R

**Hybrid Inverter**

# SUN-5K-SG01HP3-EU-AM2 SUN-6K-SG01HP3-EU-AM2 SUN-8K-SG01HP3-EU-AM2

**SUN-10K-SG01HP3-EU-AM2**

05/28 /2019 15 :34:40

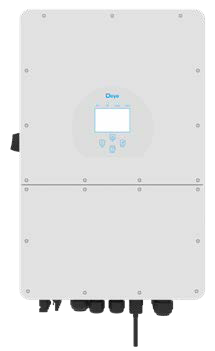
0 **8.30** 12

0 **-3.00** 8

KW ON KW

**25%**

# SUN-12K-SG01HP3-EU-AM2 SUN-15K-SG01HP3-EU-AM2 SUN-20K-SG01HP3-EU-AM2



**User Manual**

0 **-2.00** 8

KW

0 **3.00** 8

KW

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## About This Manual

The manual mainly describes the product informa�on, guidelines for installa�on, opera�on and maintenance. The manual cannot include complete informa�on about the photovoltaic (PV) system.

## How to Use This Manual

Read the manual and other related documents before performing any opera�on on the inverter. Documents must be stored carefully and be available at all �mes.

**Contents may be periodically updated or revised due to product development. The informa�on in this manual is subject to change without no�ce.**The latest manual can be acquired via [service@deye.com.cn](mailto:service@deye.com.cn)

## Safety Introduc�ons

#### Safety signs

The DC input terminals of the inverter must not be grounded.



The AC and DC circuits must be disconnected separately, and the maintenance personnel

must wait for 5 minutes before they are completely powered oﬀ before they can start working.

Surface high temperature, Please do not touch the inverter case.

Prohibit disassembling inverter case, there exis�ng shock hazard, which may cause serious injury or death, please ask qualiﬁed person to repair.



Please read the instruc�ons carefully

before use.

Do Not put it in the waste bin! Recycle it

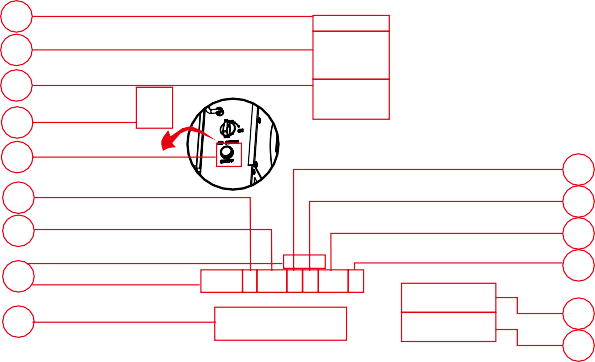
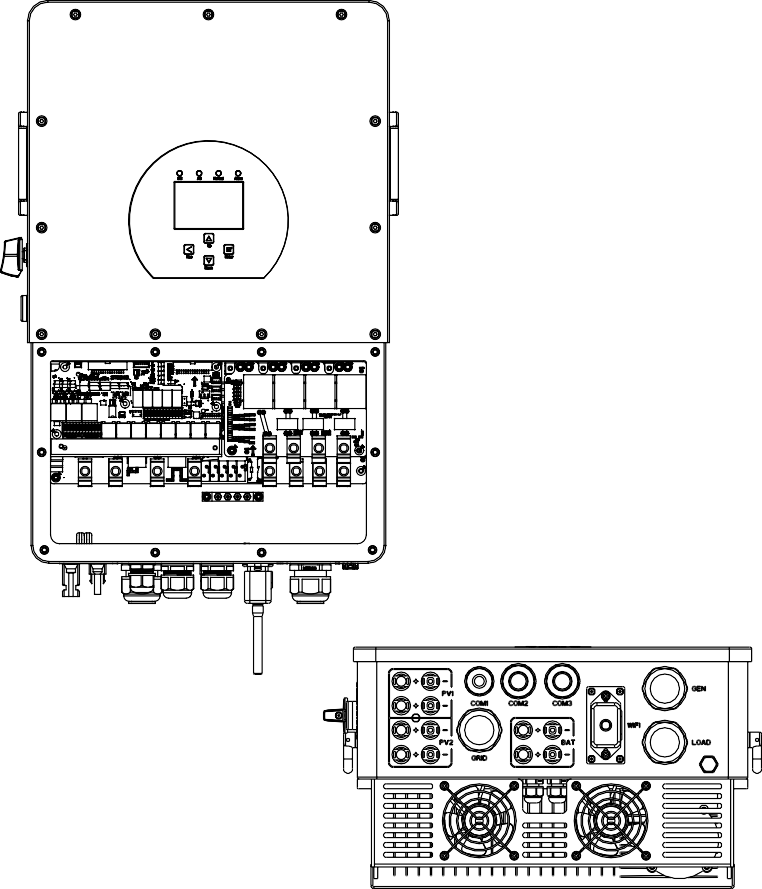
by licensed professional!

* This chapter contains important safety and opera�ng instruc�ons. Read and keep this manual for future reference.
* Before using the inverter, please read the instruc�ons and warning signs of the ba�ery and corresponding sec�ons in the instruc�on manual.
* Do not disassemble the inverter. If you need maintenance or repair, take it to a professional service center.
* Improper reassembly may result in electric shock or ﬁre.
* To reduce risk of electric shock, disconnect all wires before a�emp�ng any maintenance or cleaning. Turning oﬀ the unit will not reduce this risk.
* Cau�on: Only qualiﬁed personnel can install this device with ba�ery.
* Never charge a frozen ba�ery.
* For op�mum opera�on of this inverter, please follow required speciﬁca�on to select appropriate cable size. It is very important to correctly operate this inverter.
* Be very cau�ous when working with metal tools on or around ba�eries. Dropping a tool may cause a spark or short circuit in ba�eries or other electrical parts, even cause an explosion.
* Please strictly follow installa�on procedure when you want to disconnect AC or DC terminals. Please refer to "Installa�on" sec�on of this manual for the details.
* Grounding instruc�ons - this inverter should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regula�on to install this inverter.
* Never cause AC output and DC input short circuited. Do not connect to the mains when DC input short circuits.

## Product Introduc�ons

This is a mul�func�onal inverter, combining func�ons of inverter, solar charger and ba�ery charger to oﬀer uninterrup�ble power support with portable size. Its comprehensive LCD display oﬀers user conﬁgurable and easy accessible bu�on opera�on such as ba�ery charging, AC/solar charging, and acceptable input voltage based on diﬀerent applica�ons.

#### Product Overview



1

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17 18

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1: Inverter indicators

2: LCD display

3: Func�on bu�ons

4: DC switch

5: Power on/oﬀ bu�on

7: Parallel port

8: CAN port

9: DRM port

10: BMS port

11: RS485 port

13: Load

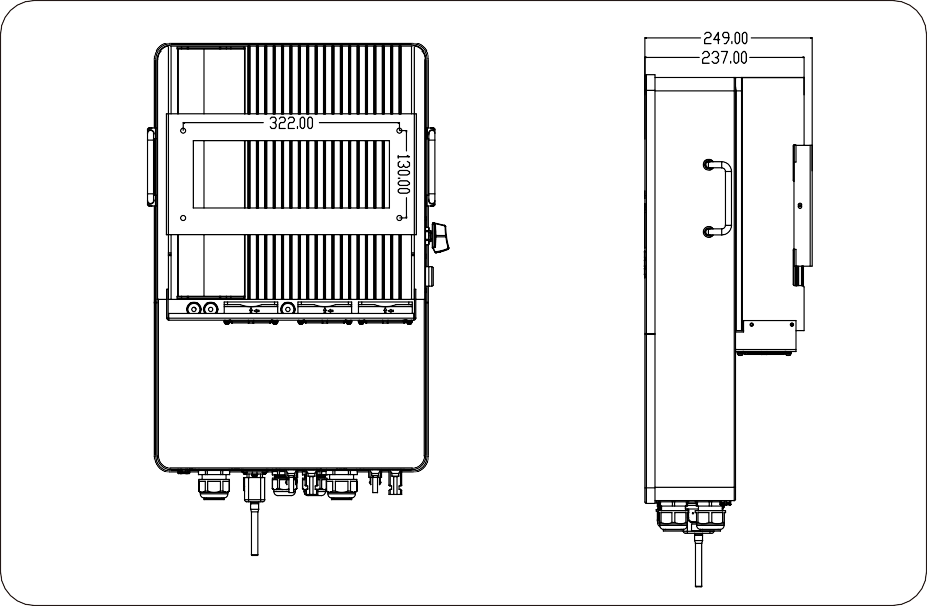
14: Func�on port

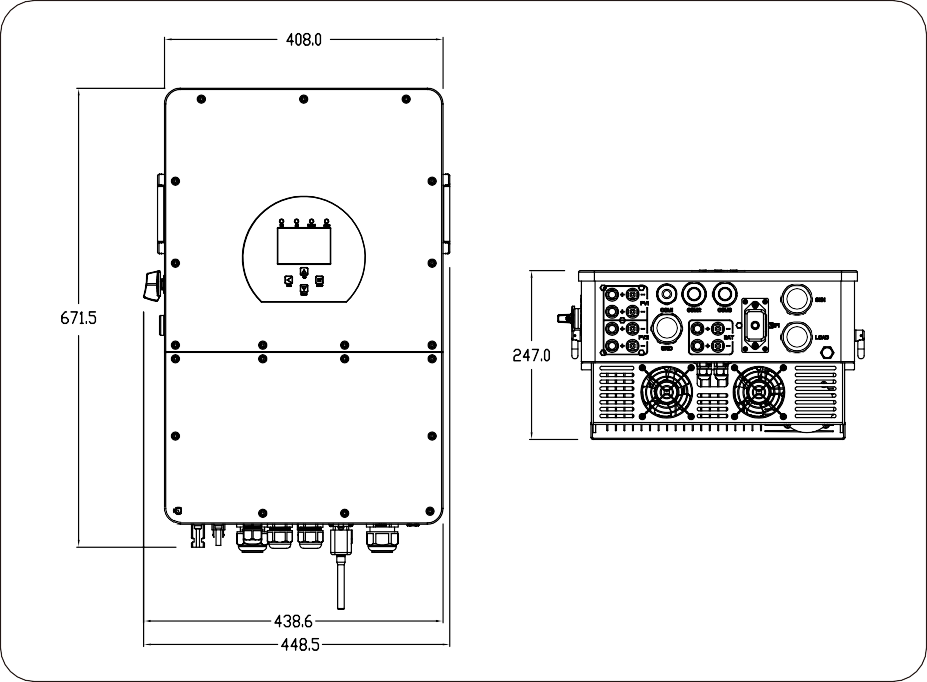
15: Grid

16: PV input with two MPPT 17: Ba�ery input

6: Meter port 12: Generator input 18: WiFi Interface

#### Product Size





Inverter Size

* 1. **Product Features**
* 230V/400V Three phase Pure sine wave inverter.
* Self-consump�on and feed-in to the grid.
* Auto restart while AC is recovering.
* Programmable supply priority for ba�ery or grid.
* Programmable mul�ple opera�on modes: On grid, oﬀ grid and UPS.
* Conﬁgurable ba�ery charging current/voltage based on applica�ons by LCD se�ng.
* Conﬁgurable AC/Solar/Generator Charger priority by LCD se�ng.
* Compa�ble with mains voltage or generator power.
* Overload/over temperature/short circuit protec�on.
* Smart ba�ery charger design for op�mized ba�ery performance
* With limit func�on, prevent excess power overﬂow to the grid.
* Suppor�ng WIFI monitoring and build-in 2 strings for 1 MPP tracker, 1 string for 1 MPP tracker.
* Smart se�able three stages MPPT charging for op�mized ba�ery performance.
* Time of use func�on.
* Smart Load Func�on.

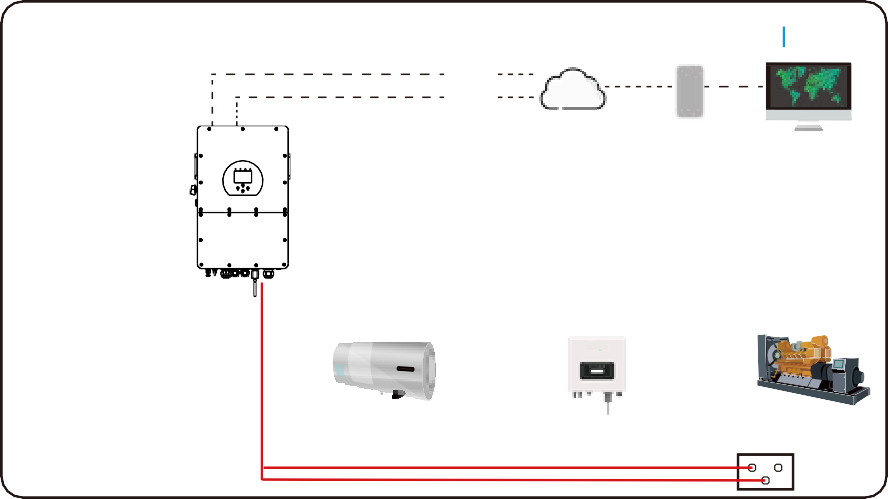
#### Basic System Architecture

The following illustra�on shows basic applica�on of this inverter.

