



All-in-One ESS (LV)

RW-F5.3-1H3

SKU: 9430



Version: V1.1

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1.Product Introduction

RW-F5.3-1H3 is a new energy storage product developed and produced, which can be used to support the reliable power supply of various equipment and systems.

The RW-F5.3-1H3 features an integrated design with a 5kW hybrid inverter, 5.3kWh LFP battery and intelligent applications.

Users can realize convenient and fast control through APP, PC and touch screen, and intelligent application supports functions such as peak load, intelligent load and AC duality.

2.Specifications

Model	RW-F5.3-1H3
Battery Input Data	
Battery Type	LiFePO ₄
PV String Input Data	
Max. PV Input Current (A)	6500W
Rated PV Input Voltage (Vdc)	370 (125 ~ 500) Vdc
Max. PV Short-circuit Current (A)	27+27A
Start Up DC Voltage (Vdc)	125Vdc
MPPT Range (V)	150 ~ 425Vdc
PV Input Current (A)	18+18A
Number of MPP Trackers	2
Number of Strings Per MPP Tracker	1+1
AC Output Data	
Rated AC Output and UPS Power (W)	5000/5000W
AC Output Rated Current (A)	22.7/21.7A
Max.AC Output (off-gird) Current(A)	25/23.9A
Max. Continuous AC Pass Through (A)	35A
Peak Power (off grid)	35A
Power Factor	0.8 leading to 0.8 lagging
Grid Type	Single phase
DC Injection Current (mA)	<0.5% In (mA)
THD	0.8 leading to 0.8 lagging
Efficiency	
MPPT Efficiency	>99%

Protection	
Grid Regulation	IEC 61727, IEC 62116, CEI 0-21, EN 50549, NRS 097, RD 140, UNE 217002, OVE-Richtlinie R25, G99, VDE-AR-N 4105
Safety EMC / Standard	IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2
General Data	
Cooling	Natural Cooling
Other Parameter	
Operating Temperature(°C)	Operating Temperature(°C)
Humidity	15% ~ 85% (No Condensing)
IP Rating of Enclosure	IP65
Noise(dB)	<30 dB
System Dimension(W×H×D,mm)	616 × 191 × 690mm (Excluding connectors and brackets)
System Weight Approximate(kg)	71kg
LCD Display	Colorful Touch LCD
Installation Location	Wall-Mounted

3.Unpacking Guide

Check the outer packing

Before unpacking the outer package, check the outer package for visible damage, such as holes, cracks, or other signs of possible internal damage, and check the energy storage model. If there is any abnormal packaging or energy storage model does not match, do not open, and contact your dealer as soon as possible.

Check deliverables

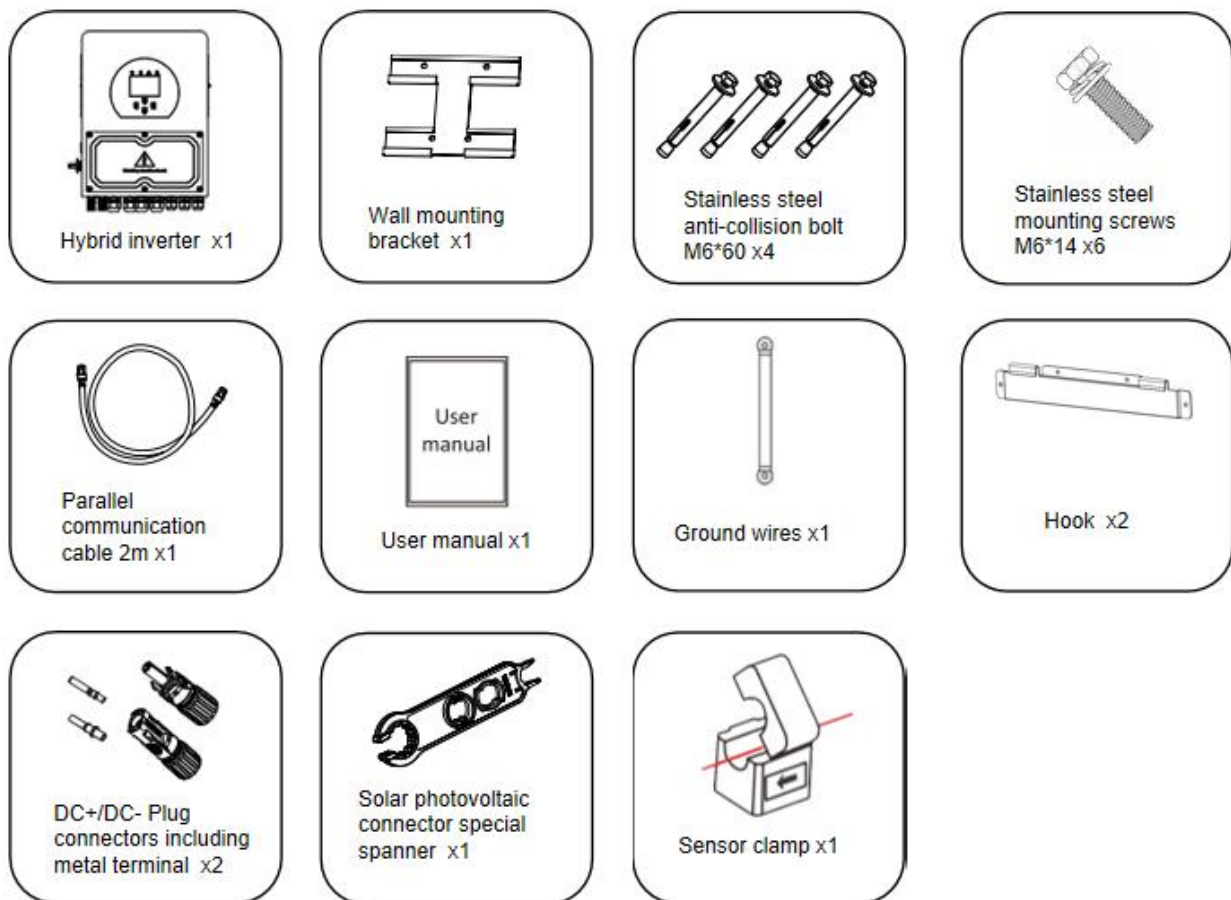
After unpacking the outer packaging of the energy storage, check that the deliverables are complete and there is no obvious external damage. If anything is missing or damaged, contact your dealer.

Note: For the quantity of deliverables shipped with the box, please refer to the Packing List in the box.

4.Packing List

4.1 Parts List

Check the equipment before installation. Please make sure nothing is damaged in the package.You should have received the items in the following package:



5.Security Introduction



Warning

1. It is very important and necessary to read the user manual (attached) carefully before installing or using the battery. Failure to do so or to follow any instructions or warnings in this document may result in electric shock, serious injury, or possible damage to the battery, rendering it inoperable.
2. If the battery is stored for a long time, it is recommended to charge the product once a month or So, and the Soc should not be less than 50% .
3. Charge the battery within 48 hours after it is fully discharged.
4. Do not expose the cable.
5. Disconnect all power supplies during maintenance.
6. If any exception occurs, please contact the supplier within 24 hours.
7. Do not use cleaning solvents to clean the battery.
8. Do not expose this product to flammable or irritating chemicals or vapors.
9. It is prohibited to paint any part of this product, including any internal or external components.
10. Direct or indirect damages caused by the above reasons do not include warranty claims.
11. Do not insert any foreign matter into any part of the product.



Warning

5.1 Preparation Before Connection

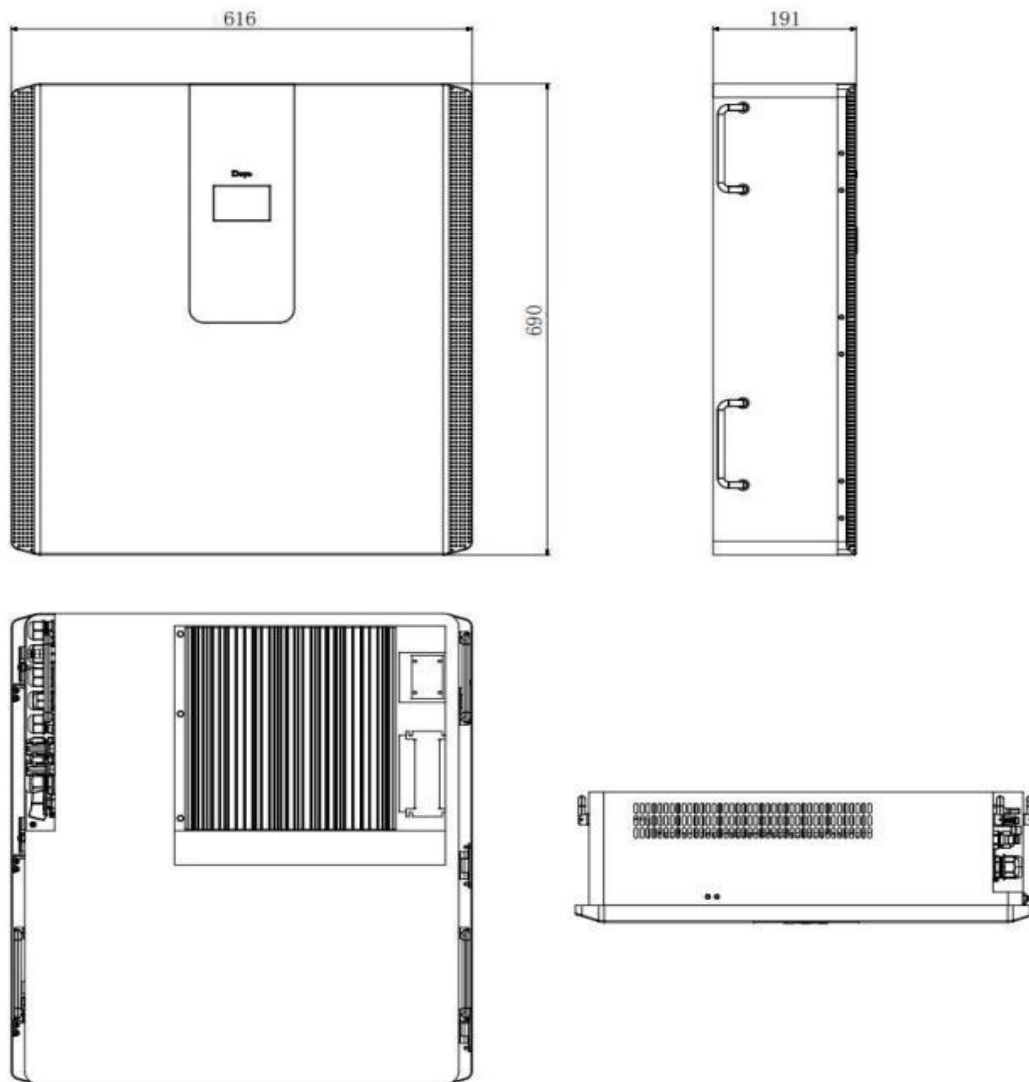
1. After unpacking, please check the product and packing list. If the product is damaged or missing, please contact the local retailer.
2. Before installation , disconnect the power supply from the power grid and ensure that the battery is turned off.
3. Cables must be connected correctly and do not short-circuit external devices.
4. Keep away from fire.
5. Do not use non-official parts or accessories.
6. Do not stack other heavy objects on the product.

