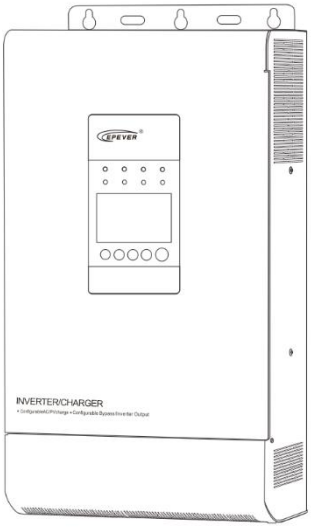
EN

User Manual

UPOWER SERIE – REINER SINUS INVERTER/Charger



Modelle

UP1000-M3212/ M3222

UP1500-M3222

UP2000-M3322

UP3000-M3322/M6322

UP3000-M2142/M6142

UP5000-M6342/M8342

Important Safety Instructions

Please reserve this manual for future review.

Please reserve this manual for future review. This manual contains all instructions about safety, installation and operation for the inverter/charger.

- Read carefully all the instructions and warnings in the manual before installation.
- Non-safety voltage exists inside the inverter/charger, users must not dismantle it by itself in order to avoid personal injury, contact professional maintenance personnel of our company in need of maintenance.
- Keep the inverter/charger out the reach of children.
- Do not place the inverter/charger in a damp, oily, inflammable and explosive or a severeenvironment with a large amount of dust accumulation.
- The utility input and AC output with high voltage, don't touch wire connections.
- Install the inverter/charger in well ventilated places, it's shell may produce heat duringoperation.
- It is suggested to install appropriate external fuses/breakers.
- Make sure switching off all connections with PV array and the fuse/breakers close to batterybefore inverter/charger installation and adjustment.
- Make sure all connections remain tight to avoid excessive heat from a loose connection.
- It's an off-grid inverter/charger, not for on-grid system.
- This inverter/charger can only be used singly, parallel or in series connections will damagethe devices.

CONTENTS

1. General Information

1.1 Overview

UPower inverter/charger combines with solar & utility charging and AC output in one unit, which adopts a multi-core processor design and advanced MPPT control algorithm to realize intelligent management. The device is usally used in remote area where is lack of reliable utility but rich of sunshine.

The PV charging module adopts the up-to-date optimized MPPT tracking technology, it can quicklytrack the maximum power point of the PV array in any environment even has the multi crest tracking ability. The MPPT tracking speed and energy transfer efficiency is quite high. The PV and AC charge current can be adjusted manually, which can meet total charge current limit function, and PV & utility charge current ratio distribution. Full electronic protection functions are available.

The AC-DC charging module adopts the advanced MPPT control algorithm, realize fully digitalized double closed-loop control for voltage and current, with high reliability and response speed. With wide AC input voltage range and charge current limitation volume can be set. This module has complete protection functions at input and output.

The DC-AC inverter module is based on full digital and intelligent design. It adopts the advanced SPWM technology, outputs the pure sine wave and converts 24/48VDC to 220/230VAC, which is suitable for AC loads of household appliances, electric tools, commercial units, electronic audio andvideo devices etc.

With Utility by-pass charging function, the utility module can provide power supply to loads directly, and charge the battery simultaneously. Under utility charge status, user can choose by-pass modeor inverter output mode. This characteristic is prefered in the area where the utility is not stable, user should choose inverter output mode to get stable output voltage to avoid the appliance damaged because of bad condition utility.

Features:

- A new type of all-digital intelligent energy storage and management Inverter/charger
- Adjustment function of Utility & Solar charging ratio to meet various applications
- Advanced MPPT technology to achieve multiple wave crest maximum power point tracking and high tracking & conversion efficiency, Max. tracking efficiency 99.5 %, Max. DC-DC conversion efficiency 98.5 %
- The advanced all-digital control is adopted for AC-DC charging modules that realized wide voltage input, high efficiency, and high stability of Utility charging
- Adoption of the advanced SPWM technology, true pure sine wave output, with high efficiency up

to 95 %①and full load efficiency of 93 % max①

- High output voltage stability: when full load working in the working voltage range of battery, output voltage
- 220V/230V±5%②, frequency 50/60±0.1 Hz; voltage& frequency optional
- Advanced voltage, current and power multi-loop control makes DC-AC unit has good dynamic response capability high resistance to surge power and high operational reliability
- With the function of Utility & Solar charging ratio selection, and total charging current setting
- Four charging modes: Utility priority, Solar priority, Utility & Solar and Solar only
- Two output modes: Battery and Utility
- Utility charging and inverter output can work at the same time, which avoids the impact of the unstable Utility voltage on the load
- Rich set of options: charging current, battery type, battery voltage threshold etc
- AC output one-key control, which can switch Utility or inverter output on and of, keeping the output of mode can make it convenient while wiring and maintaining on electric-distributions, reducing the standby loss
- Support cold start and soft start
- RS485 isolated communication interface with 5V 200mA output, it is easy to access communication devices such as WIFI module
- PC or mobile phone APP can be used for remote monitoring, management and setting to meet various remote use of users
- Optional back light and buzzer warning selection via PC software
- With PV reverse polarity, Charging power limit, short circuit, battery reverse polarity protections
- With Utility input/AC output over voltage, battery low voltage, power limit, over current and short circuit protections
- With battery low/over voltage protection and temperature compensation etc
- With internal over-temperature protection, and intelligent start-stop function of the fan
- Variety of accessories can be selected according to user's requirements

