

# ••• USER MANUAL •••

1.0KW/1.5KW  
INVERTER / MPPT SCC / AC CHARGER

VERSION: 1.0

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# 1 ABOUT THIS MANUAL

## 1.1 Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Keep this manual for future reference.

## 1.2 Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

# 2 SAFETY INSTRUCTIONS



**WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.**

1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. **CAUTION** --To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
3. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. **CAUTION** – Only qualified personnel can install this device with battery.
6. **NEVER** charge a frozen battery.
7. For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter/charger.
8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.
10. GROUNDING INSTRUCTIONS -This inverter/charger should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
11. NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
12. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.

### 3 INTRODUCTION

This is a multi-function inverter/charger, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers user-configurable and easy-accessible button operation such as battery charging current, AC/solar charger priority, and acceptable input voltage based on different applications.

#### 3.1 Features

- Pure sine wave inverter
- Configurable input voltage range for home appliances and personal computers via LCD setting
- Configurable battery charging current based on applications via LCD setting
- Configurable AC/Solar Charger priority via LCD setting
- Compatible to mains voltage or generator power
- Auto restart while AC is recovering
- Overload/ Over temperature/ short circuit protection
- Smart battery charger design for optimized battery performance
- Cold start function

#### 3.2 Basic System Architecture

The following illustration shows basic application for this inverter/charger. It also includes following devices to have a complete running system:

- Generator or Utility.
- PV modules

Consult with your system integrator for other possible system architectures depending on your requirements.

This inverter can power all kinds of appliances in home or office environment, including motor-type appliances such as tube light, fan, refrigerator and air conditioner.

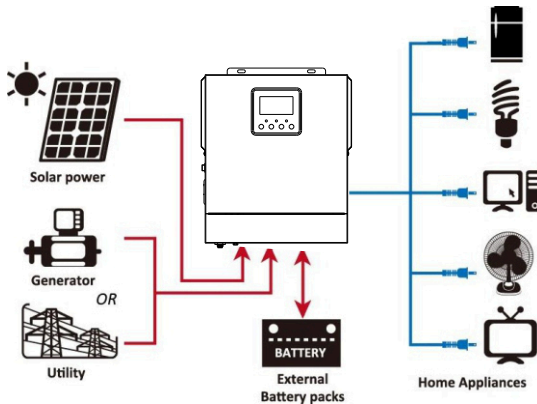
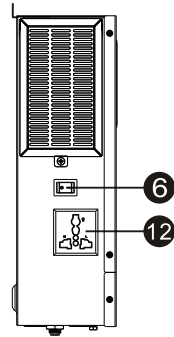
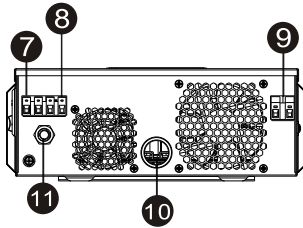
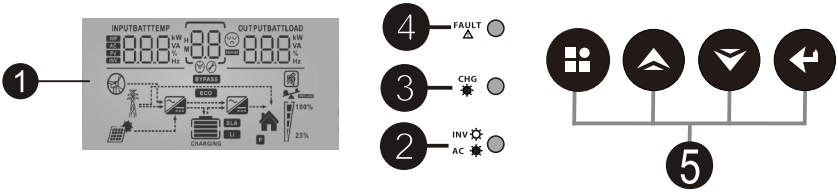


Figure 1 Hybrid Power System

### 3.3 Product Overview



1. LCD display
2. Status indicator
3. Charging indicator
4. Fault indicator
5. Function buttons
6. Power on/off switch
7. AC input
8. AC output
9. PV input
10. Battery input
11. Circuit breaker
12. Output receptacles

## 4 INSTALLATION

### 4.1 Unpacking and Inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

- The unit x 1
- User manual x 1

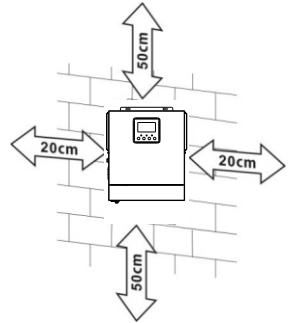
### 4.2 Preparation

Before connecting all wirings, please take off bottom cover by removing two screws as shown below.

### 4.3 Mounting the Unit

Consider the following points before selecting where to install:

- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit.
- The ambient temperature should be between 0°C and 55°C to ensure optimal operation.
- The recommended installation position is to be adhered to the wall vertically.
- Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



**SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.**

Install the unit by screwing two screws. It's recommended to use M4 or M5 screws.

