecting to smart micro inverter or not.
- (2) Check if utility grid voltage is fit in with the serviceable range of inverter.

Status indications of LED

1. Red LED indicator:

- (1) **Low-voltage protection** (DC input voltage lower than Min. input voltage of inverters).
- (2) **Over-voltage protection** (DC input voltage higher than Max. input voltage of inverters).
- (3) **Over-temperature protection** (Inverters will shut down for power output when temperature of body of inverters higher than 65–75°C, and inverter will be automatically restart up when temperature down to 40–50°C.).
- (4) **Power grid fault protection** when 110VAC or 220VAC grid power outage and/or tripped.
- (5) **Island protection:** inverter will be automatically shut down for power output when disconnect with power grid.
- (6) **Short-circuit protection:** inverter stops work when output cable short-circuits.
- (7) **Red LED** lights on for a while and then green LED lights on in one second when inverter starts to work.

2. Green LED indicator:

- (1) Green LED flash: adjusting for power output, MPPT operating for tracking.
Green LED long light: indicates inverter locking-in Max. output power operation status.
When green LED flash from the bottom up in turns, it is indicates the
- (3) inverter is locked at maximum power point as well as the output power is steady. The more power output, the faster running of green LED.

3. Grid-connected status.



FAQ

1. How to match solar panel for my inverter?

Normally, buyers can choose solar panels according to the inverter's maximum output power of 1.2–1.3 times. For example to 1000W output inverter, to install 1200–1300W solar panel is reasonable.

2. If power from solar panel exceeds the power which guided on parameter sheet, will the inverter be burn out?

If the DC input voltage are in the guided range, for example: to @18V(10.5–30V), @36V(20–50), the inverter over current protection will be started, only within the safe and allowable DC voltage range, no matter how much the actual power generated by the solar panel, only the current of the maximum allowable output power of the inverter will be sent to the inverter, and other excess power will be restricted to produce in solar panel. That means solar panel only will produce the inverter max AC allowed output power(The power loss of the inverter must be added).

3. If my solar panel power is lower than User Manual parameter guidance, it is workable?

The workable condition is that:

- (1) Both DC and AC sides' power are workable. That means only in day time with good sun light, and user local grid net with electrical power;
- (2) DC input voltage to this inverter must be keep in the allowance scope
@18V(10.5–30V, DC30V is solar panel Voc max voltage)
@36V(20–50V, DC50V is solar panel Voc max voltage)

4. When i get this new inverter, how can i do the testing?

First, you can connect with grid through your home socket. If the AC side blue color LED lamp is lighting(on inverter' s AC socket) . That means this inverter match with your local grid successfully.

Second, please connect with solar panel through DC side;

Next please turn on AC side switch, you will find the red led lamp is lighting, then green LED lamp is flashing, final green LED lamp will stable lighting.

Remark: if the red LED lamp can' t trun off, and green LED lamp will not appear. You need to take multi-meter to check they are within the allowed range or not.



5. Why when i get this inverter i can't see any color LED lamp lighting?

All inverter has been tested before packaged. Few inverter is dead for the long trip transport. If buyer can't find any LED lamp lighting, please check both DC and AC sides connecting and workable? If yes, please contact with us through email : service@marsrock.com.cn we will guide you return progress.

6. Do I need to get approval from the government grid company to connect to local city grid net?

- (1) Normal conditions are not required. Because the current generated by this product is very small, it will not cause any impact on the local power grid.
- (2) However, the local government or the power company has regulations or can not be connected. It is recommended that you choose the inverter with limited current function from our company (please consult sales).

7. Can i directly use battery as power supplier to connect with my local grid net?

- (1) Yes, but battery voltage is stable changing when working. The MPPT function of this inverter can't be used.
- (2) Meanwhile, please take care for the voltage must be matched with your inverter.

Please note that the positive and negative poles cannot be reversed, otherwise inverter will be damaged.

8. How can i know its working situation?

First, you can inspect its LED situation. If no lighting, that means the inverter doesn't be started, the reason many be;

DC or AC side doesn't be connected in well, you can use multimeter to test both sides;

Second, if the light in red, that means there is fault or some protection has been activated (Please read the description of the LED light in detail);

Third, if the LED in green but unstable. That means the DC or AC voltage is too low. Maybe the sunlight not strong to output the enough voltage to inverter. Or your local city grid voltage is unstable;

Forth, if the green light is stable, no flash. It means your inverter in good working now.



9. What happens if I reverse the positive and negative poles of the solar panel?

Normally, as long as it is in accordance with the solar panel configuration we guide, just because the positive and negative poles are reversed, the fuse of inverter will be burned out, but it can be repaired by replacing this fuse.

However, if the voltage or current is much higher than our specified value, it may damage the board. In this case, operator who are not qualified for electric operation shall not open the inverter at all, and shall not operate without cut off the electricity.

10. I don't have a wealth of basic knowledge of electricity. Can I install it myself?

Yes, you can do it! It's easy in installation. However, the connection must be made on the basis of confirmation of safety. Please read carefully the relevant sections of the Safety Instructions.

11. I am buyer from Brazil. Do i need to clear custom and pay tariff by myself? How long days i can get it once i finishing payment for my order?

We ready large storage in SP warehouse. All product prepaid tariff, we will directly delivery out from Brazil local warehouse, and ship out by post. Normally within 3 days in SP city buyer can get it .Other cities buyers can get it about 7 days by post.

12. May i install this inverter under the solar panel in outdoor?

No. You can't to do so. It must be installed indoors in a well ventilated area. Avoid direct sunlight, and pay attention to dust, moisture, corrosion.