It also includes following devices to have a complete running system.

* Generator or U�lity
* PV modules

Consult with your system integrator for other possible system architectures depending on your requirements.

This inverter can power all kinds of appliances in home or oﬃce environment, including motor type appliances such as refrigerator and air condi�oner.

AC cable DC cable

WiFI

GPRS

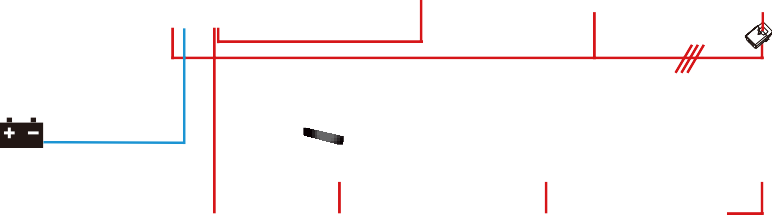
Cloud services phone

Solar

Backup Load

On-Grid Home Load

Grid



CT

Battery

Smart Load

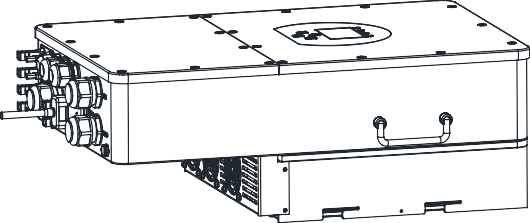
Grid-connected Inverter

Generator

ATS

#### Product handling requirements

Two people stand on both sides of the machine, holding one handles to li� the machine.

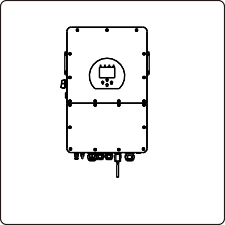


transport

## Installa�on

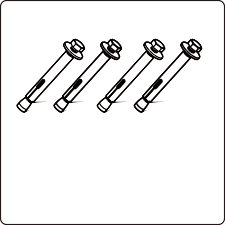
#### Parts List

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



Hybrid inverter x1

Wall moun�ng bracket x1



Stainless steel an�-collision bolt M6×60

x4



Parallel communica�on cable x1



L-type Hexagon wrench x1

Three-Phase Smart Meter

SET ESC

Meter(op�onal)

x 1

User manual x1

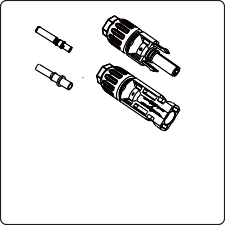
User manual



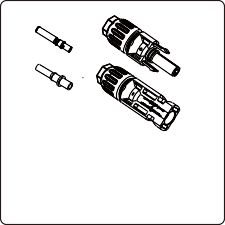
Wi-Fi-Plug(op�onal) x1



Sensor Clamp x 3



Ba�ery Plug connectors including metal terminal x2(blue)



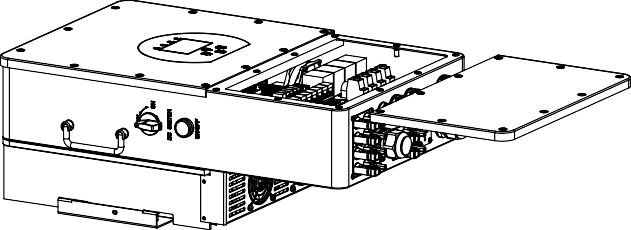
DC+/DC- Plug connectors including metal terminal xN(black)

#### Moun�ng instruc�ons Installa�on Precau�on

This Hybrid inverter is designed for outdoor use(IP65), Please make sure the installa�on site meets below condi�ons:

* Not in direct sunlight
* Not in areas where highly ﬂammable materials are stored.
* Not in poten�al explosive areas.
* Not in the cool air directly.
* Not near the television Antenna or antenna cable.
* Not higher than al�tude of about 2000 meters above sea level.
* Not in environment of precipita�on or humidity(>95%)

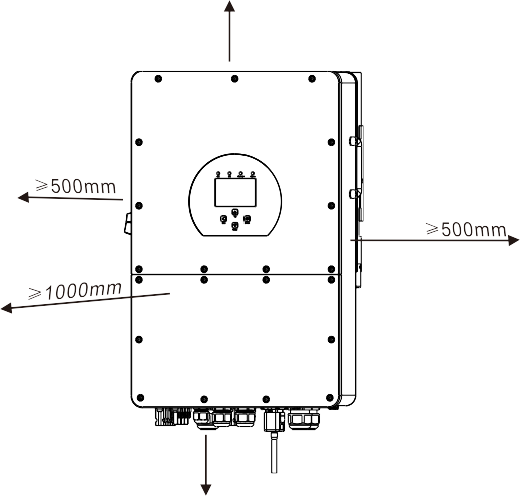
Please AVOID direct sunlight, rain exposure, snow laying up during installa�on and opera�on. Before connec�ng all wires, please take oﬀ the metal cover by removing screws as shown below:



#### Considering the following points before selec�ng where to install:

* Please select a ver�cal wall with load-bearing capacity for installa�on, suitable for installa�on on concrete or other non-ﬂammable surfaces,installa�on is shown below.
* Install this inverter at eye level in order to allow the LCD display to be read at all �mes.
* The ambient temperature is recommeded to be between -40~60℃ to ensure op�mal opera�on.
* Be sure to keep other objects and surfaces as shown in the diagram to guarantee suﬃcient heat dissipa�on and have enough space for removing wires.

≥500mm



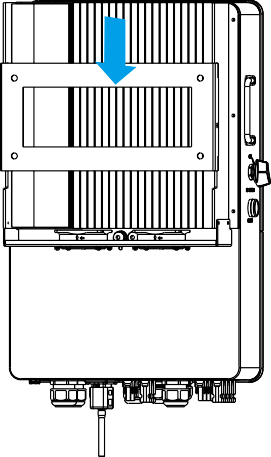
≥500mm

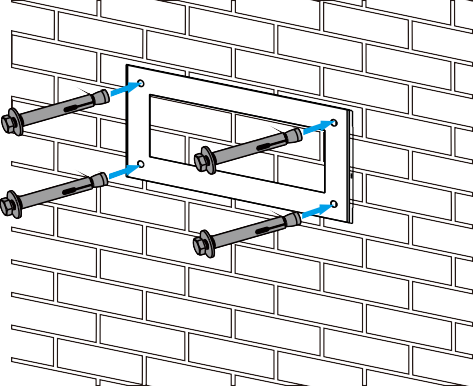
For proper air circula�on to dissipate heat, allow a clearance of approx. 50cm to the side and approx. 50cm above and below the unit. And 100cm to the front.

#### Moun�ng the inverter

Remember that this inverter is heavy! Please be careful when li�ing out from the package. Choose the recommend drill head(as shown in below pic) to drill 4 holes on the wall,

62-70mm deep.

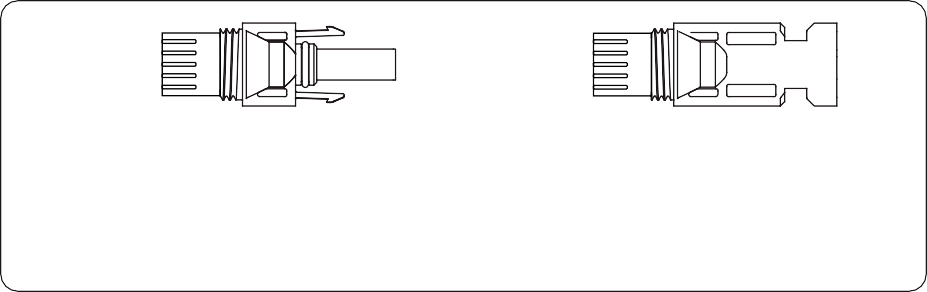
1. Use a proper hammer to ﬁt the expansion bolt into the holes.
2. Carry the inverter and holding it, make sure the hanger aim at the expansion bolt,ﬁx the inverter on the wall.
3. Fasten the screw head of the expansion bolt to ﬁnish the moun�ng.



Inverter hanging plate installa�on

#### Ba�ery connec�on

For safe opera�on and compliance, a separate DC over-current protector or disconnect device is required between the ba�ery and the inverter. In some applica�ons, switching devices may not be required but over-current protectors are s�ll required. Refer to the typical amperage in the table below for the required fuse or circuit breaker size.



Blue

Blue

6±0.2mm

6±0.2mm

5.2±0.2mm

3.75±0.2mm

3.97±0.5mm

3.75±0.2mm

Pic 3.1 DC+ male connector

Pic 3.2 DC- female connector



*Safety Hint:*

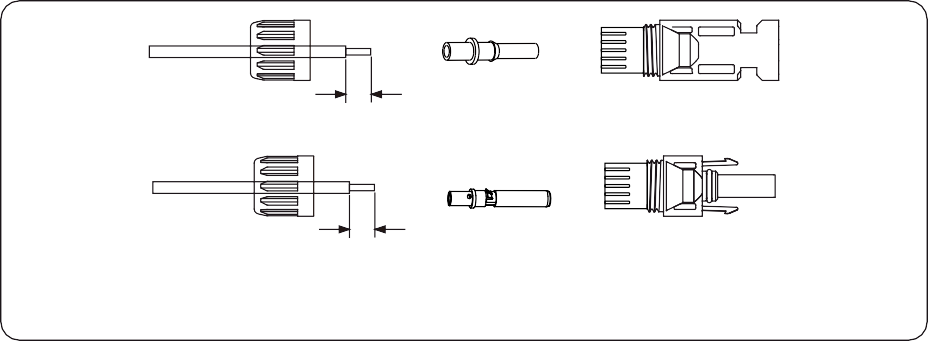
Please use approved DC cable for ba�ery system.

|  |  |  |
| --- | --- | --- |
| ***Model*** | ***Cross section***（mm ） | |
| ***Range*** | ***Recommended value*** |
| 5/6/8/10/12/15/20KW | 6~10 (10~8AWG) | 10(8AWG) |

Chart 3-2

The steps to assemble the DC connectors are listed as follows:

1. Strip oﬀ the DC wire about 7mm, disassemble the connector cap nut (see picture 3.3).

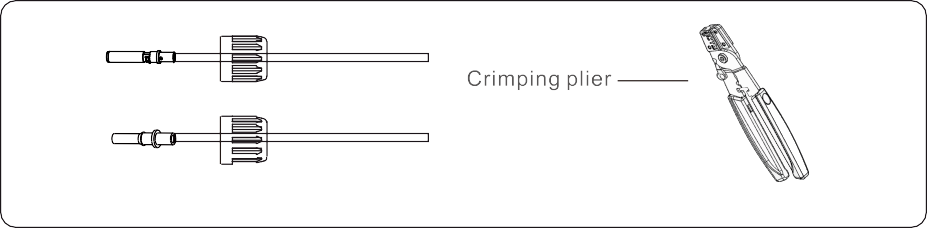


7mm

7mm

Pic 3.3 Disassemble the connector cap nut

1. Crimping metal terminals with crimping pliers as shown in picture 3.4.



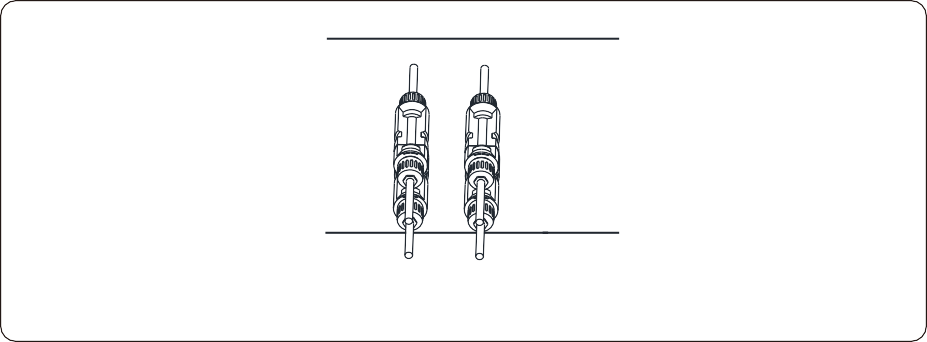
Pic 3.4 Crimp the contact pin to the wire

1. Insert the contact pin to the top part of the connector and screw up the cap nut to the top part of the connector. (as shown in picture 3.5).



