

Energy Storage Inverter

User Manual

(ME 3000SP)



2016-12-15

V1.2

Contents

1. Equipment Introduction	3
2. Equipment Safety Notes	3
2.1 Safety Signs	3
2.2 Safety Notes.....	4
2.3 Battery Installation and Maintenance Notes.....	5
3. Installation	6
3.1 Product Overview	6
3.2 Packing List	6
3.3 Installation Environment	7
3.4 Installation Tools	7
3.4 Installation Position	8
3.5 Mount ME 3000SP	9
4. Electrical Connection	10
4.1 Battery Connection.....	11
4.2 CT / RS485 / NTC connection.....	11
4.3 Grid & Load Connection	14
5. Indicators and Keys.....	15
6. Operation.....	16
6.1 Double Check.....	17
6.2 First Time Setup	17
6.3 Commissioning	19
6.4 Main interface	20
7. Technical Data.....	32
8. Troubleshooting.....	33

1. Equipment Introduction

ME 3000SP is mainly applied and developed for the renewable energy generation system compatible with lead-acid batteries and lithium batteries. It can help to achieve the optimal usage of renewable energy. ME 3000SP can control the bi-directional flow of electric power, work under the auto / manual mode and time-of-use (TOU) price mode, automatically control the battery charge / discharge. ME 3000SP will store surplus renewable energy in the battery & discharge the battery to supply power to local load when renewable energy is not enough. ME 3000SP is equipped with an LCD display panel and 4 buttons, high-quality Human Machine Interface and more importantly ME 3000SP is stable, safe, and reliable.

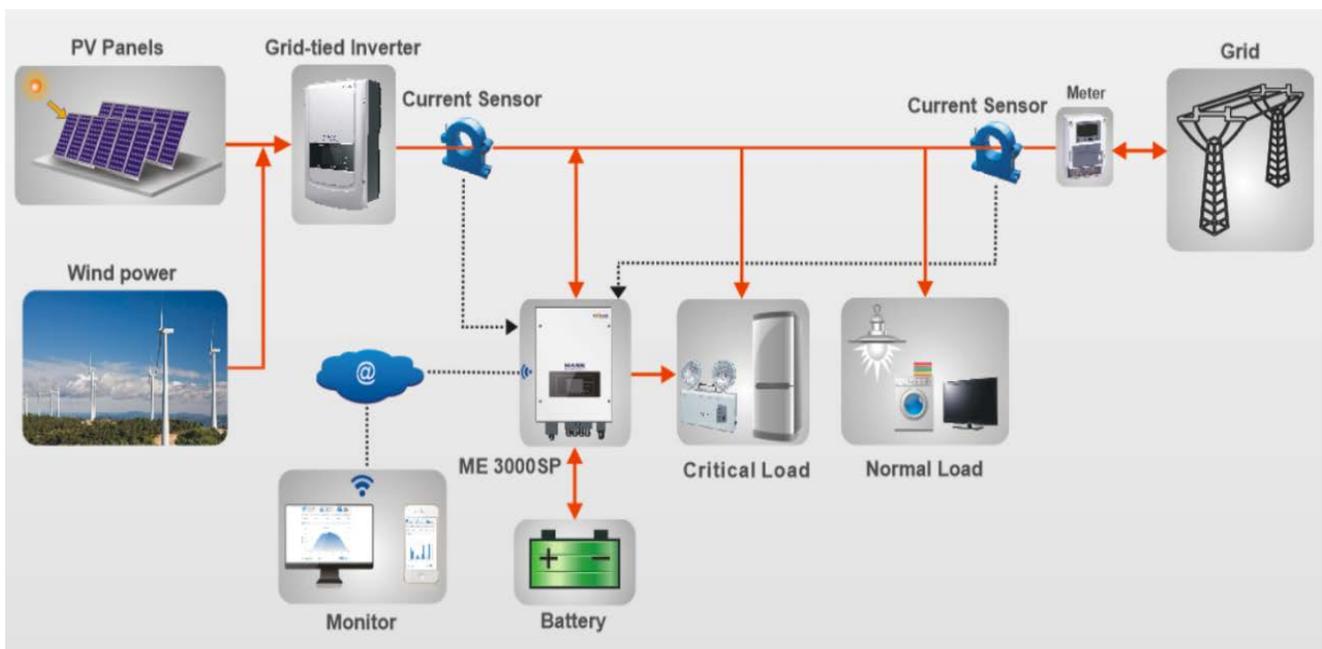


Fig. 1 ME 3000SP Storage System Solution

2. Equipment Safety Notes

Before the inverter is used, please read all instructions, warning signs and this manual. The inverter strictly meets safety rules of design and testing. During the installation, operation and maintenance, operators should abide by safety regulations. Improper operation may cause an electric shock or damage the equipment and properties.

2.1 Safety Signs

 Danger	<p>Danger indicates a hazardous situation which, if not avoided, will result in death or serious injury.</p>
 Warning	<p>Warning indicates a hazardous situation which, if not avoided, could result in death or serious injury.</p>
 Caution	<p>Caution indicates a hazardous situation, if not avoided, could result in minor or moderate injury.</p>
 Attention	<p>Attention indicates there are potential risks. If fail to prevent, may lead to equipment cannot run normally or property damage.</p>
 Note	<p>Note provides tips that are valuable for the optimal operation of the product.</p>

2.2 Safety Notes

- ✧ Electrical installation and maintenance must be carried out by competent electricians according to national connection rules.
- ✧ ME 3000SP must only be installed by qualified technical personnel, and only those who have appropriate accreditation, as required by the local authority having jurisdiction.
- ✧ The battery chamber should keep a certain distance with the ME 3000SP and protected well to prevent from the collision.
- ✧ It is forbidden to place explosives and combustibles, e.g. gasoline, kerosene, oil, slab, cotton and rag, around the ME 3000SP.
- ✧ An electric shock must be avoided and the battery input and AC output of the inverter shall be stopped for at least 5min. before its installation or maintenance.
- ✧ The temperature of some parts of the inverter may exceed 60°C. The inverter must be powered off, and allowed to cool before working on in order to avoid scalding during the maintenance.
- ✧ Children should not go near the inverter.
- ✧ Please do not open the outer cover of the inverter without permission, except for the wire connections. If someone touches or changes its components without permission, he might be injured and even damage the inverter.
- ✧ Static power may damage electronic elements. An appropriate method should be adopted for preventing from such damage; otherwise, the inverter might be damage and the warranty will be invalid.
- ✧ If the Equipment is damaged because it is not operated according to the operation method of the specified manufacturer, the warranty will be invalid.

- ✧ To completely isolate the inverter: firstly shut down the DC switch and then disconnect the battery and the AC terminal.
- ✧ The ME 3000SP shall be isolated completely before being maintained. The inverter must not be maintained in other modes!
- ✧ It is forbidden to disconnect the battery terminal and AC terminal when the ME 3000SP is running normally.

2.3 Battery Installation and Maintenance Notes

- ✧ The battery has been charged before being delivered and shall be prevented from short circuit in the transportation and installation process.
- ✧ The battery shall be placed in a well-ventilated space. Do not install the battery in airtight or badly ventilated spaces or equipment. Otherwise, the equipment might crack.
- ✧ Do not place the battery in high-temperature situations, direct sunshine or in front of a furnace or fire. Otherwise, the battery might leak and fire or crack.
- ✧ The connection cable shall not be extended from the provided cables to avoid too much voltage drop.
- ✧ Before switching on the batteries, check the connection are correct according to the manual, check the total voltage and anode and cathode of the battery system to ensure the correct installation.
- ✧ If you want to store the batteries without using them, they should be disconnected from the Charger, and kept in a cool, dry and ventilated environment.

Please be noted that it is not necessary to provide the reservation information with the following exact measures:

- Battery maintenance operators shall have the know-how and technical skill for the maintenance of the battery;
- When the battery is changed, the battery bank of the same model , firmware and quantity shall be changed;
- Warning: Do not dispose of scrap batteries with fire. Otherwise, the batteries might explode.
- Warning: Do not dismantle or damage the battery. Its electrolyte might be toxic and damage your skin and eyes.
- Warning: The battery may cause an electric shock or short circuit. Please take the following measures for the battery work:
 - a) Take off your watch, ring or other metal objects.
 - b) Only use tools with insulated handles.
 - c) Wear rubber gloves and shoes.
 - d) Do not put tools and metals above the battery.
 - e) Switch off the charge power supply before the battery terminal is disconnected.
 - f) Check if the battery is connected to the ground. If so unconsciously, disconnect the battery from the ground. Any part that touches the ground battery may suffer an electric shock. Disconnect the battery from the ground during installation and maintenance, so as to reduce the possibility of such a shock (applicable to the equipment and remote power supply without power circuits connected to the ground).

3. Installation

3.1 Product Overview

The inverter is fully checked strictly and checked before being packed and delivered. It is forbidden to put it upside down position during delivery.

Please check the product package and internal components carefully before installation, e.g. housing, display and DC connection terminals.

