Qoltec®

Monolith®

USER MANUAL
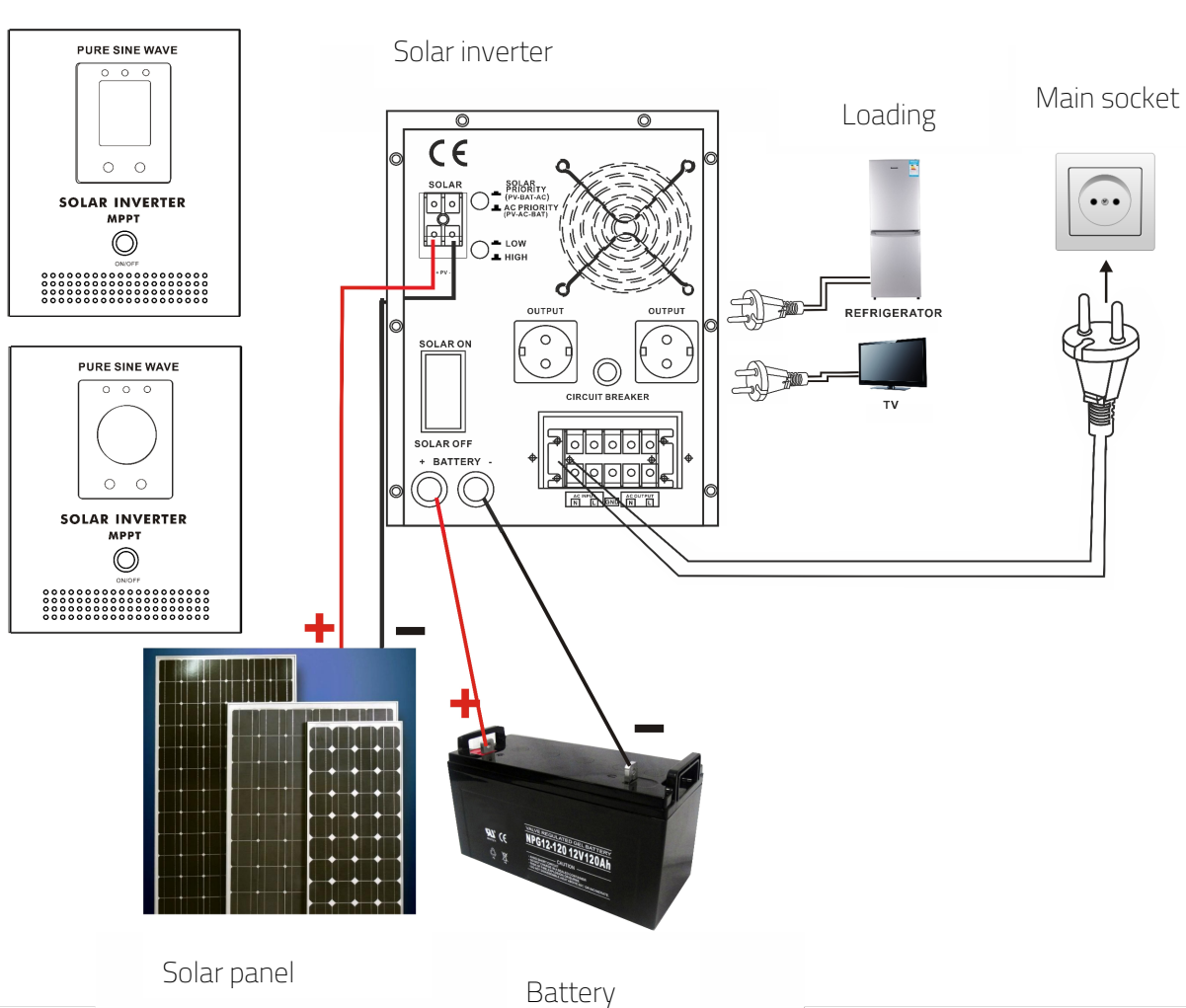
