EASUN POWER

Hybrid solar inverter

Inverter EASUN SMT-4KW 24V

Model ISolar-SMT-4K-24V-Wifi

User manual

Installation, operation, settings, troubleshooting



Manufacturer’s original manual, English translation. Structure, tables and illustrations are kept as in the original.

SUPPORT. If you have technical questions not answered in this manual, contact the seller.

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1. About this manual

1.1 Purpose

This manual describes assembly, installation, operation and troubleshooting of this unit. Read it carefully before installation and use. Keep the manual for future reference.

1.2 Scope

The manual contains safety and installation instructions, and information on tools and wiring.



2. Safety instructions

WARNING
This section contains important safety and operating instructions. Read them and keep the manual for future reference.

1. Before using the unit, read all instructions and warning labels on the unit, the batteries and in the relevant sections of this manual.
2. **CAUTION.** To reduce the risk of injury, charge only deep-cycle lead-acid batteries. Other battery types may explode and cause injury and damage.
3. Do not disassemble the unit. For service or repair, go to a qualified service centre. Incorrect reassembly may cause electric shock or fire.
4. To reduce the risk of electric shock, disconnect all wiring before any maintenance or cleaning. Switching the unit off does not remove this risk.
5. **CAUTION.** Only qualified personnel may install this unit with a battery.
6. **NEVER** charge a frozen battery.
7. For optimal inverter/charger operation, choose cable sizes as required. Correct inverter/charger operation is very important.
8. Be very careful with metal tools on or near batteries. A dropped tool may spark or short the batteries or other electrical parts and cause an explosion.
9. Strictly follow the installation order if you need to disconnect the AC or DC terminals. See the “Installation” section for details.
10. One 150 A fuse is provided as overcurrent protection for the battery supply.
11. **GROUNDING INSTRUCTIONS.** This inverter/charger must be connected to a permanent grounding system. Follow local requirements and codes during installation.
12. NEVER short-circuit the AC output and DC input. Do not connect to the grid when the DC input is shorted.
13. **Warning!** Only qualified service personnel may service this unit. If errors persist after following the troubleshooting table, return the inverter/ charger to the seller or a service centre.

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3. Introduction

This is a multifunction inverter/charger: inverter, solar charge controller and battery charger in one compact case for uninterrupted power. The handy LCD with buttons lets you set battery charge current, grid or solar charge priority and accepted input voltage depending on the application.

3.1 Features

- Pure sine wave inverter
- Input voltage range for appliances or computers is set via the LCD

- Battery charge current is set via the LCD depending on the application
- Grid or solar charge priority is set via the LCD
- Compatible with grid or generator
- Automatic restart after grid recovery
- Overload, overheating and short-circuit protection
- Smart charger for optimal battery performance
- Cold start function

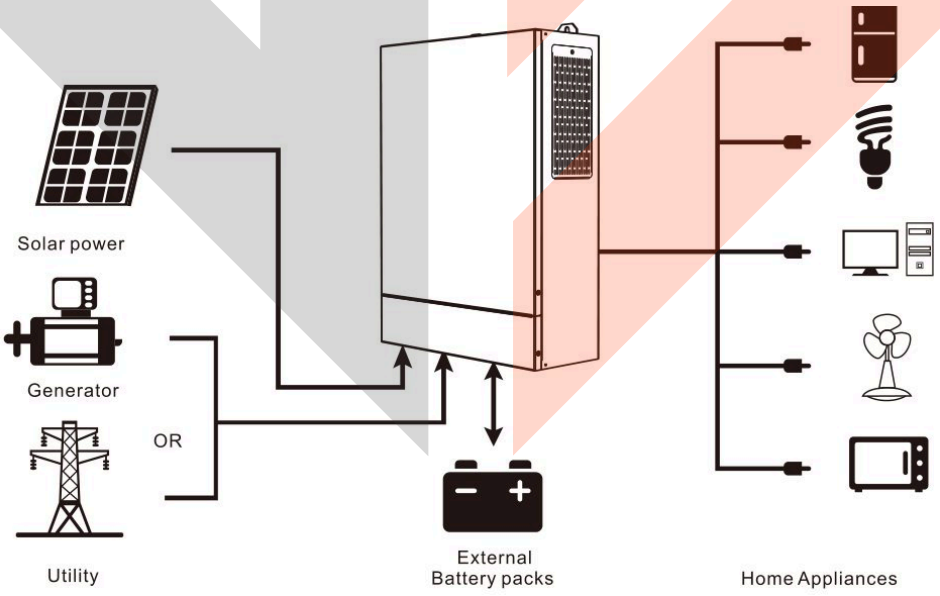
3.2 Basic system diagram

The original figure shows a typical inverter/charger application. A complete system also needs:

- Generator or grid
- PV modules (solar panels)

Discuss other possible system layouts for your needs with your system integrator.

The inverter can power any appliances at home or elsewhere, including motor loads: fluorescent lamps, fans, fridges, air conditioners.



Solar power — solar panels · Generator — generator · OR — or · Utility — grid · External Battery packs — external batteries · Home Appliances — household appliances

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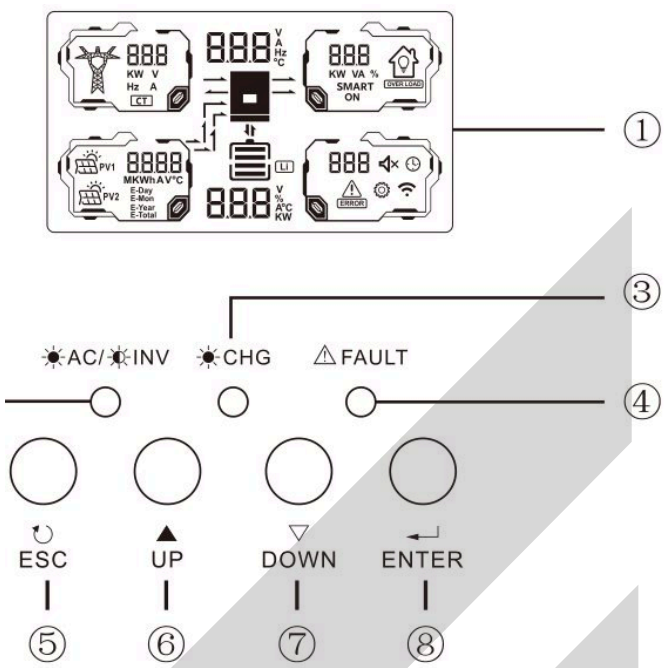
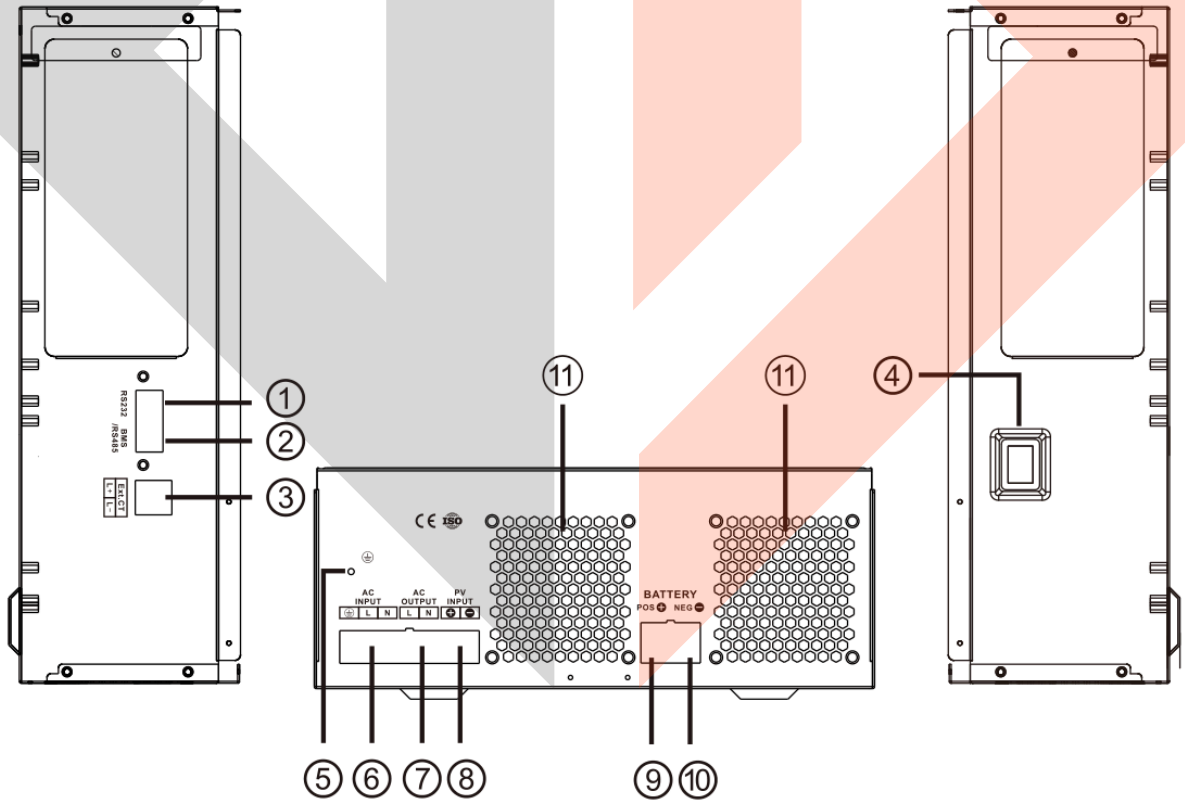
3.3 Product overview