### 4.4 Battery Connection

**CAUTION:** For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnect device between battery and inverter. It may not be requested to have a disconnect device in some applications, however, it's still requested to have over-current protection installed. Please refer to typical amperage in below table as required fuse or breaker size.

**WARNING!** All wiring must be performed by a qualified personnel.

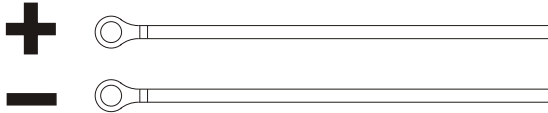
**WARNING!** It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable as below.

**Recommended battery cable size:**

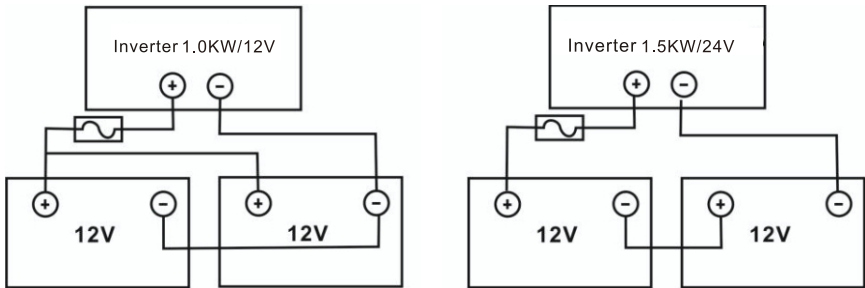
| Model     | Wire Size | Cable (mm <sup>2</sup> ) | Torque value (max) |
|-----------|-----------|--------------------------|--------------------|
| 1.0KW 12V | 1 x 6AWG  | 14                       | 5 Nm               |
| 1.5KW 24V | 1 x 6AWG  | 14                       | 5 Nm               |

Please follow below steps to implement battery connection:

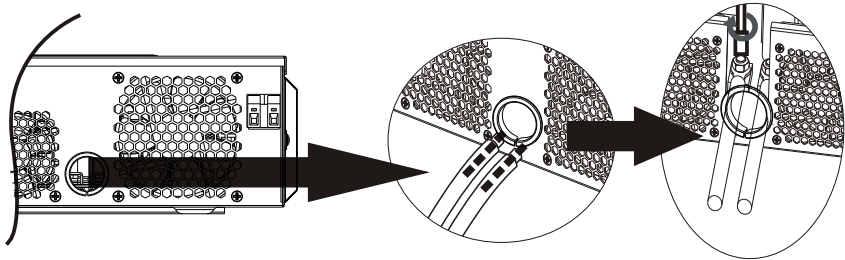
1. Remove insulation sleeve 18 mm for positive and negative conductors.
2. Suggest to put bootlace ferrules on the end of positive and negative wires with a proper crimping tool.



4. Connect all battery packs as below chart.



5. Insert the battery wires flatly into battery connectors of inverter and make sure the bolts are tightened with torque of 2 Nm in clockwise direction. Make sure polarity at both the battery and the inverter/charge is correctly connected and conductors are tightly screwed into the battery terminals.  
Recommended tool: #2 Pozzi Screwdriver



**WARNING: Shock Hazard**

Installation must be performed with care due to high battery voltage in series.



**CAUTION!!** Before making the final DC connection or closing DC breaker/disconnector, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

#### 4.5 AC Input /OutputConnection

**CAUTION!!** Before connecting to AC input power source, please install a **separate** AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input. The recommended spec of AC breaker is 20A for 1.0KW and 20A for 1.5KW.

**CAUTION!!** There are two terminal blocks with "IN" and "OUT" markings. Please do NOT mis-connect input and output connectors.

**WARNING!** All wiring must be performed by a qualified personnel.

**WARNING!** It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

#### Suggested cable requirement for AC wires

| Model     | Gauge  | Torque Value |
|-----------|--------|--------------|
| 1.0KW 12V | 14 AWG | 2 Nm         |
| 1.5KW 24V | 12 AWG | 2 Nm         |

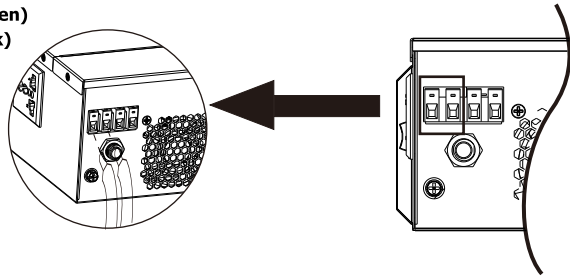
Please follow below steps to implement AC input/output connection:

1. Before making AC input/output connection, be sure to open DC protector or disconnecter first.
2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N 3 mm.
3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor (⊕) first.

