

# Energy Storage Inverter

## User Manual

(for ME-3000SP)



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## 1. Energy Storage Inverter (ME-3000SP) Delivery

Please check the packaging and accessories before installation.

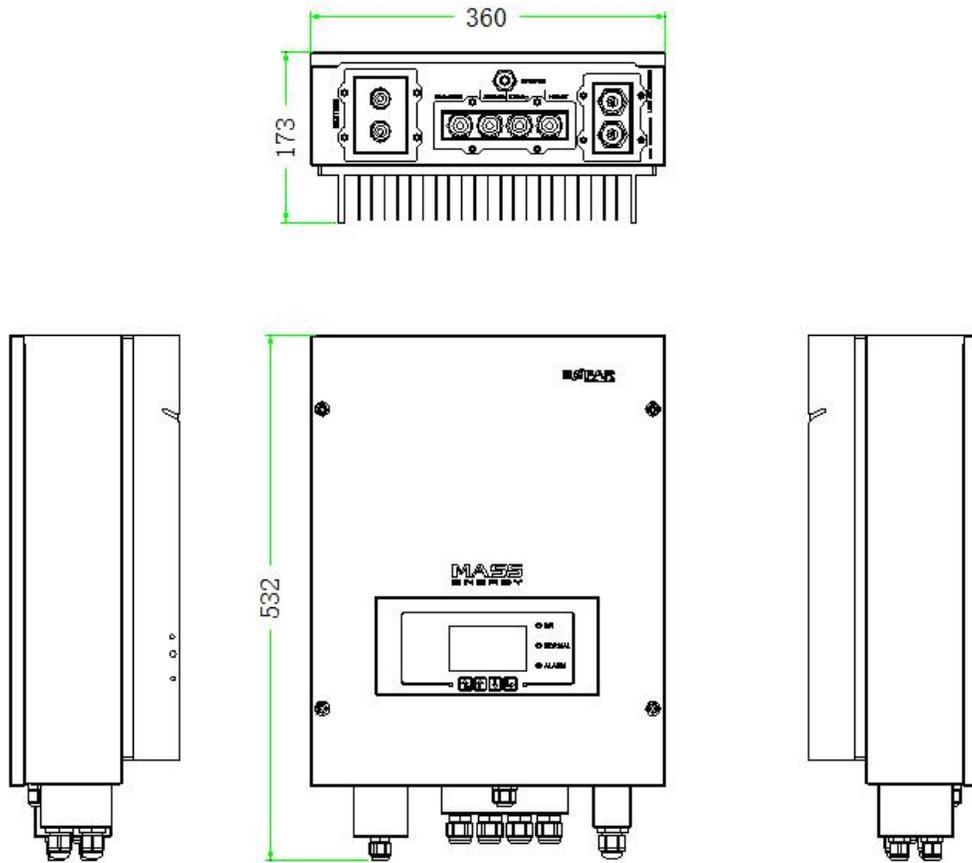
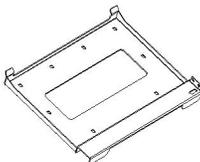
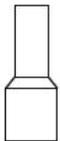
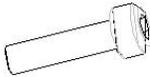


Fig. 1 Energy Storage Inverter ME-3000SP

 Mounting Bracket×1	 AC terminal×6	 M5 screw×2	 Battery terminal×2
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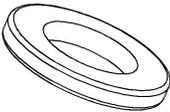
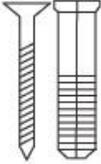
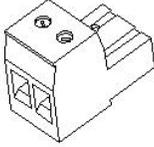
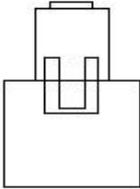
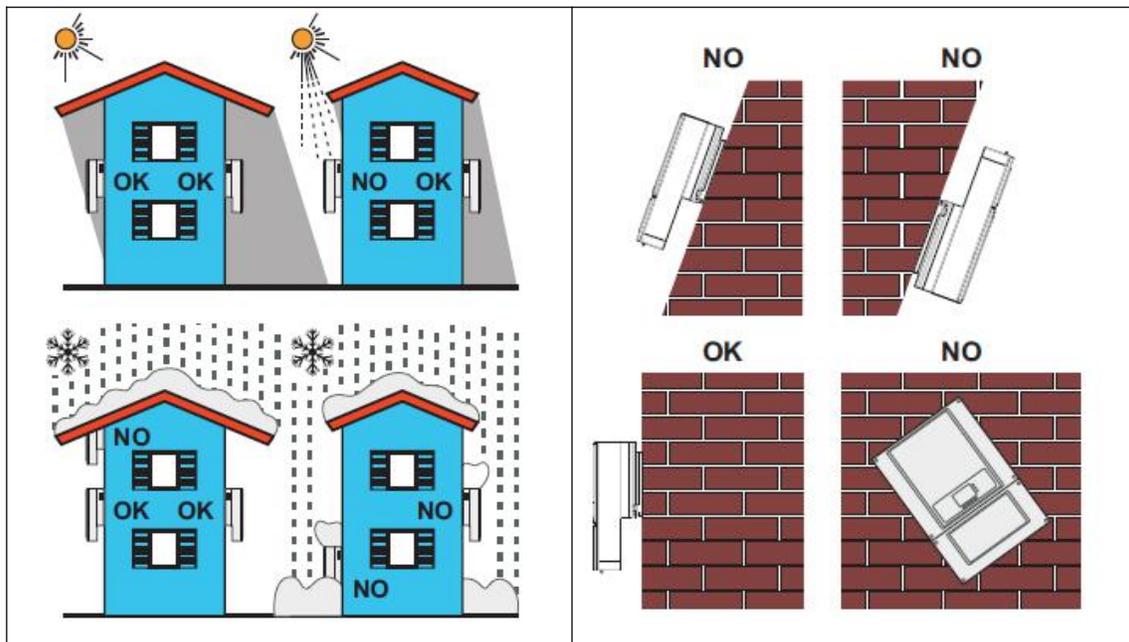
 <p>M6 flat washer×8</p>	 <p>Expansion Bolts×8</p>	 <p>Terminal cap×4</p>	 <p>CT terminal×2</p>
 <p>Current Transformer (CT)×2</p>	 <p>User Manual×1</p>	 <p>Warranty card×1</p>	 <p>Quality Certificate×1</p>