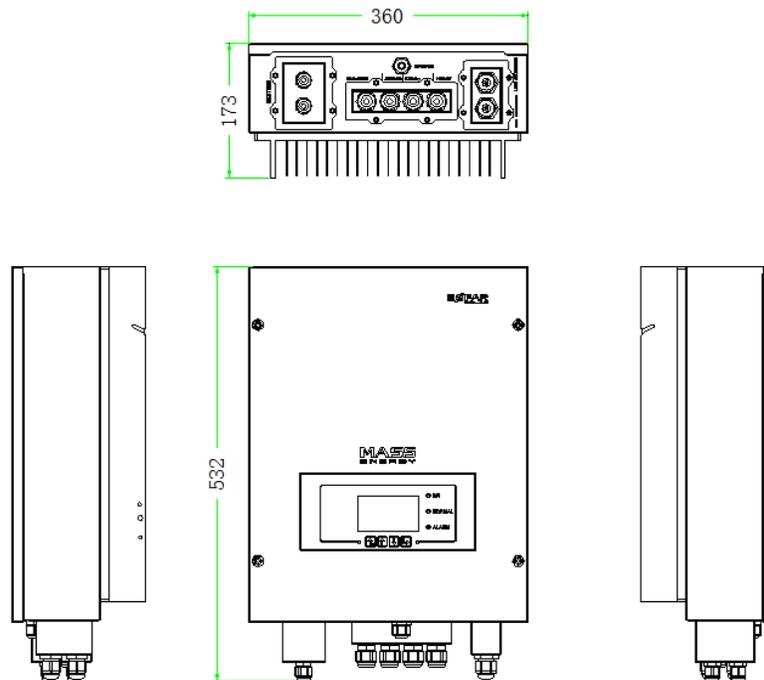
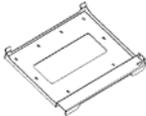


Fig. 2 ME 3000SP Overview

3.2 Packing List

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:

 Mounting Bracket×1	 AC terminal×6	 M5 screw×2	 Battery terminal×2
---	--	--	---

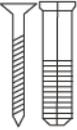
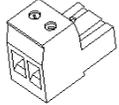
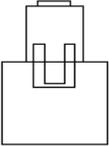
 M6 flat washer×8	 Expansion Bolts×8	 Terminal cap×4	 CT terminal×2
 Current Transformer× 2	 User Manual×1	 Warranty card×1	 Quality Certificate×1

Fig. 3 Accessories of ME 3000SP

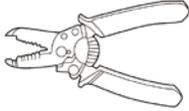
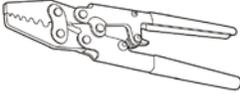
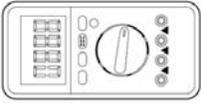
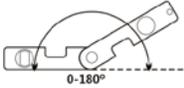
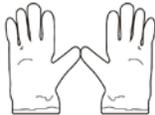
3.3 Installation Environment

- Clean and tidy indoors, convenient for installation and in a dry position
- Ambient temperature scope:-25C°~60C°
- Relative humidity:0~100%(non-condensed)
- The ME 3000SP shall be installed in the place with an independent air inlet and outlet channels.
- There are neither flammable nor explosive materials in the area.
- The ME 3000SP shall be connected to the power grid with an over-voltage of CATIII and CAT II.
- The maximum work altitude is 2000m.
- Please consult our engineers about detailed requirements for installation.

3.4 Installation Tools

The following tools shall be prepared before installation:

No.	Tool	Model	Function
1		Hammer drill Recommend drill dia.6mm	Used to drill holes on the wall
2		Screwdriver	wiring

3		Wire stripper	Strip wire
4		4mm Allen Key	Turn the screw to connect rear panel with inverter
5		Crimping tools	Used to crimp power cables
6		Multi-meter	Used to check grounding
7		Marker pen	Used to mark signs
8		Measuring tape	Used to measure distances
9		Level	Used to ensure that the rear panel is properly installed
10		ESD gloves	Operators wear
11		Safety goggles	Operators wear
12		Anti-dust respirator	Operators wear

3.5 Installation Position

ME 3000SP should be vertically mounted (to ensure fast heat dissipation), please choose a position without direct sunlight / snow accumulation to install ME 3000SP.

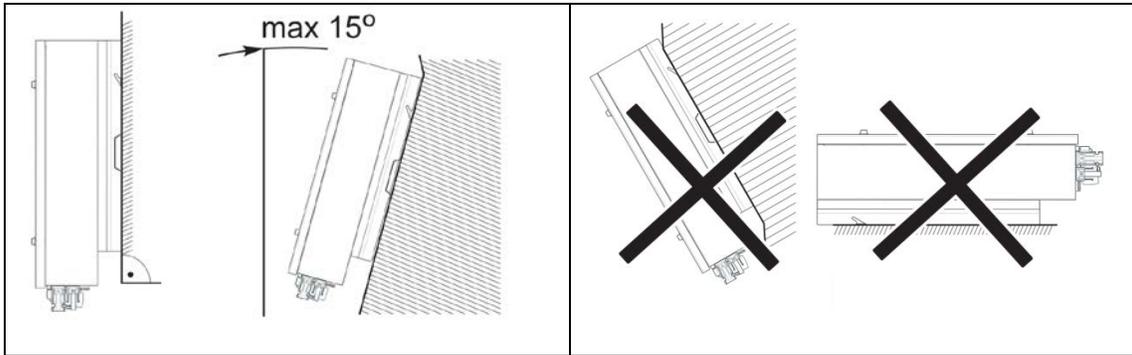


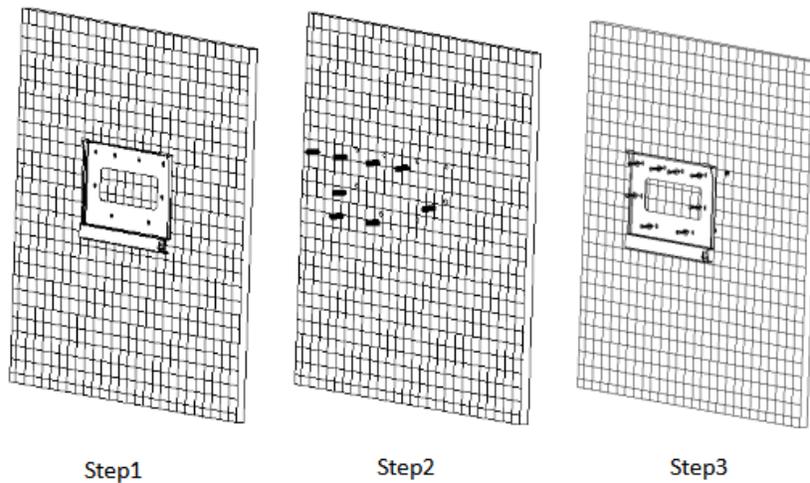
Fig. 4 Installation Position of ME 3000SP

3.6 Mount ME 3000SP

Step 1: Put the mounting bracket properly on the wall, mark these 8 drill holes using a marker pen. Drill 8 holes (drill bit 6mm) on the wall.

Step 2: Insert the expansion screw vertically into the hole, note the insertion depth. (not too shallow or too deep)

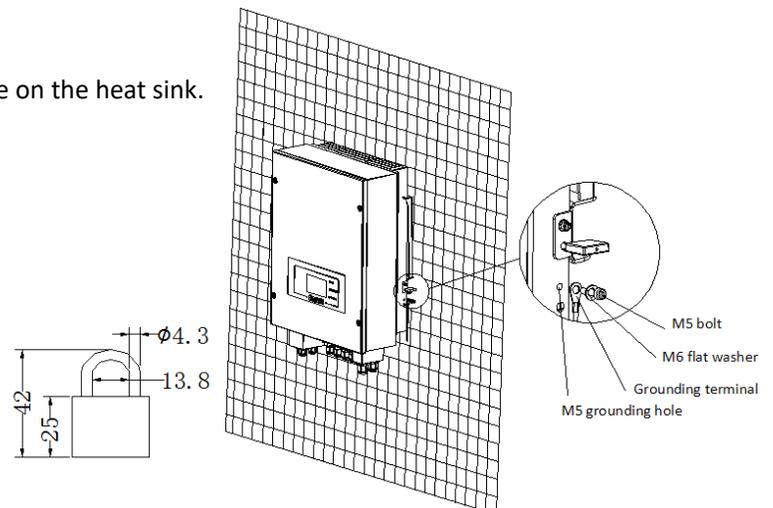
Step 3: Fix the mounting bracket on the wall using bolts & flat washers.



Step 4: Put ME 3000SP on the mounting bracket.

Step 5: Earth ME 3000SP using the grounding hole on the heat sink.

Step 6: OPTIONAL: you can lock ME 3000SP



4. Electrical Connection



Warning

- Be aware of electric shock and chemical hazards!
- Before connecting the battery, ensure the cable connectors have the correct polarity. Reversed polarity will damage the inverter!
- Before connecting to battery, please install a separate DC breaker (100A) between inverter and battery. This will ensure the inverter can be securely disconnected during maintenance.
- Before connecting to Grid, please install a separate AC breaker (25A) between inverter and grid.
- It is very important for system safety and efficient operation to use appropriate cable for electrical connection.
 - Battery connection: cable of AWG8 or AWG6.
 - Grid & Load connection: cable of AWG12.
- Make sure N wire is connected to PE wire when ME3000SP is working in EPS (Emergency Power Supply) mode.