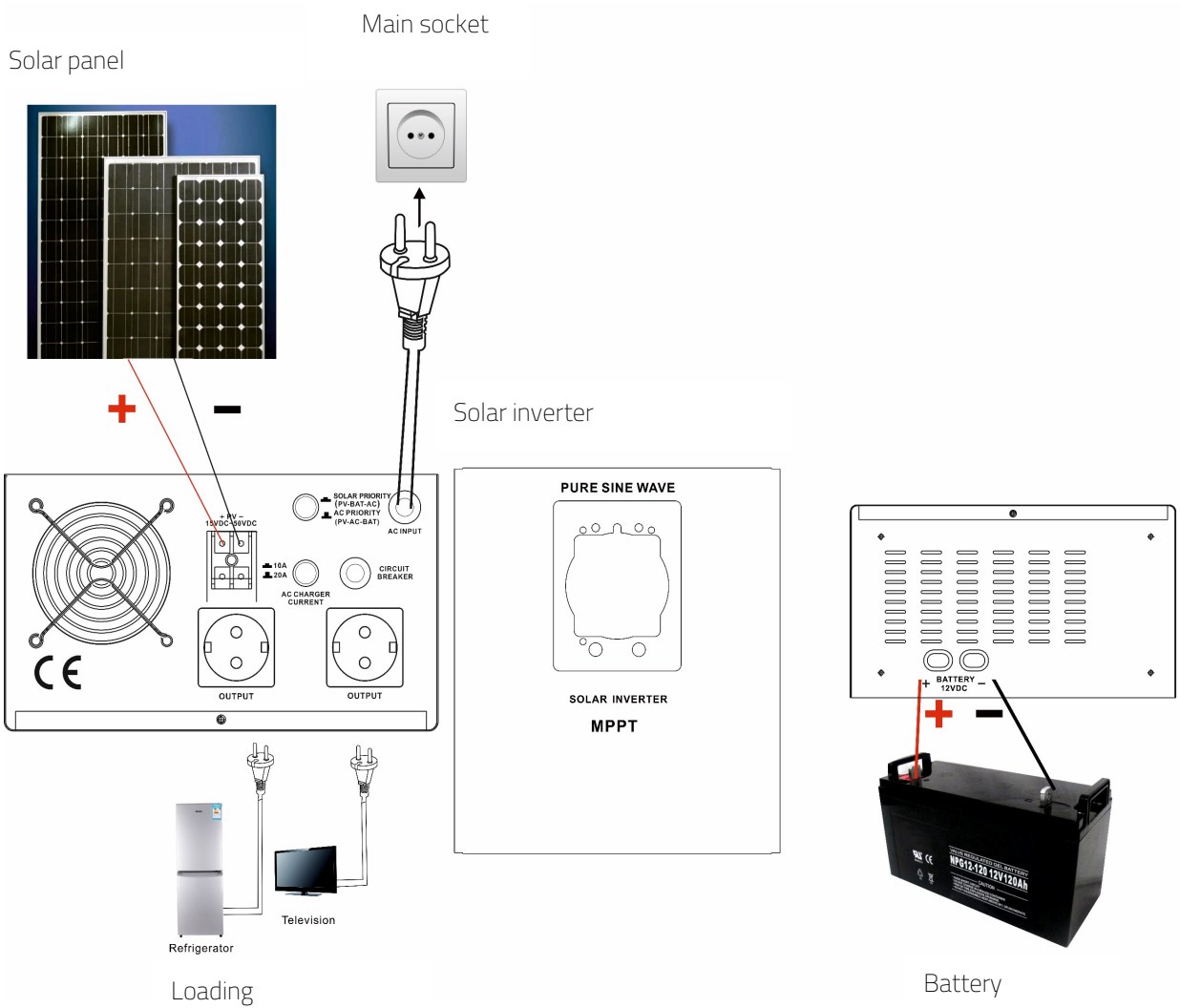Pure Sine Wave Solar Inverter