Fig. 2 Accessories of ME-3000SP

## 2. Installation

### 2.1 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.



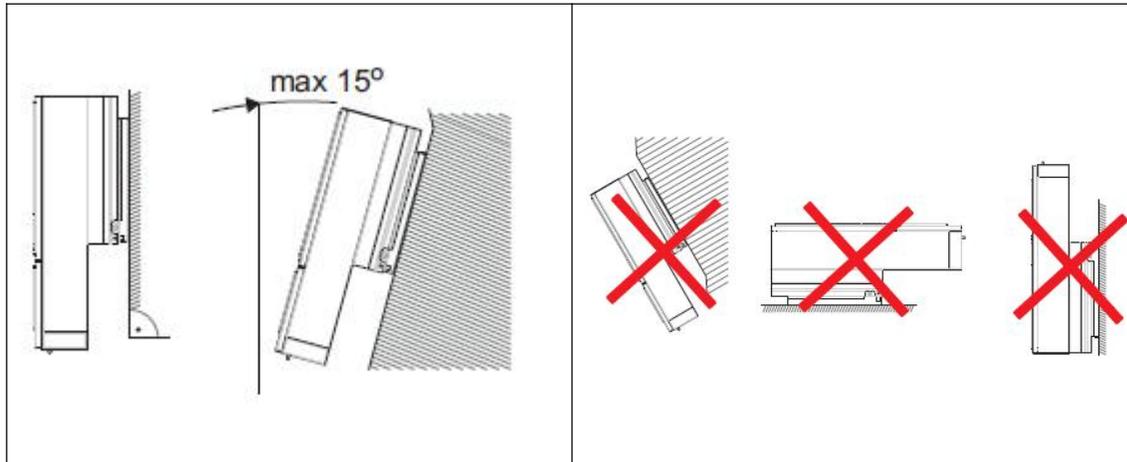


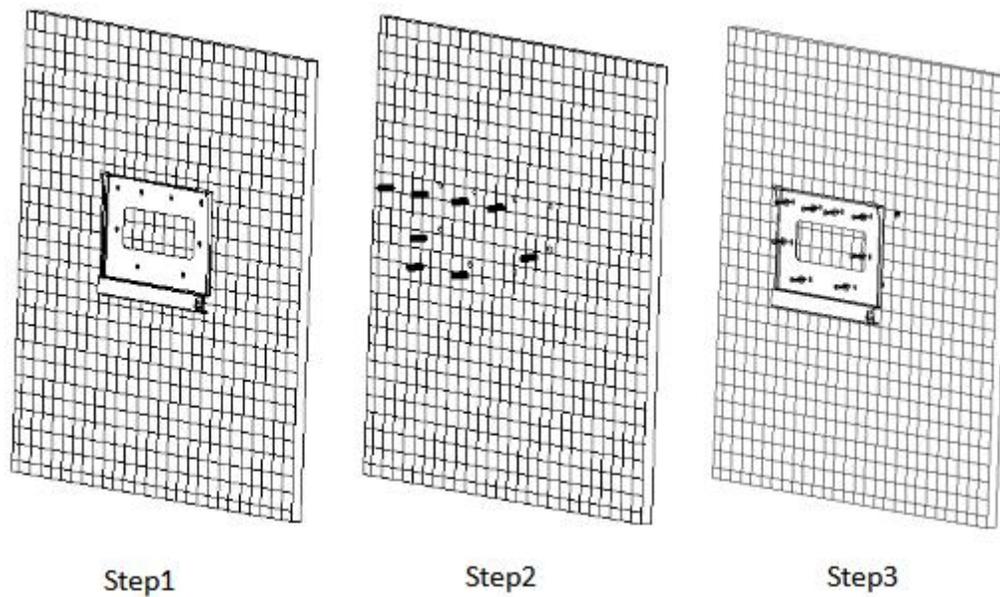
Fig. 3 Installation Position of ME-3000SP

