

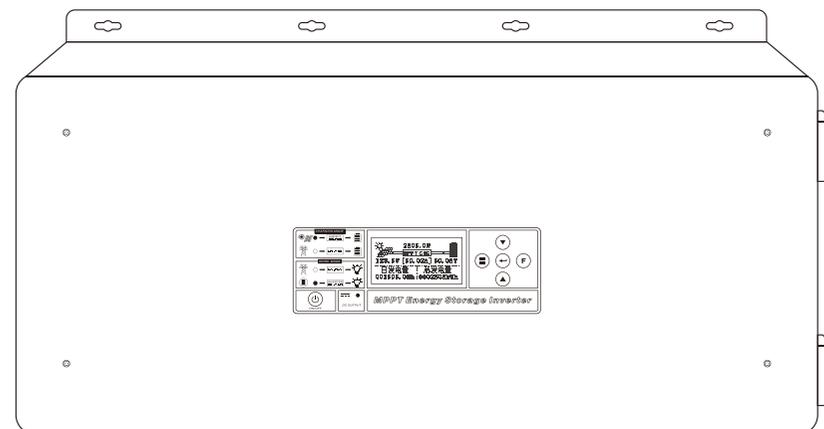
ATO

Open green life
Build bright future

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Solar Inverter

user manual



■ ATO-OGI series
Model;0.5kw-6KW

9 Quality guarantee

If the product fails during the quality assurance period, our company will provide free maintenance services or replace new products.

Evidence

During quality guarantee, our company requires customer shows purchase invoice and date of the products. At the same time, logo on the products should be clear and distinct, or we have the right not to provide quality guarantee.

Conditions

- Substandard products after replacement should be handled by our company.
- Customer should leave reasonable maintenance time to repair the failure equipment.

Responsibility immunities

Our company have the right not to provide quality guarantee on the conditions below:

- The whole machine or components have exceeded free guarantee period.
- Transportation damage
- Incorrect installation, modification or use.
- Operated beyond very harsh environment illustrated in this manual.
- Machine failure or damage caused by maintain, change or disassemble by non-our company services.
- Damages caused by abnormal natural environment.

Products failure caused by situations above, if customer requires maintenance service, we can provide paid maintenance service after our company service institution judgments.



Illustration

Any variation in product dimension and parameters will be subject to our company latest information, without prior notice.

7 Trouble shooting and solutions

| Trouble shooting and solutions | | |
|--------------------------------|-----------------------|---|
| Abnormal phenomena | | solution |
| inverter | Overheated | 1. Pls check whether the inverter is placed next to the heat source. Whether the fan port of the inverter has a shelter and the fan is working. |
| | Overload | 1. Reduce load |
| | Battery overdischarge | 1. The battery capacity is small and pls reduce load. 2. Battery aging. Pls repalce battery. 3. Weather. Extended charging time |
| | Output short circuit | 1. Checking circuit.If it is due to overload, pls reduce the electrical load and restart the machine. |
| | Mains is not charged | 1. Check for mains input. 2. Pls select AC prority option for working mode in the menu and choose PV+AC for charging mode. |
| | No AC output | 1.The system is in standby mode, pls restart. 2.The system is in alarm protection state, pls release the alarm. |

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1 Safety instructions

1.1 Safety responsibility immunities

Users should read this chapter carefully and operate according to safety cautions required by this chapter when installing, use and maintain this product. If there appears damage or loss caused by violation operations, it has no business with our company.

1.2 Safety sign illustration

 Note: due to dangers caused by violation operations, it might result in moderate damage or light injury to person as well as damage to products.