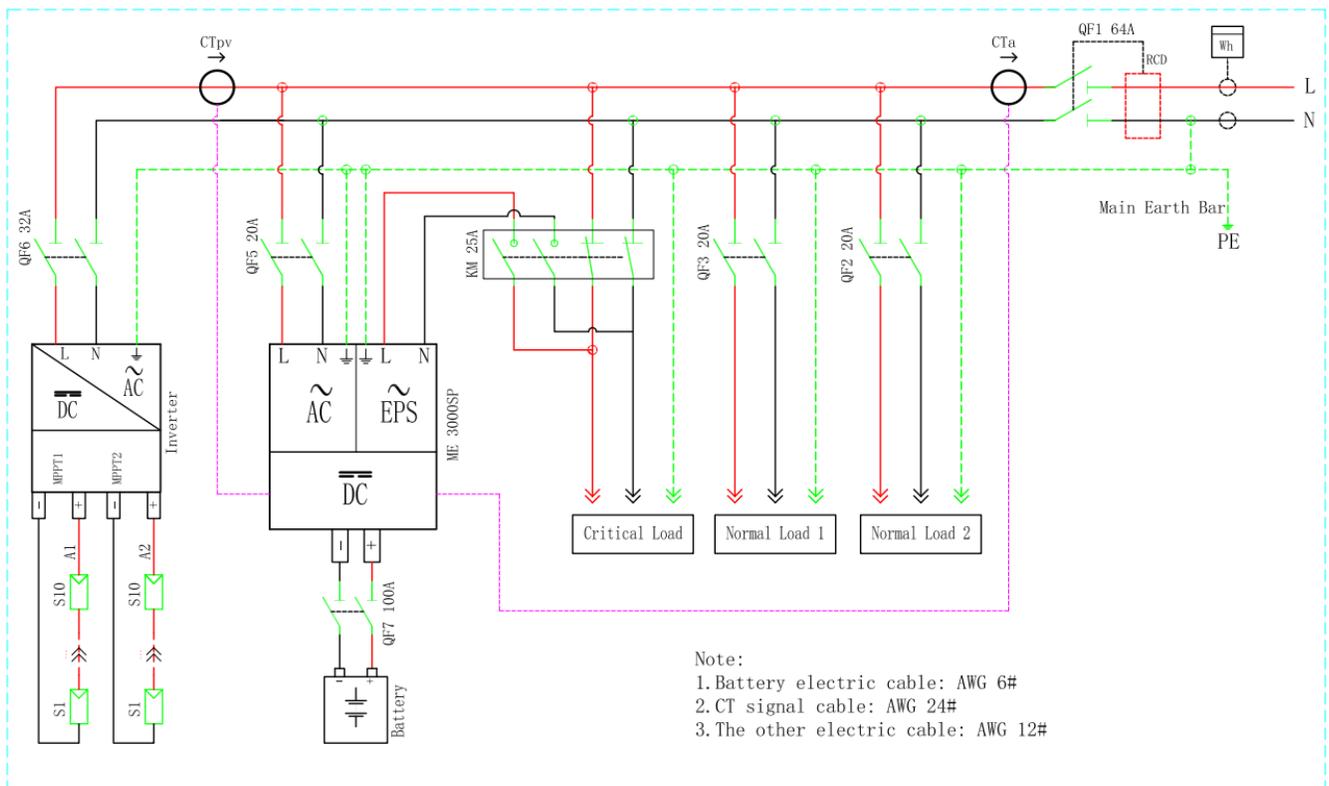


Fig. 5 Wiring Schematic of Single Phase System

4.1 Battery Connection

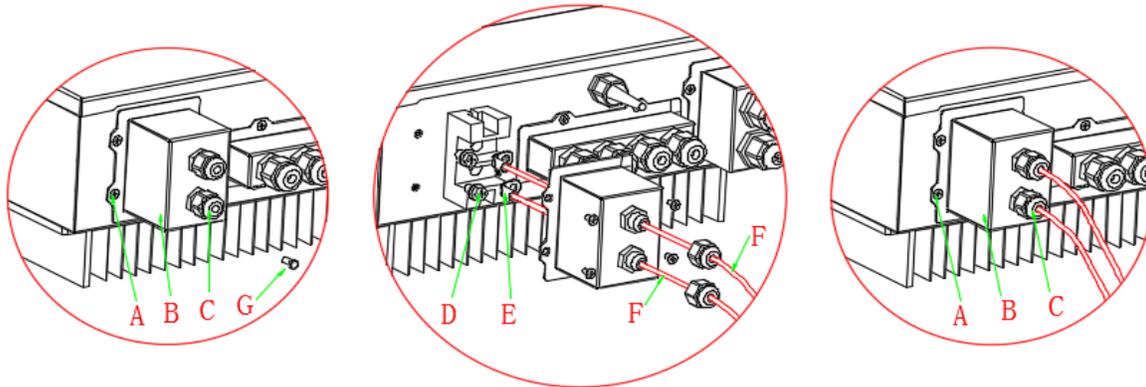


Fig. 6 Battery connection (Test battery wires polarity before connection)

Step 1: Loosen 4 screws (A) using a screwdriver (fig. 6);

Step 2: Remove the waterproof cover (B), loosen the cable gland (C), and then remove the stopper (G);

Step 3: Route the battery wires (F) through the cable gland, then connect battery wires using OT terminal (E);

Step 4: Fasten the waterproof cover using 4 screws.

4.2 CT / RS485 / NTC connection

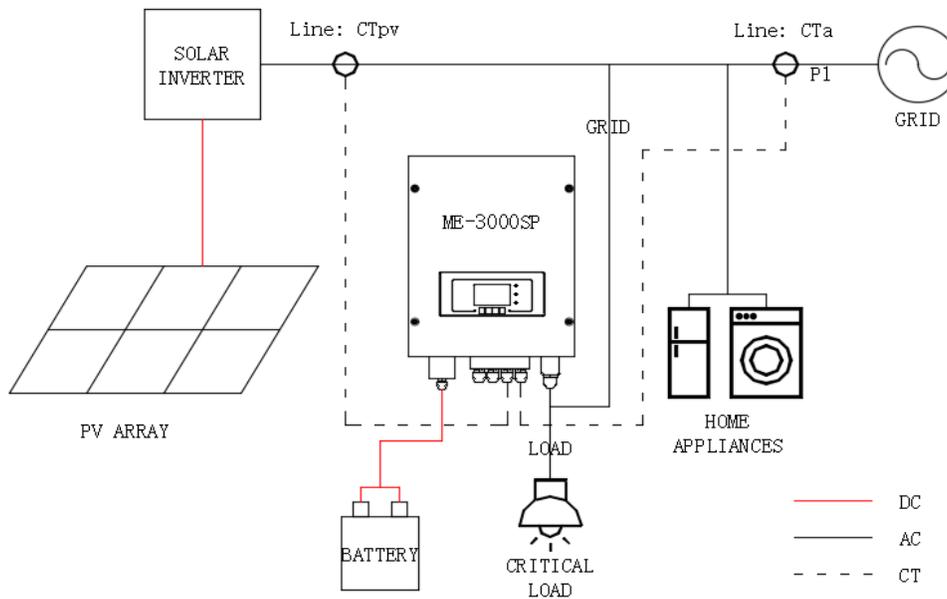


Fig. 7 Schematic Diagram (ME 3000SP: energy storage add-on to existing renewable system)

Step 1: Use network cable & terminal cap to extend the CT wire.

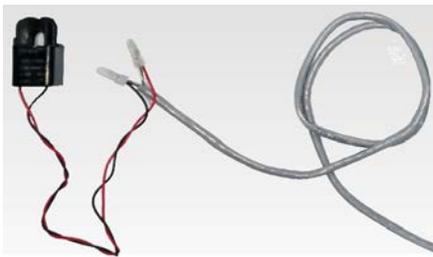


Fig. 8 CT wire extension / Direction of CTa

CT wire	Extension cable (network cable)	ME 3000SP
Red	Orange / white orange / brown / white brown	CT+
Black	Green / white green / blue / white blue	CT-

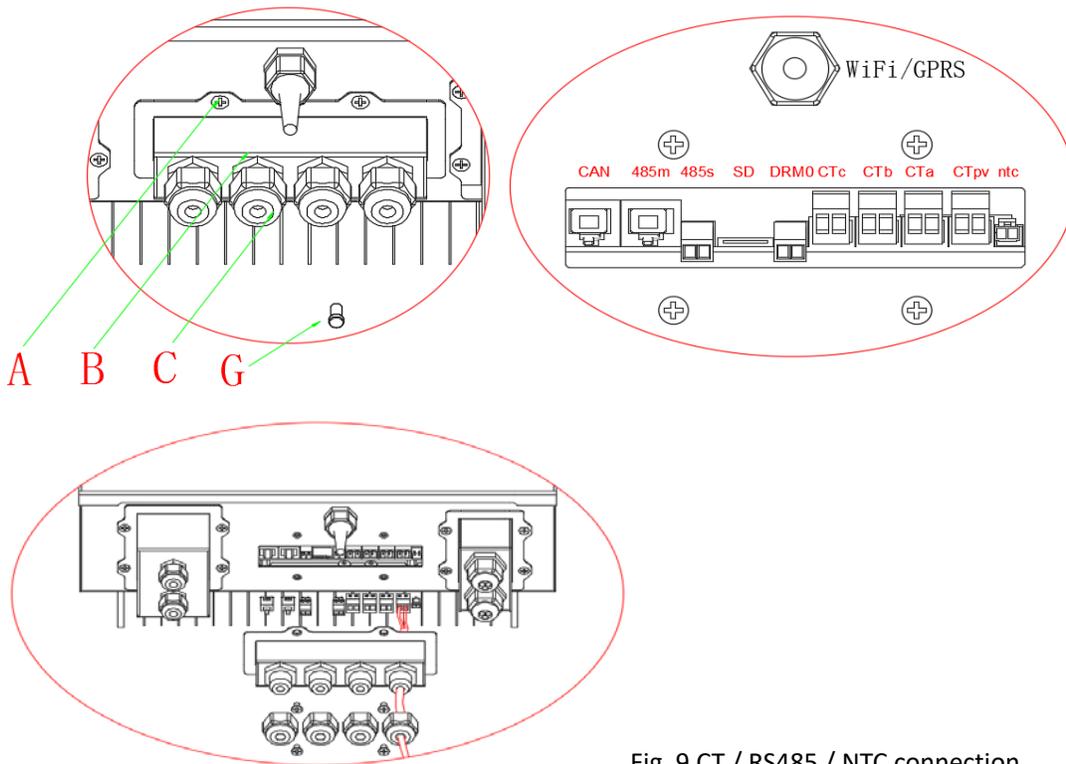


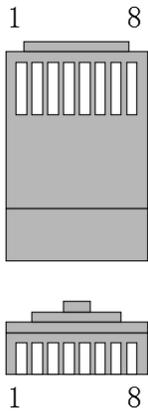
Fig. 9 CT / RS485 / NTC connection

Step 2: Loosen 4 screws (part A) using a screwdriver (fig. 6)

Step 3: Remove the waterproof cover (part B), loosen the cable gland (part C), then remove the stopper (part G)

Step 4: Route CT cable through the cable gland, connect CT cable to CT terminal, then insert CT terminal into corresponding ports. (Form 1)

Step 5: Route RS485 network cable through the cable gland, connect RS485 network cable to RJ45 connector and then insert the RJ45 connector into 485M port. (Fig. 9)



Pin	ME 3000SP 485M	PYLONTECH US2000B (BMS firmware should be B62 or newer)
1	NC	RS485B
2	NC	RS485A
3	NC	GND
4	RS485B	NC
5	RS485A	NC
6	NC	GND
7	NC	RS485A
8	NC	RS485B

F

O

Form 2 485M connection

Step 6: it's ONLY necessary to connect NTC for lead acid batteries:

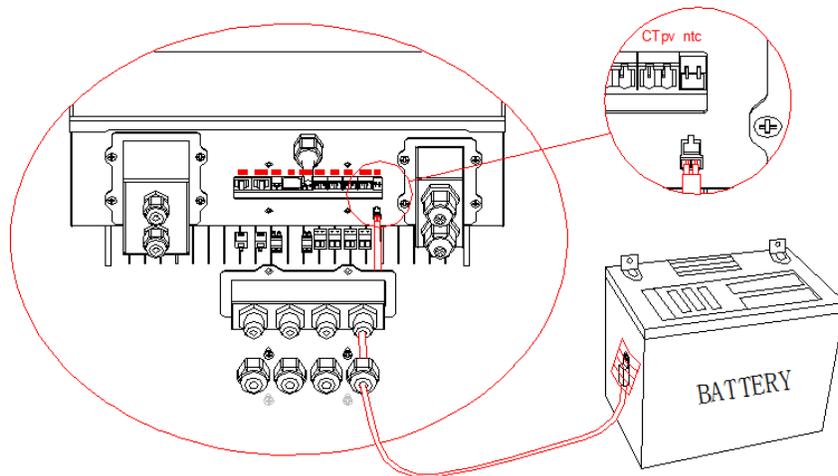


Fig. 10 NTC connection

Step 7: fasten the waterproof cover using 4 screws.