## 2.2 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)

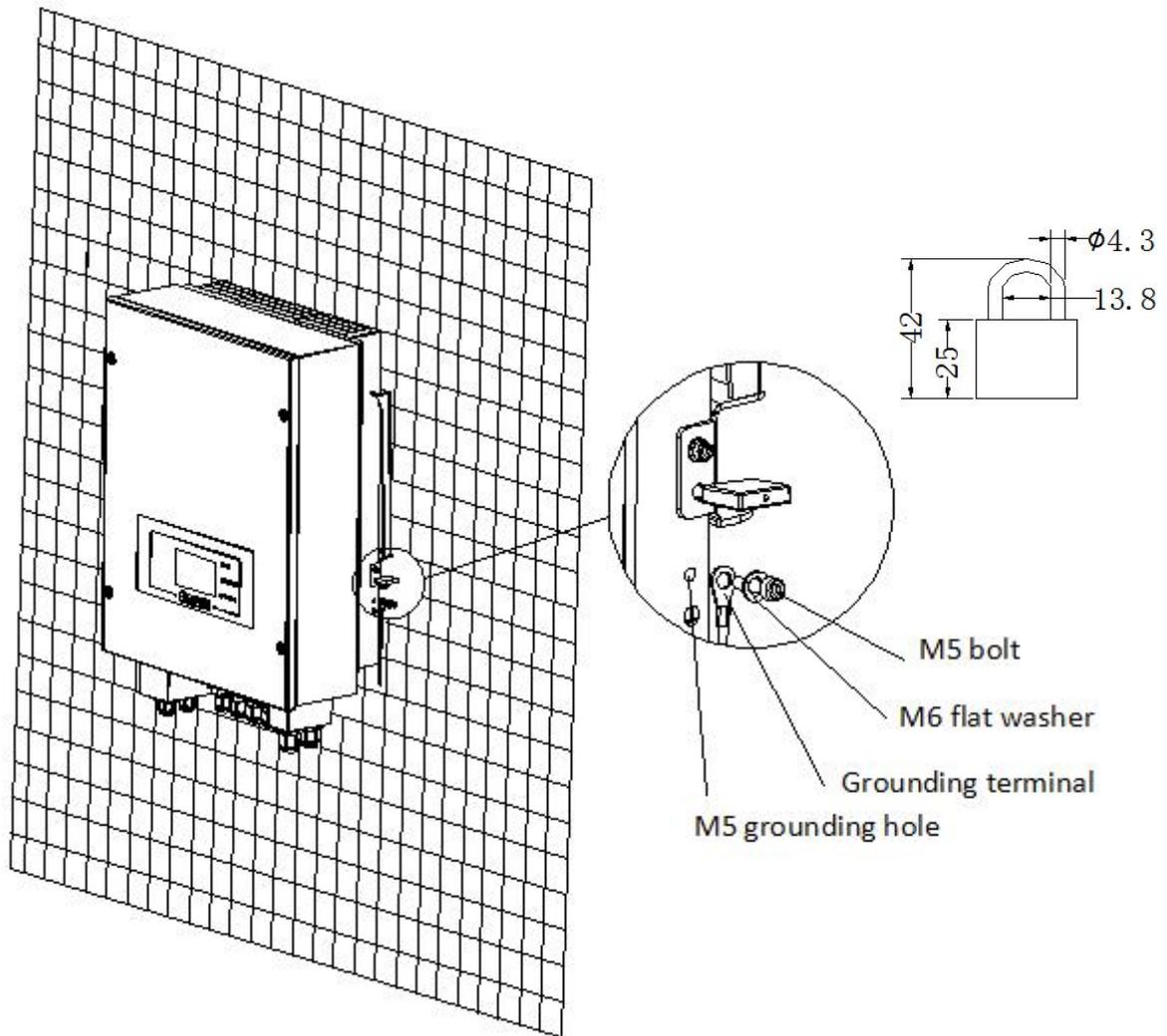
Step 3: Fix the mounting bracket on the wall using bolts & flat washers.