①UP1500 and above models: testing result under 25℃ environment temperature, ratedinput voltage, and resistive load

②In battery discharging mode Output tolerance is 220V ±5% or 230V -10%~+5% for 24V and48V input; and 220V -6%~+5% or 230V -10%~+5% with 12V battery input

1.2 Characteristics

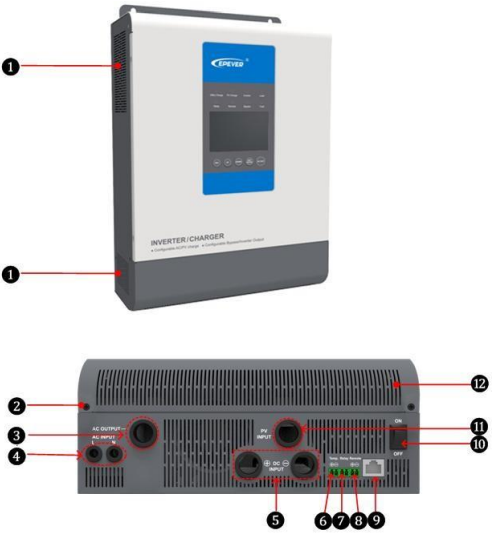


Figure 1 Product appearance

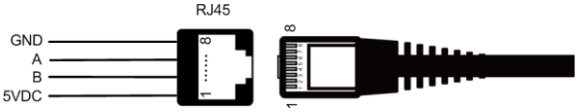
❶	Ventilation	❼	Relay interface
❷	M4 Screw (2 pcs)	❽	Remote interface
❸	AC output terminals	❾	RS485 interface(5VDC/200mA)
❹	Utility input terminals	❿	Inverter/charger switch
❺	Battery input terminals	⓫	PV input terminals
❻	RTS★ interface	⓬	Terminals cover

- **Temperature Sensor**

（Model:RT-MF58R47K3.81A）

NOTE：★Connect the temperature sensor, the inverter/charger is compensated according to the ambient temperature.

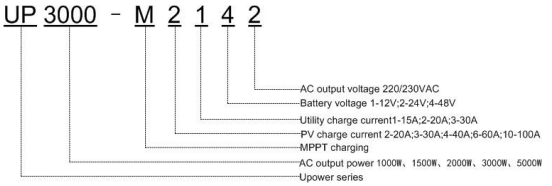
- **RS485 Interface**



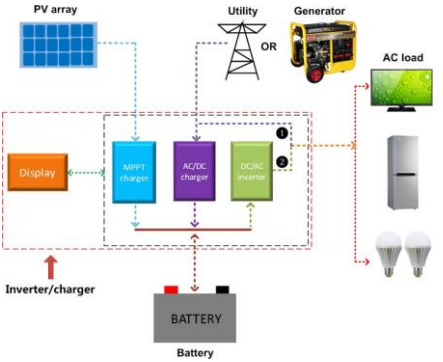
RJ45 interface pin define is shown below：

Pins	Define	Pins	Define
1	5VDC	5	RS-485-A
2	5VDC	6	RS-485-A
3	RS-485-B	7	GND
4	RS-485-B	8	GND

1.3 Designations of models



1.4 Schematic Diagram for Connections



NOTE：❶Utility power supply and ❷Battery power supply can not be carried out simultaneously.

Warning：Confirm the AC load power compatible with the power of the inverter/charger, AC load selected exceeding the maximum output powerof inverter/charger is prohibited.

2. Installation Instructions

2.1 General Installation Notes

- Please read the entire installation instructions to get familiar with the installation steps beforeinstallation.
- Be very careful when installing the batteries, especially flooded lead-acid battery. Please wear eye protection, and have fresh water available to wash and clean if any contact with battery acid.
- Keep the battery away from any metal objects, which may cause short circuit of the battery.
- Explosive acid battery gases may come out from the battery during charging, so make sureventilation condition is good.
- Ventilation is highly recommended if mounted in an enclosure. Never install the inverter/charger in a sealed enclosure with flooded batteries! Battery fumes from vented batteries will corrode anddestroy the inverter/charger circuits.
- Lead-acid battery is only recommended, other kinds please refer to the battery manufacturer.
- Loose connections and corroded wires may result in high heat that can melt wire insulation, burn surrounding materials, or even cause fire. Ensure tight connections and use cable clamps to secure cables and prevent them from swaying in motion.
- Select the system cables according to 5A/mm^2 or less current density in accordance with Article 690 of the National Electrical Code, NFPA 70.
- For outdoor installation, keep out of the direct sunshine and rain infiltration.
- High voltage still exists inside the inverter/charger after switching off the power switch, do not turn on or touch the internal units, conduct the associated operation only after discharging theelectric capacity.
- Do not place the inverter/charger in a damp, oily, inflammable and explosive or a severeenvironment with a large amount of dust accumulation.
- Prohibit reverse connection at DC input end otherwise it may damage the equipment orunpredictable danger will occur.
- The utility input and AC output are of high voltage, do not touch the wire connetion.

2.2 Wire Size& breaker

The wiring and installation methods must follow all national and local electrical code requirements.