4.2 Grid Connection

For most of the customers, please ONLY connect the GRID port.

Please leave LOAD port unconnected. Unless you are installing the critical load as shown below (See 4.3).

Step 1: Loosen 4 screws (part A) using a screwdriver (fig. 11)

Step 2: Remove the waterproof cover (part B), loosen the cable gland (part C), then remove the stopper (part G)

Step 3: Route 3-core cable through GRID cable gland, then connect 3 wires to corresponding terminal blocks. (BROWN – L, BLUE – N, YELLOW/GREEN – PE)

Step 4: Fasten the waterproof cover using 4 screws.

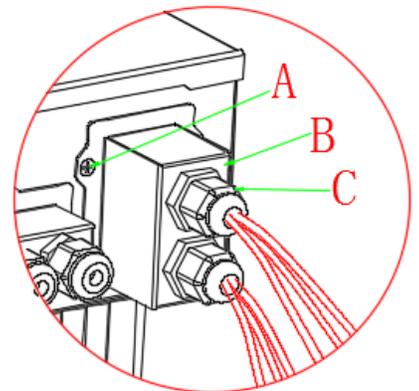
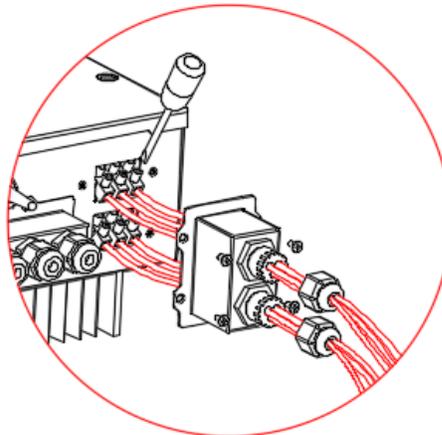
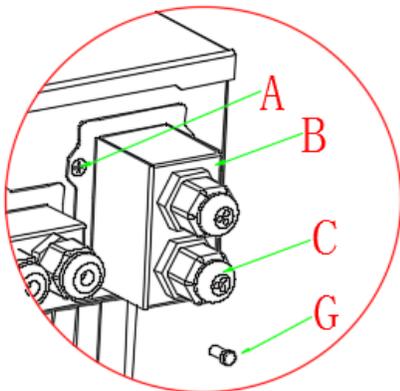
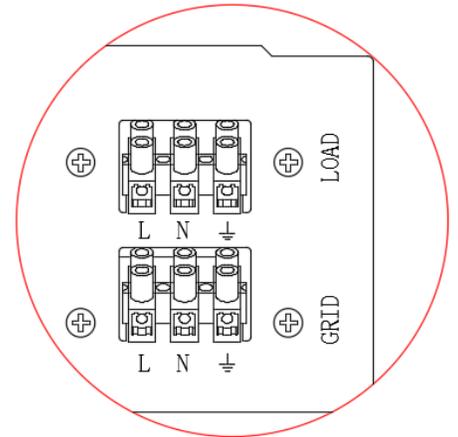


Fig. 11 Grid & Load connection

4.3 Load Connection

Critical load: in case of grid outage, ME 3000SP will work in EPS (Emergency Power Supply) mode, discharge the battery & supply power to critical load via LOAD port.

LOAD port is only for critical load connection. Please make sure you've purchased the AC contactor accessory from Shenzhen SOFARSOLAR Co., Ltd.

The connection to LOAD port is the same as grid connection (Fig. 11).

Before connecting the critical load, please make sure that you understand the following diagram (Fig. 12).

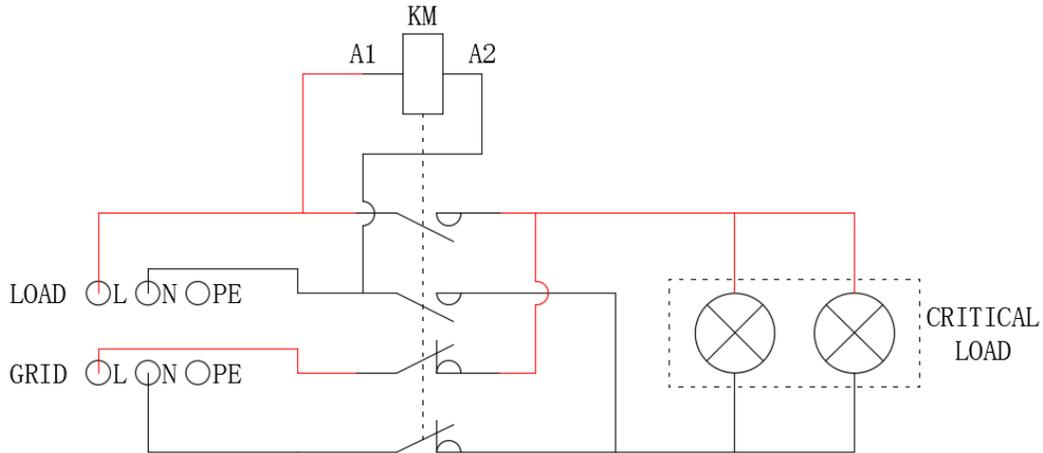
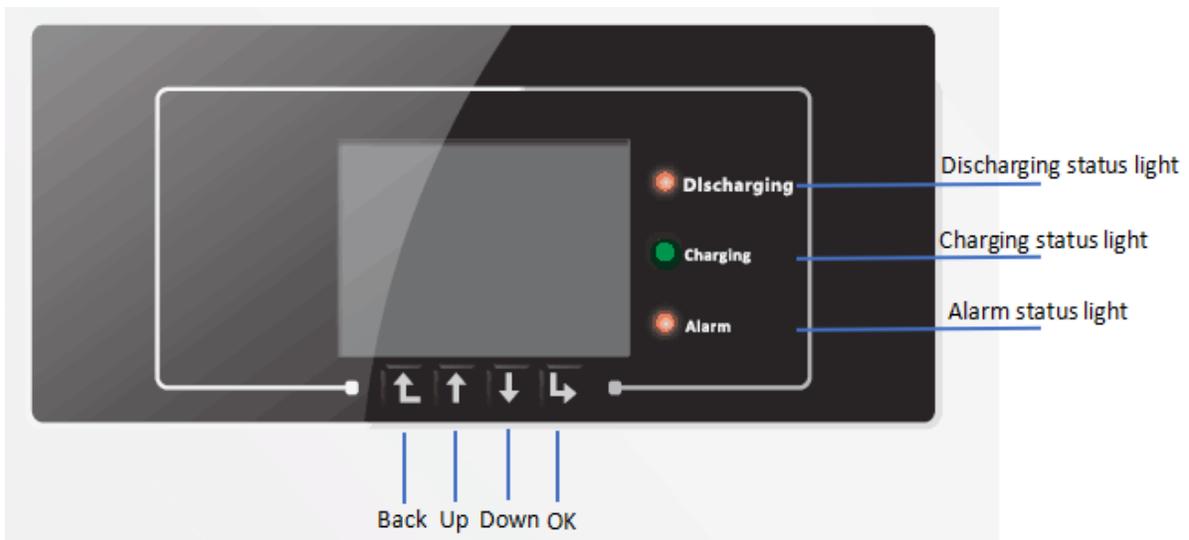


Fig. 12 Connection of critical load (AC contactor: 2 NC, 2 NO)

5. Indicators and Keys



Buttons:

- press “Back” to the previous screen or enter the main interface;
- press “Up” to the upper menu option or value plus 1;
- press “Down” to the lower menu option or value minus 1;
- Press “OK” to select the current menu option or switch to the next digit.

LED lights:

- Discharging status Light (Green)
 - Discharging light flashing: system check before discharging the battery

- Discharging light ON: discharging the battery
- Discharging light OFF: system is faulty (fault, or permanent)
- Charging status Light (Green)
 - Charging light flashing: system check before charging the battery
 - Charging light ON: charging the battery
 - Charging light OFF: system is faulty (fault, or permanent)
- Alarm light (Red)
 - Alarm light ON: system is fault (fault, or permanent)

6. Operation

6.1 Double Check

Please double check the following before operation.

1. ME 3000SP is firmly fastened to the mounting bracket on the wall;
2. The polarity of battery wires is correct, battery wires are firmly connected;
3. DC isolator is correctly connected between battery & ME 3000SP, DC isolator: OFF;
4. GRID / LOAD cables are firmly / correctly connected;
5. AC circuit breaker is correctly connected between ME3000SP GRID port & GRID, AC circuit breaker: OFF;
6. AC contactor is correctly connected (fig. 12);
7. For lithium battery, please ensure that the RS485 communication wire have been connected;
8. For the lead-acid battery, please ensure that the NTC wire has been connected.

6.2 First Time Setup

Firstly, turn on the DC isolator between battery & ME 3000SP, then turn on AC circuit breaker between ME 3000SP GRID port & GRID successively. As the ME 3000SP power-on, it needs to set following parameters before operating.