⊕ → **Ground (yellow-green)**

L → **LINE (brown or black)**

N → **Neutral (blue)**

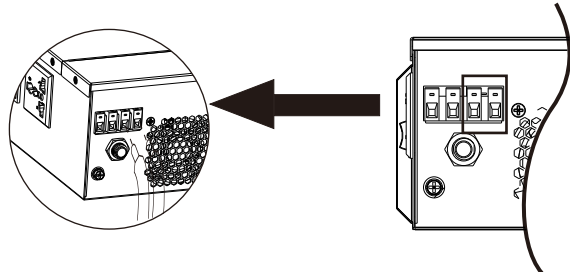


|  |   |
|--|---|
|  | <b>WARNING:</b><br>Be sure that AC power source is disconnected before attempting to hardwire it to the unit. |
|--|---|

4. Then, insert AC output wires according to polarities indicated on terminal block and tighten terminal screws.

L → **LINE (brown or black)**

N → **Neutral (blue)**





5. Make sure the wires are securely connected.

**CAUTION:** Appliances such as air conditioner are required at least 2- 3 minutes to restart because it' squired to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it's equipped with time-delay function before installation. Otherwise, this inverter/charger will trig overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

#### 4.6 PV Connection

**CAUTION:** Before connecting to PV modules, please install **separately** a DC circuit breaker between inverter and PV modules.

**WARNING!** It's very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size as below.

| Model                  | Wire Size | Torque value ( max ) |
|------------------------|-----------|----------------------|
| 1.0KW 12V<br>1.5KW 24V | 1x12AWG   | 2 Nm                 |

#### PV Module Selection:

When selecting proper PV modules, please be sure to consider below parameters:

1. Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage of inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than min. battery voltage.

| INVERTER MODEL                            | 1.0KW     | 1.5KW     |
|---|-----------|-----------|
| <b>Max. PV Array Open Circuit Voltage</b> | 150Vdc    |           |
| <b>PV Array MPPT Voltage Range</b>        | 20~150Vdc | 30~150Vdc |

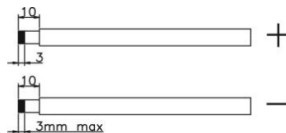
Take 250Wp PV module as an example. After considering above two parameters, the recommended module configurations are listed as below table.

| Solar Panel Spec.<br>(reference)<br>- 250Wp<br>- Vmp: 30.1Vdc<br>- Imp: 8.3A<br>- Voc: 37.7Vdc<br>- Isc: 8.4A<br>- Cells: 60 | SOLAR INPUT<br>(Min in serial: 4 pcs, max. in serial: 12 pcs) |  | Q'ty of panels | Total input power |
|--|---|--|----------------|-------------------|
|  |   |  |                |                   |
|  | 2 pcs in serial   |  | 2 pcs          | 500W              |
|  | 3 pcs in serial   |  | 3 pcs          | 750W              |
|  | 4 pcs in serial   |  | 4 pcs          | 1000W             |

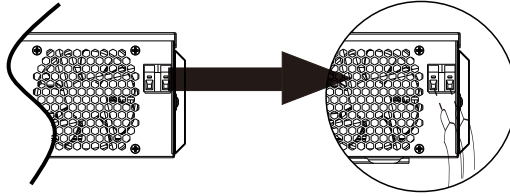
#### PV Module Wire Connection

Please follow below steps to implement PV module connection:

1. Remove insulation sleeve 10 mm for positive and negative conductors.
2. Suggest to put bootlace ferrules on the end of positive and negative wires with a proper crimping tool.



4. Check correct polarity of wire connection from PV modules and PV input connectors. Then, connect positive pole (+) of connection wire to positive pole (+) of PV input connector. Connect negative pole (-) of connection wire to negative pole (-) of PV input connector.  
Recommended tool: 4mm blade screwdriver



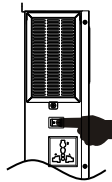
#### 4.7 Final Assembly

After connecting all wirings, please put bottom cover back by screwing four screws as shown below.