➢ **Recommended wire and circuit breaker of PV**

Model	PV wire size	Breaker
UP1000-M3212	10mm^2/8AWG	2P—63A
UP1000-M3222	10mm^2/8AWG	2P—63A

UP1500-M3222	10mm²/8AWG	2P—63A
UP2000-M3322	10mm²/8AWG	2P—63A
UP3000-M3322	10mm²/8AWG	2P—63A
UP3000-M6322	16mm²/5AWG	2P—100A
UP3000-M2142	6mm²/10AWG	2P—32A
UP3000-M6142	16mm²/5AWG	2P—100A
UP5000-M6342	16mm²/5AWG	2P—100A
UP5000-M8342	25mm²/4AWG	2P—125A
UP5000-M10342	25mm²/4AWG	2P—125A

NOTE: When the PV modules connect in series, the open circuit voltage of the PV array must not exceed max. PV input voltage at 25℃ environment temperature.

➢ **Recommended wire of Utility**

Model	Utility wire size
UP1000-M3212	2.5mm²/14AWG
UP1000-M3222	2.5mm²/14AWG
UP1500-M3222	2.5mm²/14AWG
UP2000-M3322	4mm²/12AWG
UP3000-M3322	6mm²/10AWG
UP3000-M6322	6mm²/10AWG
UP3000-M2142	6mm²/10AWG
UP3000-M6142	6mm²/10AWG
UP5000-M6342	10mm²/8AWG
UP5000-M8342	10mm²/8AWG
UP5000-M10342	10mm²/8AWG

NOTE: The utility input has the circuit breaker already and there is no need to add any more.

➢ **Recommended wire and circuit breaker of battery**

Model	Battery wire size	Breaker
UP1000-M3212	16mm²/6AWG	2P—100A
UP1000-M3222	16mm²/6AWG	2P—100A
UP1500-M3222	16mm²/6AWG	2P—100A
UP2000-M3322	25mm²/4AWG	2P—125A
UP3000-M3322	35mm²/2AWG	2P—200A
UP3000-M6322	35mm²/2AWG	2P—200A
UP3000-M2142	16mm²/6AWG	2P—100A
UP3000-M6142	16mm²/6AWG	2P—100A
UP5000-M6342	35mm²/2AWG	2P—200A
UP5000-M8342	35mm²/2AWG	2P—200A
UP5000-M10342	35mm²/2AWG	2P—200A

NOTE: Type of circuit breaker is selected based on non-independent connection of inverter at the battery end where there is no anther inverter connected.

➢ **Recommended wire and circuit breaker for AC output**

Model	AC wire size	Breaker
UP1000-M3212	2.5mm²/14AWG	2P—10A
UP1000-M3222	2.5mm²/14AWG	2P—10A
UP1500-M3222	2.5mm²/14AWG	2P—10A
UP2000-M3322	2.5mm²/14AWG	2P—16A
UP3000-M3322	4mm²/12AWG	2P—25A
UP3000-M6322	4mm²/12AWG	2P—25A
UP3000-M2142	4mm²/12AWG	2P—25A
UP3000-M6142	4mm²/12AWG	2P—25A
UP5000-M6342	6mm²/10AWG	2P—40A
UP5000-M8342	6mm²/10AWG	2P—40A
UP5000-M10342	6mm²/10AWG	2P—40A

NOTE: The wire size used for connection is for reference only, use thicker wires to lower the voltage drop and improve the system performance whenthe distance between the whole solar system components is far.

NOTE: The above wire and the circuit breaker size are for recommendeduse only, please choose the suitable wire and circuit breaker according tothe practical situation.

2.3 Mounting

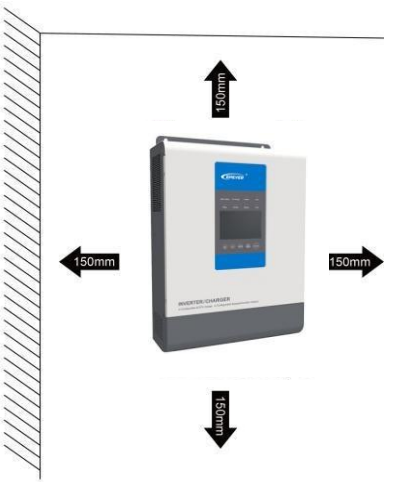


Figure2-1 Mounting

Installation steps：

Step1：Determination of Installation Location and Heat-dissipation Space

Determination of installation location: The inverter/charger shall be installed in a place withsufficient air flow through the dissipation pad of the inverter/charger and a minimum clearance of 150 mm from the upper and lower edges of the inverter/charger to ensure natural thermalconvection. Please see Figure 2-1: Mounting.

WARNING: Risk of explosion!
Never install the inverter/charger with flooded batteries in a sealed enclosure! Do notinstall the device in a confined area where battery gas can accumulate.