5.2 In Use

1. If you need to move or repair the product, you must disconnect the power supply and completely turn off the product.
2. Do not connect batteries of different models.
3. Disassembly is prohibited.
4. In case of fire, only liquid fire extinguishers can be used. Dry fire extinguishers are prohibited.

6.Quick Guide

6.1 Product Dimensions



6.2 Operation Interface

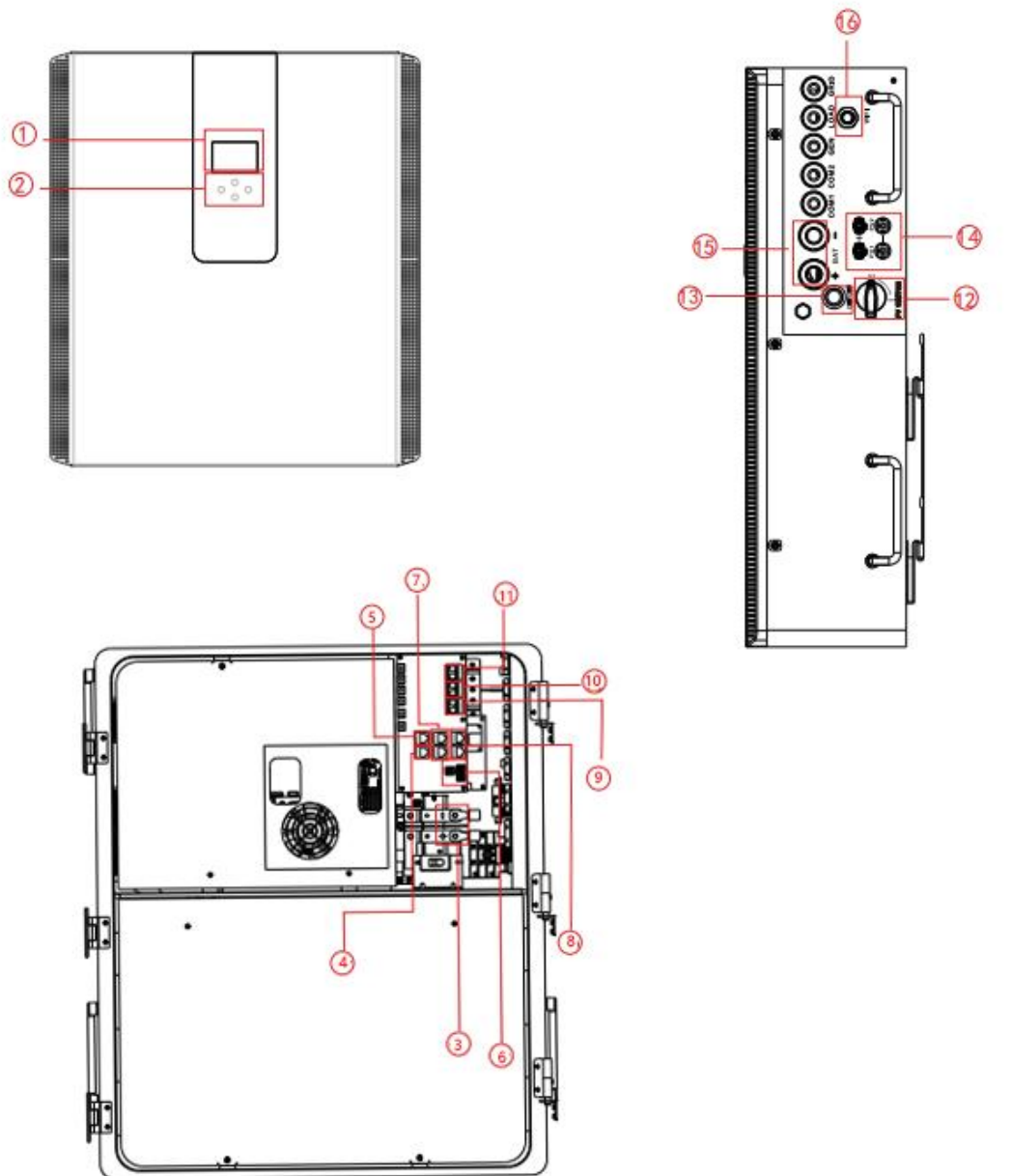


Front panel display

Function Button	Description
ESC	exit mode
Up	Go back to the previous choice
Down	skip to the next selection
Enter	confirm selection

6.3 Display ICONS

Product Overview



1: LCD display

2: Function Buttons

3: Battery input connectors

4: RS485/CAN Port

5: Meter Port

6: Function Port

7: Inverter Parallel port

8: Battery Parallel port

9: Generator input

10: Load

11: Grid

12: DC Switch

13: Power on/off button

14: PV input

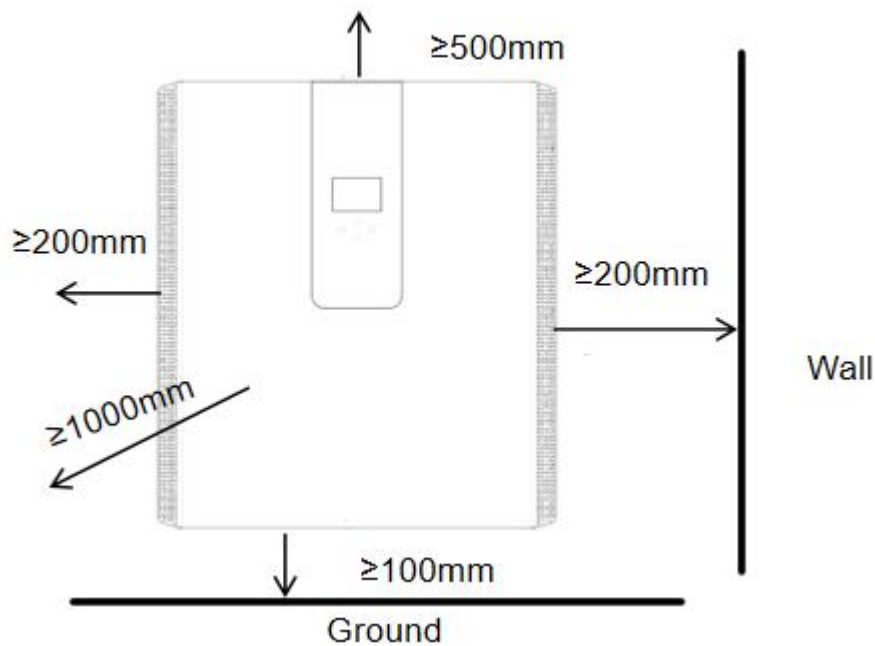
15: Battery

16: WiFi Interface

7.Mechanical Installation

7.1 Considering the following points before selecting where to install:

- Please select a vertical wall with load-bearing capacity for installation, suitable for installation on concrete or other non-flammable surfaces, installation is shown below.
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature is recommended to be between -10~40°C to ensure optimal operation.
- Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and have enough space for removing wires.

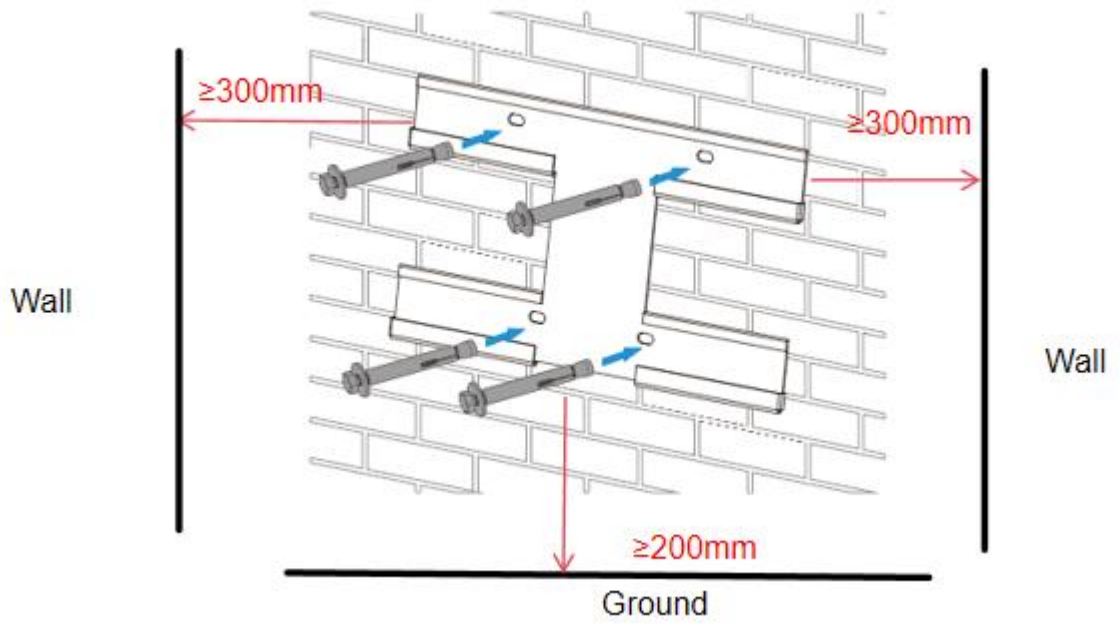


For proper air circulation to dissipate heat, the clearance is about: not less than 200mm on the side, not less than 500mm above, not less than 100mm from the ground, and 100 cm further ahead.

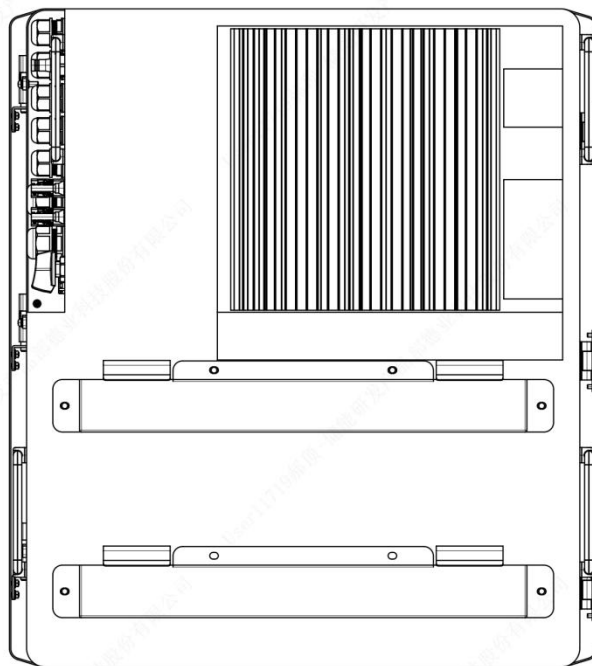
7.2 Mounting the ESS

Remember that this ESS is heavy! Please be careful when lifting out from the package. Choose the recommend drill head(as shown in below pic) to drill 4 holes on the wall,82-90mm deep.

- Use a proper hammer to fit the expansion bolt into the holes.
- Carry the ESS and holding it, make sure the hanger aim at the expansion bolt, fix the ESS on the wall.
- Fasten the screw head of the expansion bolt to finish the mounting.



