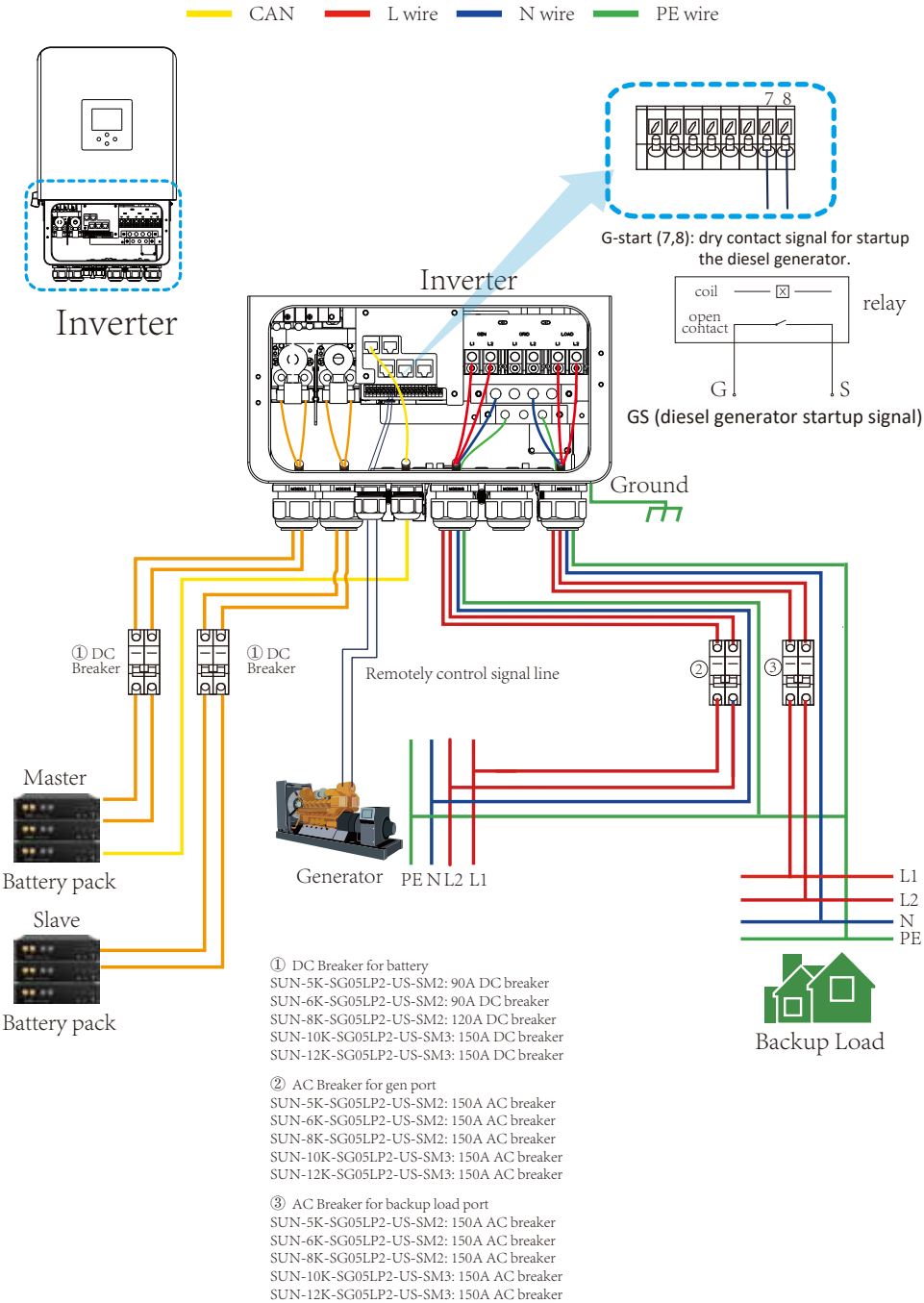
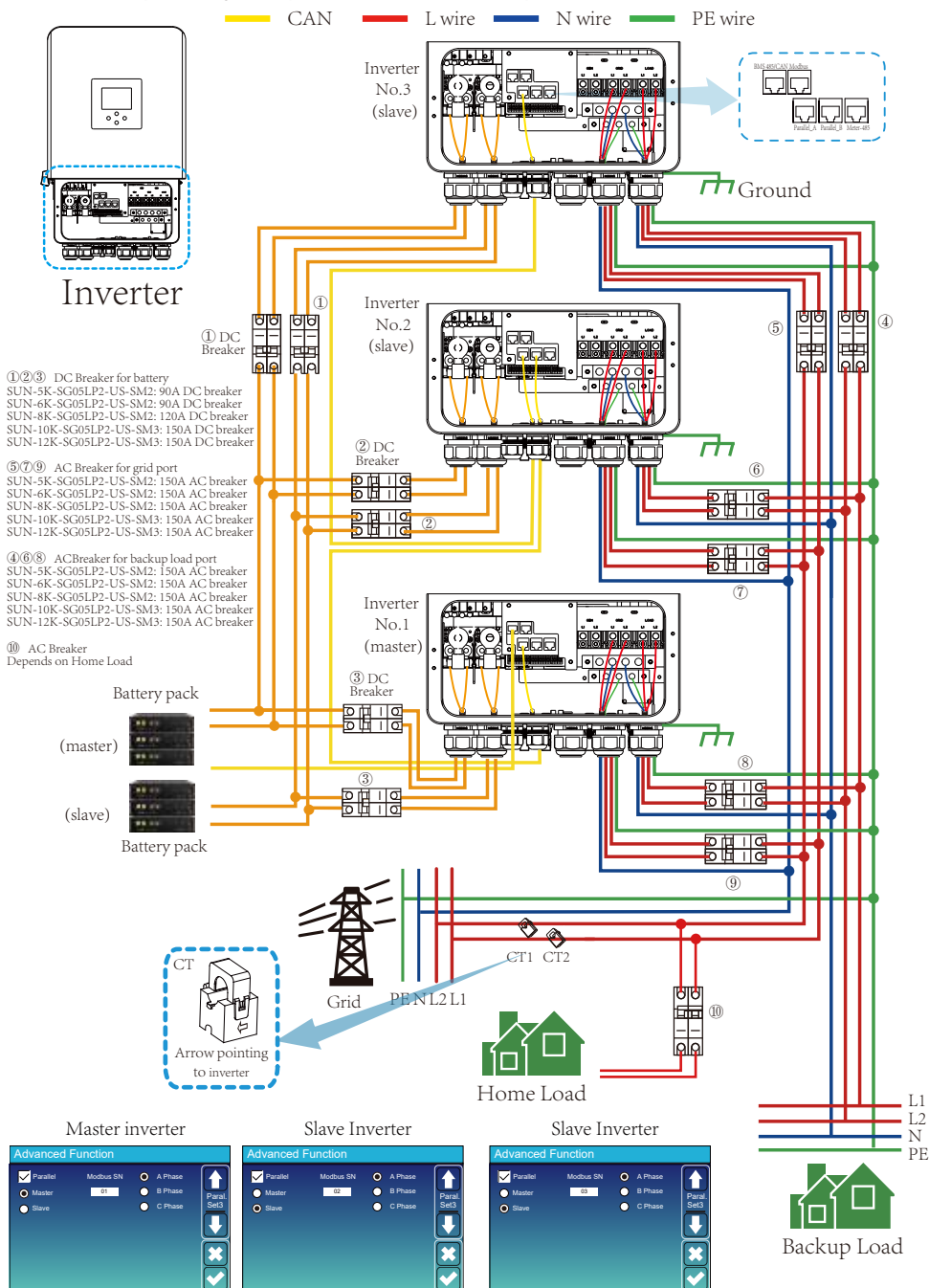