Step 2：Take down the terminal protective cover

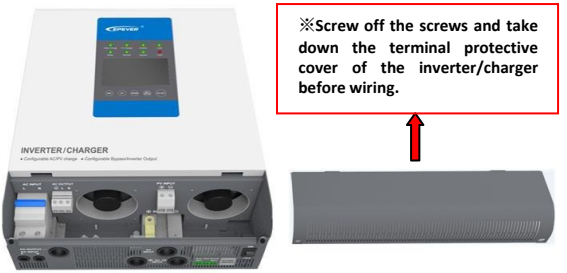


Figure2-2 Take down the cover

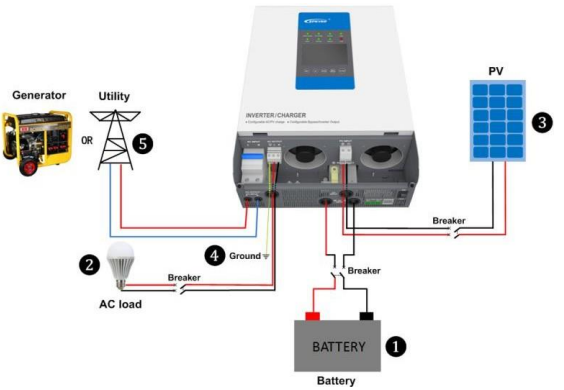


Figure 2-3Wring Diagram

Step 3：Wiring

Connect the system in an order of battery ➔ load ➔ PV array ➔ ground ➔ Utility in accordance with Figure 2-3: Wiring Diagram. Disconnect the system in the reverse order.

Warning: Danger, High-voltage! Utility input, AC output and PV array will produce dangerous voltage, make sure to disconnect the circuit breaker/ fuse before wiring.

Warning: Do not turn on the circuit breaker/ fuse when wiring, and at the same time,ensure that the wiring of "+", "-" are correctly connected.

Warning: A circuit breaker must be installed at the battery end, for selection, refer toSection 2.3 "Wire and Circuit Breaker".

NOTE: If the inverter/charger is to be used in an area with frequent lightning strikes, it isrecommended to install an external surge arrester at the PV input.

➢ Grounding

Grounding connection must be made when utility is connected to the inverter/charger. The inverter/charger has dedicated grounding terminal as shown in Fig. 2-3, the grounding must be reliable, the grounding wire have to stay consistent with Recommended wire for AC output, the grounding point shall be as close as possible to the inverter/charger, the grounding wire shall be asshort as possible.

➢ AC output, Ground and PV wiring terminal use way:

①When wiring, do not close the circuit breaker, and it is necessary to use a slotted screwdriver tounscrew the screws for connecting their corresponding wires.

②When removing the wirings, first the integrated machine must stop working, and then the screwsshall be unscrewed by using a slotted screwdriver, so as to dismantle their corresponding wires.

Step 4： Install the terminal protective coverStep

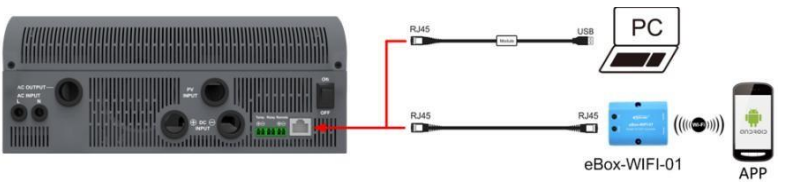
Step 5：Connect accessory

- Connect the remote temperature sensor cable (model: RTS300R47K3.81A)

Connect one end of the remote temperature sensor cable to the interface⑥ and place the other end close to the battery.

NOTE： Connect the temperature sensor, the inverter/charger is compensated according to the ambient temperature.

- Connect the remote temperature sensor cable (model: RTS300R47K3.81A)
- Connect the accessories, monitor the system status and set the parameters via PCsoftware or APP software.



(1) PC software www.epever.com Inverter Monitor(UP)

(2) Mobile APP software (Android)www.epever.com——UPower

Step 6：Recheck if the wire connection is correct

Step 7：Power on the inverter/charger:

①Turn on the circuit breaker at the battery end.

②Switch on the switch then the inverter indicator is on.

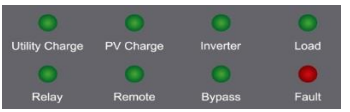
③Turn on the breaker of PV array and Utility.

④Turn on the AC load when the AC output is normal.

NOTE: In case the power is supplied to the different AC loads, it is suggested to turn on the loads with larger surge current, till the load working well, then turn on the loadswith smaller surge current.

NOTE: In case the inverter/charger is not in normal operation, or LCD or indicator displays abnormal, refer to Section 5 to clear the fault or contact the after-sale service personnel of our company.

3. Interface Instruction



3.1 Indicator

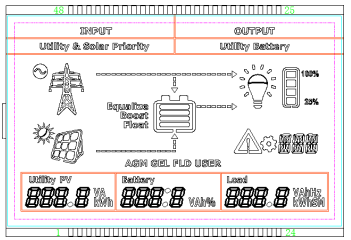
Indicator	Color	Status	Instruction
Utility Charge	Green	OFF	No utility input
		On Solid	Utility connection normal but nocharging
		Slowly Flashing(0.5Hz)	Utility charging
		Fast Flashing(2.5Hz)	Utility charge module fault
PV Charge	Green	OFF	No PV input
		On Solid	PV connection normal but nocharging
		Slowly Flashing(0.5Hz)	PV charging
		Fast Flashing(2.5Hz)	PV charge module fault
Inverter	Green	OFF	Inverter turn off
		On Solid	Inverter turn on Bypass
		Slowly Flashing(0.5Hz)	Inverter output
		Fast Flashing(2.5Hz)	Inverter fault
Load	Green	OFF	No load output
		On Solid	Load output