3.3.1 LCD display



1. LCD display
2. Status indicator
3. Charge indicator
4. Fault indicator
5. ESC
6. UP
7. DOWN
8. ENTER

3.3.2 Connector panels



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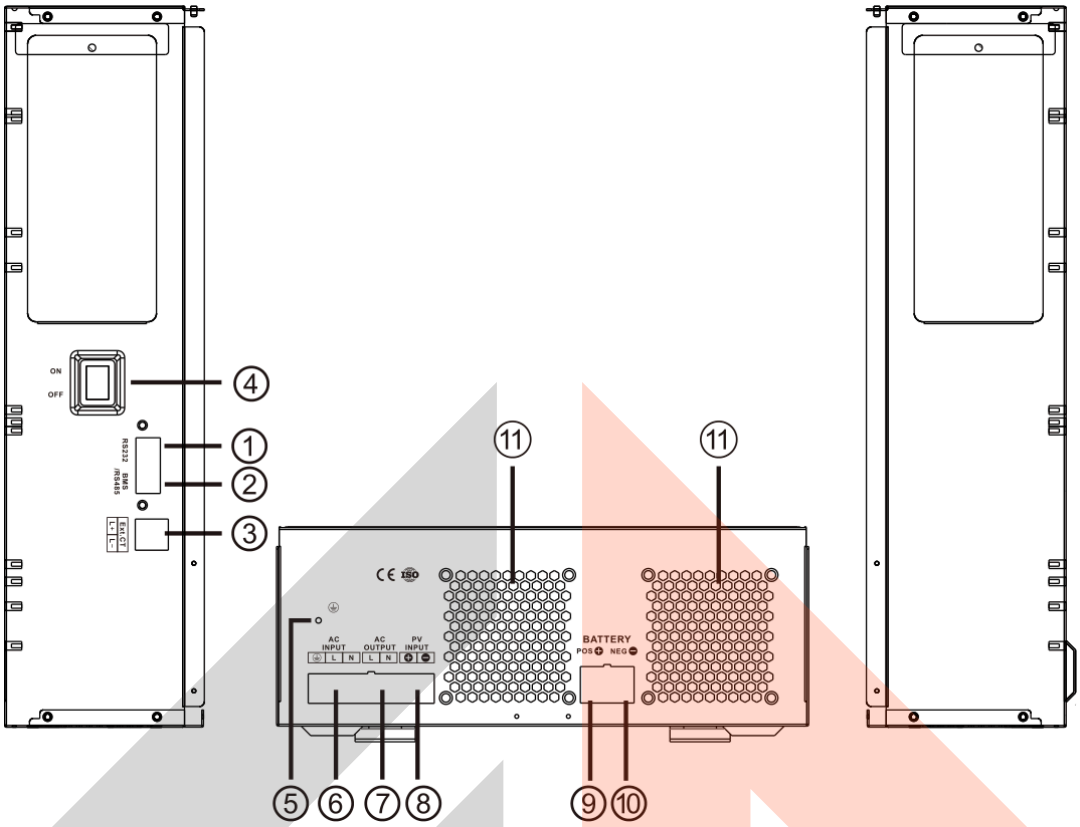


1. RS232 comms port
2. BMS/RS485 comms port
3. CT sensor signal port
4. ON/OFF power switch
5. Output ground wire
6. AC input
7. AC output
8. PV input
9. Battery positive terminal
10. Battery negative terminal
11. Fan

4. Installation

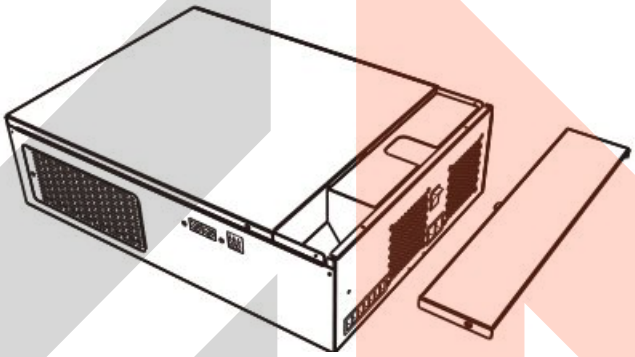
4.1 Unpacking and inspection

Inspect the unit before installation. Make sure nothing in the package is damaged. The package should contain:

- Inverter — 1 pc
- User manual — 1 pc

4.2 Preparation

Before connecting, remove the bottom cover by undoing two screws as shown below.

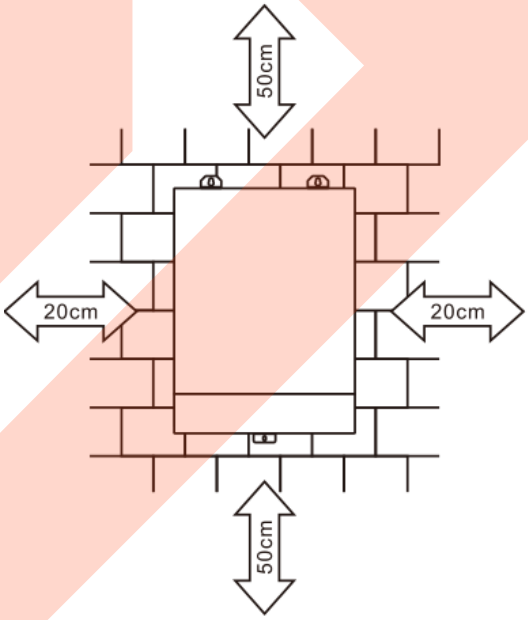


4.3 Mounting the unit

Before choosing where to install, consider:

- Do not mount the inverter on flammable building materials.
- Mount on a solid surface.
- Install the inverter at eye level so the LCD is always easy to read.
- For proper air circulation and heat removal, leave about 20 cm at the sides and about 50 cm above and below the unit.
- Ambient temperature should be 20–35 °C for optimal operation.
- The recommended position is vertical on a wall.

- Keep other objects and surfaces at the distances shown in the diagram for adequate heat removal and room for wiring.



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

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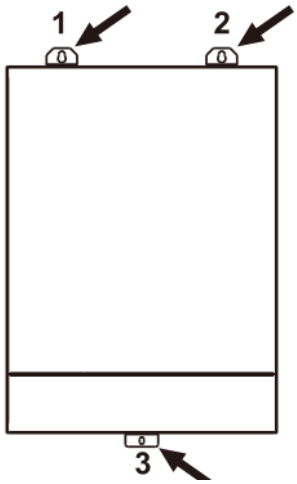
Fix the unit with three screws.

- Use M4×30 screws.

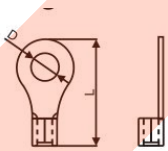


4.4 Battery connection

CAUTION
For safe operation and compliance, install a separate DC overcurrent protector or disconnect between the battery and inverter. In some applications a disconnect may not be required, but overcurrent
protection is still required. The typical current in the table below is a guide for choosing a fuse or breaker.

WARNING
All wiring must be done by qualified personnel. For system safety and efficient operation, using a suitable battery cable is very important. To reduce the risk of injury, use the recommended cable and lugs below.

Recommended battery cable and lugs (ring lug):



Rated power	Typical current	Capacity battery	Cable	Section, mm²	Lug D, mm	Lug L, mm	Tightening torque
4KVA	138 A	200 Ah	2×4 AWG	25	8.4	33.2	5 N·m

To connect the battery, follow these steps:

1. Crimp ring lugs on the battery cables according to the recommended cable and lug size.

2. Insert the battery cables flat into the inverter's battery connectors and tighten the bolts clockwise to 2 N·m. Make sure polarity is correct on both the battery and the inverter/charger and the conductors are tight in the battery terminals. Recommended tool: #2 Pozi screwdriver.