Pic 3.5 connector with cap nut screwed on

1. Finally insert the DC connector into the posi�ve and nega�ve input of the inverter, shown as picture 3.6



Pic 3.6 DC input connec�on

**3.3.2 Func�on port deﬁni�on**

### Inverter

CN1 CN2

1 2 3 4 5 6 7 8 9 10 1112 1 2 3 4 5 6 7 8 9 10 1112

Meter

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

Parallel\_1 Parallel\_2 CAN DRM BMS1 BMS2 RS485

CN1:

CT -R

CT -S

CT -T

Gen start-up N/O Relay

**SHUT DOWN B B**

Meter: for energy meter communica�on.

Parallel\_1: Parallel communica�on

port 1.

Parallel\_2: Parallel communica�on

port 2 .

CAN: reserved.

DRM: Logic interface for AS/

NZS 4777.2:2020.

BMS1: BMS port for ba�ery communica�on port 1.

BMS2: BMS port for ba�ery

CT-R (1,2,7,8): current transformer (CT-R) for“zero

export to CT”mode clamps on L1 when in three phase system.

CT-S (3,4,9,10): current transformer (CT-S) for“zero export to CT”mode clamps on L2 when in three phase system.

CT-T (5,6,11,12): current transformer (CT-T) for“zero

communica�on port 2.

RS485: RS485 port.

export to CT”mode clamps on L3 when in three phase system.

CN2:

G-start (1,2): dry contact signal for startup the diesel generator.

When the "GEN signal" is ac�ve, the open contact (GS) will switch on (no voltage output).

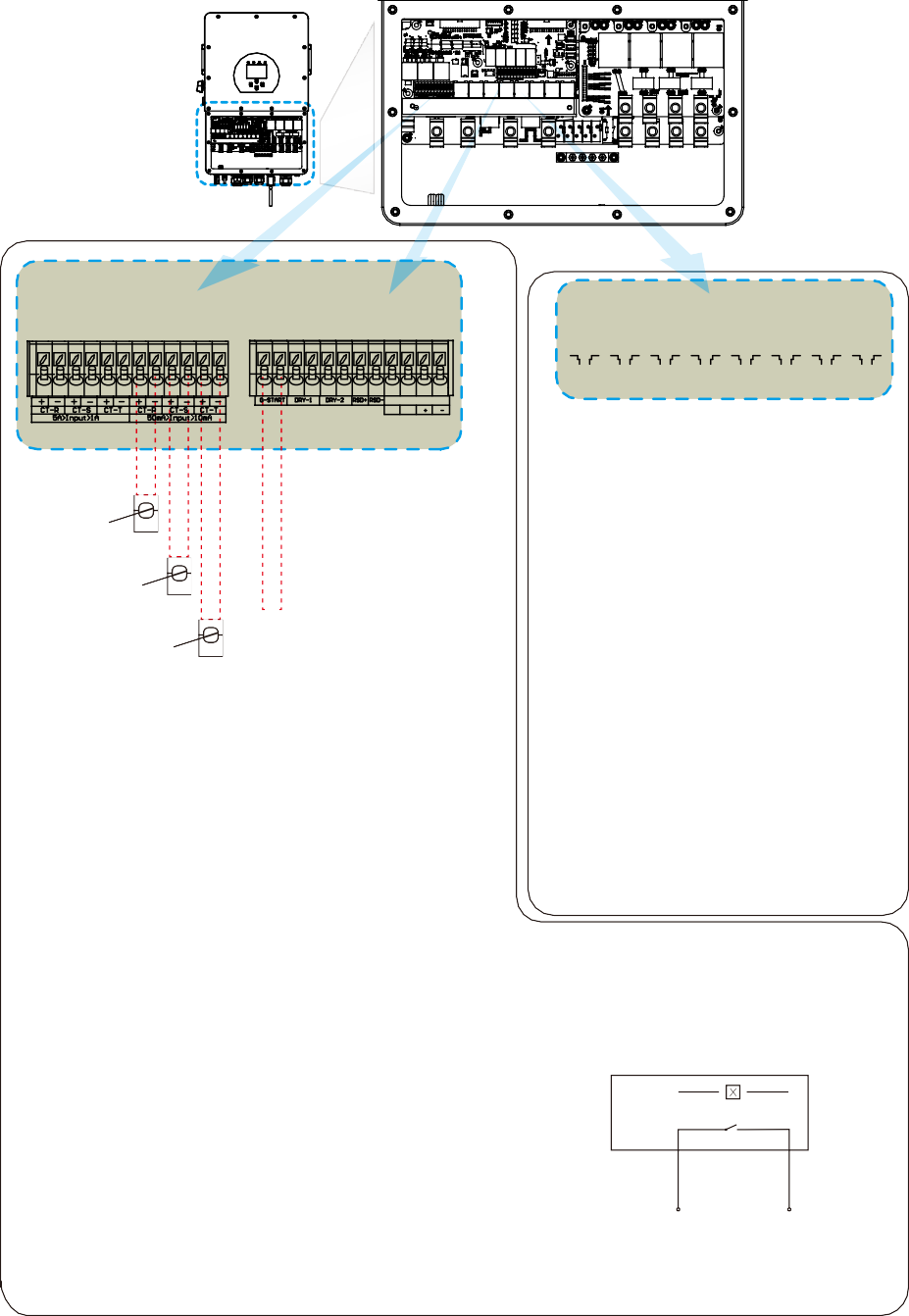
DRY-1 (3,4): Dry contact output. When the inverter is in oﬀ-grid mode and the “signal island mode" is checked, the dry contact will switch on.

coil

open contact

###### G S

relay

DRY-2 (5,6): reserved.

RSD (7,8): When ba�ery is connected and the

inverter is in "ON" status, it will provide 12Vdc.

GS (diesel generator startup signal)

#### Grid connec�on and backup load connec�on

* Before connec�ng to the grid, a separate AC breaker must be installed between the inverter and the grid, and also between the backup load and the inverter. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current. For the 5/6/8/10/12/15/20KW model, the recommended AC breaker for backup load is 100A. For the 5/6/8/10/12/15/20KW model, the recommended AC breaker for grid is 100A.
* There are three terminal blocks with "Grid" "Load"and "GEN" markings. Please do not misconnect input and output connectors.

All wiring must be performed by a qualiﬁed personnel.It is very important for system safety and eﬃcient opera�on to use appropriate cable for AC input connec�on. To reduce risk of injury, please use the proper recommended cable as below.

backup load connec�on

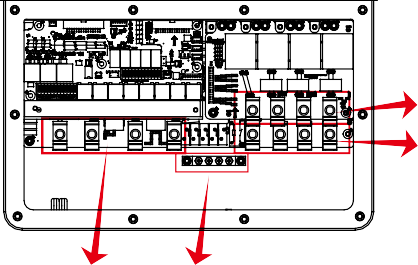
|  |  |  |  |
| --- | --- | --- | --- |
| ***Model*** | ***Wire Size*** | ***Cable(mm 2 )*** | ***Torque value(max)*** |
| 5/6/8/10Kw | 8AWG | 10 | 2.5Nm |
| 12/15/20Kw | 4AWG | 25 | 2.5Nm |

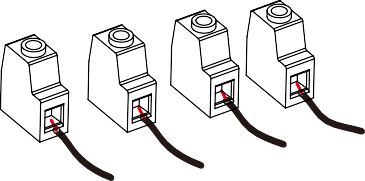
Grid connec�on

|  |  |  |  |
| --- | --- | --- | --- |
| ***Model*** | ***Wire Size*** | ***Cable(mm 2 )*** | ***Torque value(max)*** |
| 5/6/8/10Kw | 8AWG | 10 | 2.5Nm |
| 12/15/20Kw | 4AWG | 25 | 2.5Nm |

Chart 3-3 Recommended Size for AC wires

#### Please follow below steps to implement Grid, load and Gen port connec�on:

1. Before making Grid, load and Gen port connec�on, be sure to turn oﬀ AC breaker or disconnector ﬁrst.
2.  Remove insula�on sleeve 10mm length, insert the wires according to polari�es indicated on the terminal block. Make sure the connec�on is complete.



L3

L2

N

L1

###### GEN LOAD

GRID E-BAR

Be sure that AC power source is disconnected before a�emp�ng to wire it to the unit.

1. Then, insert AC output wires according to polari�es indicated on the terminal block and �ghten terminal. Be sure to connect corresponding N wires and PE wires to related terminals as well.
2. Make sure the wires are securely connected.
3. Appliances such as air condi�oner are required at least 2-3 minutes to restart because it is required to have enough �me to balance refrigerant gas inside of circuit. If a power shortage occurs and recovers in short �me, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air condi�oner if it is equipped with

�me-delay func�on before installa�on. Otherwise, this inverter will trigger overload fault and cut oﬀ output to protect your appliance but some�mes it s�ll causes internal damage to the air condi�oner

#### PV Connec�on

Before connec�ng to PV modules, please install a separately DC circuit breaker between inverter and PV modules. It is very important for system safety and eﬃcient opera�on to use appropriate cable for PV module connec�on.

To avoid any malfunc�on, do not connect any PV modules with possible leakage current to the inverter. For example, grounded PV modules will cause leakage current to the inverter. When using PV modules, please ensure the PV+ & PV- of solar panel is not connected to the system ground bar.

It is requested to use PV junc�on box with surge protec�on. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.

#### PV Module Selec�on:

When selec�ng proper PV modules, please be sure to consider below parameters:

1. Open circuit Voltage (Voc) of PV modules can not exceed max. PV array open circuit voltage of inverter.
2. Open circuit Voltage (Voc) of PV modules should be higher than min. start voltage.
3. The PV modules used to connected to this inverter shall be Class A ra�ng cer�ﬁed according to lEC 61730.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***Inverter Model*** | ***5KW*** | ***6KW*** | ***8KW*** | ***10KW*** | ***12KW*** | ***15KW*** | ***20KW*** |
| PV Input Voltage | 600V (180V~1000V) | | | | | | |
| PV Array MPPT Voltage Range | 150V-850V | | | | | | |
| No. of MPP Trackers | 2 | | | | | | |
| No. of Strings per MPP Tracker | 1 | | | | 2+1 | | 2 |

Chart 3-5

#### PV Module Wire Connec�on:

1. Switch the Grid Supply Main Switch(AC)OFF.
2. Switch the DC lsolator OFF.
3. Assemble PV input connector to the inverter.



*Safety Hint:*

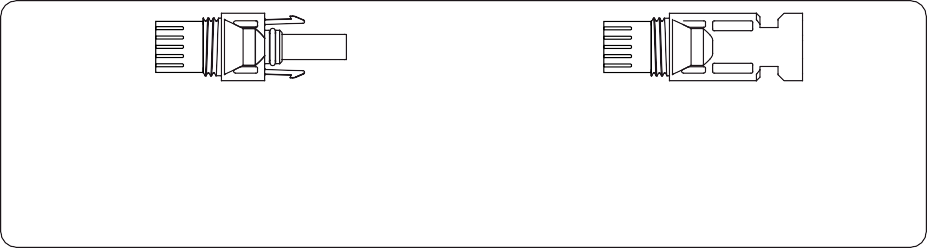
When using PV modules, please ensure the PV+ & PV- of solar panel is not connected to the system ground bar.

*Safety Hint:*

Before connec�on, please make sure the polarity of PV array matches the “DC+” and “DC-” symbols.

*Safety Hint:*

Before connec�ng inverter, please make sure the PV array open circuit voltage is within the 1000V of the inverter.