Relay	Green	OFF	Relay turn off
		On Solid	Relay turn on
Remote	Green	OFF	Input voltage(3.3～12VDC)
		On Solid	No Input voltage
Bypass	Green	OFF	Inverter output
		Slowly Flashing(0.5Hz)	Utility output
Fault	Red	OFF	Device normal
		On Solid	Device fault

3.2 Buttons

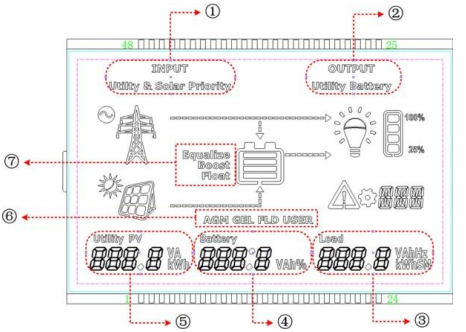
Operation	Instruction
Press the ESC button	Exit the current interface
Press the ESC button and hold on 2s	Clear the faults
Press the UP / DOWN button	Browse interface：Up/Down
	Setting interface：Up/Down
Press the SET/ ENTER button	Switch to “Browse Parameter Column" Confirm the setting parameters
Press the SET/ ENTER button and hold on 2s	Switch the" Real Time Interface" over to "Set Browse Interface"
	Switch the "Set Browse Interface" over to "Parameter Setting Interface"
Press the AC OUT button and hold on 2s	Inverter ON/OFF

3.3 Real-time interface



Icon	instruction	Icon	instruction
	Utility connecting and input		PV connecting and input

	No Utility connecting Utility connecting but no input		No PV connecting PV connecting but no input
	Load ON		Load OFF
100% 25%	Load power 8～25%	100% 25%	Load power 25～50%
100% 25%	Load power 50～75%	100% 25%	Load power 75～100%



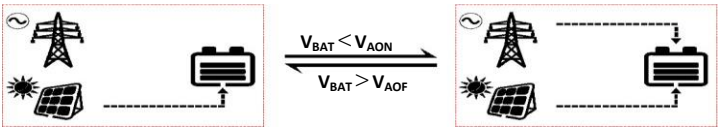
Item	Setting	Content
①	INPUT	Solar priority Utility priority Utility & solar Solar
②	OUTPUT	Battery Utility
③	Load	AC output voltage AC output current AC output power AC output frequency
④	Battery	Battery voltage Max. charging current (PV charging current+ Utility charging current) Battery temperature Battery SOC
⑤	PV	PV input voltage PV charging current PV charging powerPV charge energy
	Utility	Utility input voltage Utility charging current Utility charging power

		Utility charge energy
⑥	Battery Type	AGM GEL FLD USER
⑦	Battery charging stage	Float Boost Equalize(28th each month)

① INPUT

★Solar priority(Default)

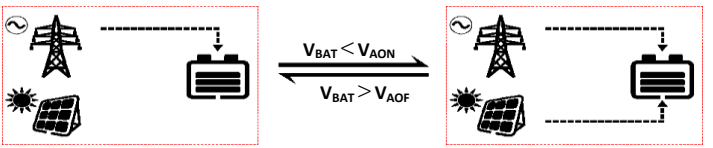
The battery is charged in solar priority mode and when the battery voltage is lower than “Auxiliary Module ON Voltage(**V_{AON}**)”, the utility starts charging. When the battery voltage reaches to “Auxiliary Module OFF Voltage(**V_{AOF}**)”, the utility stops



charging.

★Utility priority

The battery is charged in utility priority mode and when the battery voltage is lower than “Auxiliary Module ON Voltage (**V_{AON}**)”, the solar starts charging. When the battery voltagereaches to “Auxiliary Module OFF Voltage(**V_{AOF}**)”,



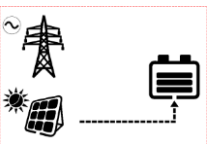
the solar stops charging.

★Utility &solar

Utility &solar charge the battery

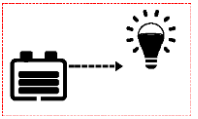
★Solar

Solar charge the battery



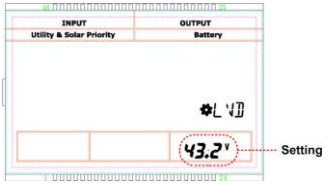
② OUTPUT

★Battery



★Utility(Default)

3.4 Setting interface



1) Common interface for common user

Operation:

Step1: Press the SET/ ENTER button and hold on 2s at the real-time interface to go to the commoninterface.

Step2: Press the SET/ ENTER button and hold on 2s at the setting parameter interface and choose theparameters.

Step3: Press the SET/ ENTER button to set the parameter, and press this button again for confirmaton.

Step4: Press the ESC button to exit the setting interface.

Setting：

Item	LCD	Instruction	Default	Range
1	BTP	Battery type	AGM	AGM GEL FLD USER
2	CSP	Charge source priority	Solar priority	Solar priority Utility priority Utility & solar Solar
3	OSP	Output source priority	Battery	Battery Utility

4	TMU	Temperature unit	℃	℃/℉
5	BLT	Backlight time	30S	30S/60S/100S(Alwayson)
6	BAS	Buzzer alarm switch	ON	ON/ OFF
7	LVD	Low voltage disconnect voltage	10.8V★	User 10.5～11.3V★ step size 0.1V★
8	LVR	Low voltage reconnect voltage	12.5V★	User 12.0～13.0V★ step size 0.1V★

★The voltage parameter are at 25℃, 12V system, and twice in 24V system, quadruple in 48Vsystem.