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



2.3 ME-3000SP wiring

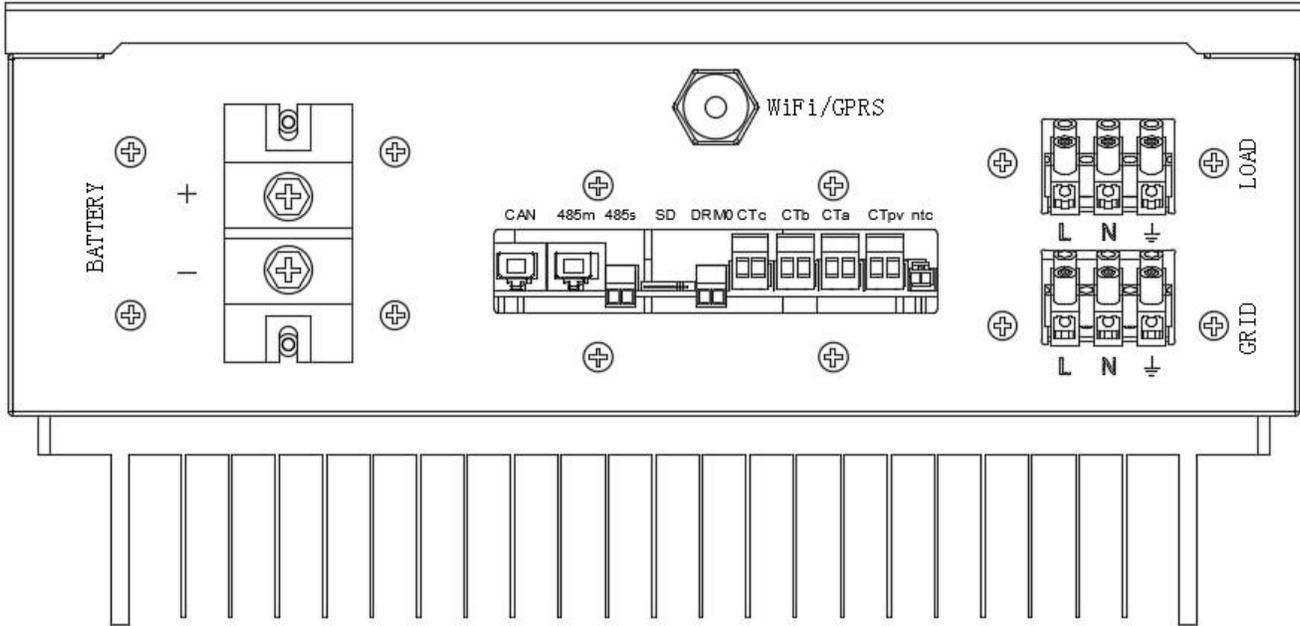


Fig. 4 ME-3000SP Bottom View

2.3.1 Battery connection

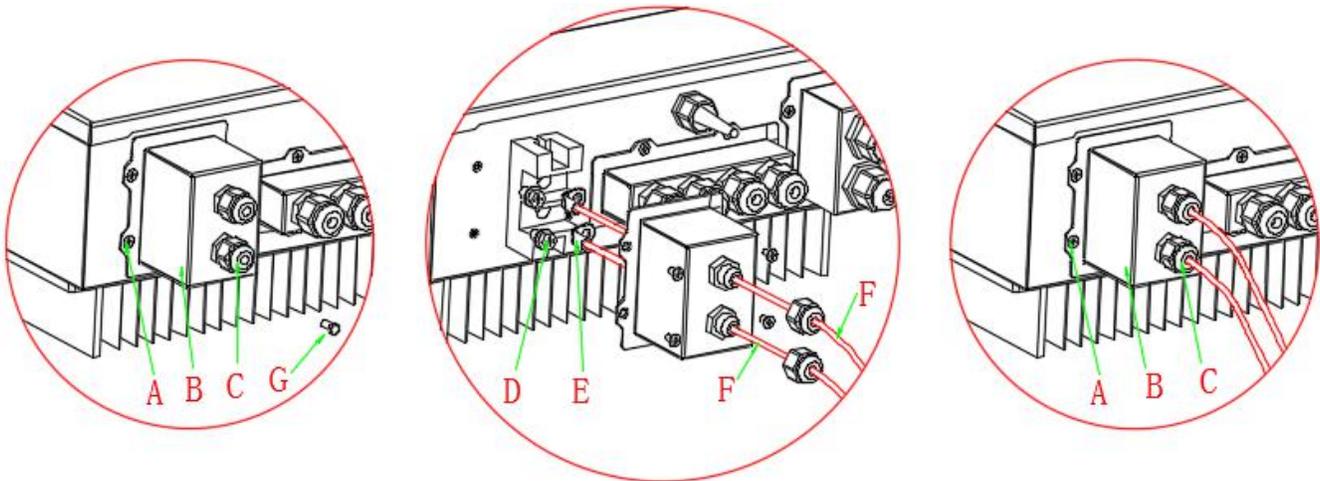


Fig. 5 Battery connection (Test battery wires polarity before connection)

Step 1: Loosen 4 screws (part A) using a screwdriver (fig. 5)

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

Step 3: Route the battery wires (part F) through the cable gland, then connect battery wires using OT terminal (part E)  
 Step 4: Fasten the waterproof cover using 4 screws.

2.3.2 CT / RS485 / NTC connection

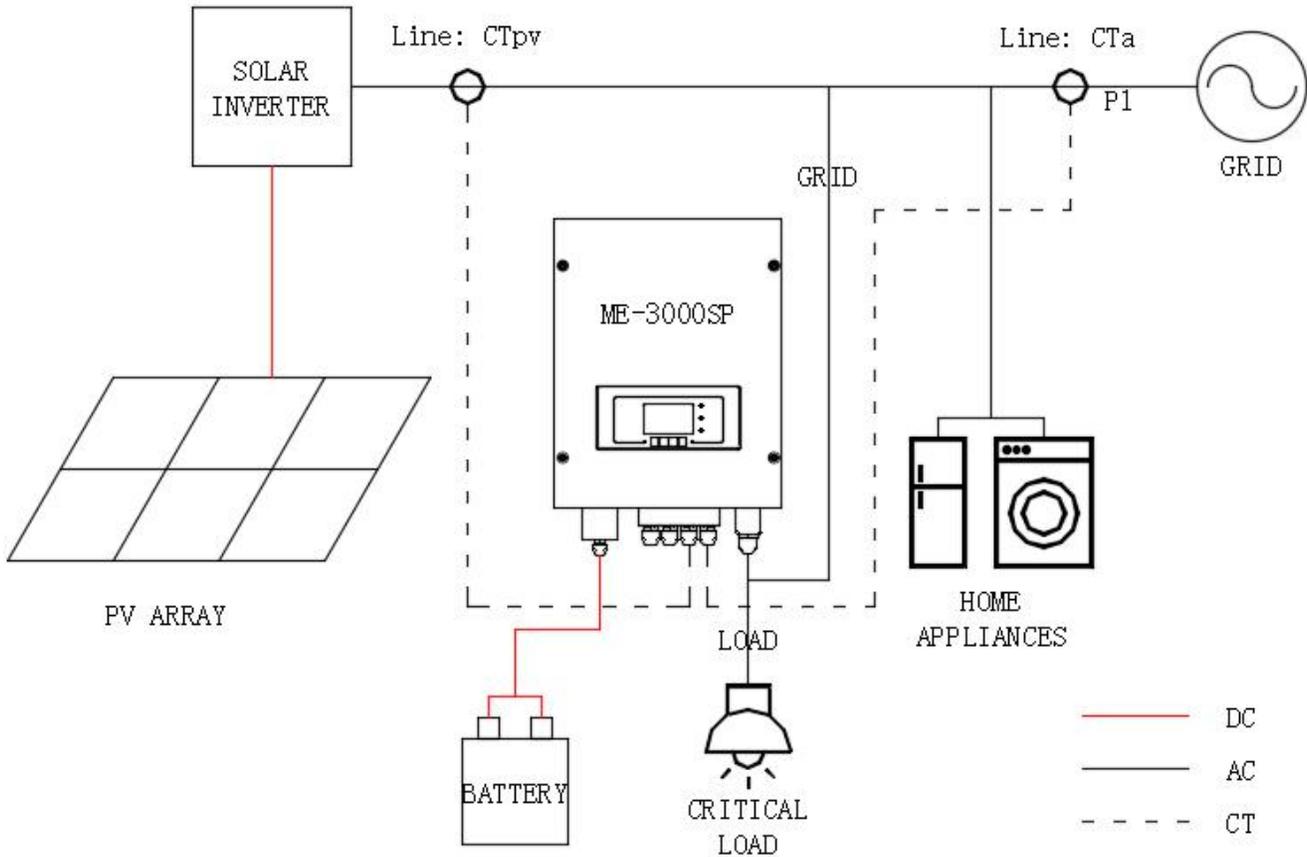


Fig. 6 Schematic Diagram (ME-3000SP: energy storage add-on to existing renewable system)

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

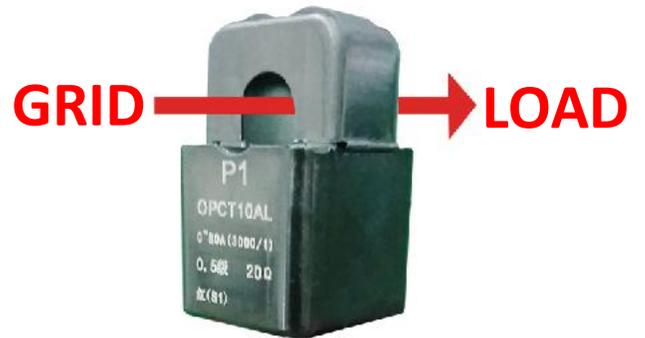
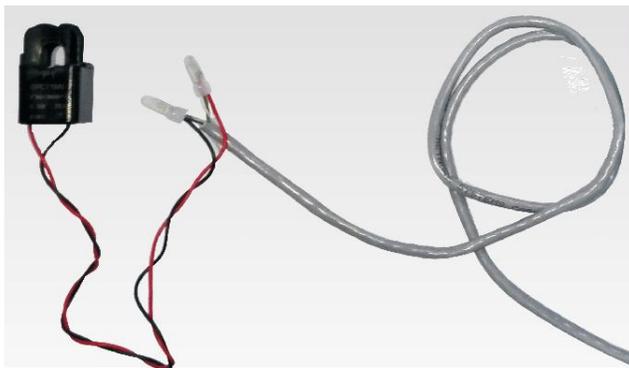