3.11 Typical application diagram of diesel generator



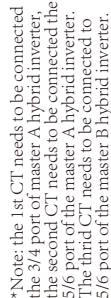
3.12 Split phase (120/240Vac) parallel connection diagram

Note: For the parallel system, please choose the "Zero export to CT" mode.



Note: For the parallel system, please choose the "Zero export to CT " mode.

Note: For the parallel system, please choose the "Zero export to CT " mode.



4. OPERATION

4.1 Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, simply press On/Off button(located on the left side of the case) to turn on the unit. When system without battery connected, but connect with either PV or grid, and ON/OFF button is switched off, LCD will still light up(Display will show OFF), In this condition, when switch on ON/OFF button and select NO battery,system can still working.

4.2 Operation and Display Panel

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

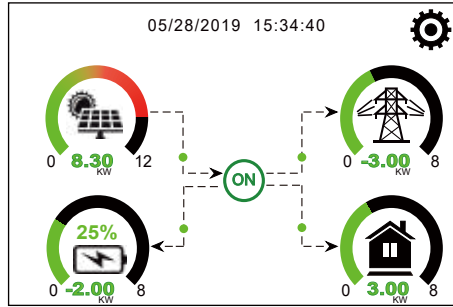
<i>Function Key</i>	<i>Description</i>
Esc	To exit setting mode
Up	To go to previous selection
Down	To go to next selection
Enter	To confirm the selection

Chart 4-2 Function Buttons

5. LCD Display Icons

5.1 Main Screen

The LCD is touchscreen, below screen shows the overall information of the inverter.



1.The icon in the center of the home screen indicates that the system is Normal operation. If it turns into "comm./F01~F64" , it means the inverter has communication errors or other errors, the error message will display under this icon(F01-F64 errors, detail error info can be viewed in the System Alarms menu).