MODEL: 53890, 53891, 53892

Features:

1.1 Pure sine wave output, strong compatibility, which can be connected with refrigerators, electric fans, televisions, fluorescent lamps etc, without damage for loads.

1.2 C.R.G.O Toroidal transformers technology , more reliable, Low static loss

1.3 Double CPU intelligent control, high performance

1.4 MPPT solar charging technology, more efficient

1.5 With wide frequency range, auto-tracking for main frequency and inverter output 50/60Hz

1.6 Intelligent selection between main mode and solar mode, more energy-saving

1.7 Full range of automatic protections & alarm: overload, short circuit, overvoltage, under voltage, high temperature etc.

1.8 Friendly display interface, clear working status
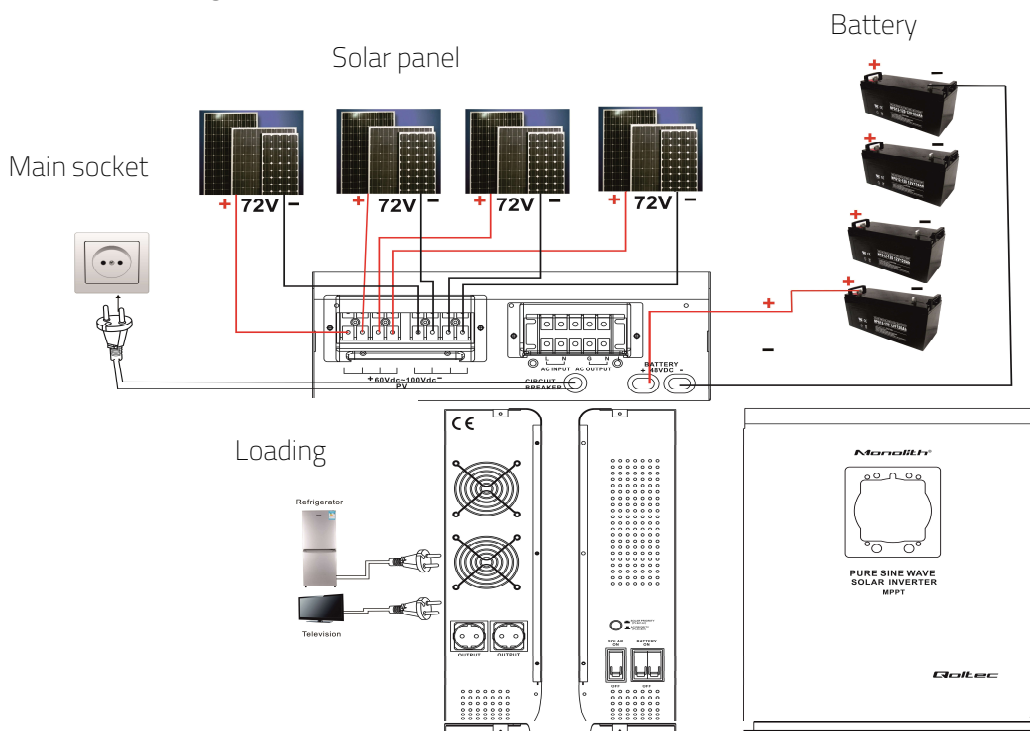
2. Product installation & precautions

2.1 Product installation & connection diagram

Solar inverter

Loading

Main socket

REFRIGERATOR

TV

Solar panel

Battery

Connection diagram (500VA to 2.5KVA)

Main socket

Solar panel

Solar inverter

PURE SINE WAVE

SOLAR PRIORITY
(PV-BAT-AC)
AC PRIORITY
(PV-AC-BAT)

AC INPUT

+ PV –
12VDC-96VDC

10A
20A

AC CHARGER
CURRENT

CIRCUIT
BREAKER

OUTPUT   OUTPUT

SOLAR INVERTER
MPPT

BATTERY
12VDC

NPG12-120 12V120Ah

Television

Refrigerator

Loading

Battery

Connection diagram (3KVA to 5KVA)

Battery

Solar panel

Main socket

+ 72V –   + 72V –   + 72V –   + 72V –

+60Vdc-100Vdc–
PV

AC INPUT AC OUTPUT

CIRCUIT
BREAKER

BATTERY
48VDC

Loading

Refrigerator

Television

PURE SINE WAVE
SOLAR INVERTER
MPPT

Monolith

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OUTPUT OUTPUT

Before installation on the wall, please check below size carefully and choose the correct expansion bolt and screw.

Product installation & connection steps:

1) Please open the packing carton to verify that products good, and unplug the power cord to ensure the output terminal without any connection;
2) Please connect the battery in right way, and check the voltage & polarity of positive/negative carefully;
3) Connect the solar panels properly, and check   the voltage & polarity of positive & negative carefully;
4) Select the machine priority mode: for solar energy systems , select the PV priority, otherwise AC priority
5) Press the ON/OFF button to start, to ensure it can work normally and connect the mains.
6) Open the solar input switch for solar charging;
7) Connect the input terminals with the loads which are turn off, and then open them one by one.

2.2 Precautions

1) connect properly to the battery and solar panel, reversed or high voltage will cause serious damage.
2) be connected to ground securely
3) don't load beyond the rated power. If connect the refrigerators, fans such inductive loads, the loading capacity should not exceed the 30% of the rated power.
4) don't install this products outdoors, avoid the electricity leakage caused by any water.
5) when the product work properly, the cabinet will have a certain degree of heat. It should be installed at a distance over 50 cm far away the human venue area. To ensure adequate ventilation around ,and away from flammable materials
6) If the product malfunctions, disconnect the mains input immediately , and then shut down. Disconnect the battery and solar panel switch, and take note of the failure and fault phenomena, etc, contact your dealer promptly, and give the products to the professional personnel.