### 5 OPERATION

#### 5.1 Power ON/OFF

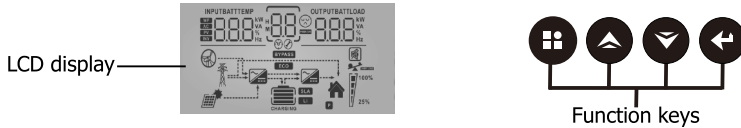
Side view of unit



Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the button of the case) to turn on the unit.

#### 5.2 Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes three indicators, four function keys and a LCD display, indicating the operating status and input/output power information.



#### LED Indicator

| LED Indicator  |       | Messages |   |
|----------------|-------|----------|---|
| ☀️ AC / ⚡️ INV | Green | Solid On | Output is powered by utility in Line mode.          |
|                |       | Flashing | Output is powered by battery or PV in battery mode. |
| ☀️ CHG         | Green | Solid On | Battery is fully charged.                           |
|                |       | Flashing | Battery is charging.                                |
| ⚠️ FAULT       | Red   | Solid On | Fault occurs in the inverter.                       |
|                |       | Flashing | Warning condition occurs in the inverter.           |

#### Function Keys

| Function Key | Description  |
|--------------|--|
| ESC          | To exit setting mode   |
| UP           | To go to previous selection                                    |
| DOWN         | To go to next selection  |
| ENTER        | To confirm the selection in setting mode or enter setting mode |

### 5.3 LCD Setting

After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or ESC button to exit.

#### Setting Programs:

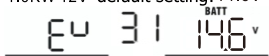
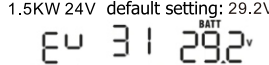
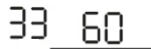
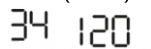
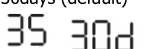

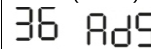
| Program | Description  | Selectable option                        |   |
|---------|--|--|---|
| 00      | Exit setting mode  | Escape (default)<br>00 <u>GOE</u>        | One-button restore setting options  |
|         |  | 00 <u>GOH</u>                            |   |
| 01      | Output source priority:<br>To configure load power source priority | Utility first (default)<br>01 <u>USb</u> | Utility will provide power to the loads as first priority.<br>Solar and battery energy will provide power to the loads only when utility power is not available.  |
|         |  | Solar first<br>01 <u>SUb</u>             | Solar energy provides power to the loads as first priority.<br>If solar energy is not sufficient to power all connected loads, utility will supply power to the loads at the same time.<br>Battery provides power to the loads only when any one condition happens:<br>- Solar energy and utility is not available.<br>- Solar energy is not sufficient and utility is not available. |
|         |  | SBU priority<br>01 <u>SbU</u>            | Solar energy provides power to the loads as first priority.<br>If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time.<br>Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.   |
|         |  | MKS priority<br>01 <u>nTs</u>            | When solar is available, solar energy and battery energy will supply power to the loads, the utility only supplies energy to the load as a backup power.<br>When solar is not available, utility energy will supply power to the loads, the battery only supplies energy to the load as a backup power.   |

|    |   |  |  |
|----|---|--|--|
| 02 | Maximum charging current:<br>To configure total charging current for solar and utility chargers.<br>(Max. charging current = utility charging current + solar charging current) | 10A<br>02 <u>  10  </u> <sup>A</sup>             | 20A<br>02 <u>  20  </u> <sup>A</sup>   |
|    |   | 30A<br>02 <u>  30  </u> <sup>A</sup>             | 40A (default)<br>02 <u>  40  </u> <sup>A</sup>   |
|    |   | 50A<br>02 <u>  50  </u> <sup>A</sup>             | 60A<br>02 <u>  60  </u> <sup>A</sup>   |
|    |   | 70A<br>02 <u>  70  </u> <sup>A</sup>             | 80A<br>02 <u>  80  </u> <sup>A</sup>   |
| 03 | AC input voltage range  | Appliances (default)<br>03 <u>  APL  </u>        | If selected, acceptable AC input voltage range will be within 90-280VAC.   |
|    |   | UPS<br>03 <u>  UPS  </u>                         | If selected, acceptable AC input voltage range will be within 170-280VAC.  |
| 05 | Battery type  | AGM (default)<br>05 <u>  AGM  </u>               | Flooded<br>05 <u>  FLD  </u>   |
|    |   | User-Defined<br>05 <u>  USE  </u>                | If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29. |
| 06 | Auto restart when overload occurs   | Restart disable (default)<br>06 <u>  LTD  </u>   | Restart enable<br>06 <u>  LTE  </u>  |
| 07 | Auto restart when over temperature occurs   | Restart disable (default)<br>07 <u>  ttd  </u>   | Restart enable<br>07 <u>  tTE  </u>  |
| 09 | Output frequency  | 50Hz (default)<br>09 <u>  50  </u> <sub>Hz</sub> | 60Hz<br>09 <u>  60  </u> <sub>Hz</sub>   |
| 10 | Output voltage  | 220V<br>10 <u>  220  </u> <sup>v</sup>           | 230V (default)<br>10 <u>  230  </u> <sup>v</sup>   |
|    |   | 240V<br>10 <u>  240  </u> <sup>v</sup>           |  |