Black

Black

4.6±0.3mm

4.6±0.3mm

5.2±0.2mm

3.05±0.3mm

4±0.2mm

3.05±0.3mm

Pic 5.1 DC+ male connector Pic 5.2 DC- female connector



*Safety Hint:*

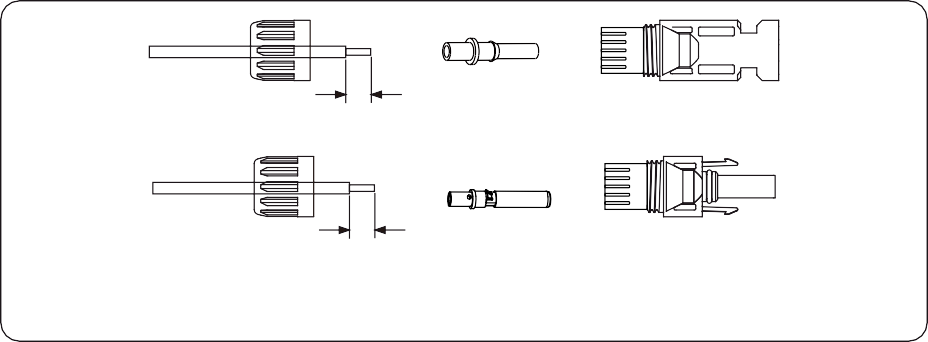
Please use approved DC cable for PV system.

|  |  |  |
| --- | --- | --- |
| ***Cable type*** | ***Cross section***（mm ） | |
| ***Range*** | ***Recommended value*** |
| Industry generic PV cable (model: PV1-F) | 2.5-6 (12~10AWG) | 6(10AWG) |

Chart 3-6

The steps to assemble the DC connectors are listed as follows:

1. Strip oﬀ the DC wire about 7mm, disassemble the connector cap nut (see picture 5.3).

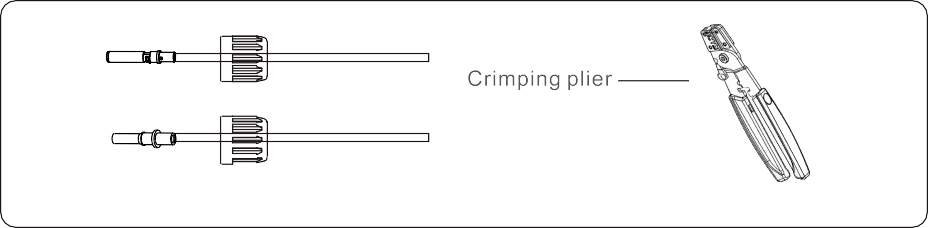


7mm

7mm

Pic 5.3 Disassemble the connector cap nut

1. Crimping metal terminals with crimping pliers as shown in picture 5.4.



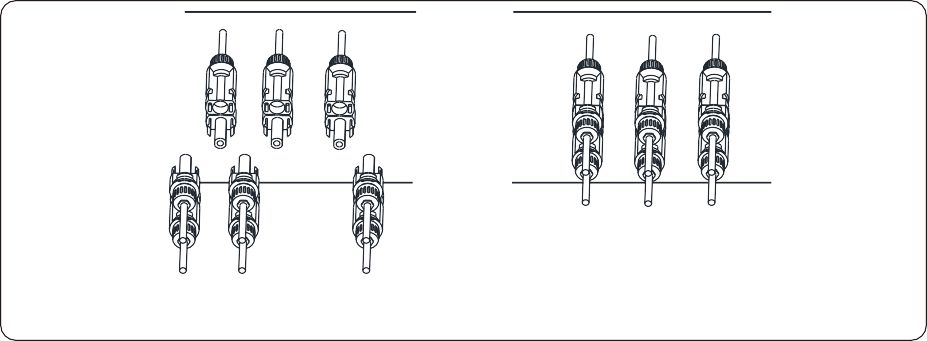
Pic 5.4 Crimp the contact pin to the wire

1. Insert the contact pin to the top part of the connector and screw up the cap nut to the top part of the connector. (as shown in picture 5.5).



Pic 5.5 connector with cap nut screwed on

1. Finally insert the DC connector into the posi�ve and nega�ve input of the inverter, shown as picture 5.6



Pic 5.6 DC input connec�on

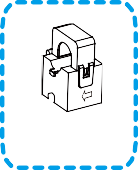
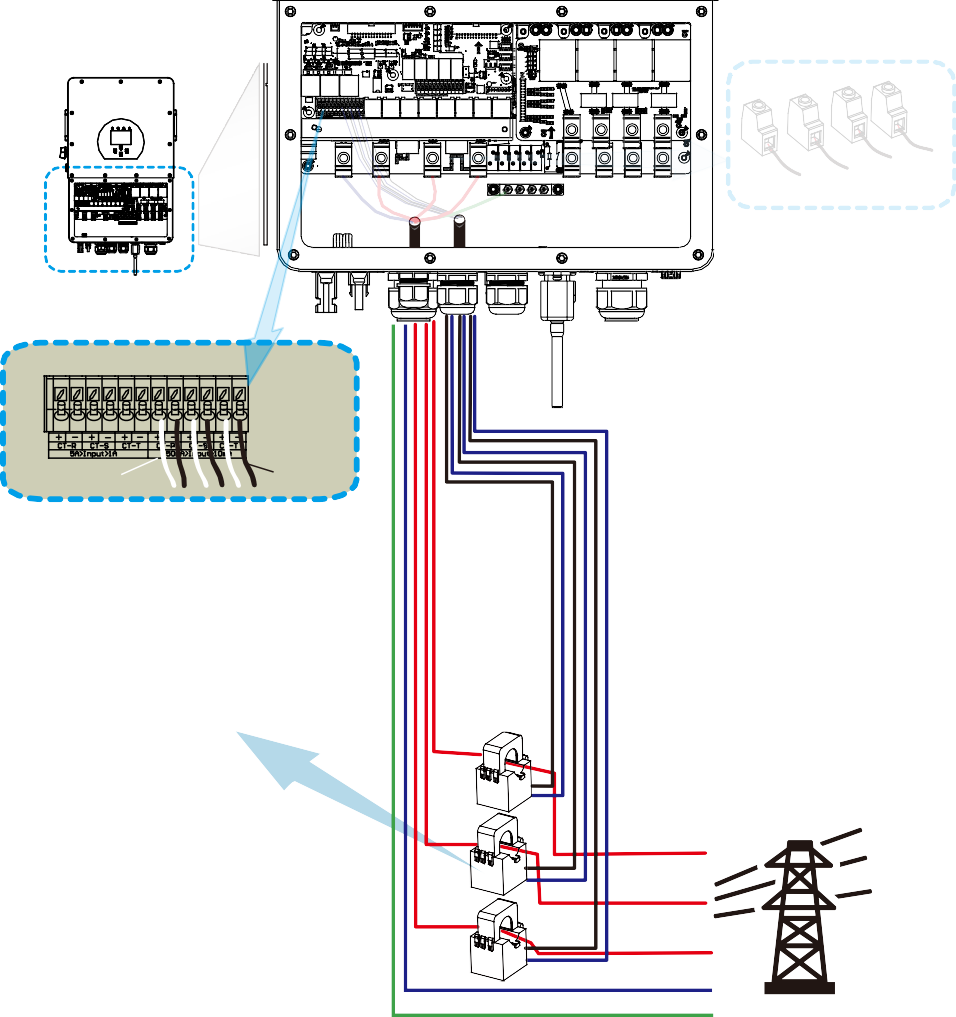
*Warning:*

Sunlight shines on the panel will generate voltage, high voltage in series may cause danger to life. Therefore, before connec�ng the DC input line, the solar panel needs to be blocked by the opaque material and the DC switch should be 'OFF', otherwise, the high voltage of the inverter may lead to life- threatening condi�ons. Please do not switch oﬀ DC isolator when the DC current when there is high voltage or current.Technicians need to wait un�l night to keep safety.

*Warning:*

Please use its own DC power connector from the inverter accessories. Do not interconnect the connectors of diﬀerent manufacturers.Max. DC input current should be 20A. if exceeds, it may damage the inverter and it is not covered by Deye warranty.

#### CT Connec�on



GRID

L3

L2

N L1

Inverter

1 2 3 4 5 6 7 8 9 10 1112

White wire Black wire

CT

Arrow pointing to inverter

L3 CT3

L2 CT2 L1

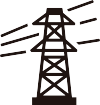
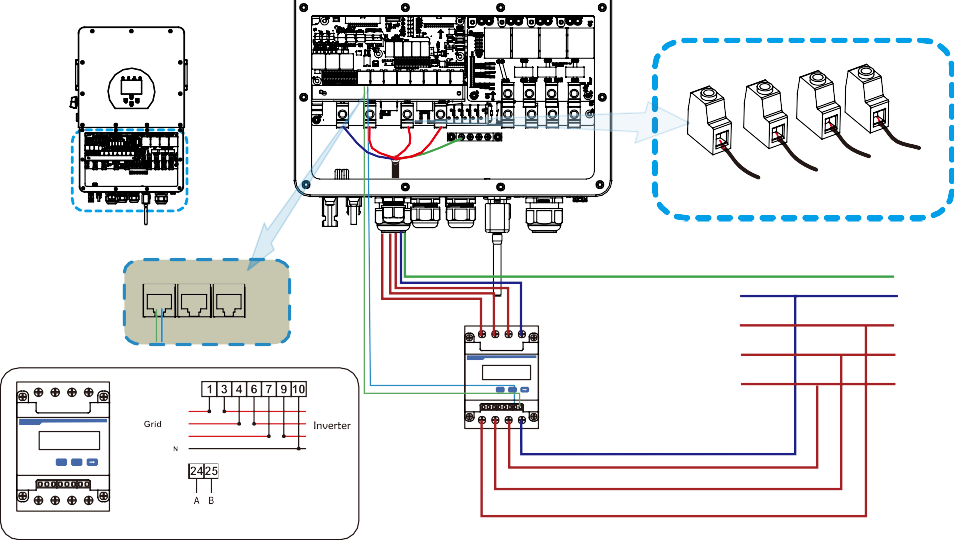
CT1

N

PE Grid

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

* + 1. **Meter Connec�on**



GRID

L3

L2

N

L1

Inverter

Meter Parallel\_1 Parallel\_2

6 9 10

Three-Phase Smart Meter

**RS485A**

3 6 9 10

SET ESC

PE N L1

L2

L3

**RS485B**

**L1 L2**

**(1,4,7,10) L3**

24 25

1 4 7 10

Three-Phase Smart Meter

**(3,6,9,10)**

SET ESC

**RS 485**

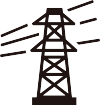
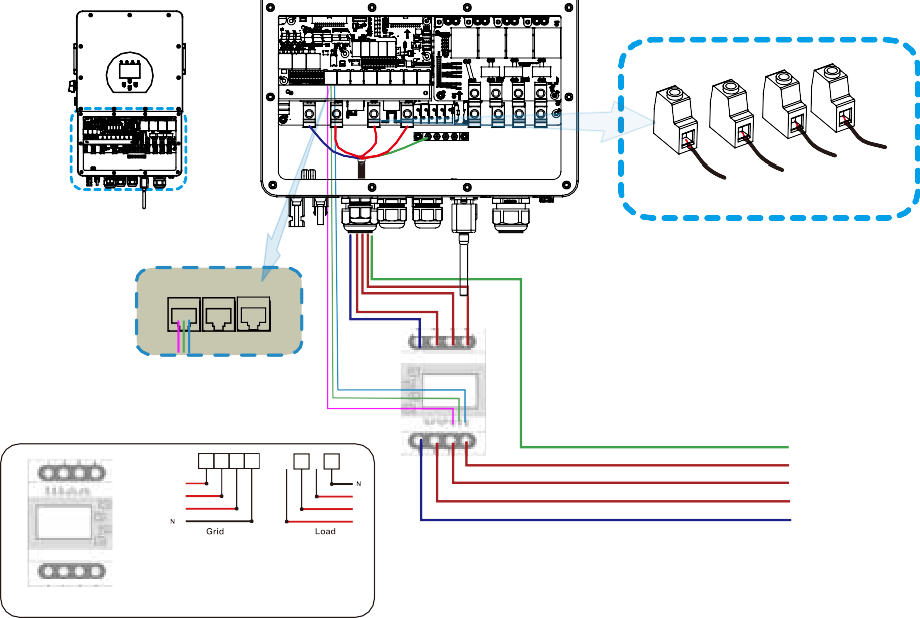
24 25

1 4 7 10

CHNT DTSU666

CHINT meter

Grid



GRID

L3

L2

N

L1

Inverter

Meter Parallel\_1 Parallel\_2

N L3 L2 L1

**RS485B**

**RS485A GND**

1 2 3 4

***L1***

Eastron

***L2 L3***

***L3***

***L2 L1***

**(1,2,3,4)**

PE L1 L2 L3

N

**(5,6,7,8)**

5 6 7 8

**RS 485**

Eastron SDM630-Modbus V2

RS 485 B RS 485 A GND

Eastron meter

7 8

5 6

Grid

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **B** | **A** | | **G** | |
|  |  |  | |  |