## 3. Working principle

3.1 System circuit diagram
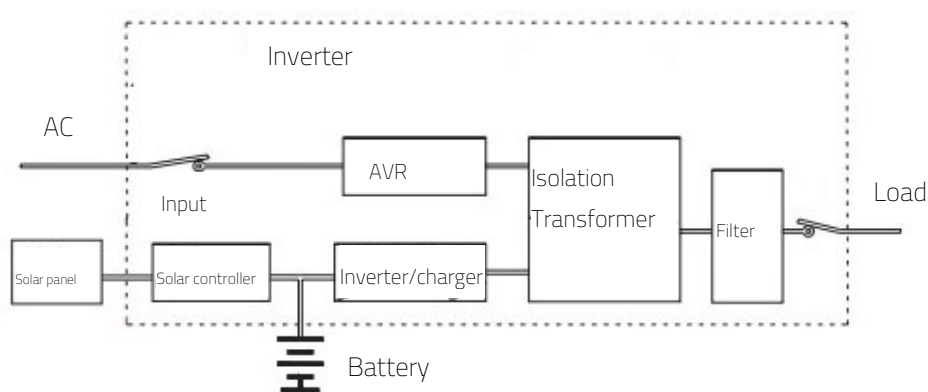
3.2 Working mode:

1) Solar energy: Strong enough
   Priority mode: No matter
   AC power input: No matter

Solar panel will adjust to the largest state through solar power controller and give power to load through the inverter (Mains as a standby).If solar energy stronger than output power, it will charge the battery at the same time.
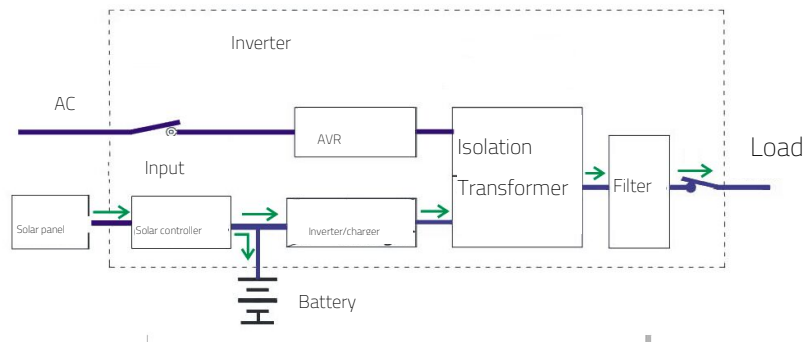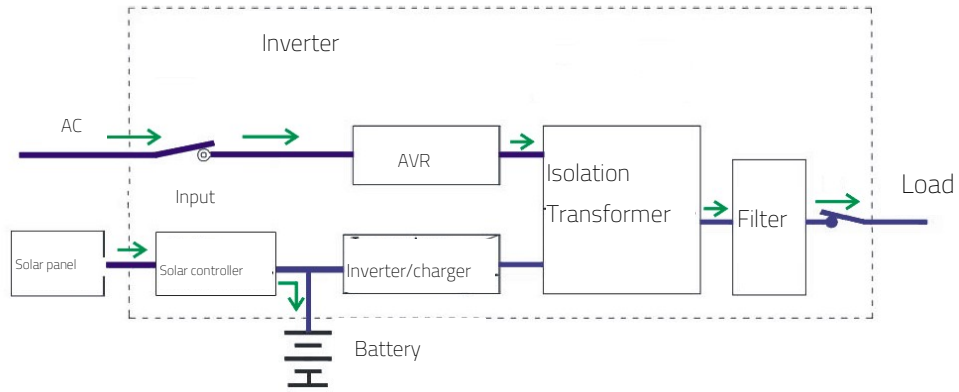