|    |   |   |   |
|----|---|---|---|
| 11 | Maximum utility charging current<br><br>Note: If setting value in program 02 is smaller than that in program in 11, the inverter will apply charging current from program 02 for utility charger. | 2A<br>11 2A   | 10A<br>11 10A                                   |
|    |   | 20A (default)<br>11 20A   | 30A<br>11 30A                                   |
|    |   | 40A<br>11 40A   |   |
| 12 | Setting voltage point back to utility source when selecting "MKS priority" in program 01  | 1.5KW 24V default setting:23V<br>12 <sup>BATT</sup> 23.0 <sub>v</sub>   |   |
|    |   | 1.0KW 12V default setting:11.5V<br>12 <sup>BATT</sup> 11.5 <sub>v</sub>   |   |
|    |   | Setting range is from 21.0V to 26.2V for 1.5KW model 10.5V to 13.1V for 1.0KW model Increment of each click is 0.1V |   |
| 13 | Setting voltage point back to battery mode when selecting "MKS priority" in program 01  | 1.5KW 24V default setting:27V<br>13 <sup>BATT</sup> 27.0 <sub>v</sub> (default)                                     | Battery fully charged<br>13 <sup>BATT</sup> FUL |
|    |   | 1.0KW 12V default setting:13.5V<br>13 <sup>BATT</sup> 13.5 <sub>v</sub> (default)                                   | Battery fully charged<br>13 <sup>BATT</sup> FUL |
|    |   | Setting range is from 24.0V to 29.2V for 1.5KW model 12V to 14.6V for 1.0KW model Increment of each click is 0.1V   |   |
| 14 | Maximum battery discharge current when selecting "SBU priority" in program 01   | 10A<br>14 10 <sup>A</sup>   | 20A (default)<br>14 20 <sup>A</sup>             |
|    |   | 30A<br>14 30 <sup>A</sup>   | 40A<br>14 40 <sup>A</sup>                       |

|    |   |  |   |
|----|---|--|---|
| 16 | Charger source priority:<br>To configure charger source priority  | If this inverter/charger is working in Line, Standby or Fault mode, charger source can be programmed as below:   |   |
|    |   | Solar first<br>16 <u>CS0</u>   | Solar energy will charge battery as first priority.<br>Utility will charge battery only when solar energy is not available.   |
|    |   | Solar and Utility (default)<br>16 <u>SNU</u>   | Solar energy and utility will charge battery at the same time.  |
|    |   | Only Solar<br>16 <u>OSO</u>  | Solar energy will be the only charger source no matter utility is available or not.   |
|    |   | If this inverter/charger is working in Battery mode or Power saving mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient. |   |
| 18 | Alarm control   | Alarm on (default)<br>18 <u>6ON</u>  | Alarm off<br>18 <u>6OF</u>  |
| 19 | Auto return to default display screen   | Return to default display screen (default)<br>19 <u>ESP</u>  | If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) after no button is pressed for 1 minute. |
|    |   | Stay at latest screen<br>19 <u>KEP</u>   | If selected, the display screen will stay at latest screen user finally switches.   |
| 20 | Backlight control   | Backlight on (default)<br>20 <u>LON</u>  | Backlight off<br>20 <u>LOF</u>  |
| 22 | Beeps while primary source is interrupted   | Alarm on (default)<br>22 <u>AON</u>  | Alarm off<br>22 <u>AOF</u>  |
| 23 | Overload bypass:<br>When enabled, the unit will transfer to line mode if overload occurs in battery mode. | Bypass disable (default)<br>23 <u>byd</u>  | Bypass enable<br>23 <u>byE</u>  |