NOTE: When Output source priority is Battery and the battery voltage lower than the Low Voltage Disconnect Voltage(LVD adjustable), the system will switch utility to supply power for load.

2) Advanced interface for engineers

Operation:

Step1: Press the UP + DOWN button and hold on 2s under the real-time interface.

Step2: Press the SET/ENTER button and hold on 2s under the setting parameter interface.

Step3: Press the SET/ENTER button to enter the parameter.

Step4: Press the ESC button to exit the setting interface.

Setting：

Item	LCD	Instruction	Default	Range
9	BCT	Boost Charging Time	30min	30/60/120/180min
10	BCV	Boost Charging Voltage	AGM:14.4V★ GEL:14.2V★ FLD:14.6V★ USER:14.4V★	User 12.5～14.8V★ Step size 0.1V★
11	BVR	Boost Voltage Reconnect	13.2V★	User: 12.5～14.0V★ Step size 0.1V★
12	FCV	Float Charging Voltage	13.8V★	User: 13.0～14.0V★ Step size 0.1V★
13	OVR	Over Voltage Reconnect Voltage	15.0V★	User: 14.5～15.5V★ Step size 0.1V★
14	OVD	Over Voltage Disconnect Voltage	16.0V★	User: 15.5～16.1V★ Step size 0.1V★
15	AOF	Auxiliary module OFF voltage	14.0V★	User: 12.0～14.8V★ Step size 0.1V★
16	AON	Auxiliary module ON voltage	12.0V★	
17	DON	Dry contact ON voltage	11.1V★	User: 10.8～12.0V★ Step size 0.1V★
18	DOF	Dry contact OFF voltage	12.0V★	User:12.0～13.25V★ Step size 0.1V★
19	MCC	Max. charging current	60.0A◆	15.0～60.0A◆
20	PSM	Power saving mode	OFF	ON/OFF

21	CLR	Clear fault	OFF	ON/OFF
22	RCL	Clear the accumulated energy	OFF	ON/OFF
23	TBC	Total battery capacity	600AH	100～4000AH Step size 100AH
23	VER	Software version	U-1.0	—

★The voltage parameter are at 25℃, 12V system, and twice in 24V system, quadruple in 48Vsystem.

The following rules must be observed when modifying the parameter values in User forlead-acid battery.

Ⅰ. Over Voltage Disconnect Voltage > Charging Limit Voltage ≥ Equalize Charging Voltage ≥ Boost Charging Voltage ≥ Float Charging Voltage > Boost Reconnect Charging Voltage.

Ⅱ. Over Voltage Disconnect Voltage > Over Voltage Reconnect Voltage

Ⅲ. Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage ≥ Discharging Limit Voltage.

Ⅳ. Under Voltage Warning Reconnect Voltage > Under Voltage Warning Voltage ≥ Discharging Limit Voltage.

Ⅴ. Boost Reconnect Charging voltage >Low Voltage Reconnect Voltage.

◆ For the inverter/charger of different power, the current setting range is not the same, seeTechnical Parameters for details.

NOTE：

15/16：Stop/restore auxiliary module charging voltage. Only when the charging mode is Solar priority or Utility priority will the auxiliary module charging voltage be effective.

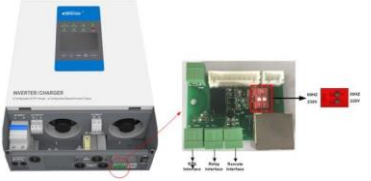
20：Power saving mode

When the switch is on “Saving” side, the inverter will enter into the Saving Mode. It will shut off the output if the loads value is less the 70W. Then restart and detect the power of the load again after 10s.If the load is more than 70W, the inverter will turn on the output. Otherwise it will shut off output.It cycles like this. So please don’t use the saving mode if the load is smaller than 70W.

21：Clear the faults

In occurrence of short circuit or overload caused to AC output, the fault can be cleared out.

3.5 Other function

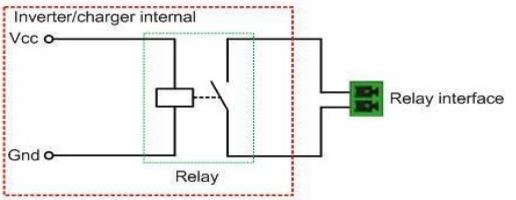


1) Output voltage & frequency switch

- When Switch 1 is in "ON", the output voltage is selected as 230VAC, and on the contrary as 220VAC;
- When Switch 2 is in "ON", the output frequency is selected as 60Hz, and on the contrary as50Hz.

NOTE : If the output frequency or voltage of the inverter/charger is to be reset, it isrequired to turn off the inverter/charger and power on the unit after setting.

2） Relay interface



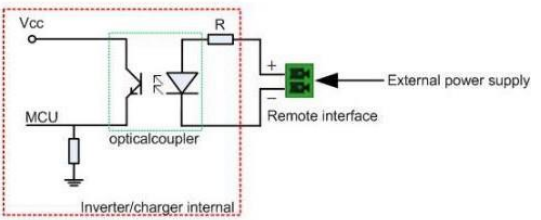
Working principle: When the battery voltage reaches the Low Voltage Disconnect Voltage（LVD）,the coil of relay is energized, and the switch is turned on. The dry contact can drive resistive loads 125VAC /1A, 30VDC/1A.