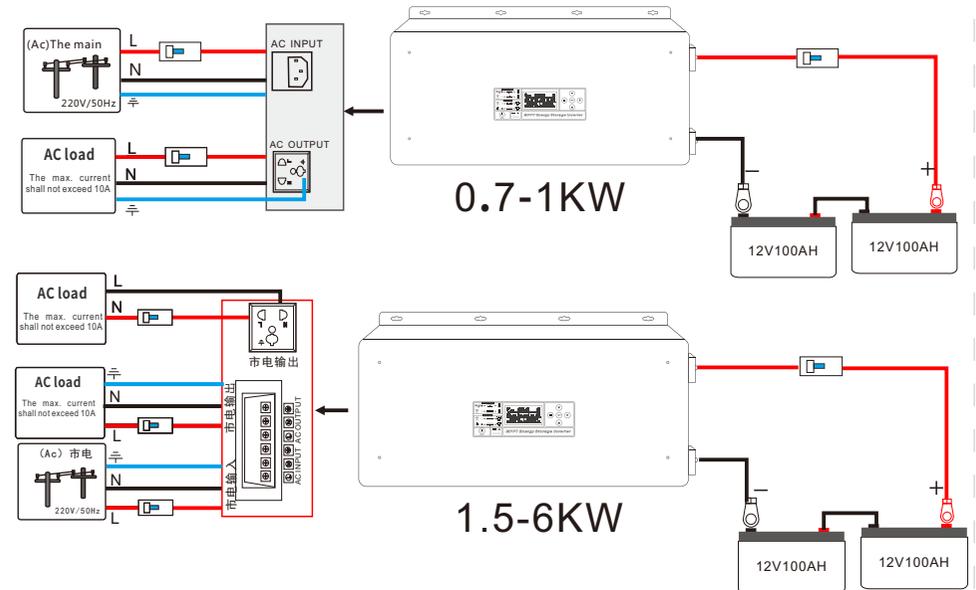
 Danger? Due to dangers caused by violation operations, it might result in fire, persons serious injury even death.

Safety instructions

| | |
|---------------------------|---|
| Transport |  Danger |
| | It should avoid strong vibration, fall, collisions and packing box upset down is prohibited during moving. Do not loss accessories, instructions and guarantee card etc. during unpacking and moving. |
| |  Note |
| | Please pay attention to safety during moving to avoid harming to your body. |
| Unpacking and inspecting. |  Note |
| | <ul style="list-style-type: none"> • If product damage or lack of components, you can not install, or accident maybe happened. • If packing list not agree with the product, please do not install and contact supplier on time. |
| Installation |  Danger |
| | <ul style="list-style-type: none"> • Wiring work must be conducted by qualified electrical engineering personnel, otherwise there is risk of electric shock or damage to the system • Must make sure power supply is off before wiring, or there is risk of electric shock or fire. • AC input has overload and electricity leakage protection. • Cables must meet with related requirements, distribution section must meet with safety regulations. • Installing must be conducted strictly according to installation steps illustrated in the following chapters, otherwise it will cause damage to products. |
| |  Note |
| | <ul style="list-style-type: none"> • When moving and installing, please handling with care to avoid injuring feet or damage to products. • This product should be keep away from inflammable objects and heat source, as well as no shelter to back panel cooling fan. • When installing, do keep sundries from dropping inside the product, otherwise it will cause system failure. • The product must be ground connected reliably, ground wire should be as short as possible, to avoid electric shock. |