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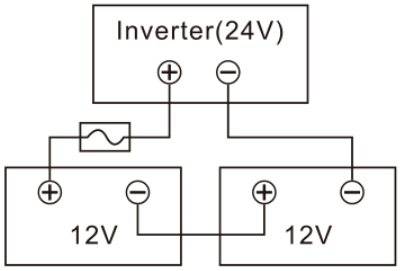
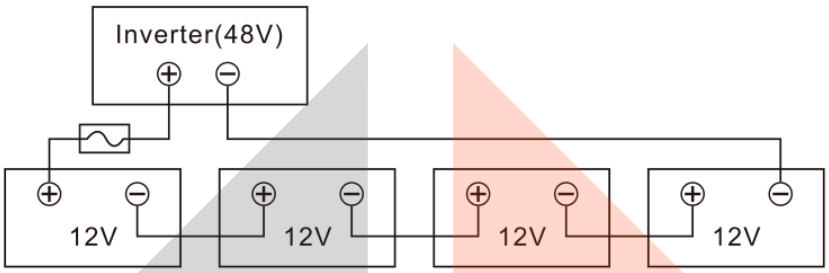
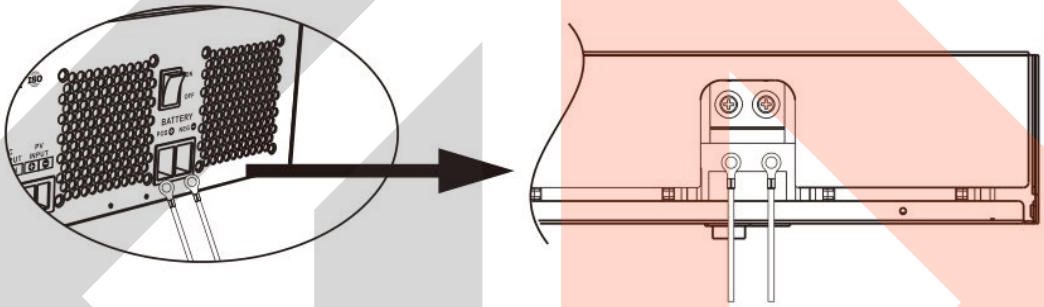




Inverter (24V) / (48V) — 24 V / 48 V inverter; the diagram shows 12 V batteries in series with a fuse in the positive wire



WARNING
Electric shock hazard. Work carefully: series-connected batteries carry high voltage.

CAUTION
Before the final DC connection or closing the DC breaker/disconnect, make sure positive (+) goes to positive (+) and negative (–) to negative (–).

4.5 AC input and output connection

CAUTION
Before connecting to the AC supply, install a separate AC breaker between the inverter and the supply. This lets you disconnect the inverter for service and fully protects the AC input from overcurrent. Recommended breaker: 32 A for a 24 V system and 63 A for a 48 V system.

CAUTION
There are two terminal blocks marked “IN” and “OUT”. Do NOT mix up the input and output connectors.

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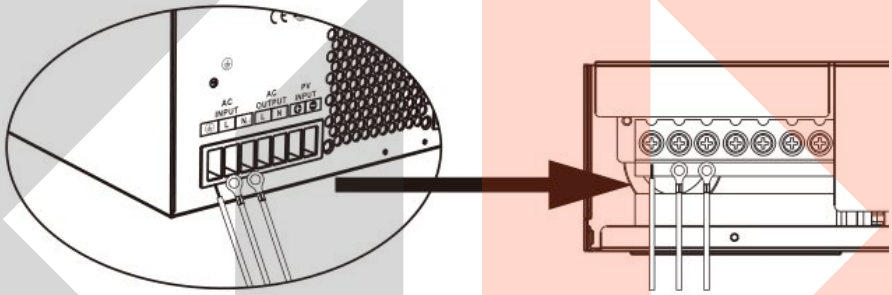
WARNING
All wiring must be done by qualified personnel. For system safety and efficient operation, using a suitable AC input cable is very important. To reduce the risk of injury, use the recommended cable size below.

Recommended AC cables

Rated power	Section	Torque
4KVA	12 AWG	1.2–1.6 N·m

To connect the AC input and output, follow these steps:

1. Before connecting AC input/output, first open the DC protector or disconnect.
2. Strip 10 mm of insulation from the six conductors. Shorten phase L and neutral N by 3 mm.
3. Insert the AC input wires per the polarity on the terminal block and tighten the screws. Connect the PE protective conductor (⏚) first.
   ⏚ → ground (yellow-green)
   L → line (brown or black)
   N → neutral (blue)
4. Make sure the wires are secure.



WARNING
Before wiring the unit, make sure the AC supply is disconnected.

CAUTION
Appliances such as air conditioners need at least 2–3 minutes to restart so that refrigerant pressure can equalise. If power drops and returns quickly, connected appliances may be damaged. To prevent this, check before installation that the air conditioner has a start delay function. Otherwise the inverter/ charger will detect an overload fault and cut the output to protect the appliance, but this can still cause internal damage to the air conditioner.

4.6 PV connection

PV connection (solar controller model only)

CAUTION
Before connecting PV modules, install a **separate** DC breaker between the inverter and the PV modules.

WARNING
All wiring must be done by qualified personnel. For system safety and efficient operation, using a suitable PV module cable is very important. To reduce the risk of injury, use the recommended cable size below.

Typical current	Section	Torque
30 A	12 AWG	1.4–1.6 N·m

Choosing PV modules. When choosing PV modules, first consider these requirements: the open-circuit voltage (Voc) of the PV modules must not exceed the inverter's maximum PV array open-circuit voltage. The maximum power voltage of the PV modules should be close to the inverter's optimal PV input voltage range for best performance. If one PV module does not meet this requirement, connect several PV modules in series.

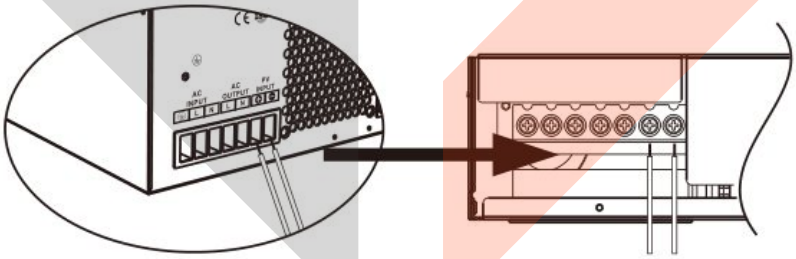
Model	ISolar-SMT-4K-Wifi
PV charge mode	MPPT
Max. PV input power	5000 W
MPPT tracking range	60–500 V DC
Optimal voltage	300–400 V
Max. PV input voltage	500 V DC
Max. PV input current	15 A
Max. PV charge current	120 A
Max. AC charge current	100 A
Max. charge current	120 A

Wiring PV modules. To connect the PV modules, follow these steps:

1. Strip 10 mm of insulation from the positive and negative conductors.
2. We recommend crimping ferrules on the ends of the positive and negative wires with a suitable tool.



3. Fix the wire cover on the inverter with the supplied screws as shown.



4. Check the polarity of the wires from the PV modules and the PV input connectors. Then connect the positive (+) of the wire to the positive (+) of the PV input connector, and the negative (–) to the negative (–). Tighten both wires firmly clockwise. Recommended tool: 4 mm flat screwdriver.

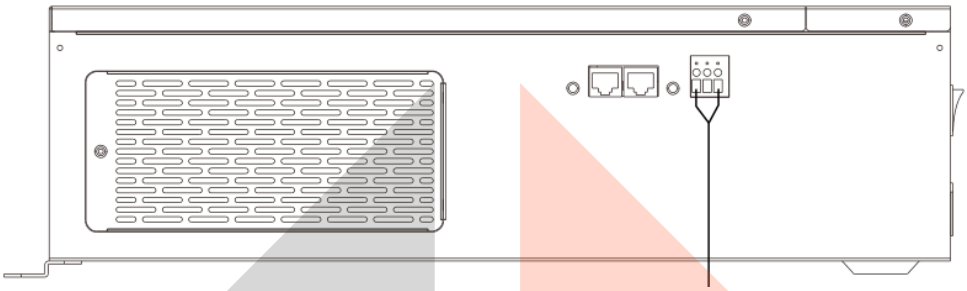
Connecting the CT current sensor

With a CT connected, the hybrid inverter integrates easily into an existing home system: the CT enables self-consumption and control of generation and battery charging.

1. Single inverter setup

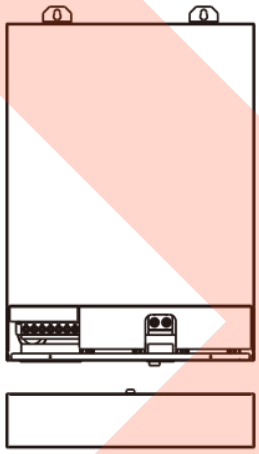
1. Switch the inverter off and connect the external CT to the spring terminal block using the supplied tool. Note: the current direction arrow on the CT must point to the inverter, and the CT wires on the terminal block go as follows: “L+” — red wire, “L–” — black.

2. Switch on the inverter.
3. Enter the LCD settings of the inverter with the CT connected and set the CT function to **PEC** (program 01).



4.7 Final assembly

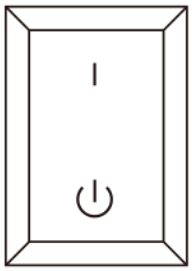
After connecting all wires, refit the bottom cover with two screws as shown.



5. Operation

5.1 Power on and off

Once the unit is properly installed and the batteries are securely connected, simply press the On/Off switch on the case to switch the unit on.



5.1.1 Start-up procedure

Connect a battery that meets the requirements (the original states: battery voltage above 23 V) or the AC grid (AC input voltage must be within the allowed range for the output mode); the inverter can then be started.

➤ **Start from grid.** Connect the normal AC grid and press the switch — the system starts automatically. If grid output priority is set, AC mode appears on the panel after a while: the unit has started successfully and entered AC mode.