1)Set system time	8)Set min discharge voltage
2)Set country	9)Set max discharge current
3)Select battery type	10)Set min protect voltage
4)Set battery capacity	11)Set discharge depth
5)Set max charge voltage	12)Set empty discharge voltage

6)Set max charge current	13)Set full charge voltage
7)Set max protect voltage	

1)Set system time

The format of System time is “YYYY-MM-DD-HH-MM-SS”, press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit, press “Ok” to complete the time setting. When the system setting is complete, then it will enter “country” setting automatically.

2)Set country

Press “Up” or “Down” to select a country, press “Ok” to complete the country setting, then it will enter “battery type” setting automatically.

CODE	Country	CODE	Country
00	Germany4105	14	Germany_0126
01	CEI021_INT	15	Italy_CEI0_16
02	Australia	16	UK_G83
03	SpainRD1699	17	Greece island
04	Turkey	18	EU_EN50438
05	Denmark	19	EU_EN61727
06	Greece Continent	20	Korea
07	Netherland	21	Sweden
08	Belgium	22	Europe general
09	UK_G59	23	CEI021_EXT
10	China	24	Cyprus
11	France	25	India
12	Poland	26	Philippines
13	Germany_BDEW	27	New Zealand

3)Select battery type

Press “Up” or “Down” to select the correct battery type, then press “Ok” to complete the battery type setting, then it will enter “battery capacity” setting automatically.

MENU	Suitable Battery
1.DARFON	DARFON EAA01 2.7KWH DARFON EIA02 5KWH
2.PYLON	PYLONTECH US2000B (BMS firmware should be B62 or newer)
3.TELE	TELE LEAD CRYSTAL
4.DEFAULT	LEAD ACID / AQUION

Recommended settings for customers using PYLONTECH US2000B batteries:

Batteries parallel number	1 x US2000B	2 x US2000B	3 x US2000B	4 x US2000B
Battery type	PYLON	PYLON	PYLON	PYLON
Battery capacity	50Ah	100Ah	150Ah	200Ah
Depth of Discharge	80%	80%	80%	80%
Max Charge (A)	25A	50A	60A	60A
Over (V) Protection	54V	54V	54V	54V
Min Discharge (V)	47V	47V	47V	47V
Max Discharge (A)	25A	50A	60A	60A
Low (V) Protection	46V	46V	46V	46V
Max Charge (V)	53.8V	53.8V	53.8V	53.8V

4)Set battery capacity

Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting the battery capacity per your battery specification, press “Ok”, then it will enter “max charge voltage” setting automatically.

5)Set max charge voltage

Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting max charge voltage per your battery specification, press “Ok”, then it will enter “max charge current” setting automatically.

6)Set max Charge current

Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting the max charge current per your battery specification, press “Ok”, then it will enter “max protect voltage” setting automatically.

7)Set max protect voltage

Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting the max protect voltage per your battery specification, press “Ok”, then it will enter “min discharge voltage” setting automatically.

8)Set min discharge voltage

Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting the min discharge voltage per your battery specification, press “Ok”, then it will enter “max discharge current” setting automatically.

9)Set max discharge current

Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting the max discharge current per your battery specification, press “Ok”, then it will enter “min protect voltage” setting automatically.

10)Set min protect voltage



Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting the min protect voltage per your battery specification, press “Ok”, then it will enter “discharge depth” setting automatically.

11)Set discharge depth

Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting the discharge depth per your battery specification, press “Ok”, then it will enter “empty discharge voltage” setting automatically.

12)Set empty discharge voltage

Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting the empty discharge voltage per your battery specification, press “Ok”, then it will enter “full charge voltage” setting automatically.

13)Set full charge voltage

Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting the full charge voltage per your battery specification, press “Ok”, ME 3000SP will display “Success”. The ME 3000SP’s first time setup is complete and press “Back” to return to the main interface. If “Fail” is displayed, ME 3000SP should be reset again.

6.3 Commissioning

After the completion of the above settings, turn off the ME3000SP, then power on the ME3000SP per the following steps to complete sensor calibration on the grid and PV:

IMPORTANT: PLEASE FOLLOW THE FOLLOWING PROCEDURE:

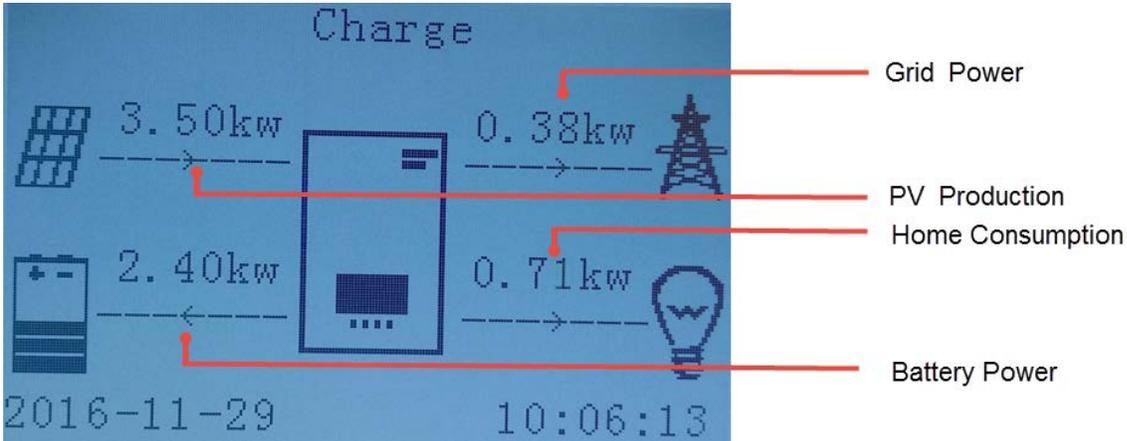
- 1) Turn OFF the solar inverter. Make sure there’s no power generation in ME 3000SP’s phase.
- 2) Turn ON DC isolator between battery & ME 3000SP.
- 3) Turn ON AC circuit breaker between ME 3000SP GRID port & GRID. ME 3000SP should start to operate now.
- 4) Turn ON some home appliances. Make sure power consumption in ME 3000SP’s phase is greater than 200W. You should be able to read the data on the screen.
- 5) Turn ON the solar inverter. (power generation > 100W)

If power generation > power consumption, the battery is not full. ME 3000SP will charge the battery.

If power generation < power consumption, the battery is not flat. ME 3000SP will discharge the battery.

Every time you change the CT connection, you need to repeat the procedure above.

The main interface:



6.4 Main Menu

At the standard interface, press the “back” button to enter the main menu. The main menu includes five options: parameter settings, event list, system information, software upgrade, and energy statistics.

Main Menu
1.Enter Setting
2.Event List
3.System Information
4.Software Update
5.Energy Statistics

6.4.1 Parameter setting:

1.Enter Setting	
1.Batt Parameter	7.Set Language
2.Clear Energy Data	8.Set Time
3.Clear Events	9.Set EPS Mode
4.Set Country	10. DRMS0 Control
5.Set Communication Add	11. Auto Test
6.Function to Set Country	12. Work Mode Set

1. Batt Parameter

1.Batt Parameter	
1.Battery Type	7.Max. Discharge (A)

2. Battery Capacity	8. Low (V) Protection
3. Discharge Depth	9. Max. Charge (V)
4. Max. Charge (A)	10. Discharge Time
5. Over (V) Protection	11. Empty Charged Voltage
6. Min. Discharge (V)	12. Full Charged Voltage

Press “back” button to enter main menu, select “1. Enter Setting”, Press “OK”. Select “1. Batt Parameter” and press “OK”, “input password” is shown, press “OK” again. Input the password (normal “0001”, advanced “0715”), press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit, when “0001 / 0715” is shown on the screen, press “OK” to enter “Batt Parameter” interface. If “Error! Try again” is shown on the screen, press “Back” and input the password again.

1) Battery Type (refer to page 17)

Select “1. Battery Type” and press “OK”. Press “up” or “down” to select the battery type. Press “OK”.

2) Battery Capacity

Select “2. Battery Capacity” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of battery capacity. Press “OK”.

3) Discharge Depth

Select “3. Discharge Depth” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of Depth of Discharge per battery specification. Press “OK”.

For example: if Depth of Discharge = 80%, ME 3000SP won’t discharge the battery when its SOC (State of Charge) is less than 20%.

4) Max. Charge (A)

Select “4. Max. Charge (A)” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of Max. Charge (A) per battery specification. Press “OK”.

5) Over (V) Protection

Select “5. Over (V) Protection” and press “OK. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of Over (V) Protection per battery specification. Press “OK”.

6) Min. Discharge (V)

Select “6. Min. Discharge (V)” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of Min. Discharge (V) per battery specification. Press “OK”.

7) Max. Discharge (A)

Select “7. Max. Discharge (A)” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of Max. Discharge (A) per battery specification. Press “OK”.

8) Low (V) Protection

Select “8. Low (V) Protection” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of Low (V) Protection per battery specification. Press “OK”.

9) Max. Charge (V)

Select “9. Max. Charge (V)” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to

next digit. Input the value of Max. Charge (V) per battery specification. Press “OK”.

10) Discharge Time

Select “10. Discharge Time” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of Discharge Time. Press “OK”.

11) Empty Charged Voltage (NOT for lithium batteries)

Select “11. Empty Charged Voltage” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of Empty Charged Voltage per battery specification. Press “OK”.

12) Full Charged Voltage (NOT for lithium batteries)

Select “12.Full Charged Voltage” and press “OK”. Press “up” or “down” to change the 1st digit, press “ok” to switch to next digit. Input the value of Full Charged Voltage per battery specification. Press “OK”.

2. Clear Energy Data

Select “2. Clear Energy” and press “OK”, “input password” is shown, press “OK” again. Input the password “0001”, press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit, when “0001” is shown on the screen, press “OK”. If “Error! Try again” is shown on the screen, press “Back” and input the password again.

3. Clear Events

Select “3. Clear Events”, press “OK” button twice to clear all the events.

4. Set Country (refer to page 17)

Select “4. Set Country”, press “OK”, “Input Country Code” is shown, press “OK”, if “Set Disable” is shown, you need to go to “6. Function to Set Country” to enable country setting, then return to “4. Set Country” to input the country code (refer to Page 17 of this manual). Press “OK”.