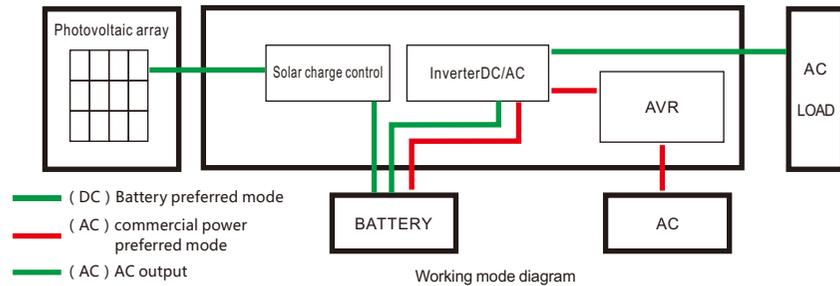
7 Installation steps

1. Prepare corresponding installation tools and measuring tools before installation and debugging Such as Philips screwdriver, diagonal pliers, multimeter, No.10 hammer wrench, etc.
2. Check whether the required accessories are complete. Wire and switch shall be selected according to the selection table.
3. Make sure all power switches of the machine are turned off. Confirm positive and negative poles of the battery, and its voltage is consistent with the input voltage of the machine.
4. Select a black wire with appropriate cross-sectional area and connect them in sequence: battery negative --- negative terminal of the machine battery to complete the negative connection of the battery. Select a red wire with appropriate cross-sectional area. Battery positive--switch--positive terminal of the machine battery to complete the positive connection of the battery.
5. Select wires with appropriate cross-sectional area and connect them in sequence: (AC live wire--switch--live wire terminal/ AC neutral-- neutral terminal/ AC earth wire--earth wire terminal). Completing AC input wiring.
6. Repeat step 5 to complete AC output wiring.
7. After checking each connection is correct, first of all, turn on battery switch. Second, press ON button of the display screen, then LCD screen will display normally.
8. When the mains input switch is turned on, it can charge the battery and supply power to the load. The screen will display AC charging voltage and status.
9. Turn on the mains output switch and the load can be used. It will display AC charging voltage and status.



6 Work mode instructions

Work mode instructions



(1) (DC) Battery preferred mode

Under (DC) battery preferred mode, the batteries supply power to load, as shown of green arrow in the above picture.

- 1、 not only the power produced by solar panels will supply to user's appliances, but also the redundant power will be restored in the batteries
- 2、 When power produced by solar panels is not sufficient for user's load, the power restored in batteries will supplement to load.
- 3、 When batteries's power is not sufficient, power produced by solar panels is not sufficient, the system will switch over to AC to supply power to load. If batteries' power is gravely insufficient, the system will switch over to AC to supply power to load, besides, it will automatically start up AC to charge for batteries. When batteries are full charged to 100%, the system will return to (DC) battery work mode automatically.

(2) (AC) commercial power preferred mode

Under (AC) commercial power preferred mode, commercial power supply power to load, it is output to load through system AVR and isolating part, to make sure the stability of output power source.

1. AC input supply power for user's load, at this time, power produced by solar panels only charge for batteries.
2. When batteries' power is gravely insufficient, except for supply power for users' load, AC will start up to auxiliary charge for batteries. But it won't fully charge to batteries.
3. When AC is off or abnormal, the system will switch over to batteries to supply power for load.

(3) Power saving mode

Under power saving mode, users can set the charging mode to PV charge preferred mode, at this time, AC will not charge to batteries.

(4) Off-peak power consumption mode

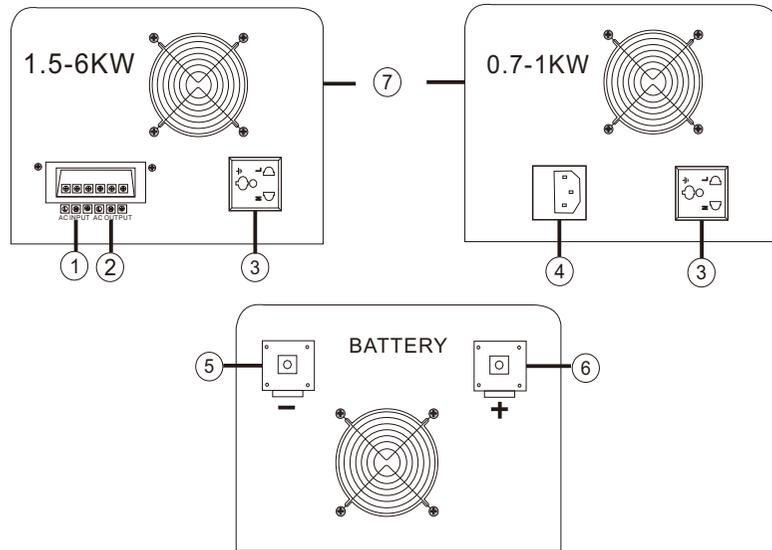
For countries and regions where electric accounted according to time-of use, users can set timing work mode switching according to requirements. Regarding off-peak power consumption function, it will use AC power during the time of low power grid load and cheap power rate, it will fully charge to batteries at the same time. During the time of peak power grid load, it will make use of power stored in batteries to realize the purpose of off-peak power consumption and save electricity cost.