Fig. 7 CT wire extension (direction of CTa)

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

Form 1 CT connection

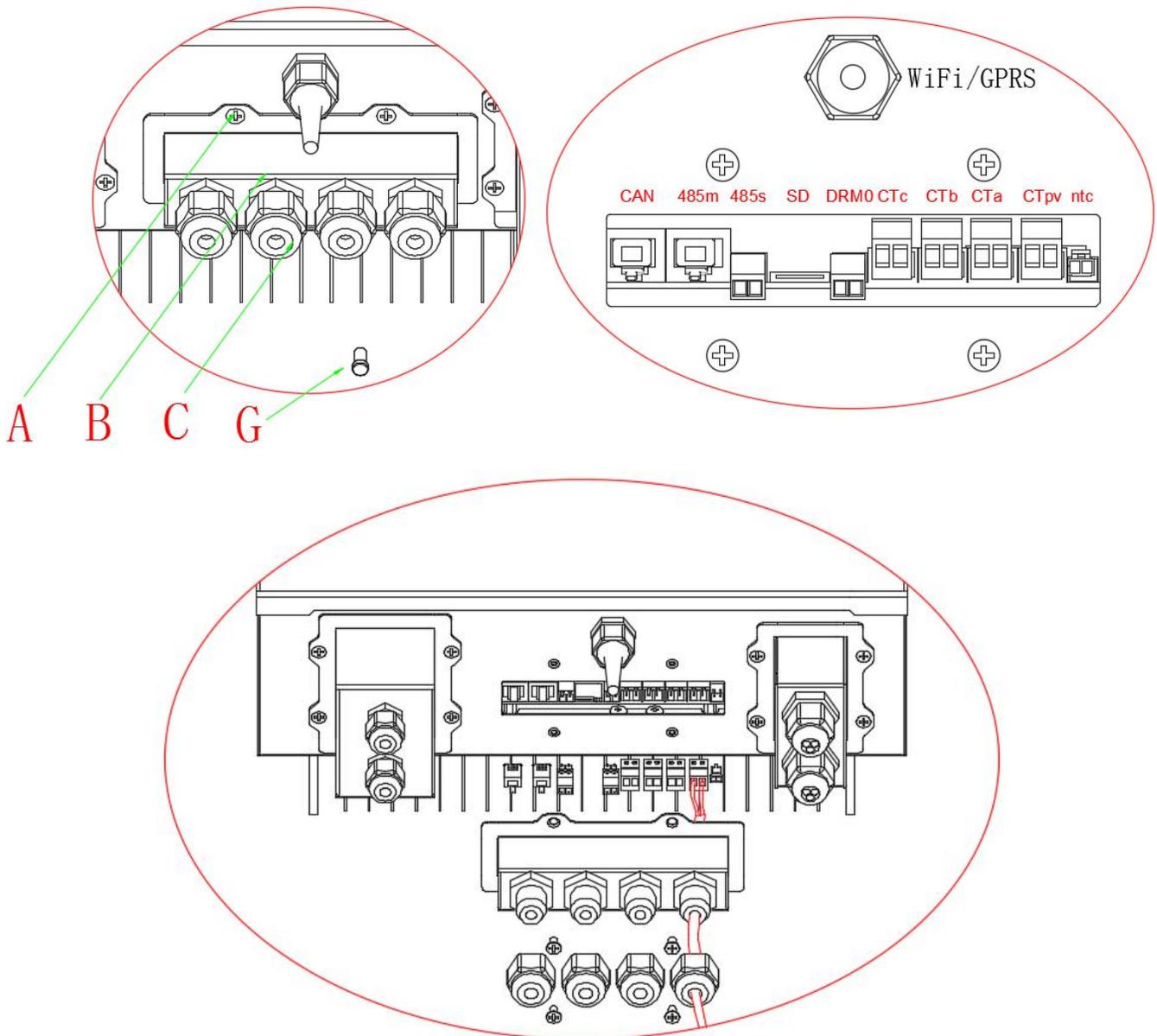


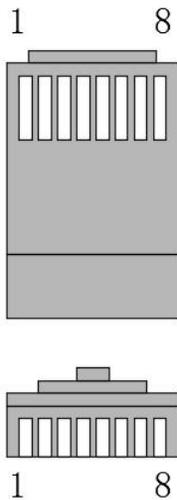
Fig. 8 CT / RS485 / NTC connection

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)