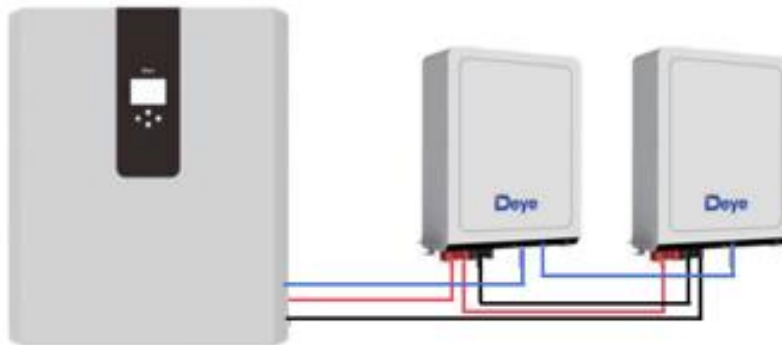
Wall mounting bracket installation



8.Product Wiring Instructions

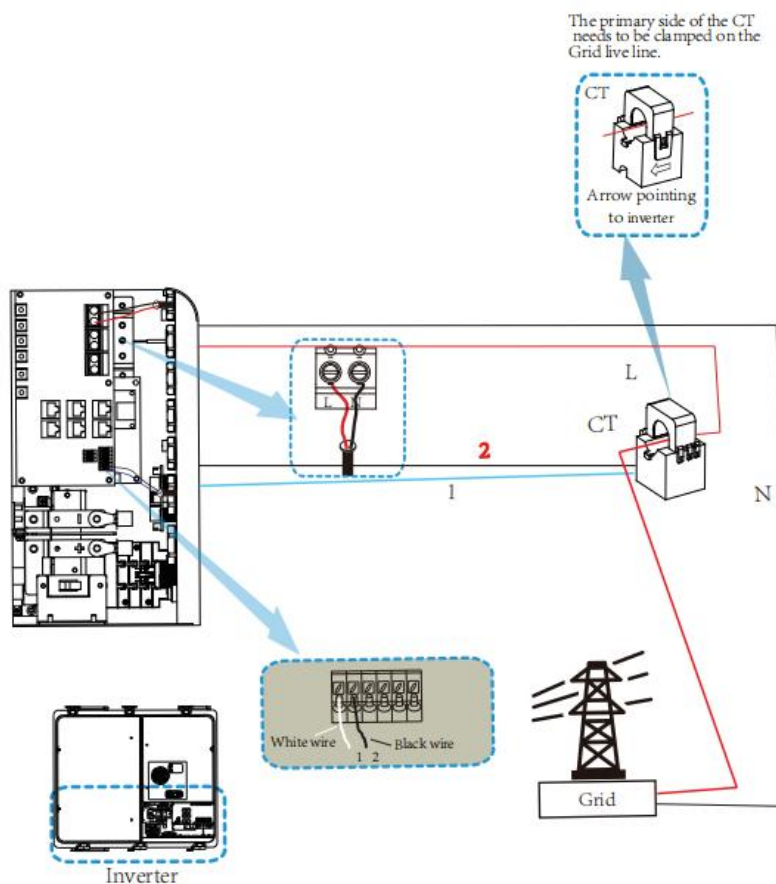
8.1 Cables for Battery Expansion

Easy to expand, support multiple parallel, support up to 16 all-in-one parallel(57.6kW/84.8kWh). At the same time, it also supports Deye 5.3kWh battery expansion,supporting a maximum of 31 battery packs in parallel with a maximum capacity of 169kWh.



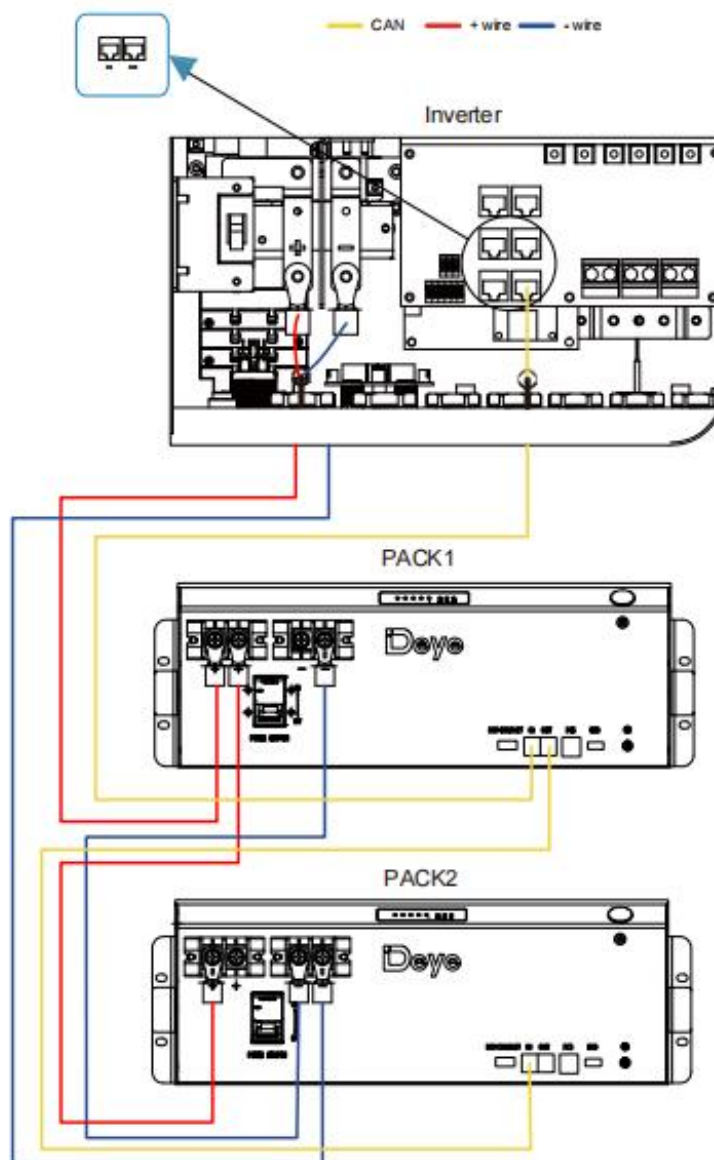
White is the network cable, red is the positive electrode, and black is the negative electrode.