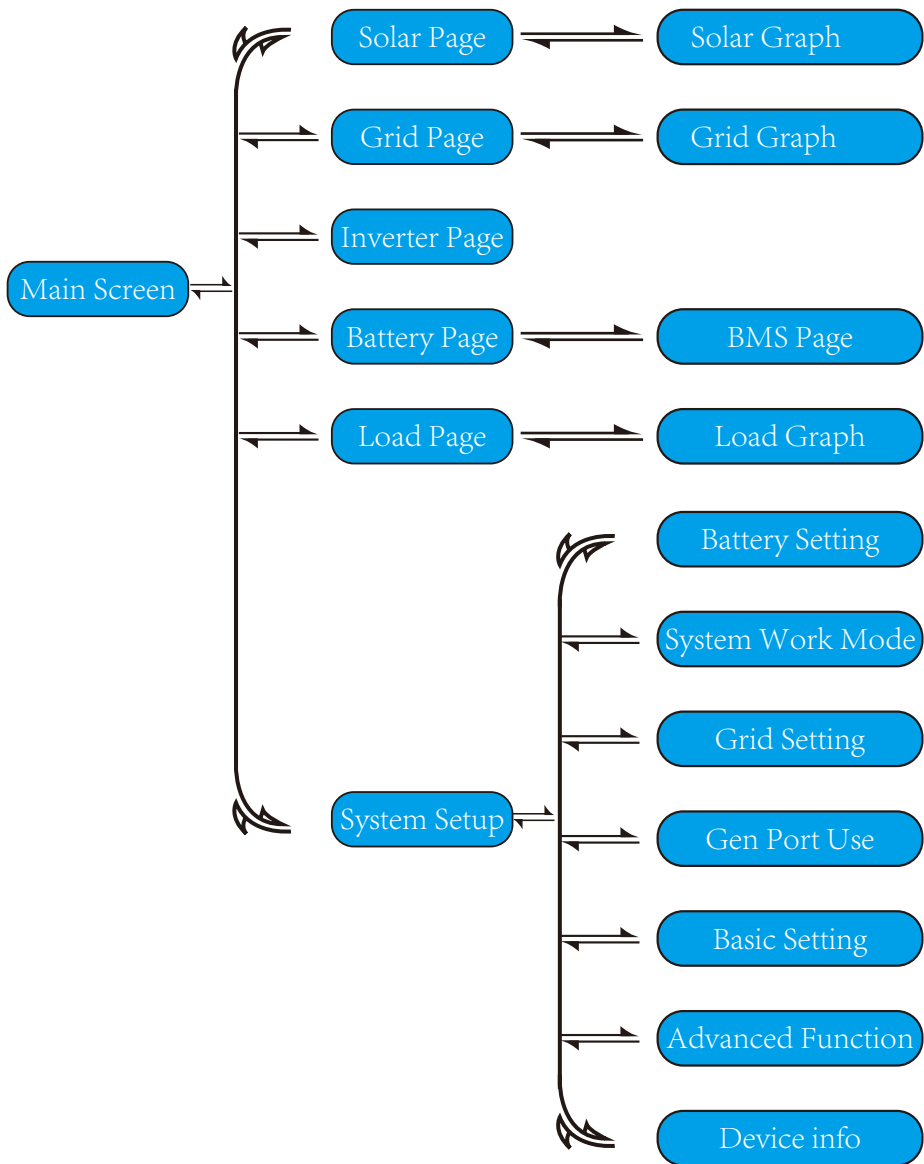
2.At the top of the screen is the time.

3.System Setup Icon, Press this set button,you can enter into the system setup screen which including Basic Setup, Battery Setup, Grid Setup, System Work Mode, Generator port use, Advanced function and Li-Batt info.

4.The main screen showing the info including Solar, Grid, Load and Battery. Its also displaying the energy flow direction by arrow. When the power is approximate to high level, the color on the panels will changing from green to red so system info showing vividly on the main screen.

- PV power and Load power always keep positive.
- Grid power negative means sell to grid, positive means get from grid.
- Battery power negative means charge, positive means discharge.

5.1.1 LCD operation flow chart



5.2 Solar Power Curve

Solar

Power: 2923W ①

Grid Tie Power: 2923W ②

PV1-V: 0V PV2-V: 0V PV3-V: 0V

PV1-I: 0A PV2-I: 0.1A PV3-I: 0.0A

P1: 0W P2: 0W P3: 0W

③

Today=0.3 KWH

Total =3.90 KWH

④

Energy

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.

Inverter

Power: 44W ①

DC-T:52.6C ③

0.0Hz ②

AC-T:41.0C

L1: 240V

I1:0.6A

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.

Load

Power: 0W ①

Today=0.0 KWH ③

L: 0V ②

Total =0.40 KWH

Energy

This is Load detail page.

① Load Power.

② Voltage, Power for each Phase.

③ Load consumption for Day and Total.

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.

Grid

Stand-by ①

BUY ③

Power: 0W

Today=2.2KWH

0.0Hz

Total =11.60 KWH

L1: 0V L2: 0V

CT1: 0W CT2: 0W

LD1: 0W LD2: 0W

②

SELL

Today=0.0KWH

Total =8.60 KWH

Energy

This is Grid detail page.

① Status, Power, Frequency.

② L1&L2: Voltage for each Phase

CT1&CT2: External Current Sensor Power

LD1&LD2: Internal Current Sensor Power.

③ BUY: Energy from Grid to Inverter,

SELL: Energy from Inverter to Grid.

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

Li-BMS				Sum Data	Details Data
Mean Voltage:50.34V	Charging Voltage :53.2V				
Total Current:55.00A	Discharging Voltage :47.0V				
Mean Temp :23.5C	Charging current :50A				
Total SOC :38%	Discharging current :25A				
Dump Energy:57Ah					
Request Force Charge					