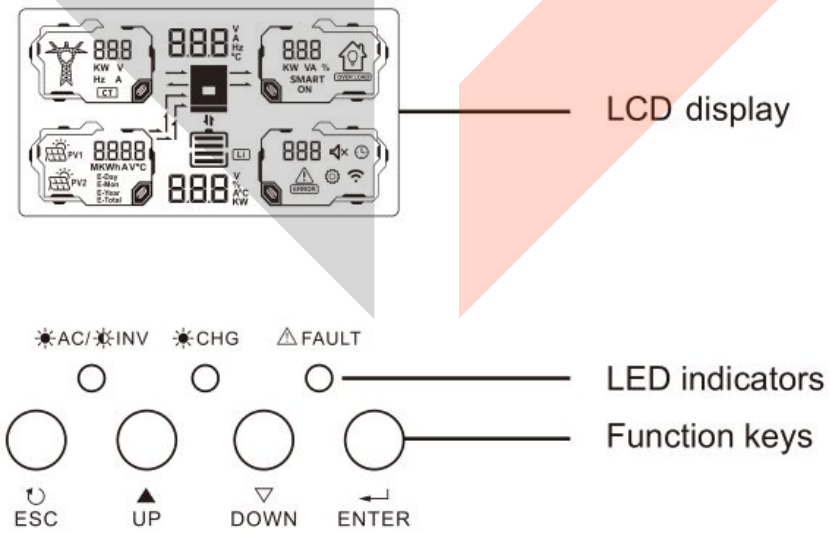
➤ **Start from battery.** Connect the battery and press the power button to create a working power source. The system starts automatically; after a while battery mode appears on the panel — the unit has started successfully and entered battery mode.

5.1.2 Shutdown procedure

When the system runs in battery mode or grid output mode, press the switch again — the system shuts down.

5.2 Control and display panel

The control and display panel shown below is on the front of the inverter. It has three indicators, four function keys and an LCD showing the operating status and input/output power data.



LCD display · LED indicators · Function keys

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LED indicators

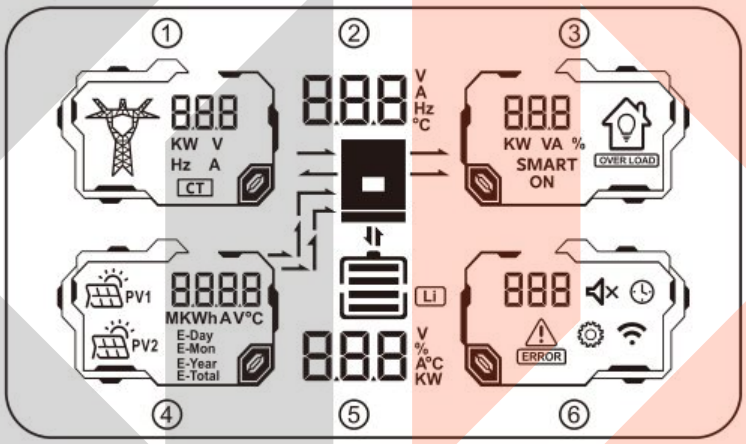
Indicator	Colour	State	Value
AC / INV	Green	Steady	Output fed from the grid (grid mode).
		Flashing	Output fed from battery or PV (battery mode).
CHG	Yellow	Steady	Battery fully charged.
		Flashing	Battery charging.
FAULT	Red	Steady	A fault has occurred in the inverter.
		Flashing	A warning has occurred in the inverter.

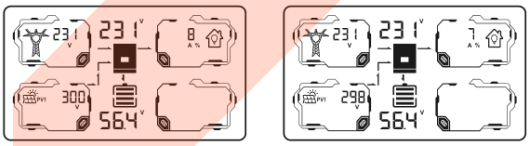
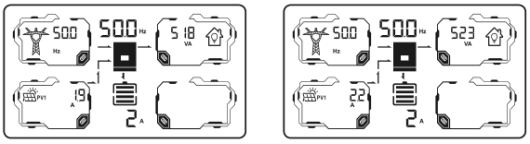
Function keys

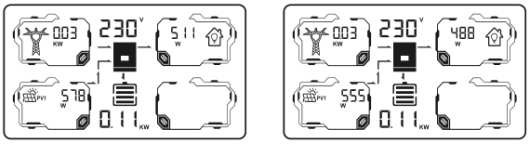
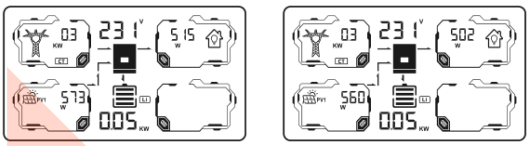
Button	Description
ESC	Exit settings mode
UP	Previous item
DOWN	Next item
ENTER	Confirm a selection in settings mode or enter settings mode

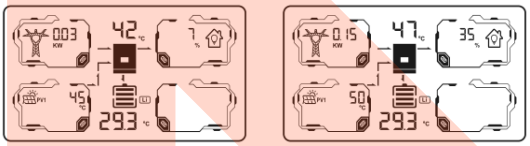
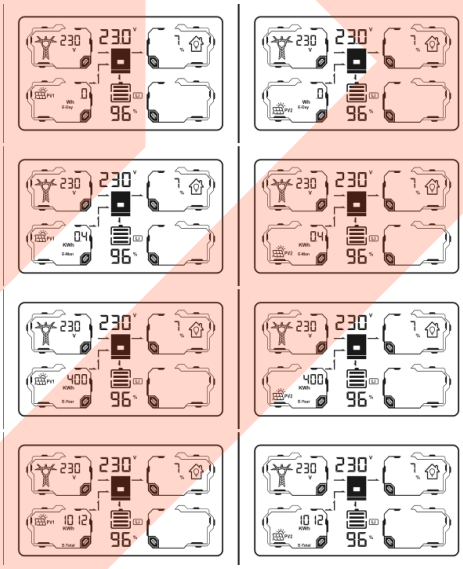
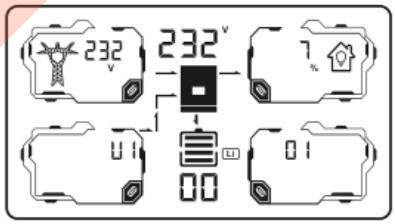
Display settings

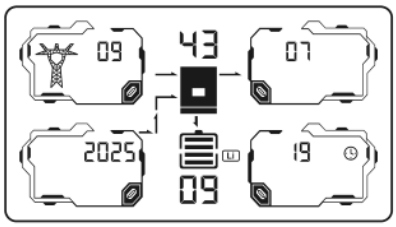
Information on the LCD cycles with “UP” or “DOWN” in this order: voltage, frequency, current, power, temperature, firmware version, date.



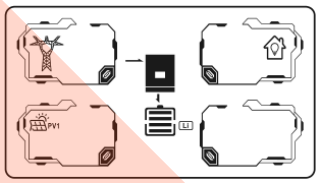
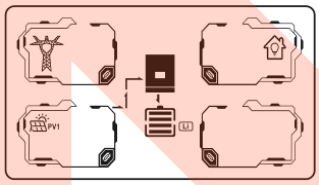
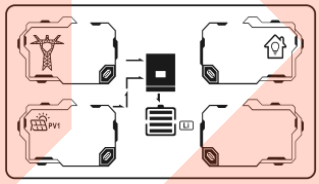
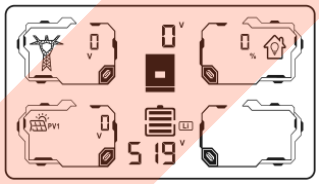
What is shown	LCD display
① AC input voltage (if a generator is running, generator voltage is shown, and power and frequency on the next screens are also generator values) ② Output voltage ③ Load in percent ④ Left: PV1 input voltage, right: PV2 ⑤ Battery voltage ⑥ Warning or fault code (main screen)	
① AC input frequency ② Output frequency ③ Load in VA ④ Left: PV1 input current, right: PV2 ⑤ Battery current ⑥ Warning or fault code	

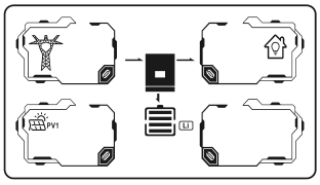
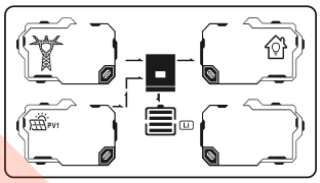
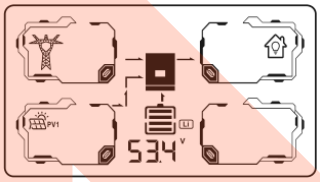
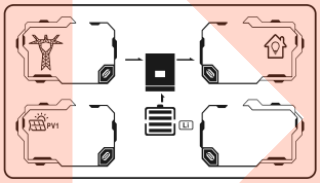
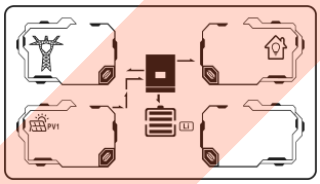
What is shown	LCD display
① AC input power in W ② Output voltage ③ Load in W ④ Left: PV1 input power in W, right: PV2 ⑤ Battery power in W ⑥ Warning or fault code	
① AC input power from the external CT in W (if the CT is reversed, “–” appears before the value) ② Output voltage ③ Apparent power ④ Left: PV1 input power in W, right: PV2 ⑤ Battery power in W ⑥ Warning or fault code	