|    |                                     |   |  |
|----|-------------------------------------|---|--|
| 25 | Record Fault code                   | Record enable (default)<br>25 FEN   | Record disable<br>25 FdS                         |
| 26 | Bulk charging voltage (C.V voltage) | 1.0KW 12V default setting: 14.1V<br>CU 26 BATT 14.1V  |  |
|    |                                     | 1.5KW 24V default setting: 28.2V<br>CU 26 BATT 28.2V  |  |
|    |                                     | If self-defined is selected in program 5, this program can be set up. Setting range is from 12V to 15V for 1.0KW 12V model and 24V to 30V for 1.5KW 24V model. Increment of each click is 0.1V.   |  |
| 27 | Floating charging voltage           | 1.0KW 12V default setting: 13.5V<br>FLU 27 BATT 13.5V   |  |
|    |                                     | 1.5KW 24V default setting: 27.0V<br>FLU 27 BATT 27.0V   |  |
|    |                                     | If self-defined is selected in program 5, this program can be set up. Setting range is from 12V to 15V for 1.0KW 12V model and 24V to 30V for 1.5KW 24V model. Increment of each click is 0.1V.   |  |
| 29 | Low DC cut-off voltage              | 1.0KW 12V default setting: 10.0V<br>COU 29 BATT 10.0V   |  |
|    |                                     | 1.5KW 24V default setting: 20.0V<br>COU 29 BATT 20.0V   |  |
|    |                                     | If self-defined is selected in program 5, this program can be set up. Setting range is from 10.0V to 12.0V for 1.0KW 12V model and 20.0V to 24.0V for 1.5KW 24V model. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected. |  |
| 30 | Battery equalization                | Battery equalization<br>30 EEN  | Battery equalization disable (default)<br>30 EdS |
|    |                                     | If "Flooded" or "User-Defined" is selected in program 05, this program can be set up.   |  |

|    |                                    |  |  |
|----|------------------------------------|--|--|
| 31 | Battery equalization voltage       | 1.0KW 12V default setting: 14.6V<br>  |  |
|    |                                    | 1.5KW 24V default setting: 29.2V<br>  |  |
|    |                                    | Setting range is from 12V to 15V for 1.0KW 12V model and 24V to 30V for 1.5KW 24V model. Increment of each click is 0.1V.  |  |
| 33 | Battery equalized time             | 60min (default)<br>   | Setting range is from 5min to 900min. Increment of each click is 5min.                                 |
| 34 | Battery equalized timeout          | 120min (default)<br>  | Setting range is from 5min to 900 min. Increment of each click is 5 min.                               |
| 35 | Equalization interval              | 30days (default)<br>  | Setting range is from 0 to 90 days. Increment of each click is 1 day                                   |
| 36 | Equalization activated immediately | Enable<br>  | Disable (default)<br> |
|    |                                    | If equalization function is enabled in program 30, this program can be set up. If "Enable" is selected in this program, it's to activate battery equalization immediately and LCD main page will shows "EQ". If "Disable" is selected, it will cancel equalization function until next activated equalization time arrives based on program 35 setting. At this time, "EQ" will not be shown in LCD main page. |  |



### 5.4 Fault Reference Code

| Fault Code | Fault Event  | Icon on |
|------------|--|---------|
| 01         | Fan is locked when inverter is off.  |         |
| 02         | Over temperature   |         |
| 03         | Battery voltage is too high  |         |
| 04         | Battery voltage is too low   |         |
| 05         | Output short circuited or over temperature is detected by internal converter components. |         |
| 06         | Output voltage is too high.  |         |
| 07         | Overload time out  |         |
| 08         | Bus voltage is too high  |         |
| 09         | Bus soft start failed  |         |
| 51         | Over current or surge  |         |
| 52         | Bus voltage is too low   |         |
| 53         | Inverter soft start failed   |         |
| 55         | Over DC voltage in AC output   |         |
| 57         | Current sensor failed  |         |
| 58         | Output voltage is too low  |         |
| 59         | PV voltage is over limitation  |         |