If solar energy less than output power, the system will convert the energy of battery and PV systems and give power supply to the user equipment.
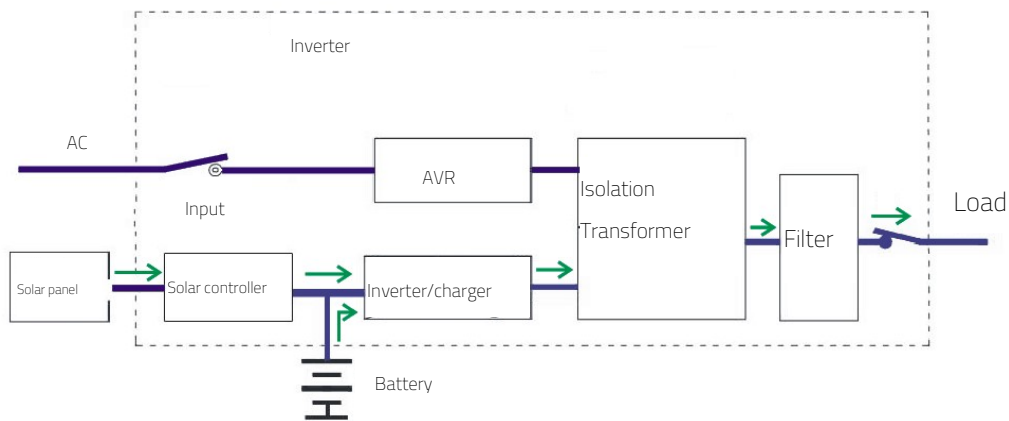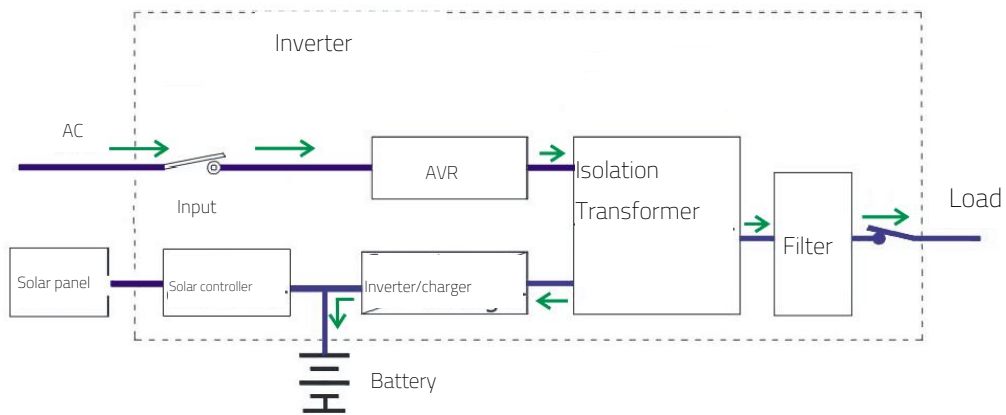

2) Solar energy: No strong enough
   Priority mode: AC priority
   AC power input: Normal

AC input will provide power to equipments through regulator by relays and transformer. At this time, PV gives power to batteries only through MPPT control system.
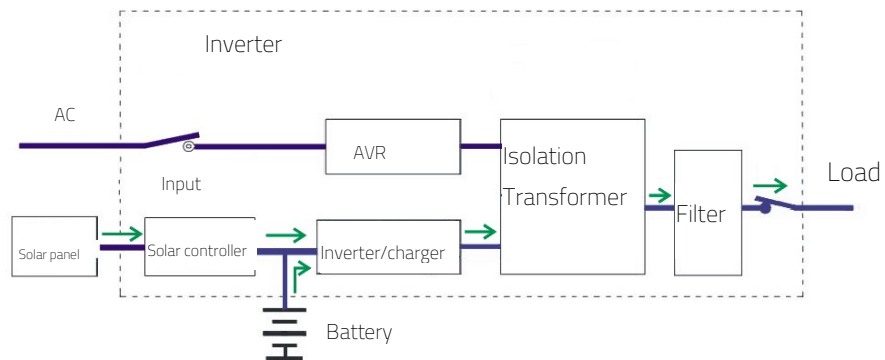
During the evening (or rainy days, with no sun), AC power will charge battery by charger inside the inverter.

3) Solar energy: No strong enough
   Priority mode: AC priority
   AC power input: Wrong

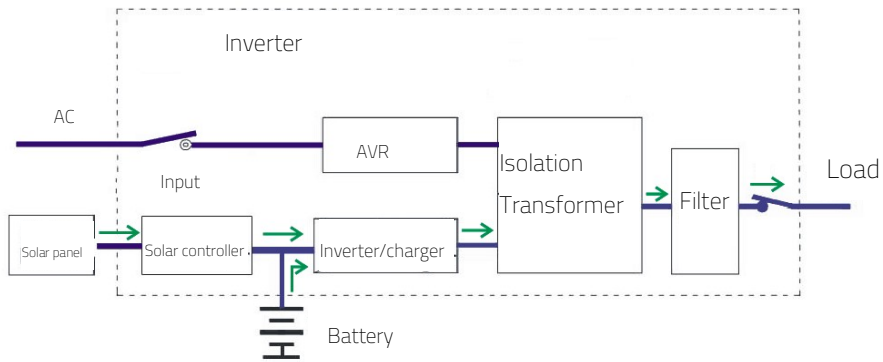The system will convert the energy of battery and PV systems and give power supply to the user equipment.