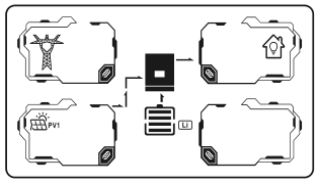
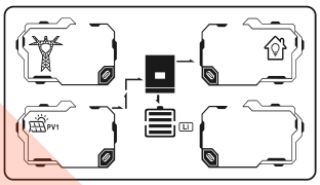
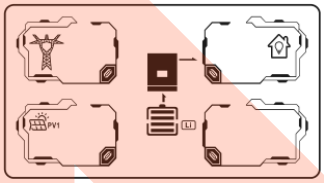
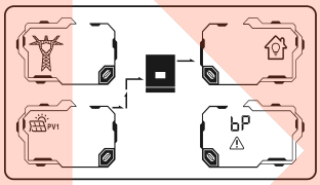
What is shown	LCD display
① AC input power in W ② Inverter temperature ③ Load in percent ④ Left: PV1 temperature, right: PV2 ⑤ Battery temperature ⑥ Warning or fault code	
① AC input voltage ② Output voltage ③ Load in percent ④ Left: PV1 energy per day / month / year / total, right: the same for PV2 ⑤ Battery charge in percent ⑥ Warning or fault code (main screen)	
Main board firmware version ① AC input voltage ② Output voltage ③ Load in percent ④⑤⑥ Firmware version (CPU: U1.00.01)	

What is shown	LCD display
① Hours ② Minutes ③ Seconds ④ Year ⑤ Month ⑥ Day (figure: 09:43:07, 19 September 2025)	

Operating modes

Operating mode	Behaviour	LCD display
Standby mode Standby: the inverter is not yet on but can charge the battery without AC output. Power saving: if enabled, the inverter output turns off when the load is very low or not detected.	No output power; solar or grid charging available	Battery charging from the grid. 
		Battery charging from PV. 
		Battery charging from grid and PV. 
		No charging. 

Operating mode	Behaviour	LCD display
Grid mode	Output fed from the grid, charging available	The grid charges the battery and powers the load. 
		PV, battery and grid power the load. 
		If output priority “PEC” is selected, PV and battery together with the grid power the load. 
		If output priority “PEC” is selected: power from battery and grid. 
		If output priority “SUF” is selected, surplus PV energy can be exported to the grid. 

Operating mode	Behaviour	LCD display
Battery mode	Output fed from battery or PV	PV and battery power the load. 
		PV powers the load and the surplus charges the battery. 
		The battery powers the load. 
PV-only mode	Output fed from PV	PV powers the load. 

5.3 LCD settings

Hold ENTER for 3 seconds to enter settings mode. Use “UP” or “DOWN” to choose a program, “ENTER” to confirm, ESC to exit.

On-screen codes are shown as the seven-segment display shows them.

Program	Description	Options
00	Exit settings mode	**ESC —** exit

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Program	Description	Options
01	Output source priority	**SUb** solar powers the load first; if it is not enough for all loads, the grid supplies at the same time. **SbU** solar powers the load first; if it is not enough, the battery supplies at the same time. The grid powers the load only when battery voltage drops to the low-voltage warning level or to the value of program 12, or when solar and battery are not enough. **SUF** if solar is enough for all loads and battery charging, the surplus can be exported to the grid (selling energy). If solar is not enough for all loads, the grid supplies at the same time. **PEC** the inverter powers both the connected load and the home loads. If PV and battery are not enough, grid energy is added. No energy is sold to the grid. In this mode a CT sensor can be used (see the CT connection section): the external CT detects energy flowing back to the grid and reduces inverter power to only supply the local load, battery charging and home loads.
02	Max. charge current: total charge current from solar and grid (max. charge current = grid charge current + solar charge current)	**60A** default. Range from 10 A to the max. charge current, step 10 A.
03	AC input voltage range	**APL** appliances (default): accepted AC input voltage 90–280 V. **UPS:** accepted AC input voltage 170– 280 V.

Program	Description	Options
05	Battery type	**AGn** AGM (default) · **FLd** flooded **USE** user-defined: charge voltage, low DC cut-off voltage and dual cut-off voltage can be set in programs 24, 26, 27, 29 and 61. **LIA** LIA-protocol battery · **PYL** Pylontech battery · **tqF** Techfine battery · **GrO** Growatt battery · **FEL** Felicity battery: programs 24, 26, 27 and 29 are set automatically, no extra setup needed. **LIb** LIB-protocol battery: choose if the lithium battery is LIB-protocol compatible; programs 26, 27 and 29 are set automatically, no extra setup needed. **LIC** lithium battery from another maker: programs 26, 27 and 29 are set automatically, no extra setup needed. Check the setup procedure with the battery maker.

Program	Description	Options
06	Auto restart after overload	**LtD** off (default) · **LtE** on
07	Auto restart after overheating	**ttD** off (default) · **ttE** on
08	ECO function: on battery with low load, the system pauses temporarily	**ECO SdS** off (default) · **ECO SEN** on
09	Output frequency	**50** Hz (default) · **60** Hz
10	Output voltage	**220** V · **230** V (default) · **240** V
11	Max. grid charge current. Note: if the value in program 02 is lower than in program 11, the inverter uses the current from program 02 for grid charging.	**30A** default. Range: 2 A, then from 10 A to the max. AC charge current, step 10 A.
12	Back-to-grid voltage when “SBU” is selected in program 01	24 V system: **23.0** V default, range 22–25.5 V, step 0.5 V. 48 V system: **46.0** V default, range 44–51 V, step 1 V.
13	Back-to-battery voltage when “SBU” is selected in program 01	24 V system: **FUL** battery fully charged or **27.0** V (default); range 24–29 V, step 0.5 V. 48 V system: **FUL** or **54.0** V (default); range 48–58 V, step 1 V.

Program	Description	Options
16	Charging source priority	If the inverter/charger is in grid, standby or fault mode, the charge source can be set as follows: **CSO** solar first: solar charges the battery first; the grid charges only when there is no solar. **SNU** solar and grid (default): solar and grid charge the battery at the same time. **OSO** solar only: solar is the only charge source, whether or not the grid is present. **SOt** solar surplus: solar first powers all connected loads, and the rest charges the battery. If the inverter is in battery mode, only solar can charge the battery, if there is enough solar.
17	Battery restart voltage	Default **rtV 53.5** V. In SOC mode, after the unit shuts down due to low battery, when PV charging brings the voltage to this value, the unit restarts and keeps running.
18	Beeper	**bON** on (default) · **bOF** off

Program	Description	Options
19	Auto return to main screen	**ESP** return to main screen (default): whatever screen is selected, if no key is pressed for 1 minute, the display returns to the main screen (input/output voltage). **HEP** stay on the last screen the user selected.
20	Backlight	**LON** on (default) · **LOF** off
22	Beep when the primary source is interrupted	**AON** on (default) · **AOF** off
23	Overload bypass: if enabled, on overload in battery mode the unit switches to grid mode	**byd** off (default) · **byE** on
24	Low battery voltage: if the battery is the only available source, the inverter sounds an alarm	**LOV 44.0** V (in the figure). Range 20.0–27.0 V for 24 V systems and 40.0–54.0 V for 48 V systems.
25	Fault code logging	**FEN** recording on (default) · **FbS** off

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Program	Description	Options
26	Bulk charge voltage (CV voltage)	24 V system: default **28.2** V. 48 V system: default **56.4** V. Adjustable if user-defined type is selected in program 5. Range 24.0–30.0 V for 24 V systems and 48.0–60.0 V for 48 V systems, step 0.1 V.
27	Float charge voltage	24 V system: default **27.0** V. 48 V system: default **54.0** V.
28	Reset to factory settings	**Std OFF** (default) · **Std ON** reset
29	Low DC cut-off voltage: if the battery is the only available source, the inverter shuts down; if PV and battery are available, the inverter charges the battery without AC output	24 V system: default **21.0** V. 48 V system: default **42.0** V. Adjustable if user-defined type is selected in program 5. Range 20.0–26.0 V for 24 V systems and 40.0–52.0 V for 48 V systems, step 0.1 V. The cut-off voltage is fixed at the set value regardless of load.
30	Battery equalisation charge	**EEN** on · **EdS** off (default). Available if flooded (FLd) or user-defined (USE) type is selected in program 05.
31	Equalization charge voltage	24 V system: default **29.2** V. 48 V system: default **58.4** V. Range 24.0–30.0 V for 24 V systems and 48.0–60.0 V for 48 V systems, step 0.1 V.
33	Equalisation time	**60** min (default). Range 5–900 min, step 5 min.
34	Equalisation timeout	**120** min (default). Range 5–900 min, step 5 min.

Program	Description	Options
35	Equalising interval	**30d** 30 days (default). Range 0–90 days, step 1 day.
36	Start equalisation now	**AEN** on · **AdS** off (default). Available if equalisation is enabled in program 30. If “on” is selected, equalisation starts immediately and **E9.** appears on the main screen. If “off” is selected, equalisation is cancelled until the next scheduled time per program 35; then **E9** is not shown on the main screen.
37	Enable BMS comms	**bnS OFF** off (default) · **bnS ON** on. Whether to use BMS comms.