3） Remote interface

Remote interface input voltage (3.3~12V)

(1) The input voltage Vi is within 2.5~ 10s, the AC output state is reversed (when the AC is formerlyin output state, now it is in no-output state ; when the AC is formerly in no-output state, now it is in output state;)

(2) The input voltage Vi is greater than 10s, the AC is in output state all the time till the input voltageVi disappears.



NOTE: If it is to change the range of input voltage, it can be realized by changing theresistance value of R.

4. Protection

Protection	Instruction				
PV limit Current	When the charging current of the PV array exceeds its rated current, it will be charged at the rated current. **NOTE: When the PV modules are in series, ensure that the open-circuit voltage of the PV array does not exceed the "maximum PV open-circuit voltage". Otherwise the inverter/charger may be damaged.**				
PV short circuit	When PV is not charging and short circuit, the inverter/charger is not damaged.				
PV Reverse Polarity	Fully protection against PV reverse polarity, correct the wire connection to resume normal operation. **NOTE: The inverter/charger will be damaged when the PV array straight polarity and the actual operation power of the PV array is 1.5 times greater than the rated charge power!**				
Night Reverse Charging	Prevent the battery discharging through the PV module in the night.				
Utility input overvoltage	When the utility voltage exceeds 280V, it will stop utility charging/discharging.				
Utility input under voltage	When the utility voltage less than 160V, it will stop utility charging/discharging.				
Battery overvoltage	When the battery voltage reaches to the set point of Over Voltage Disconnect Voltage, the inverter/charger will stop charging the battery to protect the battery from being over charged to break down.				
Battery Over Discharge	When the battery voltage reaches to the set point of Low Voltage Disconnect Voltage, the inverter/charger will stop discharging the battery to protect the battery from being over discharged to break down.				
Load output Short Circuit	It will immediately close the output in occurrence of short-circuit and hereafter the output is automatically recovered intime delay (the first time delay for 5s, the second time delay for 10s, the third time delay for 15s); if the short-circuit remains after 3 times of delay, restart the inverter/charger only after clearing the fault.				
Load output Overload	Overload	1.2	1.5	1.8	2.0
	Continuance	15min.	30S	10S	5S
	Recover 3 times	The first time delay for 5s, the second time delay for 10s, the third time delay for 15s			
Device overheating	The inverter/charger will stop charging/discharging when the internal temperature is too high, and will restore charging/discharging when the temperature is recovered to normal.				

5. Troubleshooting

5.1 Fault

Module	Code	Fault	battery frame blink	indicator	Buzzer	Fault indicator
Battery	BLV	Battery low voltage	Flashing	—	—	—
	BOV	Battery over voltage			Alarm	On Solid
	BOD	Battery over discharge				
	NVE	Nominal voltage error				
	LTP	Low temperature				
PV charging module	OTP	over temperature (PV charge module)	—	PV charge Fast Flashing		
	CFA	Communication Fault Alarm				
Utility charging module	IOV	Input over voltage		Utility Fast Flashing		
	ILV	Input low voltage				
	OTP	over temperature (Utility charge module)				
	CFA	Communication Fault Alarm				
Inverter output module	OVA	Output Voltage Abnormal		inverter Fast Flashing		
	IOS	Inverter Output Short Circuit				
	OOL	Output over load				
	OTP	Inverter temperature				
	CFA	Communication Fault Alarm				

5.2 Troubleshooting

Fault	Troubleshooting
Battery over voltage	Check if battery voltage too high, and disconnect solar modules.
Battery over discharge	When the battery voltage resume to or above LVR point (low voltage reconnect voltage), or change the battery by other ways
Battery overheating	The inverter/charger will automatically turn the system off. But while thebattery temperature declines to be below overheating recover temperature value, the inverter/charger will work normally.
Device overheating	The inverter/charger will automatically turn the system off. But while thedevice temperature declines to be below overheating recover temperature value, the inverter/charger will work normally.
Output overload	①Please reduce the number of AC loads. ②Restart the device or CFA of setting interface change to ON .
Output short circuit	①Check carefully loads connection, clear the fault. ②Restart the device CFA of setting interface change to ON ..

6. Maintenance

1） The following inspections and maintenance tasks are recommended at least two times per year for best performance.

- Make sure inverter/charger firmly installed in a clean and dry ambient.
- Make sure no block on air-flow around the inverter/charger. Clear up any dirt and fragments onradiator.
- Check all the naked wires to make sure insulation is not damaged for serious solarization.frictional wear, dryness, insects or rats etc. Repair or replace some wires if necessary.
- Tighten all the terminals. Inspect for loose, broken, or burnt wire connections.
- Check and confirm that LED is consistent with required. Pay attention to any troubleshooting orerror indication .Take corrective action if necessary.
- Confirm that all the system components are ground connected tightly and correctly.
- Confirm that all the terminals have no corrosion, insulation damaged, high temperature orburnt/discolored sign, tighten terminal screws to the suggested torque.
- Check for dirt, nesting insects and corrosion. If so, clear up in time.
- Check and confirm that lightning arrester is in good condition. Replace a new one in time to avoiddamaging of the inverter/charger and even other equipments.

WARNING：Risk of electric shock!

Make sure that all the power is turned off before above operations, and then follow the corresponding inspections and operations.