### 5.5 Warning Indicator

| Warning Code | Warning Event                      | Audible Alarm                 | Icon flashing |
|--------------|------------------------------------|-------------------------------|---------------|
| 01           | Fan is locked when inverter is on. | Beep three times every second |               |
| 03           | Battery is over-charged            | Beep once every second        |               |
| 04           | Low battery                        | Beep once every second        |               |
| 07           | Overload                           | Beep once every 0.5 second    |               |
| 10           | Output power derating              | Beep twice every 3 seconds    |               |
| 15           | PV energy is low.                  | Beep twice every 3 seconds    |               |
| E9           | Battery equalization               | None                          |               |

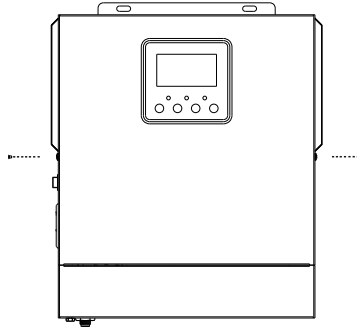
## 6 CLEARANCE AND MAINTENANCE FOR ANTI -DUST KIT (Optional)

### 6.1 Overview

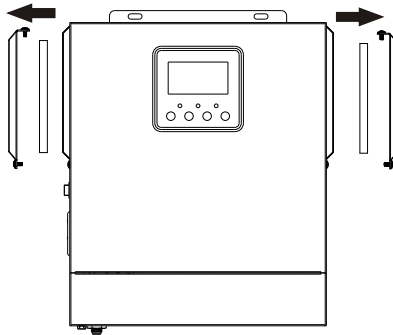
Every inverter is already installed with anti-dusk kit from factory. Inverter will automatically detect this kit and activate internal thermal sensor to adjust internal temperature. This kit also keeps dusk from your inverter and increases product reliability in harsh environment.

### 6.2 Clearance and Maintenance(option)

**Step 1:** Please remove screws as below.



**Step 2:** Then, dustproof case can be removed and take out air filter foam as shown in below chart.



**Step 3:** Clean air filter foam and dustproof case. After clearance, re-assemble the dust-kit back to the inverter.

**NOTICE:** The anti-dust kit should be cleaned from dust every one month.

## 7 SPECIFICATIONS

Table 1 Line Mode Specifications

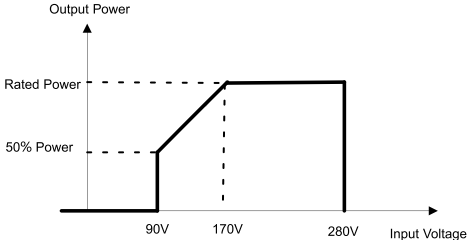
| INVERTER MODEL  | 1.0KW-12V  | 1.5KW-24V |
|---|--|-----------|
| <b>Input Voltage Waveform</b>   | Sinusoidal (utility or generator)  |           |
| <b>Nominal Input Voltage</b>  | 230Vac   |           |
| <b>Low Loss Voltage</b>   | 170Vac±10V (UPS);<br>90Vac±10V (Appliances)  |           |
| <b>Low Loss Return Voltage</b>  | 180Vac±10V (UPS);<br>100Vac±10V (Appliances)   |           |
| <b>High Loss Voltage</b>  | 280Vac±10V   |           |
| <b>High Loss Return Voltage</b>   | 270Vac±10V   |           |
| <b>Max AC Input Voltage</b>   | 300Vac   |           |
| <b>Nominal Input Frequency</b>  | 50Hz / 60Hz (Auto detection)   |           |
| <b>Low Loss Frequency</b>   | 40±1Hz   |           |
| <b>Low Loss Return Frequency</b>  | 42±1Hz   |           |
| <b>High Loss Frequency</b>  | 65±1Hz   |           |
| <b>High Loss Return Frequency</b>   | 63±1Hz   |           |
| <b>Output Short Circuit Protection</b>  | Circuit Breaker  |           |
| <b>Efficiency (Line Mode)</b>   | >95% ( Rated R load, battery full charged )  |           |
| <b>Transfer Time</b>  | 10ms   |           |
| <p><b>Output power derating:</b><br/>When AC input voltage drops to 170V, the output power will be derated.</p> |  <p>The graph plots Output Power on the vertical axis against Input Voltage on the horizontal axis. The horizontal axis has markers at 90V, 170V, and 280V. The vertical axis has markers for 50% Power and Rated Power. The power curve starts at zero for input voltages below 90V, jumps to 50% of the rated power at 90V, then rises linearly to reach the full Rated Power at 170V. From 170V to 280V, the output power remains constant at the Rated Power level. Above 280V, the power drops to zero.</p> |           |