5. Set Communication Add

Select “5. Set Communication Add”, press “OK” button twice to enter Communication Address setting interface. Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit, after inputting the communication address, press “OK”.

6. Function to Set Country

Select “6. Function to Set Country”, press “OK”, “input password” is shown, press “OK” again. Input the password “0001”, press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit, when “0001” is shown on the screen, press “OK”. If “Error! Try again” is shown on the screen, press “Back” and input the password again.

7. Set Language

Select “7. Set Language”, press “OK”. Press “up” or “down” to select the language and press “OK”.

8. Set Time

Select “8.Set Time”, press “OK” to enter into time setting interface, the format of the time is YYYY-MM-DD HH:MM:SS. Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit, after inputting the current time, press “OK”.

9. Set EPS (Emergency Power Supply) Mode

MENU		
9. Set EPS Mode	1.EPS Mode Control	1.Enable EPS Mode
		2.Disable EPS Mode
	2.Set EPS Changeover Time	*** seconds

10. DRMs0 Control (This part is valid for Australian Market ONLY)

Select "10. DRMs0 Control" , press "OK", "input password" is shown, press "OK" again. Input the password "0001", press "Up" or "Down" to change the 1st digit, press "OK" to switch to next digit, when "0001" is shown on the screen, press "OK". After entering DRMs0 control interface, press "up" or "down" to select "1. Enable DRMs0" or "2. Disable DRMs0", press "OK".

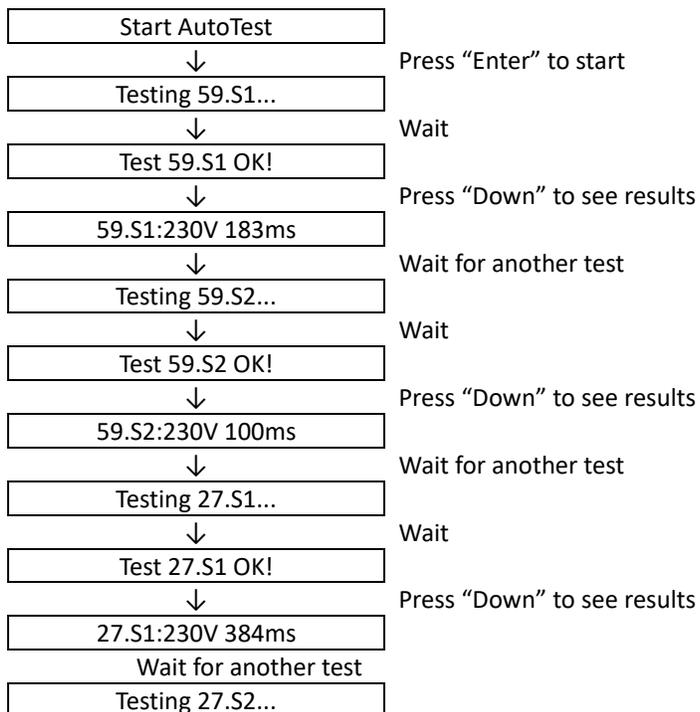
11. Auto Test (This part is valid for Italian Market ONLY)

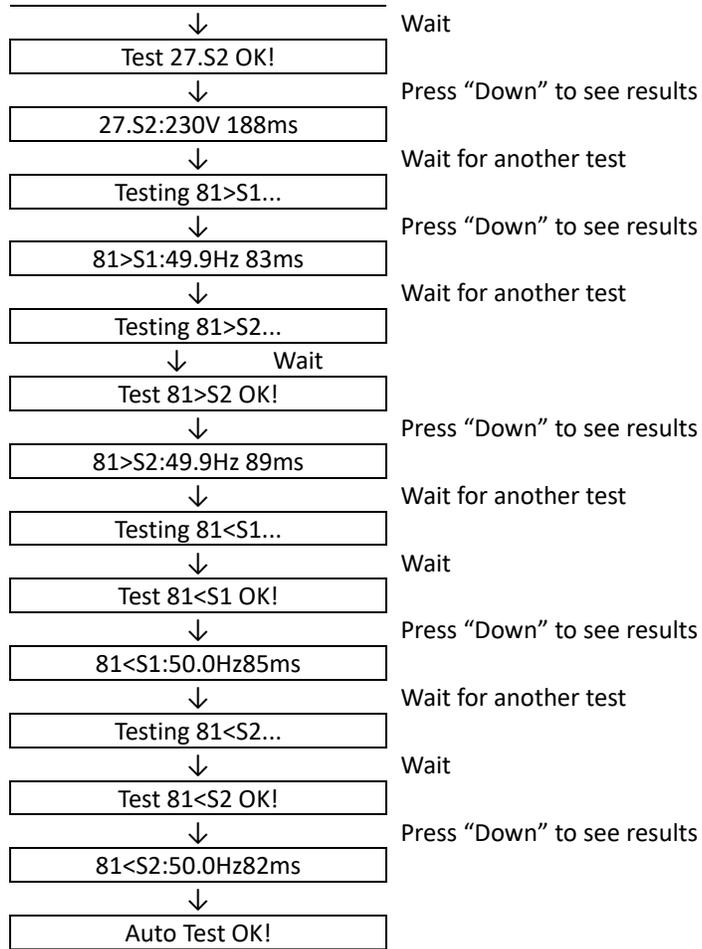
Select "11.Auto Test", press "OK" to enter autotest interface.

11.Auto Test		
	1.Autotest Fast	4.Setting QV time
	2.Autotest STD	5.Control 81.S1
	3.Setting Pf time	

1) Autotest Fast

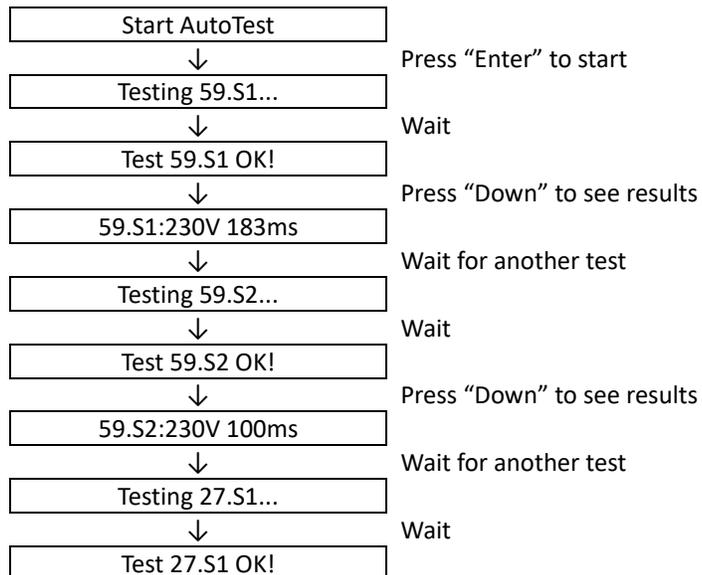
After entering Auto Test interface, press "up" or "down" to select "1.Autotest Fast", then press "OK" to start Auto test Fast.

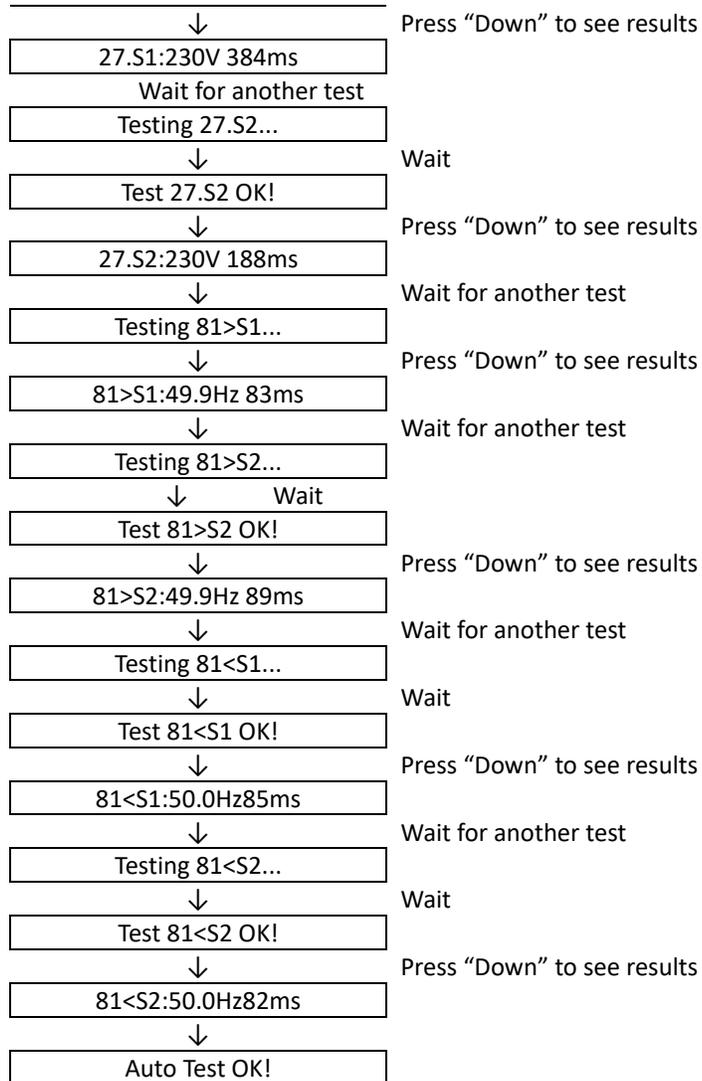




2) Autotest STD

After entering Auto Test interface, press "up" or "down" to select "2.Autotest STD", then press "OK" to start Auto test STD.





3) Setting Pf time

After entering Auto Test interface, press "up" or "down" to select "3.Setting Pf time", then press "OK" to enter Setting Pf time interface.

After entering Setting Pf time interface, it will display as below:



*. *** is the time value need to be set. Press "Up" or "Down" to change the 1st digit, press "OK" to switch to next digit. After inputting numbers for all digits, press "OK".

4) Setting QV time

After entering Auto Test interface, press "up" or "down" to select "4.Setting QV time", then press "OK" to enter Setting QV time interface.

After entering Setting QV time interface, it will display as below:

Set : ** s

** is the time value needing to be set. Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit. After inputting numbers for all digits, press “OK”.