During the evening (or rainy days, with no sun), the system will convert the energy of battery and give power supply to the user equipment.
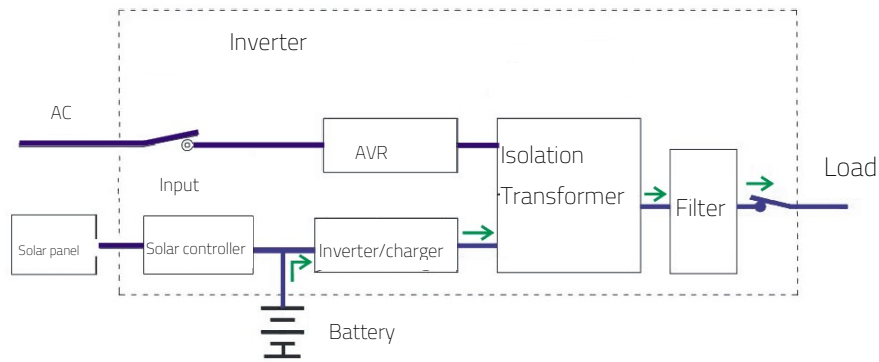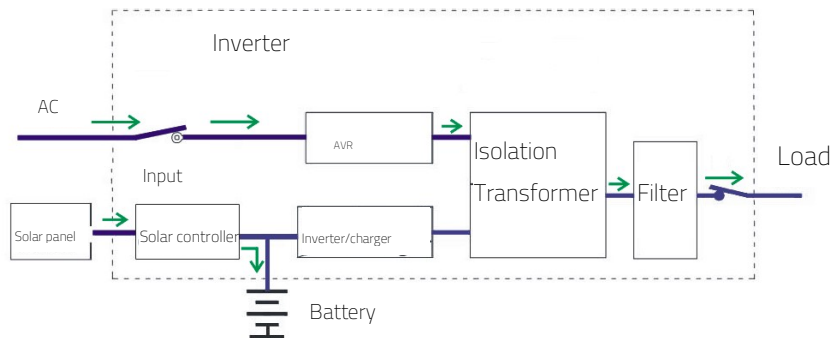
4) **Solar energy:** No strong enough
   Priority mode: PV priority
   AC power input: Normal

The system will convert the energy of battery and PV systems and give power supply to the user equipment.


If battery capacity less than 40%, AC input will provide power to equipments through regulator by relays and transformer. At this time, PV gives power to batteries only through MPPT control system.
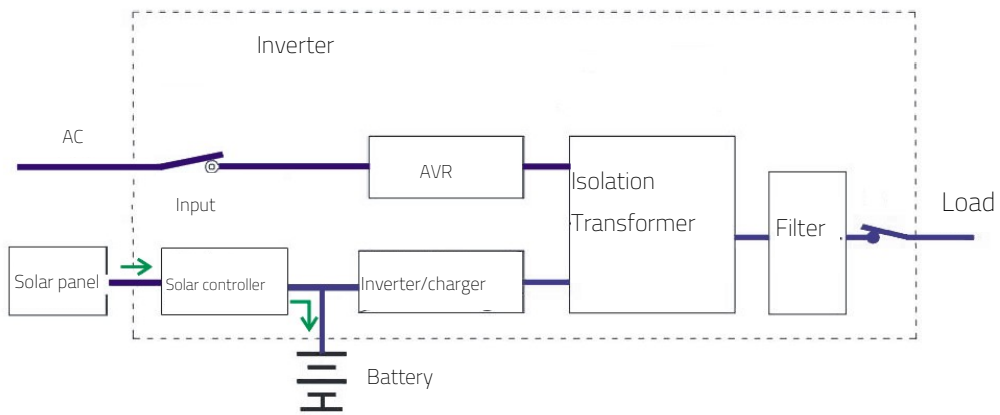