8.2 CT Connection

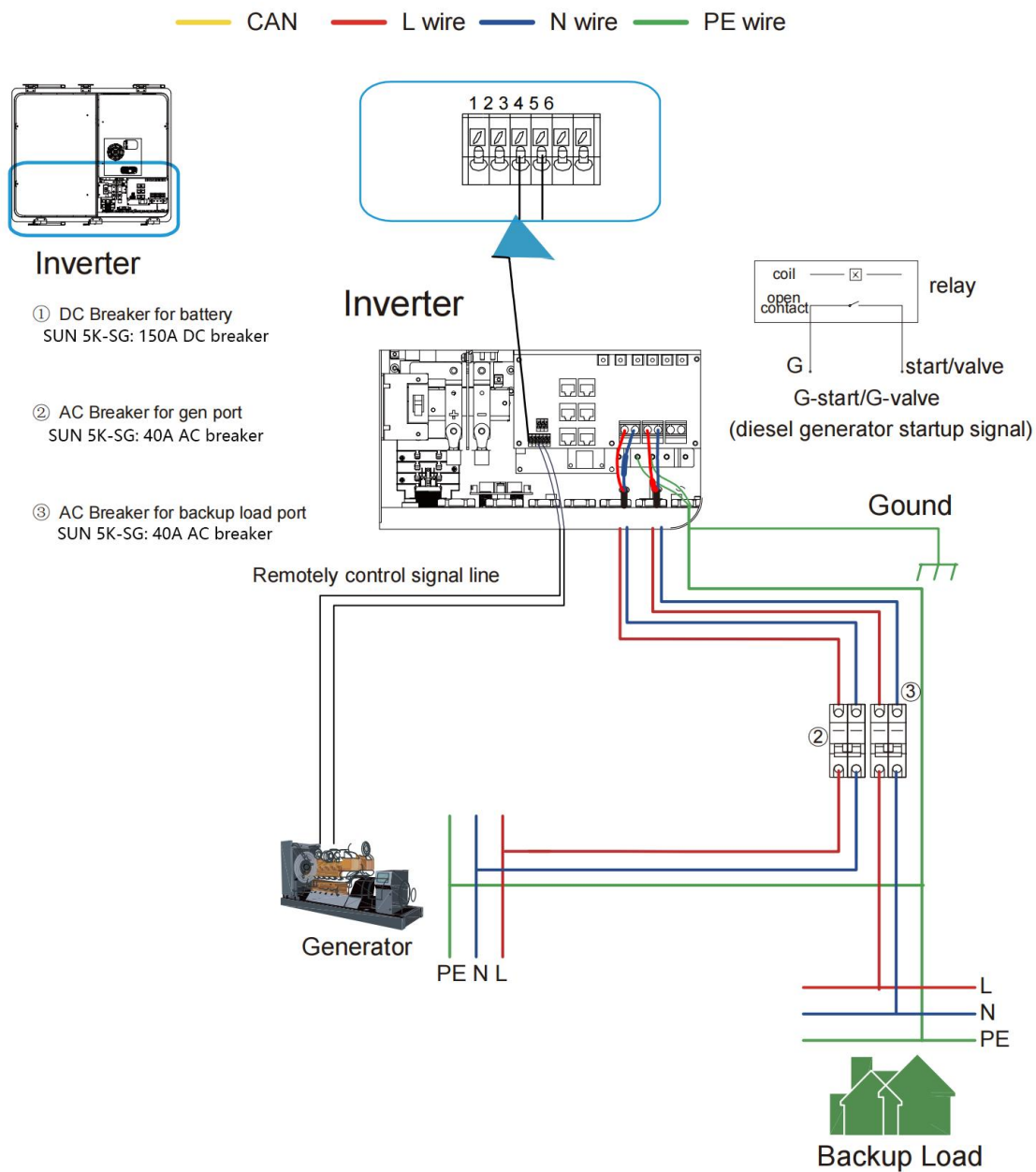


***Note:** when the reading of the load power on the LCD is not correct, please reverse the Ct arrow.

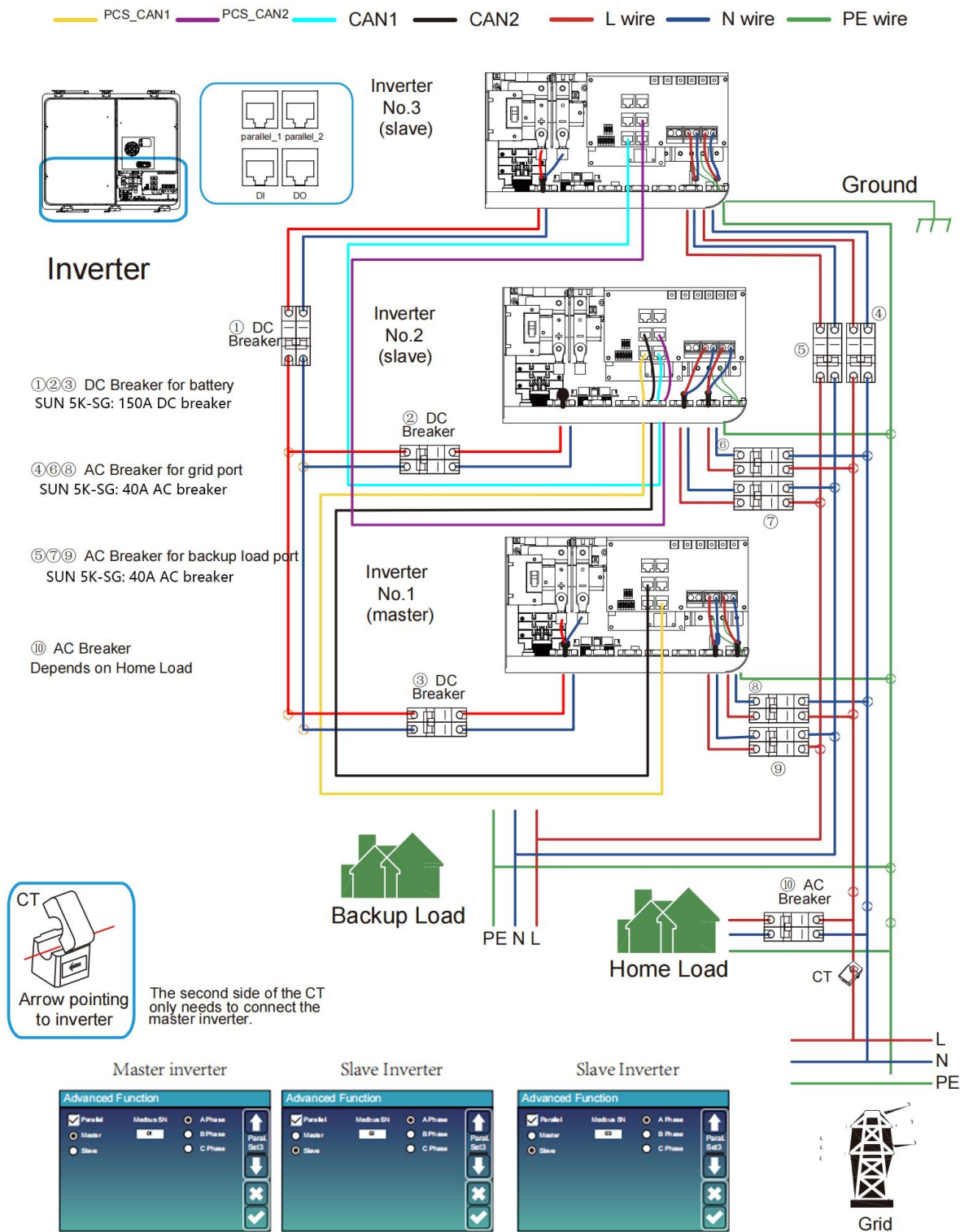
8.3 Parallel Capacity Expansion



8.4 Typical Application Diagram of Diesel Generator



8.5 Single Phase Parallel Connection Diagram



8.6 Three Phase Parallel Inverter

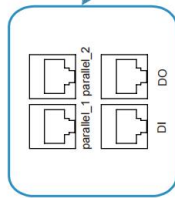
①②③ DC Breaker for battery
SUN 5K-SG: 150A DC breaker

⑤ AC Breaker for grid port
SUN 5K-SG: 40A AC breaker

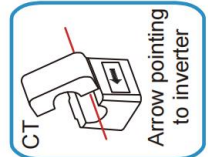
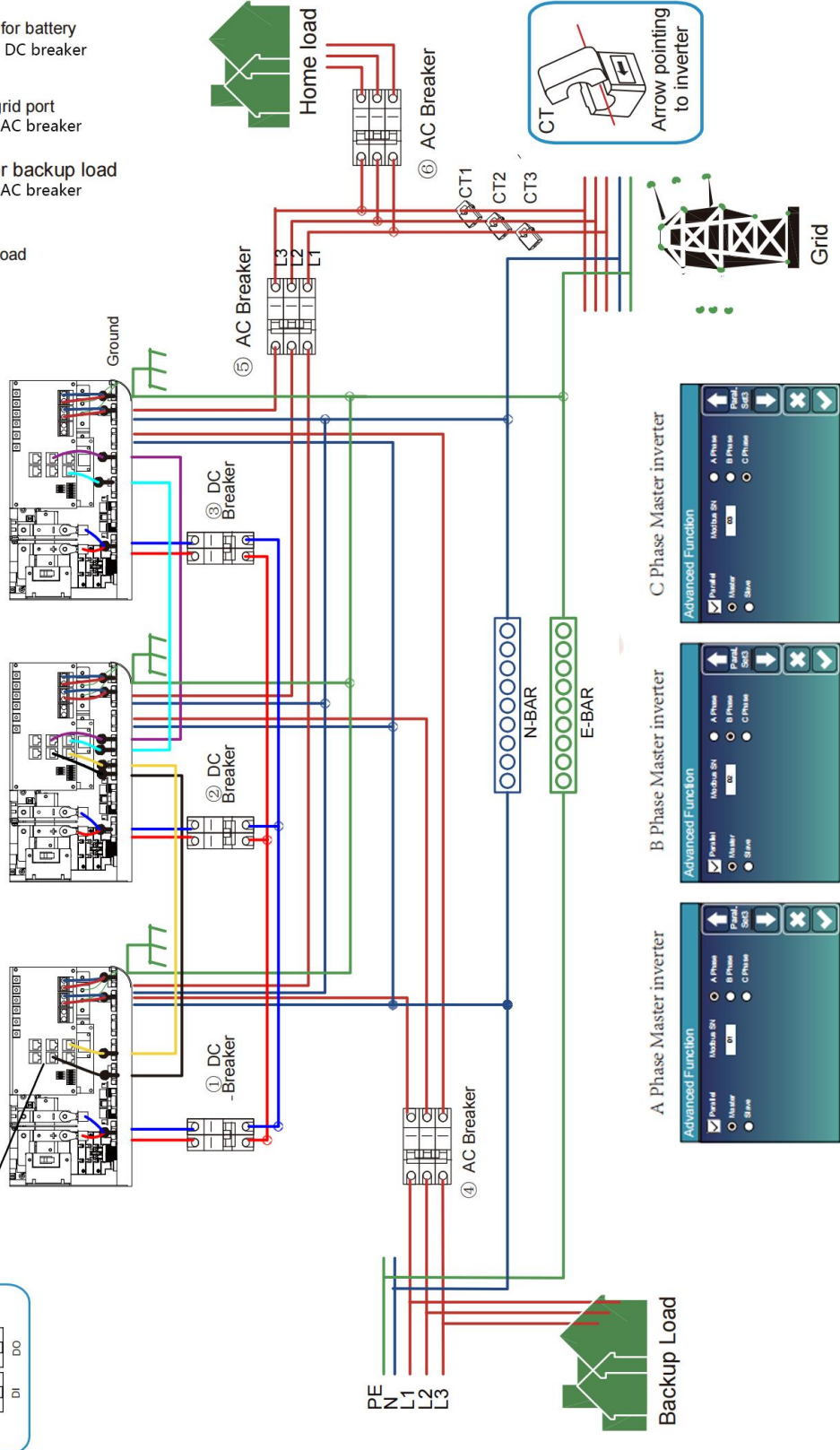
④ AC Breaker for backup load
SUN 5K-SG: 40A AC breaker

⑥ AC Breaker
Depends on Home Load

PCS_CAN1 PCS_CAN2 CAN1 CAN2 L wire N wire PE wire



A Phase Inverter No.1(master) B Phase Inverter No.2(master) C Phase Inverter No.3(master)



9.Working Mode

9.1 Solar Power Curve

This is Solar Panel detail page.

- ① Solar Panel Generation.
- ② **Grid Tie Power:** when there's a string inverter AC couple at the grid or load side of hybrid inverter and there's a meter installed for the string inverter, then the hybrid inverter LCD will show the string inverter output power on its PV icon. Please make sure the meter can communicate with the hybrid inverter successfully.
- ③ Voltage, Current, Power for each MPPT.
- ④ Solar Panel energy for Day and Total. Press the "Energy" button will enter into the power curve page.

This is Inverter detail page.

- ① Inverter Generation.
- ② 0.0Hz: frequency after DC/AC. Voltage, Current, Power for each Phase.
- ③ *DC-T: mean DC-DC temperature, AC-T: mean Heat-sink temperature. *Note: this part info is not available for some LCD FW.

This is Load detail page.

- ① Load Power.
- ② Voltage, Power for each Phase.
- ③ Daily and total Load consumption .

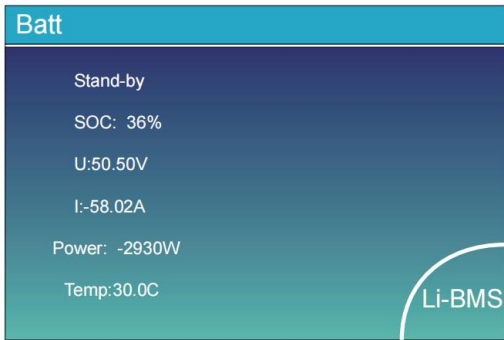
When you check "Selling First" or "Zero export to Load" on system work mode page, the information on this page is about backup load which connect on Load port of hybrid inverter.
When you check "Zero export to CT" on system work mode page, the information on this page is including backup load and home load.

Press the "Energy " button will enter into the power curve page.

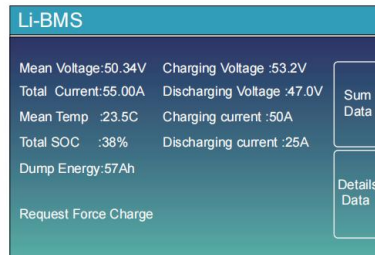
This is Grid detail page.

- ① Status, Power, Frequency.
- ② L: Voltage for each Phase
CT: Power detected by the external current sensors
LD: Power detected using internal sensors on AC grid in/out breaker
- ③ BUY: Energy from Grid to Inverter, SELL: Energy from Inverter to grid.

Press the "Energy " button will enter into the power curve page.



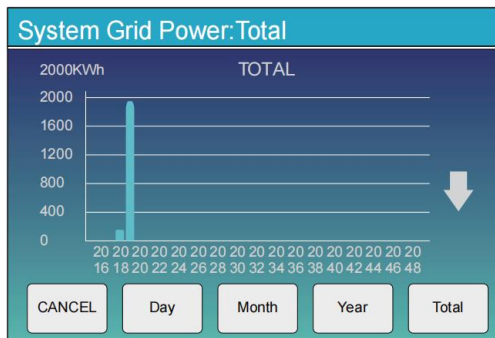
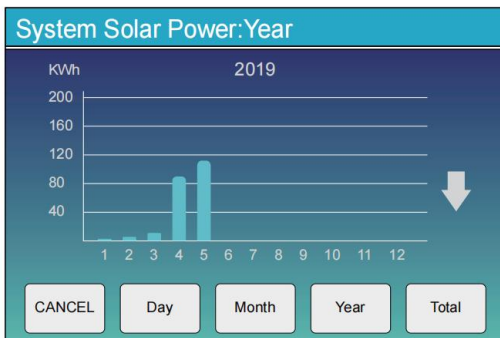
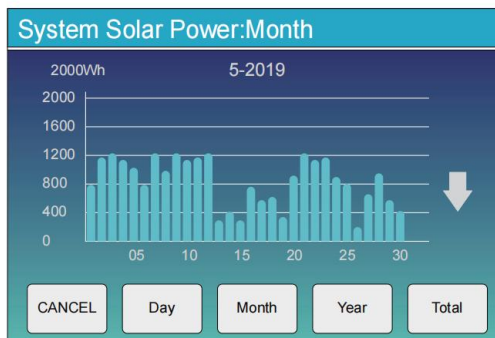
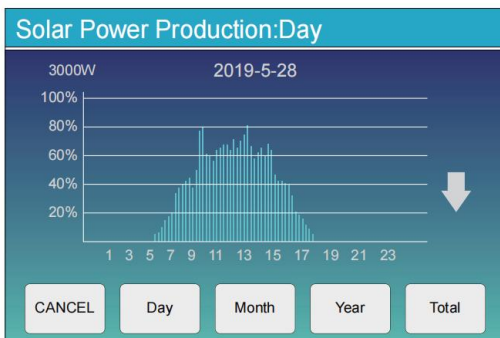
This is Battery detail page.
if you use Lithium Battery, you can enter BMS page.