5) Control 81.S1

After entering Auto Test interface, press “up” or “down” to select “5.Control 81.S1”. After entering control 81.S1 interface, press “up” or “down” to select “1. Enable 81.S1” or “2. Disable 81.S1”, press “OK”.

12. Work Mode Set

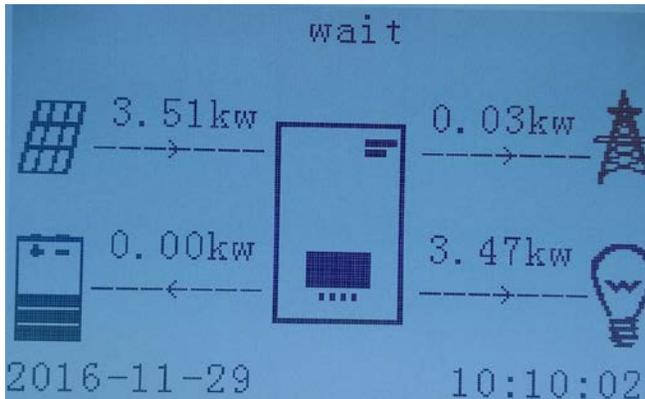
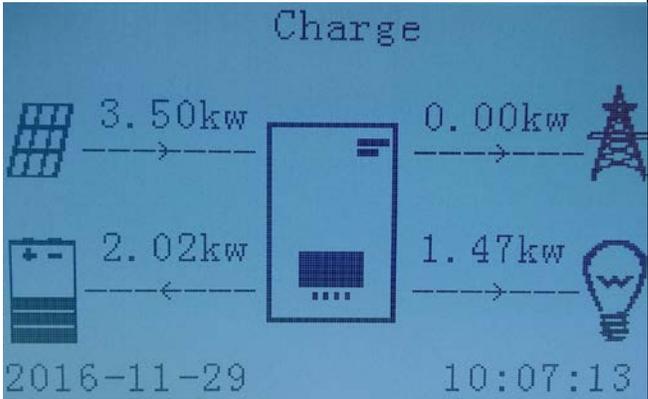
Select “12. Work Mode Set”, press “OK” to enter work mode setting interface.

12.Work Mode Set	
	1.Set Auto Mode
	2.Set Time-of-use Mode
	3.Set Timing Mode

1) Set Auto Mode

Select “1. Set Auto Mode”, then press “OK”.

In auto mode, the device will automatically determine the charging time & discharging time, & ensure that the battery SOC (State of Charge) won't be too low.

<p>1) PV generation = LOAD consumption ($\Delta P < 100W$), ME 3000SP will stay in Standby state.</p> 	<p>2) PV generation > LOAD consumption, the surplus power will be stored in the battery firstly.</p> 
<p>3) When the battery is full(or already at Max Charge Power), excess power will be exported to the grid.</p>	<p>4) PV generation < LOAD consumption, discharge the battery to supply power to load firstly,</p>

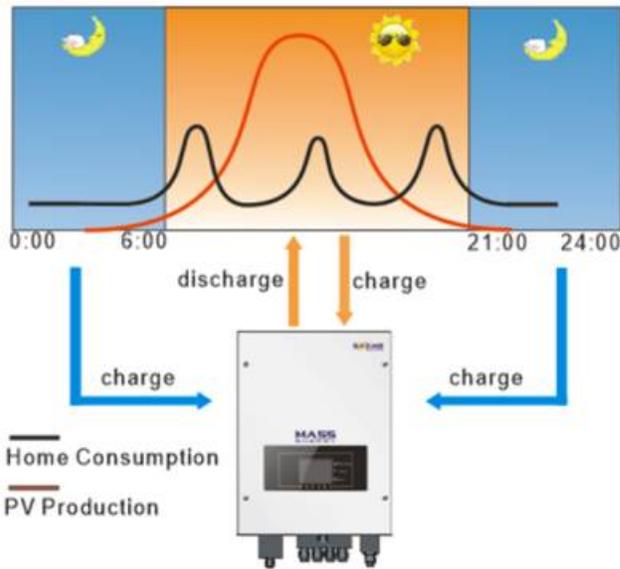
<p>5) If PV generation + Battery < LOAD consumption, ME 3000SP will import power from the grid.</p>	<p>6) Press "DOWN" button to view current information of the ME 3000SP in the main interface, as below.</p> <pre> Vgrid:..... 230.2V Igrid:..... 7.85A Frequency:..... 50.01Hz Bat Voltage:..... 48.2V Bat CurCHRG:..... 0.00A Bat CurDisC:..... 39.86A Bat Capacity: 52% Bat Cycles: 0000T Bat Temp: 25°C </pre>

2) Set Time-of-use Mode

Select "2.Set Time-of-use Mode", and then press "OK" to enter Set Time-of-use mode interface. End user can set a off-peak time period (evening charging time period) and target SOC (State Of Charge to terminate evening charging). The interface of Time-of-use Mode is shown as below. This mode is for customers who have TOU (Time-of-use) pricing electricity (cheaper rate in off peak time & more expensive rate in peak time) and owning a PV on-grid system.

For example:

- a) From 9:00PM to 6:00AM, the electricity is cheap, ME 3000SP will import power from grid & charge the battery to target SOC.
- b) From 6:00AM to 8:00AM, the electricity is expensive and the PV generation is quite low, ME3000SP will discharge the battery to supply the morning peak consumption;
- c) From 8:00AM to 7:00PM, PV generation > LOAD consumption, the surplus PV power will be stored in the battery;
- d) From 7:00PM to 9:00PM, the electricity is expensive & ME3000P will discharge battery to supply the night peak consumption;



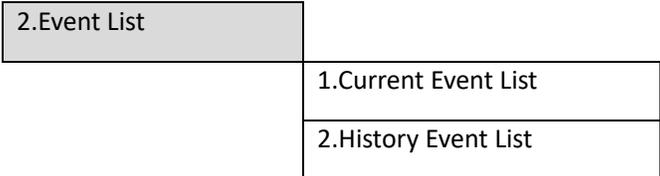
Charge Start:	21 h 00 m
Charge End:	06 h 00 m
Set Aimed SOC	080 %

3) Set Timing Mode

Select “3.Set Timing Mode”, and then press “OK” to enter Set Timing mode interface. End user can set a off-peak time period (evening charging time period) & a peak time period (daylight discharging time period) & corresponding powers. The interface of Set Timing Mode is shown as below. This mode is for customers who have TOU (Time-of-use) pricing electricity (cheaper rate in off peak time & more expensive rate in peak time).

Charge Start	22 h 00 m
Charge End	05 h 00 m
Charge Power	2000 W
DisCharge Start	14 h 00m
DisCharge End	16 h 00m
DisCharge Power	25000 W

6.4.2 Event List



Event list of ME 3000SP, including current event list and history event list.

1) Current Event List

Select “1. Current Event List”, press “OK” to check the current events.

2) History Event List

Select "2. History Event List", press "OK" to check the history events. Press "up" or "down" to check all history events if there're more than 1 pages of events.

6.4.3 System information interface

3.System Information	
1.Product SN	7.EPS Mode
2.Software Version	8.Batt Parameter
3.Hardware Version	9.Setting Pf time
4.RS485 Address	10.Setting QV time
5.Country	11. Defa. Pf time
6.Power Factor	12. Defa. QV time

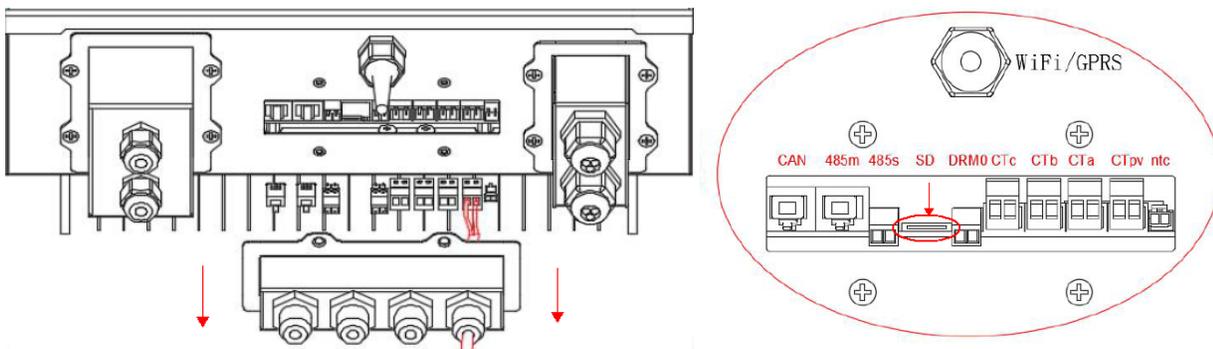
6.4.4 Software upgrading

Select "4. Software Update" in the main menu, press "OK", "input password" is shown, press "OK" again. Input the password ("0715"), press "Up" or "Down" to change the 1st digit, press "OK" to switch to next digit, when "0715" is shown on the screen, press "OK". ME 3000SP will start to upgrade the software automatically.

It's easy to upgrade the software of ME 3000SP, new software includes new features & improvements for reliability.

Upgrading Procedure:

Step 1 Turn off the DC isolator (battery) and AC circuit breaker (grid), then remove the communication waterproof cover (as shown in the following picture). If the communication cables (RS485, NTC, CT) have been connected, please loosen their cable glands before removing the waterproof cover.



Step 2 Press the SD card inwards into the SD slot and it will release back out of the slot so that you can pull it out. Insert the SD card into a micro-SD card reader, then insert micro-SD card reader into a PC; (NOTE: micro-SD card reader & PC are not provided by SOFARSOLAR).

Step 3 If there is a folder named "ES3000firmware" in the SD card, empty the folder.

If there isn't, create a new folder named "ES3000firmware" in the SD card. Copy these 3 files: "ARM.hex", "DSPM.hex" and "DSPS.hex" into the "ES3000firmware" folder. (ask our technical support service@sofarsolar.com to send you the

latest version software)

Step 4 Insert the SD card into the SD card slot, there will be a faint clicking as the SD card returns into position.