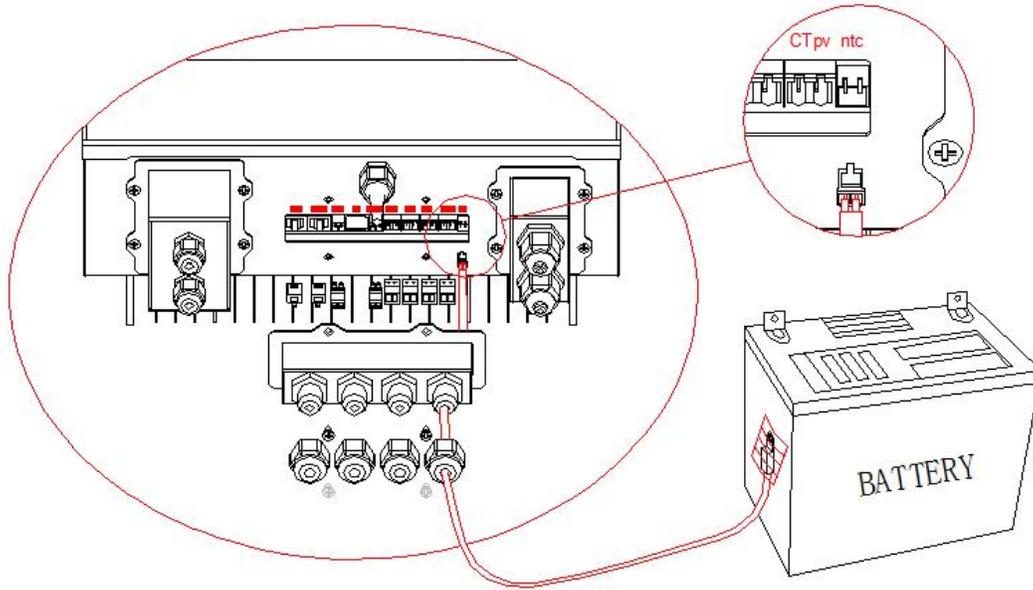
Step 5: Route RS485 network cable through the cable gland, connect RS485 network cable to RJ45 connector, then insert RJ45 connector into 485M port. (fig. 8)



No.	ME-3000SP 485M	PYLONTECH US2000
1		RS485B
2		RS485A
3		GND
4	RS485B	
5	RS485A	
6		GND
7		RS485A
8		RS485B

Form 2 485M connection

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



Step 7: fasten the waterproof cover using 4 screws.

2.3.3 Grid & Load connection

Step 1: Loosen 4 screws (part A) using a screwdriver (fig. 9)

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

Step 3: Route GRID / LOAD cables through cable glands, then connect GRID / LOAD cables to corresponding terminal blocks.

Step 4: Fasten the waterproof cover using 4 screws.

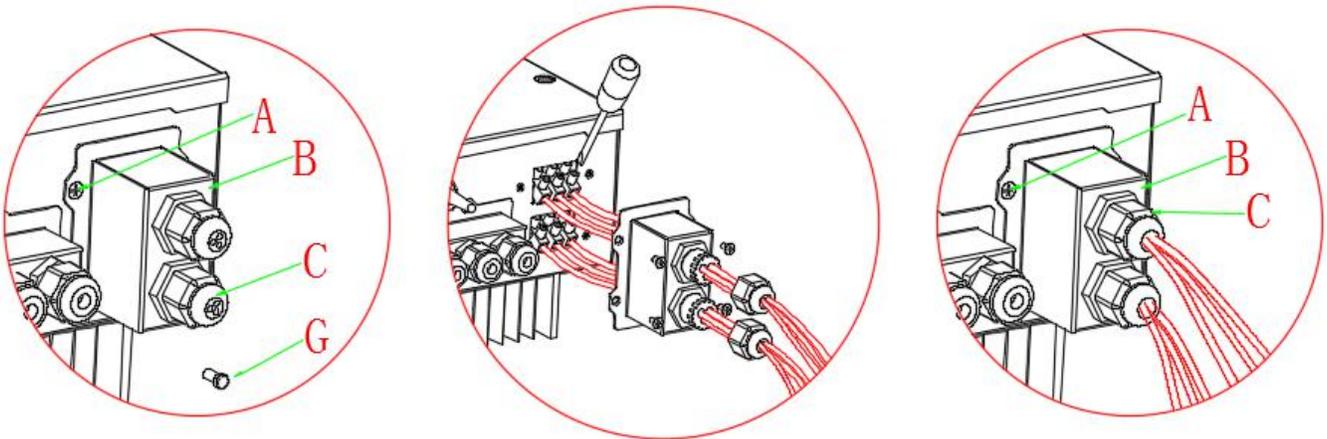
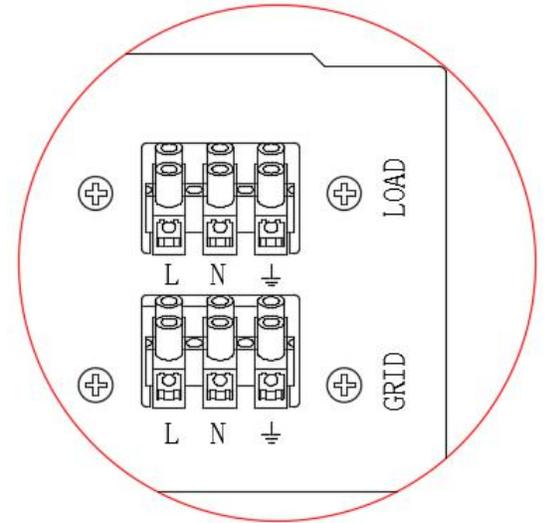


Fig. 9 Grid & Load connection

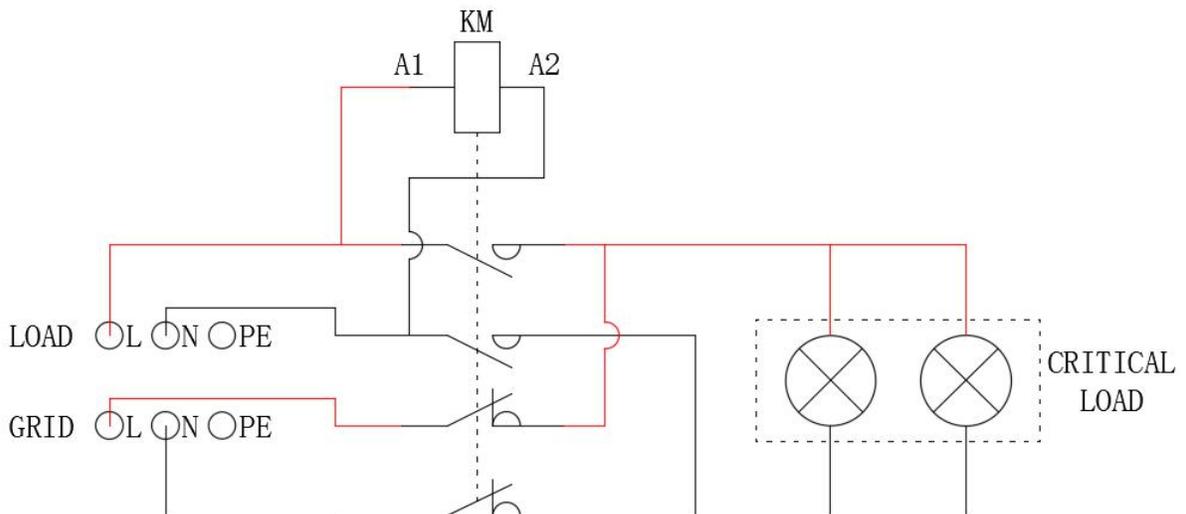


Fig. 10 Connection of critical load (AC contactor: 2 NC, 2 NO)