Request Force Charge: It indicates the BMS requests hybrid inverter to charge the battery actively.

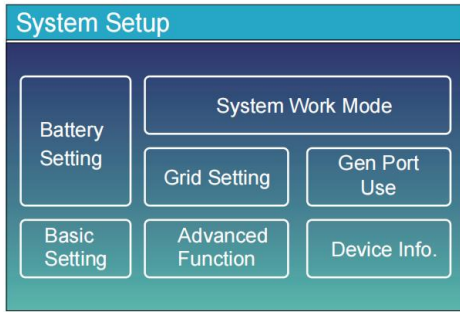
Volt	Charge		SOC	Energy	Fault			
	Volt	Curr						
1	50.38V	19.70A	30.6C	52.0%	26.0Ah	0.0V	0.0A	0 0 0
2	50.33V	19.10A	31.0C	51.0%	25.5Ah	53.2V	25.0A	0 0 0
3	50.30V	18.90A	30.2C	12.0%	6.0Ah	53.2V	25.0A	0 0 0
4	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
5	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
6	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
7	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
8	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
9	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
10	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
11	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
12	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
13	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
14	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0
15	0.00V	0.00A	0.0C	0.0%	0.0Ah	0.0V	0.0A	0 0 0

9.2 Curve Page-Solar & Load & Grid



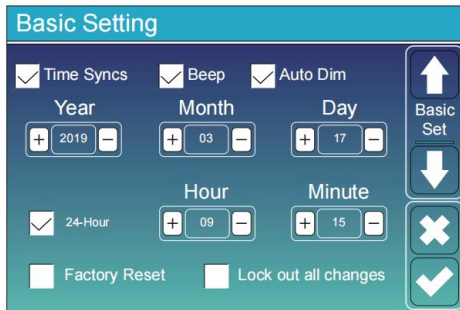
Solar power curve for daily, monthly, yearly and total can be roughly checked on the LCD, for more accuracy power generation, pls check on the monitoring system. Click the up and down arrow to check power curve of different period.

9.3 System Setup Menu

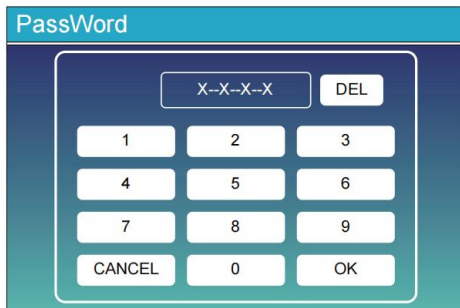


This is System Setup page.

9.4 Basic Setup Menu



Factory Reset: Reset all parameters of the inverter.
Lock out all changes: Enable this menu for setting parameters that require locking and cannot be set up. Before performing a successful factory reset and locking the systems, to keep all changes you need to type in a password to enable the setting.
The password for factory settings is 9999 and for lock out is 7777.



Factory Reset Password: 9999

Lock out all changes Password: 7777

System selfchek: After ticking this item, it needs input the password.
The default password is 1234

9.5 Battery Setup Menu

Battery capacity: it tells Deye hybrid inverter to know your battery bank size.
Use Batt V: Use Battery Voltage for all the settings (V).
Use Batt %: Use Battery SOC for all the settings (%).
Max. A charge/discharge: Max battery charge/discharge current (0-140A for 3KW-24 model, 0-70A for 3KW model, 0-90A for 3.6KW model, 0-120A for 5KW model, 0-135A for 6KW model).
 For AGM and Flooded, we recommend Ah battery size x 20% = Charge/Discharge amps.
 . For Lithium, we recommend Ah battery size x 50% = Charge/Discharge amps.
 . For Gel, follow manufacturer' s instructions.
No Batt: tick this item if no battery is connected to the system.

Active battery: This feature will help recover a battery that is over discharged by slowly charging from the solar array or grid.

Disable Float Charge: For the lithium battery with BMS communication, the inverter will keep the charging voltage at the current voltage when the BMS charging current requested is 0. It is used to help prevent battery from being overcharged.

This is Battery Setup page. ① ③

Start =30%: Percent S.O.C at 30% system will AutoStart a connected generator to charge the battery bank.

A = 40A: Charge rate of 40A from the attached generator in Amps.

Gen Charge: uses the gen input of the system to charge battery bank from an attached generator.

Gen Signal: Normally open relay that closes when the Gen Start signal state is active.

Gen Force: When the generator is connected, it is forced to start the generator without meeting other conditions.

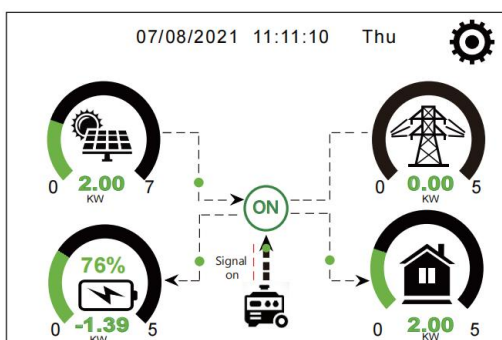
This is Grid Charge, you need select. ②

Start =30%: No use, Just for customization.

A = 40A: It indicates the Current that the Grid charges the Battery.

Grid Charge: It indicates that the grid charges the battery.

Grid Signal: Disable.



This page tells the PV and diesel generator power the load and battery.

Generator

Power: 1392W Today=0.0 KWH
 Total =2.20 KWH

L1: 228V

Freq:50.0Hz

This page tells generator output voltage, frequency, power. And, how much energy is used from generator.

Battery Setting

Lithium Mode

Shutdown

Low Batt

Restart

↑
Batt Set3
↓
✕
✓

Lithium Mode: This is BMS protocol. Please reference the document (Approved Battery).

Shutdown 10%: It indicates the inverter will shutdown if the SOC below this value.

Low Batt 20%: It indicates the inverter will alarm if the SOC below this value.

Restart 40%: Battery voltage at 40% AC output will resume.

Battery Setting

Float V **①**

Absorption V

Equalization V

Equalization Days

Equalization Hours

Shutdown **③**

Low Batt

Restart

TEMPCO (mV/C/Cell) **②**

Batt Resistance

↑
Batt Set3
↓
✕
✓

There are 3 stages of charging the Battery . **①**

This is for professional installers, you can keep it if you do not know. **②**

Shutdown 20%: The inverter will shutdown if the SOC below this value.


Low Batt 35%: The inverter will alarm if the SOC below this value. **③**

Restart 50%: Battery SOC at 50% AC output will resume.

Recommended battery settings

Battery Type	Absorption Stage	Float Stage	Equalization Voltage (every 30 days 3hr)
AGM (or PCC)	14.2V (57.6V)	13.4V (53.6V)	14.2V (57.6V)
Gel	14.1V (56.4V)	13.5V (54.0V)	
Wet	14.7V (59.0V)	13.7V (55.0V)	14.7V (59.0V)
Lithium	Follow its BMS voltage parameters		

9.6 System Work Mode Setup Menu

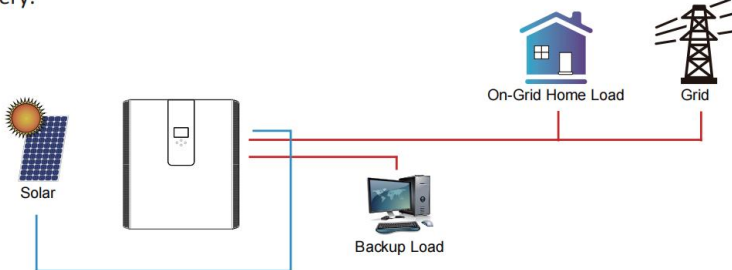


Work Mode

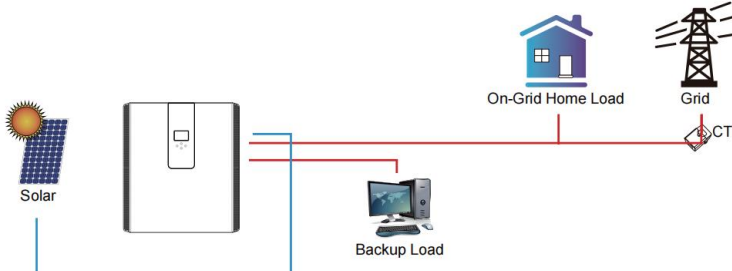
Selling First: This Mode allows hybrid inverter to sell back any excess power produced by the solar panels to the grid. If time of use is active, the battery energy also can be sold into grid. The PV energy will be used to power the load and charge the battery and then excess energy will flow to grid. Power source priority for the load is as follows:

1. Solar Panels.
2. Grid.
3. Batteries (until programable % discharge is reached).

Zero Export To Load: Hybrid inverter will only provide power to the backup load connected. The hybrid inverter will neither provide power to the home load nor sell power to grid. The built-in CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load and charge the battery.



Zero Export To CT: Hybrid inverter will not only provide power to the backup load connected but also give power to the home load connected. If PV power and battery power is insufficient, it will take grid energy as supplement. The hybrid inverter will not sell power to grid. In this mode, a CT is needed. The installation method of the CT please refer to chapter 3.6 CT Connection. The external CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load, charge battery and home load.



Solar Sell: "Solar sell" is for Zero export to load or Zero export to CT: when this item is active, the surplus energy can be sold back to grid. When it is active, PV Power source priority usage is as follows: load consumption and charge battery and feed into grid.

Max. sell power: Allowed the maximum output power to flow to grid.

Zero-export Power: for zero-export mode, it tells the grid output power. Recommend to set it as 20-100W to ensure the hybrid inverter won't feed power to grid.

Energy Pattern: PV Power source priority.

Batt First: PV power is firstly used to charge the battery and then used to power the load. If PV power is insufficient, grid will make supplement for battery and load simultaneously.

Load First: PV power is firstly used to power the load and then used to charge the battery. If PV power is insufficient, grid will make supplement for battery and load simultaneously.

Max Solar Power: allowed the maximum DC input power.

Grid Peak-shaving: when it is active, grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and battery as supplement. If still can't meet the load requirement, grid power will increase to meet the load needs.