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

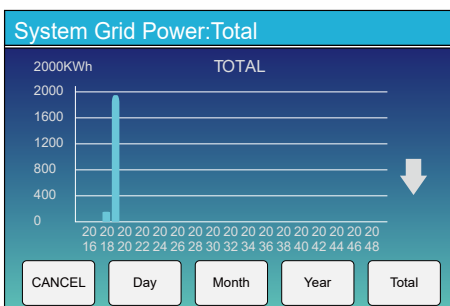
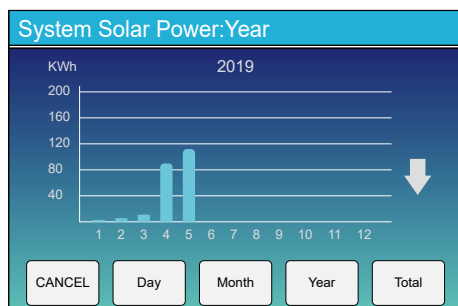
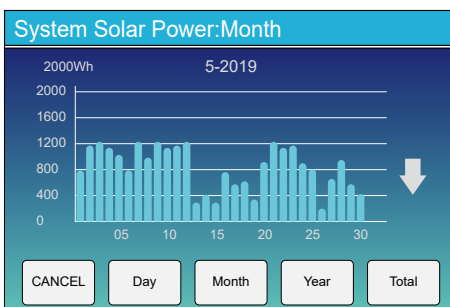
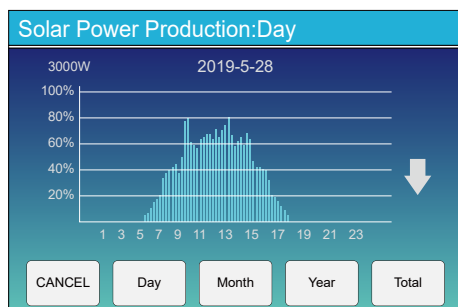
Li-BMS											Sum Data	Details Data		
	Volt	Curr	Temp	SOC	Energy	Charge		Fault						
						Volt	Curr							
1	50.38V	19.70A	30.6C	52.0%	26.0Ah	0.0V	0.0A	0.00						
2	50.33V	19.10A	31.0C	51.0%	25.5Ah	53.2V	25.0A	0.00						
3	50.30V	18.90A	30.2C	12.0%	6.0Ah	53.2V	25.0A	0.00						
4	0.00V	0.00A	0.0C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

Batt	
Stand-by	
SOC: 36%	
U:50.50V	
I:-58.02A	
Power: -2930W	
Temp:30.0C	
Li-BMS	

This is Battery detail page.

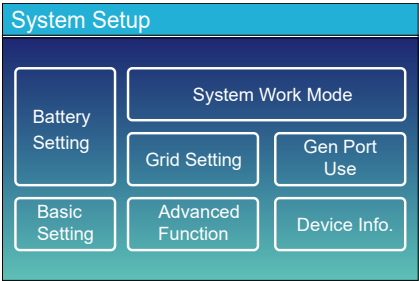
if you use Lithium Battery, you can enter BMS page.

5.3 Curve Page-Solar & Load & Grid



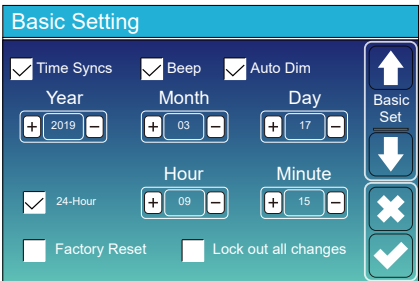
Solar power curve for daily, monthly, yearly and total can be roughly checked on the LCD, for more accuracy power generation, pls check on the monitoring system. Click the up and down arrow to check power curve of different period.

5.4 System Setup Menu

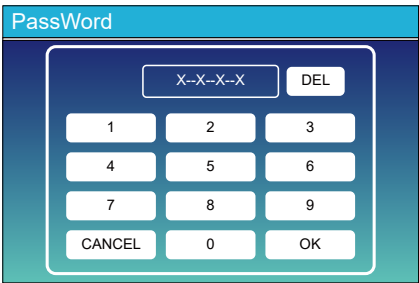


This is System Setup page.

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

5.6 Battery Setup Menu

Battery Setting

Batt Mode

☒ Lithium

☐ Use Batt V

☐ Use Batt %

☐ No Batt

☐ Activate Battery

☐ Disable Float Charge

Batt Capacity

400Ah

Max A Charge

40A

Max A Discharge

40A

↑

Batt Mode

↓

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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(0-120A for 5kW model, 0-135A for 6kW model, 0-190A for 8kW model, 0-220A for 10/12kW 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.

Battery Setting

Start 30%

A 40A

☐ Gen Charge

☐ Gen Signal

☐ Gen Force

30%

40A

☐ Grid Charge

☐ Grid Signal

↑

Batt Set2

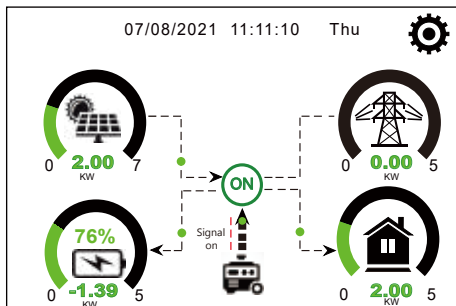
↓

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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		

5.7 System Work Mode Setup Menu

System Work Mode

☒ Selling First 8000 Max Solar Power

☐ Zero Export To Load ☒ Solar Sell

☐ Zero Export To CT ☒ Solar Sell

Max Sell Power 8000 Zero-export Power 20

Energy pattern ☒ BattFirst ☐ LoadFirst

☒ Grid Peak Shaving 8000 Power

Work Mode1

Work Mode

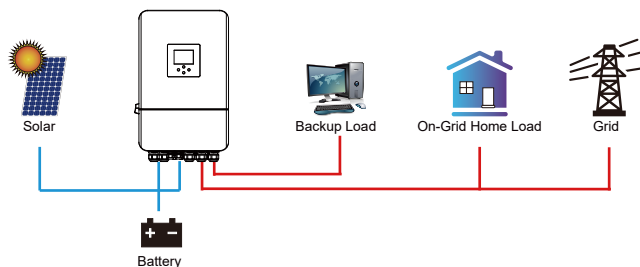
Selling First: This Mode allows hybrid inverter to sell back any excess power produced by the solar panels to the grid. If time of use is active, the battery energy also can be sold into grid.