### 3. Operation

#### 3.1 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. 10)
7. For lithium

#### 3.2 First time setup

**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)
6. If power generation > power consumption, battery is not full.  
ME-3000SP will charge the battery
7. If power generation < power consumption, battery is not flat.  
ME-3000SP will discharge the battery

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

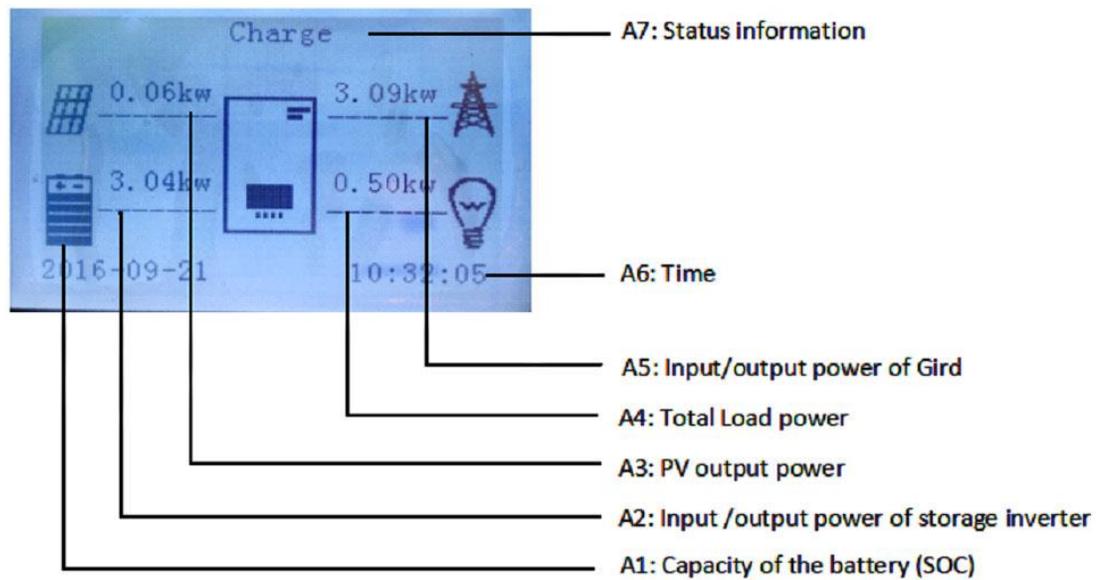
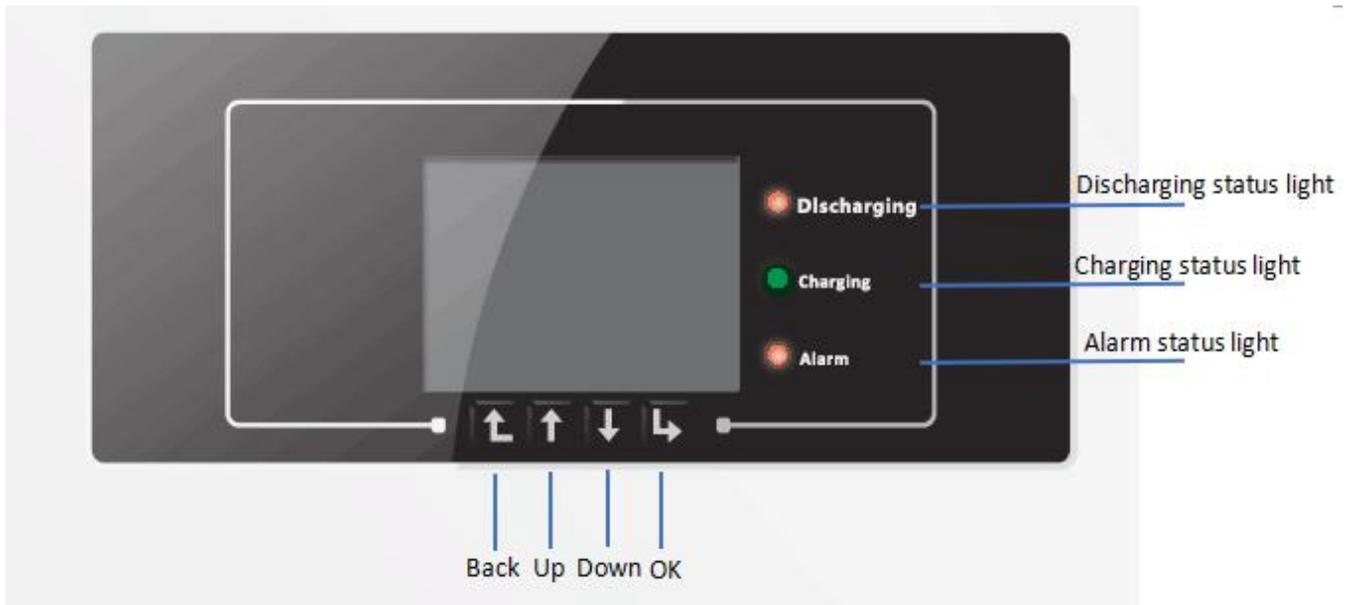
First time setup:

1)Set system time
2)Set country
3)Select battery type
4)Set battery capacity
5)Set bat manage mode
6)Set max charge voltage
7)Set max Charge current
8)Set max protect voltage
9)Set min discharge voltage
10)Set max discharge current
11)Set min protect voltage
12)Set discharge depth
13)Set discharge time
14)Set empty discharge voltage
15)Set full charge voltage

Input number in ME-3000SP:

Press "UP" or "DOWN" to change the value of 1<sup>st</sup> digit, press "CONFIRM" to switch to next digit.