System Work Mode						
Grid Charge	Gen	Time Of Use		Power	Batt	Work Mode2
		Time	Time			
<input type="checkbox"/>	<input type="checkbox"/>	01:00	5:00	5000	49.0V	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	05:00	9:00	5000	50.2V	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	09:00	13:00	5000	50.9V	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	13:00	17:00	5000	51.4V	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	17:00	21:00	5000	47.1V	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	21:00	01:00	5000	49.0V	

Time of use: it is used to program when to use grid or generator to charge the battery, and when to discharge the battery to power the load. Only tick "Time Of Use" then the follow items (Grid, charge, time, power etc.) will take effect.

Note: when in selling first mode and click time of use, the battery power can be sold into grid.

Grid charge: utilize grid to charge the battery in a time period.

Gen charge: utilize diesel generator to charge the battery in a time period.

Time: real time, range of 01:00-24:00.

Power: Max. discharge power of battery allowed.

Batt(V or SOC %): battery SOC % or voltage at when the action is to happen.

System Work Mode						
Grid Charge	Gen	Time Of Use		Power	Batt	Work Mode2
		Time	Time			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	01:00	5:00	5000	80%	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	05:00	8:00	5000	40%	
<input type="checkbox"/>	<input type="checkbox"/>	08:00	10:00	5000	40%	
<input type="checkbox"/>	<input type="checkbox"/>	10:00	15:00	5000	80%	
<input type="checkbox"/>	<input type="checkbox"/>	15:00	18:00	5000	40%	
<input type="checkbox"/>	<input type="checkbox"/>	18:00	01:00	5000	35%	

For example:

During 01:00-05:00, when battery SOC is lower than 80%, it will use grid to charge the battery until battery SOC reaches 80%.

During 05:00-08:00 and 08:00-10:00, when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

During 10:00-15:00, when battery SOC is higher than 80%, hybrid inverter will discharge the battery until the SOC reaches 80%.

During 15:00-18:00, when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

During 18:00-01:00, when battery SOC is higher than 35%, hybrid inverter will discharge the battery until the SOC reaches 35%.

System Work Mode						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

It allows users to choose which day to execute the setting of "Time of Use".

For example, the inverter will execute the time of use page on Mon/Tue/Wed/Thu/Fri/Sat only.

9.7 Grid Setup Menu

Grid Setting

Unlock Grid Setting

Grid Mode: General Standard 0/16

Grid Frequency: 50Hz 60Hz

INV Output Voltage: 240V
220V
230V
200V

Grid Type: Single Phase
 120/240V Split Phase
 120/208V 3 Phase

↑ Grid Set1
↓
✕
✓

Unlock Grid Setting: before changing the grid parameters, please enable this with password of 7777. Then it is allowed to change the grid parameters.

Grid Mode: General Standard、UL1741 & IEEE1547、CPUC RULE21、SRD-UL-1741、CEI 0-21、EN50549_CZ、Australia_A、Australia_B、Australia_C、NewZealand、VDE4105、OVE_Directive_R25、EN50549_CZ_PPDS_L16A、NRS097、G98/G99、G98/G99_NI、ESB Networks(Ireland). Please follow the local grid code and then choose the corresponding grid standard.

Grid Setting/Connect

Normal connect: Normal Ramp rate 60s

Low frequency: 48.00Hz High frequency: 51.50Hz

Low voltage: 185.0V High voltage: 265.0V

Reconnect after trip: Reconnect Ramp rate 60s

Low frequency: 48.20Hz High frequency: 51.30Hz

Low voltage: 187.0V High voltage: 263.0V

Reconnection Time: 60s PF: 1.000

↑ Grid Set2
↓
✕
✓

Normal connect: The allowed grid voltage/frequency range when the inverter first time connect to the grid.

Normal Ramp rate: It is the startup power ramp.

Reconnect after trip: The allowed grid voltage /frequency range for the inverter connects the grid after the inverter trip from the grid.

Reconnect Ramp rate: It is the reconnection power ramp.

Reconnection time: The waiting time period for the inverter connects the grid again.

PF: Power factor which is used to adjust inverter reactive power.

Grid Setting/IP Protection

Over voltage $U > (10 \text{ min. running mean})$ 260.0V

HV3	265.0V		HF3	51.50Hz	
HV2	265.0V	0.10s	HF2	51.50Hz	0.10s
HV1	265.0V	0.10s	HF1	51.50Hz	0.10s
LV1	185.0V	0.10s	LF1	48.00Hz	0.10s
LV2	185.0V	0.10s	LF2	48.00Hz	0.10s
LV3	185.0V		LF3	48.00Hz	

↑ Grid Set3
↓
✕
✓

HV1: Level 1 overvoltage protection point;
HV2: Level 2 overvoltage protection point; **②** 0.10s—Trip time.
HV3: Level 3 overvoltage protection point.

LV1: Level 1 undervoltage protection point;
LV2: Level 2 undervoltage protection point;
LV3: Level 3 undervoltage protection point.

HF1: Level 1 over frequency protection point;
HF2: Level 2 over frequency protection point;
HF3: Level 3 over frequency protection point.

LF1: Level 1 under frequency protection point;
LF2: Level 2 under frequency protection point;
LF3: Level 3 under frequency protection point.

Grid Setting/F(W)

F(W)

Over frequency: Droop f 40%PE/Hz

Start freq f: 50.20Hz Stop freq f: 50.20Hz

Start delay f: 0.00s Stop delay f: 0.00s

Under frequency: Droop f 40%PE/Hz

Start freq f: 49.80Hz Stop freq f: 49.80Hz

Start delay f: 0.00s Stop delay f: 0.00s

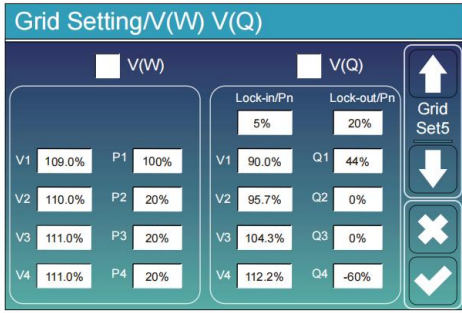
↑ Grid Set4
↓
✕
✓

FW: this series inverter is able to adjust inverter output power according to grid frequency.

Droop f: percentage of nominal power per Hz

For example, "Start freq $f > 50.2\text{Hz}$, Stop freq $f < 50.2$, Droop $f = 40\%PE/Hz$ " when the grid frequency reaches 50.2Hz, the inverter will decrease its active power at Droop f of 40%. And then when grid system frequency is less than 50.2Hz, the inverter will stop decreasing output power.

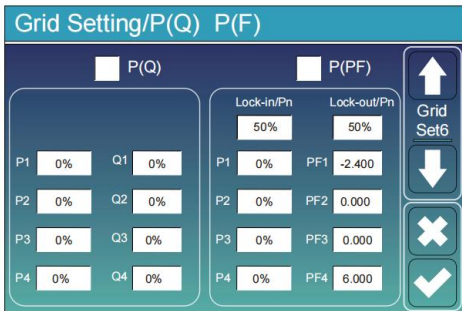
For the detailed setup values, please follow the local grid code.



V(W): It is used to adjust the inverter active power according to the set grid voltage.
V(Q): It is used to adjust the inverter reactive power according to the set grid voltage.
 This function is used to adjust inverter output power (active power and reactive power) when grid voltage changes.

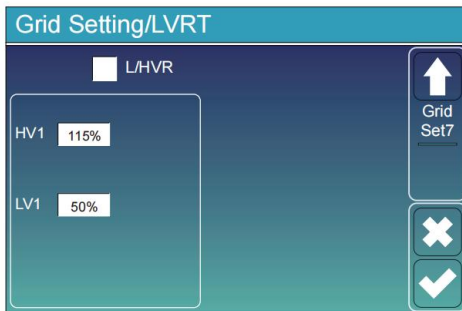
Lock-in/Pn 5%: When the inverter active power is less than 5% rated power, the VQ mode will not take effect.
Lock-out/Pn 20%: If the inverter active power is increasing from 5% to 20% rated power, the VQ mode will take effect again.

For example: V2=110%, P2=20%. When the grid voltage reaches the 110% times of rated grid voltage, inverter output power will reduce its active output power to 20% rated power.
 For example: V1=90%, Q1=44%. When the grid voltage reaches the 90% times of rated grid voltage, inverter output power will output 44% reactive output power.
 For the detailed setup values, please follow the local grid code.



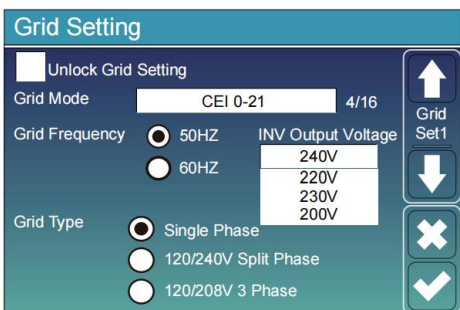
P(Q): It is used to adjust the inverter reactive power according to the set active power.
P(PF): It is used to adjust the inverter PF according to the set active power.
 For the detailed setup values, please follow the local grid code.

Lock-in/Pn 50%: When the inverter output active power is less than 50% rated power, it won't enter the P(PF) mode.
Lock-out/Pn 50%: When the inverter output active power is higher than 50% rated power, it will enter the P(PF) mode.
 Note : only when the grid voltage is equal to or higher than 1.05times of rated grid voltage, then the P(PF) mode will take effect.

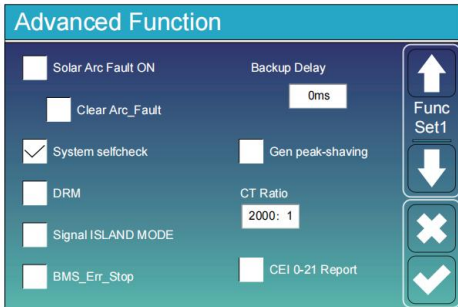
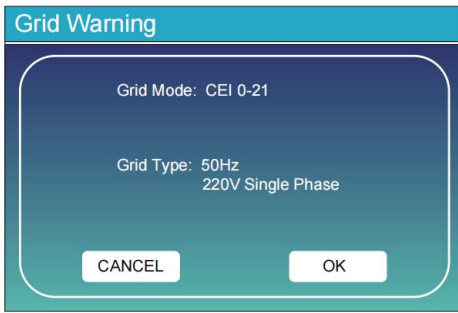


Reserved: This function is reserved. It is not recommended.

9.8 The Method of CEI-021 Standard Self-Check



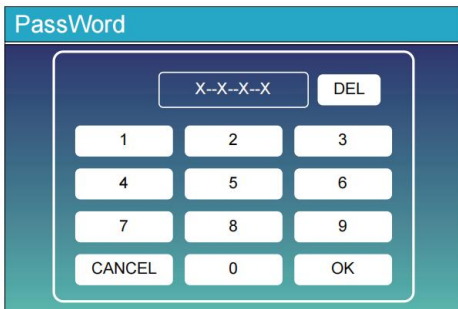
Firstly, tick the "CEI-021" and "Single phase/50Hz" on the grid setting menu.



Secondly, tick "System selfcheck", then it will ask you input the password, and the default password is 1234.

Note: please don't tick "CEI-021 Report".