The PV energy will be used to power the load and charge the battery and then excess energy will flow to grid.

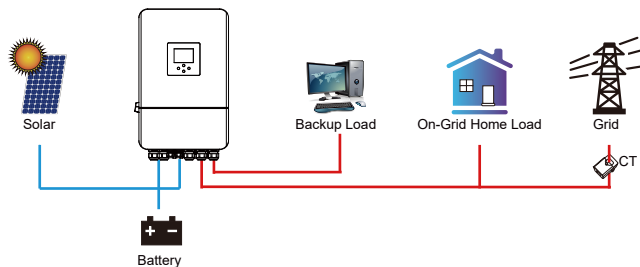
Power source priority for the load is as follows:

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	Time	Power	Batt	
☐	☐		01:00	5:00	5000	49.0V
☐	☐		05:00	9:00	5000	50.2V
☒	☐		09:00	13:00	5000	50.9V
☒	☐		13:00	17:00	5000	51.4V
☒	☐		17:00	21:00	5000	47.1V
☒	☐		21:00	01:00	5000	49.0V

↑ Work Mode2

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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.

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

Grid Charge	Gen	☒ Time Of Use	Time	Power	Batt	
☒	☐		01:00	5:00	5000	80%
☐	☐		05:00	8:00	5000	40%
☐	☐		08:00	10:00	5000	40%
☐	☐		10:00	15:00	5000	80%
☐	☐		15:00	18:00	5000	40%
☐	☐		18:00	01:00	5000	35%

↑ Work Mode2

↓

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✓

System Work Mode

Mon	Tue	Wed	Thu	Fri	Sat	Sun
☒	☒	☒	☒	☒	☒	☐

↑ Work Mode4

↓

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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.

5.8 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

Grid Set2

Grid Set3

Grid Set4

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

Grid Set3

Grid Set4

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 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

--

0.10s

LF3

48.00Hz

--

0.10s

Grid Set3

Grid Set4

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

Drop 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

Drop 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

Grid Set5

FW: this series inverter is able to adjust inverter output power according to grid frequency.
Drop f: percentage of nominal power per Hz
For example, “Start freq f > 50.2Hz, Stop freq f < 50.2, Drop f=40%PE/Hz” when the grid frequency reaches 50.2Hz, the inverter will decrease its active power at Drop 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.

Grid Setting/V(W) V(Q)

☐ V(W)
 ☐ V(Q)

V(W)		V(Q)	
		Lock-in/Pn	Lock-out/Pn
V1	109.0%	P1	100%
V2	110.0%	P2	20%
V3	111.0%	P3	20%
V4	111.0%	P4	20%

V(Q)	
V1	90.0% Q1 44%
V2	95.7% Q2 0%
V3	104.3% Q3 0%
V4	112.2% Q4 -60%

Grid Set5
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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.

Grid Setting/P(Q) P(F)

☐ P(Q)
 ☐ P(PF)

P(Q)		P(PF)	
		Lock-in/Pn	Lock-out/Pn
P1	0%	Q1	0%
P2	0%	P2	0%
P3	0%	Q3	0%
P4	0%	Q4	0%

P(PF)	
P1	0% PF1 -2.400
P2	0% PF2 0.000
P3	0% PF3 0.000
P4	0% PF4 6.000

Grid Set6
 ↑
 ↓
 ✕
 ✓

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 1.05 times of rated grid voltage, then the P(PF) mode will take effect.

Grid Setting/LVRT

☐ L/HVR

HV1	115%
LV1	50%

Grid Set7
 ↑
 ↓
 ✕
 ✓

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

5.9 Generator Port Use Setup Menu

GEN PORT USE

☐ Mode
 ☐ AC couple on grid side

☐ Generator Input Rated Power
 ☐ AC couple on load side

☐ SmartLoad Output Power
 ☐ GEN connect to Grid input

☐ Micro Inv Input
 ☐ On Grid always on

☐ OFF
 ☐ off grid immediately off

AC Couple Freq High

100% 95% 52.00Hz

PORT Set1
 ↑
 ↓
 ✕
 ✓

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.

5.10 Advanced Function Setup Menu

Advanced Function

☐ Solar Arc Fault ON(Optional)

Backup Delay

0ms

☐ Clear Arc_Fault(Optional)

☐ System selfcheck

☐ DRM

CT Ratio

2000: 1

☐ Signal ISLAND MODE

☐ BMS_Err_Stop

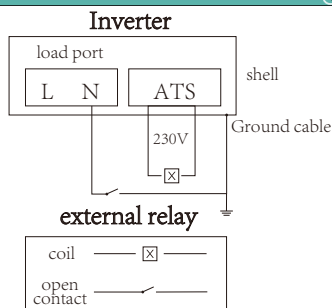
CEI 0-21 Report

↑
Func
Set1

↓

✕

✓



Solar Arc Fault ON(Optional): For '-US' version hybrid inverter, this feature is standard. After enabling this function, the inverter will detect whether there is a arcing fault on the PV side. If arcing occurs, the inverter will report a fault and stop outputting power.