Program	Description	Options
38	Battery lockout SOC	**bSU 10%.** If any lithium battery type is selected in program 5: if the SOC reported by the BMS is below the set value, the inverter shuts down to protect the battery.
39	SOC for switching to grid	**StG 20%.** If any lithium battery type is selected in program 5: when running with battery priority, the inverter forces grid charging if the BMS SOC is below the set value.
40	Back-to-battery SOC	**Stb 95%.** If any lithium battery type is selected in program 5: when running with battery priority, the inverter returns to DC operation if the BMS SOC is above the set value.
41	SOC for restart	**bSt 50%.** If any lithium battery type is selected in program 5: at inverter start-up, SOC must be above the set value for normal operation.
45	PV energy counter reset	**nrt** do not reset (default) · **rSt** reset
46	Grid charging start time	**StA 00:00** (default). Range 00:00–23:00, step 1 hour.
47	Grid charging end time	**StO 00:00** (default). Range 00:00–23:00, step 1 hour.
48	Scheduled AC output on time	**ON 00:00** (default). Range 00:00– 23:00, step 1 hour.
49	Scheduled AC output off time	**OFF 00:00** (default). Range 00:00–23:00, step 1 hour.

Program	Description	Options
50	Country grid export requirements	**IND** mode 1: export voltage 195.5–253 V AC, frequency 49–51 Hz. **GEn** mode 2: 184–264.5 V AC, 47.5–51.5 Hz. **SAd** mode 3: 184–264.5 V AC, 57–62 Hz. **PAK** mode 4: 170–264.5 V AC, 47.5–53.5 Hz. **U2b** mode 5 (default): 100–280 V AC, 47.5–53.5 Hz.
51	Time: minutes	**MIN 00,** range 00–59.
52	Time: hours	**HOU 00,** range 00–23.
53	Date: day	**DAT 01,** range 00–31.
54	Date: month	**MON 01,** range 1–12.
55	Date: year	**YEA 16,** range 16–99.

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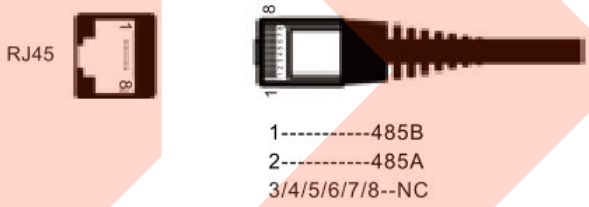
Program	Description	Options
56	Grid export power	Manual figure shows **6.2KW.** Step 200 W.
58	Power drawn from the grid	**ZEP 0.15KW** (default). Range 0.01–0.5 kW, step 0.01 kW.
59	Max. battery discharge current	**dIC 200** (default). If discharge current exceeds the set value, the unit gives a warning. Range 20–200.
67	Output on time	**dtA 000,** values 0–23.
68	Output off time	**dtO 000,** values 0–23.
71	Grid peak shaving start time	**LSA 00:00** (default). Range 00:00–23:00, step 1 hour. In PEC mode sets the time from which the battery supplies energy (if needed).
72	Grid peak shaving end time	**LSO 00:00** (default). Range 00:00–23:00, step 1 hour. In PEC mode sets the time until which the battery supplies energy (if needed).

Program	Description	Options

If a BMS/485 comms interface is connected externally, the RJ45 pinout is:

RJ45 pin	Signal
1	RS485-B
2	RS485-A
3, 4, 5, 6, 7, 8	not used (NC)



Comms connection

Use the supplied comms cable to connect the inverter to a PC. Install the monitoring software on the computer.

5.4 Battery equalisation charge

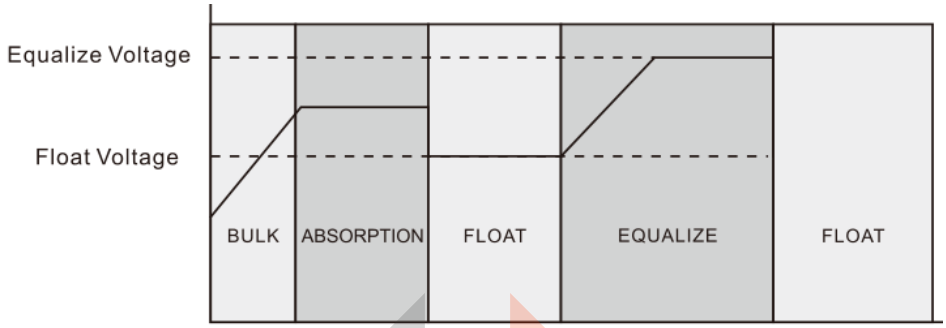
An equalisation function has been added to the charge controller. It reverses the build-up of negative chemical effects such as stratification, where acid concentration is higher at the bottom of the battery than at the top. Equalisation also helps remove sulphate crystals that may have formed on the plates. Left unchecked, sulphation will reduce the overall battery capacity. Periodic equalisation is therefore recommended.

How to use equalisation. First enable equalisation charge in program 30 of the LCD settings. Then apply it in one of these ways:

1. Set the equalisation interval in program 35.
2. Start equalisation now in program 36.

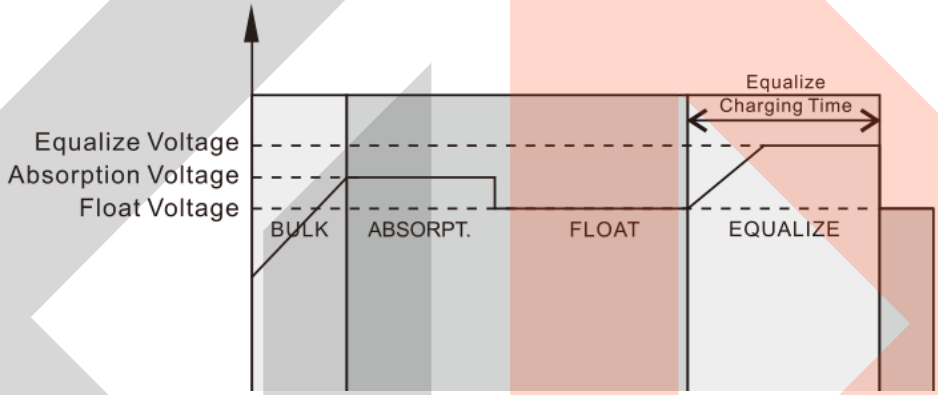
> **NOTE**
> Equalisation is not used for lithium batteries: program 30 is available only for flooded or user-defined type.

When equalisation runs. When the set equalisation interval (battery equalisation cycle) arrives or equalisation is started immediately, the controller enters the equalisation stage.



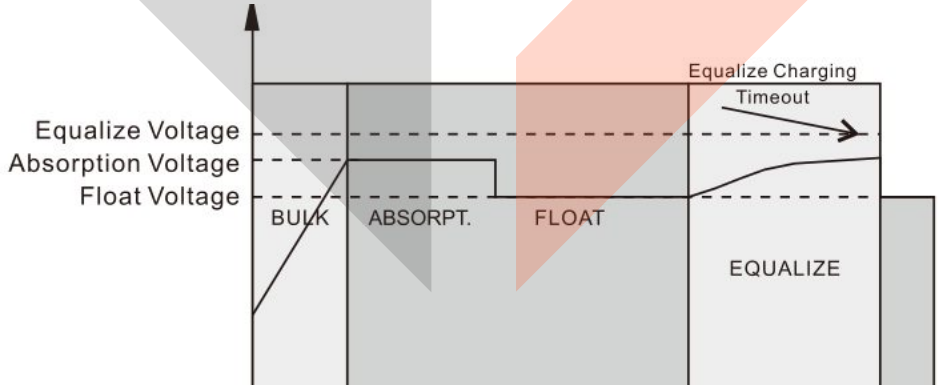
Equalize Voltage — equalisation voltage · Float Voltage — float charge voltage · BULK — bulk charge · ABSORPTION — constant voltage charge · FLOAT — float charge · EQUALIZE — equalisation

Equalisation time and timeout. In the equalisation stage, the controller charges the battery at the highest possible current until voltage rises to the equalisation voltage. Voltage is then held constant at that level. The battery stays in equalisation until the set equalisation time ends.



Absorption Voltage — constant voltage charge voltage · Equalize Charging Time — equalisation time

However, if the equalisation time has passed and the battery has not reached the equalisation voltage, the controller extends equalisation until it does. If after the equalisation timeout the battery voltage is still below the equalisation voltage, the controller stops equalisation and returns to float charge.



Equalize Charging Timeout — equalisation timeout

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5.5 Faults and warnings

5.5.1 Faults

➤ **Fault:** the inverter enters fault mode, the red indicator is steady on, and the LCD shows the fault code (ERROR icon).

Fault code	Event
F01	Fan locked while the inverter is off.
F02	Overheating or poorly connected NTC temperature sensor.
F03	Battery voltage too high.
F04	Battery voltage too low.
F05	Output short circuit or overheating detected by internal converter components.
F06	Output voltage too high.
F07	Overload timeout.
F08	Bus voltage too high.
F09	Bus soft start failed.
F51	Overcurrent or surge.
F52	Bus voltage too low.
F53	Inverter soft start failed.
F55	DC offset in AC output voltage too high.
F57	Current sensor fault.
F58	Output voltage too low.
F59	PV voltage exceeds the limit.