## 4. Interface



## 5. Technical Data

Technical Data		ME 3000SP
<b>Battery Parameters</b>		
Battery Type		Lead-acid,Lithium-ion
Nominal battery voltage		48V
Battery voltage range		40-60V
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
<b>AC Output</b>		
Max.Output Power		3kVA
Peak Power		1.5*Pnom ,10S; 1.2*Pnom ,30S
Rated Output Voltage		230V
Max.Output Current		13A
AC Voltage Range		180V-270V
Grid Frequency Range		44~55Hz / 54~66Hz
THD		<3%
Power Factor		1(Adjustable +/-0.8)
Connection phase		single
<b>System Parameters</b>		
Max.Charging Efficiency		94.5%
Max.Discharging Efficiency		94%
Stanby Losses		<5W
Topology		High Frequency Isolated Transformer
Degree Of Protection		IP65
Safety Protection		Anti islanding, RCMU, Groud Fault Monitoring
Certification		AS4777,VDE0126-1-1,G83/2,C10/11,RD1699,UTEC15-712-1,EN50438,VDE-AR-N4105
Communication		WiFi,RS485,CAN2.0
<b>Environmental</b>		
Ambient temperature range		-25°C...+60°C (Above 45°Derating)
Allowable Relative Humidity Range		0... 95%, No Condensing
Max.Operating Altitude		2000m
Current Senor Connection		external
<b>General Data</b>		
Noise		<25dB
Weight		16kg
Cooling		Natural
Dimension(W*H*D)		532*360*173mm
Display		LCD display
Warranty		5 Years (Optional: extension to 10 years)
<b>Emergency Power Supply</b>		
EPS rated power		3000VA
EPS rated voltage, Frequency		230V,50/60Hz
EPS rated current		13A
EPS peak power		1.5*Prated, 10s
Total harmonic distortion		<3%
Switich time		<3s

## 6. Country code

CODE	Country
0	Germany4105
1	CEI021_INT
2	Australia
3	SpainRD1699
4	Turkey
5	Denmark
6	GreeceContinent
7	Netherland
8	Belgium
9	UK_G59
10	China
11	France
12	Poland
13	Germany_BDEW
14	Germany_0126
15	Italy_CEI0_16
16	UK_G83
17	Greece_island
18	EU_EN50438
19	EU_EN61727
20	Customer_VDE0126
21	Korea
22	Sweden
23	europeneral
24	CEI021_EXT
25	Cyprus

## 7. Troubleshooting

Code	Name	description	solution
ID01	GridOVP	The power grid voltage is too high	If the alarm occurs occasionally, the possible cause is that the electric grid is abnormal occasionally. SOFAR inverter automatically returns to normal operating status when the electric grid's back to normal.
ID02	GridUVP	The power grid voltage is too low	
ID03	GridOFP	The power grid frequency is too high	If the grid voltage/frequency is within the acceptable range an AC wiring is correct, while the alarm occurs repeatedly, contact SOFAR 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.
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 over voltage setting of the battery consistent with the parameter of battery manufacturer and contact SOFAR technical support.</p>
ID09	HW_LLCCBus_OVP	LLCBus voltage is too high, and has happen hardware protection	ID09- ID26 are internal faults of SOFAR storage inverter, 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.
ID10	HW_Boost_OVP	Boost voltage is too high, and has happen hardware protection	
ID11	HwBuckBoostOCP	BuckBoost current is too high, and has happen hardware protection	
ID12	HwBatOCP	The battery current is too high, and has happen hardware protection	
ID15	HwAcOCP	The grid current is too high, and has happen hardware protection	
ID17	HwADFaultIGrid	The grid current sampling error	
ID18	HwADFaultDCI	The DCI sampling error	

ID19	HwADFaultVGrid	The grid voltage sampling error	<p>If the fault occurs frequently, please contact SOFAR technical support.</p> <p>ID28-ID55 are internal faults of SOFAR storage inverter, 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>
ID21	MChip_Fault	The master chip fault	
ID22	HwAuxPowerFault	The auxiliary voltage error	
ID25	LLCBusOVP	LLCBus voltage is too high	
ID26	SwBusOVP	Bus voltage is too high, and has happen software protection	
ID27	BatOCP	Battery current is too high	
ID28	DciOCP	The Dci is too high	
ID29	SwOCPInstant	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	
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	
ID58	OverTempFault_HeatSink	The temperature of heatsink 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	ID65-ID77 are internal faults of SOFAR storage inverter, 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 SOFAE technical support.
ID66	unrecoverBusOVP	The bus voltage is too high,and has cause unrecoverable fault	
ID70	unrecoverOCPIinstant	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	
ID94	Software version is not consistent		
ID95	CommEEPROMFault	The Communication board EEPROM is fault	ID95-ID96 are internal faults of SOFAR storage inverter, 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 SOFAE technical support.
ID96	RTCFault	RTC clock chip is fault	
ID97	InValidCountry	Invalid Country	Check the country setting according to country ID
ID98	SDfault	The SD card is fault	Please replace the SD card.
ID100	BatOCD	Battery over current discharging protect	ID100-ID103 are battery fault. If this fault occurs occasionally, wait few minutes to see whether the fault is rectified. If this fault occurs frequently, please contact SOFAR 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 SOFAR technical support.
ID105	BatOTC	Battery charging high temperature protect	
ID106	BatUTD	Battery discharging Low temperature protect	Id106-id107 are battery fault. Increase the temperature of the battery. If the fault occurs frequently, please contact SOFAR technical support.
ID107	BatUTC	Battery charging Low temperature protect	