13. Why the fan of this inverter doesn't t run when i start my inverter?

This inverter with high temperature protection. If the inner temperature of inverter is not higher than 45°C, the fan will not be activated.

14. How to assure its high quality as inverter designer and supplier?

- (1) The outer casing is made of aluminum alloy and the surface is treated with anti-oxidation treatment. At the same time ensure good heat dissipation performance;
- (2) Our products are designed safely according to the following standards:



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- ① EMC:EN61000–6–3:2007 EN61000–6–1:2007;
- ② Grid Disturbance:EN 50178+EN 62109–1+VDE0126–1–12;
- ③ Grid Detection:DIN VDE 1026 UL1741;
- ④ Certificate approved:Rohs, FCC, CE.

15. If I want to use an inverter with a larger function and communication function, can you provide it?

Yes, there is WVC and WV , SG series whose waterproof in IP68, and can be monitored by mobile and PC through WIFI, you can find them on our Aliexpress and Amazon store.

16. GTI series inverter is designed for use in a single–phase grid, can I use it in local city grid in two–phase or three–phase grids?

Yes, we have described in detail in the installation manual how to connect with the two–phase and three–phase grid, please read it carefully.

17. Why choose MARS ROCK as a provider of products?

- (1) Mars Rock has a strong R&D technical team and a professional production line;
- (2) Mars Rock is a manufacturer specializing in the production of micro–inverters from China. It has a complete quality management system and cost control advantages. It is the No. 1 manufacturer from China that can supply large quantities.
- (3) Mars Rock is a leader in cross–border e–commerce. After many years of operation, Mars Rock has completed the integration of the supply chain and established overseas warehouses in several countries, such as the United States, Canada, Mexico, Brazil, the United Kingdom, Spain, and Russia, Poland. Local delivery can be done quickly.
- (4) Mars Rock has established sales and after–sales teams in several countries, which can provide pre–sales guidance and after–sales service in a local language.
- (5) Since becoming a golden member of ALABABA in 2007, Mars Rock has won praises from more and more customers around the world for its professionalism, responsible attitude and high quality. At the same time, MARS ROCK has become a well–known brand of micro inverters produced by the world. In the sales of similar products, it has been the first in sales for AMAZON, Alibaba, Aliexpress for many years.



Disclaimer

Exemption regulations stipulated by law

1. Force majeure: article 117th of the contract law stipulates that if force majeure fails to perform the contract, part or all of the liability shall be exempted according to the influence of force majeure, except as otherwise stipulated by law. If the party fails to perform force majeure after the delay, it cannot be exempted from responsibility. Force Majeure as mentioned in this Law refers to an objective situation that cannot be foreseen, unavoidable and insurmountable.

2. Natural nature of the goods themselves and reasonable loss of the goods: article 311st of the contract law stipulates that the carrier shall be liable for damages to damage or loss of the goods during transportation, however, the carrier proves that the damage or loss of the goods is caused by force majeure, the natural nature or reasonable loss of the goods themselves, and the fault of the shipper and consignee.

3. Creditor's fault: article 311st of the Contract Law and Article 370th of the Contract Law stipulate that the custody delivered by the depositor is defective or special custody measures are required according to the nature of the custody delivered by the depositor is defective or special custody measures are required according to the nature of the custody, the depositor shall inform the custodian of the relevant information. If the depositor fails to inform and causes the storage to be lost, the custodian shall not bear the liability for damages; if the custodian is therefore lost, except if the custodian knows or should know and fails to take remedial measures, the depositor shall bear the liability for damages.

Exemption clause:

1. Concept of exemption clause

The exemption clause is the contract clause in which the parties exclude or restrict their future responsibilities by agreement. First, the exemption clause is the part of the contract is a kind of contract clause; second, the proposal of the exemption clause must be Express and not allowed to be silent.

The method is made and the judge is not allowed to assume the existence of exemption clause.



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2. The validity and invalidity of the exemption clause

- (1) Determine the validity or invalidity of the exemption clause based on the provisions of the current law. The disclaimer clause is expressed as an element by meaning.
The purpose of excluding or restricting the future liability of the belong to a civil act and should be subject to the contract law.
The provisions of Article 52nd, article 53rd, article 54th, article 47th, article 48th, article 51st and article 40th shall be adjusted.
- (2) Determining the validity or invalidity of the exemption clause on the risk allocation theory.
- (3) To determine the validity or invalidity of the exemption clause according to the degree of fault. Article 40th and article 53rd of the contract law.
- (4) Datermine the validity or invalidity of the exemption clause according to the severity of the breach of contract.

Disclaimer content:

- (1) The appearance of the whole machine is discolored, the parts are damaged, peeling, etc;
- (2) The appearance deformation caused by natural disasters or human impact and fall of the product cannot be used;
- (3) Unauthorized private disassembly and replacement, welding, cracking and commissioning caused damage;
- (4) Non-professional personnel carry out maintenance;
- (5) Due to the user's use of related plug sockets, connecting heads or adapter and other poor contact caused by damage;
- (6) The number of hand-in-hand connection of each group exceeds the specified number in the manual;
- (7) If the cable diameter not guided by professional electricians does not meet the current standard during installation;
- (8) Can not show the warranty card or pprovide purchase vouchers;
- (9) The installed position causes the inverter water to burn out on the border of the solar energy;
- (10) If the power grid is not disconnected for live operation during installation or maintenance, it will cause damage;

The above terms do not belong to the free warranty range of the product. Please be sure to clearly indicate the terms. Once the warranty is exceeded, the warranty will not be guaranteed. Be sure to refer to the product manual for installation.