GRID

##### Inverter

L3

L2

N L1

Meter Parallel\_1 Parallel\_2

AC Breaker

**RS485A**

**RS485B**

PE

N L1 L2

L3

AC Breaker Home Load

3 6 9 10

Three-Phase Smart Meter

SET ESC

13 14 16 1719 2124 25

7

CT3

CT2

PE N L1

CT1

L2

L3

Grid

Blue line

White line Blue line

White line

Blue line

White line

**Note: the arrow direc�on towards the inverter**

3 6 9 10

**3 6 9 10 13 14 16 17 19 21**

**L1 L2**

Three-Phase Smart Meter

**(3,6,9,10) L3**

SET ESC

13 14 16 1719 2124 25

**RS 485**

Phase A current =5.000A

230/400V,3~

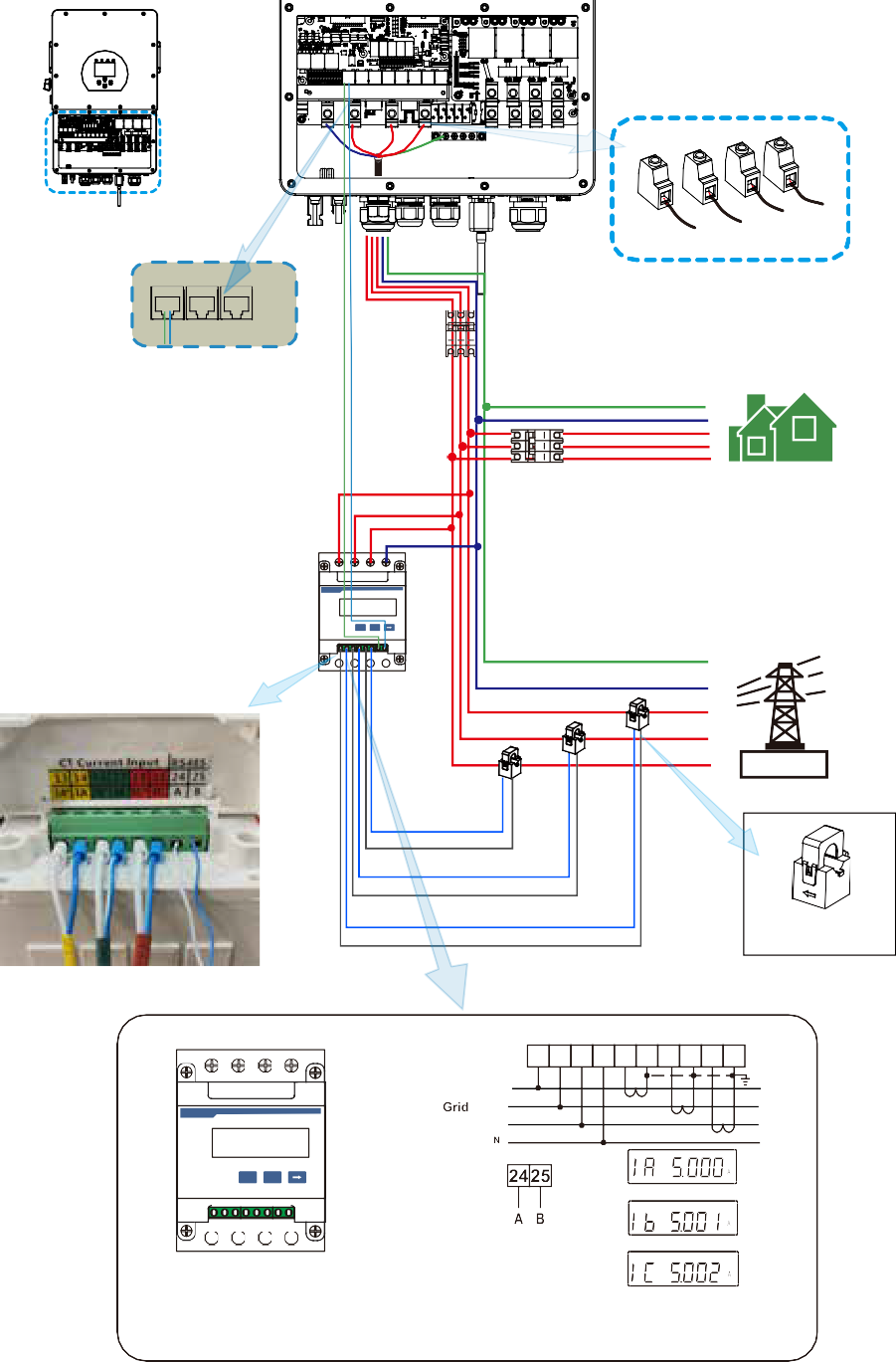
250A/50mA

50/60Hz

CHINT meter

Phase B current =5.001A

Phase C current =5.002A

CHNT DTSU666

PIN 13,16,19：White cable of the CT

PIN 14,17,21: Blue cable of the CT

GRID

##### Inverter

L3

L2

N L1

Meter Parallel\_1 Parallel\_2

AC Breaker

PE

**RS485A**

N L1 L2

**GND**

**RS485B**

L3

AC Breaker Home Load

NA LA L1 L2 L3 N

S1 S2 S1 S2 S1 S2

CT3

CT2

PE N L1

CT1

L2

L3

Grid

meter

Black line

Red line

Black line Red line

Black line Red line

**Note: the arrow direc�on towards the inverter**

9 10 11 12 13 14 15 16 17 18 19 20

Eastron U/I

ESC

P2

P2 P1 S2

P2 P1

P1 S2 S1 L2

3 PHASE 4 WIRE

L1

S1 L3

M S2 S1 N

P

E 1 2 3 4 5 6

15 16 17 18 19 20

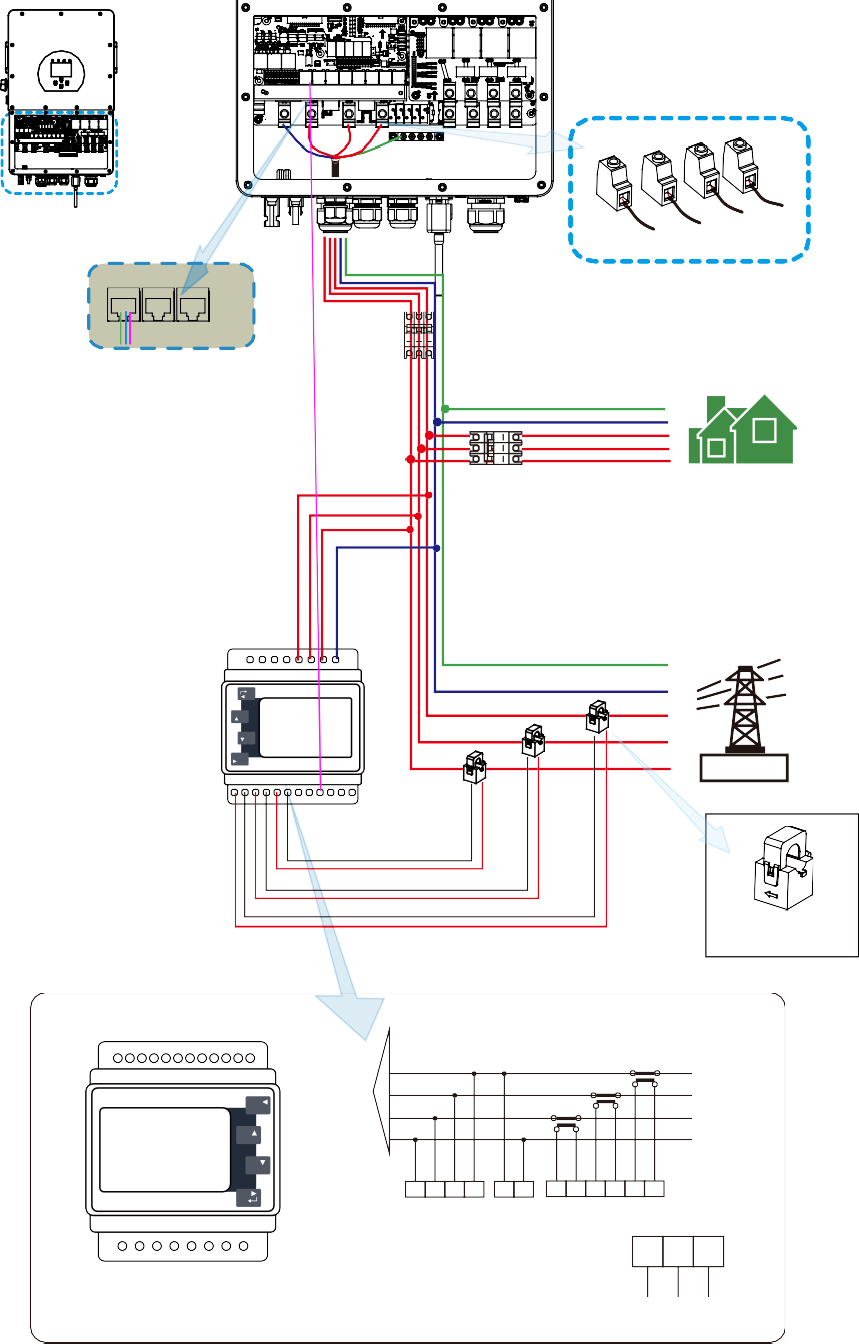
1 2 3 4 5 6 7 8

Grid voltage sampling

Auxiliary power supply

Current inputs

**14 13 12**



Eastron SDM630MCT

Eastron meter

**RS 485**

RS 485 A RS 485 B GND

*Note:*

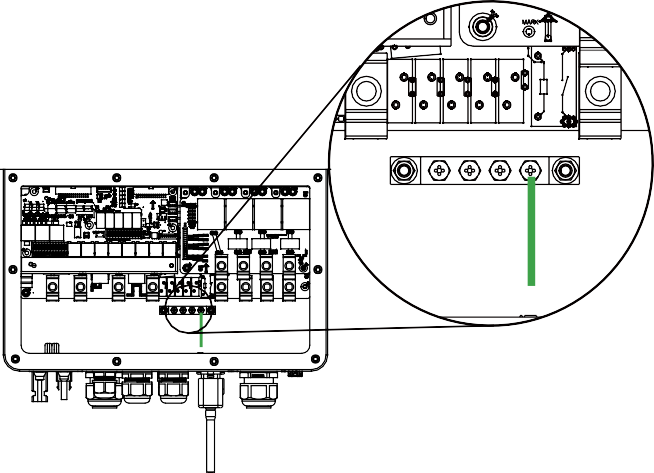
When the inverter is in the oﬀ-grid state, the N line needs to be connected to the earth.

*Note:*

In ﬁnal installa�on,breaker cer�ﬁed according to IEC 60947-1 and IEC 60947-2 shall be installed with the equipment.

#### Earth Connec�on(mandatory)

Ground cable shall be connected to ground plate on grid side this prevents electric shock if the original protec�ve conductor fails.



Earth connec�on(Copper wires)

|  |  |  |  |
| --- | --- | --- | --- |
| ***Model*** | ***Wire Size*** | ***Cable(mm 2 )*** | ***Torque value(max)*** |
| 5/6/8/10/  12/15/20K | 5AWG | 16 | 12.4Nm |

The conductor should be made of the same metal as the phase conductors.

#### WIFI Connec�on

For the conﬁgura�on of Wi-Fi Plug, please refer to illustra�ons of the Wi-Fi Plug. The Wi-Fi Plug is not a standard conﬁgura�on, it's op�onal.

###### PV

DC Breaker

**This diagram is an example for an applica�on that neutral connects with the PE in a distribu�on box.**

For countries such as Australia, New Zealand, South Africa, etc., please follow local wiring regula�ons!

Battery

BMS

DC Breaker

Hybrid Inverter

N L1 L2 L3

PE or

Load

AC Breaker

o not connect thi ter ina when the ne tra wire and PE wire are connected together.

###### RCD

N L1

L2 Load

L3

PE

###### GEN PORT

N

L1 L2 L3

AC Breaker

PE

Inverter case grounding

N L1 L2 L3 PE

Grid

AC Breaker

###### RCD

CT

CT1 CT2 CT3

AC Breaker

N L1

L2 Grid

L3

PE

E-BAR

E-BAR



**3.9 Wiring System for Inverter**

- 21 -

N L1 L2 L3 PE

Home Loads

**This diagram is an example for an applica�on in which neutral is separated from the PE in the distribu�on box.**

For countries such as China, Germany,the Czech Republic, Italy, etc., please follow local wiring regua�ons!

Note:Backup func�on is op�onal in German market.please leave backup side empty if backup func�on is not available in the inverter.

When the inverter is working in backup mode, neutral and PE on the backup side are connected via the internal relay. Also,this internal relay will be open when the inverter is working in grid �ed mode.