5) **Solar energy:** No strong enough
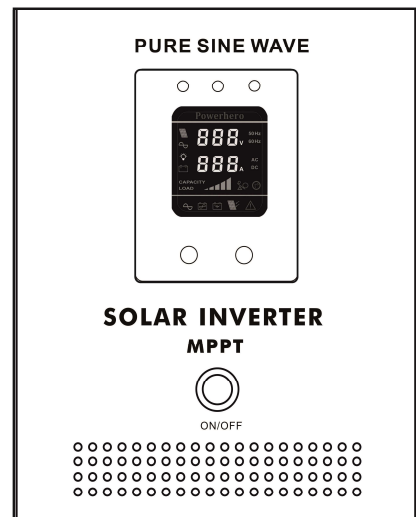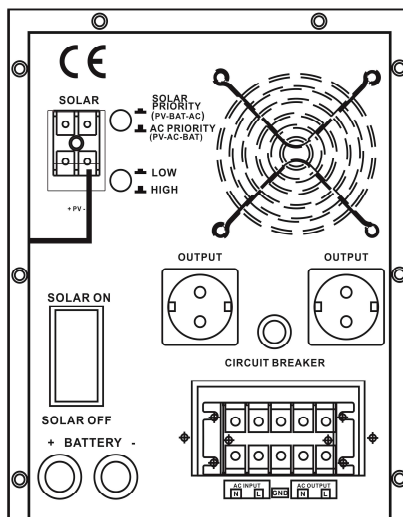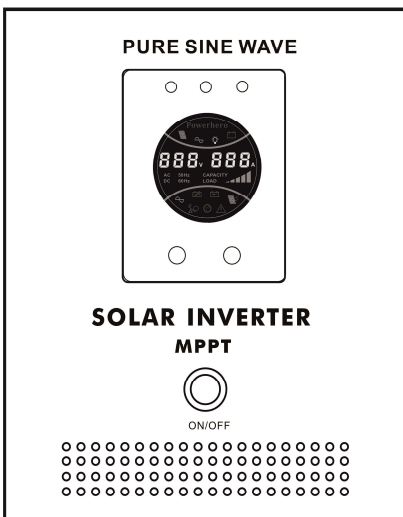   **Priority mode:** PV priority
   AC power input: Wrong

The system will convert the energy of battery and PV systems and give power supply to the user equipment.
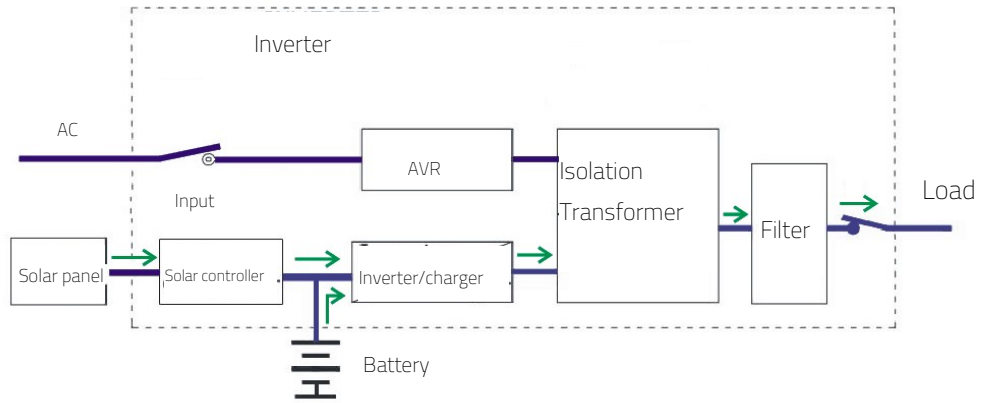
If battery capacity less than 30%, the inverter turn off and no power supply to de user equipment. At this time, solar energy can charge the battery normally.

4. Product panel and display details:
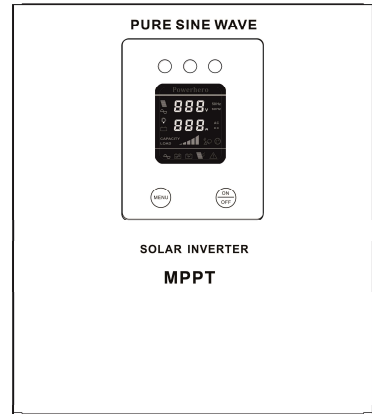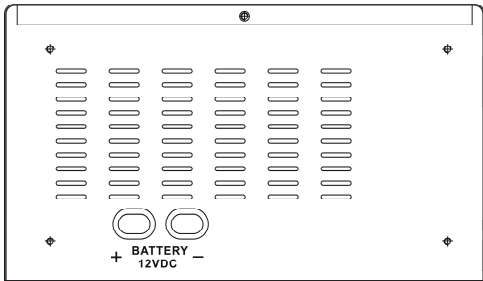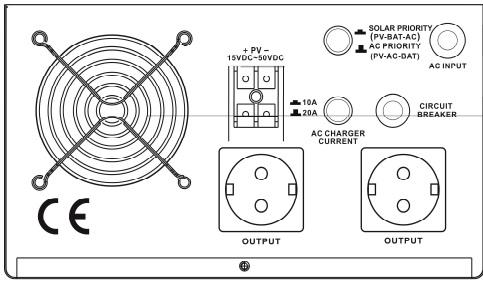
Detail display status by press MENU
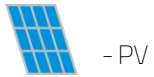
 - PV

 - City power

 - Output

 - Battery

 Voltage indication. When lighting, here shows solar panel voltage; lighting

Here shows city power input voltage; lighting, here shows output voltage.