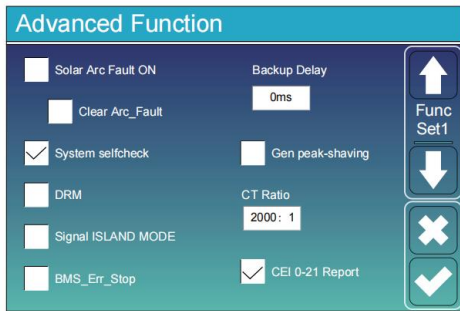
This "System selfcheck" program is valid only after choosing grid type as "CEI-021".



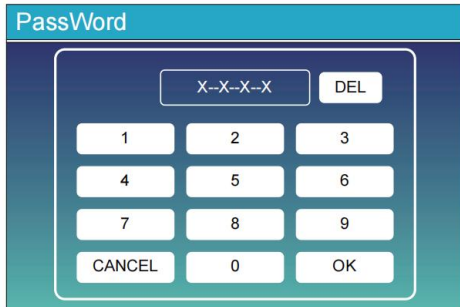
The default password is 1234
After input the password and then tick "OK"

Inverter ID : 2012041234	
Self-Test OK	8/8
Testing 59.S1...	Test 59.S1 OK!
Testing 59.S2...	Test 59.S2 OK!
Testing 27.S1...	Test 27.S1 OK!
Testing 27.S2...	Test 27.S2 OK!
Testing 81>S1...	Test 81>S1 OK!
Testing 81>S2...	Test 81>S2 OK!
Testing 81<S1...	Test 81<S1 OK!
Testing 81<S2...	Test 81<S2 OK!

During the self-test process, all the indicators will be on and the alarm keeps on.
When all the test items shows OK, which means the self-test is completed successfully.



then press “esc” button to quit from this page. Tick “system selfcheck” on the Advanced function menu and tick “CEI-021 Report”.

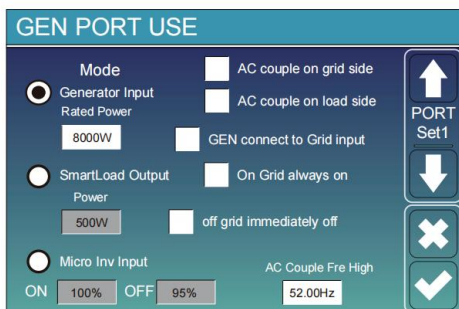


System selfcheck: After ticking this item, it needs input the password. The default password is 1234. After input the password and then tick "OK"

Inverter ID : 2012041234			
Self-Test Report			
59.S1 threshold	253V	900ms	59.S1: 228V 902ms
59.S2 threshold	264.5V	200ms	59.S2: 229V 204ms
27.S1 threshold	195.5V	1500ms	27.S1: 228V 1508ms
27.S2 threshold	34.5V	200ms	27.S2: 227V 205ms
81>.S1 threshold	50.2Hz	100ms	81>.S1: 49.9Hz 103ms
81>.S2 threshold	51.5Hz	100ms	81>.S2: 49.9Hz 107ms
81<.S1 threshold	49.8Hz	100ms	81<.S1: 50.0Hz 95ms
81<.S2 threshold	47.5Hz	100ms	81<.S2: 50.1Hz 97ms

This page will shows the test result of "CEI-021 self-check".

9.9 Generator Port Use Setup Menu



Generator input rated power: allowed Max. power from diesel generator.
GEN connect to grid input: connect the diesel generator to the grid input port.
Smart Load Output: This mode utilizes the Gen input connection as an output which only receives power when the battery SOC and PV power is above a user programmable threshold.
e.g. Power=500W, ON: 100%, OFF=95%: When the PV power exceeds 500W, and battery bank SOC reaches 100%, Smart Load Port will switch on automatically and power the load connected. When the battery bank SOC < 95% or PV power < 500w, the Smart Load Port will switch off automatically.

Smart Load OFF Batt

- Battery SOC at which the Smart load will switch off.

Smart Load ON Batt

- Battery SOC at which the Smart load will switch on. Also, the PV input power should exceed the setting value (Power) simultaneously and then the Smart load will switch on.

On Grid always on: When click "on Grid always on" the smart load will switch on when the grid is present.

off grid immediately off: the smart load will stop working immediately when the grid is disconnected if this item is active.

Micro Inv Input: To use the Generator input port as a micro-inverter on grid inverter input (AC coupled), this feature will also work with "Grid-Tied" inverters.

- * **Micro Inv Input OFF:** when the battery SOC exceeds setting value, Microinverter or grid-tied inverter will shut down.
- * **Micro Inv Input ON:** when the battery SOC is lower than setting value, Microinverter or grid-tied inverter will start to work.

AC Couple Fre High: If choosing "Micro Inv input", as the battery SOC reaches gradually setting value (OFF), During the process, the microinverter output power will decrease linear. When the battery SOC equals to the setting value (OFF), the system frequency will become the setting value (AC couple Fre high) and the Microinverter will stop working. Stop exporting power produced by the microinverter to the grid.

- * **Note:** Micro Inv Input OFF and On is valid for some certain FW version only.
- * **AC couple on load side:** connecting the output of on-grid inverter at the load port of the hybrid inverter. In this situation, the hybrid inverter will not able to show the load power correctly.
- * **AC couple on grid side:** this function is reserved.
- * **Note:** Some firmware versions don't have this function.

9.10 Advanced Function Setup Menu

Advanced Function

Solar Arc Fault ON Backup Delay: 0ms

Clear Arc_Fault

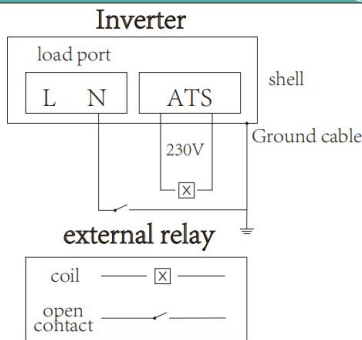
System selfcheck Gen peak-shaving

DRM CT Ratio: 2000: 1

Signal ISLAND MODE

BMS_Err_Stop CEI 0-21 Report

Func Set1



Solar Arc Fault ON: Enable the solar arc protection function. Note: This function is optional.

Clear Arc_Fault: Eliminate arc fault and reset. Note: This function is optional.

Gen Peak-shaving: Enable When the power of the generator exceeds the rated value of it, the inverter will provide the redundant part to ensure that the generator will not overload.

DRM: For AS4777 standard.

Backup Delay: When the grid cuts off, the inverter will give output power after the setting time.

For example, backup delay: 3ms. the inverter will give output power after 3ms when the grid cuts off.

Note: for some old FW version, the function is not available.

BMS_Err_Stop: When it is active, if the battery BMS failed to communicate with inverter, the inverter will stop working and report fault.

Signal ISLAND MODE: when "signal island mode" is checked and the inverter connects the grid, the ATS port voltage will be 0. When "signal island mode" is checked and the inverter disconnected from the grid, the ATS port voltage will output 230Vac voltage. With this feature and outside NO type relay, it can realize N and PE disconnection or bond.

More details, please refer to left side picture.

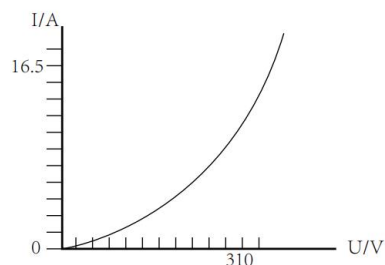
Advanced Function

DC 1 for WindTurbine DC 2 for WindTurbine

V1	90V	0.0A	V7	210V	9.0A
V2	110V	1.5A	V8	230V	10.5A
V3	130V	3.0A	V9	250V	12.0A
V4	150V	4.5A	V10	270V	13.5A
V5	170V	6.0A	V11	290V	15.0A
V6	190V	7.5A	V12	310V	16.5A

Wind Set2

This is for Wind Turbine



Advanced Function

Parallel Modbus SN A Phase
 Master 00 B Phase
 Slave C Phase

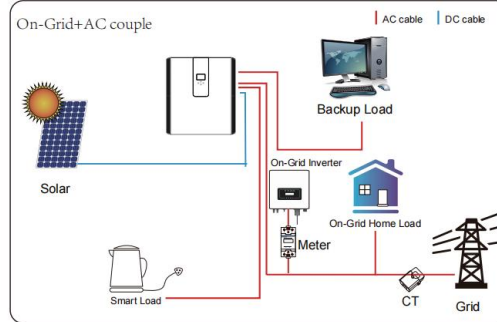
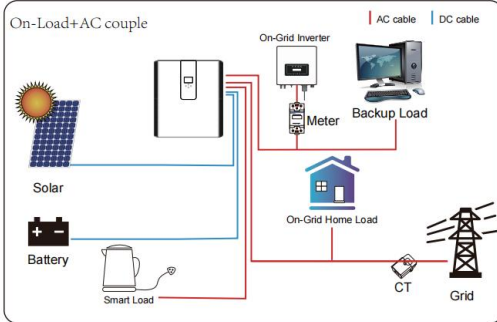
Ex_Meter For CT Meter Select
 A Phase CHNT-3P 0/4
 B Phase CHNT-1P
 C Phase Eastron-3P
 Grid Side INV Meter2 Eastron-1P

↑ Parol. Set3
↓
✕
✓

Ex_Meter For CT: when in Three phase system with CHNT Three phase energy meter (DTSU666), click corresponding phase where hybrid inverter is connected. e.g. when the hybrid inverter output connects to A phase, please click A Phase.

Meter Select: select the corresponding meter type according to the meter installed in the system.

Grid Side INV Meter2: when there's a string inverter AC couple at the grid or load side of hybrid inverter and there's a meter installed for the string inverter, then the hybrid inverter LCD will show the string inverter output power on its PV icon. Please make sure the meter can communicate with the hybrid inverter successfully.



Advanced Function

ATS ON
 8820W 8320W
 Export power limiter Import power limiter

Low Noise Mode
 Low Power Mode<Low Batt
 MPPT Multi-Point Scanning

↑ Func Set4
↓
✕
✓

ATS: It is related with ATS port voltage. it is better in "uncheck" position.

Export power limiter: It is used to setup the allowed the maximum output power to flow to grid.

Import power limiter: when it is active, the grid output power will be limited. its priority is lower than "grid peak shaving" if the "grid peak shaving" is selected.

Low Noise Mode: In this mode, inverter will work in "low noise mode".

Low Power Mode<Low Batt: if selected and when battery SOC is less than "Low Batt" value, the self-consumption power of inverter will be from grid and battery simultaneously. If unselected, the self-consumption power of inverter will be mainly from grid.

MPPT Multi-Point Scanning: it will check whether the I/V of PV is working on its Max. power point. If not, then it will adjust I/V to the Max. power point.

9.11 Device Info Setup Menu

Device Info.

Inverter ID: 1601012001 Flash
 HMI: Ver0302 MAIN:Ver 0-5213-0717

Alarms Code	Occurred
F64 Heatsink_HighTemp_Fault	2019-03-11 15:56
F64 Heatsink_HighTemp_Fault	2019-03-08 10:46
F64 Heatsink_HighTemp_Fault	2019-03-08 10:45

↑ Device Info
↓
✕
✓

This page show Inverter ID, Inverter version and alarm codes.