Battery

N

PE

Solar Array

BMS

Hybrid Inverter

L1 L2 L3 N

PE or

Backup CT

L1 L2 L3 N PE

On-Grid

Distribution box

RCD



CT1 CT2 CT3

L1 L2

L3 Backup N Loads PE

L1 L2

L3 Grid

N

PE

##### Grouding screw hole in the lower right corner

E-BAR

RCD

E-BAR

**3.10 Wiring diagram**

- 22 -

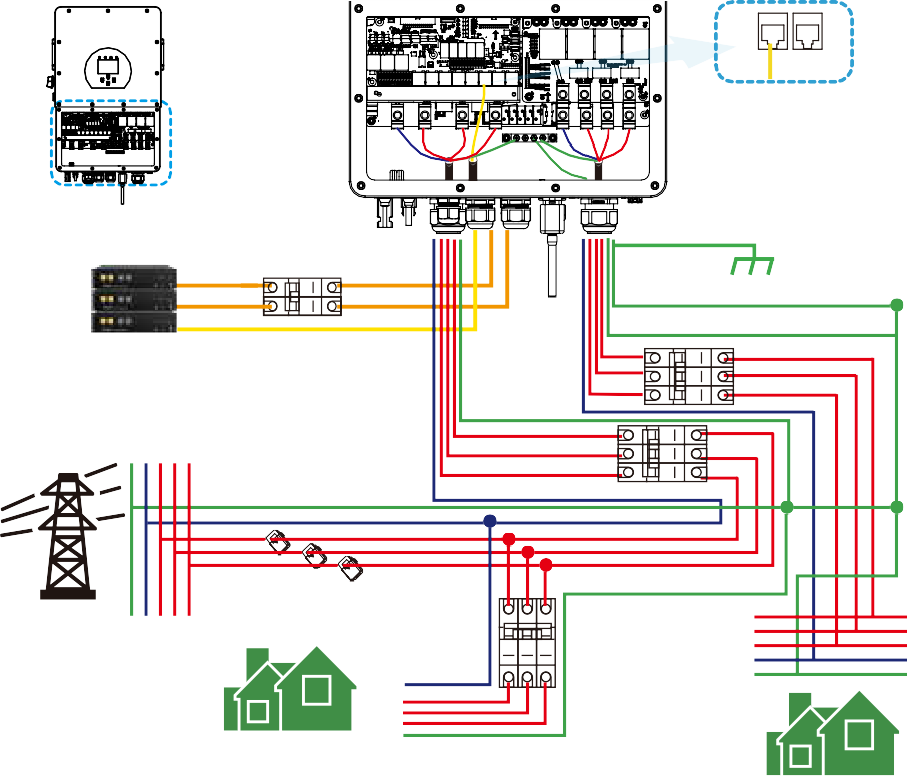
L1 L2 L3 N PE

Home Loads

CAN

L wire

N wire PE wire

BMS1 BMS2

### Inverter

①DC Breaker

##### Ground

Battery pack

②AC Breaker

③AC Breaker

Grid PE NL1L2 L3

CT1 CT2 CT3

N L1 L2 L3

L3

④AC Breaker L2

L1

N PE

① DC Breaker for battery

Home Load PE

SUN 5K-SG-EU: 80A DC breaker SUN 6K-SG-EU: 80A DC breaker SUN 8K-SG-EU: 80A DC breaker SUN 10K-SG-EU: 80A DC breaker SUN 12K-SG-EU: 80A DC breaker SUN 15K-SG-EU: 80A DC breaker SUN 20K-SG-EU: 80A DC breaker

② AC Breaker for backup load SUN 5K-SG-EU: 100A AC breaker SUN 6K-SG-EU: 100A AC breaker SUN 8K-SG-EU: 100A AC breaker SUN 10K-SG-EU: 100A AC breaker SUN 12K-SG-EU: 100A AC breaker SUN 15K-SG-EU: 100A AC breaker SUN 20K-SG-EU: 100A AC breaker

③ AC Breaker for grid

SUN 5K-SG-EU: 100A AC breaker SUN 6K-SG-EU: 100A AC breaker SUN 8K-SG-EU: 100A AC breaker SUN 10K-SG-EU: 100A AC breaker SUN 12K-SG-EU: 100A AC breaker SUN 15K-SG-EU: 100A AC breaker SUN 20K-SG-EU: 100A AC breaker

④AC Breaker for home load Depends on household loads

Backup Load

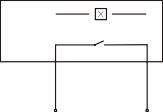
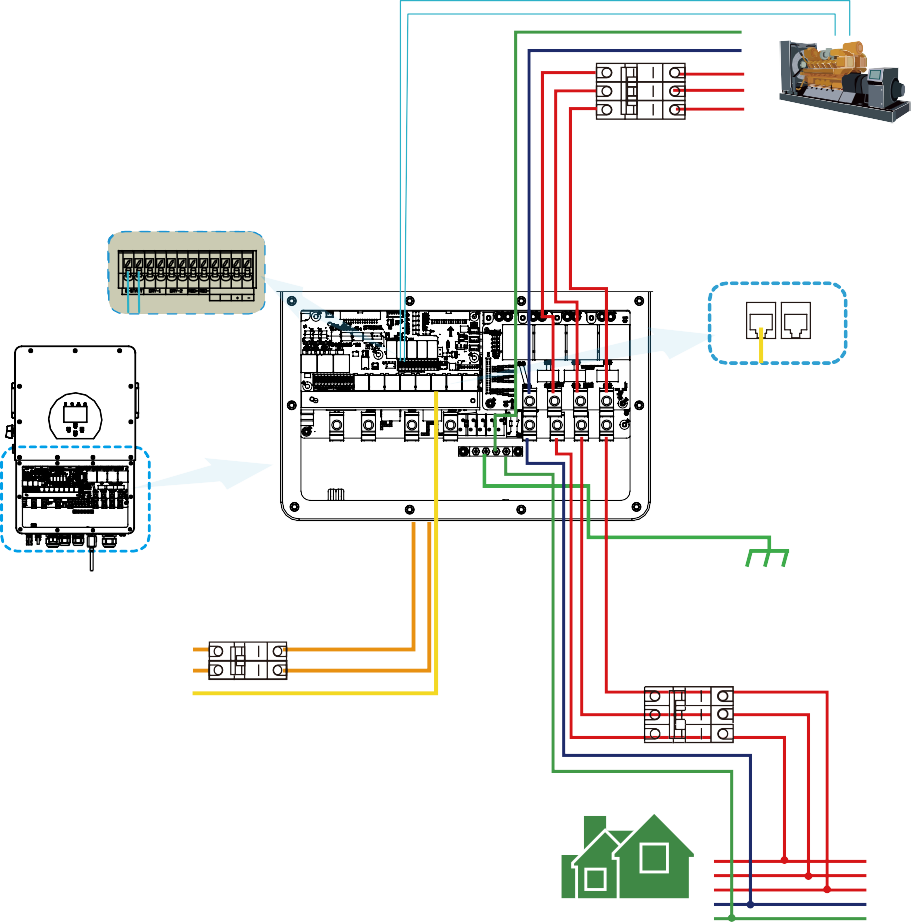
#### 3.11 Typical applica�on diagram of diesel generator

CAN

L wire

N wire PE wire

Remotely control signal line



coil

relay

contact

open

PE N

L1 L2 L3

G S

③AC Breaker

Generator

GS (diesel generator startup signal)

G-start (1,2): dry contact signal for startup

the diesel generator.

1 2 3 4 5 6 7 8 9 10 1112

**SHUT DOWN B B**

BMS1 BMS2

Ground

Inverter

①DC Breaker

②AC Breaker

Battery pack

① DC Breaker for battery

SUN 5K-SG-EU: 80A DC breaker SUN 6K-SG-EU: 80A DC breaker SUN 8K-SG-EU: 80A DC breaker SUN 10K-SG-EU: 80A DC breaker SUN 12K-SG-EU: 80A DC breaker SUN 15K-SG-EU: 80A DC breaker SUN 20K-SG-EU: 80A DC breaker

② AC Breaker for backup load

Backup Load

L1 L2 L3 N PE

SUN 5K-SG-EU: 100A AC breaker SUN 6K-SG-EU: 100A AC breaker SUN 8K-SG-EU: 100A AC breaker SUN 10K-SG-EU: 100A AC breaker SUN 12K-SG-EU: 100A AC breaker SUN 15K-SG-EU: 100A AC breaker SUN 20K-SG-EU: 100A AC breaker

③ AC Breaker for Generator port SUN 5K-SG-EU: 100A AC breaker SUN 6K-SG-EU: 100A AC breaker SUN 8K-SG-EU: 100A AC breaker SUN 10K-SG-EU: 100A AC breaker SUN 12K-SG-EU: 100A AC breaker SUN 15K-SG-EU: 100A AC breaker SUN 20K-SG-EU: 100A AC breaker

#### 3.12 Three phase parallel connec�on diagram

Note: The func�on of Mul�ple units work in parallel mode will be avaiable in Q1 2023.

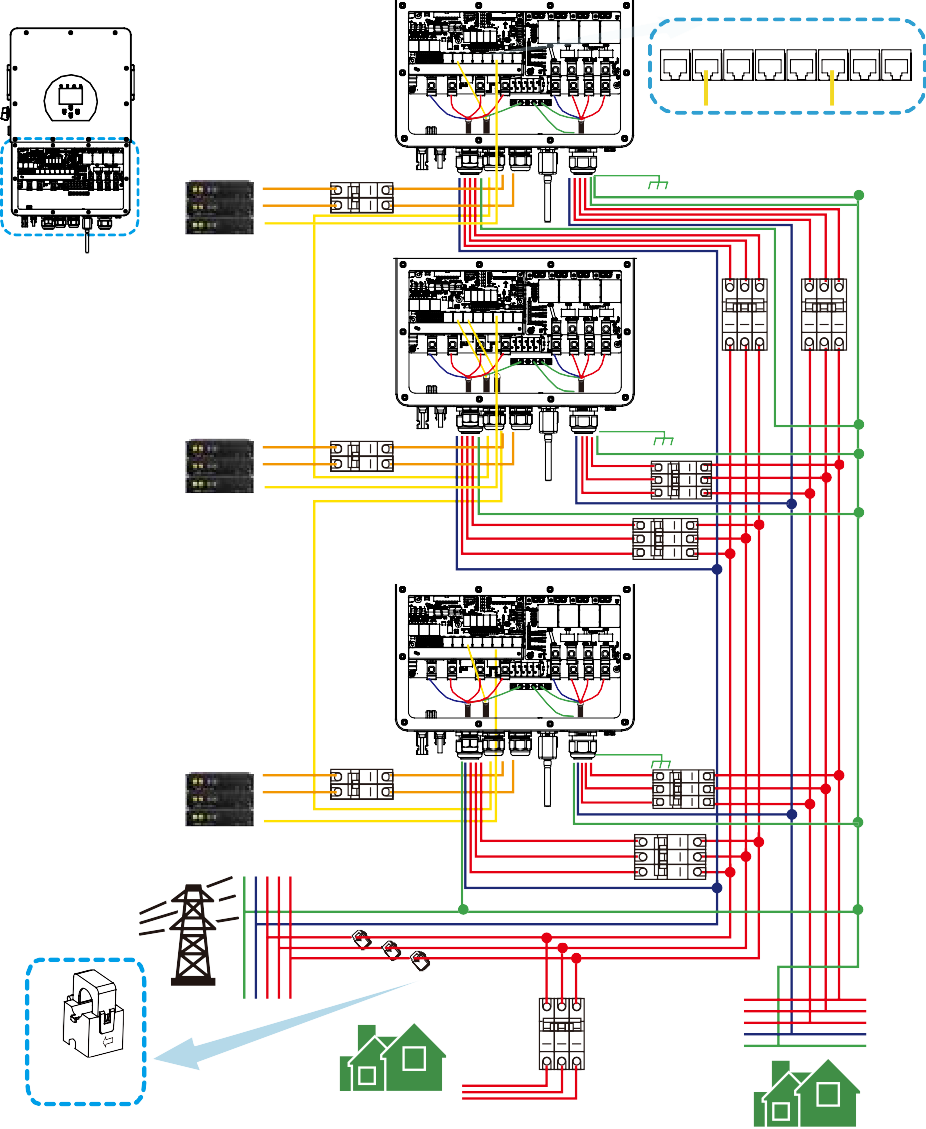
For the parallel system, the lead-acid ba�ery is not supported. Please use Deye approved

lithium ba�ery.

CAN

L wire

N wire PE wire

Inverter No.3

(slave)

Meter Parallel\_1 Parallel\_2 CAN DRM BMS1 BMS2 RS485

① Ground

Inverter

Battery pack

Note: unlike cases of other hybrid inverter with LV ba�ery, HV ba�ery can only be connected separately to HV hybrid inverters.

Inverter

No.2 ④ ⑤

(slave)

④⑥⑧ AC Breaker for grid port SUN 5K-SG-EU: 100A AC breaker SUN 6K-SG-EU: 100A AC breaker SUN 8K-SG-EU: 100A AC breaker SUN 10K-SG-EU: 100A AC breaker SUN 12K-SG-EU:100A AC breaker SUN 15K-SG-EU:100A AC breaker SUN 20K-SG-EU:100A AC breaker

⑤⑦⑨ AC Breaker for backup load SUN 5K-SG-EU: 100A AC breaker SUN 6K-SG-EU: 100A AC breaker SUN 8K-SG-EU: 100A AC breaker SUN 10K-SG-EU: 100A AC breaker SUN 12K-SG-EU:100A AC breaker SUN 15K-SG-EU:100A AC breaker SUN 20K-SG-EU:100A AC breaker

①②③ DC Breaker for battery SUN 5K-SG-EU: 80A DC breaker SUN 6K-SG-EU: 80A DC breaker SUN 8K-SG-EU: 80A DC breaker SUN 10K-SG-EU: 80A DC breaker SUN 12K-SG-EU: 80A DC breaker SUN 15K-SG-EU: 80A DC breaker SUN 20K-SG-EU: 80A DC breake

⑩ AC Breaker for home load Depends on household loads

Battery pack

Battery pack

②

Inverter No.1

(master)

③

Ground

⑦

⑥

Ground

⑨

⑧

CT

Arrow pointing to inverter

Grid

PEN L1L2L3

CT1 CT2 CT3

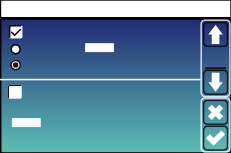
L3 L2 L1 N PE

⑩

Home Load

Master inverter Slave Inverter Slave Inverter

Advanced Function



EX\_Meter For CT

Meter Select

No Meter 0/3

Paral. Set3

Slave

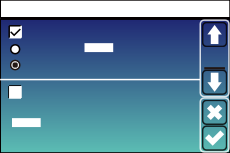
02

Master

Modbus SN

Parallel

Advanced Function



EX\_Meter For CT

Meter Select

No Meter 0/3

Paral. Set3

Slave

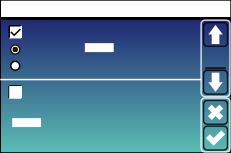
03

Master

Modbus SN

Parallel

Advanced Function



EX\_Meter For CT

Meter Select

No Meter 0/3

Paral. Set3

Slave

01

Master

Modbus SN

Parallel

Backup Load

1. **OPERATION**

#### Power ON/OFF

Once the unit has been properly installed and the ba�eries are connected well, simply press On/Oﬀ bu�on(located on the le� side of the case) to turn on the unit. When system without ba�ery connected, but connect with either PV or grid, and ON/OFF bu�on is switched oﬀ, LCD will s�ll light up(Display will show OFF), In this condi�on, when switch on ON/OFF bu�on and select NO ba�ery,system can s�ll working.