Step 5 Then turn on DC isolator (battery) and AC circuit breaker (grid), press “Back” to enter main menu. Press “Down” to select “4. Software Update”, then press “Ok”.

Step 6 “input password” is shown, press “OK” again. Input the password (“0715”), press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit, when “0715” is shown on the screen, press “Ok” to start software update.

Step 7 After the update is complete, turn OFF AC circuit breaker (grid) & DC isolator (battery), lock the communication waterproof cover with four screws, then turn ON DC isolator, wait for 5 seconds, turn ON AC circuit breaker again, ME 3000SP will start to operate automatically.

NOTE: If “DSP communicate fail”, “Update DSP1 Fail” or “Update DSP2 Fail” is shown on the screen, which means the software upgrade is unsuccessful, please turn OFF AC circuit breaker (grid) & DC isolator (battery), wait for 1 minute, then start from “Step 5”

6.3.5 Energy Statistics :

5. Energy Statistics		
	Today	
Renewable	100.00KWh	
Self-Use	80.00KWh	80%
Export	20.00KWh	20%
For Load	100.00KWh	
Self-Use	80.00KWh	80%
Import	20.00KWh	20%

Select “5. Energy Statistics” in the main menu, press “OK” to enter Energy Statistics interface, it shows the energy generation and consumption within a certain range of time. Press “Up” or “Down” to check the daily / weekly / monthly / yearly / lifetime statistics.

7. Technical Data

Technical Data	ME 3000SP
-----------------------	------------------

BATTERY PARAMETERS	
Battery Type	Lead-acid,Lithium-ion
Nominal battery voltage	48V
Battery voltage range	42-58V
Recommended battery capacity	200Ah (100~500Ah optional)
Recommended Storage capacity	9.6kWh
Max.Charging Current	60A
Charging Current Range	0-60A(Programmable)
Charging curve	3-stage adaptive with maintenance
Max.Discharging Current	60A
Electronic protection	OCP OTP OVP
Short circuit protection	Fuse (100A)
Discharge times (Hour)	Po=1kVA 9.6h
	Po=3kVA 3.2h
Depth of discharge	Lithium : 0~80%DOD adjustable
	Lead-acid:0~50%DOD adjustable

AC PARAMETERS	
Max.Output Power	3kVA
Rated Input/Output Voltage	230V
Max.Input/Output Current	13A
AC Input/Voltage Range	180V-270V
Grid Frequency Range	44~55Hz / 54~66Hz
THD	<3%
Power Factor	1(Adjustable +/-0.8)
Connection phase	single
Current(inrush)	0.8A/1us
Maximum output fault current	100A/1us
Maximum output overcurrent protection	13A

SYSTEM PARAMETERS	
Max.Charging Efficiency	94.1%
Max.Discharging Efficiency	94.3%
Stanby Losses	<5W
Topology	High Frequency Isolated Transformer
Degree Of Protection	IP65
Safety Protection	Anti islanding, RCMU, Ground Fault Monitoring
Certification	AS4777,VDE0126-1-1,G83/2,C10/11,RD1699,UTEC15-712-1,EN50438,VDE-AR-N4105
Communication	WiFi,RS485,CAN2.0

ENVIRONMENTAL	
Ambient temperature range	-25°C...+60°C (Above 45°Derating)
Allowable Relative Humidity Range	0... 100%, No Condensing
Protective Class	Class I
Max.Operating Altitude	2000m
Current Senor Connection	external

GENERAL DATA	
Noise	<25dB
Weight	16kg
Cooling	Natural
Dimension(W*H*D)	532*360*173mm
Display	LCD display
Warranty	5 Years (Optional: extension to 10 years)

Emergency Power Supply	
EPS rated power	3000VA
EPS rated voltage, Frequency	230V,50/60Hz
EPS rated current	13A
Total harmonic distortion	<3%
Switch time	<3s

8. Troubleshooting

Code	Name	description	solution
ID01	GridOVP	The power grid voltage is too high	<p>If the alarm occurs occasionally, the possible cause is that the electric grid is abnormal occasionally. ME3000SP automatically returns to normal operating status when the electric grid's back to normal.</p> <p>If the alarm occurs frequently, check whether the grid voltage/frequency is within the acceptable range. If no, contact technical support. If yes, check the AC circuit breaker and AC wiring of the ME3000SP.</p> <p>If the grid voltage/frequency is within the acceptable range and AC wiring is correct, while the alarm occurs repeatedly, contact technical support to change the grid over-voltage, under-voltage, over-frequency, under-frequency protection points after obtaining approval from the local electrical grid operator.</p>
ID02	GridUVP	The power grid voltage is too low	
ID03	GridOFP	The power grid frequency is too high	
ID04	GridUFP	The power grid frequency is too low	
ID05	BatOVP	The battery voltage is too high	<p>If the alarm occurs occasionally, the possible cause is during the process of charging.</p> <p>If the alarm occurs occasionally, check whether the overvoltage setting of the battery consistent with the parameter of battery manufacturer and contact technical support.</p>
ID09	HW_LLCBus_OVP	LLCBus voltage is too high and has triggered hardware protection	<p>ID09- ID26 are internal faults of ME3000SP, turn OFF the "DC & AC switch", wait for 5 minutes, then turn ON the "DC switch" and turn ON the "AC switch". Check whether the fault is rectified. If no, please contact technical support.</p>
ID10	HW_Boost_OVP	Boost voltage is too high and has triggered hardware protection	
ID11	HwBuckBoostOCP	BuckBoost current is too high and has triggered hardware protection	
ID12	HwBatOCP	The battery current is too high and has triggered hardware protection	
ID15	HwAcOCP	The grid current is too high and has triggered hardware protection	
ID17	HwADFaultIGrid	The grid current sampling error	
ID18	HwADFaultDCI	The DCI sampling error	
ID19	HwADFaultVGrid	The grid voltage sampling error	
ID21	MChip_Fault	The master chip fault	
ID22	HwAuxPowerFault	The auxiliary voltage error	

ID25	LLCBusOVP	LLCBus voltage is too high	<p>If the fault occurs frequently, please contact technical support.</p> <p>ID28-ID55 are internal faults of ME3000SP, turn OFF the "DC&AC switch", wait for 5 minutes, then turn ON the "DC switch" and turn ON the "AC switch". Check whether the fault is rectified. If no, please contact technical support.</p>	
ID26	SwBusOVP	Bus voltage is too high and has triggered software protection		
ID27	BatOCP	Battery current is too high		
ID28	DciOCP	The DCI is too high		
ID29	SwOCPIstant	The grid current is too high		
ID30	BuckOCP	Buck current is too high		
ID31	AcRmsOCP	The output current is too high		
ID49	ConsistentFault_VGrid	The grid voltage sampling value between the master DSP and slave DSP is not consistent		
ID50	ConsistentFault_FGrid	The grid frequency sampling value between the master DSP and slave DSP is not consistent		
ID51	ConsistentFault_DCI	The Dci sampling value between the master DSP and slave DSP is not consistent		
ID52	BatCommunicationFlag	Battery communication fault		
ID53	SpiCommLose	SPI communication is fault		
ID54	SciCommLose	SCI communication is fault		
ID55	RecoverRelayFail	The relays fault		
ID57	OverTempFault_BAT	The battery temp is too high		<p>ID57-ID59 Check whether the air condition around the equipment is good. Or set the "max discharging & charging current "a little lower to check whether the fault is rectified. If the fault occurs frequently, please contact SOFAR technical support.</p>
ID58	OverTempFault_HeatSink	The temperature of heat sink is too high		
ID59	OverTempFault_Env	The environment temp is too high		
ID65	unrecoverHwAcOCP	The grid current is too high and has cause unrecoverable hardware fault	<p>ID65-ID77 are internal faults of ME3000SP, turn OFF the "DC switch", wait for 5 minutes, then turn ON the "DC switch" and turn ON the "AC switch". Check whether the fault is rectified. If no, please contact SOFAR technical support.</p>	
ID66	unrecoverBusOVP	The bus voltage is too high and has cause unrecoverable fault		
ID67	BitEPSunrecoverBatOcp	Unrecoverable fault of battery overcurrent in EPS mode		
ID70	unrecoverOCPIstant	The grid current is too high, and has		

		cause unrecoverable fault	
ID75	unrecoverEEPROM_W	The EEPROM is unrecoverable	
ID76	unrecoverEEPROM_R	The EEPROM is unrecoverable	
ID77	unrecoverRelayFail	Relay has happen permanent fault	
ID81	Over temperature	Internal temperature is too high.	1. Please make sure ME 3000SP in installed in a place without direct sunlight. 2. Please make sure the inverter is vertically installed & the ambient temperature is less than the temperature upper limit of ME 3000SP
ID82	Over frequency	AC frequency is too high	
ID85	Battery voltage is low		ME 3000SP won't discharge the battery before charging the battery.
ID94	Software version is not consistent		Contact technical support to upgrade software.
ID95	CommEEPROMFault	The Communication board EEPROM is fault	ID95-ID96 are internal faults of ME3000SP, turn OFF the "DC&AC switch", wait for 5 minutes, then turn ON the "DC switch" and turn ON the "AC switch". Check whether the fault is rectified. If no, please contact technical support.
ID96	RTCFault	RTC clock chip is fault	
ID97	InValidCountry	Invalid Country	
ID98	SDfault	The SD card is fault	Please replace the SD card.
ID100	BatOCD	Battery over current discharging protect	ID100-ID103 is battery fault. If this fault occurs occasionally, wait few minutes to see whether the fault is rectified. If this fault occurs frequently, please contact technical support.
ID101	BatSCD	Discharging short circuit protect	
ID102	BatOV	Battery high voltage protect	
ID103	BatUV	Battery low voltage protect	
ID104	BatOTD	Battery discharging high temperature protect	Battery fault. Check whether the air condition around the equipment is good. Or set the "max discharging & charging current" a little lower to check whether the fault is rectified. If the fault occurs frequently, please contact technical support.
ID105	BatOTC	Battery charging high temperature protect	
ID106	BatUTD	Battery discharging Low temperature protect	Id106-id107 is battery fault. Increase the temperature of the battery. If the fault occurs frequently, please contact technical support.
ID107	BatUTC	Battery charging Low temperature protect	