HMI: LCD version

MAIN: Control board FW version

10.Fault Content

10.1 Fault Information and Processing

The energy storage inverter is designed according to the grid-connected operation standard and meets the safety requirements and electromagnetic compatibility requirements. Before leaving the factory, the inverter undergoes several rigorous tests to ensure that the inverter can operate reliably.



If any of the fault messages listed in Table7-1 appear on your inverter and the fault has not been removed after restarting, please contact your local dealer or service center. you need to have the following information ready.

1. Inverter serial number.
2. Distributor or service center of the inverter .
3. on-grid power generation date.
4. The problem description (including the fault code and indicator status displayed on the LCD) is as detailed as possible.
5. your contact information. In order to give you a clearer understanding of the inverter's fault information, we will list all possible fault code sand their descriptions when the inverter is not working properly.

10.2 Low Voltage Fault Analysis Method

The cloud platform or LCD displays the hexadecimal value of the original fault. Each Bit indicates a fault. 1 indicates yes and 0 indicates none.

0x0000 0x0000
0x0000 0x0000

The preceding data corresponds to CAN packets in the PCS CAN communication protocol.
Corresponding CAN packet:

byte0、 1 byte2、 3
byte4、 5 byte6、 7

For example, parsing red fonts fails and converting them to binary
That is: byte0: bit7 bit6 bit5 bit4 bit3 bit2 bit1 bit0

Bit7	Bit6	Bit5	Bit4	Bit	Bit2	Bit1	Bit0
Cell under temperature (Charge) (Errcode:8)	Cell over temperature (Charge) (Errcode:7)	Discharge Over Current (Errcode:6)	Charge over Current (Errcode:5)	Reserved	Reserved	Cell under voltage (Errcode:2)	Cell over Voltage (Errcode:1)

Byte1: bit7 bit6 bit5 bit4 bit3 bit2 bit1 bit0

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Reserved	Reserved	Heating film over Temperature (Errcode:14)	Mos over temperature (Errcode:13)	Cell temperature over Difference (Errcode:12)	Cell voltage over difference (Errcode:11)	Reserved	Reserved

For example, parse blue font failure and convert it to binary

That is: byte2: bit7 bit6 bit5 bit4 bit3 bit2 bit1 bit0

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
AFE-SCDL (Errcode:24)	Reserved	Reserved	Reserved	Reserved	AFE- OCDL/OCD1/ OCD2 (Errcode:19)	Reserved	Reserved

Byte3: bit7 bit6 bit5 bit4 bit3 bit2 bit1 bit0

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Master Address Repeat (Errcode:31)	PCS communication Fail (Errcode:30)	Internal communication Fail (Errcode:30)	EEPROM error (Errcode:29)	Mosfet short circuit (Errcode:28)	Temperature Sampling fail (Errcode:27)	Cell voltage Sampling fail (Errcode:26)	AFE communication Fail (Errcode:25)

For example, parse the purple font failure and convert it to binary.

That is: byte4: bit7 bit6 bit5 bit4 bit3 bit2 bit1 bit0

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

Byte5: bit7 bit6 bit5 bit4 bit3 bit2 bit1 bit0

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Heat Error (Errcode:2)	Heat Mos Adhesion (Errcode:1)	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

For example, parse the green font failure and convert it to binary

That is: byte6: bit7 bit6 bit5 bit4 bit3 bit2 bit1 bit0

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
CHG_VOLT _LOW (Errcode:8)	TEMP_OPE N_WIRE_F AIL (Errcode:7)	VOLT_OP EN_WIRE_ FAIL (Errcode:6)	FUSE Blown (Errcode:5)	OverTermi nalTemp	Charge Inversed (Errcode:4)	Pre Charge Failed (Errcode:3)	OverConnect Temp

Byte7: Disable

Error code	Description	Solutions
F08	GFDI_Relay_Failure	<ol style="list-style-type: none"> 1.When inverter is in Split phase(120/240Vac)or three-phase system (120/208Vac) system,the back up load port N line needs to connect ground. 2.If the fault still exists,please contact us for help.
F13	Working mode change	<ol style="list-style-type: none"> 1.When the grid type and frequency changed it will report F13. 2.When the battery mode was changed to “No battery”mode, it will report F13. 3.For some old FW version,it will reportF13 when the system work mode changed. 4,Generally,it will disappear automatically when shows F13. 5.If still same,and turn off the DC switch and AC switch and wait for one minute and then turn on the DC/AC switch. 6.Seek help from us,if can not go back to normal state.
F18	AC over current fault of hardware	<p>AC side over current fault</p> <ol style="list-style-type: none"> 1.Please check whether the back up load power and common load power are within the range. 2.Restart and check whether it is in normal. 3.Seek help from us,if can not go back to normal state.
F20	DC over current fault of the hardware	<p>DC side over current fault</p> <ol style="list-style-type: none"> 1.Check PV module connect and battery connect. 2.When in the off-grid mode,the inverter startup with big power load,it may report F20.Please reduce the load power connected. 3.Turn off the DC switch and AC switch and then wait one minute,then turn on the DC/AC switch again. 4.Seek help from us,if can not go back to normal state
F22	Tz_EmergStop_Fault	Please contact your installer for help.
F23	AC leakage current is transient over current	<p>Leakage current fault</p> <ol style="list-style-type: none"> 1.Check PV side cable ground connection. 2.Restart the system 2~3 times. 3.If the fault still exists,please contact us for help.

F24	DC insulation impedance failure	<p>PV isolation resistance is too low</p> <ol style="list-style-type: none"> 1.Check the connection of PV panels and inverter is firmly and correctly. 2.Check whether the PE cable of inverter is connected to ground. 3.Seek help from us,if can not go back to normal state.
F26	The DC busbar is unbalanced	<ol style="list-style-type: none"> 1.Please wait for a while and check whether it is normal. 2.When the hybrid in split phase mode,and the load of L1 and load ofL2 is big different,it will report the F26. 3.Restart the system 2~3 times. 4.Seek help from us,if can not go back to normal state.
F29	Parallel CANBus fault	<ol style="list-style-type: none"> 1.When in parallel mode,check the parallel communication cable connection and hybrid inverter communication address setting. 2.During the parallel system start up period,inverters will report F29. when all inverters are in ON status,it will disappear automatically. 3.If the fault still exists,please contact us for help.
F34	AC Over current fault	<ol style="list-style-type: none"> 1.Check the backup load connected,make sure it is in allowed power range. 2.If the fault still exists,please contact us for help.
F35	No AC grid	<p>No Utility</p> <ol style="list-style-type: none"> 1.Please confirm grid is lost or not. 2.Check the grid connection is good or not. 3.Check the switch between inverter and grid is on or not. 4.Seek help from us,if can not go back to normal state.
F41	Parallel system stop	<ol style="list-style-type: none"> 1.Check the hybrid inverter working status.If there's 1 pcs hybrid inverter is in OFF status,the other hybrid inverters may reportF41 fault in parallel system. 2.If the fault still exists,please contact us for help.
F42	AC linelow voltage	<p>Grid voltage fault</p> <ol style="list-style-type: none"> 1.Check the AC voltage is in the range of standard voltage in specification. 2.Check whether grid AC cables are firmly and correctly connected. 3.Seek help from us,if can not go back to normal state
F47	AC over frequency	<p>Grid frequency out of range</p> <ol style="list-style-type: none"> 1.Check the frequency is in the range of specification or not. 2.Check whether AC cables are firmly and correctly connected. 3.Seek help from us,if can not go back to normal state.
F48	AC lower frequency	<p>Grid frequency out of range</p> <ol style="list-style-type: none"> 1.Check the frequency is in the range of specification or not. 2.Check whether AC cables are firmly and correctly connected. 3.Seek help from us,ifcan notgo back to normal state.
F56	DC busbar voltage is too low	<p>Battery voltage low</p> <ol style="list-style-type: none"> 1.Check whether battery voltage is too low. 2.If the battery voltage is too low,using PV or grid to charge the battery.

		3.Seek help from us,if can not go back to normal state.
F58	BMS communication fault	1.it tells the communication between hybrid inverter and battery BMS disconnected when"BMS_Err-Stop"is active. 2.if don't want to see this happen,you can disable "BMS_Err-Stop"item on the LCD. 3.If the fault still exists,please contact us for help.
F63	ARC fault	1.ARC fault detection is only for US market. 2.Check PV module cable connection and clear the fault. 3.Seek help from us,if can not go back to normal state.
F64	Heat sink high temperature failure	Heat sink temperature is too high 1.Check whether the work environment temperature is too high. 2.Turn off the inverter for 10mins and restart. 3.Seek help from us,if can not go back to normal state.

Chart 7-1 Fault information

Under the guidance of our company,customers return our products so that our company can provide service of maintenance or replacement of products of the same value.Customers need to pay the necessary freight and other related costs.Any replacement or repair of the product will cover the remaining warranty period of the product.If any part of the product or product is replaced by the company itself during the warranty period,all rights and interests of there placement product or component belong to the company.

Factory warranty does not include damage due to the following reasons:

- Damage during transportation of equipment.
- Damage caused by incorrect installation or commissioning.
- Damage caused by failure to comply with operation instructions,installation instructions or maintenance instructions.
- Damage caused by attempts to modify,alter or repair products.
- Damage caused by incorrect use or operation.
- Damage caused by insufficient ventilation of equipment.
- Damage caused by failure to comply with applicable safety standards or regulations.
- Damage caused by natural disasters or force majeure (e.g.floods,lightning,over voltage,storms,fires,etc.)

In addition,normal wear or any other failure will not affect the basic operation of the product.Any external scratches,stains or natural mechanical wear does not represent a defect in the product.

11.FAQ

Q1: What type of battery does the product use? Is it safe?

Use high-quality lithium iron phosphate batteries. system multiple protection strategy, charge overload protection, discharge overload protection, to ensure the safe and normal operation of the battery.

Q2: How to judge the product in charge and discharge?

When charging, the LCD display displays the remaining charging time, the power indicator chart outside the battery power percentage starts to rotate, and displays the input power. LED lights flicker on charge and discharge.

Q3: How to clean this product?

Please use a dry, soft, clean cloth or paper towel to wipe the product.

Q4: How to store products?

When storing please turn off the power supply of the product, and then store the product in a dry, ventilated and suitable temperature environment. Do not store the product in an environment that is not conducive to the storage of the product, such as humidity, high temperature, large dust and high salinity, So as to avoid damage to the product. For long-term storage, it is recommended that the battery of this product be discharged to 50% and then charged to 100%for about one month. To extend the service life of this product.

12.After-Sales Service

During the use of the product, according to the normal operation of the user manual can not discharge the fault, please contact the dealer in time, and give clear feedback to the after-sales personnel: product model, purchase date, contact phone number, fault phenomenon.

1.The product warranty period is 10 years.The shelf life is calculated from the date of purchase by the consumer. In order to determine the date of purchase, consumers are asked to save the purchase of relevant bills and online shopping records.

2.During the warranty period, due to the damage caused by the product process or materials and non -human reasons, the company undertakes free maintenance and parts replacement obligations.

3.The following conditions are not covered by the warranty:

- a. Unauthorized disassembly and maintenance.
- b. Product performance failure due to human reasons.
- c. Damage caused by irresistible factors such as natural disasters, lightning, accidents.
- d. Appearance damage after use is not covered by warranty.