1 Safety instructions

Safety instructions

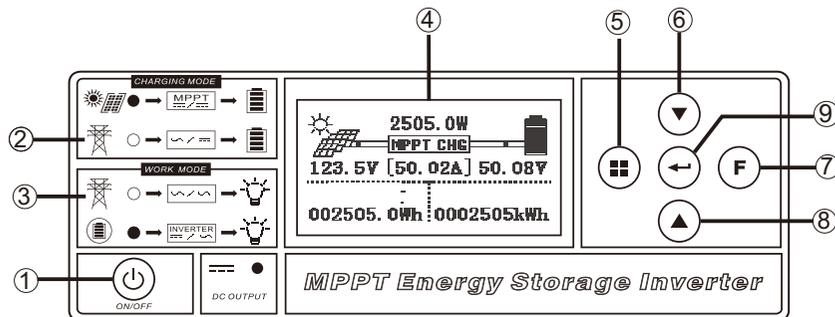
| | |
|----------------------|--|
| Operating |  Danger |
| | <ul style="list-style-type: none"> • Before operating, please make sure this product is operated within the allowed working range, otherwise, it will cause damage to this product. • When do not use this product for long time, the battery should be full charged, and battery breaker should be disconnected to avoid battery full discharged caused by long term standing of battery • When do not use this product for long time, it should be charged for more than 2-4 hours by AC or solar energy input after charging the battery breaker should be disconnected. |
| Maintenance overhaul |  Danger |
| | <p>When disassemble the shell, please do disconnect solar energy input, AC input, AC output and battery breaker, otherwise there will be risk of electric shock.</p> <p>Even after disassembling the sell, there will remains electricity inside the machine, please do no touch naked part of the wire directly to avoid electric shock.</p> <p>Maintenance and overhaul should be conducted by professional maintenance personnels, uses do not disassemble the machine by themselves, otherwise it will cause electric shock and damage to this product.</p> |
| Others |  Danger |
| | <p>Transforming by oneself is prohibited to avoid serious accident.</p> <p>When abnormal situation appears inside the machine, please disconnect battery breaker and power source input and output wire immediately.</p> <p>If the machine is on fire by any chance, please use dry powder extinguisher and disconnect all switches immediately.</p> <p>The machine should be started and operated only after the battery is connected, otherwise the machine will be damaged.</p> |

2 Sketch of product appearance



Machine description

| Machine description | |
|---------------------|--|
| 1 | AC input terminal (live wire, neutral wire and earth wire) |
| 2 | AC output terminal (live wire, neutral wire and earth wire) |
| 3 | AC output universal socket(The max. current shall not exceed 10A) |
| 4 | AC input socket |
| 5 | Battery positive terminal |
| 6 | Battery negative terminal |
| 7 | Cooling fan |



5.3 Functional Setting attention

1.Factory reset password

When the machine cannot operate normally due to incorrect setting of operating parameters, it can be restored to the factory settings.

Press DOWN key 3 times and press UP key 3 times, then press ENTER key to enter the operation parameter

2.Power-on test run



Attention: Please check the polarity of positive and negative poles of all DC connection wires before power-on test run.

Follow these steps to test run:

- 1.Check that the positive and negative poles of the connecting wire must be connected correctly.
- 2.First , open the circuit breaker connected to the battery.
- 3.Battery type: factory default lead-acid maintenance-free battery

3. Record query



First, under the default main interface, press MENU key to enter the main menu. Second, press DOWN key to select the record query. Third, press ENTER key to enter the record query. Fourth, press DOWN key or UP key to select curve query or fault record query. Fifth, press ENTER key to enter curve record query or fault record query. Sixth, press DOWN or UP key to read records. A total of 10 records. Finally, press MENU to return to previous menu and home page.