#### Opera�on and Display Panel

The opera�on and display panel, shown in below chart, is on the front panel of the inverter.

It includes four indicators, four func�on keys and a LCD display, indica�ng the opera�ng status and input/output power informa�on.

|  |  |  |
| --- | --- | --- |
| ***LED Indicator*** | | ***Messages*** |
| DC | Green led solid light | PV Connec�on normal |
| AC | Green led solid light | Grid Connec�on normal |
| Normal | Green led solid light | Inverter opera�ng normal |
| Alarm | Red led solid light | Malfunc�on or warning |

Chart 4-1 LED indicators

|  |  |
| --- | --- |
| ***Function Key*** | ***Description*** |
| Esc | To exit se�ng mode |
| Up | To go to previous selec�on |
| Down | To go to next selec�on |
| Enter | To conﬁrm the selec�on |

Chart 4-2 Func�on Bu�ons

## LCD Display Icons

#### Main Screen

The LCD is touchscreen, below screen shows the overall informa�on of the inverter.



12/08/2022 15:34:40 Thu

0 **0.00** 15

0 **8.61** 15

KW

ON

KW

**91%**

0 **-8.12** 15

0 **0.00** 15

KW

KW

1. The icon in the center of the home screen indicates that the system is Normal opera�on. If it turns into "comm./F01~F64" , it means the inverter has communica�on 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 �me.
3. System Setup Icon, Press this set bu�on,you can enter into the system setup screen which including Basic Setup, Ba�ery Setup, Grid Setup, System Work Mode, Generator port use, Advanced func�on and Li-Ba� info.
4. The main screen showing the info including Solar, Grid, Load and Ba�ery. Its also displaying the energy ﬂow direc�on 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 posi�ve.
   * Grid power nega�ve means sell to grid, posi�ve means get from grid.
   * Ba�ery power nega�ve means charge, posi�ve means discharge.

#### LCD opera�on ﬂow chart



Main Screen

Solar Page

Solar Graph

Grid Graph

BMS Page

Load Graph

Battery Setting

System Work Mode

Grid Setting

Gen Port Use

Basic Setting

Advanced Function

Device info

Grid Page

Inverter Page

Battery Page

Load Page



System Setup

* 1. **Solar Power Curve**



|  |  |
| --- | --- |
| Solar | |
| PV1-V: 286V | PV1-I: 5.5A PV1-P: 1559W **②** |
| PV2-V: 286V | PV2-I: 5.5A PV2-P: 1559W |
|  | Today=8.0 KWH **③** |
|  |  |
| **①** | Total =12.00 KWH Energy |

**This is Solar Panel detail page.**

① Solar Panel Genera�on.

② Voltage, Current, Power for each MPPT.

③ Daily and total PV produc�on.

Press the “Energy “bu�on will enter into the power curve page.

|  |  |  |  |
| --- | --- | --- | --- |
| 1166w | | 1244w  50Hz | -81w **①**  50Hz |
| 221v 0w  229v 1166w  225v 0w | | 222v 0.8w  229v 5.0w  229v 0.9w  HM: LD: | 222v 0.1A  230v 0.1A  223v 0.1A INV\_P: |
|  | | -10W 28W | -30W |
| Load | |
| 5W 1192W | -26W AC\_T: |
| 0W 24W | -25W 38.8C |
| 21w | |
| 0w | 0w | Grid | Inverter |
| 150V  -0.41A 27.0C | 150V  -0.41A 27.0C | 0W  0V  0.0A | 0W  0V  0.0A |
| Battery | | PV | |

**This is Inverter detail page.**

① Inverter Genera�on.

Voltage, Current, Power for each Phase. AC-T: mean Heat-sink temperature.

|  |  |  |  |
| --- | --- | --- | --- |
| Load | | | |
| Power: | 55W | **①** | Today=0.5 KWH **③** |
|  |  |  | Total =1.60 KWH |
|  | L1: 220V |  | P1: 19W **②** |
|  | L2: 220V |  | P2: 18W |
|  | L3: 220V |  | P3: 18W |
|  |  |  | Energy |

**This is Back-up Load detail page.**

① Back-up Power.

② Voltage, Power for each Phase.

③ Daily and total backup consump�on .

Press the “Energy “ bu�on will enter into the power curve page.

|  |  |
| --- | --- |
| Grid | |
| Stand by **①** | BUY **③** |
| 0W | Today=2.2KWH |
| 0.0Hz | Total =11.60 KWH |
|  | SELL |
| CT1： 0W LD1：0W **②** | Today=0.0KWH |
| CT2: 0W LD2：0W | Total =8.60 KWH |
| CT3: 0W LD3：0W |  |
| L1: 0V L2: 0V L3: 0V | Energy |

**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 “ bu�on will enter into the power curve page.

Batt



Energy

U:170V I:2.04A

Power: 101W

Temp:25.0C

Battery 1 Stand by

Li-BMS



Details Data

Data

Charging current :30A

Discharging current :25A

Mean Temp :23.5C Total SOC :38%

Dump Energy:57Ah

Mean Voltage:170.0V Charging Voltage :180.0V

Total Current:37.00A Discharging Voltage :160.0V Sum

This is Ba�ery detail page.



|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Li-BMS | | | | | | | | |
|  | Volt | Curr | Temp | SOC | Energy | Charge | Fault |  |
|  |  |  |  |  |  | Volt Curr |  |  |
| 1 | 150.3V | 19.70A | 30.6C | 52.0% | 26.0Ah | 0.0V 0.0A | 0|0|0 |  |
| 2 | 150.2V | 19.10A | 31.0C | 51.0% | 25.5Ah | 153.2V 25.0A | 0|0|0 | Sum |
| 3 | 150.1V | 16.90A | 30.2C | 12.0% | 6.0Ah | 153.2V 25.0A | 0|0|0 |  |
| 4 | 0.00V | 0.00A | 0.0C | 0.0% | 0.0Ah | 0.0V 0.0A | 0|0|0 | Data |
| 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 | Details |
| 11 | 0.00V | 0.00A | 0.0C | 0.0% | 0.0Ah | 0.0V 0.0A | 0|0|0 | Data |
| 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 |  |

if you use Lithium Ba�ery, you can enter BMS page.

#### Curve Page-Solar & Load & Grid



|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Solar Power Production:Day | | | | | | | | |
| 3000W |  |  |  |  | 2019-5-28 |  |  |  |
| 100% |  |  |  |  |  |  |  |  |
| 80% |  |  |  |  |  |  |  |  |
| 60% |  |  |  |  |  |  |  |  |
| 40% |  |  |  |  |  |  |  |  |
| 20% |  |  |  |  |  |  |  |  |
|  | 1 | 3 | 5 7 | 9 | 11 13 15 17 | 19 21 | 23 |  |
| CANCEL |  |  | Day |  | Month | Year |  | Total |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| System Solar Power:Month | | | | | | | |
| 2000Wh |  |  |  | 5-2019 |  |  |  |
| 2000 |  |  |  |  |  |  |  |
| 1600 |  |  |  |  |  |  |  |
| 1200 |  |  |  |  |  |  |  |
| 800 |  |  |  |  |  |  |  |
| 400 |  |  |  |  |  |  |  |
| 0 |  |  |  |  |  |  |  |
|  | 05 |  | 10 | 15 20 | 25 | 30 |  |
| CANCEL |  | Day |  | Month | Year |  | Total |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| System Solar Power:Year | | | | | | | | | | |
| KWh |  |  |  |  |  | 2019 |  |  |  |  |
| 200 |  |  |  |  |  |  |  |  |  |  |
| 160 |  |  |  |  |  |  |  |  |  |  |
| 120 |  |  |  |  |  |  |  |  |  |  |
| 80 |  |  |  |  |  |  |  |  |  |  |
| 40 |  |  |  |  |  |  |  |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 7 8 | 9 | 10 11 | 12 |  |
| CANCEL |  |  | Day |  |  | Month |  | Year |  | Total |

|  |  |
| --- | --- |
| System Solar Power:Total | |
| 2000KWh TOTAL |  |
| 2000 |  |
| 1600 |  |
| 1200 |  |
| 800 |  |
| 400 |  |
| 0 |  |
| 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 |  |
| 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 |  |
| CANCEL Day Month Year | Total |

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

* 1. **System Setup Menu**

|  |  |
| --- | --- |
| System Setup | This is System Setup page. |
| System Work Mode  Battery  Setting Gen Port  Grid Setting Use  Basic Advanced Device Info.  Setting Function |

* 1. **Basic Setup Menu**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Basic Setting | | | | **Factory Reset:** Reset all parameters of the inverter. |
| Time Syncs  Year  2019  24-Hour  Factory Reset | Beep  Month  03  Hour  09 | Auto Dim  Day  17  Minute  15  Lock out all changes | Basic Set |
| **Lock out all changes:** Enable this menu for se�ng |
| 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 se�ng. |
| The password for factory se�ngs is 9999 and for lock |
| out is 7777. |

|  |  |  |  |
| --- | --- | --- | --- |
| PassWord | | | **Factory Reset Password:** 9999 |
|  |  |  |
|  | X--X--X--X | DEL | **Lock out all changes Password:** 7777 |
| 1 | 2 | 3 |  |
| 4 | 5 | 6 |  |
| 7 | 8 | 9 |  |
| CANCEL | 0 | OK |  |

* 1. **Ba�ery Setup Menu**

Battery Setting



Start 30%

30%

A

20A

37A

Batt Set2

① Gen Charge Grid Charge ②

Gen Signal

Grid Signal

Gen Max Run Time 24.0 hours

③

Gen Down Time

0.0 hours

**This is Grid Charge, you need select.** ② **Start =30%:** No use，Just for customiza�on. **A = 37A:** It indicates the Current that the

Grid charges the Ba�ery.

**Grid Charge:** It indicates that the grid charges the ba�ery.

**Grid Signal:** Disable.

**This is Ba�ery Setup page.** ① ③

**Start =30%:** Percent SOC below 30% system will AutoStart a connected generator to charge the ba�ery bank.

**A = 20A:** Charge rate of 20A from the a�ached generator in Amps.

**Gen Charge:** uses the gen input of the system to charge ba�ery bank from an a�ached generator.

**Gen Signal:** Normally open relay that closes when the Gen Start signal state is ac�ve.

**Gen Max Run Time:** It indicates the longest �me Generator can run in one day, when �me is up, the Generator will be turned oﬀ. 24H means that it does not shut down all the �me.