5.5.2 Warnings

➤ **Warning:** the red indicator flashes, the LCD shows the warning code (⚠ icon flashes), and the inverter does not enter fault mode.

Warning code	Event	Beeper
A01	Fan locked while the inverter is on.	Three beeps per second
A02	Overheating	None
A03	Battery overcharged	One beep per second
A04	Battery low	One beep per second
A07	Overload	One beep every 0.5 s
A10	Output power derating	Two beeps every 3 s
A15	Low PV energy	Two beeps every 3 s
A16	High AC input voltage (> 280 V) during bus soft start	None
A27	Set max. battery discharge current exceeded (program 59)	None
E9	Battery equalisation charge	None
bP	Battery not connected	None

5.5.3 Information codes

The relevant information code is shown on the LCD with the ⚠ icon. Check the inverter screen.

Code	Description
60	If, after comms between inverter and battery are established, the battery state allows neither charging nor discharging, code 60 appears and charging and discharging stop.

Code	Description
61	Comms lost. • If no comms signal is detected within 1 minute after connecting the battery, a beep sounds. • If comms are lost after the inverter and battery have connected, the beep sounds immediately.
69	If, after comms are established, the battery state does not allow charging, code 69 appears and charging stops.
70	If, after comms are established, the battery needs charging, code 70 appears and the battery charges.
71	If, after comms are established, the battery state does not allow discharging, code 71 appears and discharging stops.

6. Troubleshooting

Problem	Display / LEDs / beep	Explanation / possible cause	What to do
Unit shuts down automatically during start-up	LCD, LEDs and buzzer work for 3 seconds, then everything goes off	Battery voltage too low (< 1.91 V/cell)	1. Charge the battery. 2. Replace the battery.
No response after power-on	Nothing lights up	1. Battery voltage very low (< 1.4 V/cell). 2. Internal fuse has blown.	1. Contact a service centre to replace the fuse. 2. Charge the battery. 3. Replace the battery.
Grid present but unit runs in battery mode	Display shows input voltage 0, green LED flashes	Input protection tripped	Check whether the AC breaker has tripped and the AC wiring is correct.
	Green LED flashes	Poor AC power quality (grid or generator)	1. Check whether the AC wires are too thin or too long. 2. Check that the generator (if any) works properly and the input voltage range is set correctly (UPS → APL).
	Green LED flashes	Output source priority is set to “solar first”	Change the output source priority to grid.
After power-on the internal relay keeps switching on and off	LCD and LEDs flash	Battery disconnected	Check that the battery wires are securely connected.
Buzzer sounds continuously, red LED on	Fault code 07	Overload: inverter overloaded by 105 % and time has run out	Reduce the connected load by switching off some appliances.
		If PV input voltage is above the limit, output power is derated. If the connected load is then above the derated power, an overload occurs.	Reduce the number of PV modules in series or the connected load.
	Fault code 05	Output short circuit	Check the wiring and disconnect the faulty load.
		Internal converter component temperature above 120 °C	Check that airflow is not blocked and ambient temperature is not too high.
	Fault code 02	Inverter internal temperature above 100 °C	Same.
	Fault code 03	Battery overcharged	Return to a service centre.
		Battery voltage too high	Check that the battery specs and number meet the requirements.
	Fault code 01	Fan fault	Replace the fan.
	Fault codes 06 / 58	Abnormal output (inverter voltage below 190 V AC or above 260 V AC)	1. Reduce the connected load. 2. Return to a service centre.
	Fault codes 08 / 09 / 53 / 57	Internal component fault	Return to a service centre.
	Fault code 51	Overcurrent or surge	Restart the unit; if the error repeats, return it to a service centre.
	Fault code 52	Bus voltage too low	Same.
	Fault code 55	Unbalanced output voltage	Same.

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Problem	Display / LEDs / beep	Explanation / possible cause	What to do
	Fault code 59	PV input voltage exceeds the limit	Reduce the number of PV modules in series.

7. Technical specifications

	Parameter	ISolar-SMT-4K-24V-Wifi
Input	Input sources	L + N + PE
	Rated input voltage	220 / 230 / 240 V AC
	Voltage range	90–280 V AC ±3 V (APL mode), 170–280 V AC ±3 V (UPS mode)
	Frequency	50 / 60 Hz (auto-detect)
Output	Rated power from battery	3600 W
	Rated power from PV	3600 W
	Output voltage	220 / 230 / 240 V AC ±5 %
	Output frequency	50 / 60 Hz ±0.1 %
	Waveform	Pure sine wave
	Transfer time (adjustable)	Computers (UPS mode) 10 ms, appliances (APL mode) 20 ms
	Peak power	7200 VA
	Overload capacity	In battery mode: 11 s at 105–150 % load; 2 s at 150–200 %; 400 ms above 200 %
Grid operation	Output voltage	220 / 230 / 240 V AC ±5 %
	Grid export voltage range	100–280 V AC
	Grid export frequency range	47–53 ±1 Hz / 57–62 ±1 Hz
	Rated output current	15.7 A
	Power factor	> 0.99
	Max. conversion efficiency (DC/AC)	98 %
Battery	Battery voltage	24 V DC
	Constant voltage charge voltage (adjustable)	28.2 V DC
	Float charge voltage (adjustable)	27 V DC
Chargers	PV charge mode	MPPT
	Max. PV input power	5000 W
	MPPT tracking range	60–500 V DC
	Optimal voltage	300–400 V
	Max. PV input voltage	500 V DC
	Max. PV input current	15 A
	Max. PV charge current	120 A
	Max. AC charge current	100 A
	Max. charge current	120 A
Display	LCD display	Shows operating mode, load, input, output, etc.
Interfaces	RS232	2400 baud
	Expansion slot	Lithium battery BMS comms board, Wi-Fi board
Environment	Operating temperature	−10…+50 °C
	Humidity	20–95 % non-condensing
	Storage temperature	−15…+60 °C
	Altitude	Up to 1000 m without derating, above 1000 m derated, max. 4000 m (per IEC 62040)
	Noise	≤ 50 dB
Standards and certification		EN-IEC 60335-1, EN IEC 60335-2-29, IEC 62109-1

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Appendix. Wi-Fi connection via the app

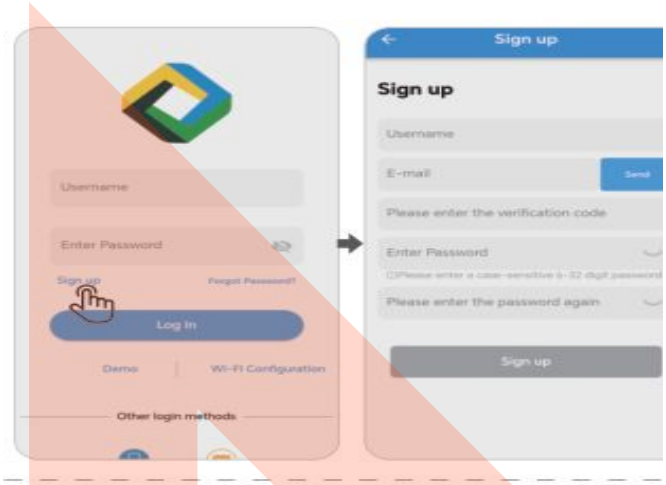
1. Wi-Fi wireless network setup

1.1 Downloading the app

- Method 1: scan the QR code on the film of the data logger (collector).
- Method 2: search the app store for “Solar of Things” and install it.

1.2 Account registration

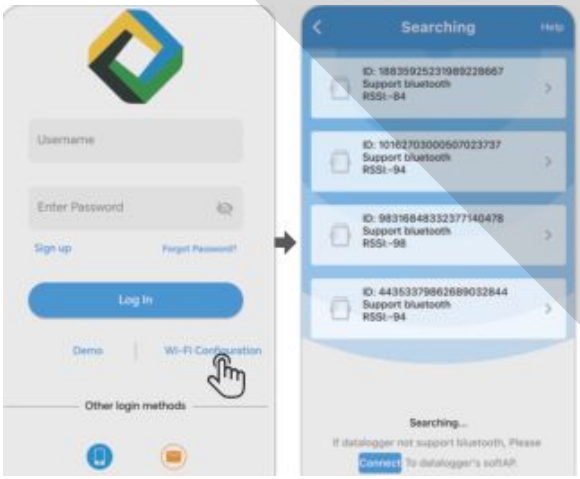
On the app home page tap “Sign Up”, fill in the required details as prompted and complete registration.

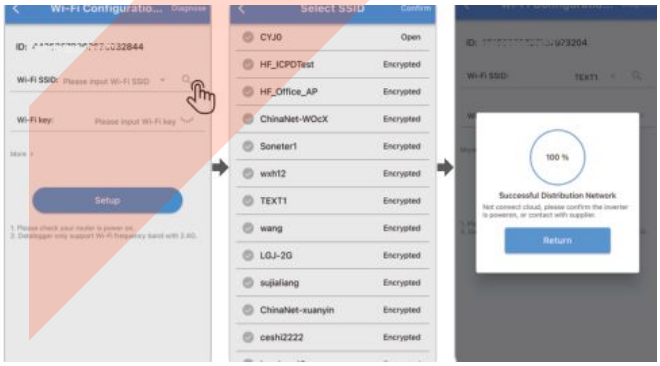


2. Network connection and adding a device

2.1 Connecting the Wi-Fi collector to the router

1. When the PWR LED on the collector lights up, turn on Bluetooth on the phone, open Solar of Things and tap “Wi-Fi Configuration” to go to the “Searching” page. The app shows nearby Bluetooth devices automatically.
2. Choose the collector to connect, open the connection page and tap the search icon. Choose your Wi-Fi network name and enter the password. The collector supports only 2.4 GHz Wi-Fi; the router must be on.