2） This warranty does not apply under the following conditions:

- Damage from improper use or use in an unsuitable environment.
- PV or load current, voltage or power exceeding the rated value of inverter/charger.
- The inverter/charger is working temperature exceed the limit working environment temperature.
- User disassembly or attempted repair the inverter/charger without permission.
- The inverter/charger is damaged due to natural elements such as lighting.
- The inverter/charger is damaged during transportation and shipment.

7. Technical Specifications

Item	UP1000-M3212	UP1000-M3222	UP1500-M3222	UP2000-M3322	UP3000-M3322	UP3000-M6322
Nominal battery voltage	12VDC	24VDC				
Battery input voltage range	10.8～16VDC	21.6～32VDC				
Inverter output						
Continuous output power	800W	800W	1200W	1600W	2400W	2400W
Output power (15min.)	1000W	1000W	1500W	2000W	3000W	3000W
Overload power(5s)	1600W	1600W	2400W	3200W	4800W	4800W
Max. surge power	2000W	2000W	3000W	4000W	6000W	6000W
Output voltage range	220V -6%~+5% 230V -10%~+5%	220VAC±5%,230VAC(-10%～+5%)				
Output frequency	50/60±0.1Hz					
Output mode	Single phase					
Output wave	Pure Sine Wave					
Load power factor	0.2-1（VA≤continuous output power）					
Distortion THD	≤3%(12V or 24V resistive load)					
Max. efficiency	91%	94%	95%	95%	95%	95%
Transfer time	20mS(resistive load)					
Utility charging						
Utility input voltage range	160VAC～280VAC(Working voltage range) 170VAC～270VAC(Utility starting voltage range)					
Max. utility charge current	20A	20A	20A	30A	30A	30A
Solar charging						
Max. PV open circuit voltage	60V★ 46V◆	100V★ 92V◆				150V★ 138V◆
Max. PV input power	390W	780W	780W	780W	780W	1500W
Max. PV charging current	30A	30A	30A	30A	30A	60A
Equalization voltage	14.6V	29.2V				
Boost voltage	14.4V	28.8V				
Float voltage	13.8V	27.6V				

Tracking efficiency	≤99.5%					
Charging conversion efficiency	≤98%					
Temperature compensate coefficient	-3mV/℃/2V (Default)					
Others						
No load consumption	≤1.2A	≤0.6A	≤0.6A	≤0.8A	≤0.8A	≤0.8A
Enclosure	IP30					
Relative humidity	< 95% (N.C.)					
Working environment temperature	-20℃～50℃（full input and output with no derating）					
Altitude	＜5000m (Derating to operate according to IEC62040 at a height exceeding 1000m)					
Mechanical Parameters						
Dimension(H x W x L)	386×300×126mm			444×300×126mm		518×310×168mm
Mounting dimension	230mm					
Mounting hole size	Φ8mm					
Weight	7.3kg	7.3kg	7.4kg	8.5kg	9.2kg	14.9kg

★At minimum operating environment temperature

◆At 25℃ environment temperature

Item	UP3000-M2142	UP3000-M6142	UP5000-M6342	UP5000-M8342	UP5000-M10342
Nominal battery voltage	48VDC				
Battery input voltage range	43.2～64VDC				
Inverter output					
Continuous output power	2400W	2400W	4000W	4000W	4000W
Output power (15min.)	3000W	3000W	5000W	5000W	5000W
Overload power(5s)	4800W	4800W	8000W	8000W	8000W
Max. surge power	6000W	6000W	10000W	10000W	10000W
Output voltage range	220VAC±5%,230VAC(-10%～+5%)				
Output frequency	50/60±0.1Hz				
Output mode	Single phase				
Output wave	Pure Sine Wave				
Load Power factor	0.2-1（VA≤continuous output power）				
Distortion THD	≤3%(24V or 48V resistive load)				
Max. efficiency	95%				

Transfer time	20mS（resistive load）				
Utility charging					
Utility input voltage range	160VAC～280VAC(Working voltage range) 170VAC～270VAC(Utility starting voltage range)				
Max. utility charge current	15A	15A	30A	30A	30A
Solar charging					
Max. PV open circuit voltage	150V★ 138V◆			200V★ 180V◆	
Max. PV input power	1040W	3000W	3000W	4000W	5000W
Max. PV charging current	20A	60A	60A	80A	100A
Equalization voltage	58.4V				
Boost voltage	57.6V				
Float voltage	55.2V				
Tracking efficiency	≤99.5%				
Charging conversion efficiency	≤98%				
Temperature compensate coefficient	-3mV/℃/2V (Default)				
Others					
No load consumption	≤0.6A	≤0.6A	≤0.8A	≤0.8A	≤0.8A
Enclosure	IP30				
Relative humidity	< 95% (N.C.)				
Working environment temperature	-20℃～50℃（full input and output with no derating）				
Altitude	＜5000m (Derating to operate according to IEC62040 at a height exceeding 1000m)				
Mechanical Parameters					
Dimension	444×300×126mm	518×310×168mm	605x315x178mm		
Mounting dimension	230mm				
Mounting hole size	Φ8mm				
Weight	7.3kg	14.7kg	16.6kg	17.5kg	17.8kg

★At minimum operating environment temperature

◆ At 25℃ environment temperature

Any changes without prior notice! Version number: V2.0

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