 Current indication. When lighting, here shows solar panel current;

AC AC voltage indication

DC DC voltage indication

50 Hz
60 Hz Frequency indication

CAPACITY
LOAD Loading bar shows the loading situation; Battery bar shows the battery capacity, when in city power charge, the bar will flashing.

PV charging indication

Battery mode

City power mode

Abnormal/Faulty indication

Overloading indication

Overheating indication

SOLAR	BATTERY	FAULT
◯	◯	◯

Left :   Green LED: Solar panel connect state. Long light means normal. Light off or flash means connect unusual
Middle Yellow LED: Battery connect state : long light means normal, light off or flash means connect unusual
Right   Red Led : means abnormal state, light means solar part abnormal

5. ON/OFF Instructions

5.1 About ON/OFF inverter;

1) On: When Mains is normal, inverter will start; when the Mains is abnormal or no input , press the button "ON" in 3 seconds, it will start also.
2) Off: Press the shut-down ("OFF") in 3 seconds, it will cut off the output.

5.2 About ON/OFF solar controller;

1) On: When PV voltage is in the set range of device & Switcher for solar is "ON", solar controller will startup automatically and charge the battery.

2) Off: When PV voltage is lower than the set range of device Or Switcher for solar is "OFF", solar controller will switch off automatically.

5.3 Turning on steps;

1) Please ensure the battery connecting properly (positive/ negative and voltage parameters consistent with the product identification), and then turn on the battery switch

2) Please ensure the solar panel connecting properly (positive/ negative and voltage parameters consistent with the product identification), and then turn on the solar input switch

3) Press the button "on/off" in 3 seconds, and start the inverter

4) Turn on the solar panel input switch , and it will charge automatically

5) Connect the mains properly, after the inverter starts normally, and then start the mains switch

6) After 30 seconds, inverter will output normally and connect the loading, then start the loads one by one.

5.4 Turning off steps:

1) Turn off the loads one by one

2) Press the shut-down ("Off ") manually in 3 seconds, and cut the output

3) Unplug the power cable or connector cable, cut off the Mains input (if no need Mains charging)

4) Turn off the switch of solar panel on the real panel (If no need Solar panel charging)

5) Turn off the switch of battery on the real panel (if no need charging)

6. Specifications

Solar Integrated Off-Grid Inverter									
Model		500VA	800VA	1000VA	1500VA	2000VA	2500VA	3000VA	5000VA
Power Capacity		300W	500W	700W	1050W	1400W	1800W	2100W	3500W
Battery voltage		12Vdc	12Vdc	12Vdc	24Vdc	24Vdc	24Vdc	48Vdc	48Vdc
Working mode		PV(Photovoltaic priority) / AC（AC priority）Optional							
PV	Input voltage range	15Vdc-50Vdc				30Vdc-50Vdc			60Vdc-100Vdc
	Max. charge current	10A/20A/30A//40A Optional According to print on machine							60A
	Max. Conversion efficiency	98%							
Display	Panel indicator light	LED Graphic Screen LED lights							
Mains status	Input voltage range	140Vac~275Vac							
	Input Frequency range	45-65 Hz (Automatically transfer to inverter power when over frequency)							

	Output voltage range	195Vac~240Vac
	Input PF.(AC/DC)	98%
	Efficiency	Mains mode≥ 96%
	Charge current	10A/15A/20A
	Mains overload	warning until decrease load
	Short circuit	Yes
Inverter output	Inverter output voltage	220V±3%
	Output frequency	50 Hz / 60Hz ± 0.3Hz frequency adaptive
	Output power factor	≥0.8
	Wave form distortion	Linear load≤ 3%
	PV-AC transfer time	4Ms typical value Max.6 Ms
	Efficiency	Inverter mode≥ 80%
	Inverter overload	110%-130% shutdown at 30s,130%-150% shutdown at 3s
	Short circuit	Systems automatically shut down
Alarm	Mains abnormal	1time/1S, silence auto after 5S
	Low battery	1time/1S and flash battery last grid
	Overload	1time/ 1S and display "overload" grid
Others	Output sockets	1xSchuko, 1xfrench
	Surge protection	Optional
	Ambient temperature	0°C ~ 40°C
	Ambient humidity	10% ~ 90%(Non Condensed)
	Noise	≤ 50dB

CE   RoHS