Clear Arc_Fault(Optional): After the arc fault on the PV side is eliminated, enabling this function can eliminate the arc fault alarm of the inverter and restore normal operation of the inverter.

System selfcheck: Disable. this is only for factory.

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

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

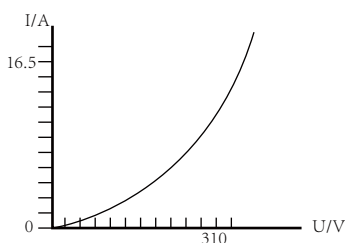
↑
Wind
Set2

↓

✕

✓

This is for Wind Turbine



Advanced Function

☐ Parallel
 ☒ Master
 ☐ Slave

Modbus SN: 00

☒ A Phase
☐ B Phase
☐ C Phase

☐ Ex_Meter For CT

Meter Select: CHNT-3P 0/4
 CHNT-1P
 Easton-3P
 Easton-1P

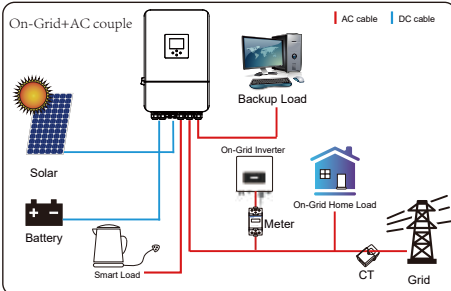
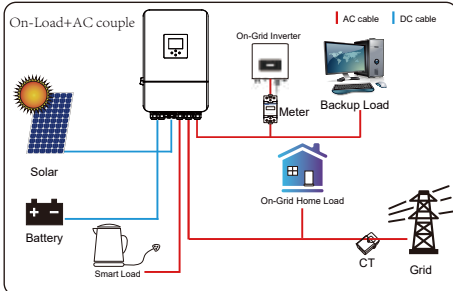
☐ Grid Side INV Meter2

↑ Par. 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 Export power limiter

8320W 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 then "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 then "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.

5.11 Device Info Setup Menu

Device Info.

Inverter ID: 1601012001
 HMI: Ver0302

Flash
 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
 ↓
 ✕
 ✓

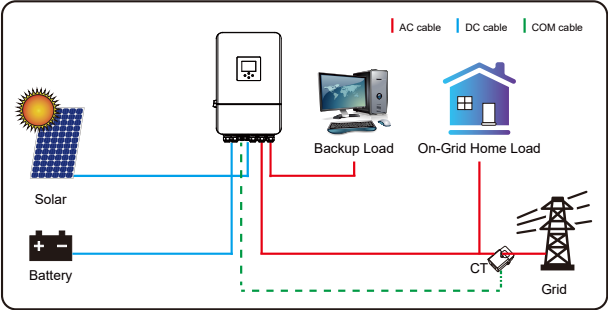
This page show Inverter ID, Inverter version and alarm codes.