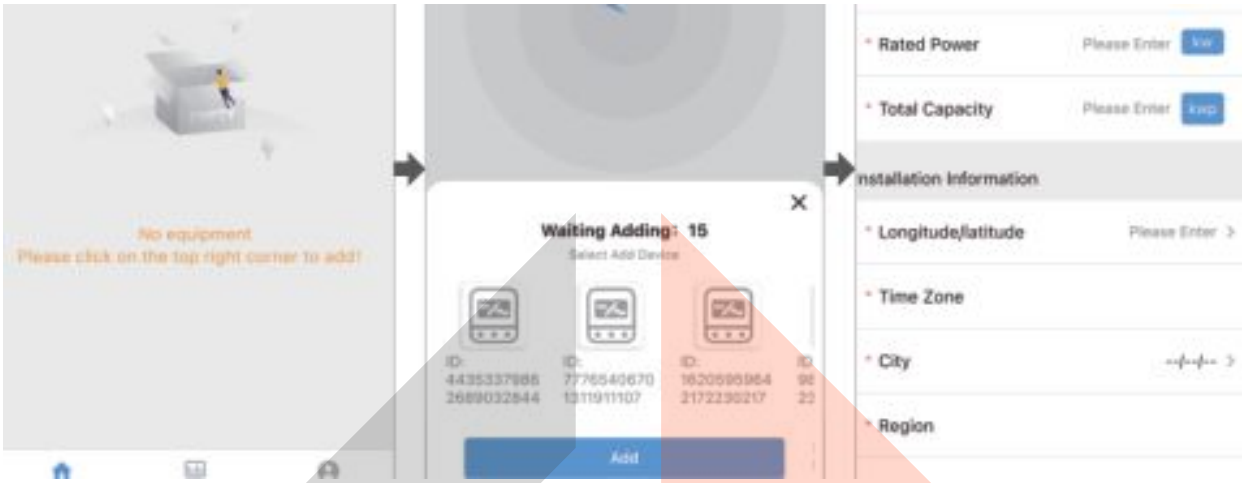


2.2 Adding a device

Method 1. On the app home page tap “+” in the top right corner to open the add device page; hold the phone near the device and the app will find it

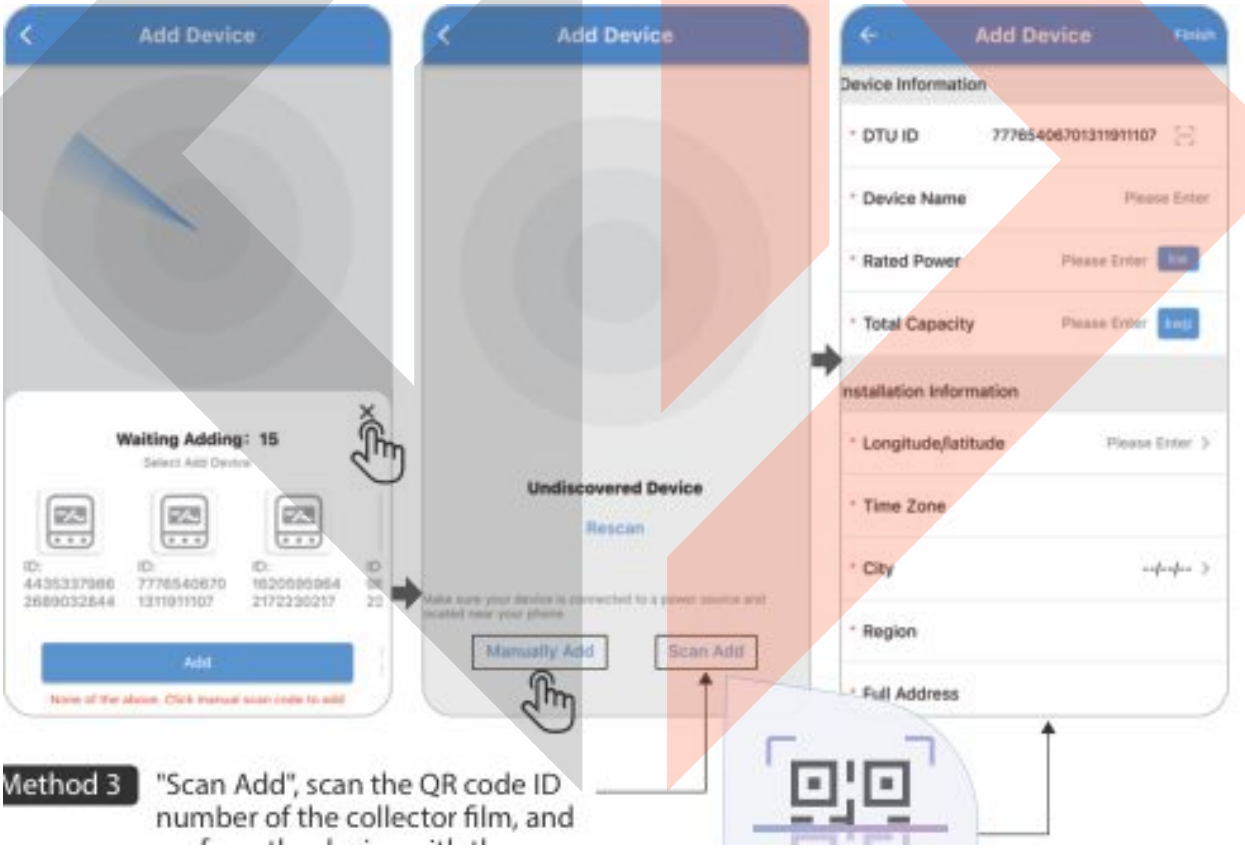
automatically. After the scan, choose the ID that matches the ID on the collector label and tap “Add”.

Note: check the collector ID before scanning. If the ID cannot be found on the case, see it on the connection page.



Method 2. “Manually Add”: enter the collector ID, name and other details as prompted on screen.

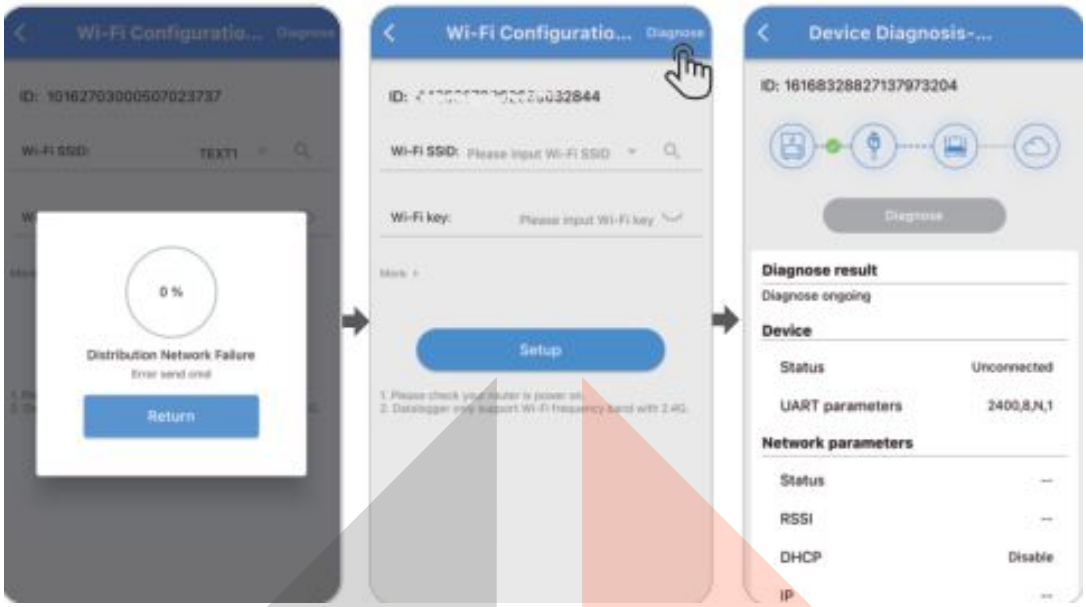
Method 3. “Scan Add”: scan the ID QR code on the collector film and add the matching collector.



3. Collector diagnostics and LED meanings

3.1 Diagnostics

After the network connection succeeds or fails, you can run diagnostics by tapping “Diagnose” in the top right corner.



3.2 Collector LEDs

Indicator	State
PWR (power)	Lit: power supply normal; off: power supply problem.
COM (serial port data exchange)	Off — no data exchange; off 0.3 s and on 0.9 s — sending data; off 0.3 s and on 0.3 s — receiving data; on — two-way exchange.
NET (network)	Off 0.3 s and on 3 s — collector connected to the router (STA mode); off 0.3 s and on 0.3 s — collector not connected to the router.
SRV (server)	On — connected to the server; off — no server connection.

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