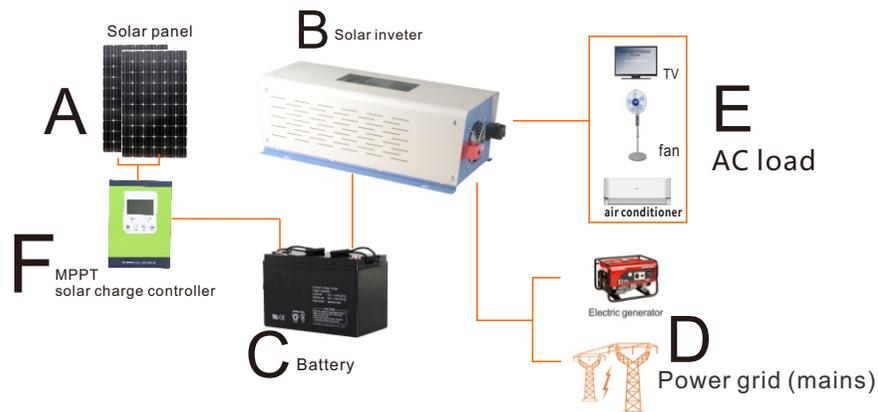
5.4 Wire and switch configuration table

| Wire and circuit breaker specification configuration table | | | | | | | | | | | | | | | | | |
|--|-----------|-----|-------|-----|-------|-----|-------|-----|-------|------|-------|------|-------|------|-------|------|-----|
| Capacity | 0.7KW | | 1.0KW | | 1.5KW | | 2.0KW | | 3.0KW | | 4.0KW | | 5.0KW | | 6.0KW | | |
| Voltage(V) | 12 | 24 | 12 | 24 | 24 | 48 | 24 | 48 | 24 | 48 | 48 | 48 | 96 | 48 | 96 | | |
| AC voltage | 110 | 220 | 110 | 220 | 110 | 220 | 110 | 220 | 110 | 220 | 110 | 220 | 110 | 220 | 110 | 220 | |
| Battery wire mm ² | 10 | 10 | 16 | 10 | 16 | 10 | 16 | 10 | 25 | 16 | 25 | 25 | 25 | 16 | 35 | 16 | |
| (Input/Output) Neutral wire/Live wire | 1.0 | 1.0 | 1.0 | 1.0 | 2.5 | 1.5 | 4 | 4 | 6 | 2.5 | 6 | 4 | 10 | 6 | 10 | 6 | |
| Circuit breaker | Battery | 60A | 32A | 60A | 32A | 60A | 32A | 60A | 60A | 125A | 60A | 125A | 60A | 125A | 60A | 125A | 60A |
| | AC input | 16A | 16A | 16A | 16A | 16A | 16A | 32A | 16A | 32A | 16A | 60A | 32A | 60A | 32A | 60A | 32A |
| | AC output | 16A | 16A | 16A | 16A | 16A | 16A | 32A | 16A | 32A | 16A | 60A | 32A | 60A | 32A | 60A | 32A |

5 Product description

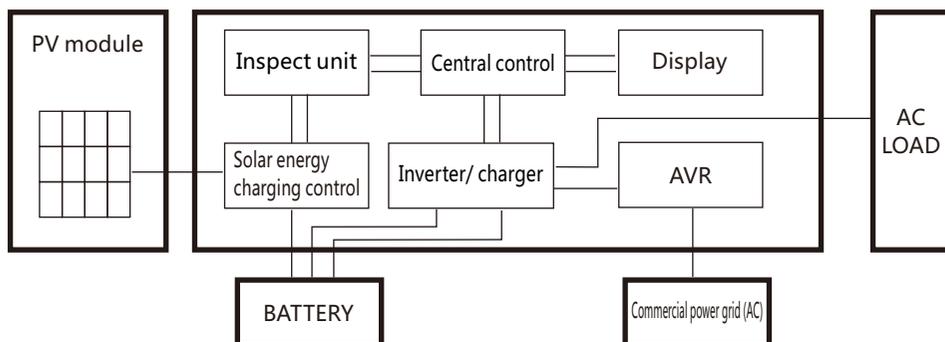
5.1 Consists of off-grid PV power system

The off-grid PV power system consists of PV modules, controller/ inverter, batteries and AC(power grid).



| Name | Describe | Note |
|------|----------------------------|--|
| A | PV module | Monocrystalline, polycrystalline |
| B | Inverter | Inverter unit |
| C | Battery | Optional battery type(the default item is lead-acid battery) |
| D | Commercial power grid (AC) | 50Hz/220V、230V、240V 60Hz/110V、120V |
| E | AC load | Inductiveness, resistiveness, capacitive |
| F | Solar charge controller | Charging control unit |

5.2 System block diagram



2 LCD display description

| | |
|---|--------------------------------------|
| 1 | Power start switch |
| 2 | AC charging mode- indicator light on |
| 3 | AC working mode- indicator light on |
| 4 | Display |
| 5 | Menu |
| 6 | Down |
| 7 | Shortcut |
| 8 | Up |
| 9 | Enter |