HMI: LCD version

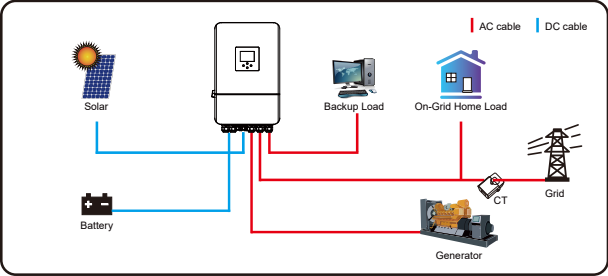
MAIN: Control board FW version

6. Mode

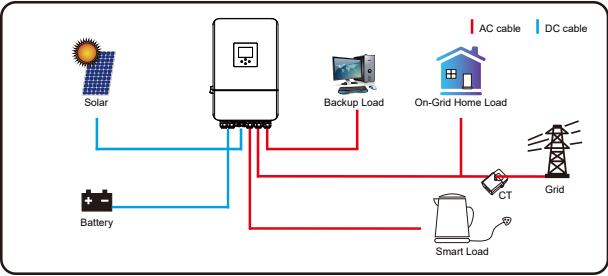
Mode I:Basic



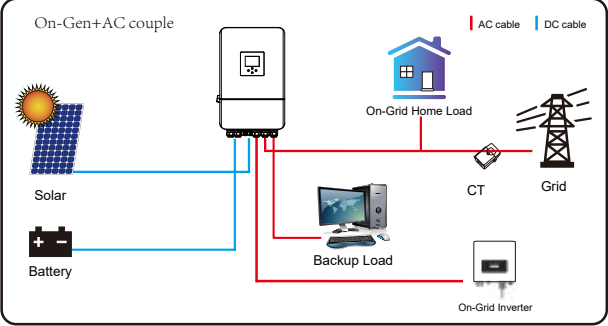
Mode II: With Generator

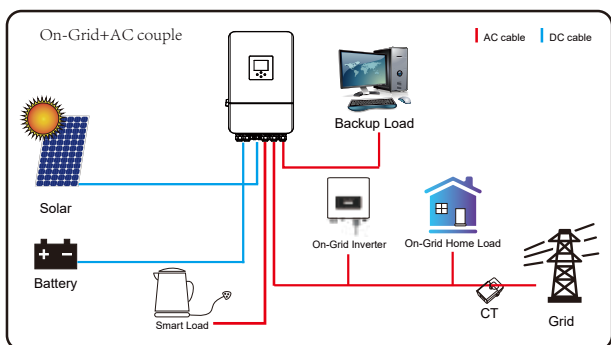
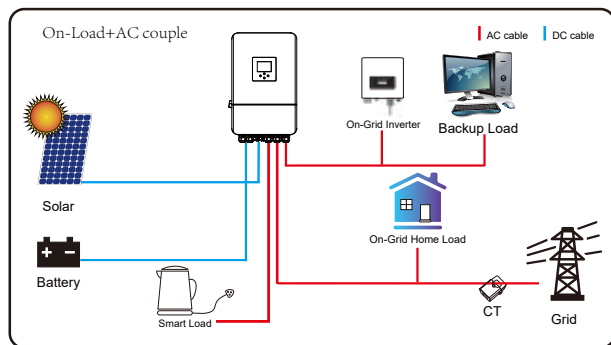


Mode III: With Smart-Load



Mode IV: AC Couple





The 1st priority power of the system is always the PV power, then 2nd and 3rd priority power will be the battery bank or grid according to the settings. The last power backup will be the Generator if it is available.

7. 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 Table 7-1 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 codes and their descriptions when the inverter is not working properly.

Error code	Description	Solutions
F08	GFDI_Relay_Failure	1. When inverter is in Split phase(120/240Vac) or three-phase system (120/208Vac) system, the backup load port N line needs to connect ground; 2. If the fault still exists, please contact us for help.
F13	Working mode change	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 report F13 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	AC side over current fault 1. Please check whether the backup 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	DC side over current fault 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	Leakage current fault 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	PV isolation resistance is too low 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	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 of L2 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	1. When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting; 2. During the parallel system startup 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.

Error code	Description	Solutions
F34	AC Overcurrent fault	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	No Utility 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	1. Check the hybrid inverter working status. If there's 1 pcs hybrid inverter is in OFF status, the other hybrid inverters may report F41 fault in parallel system. 2. If the fault still exists, please contact us for help.
F42	AC line low voltage	Grid voltage fault 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	Grid frequency out of range 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	Grid frequency out of range 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.
F56	DC busbar voltage is too low	Battery voltage low 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. Check PV module cable connection and clear the fault; 2. 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 the replacement 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, overvoltage, 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.

8.Limitation of Liability

In addition to the product warranty described above, the state and local laws and regulations provide financial compensation for the product's power connection (including violation of implied terms and warranties). The company hereby declares that the terms and conditions of the product and the policy cannot and can only legally exclude all liability within a limited scope.

9. Datasheet

Model	SUN-5K-SG05LP2-US-SM2	SUN-6K-SG05LP2-US-SM2	SUN-8K-SG05LP2-US-SM2	SUN-10K-SG05LP2-US-SM3	SUN-12K-SG05LP2-US-SM3
Battery Input Data					
Battery Type	Lead-acid or Lithium-ion				
Battery Voltage Range(V)	40-60				
Max. Charging Current(A)	120	135	190	220	220
Max. Discharging Current(A)	120	135	190	220	220
Charging Strategy for Li-Ion Battery	Self-adaption to BMS				
Number of Battery Input	2				
PV String Input Data					
Max. PV Input Power(W)	8000	9600	12800	16000	19200
Max. PV Input Voltage(V)	500				
Start-up Voltage(V)	125				
PV Input Voltage Range(V)	125-500				
MPPT Voltage Range(V)	150-425				
Full Load MPPT Voltage Range(V)	150-425		170-425	200-425	
Rated PV Input Voltage(V)	370				
Max. Operating PV Input Current(A)	32+32			32+32+32	
Max. Input Short-Circuit Current(A)	60+60			60+60+60	
No. of MPP Trackers/No. of Strings MPP Tracker	2/2+2			3/2+2+2	
Max. Inverter Backfeed Current to The Array	0				
AC Input/Output Data					
Rated AC Input/Output Active Power(W)	5000	6000	8000	10000	12000
Max. AC Input/Output Apparent Power(VA)	5000	6000	8000	10000	12000
Peak Power (off-grid)(W)	2 times of rated power, 10s				
Rated AC Input/Output Current(A)	20.9	25	33.4	41.7	50
Max. AC Input/Output Current(A)	20.9	25	33.4	41.7	50
Max. Continuous AC Passthrough (grid to load)(A)	100				
Rated Input/Output Voltage/Range(V)	120/240V; 208V 0.88Un-1.1Un				
Grid Connection Form	2L+N+PE				
Rated Input/Output Grid Frequency/Range	60Hz/55Hz-65Hz				
Power Factor Adjustment Range	0.8 leading-0.8 lagging				
Total Current Harmonic Distortion THDi	<3% (of nominal power)				
DC Injection Current	<0.5%In				
Efficiency					
Max. Efficiency	97.60%				
CEC Efficiency	96.50%				
MPPT Efficiency	>99%				
Equipment Protection					
DC reverse polarity protection	Yes				
AC Output Overcurrent Protection	Yes				
AC Output Overvoltage Protection	Yes				
AC Output Short Circuit Protection	Yes				
Thermal Protection	Yes				
Insulation Impedance detection	Yes				