Table 2 Inverter Mode Specifications

| <b>INVERTER MODEL</b>   | <b>1.0KW-12V</b>                          | <b>1.5KW-24V</b> |
|---|---|------------------|
| <b>Rated Output Power</b>   | 1000VA/1000W                              | 1500VA/1500W     |
| <b>Output Voltage Waveform</b>  | Pure Sine Wave                            |                  |
| <b>Output Voltage Regulation</b>  | 230Vac $\pm$ 5%                           |                  |
| <b>Output Frequency</b>   | 50Hz                                      |                  |
| <b>Peak Efficiency</b>  | 94%                                       |                  |
| <b>Overload Protection</b>  | 3s@ $\geq$ 150% load;5s@ 100% ~ 150% load |                  |
| <b>Surge Capacity</b>   | 2* rated power for 5 seconds              |                  |
| <b>Nominal DC Input Voltage</b>   | 12Vdc                                     | 24Vdc            |
| <b>Cold Start Voltage</b>   | 11.5Vdc                                   | 23.0Vdc          |
| <b>Low DC Warning Voltage</b><br>@ load < 50%<br>@ load $\geq$ 50%        | 11.25Vdc<br>11.0Vdc                       | 22.5Vdc<br>22Vdc |
| <b>Low DC Warning Return Voltage</b><br>@ load < 50%<br>@ load $\geq$ 50% | 11.75Vdc<br>11.5Vdc                       | 23.5Vdc<br>23Vdc |
| <b>Low DC Cut-off Voltage</b><br>@ load < 50%<br>@ load $\geq$ 50%        | 10.75Vdc<br>10.5Vdc                       | 21.5Vdc<br>21Vdc |
| <b>High DC Recovery Voltage</b>   | 15.5Vdc                                   | 31Vdc            |
| <b>High DC Cut-off Voltage</b>  | 16.0Vdc                                   | 32Vdc            |
| <b>No Load Power Consumption</b>  | <17W                                      | <27W             |

Table 3 Charge Mode Specifications

| Utility Charging Mode              |                   |  |
|------------------------------------|-------------------|--|
| INVERTER MODEL                     | 1.0 KW-12V        | 1.5KW-24V  |
| Charging Algorithm                 |                   | 3-Step   |
| AC Charging Current ( Max)         |                   | 40Amp<br>(@V <sub>I/P</sub> = 230Vac)  |
| Bulk Charging                      | Flooded Battery   | 29.2   |
| Voltage                            | AGM / Gel Battery | 28.2   |
| Floating Charging Voltage          |                   | 27Vdc  |
| Charging Curve                     |                   | <p>The graph plots Battery Voltage (per cell) on the left y-axis and Charging Current (%) on the right y-axis against Time on the x-axis. The voltage curve (black) rises linearly in the Bulk stage, plateaus in the Absorption stage, and remains constant in the Maintenance stage. The current curve (red) is constant in the Bulk stage, then decreases exponentially in the Absorption stage, and remains very low in the Maintenance stage. Key parameters include 2.40Vdc (2.35Vdc) for flooded/gel batteries, 2.25Vdc for AGM/gel batteries, and a maximum stress time of 72-10*70 hours.</p> |
| MPPT Solar Charging Mode           |                   |  |
| INVERTER MODEL                     | 1.0KW-12V         | 1.5KW-24V  |
| Max. PV Array Power                |                   | 600W   |
| PV Array MPPT Voltage Range        |                   | 20~150Vdc  |
| Max. PV Array Open Circuit Voltage |                   | 150Vdc   |
| Max solar charging current         |                   | 40Amp  |
| Max(AC+Solar) Charging current     |                   | 80Amp  |

Table 4 General Specifications

| INVERTER MODEL              | 1.0KW-12V                                    | 1.5KW-24V |
|-----------------------------|--|-----------|
| Safety Certification        | CE   |           |
| Operating Temperature Range | -10° C to 50° C                              |           |
| Storage temperature         | -15° C- 60° C                                |           |
| Humidity                    | 5% to 95% Relative Humidity (Non-condensing) |           |
| Dimension (D* W* H) , mm    | 286X240X91                                   |           |
| Net Weight, kg              | 3  | 3.5       |

技术要求：单页尺寸142\*210mm；  
材质：封面105g铜版纸,内页80g书写纸；  
料号打于后封面左下角；  
颜色：黑白印刷  
注：此技术要求不用印刷