Communication settings
Press to enter



Quick operation
AC priority mode
press to enter



Quick operation
AC priority mode
press to enter



DC Priority--Inverter
053.0V | 000V~ | 00990w
100% | 218V~
PV+AC | 50Hz

LCD display functional description

| | | | |
|--|------------------------------|--|--------------------------------|
| | Language settings | | Mains charging setting |
| | Date and time settings | | Standby mode |
| | Contrast settings | | Battery type setting |
| | Brightness setting | | Rated voltage setting |
| | Sound setting | | Charging voltage setting |
| | Record query(Fault record) | | Charging current setting |
| | Clear record | | Discharge limit setting |
| | SYS info query | | Restore factory settings |
| | Communication settings | | City power priority mode |
| | Operating parameter settings | | Battery priority mode |
| | Working mode | | Solar+city power charging mode |
| | Charging mode | | Standby mode |
| | Switching voltage setting | | Boot mode |

4 Technical data

| MODEL | | 0712 | 0724 | 1024 | 1524 | 1548 | 2024 | 2048 | 3024 | 3048 | 4048 | 4096 | 5048 | 5096 | 6048 | 6096 |
|------------------|-----------------------------|---|------|--------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|
| Rated capacity | | 1000VA | | 1500VA | 2000VA | | 3000VA | | 5000VA | | 6000VA | | 7000VA | | 8000VA | |
| Rated Power load | | 700W | | 1000W | 1500W | | 2000W | | 3000W | | 4000W | | 5000W | | 6000W | |
| Input | DC input | DC10.5-15V(12V)/DC21-30V(24V)/DC42-60V(48V)/DC84-120V (96V) | | | | | | | | | | | | | | |
| | AC input voltage(Vac) | 190-275VA | | | | | | | | | | | | | | |
| | Frequency (Hz) | 50/60Hz±5% Auto) | | | | | | | | | | | | | | |
| Output | Voltage | 220V/230V240V/110V±3% | | | | | | | | | | | | | | |
| | Frequency | 50/60Hz±5% | | | | | | | | | | | | | | |
| | Wave form | Pure sine wave | | | | | | | | | | | | | | |
| | Transfer efficiency | ≥85% (full load) | | | | | | | | | | | | | | |
| | Wave form distortion factor | ≤3% | | | | | | | | | | | | | | |
| | Output power load factor | ≥0.8(> 30% Load) | | | | | | | | | | | | | | |
| Protection | Overload capacity | 105-120% 30S;120-150% 10S;>150% 5S | | | | | | | | | | | | | | |
| | Low voltage | DC10.5V(12V)/DC21V(24V)/DC42(48V)/DC84V , Alarm and shut down | | | | | | | | | | | | | | |
| | High temperature | 85° Auto shut-down after alarm | | | | | | | | | | | | | | |
| | Short-circuit | Automatic shut-down | | | | | | | | | | | | | | |
| | Over voltage | DC17V(12V)/DC33V(21V)/DC66(48V)/DC128V , Auto shut-down after alarm | | | | | | | | | | | | | | |
| Grid charge | Charge current | 0-30A adjust | | | | | | | | | | | | | | |
| Function | Setting | Chiese&English optional、Time&date setting、 Contrast、 Brightness、 Sound、 Voltage switch、 Grid charge、 Clear records、 Reset | | | | | | | | | | | | | | |
| | Work Mode (Optional) | Grid first/battery first//standby mode | | | | | | | | | | | | | | |
| | LCD display | Record (Fault Record) 、 system information | | | | | | | | | | | | | | |
| Others | Switch time | ≤4mS | | | | | | | | | | | | | | |
| | Cooling method | fan | | | | | | | | | | | | | | |
| | Noise[dBA] | <60 | | | | | | | | | | | | | | |
| | Work Temperature(°C) | -10 ~ 50 | | | | | | | | | | | | | | |
| | Environment Humidity | 10% ~ 90%(No condensation) | | | | | | | | | | | | | | |
| | Working elevation(M) | <3000 (>1000m,Derating) | | | | | | | | | | | | | | |