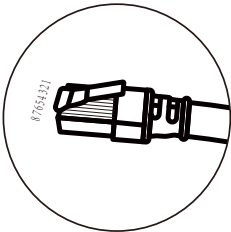
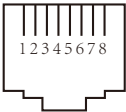
DC Component Monitoring	Yes
Arc fault circuit interrupter (AFCI)	Optional
Anti-islanding protection	Yes
DC Switch	Yes
Residual Current Detection	Yes
Surge Protection Level	TYPE II(DC), TYPE II(AC)
Interface	
Display	LCD+LED
Communication Interface	RS232, RS485, CAN
Monitor Mode	GPRS/WIFI/Bluetooth/4G/LAN(optional)
General Data	
Operating Temperature Range	-40 to +60 C, >45 C Derating
Permissible Ambient Humidity	0-100%
Permissible Altitude	3000m
Noise	<45 dB
Ingress Protection(IP) Rating	NEMA 3R, IP65
Inverter Topology	Non-Isolated
Over Voltage Category	OVC II(DC), OVC IV(AC)
Cabinet size(W*H*D) [mm]	386W×606.5H×240D (Excluding connectors and brackets)
Weight(kg)	29.2
Warranty	5 Years/10 Years the Warranty Period Depends the Final Installation Site of Inverter, More Info Please Refer to Warranty Policy
Type of Cooling	Intelligent Air Cooling
Grid Regulation	IEEE 1547.1,SRD V2.0
Safety EMC/Standard	FCC,UL 1741

10. Appendix I

Definition of RJ45 Port Pin for BMS

No.	BMS Pin
1	485_B
2	485_A
3	
4	CAN-H
5	CAN-L
6	GND_485
7	485_A
8	485_B

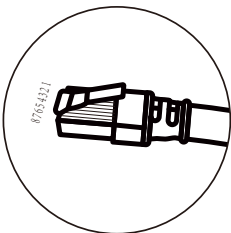
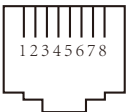
BMS 485/CAN Port



This port is used to connect the energy meter.

No.	Meter-485 Pin
1	METER-485-B
2	METER-485-A
3	COM-5V
4	METER-485-B
5	METER-485-A
6	COM-GND
7	METER-485-A
8	METER-485-B

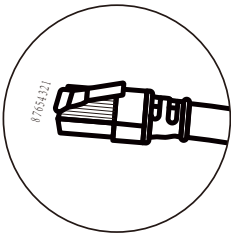
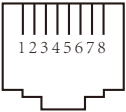
Meter-485 port



Definition of RJ45 Port Pin of "Modbus port" for remotely monitoring

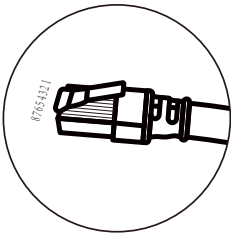
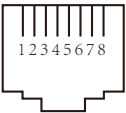
No.	BMS 485/CAN Pin
1	SUNSPE-485_B
2	SUNSPE-485_A
3	GND_SUNSPE-485
4	
5	
6	GND_SUNSPE-485
7	SUNSPE-485_A
8	SUNSPE-485_B

Modbus Port



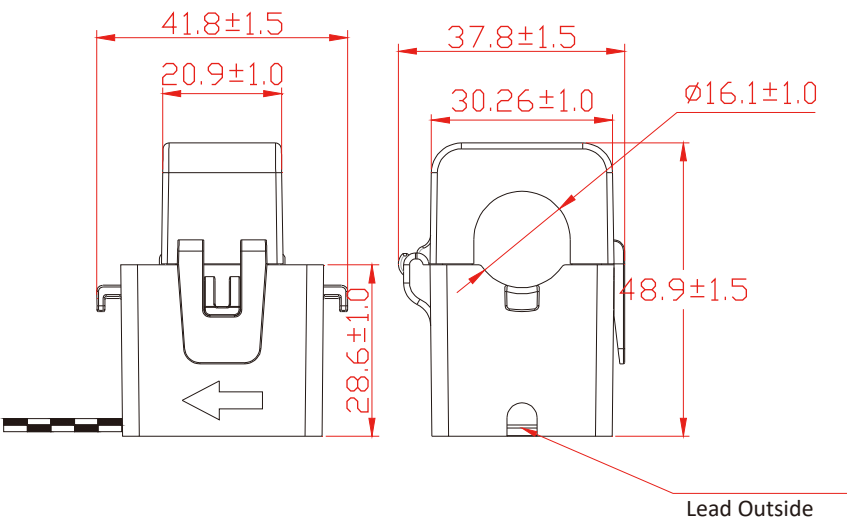
No.	DRM Pin
1	DRM1/5
2	DRM2/6
3	DRM3/7
4	DRM4/8
5	REF-GEN/0
6	LCD-GND
7	NetDRM_7
8	NetDRM_7

DRM Port



11. Appendix II

- 1. Split Core Current Transformer (CT) dimension: (mm)
- 2. Secondary output cable length is 4m.



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