**Gen Down Time:** It indicates the delay �me of the Generator to shut down a�er it has reached the running

�me.

|  |  |  |  |
| --- | --- | --- | --- |
| Battery Setting | | | **Ba�ery capacity:** it shows your ba�ery bank size to Deye hybrid inverter.  **Use Ba� V:** Use Ba�ery Voltage for all the se�ngs (V). |
| Batt Mode  Lithium | Batt Capacity 0Ah | Batt |
| Use Batt V | Max A Charge 0A | Mode | **Use Ba� %:** Use Ba�ery SOC for all the se�ngs (%). |
| Use Batt %  No Batt  Activate Battery1 Activate Battery2 | Max A Discharge 0A  Parallel bat1&bat2 |  | **Max. A charge/discharge:** Max ba�ery charge/discharge  current(0-37A for 5/6/8/10/12/15/20KW model). For AGM and Flooded, we recommend Ah ba�ery size x 20%= Charge/Discharge amps.  . For Lithium, we recommend Ah ba�ery size x 50% = Charge/Discharge amps.  . For Gel, follow manufacturer' s instruc�ons. |
|  | | |
| **No Ba�:** �ck this item if no ba�ery is connected to the system. |
| **Ac�vate Ba�ery1/Ac�vate Ba�ery2:** This feature will help recover a ba�ery that is over discharged by slowly charging from the solar array or grid. |





12/08/2022 15:34:40 Thu

0 **0.00** 15

0 **8.61** 15

KW

ON

KW

**91%**

Signal on

0 **-8.12** 15

0 **0.00** 15

KW

KW

This page tells the PV and diesel generator power the load and ba�ery.

|  |  |
| --- | --- |
| Generator | |
| Power: 6000W | Today=10 KWH |
|  | Total =10 KWH |
| V\_L1: 230V | P\_L1: 2KW |
| V\_L2: 230V | P\_L2: 2KW |
| V\_L3: 230V | P\_L3: 2KW |

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

|  |  |
| --- | --- |
| Battery Setting | **Lithium Mode:** This is BMS protocol.Please reference the document(Approved Ba�ery).  **Shutdown 10%:** It indicates the inverter will shutdown if the SOC below this value.  **Low Ba� 20%:** It indicates the inverter will alarm if the SOC below this value.  **Restart 40%:** Ba�ery SOC at 40% AC output will resume. |
| Lithium Mode 00  Batt  Shutdown 10% Set3  Low Batt 20%  Restart 40% |

Recommended ba�ery se�ngs

|  |  |  |  |
| --- | --- | --- | --- |
| ***Battery Type*** | ***Absorption Stage*** | ***Float Stage*** | ***Torque value (every 30 days 3hr )*** |
| Lithium | Follow its BMS voltage parameters | | |

#### System Work Mode Setup Menu

|  |  |
| --- | --- |
| System Work Mode  Selling First 12000 Max Solar Power  Work Zero Export To Load Solar Sell Mode1  Zero Export To CT Solar Sell  Max Sell Power 12000 Zero-export Power 20 Energy pattern BattFirst LoadFirst  Grid Peak Shaving 8000 Power | **Work Mode**  **Selling First:** This Mode allows hybrid inverter to sell back any excess power produced by the solar panels to the grid. If �me of use is ac�ve, the ba�ery energy also can be sold into grid.  The PV energy will be used to power the load and charge the ba�ery and then excess energy will ﬂow to grid.  Power source priority for the load is as follows:   1. Solar Panels. 2. Grid. 3. Ba�eries (un�l 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 ba�ery.  Solar Backup Load On-Grid Home Load Grid  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 ba�ery 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 installa�on  method of the CT please refer to chapter 3.6 CT Connec�on. 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 ba�ery and home load.  Solar Backup Load On-Grid Home Load Grid CT  Battery | |

|  |
| --- |
| 01:00 |
| 05:00 |
| 09:00 |
| 13:00 |

|  |
| --- |
| 5:00 |
| 9:00 |
| 13:00 |
| 17:00 |
| 21:00 |
| 01:00 |

|  |
| --- |
| 12000 |
| 12000 |
| 12000 |
| 12000 |
| 12000 |
| 12000 |

|  |
| --- |
| 160V |
| 160V |
| 160V |
| 160V |
| 160V |
| 160V |

|  |
| --- |
| 5:00 |
| 8:00 |
| 10:00 |
| 15:00 |
| 18:00 |
| 01:00 |

|  |
| --- |
| 12000 |
| 12000 |
| 12000 |
| 12000 |
| 12000 |
| 12000 |

|  |
| --- |
| 80% |
| 40% |
| 40% |
| 100% |
| 40% |
| 35% |

|  |
| --- |
| 05:00 |
| 08:00 |
| 10:00 |
| 15:00 |

**Solar Sell:** “Solar sell” is for Zero export to load or Zero export to CT: when this item is ac�ve, the surplus energy can be sold back to grid. When it is ac�ve, PV Power source priority usage is as follows: load consump�on and charge ba�ery 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 Pa�ern:** PV Power source priority.

**Ba� First:** PV power is ﬁrstly used to charge the ba�ery and then used to power the load. If PV power is insuﬃcient, grid will make supplement for ba�ery and load simultaneously.

**Load First:** PV power is ﬁrstly used to power the load and then used to charge the ba�ery. If PV power is insuﬃcient, Grid will provide power to load.

**Max Solar Power:** allowed the maximum DC input power.

**Grid Peak-shaving:** when it is ac�ve, grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and ba�ery as supplement. If s�ll can’t meet the load requirement, grid power will increase to meet the load needs.

|  |  |  |  |
| --- | --- | --- | --- |
| System Work Mode  Grid Time Of Use  Charge Gen Time Power  17:00  21:00 | Batt | Work Mode2 | **Time of use:** it is used to program when to use grid or generator to charge the ba�ery, and when to discharge the ba�ery to power the load. Only �ck "Time Of Use" then the follow items (Grid, charge, �me, power etc.) will take eﬀect.  **Note:** when in selling ﬁrst mode and click �me of use, the ba�ery power can be sold into grid.  **Gen charge:** u�lize diesel generator to charge the ba�ery in a �me period.  **Time:** real �me, range of 01:00-24:00.  **Note:** when the grid is present, only the “�me of use” is �cked, then the ba�ery will discharge. Otherwise, the ba�ery won’t discharge even the ba�ery SOC is full. But in the oﬀ-grid mode (when grid is not |
| Battery Setting  Start 30% 30%  A 20A 37A  Gen Charge Grid Charge ①  Gen Signal Grid Signal Gen Max Run Time 24.0 hours Gen Down Time 0.0 hours  System Work Mode  **②**Grid Time Of Use  Charge Gen Time Power Batt  01:00  18:00 | | Batt Set2 | available, inverter will work in the oﬀ-grid mode  automa�cally).  **Power:** Max. discharge power of ba�ery allowed. **Ba�(V or SOC %):** ba�ery SOC % or voltage at when the ac�on is to happen. |
|  | **For example** |
|  | **During 01:00-05:00,** |
|  | if ba�ery SOC is lower than 80%, it will use grid to charge the |
|  | ba�ery un�l ba�ery SOC reaches 80%. |
|  | **During 05:00-08:00,** |
|  | if ba�ery SOC is higher than 40%, hybrid inverter will discharge |
|  | the ba�ery un�l the SOC reaches 40%. At the same �me, |
|  | if ba�ery SOC is lower than 40%, then grid will charge the |
|  | ba�ery SOC to 40%. |
|  | **During 08:00-10:00,** |
|  | if ba�ery SOC is higher than 40%, hybrid inverter will discharge |
| Work Mode2 | the ba�ery un�l the SOC reaches 40%.  **During 10:00-15:00,**  when ba�ery SOC is higher than 80%, hybrid inverter will |
|  | discharge the ba�ery un�l the SOC reaches 80%. |
|  | **During 15:00-18:00,** |
|  | when ba�ery SOC is higher than 40%, hybrid inverter will discharge |
|  | the ba�ery un�l the SOC reaches 40%. |
|  | **During 18:00-01:00,** |
|  | when ba�ery SOC is higher than 35%, hybrid inverter will discharge |
|  | the ba�ery un�l the SOC reaches 35%. |

* 1. **Grid Setup Menu**

|  |  |  |
| --- | --- | --- |
| Grid Setting/Grid code selection  Grid Mode General Standard 0/10 Grid Frequency 50HZ Phase Type  60HZ 0/120/240  0/240/120  Grid Level LN:220V/LL:380V(AC)  IT system-neutral is not grounded | Grid Set1 | **Grid Mode:**General Standard、UL1741 & IEEE1547、 CPUC RULE21、SRD-UL-1741、CEI 0-21、Australia A、  Australia B、Australia C、EN50549\_CZ-PPDS(>16A)、  NewZealand、VDE4105、OVE-Direc�ve R25. |
| Please follow the local grid code and then choose the |
| corresponding grid standard. |
| **Grid level**: there’re several voltage levels for the inverter |
| output voltage when it is in oﬀ-grid mode. |
| LN:230VAC LL:400VAC,LN:240VAC LL:420VAC, |
| LN:120VAC LL:208VAC, LN:133VAC LL:230VAC. |
| **IT system**: For the IT grid system, the Line voltage |
| (between any two lines in a three-phase circuit) is 230Vac, and the diagram is as follow.If your grid system is IT system, please enable “IT system” and �ck the “Grid level” as 133-3P as below picture shows. | | |

U V W



220VAC 220VAC 220VAC

Rz

N

Rz: Large resistance ground resistor. Or the system doesn’t have Neutral line

Grid Setting/Connect



Normal connect

Normal Ramp rate 10s

Low frequency 48.00Hz High frequency 51.50Hz

Low voltage 185.0V High voltage

265.0V

Grid Set2

Reconnect after trip Reconnect Ramp rate 36s

Low frequency 48.20Hz High frequency 51.30Hz

Low voltage 187.0V High voltage 263.0V

Reconnection Time

60s

PF 1.000

**Normal connect**: The allowed grid voltage/frequency range when the inverter ﬁrst �me connect to the grid. **Normal Ramp rate**: It is the startup power ramp.

**Reconnect a�er trip**: The allowed grid voltage

/frequency range for the inverter connects the grid a�er the inverter trip from the grid.

**Reconnect Ramp rate**:It is the reconnec�on power ramp.

**Reconnec�on �me**: The wai�ng �me period for the inverter connects the grid again.

**PF**: Power factor which is used to adjust inverter reac�ve power.



Over voltage U>(10 min. running mean) 260.0V

HV3

HF3

Grid Set3

①HV2

HV1

-- 0.10s ② HF2

-- 0.10s

-- 0.10s

HF1

-- 0.10s

LV1

-- 0.10s

LF1

-- 0.10s

LV2

-- 0.10s

LF2

-- 0.10s

LV3

LF3

Grid Setting/IP Protection

48.00Hz

185.0V

48.00Hz

185.0V

48.00Hz

185.0V

51.50Hz

265.0V

51.50Hz

265.0V

51.50Hz

265.0V

**HV1:** Level 1 overvoltage protec�on point;

①**HV2:** Level 2 overvoltage protec�on point;② 0.10s—Trip �me.

**HV3**: Level 3 overvoltage protec�on point.

**LV1:** Level 1 undervoltage protec�on point; **LV2:** Level 2 undervoltage protec�on point; **LV3**: Level 3 undervoltage protec�on point.

**HF1:** Level 1 over frequency protec�on point; **HF2:** Level 2 over frequency protec�on point; **HF3**: Level 3 over frequency protec�on point.

**LF1:** Level 1 under frequency protec�on point; **LF2:** Level 2 under frequency protec�on point; **LF3**: Level 3 under frequency protec�on point.



**V(W)**: It is used to adjust the inverter ac�ve power according to the set grid voltage.

**V(Q)**: It is used to adjust the inverter reac�ve power according to the set grid voltage.

This func�on is used to adjust inverter output power (ac�ve power and reac�ve power) when grid voltage changes.

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

For example: V2=110%, P2=80%. When the grid voltage reaches the 110% �mes of rated grid voltage, inverter output power will reduce its ac�ve output power to 80% rated power.

For example: V1=94%, Q1=44%. When the grid voltage reaches the 94% �mes of rated grid voltage, inverter output power will output 44% reac�ve output power.

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



Grid Setting/F(W)

F(W)

Over frequency

Droop F

40%PE/Hz

Grid

Start freq F 50.20Hz Stop freq F 51.5Hz Set4

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

**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＞50.2Hz, Stop freq F＜51.5, Droop F=40%PE/Hz” when the grid frequency reaches 50.2Hz, the inverter will decrease its ac�ve power at Droop F of 40%. And then when grid system frequency is less than 50.1Hz, 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) |  |
|  |  |  |  |  | Lock-in/Pn |  | Lock-out/Pn |  |
|  |  |  |  |  |  |  |  | Grid |
|  |  |  |  |  | 5% |  | 20% | Set5 |
| V1 | 108.0% | P1 | 100% | V1 | 94.0% | Q1 | 44% |  |
| V2 | 110.0% | P2 | 80% | V2 | 97.0% | Q2 | 0% |  |
| V3 | 112.0% | P3 | 60% | V3 | 105.0% | Q3 | 0% |  |
| V4 | 114.0% | P4 | 40% | V4 | 108.0% | Q4 | -44% |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Grid Setting/P(Q) P(F) | | | | | | | |
|  |  | P(Q) |  |  |  | P(PF) |  |
|  |  |  |  | Lock-in/Pn |  | Lock-out/Pn | Grid |
|  |  |  |  | 50% |  | 50% | Set6 |
| P1 | 0% | Q1 2% | P1 | 0% | PF1 | -0.000 |  |
| P2 | 2% | Q2 0% | P2 | 0% | PF2 | -0.000 |  |
| P3 | 0% | Q3 21% | P3 | 0% | PF3 | 0.000 |  |
| P4 | 22% | Q4 25% | P4 | 62% | PF4 | 0.264 |  |

**P(Q):** It is used to adjust the inverter reac�ve power according to the set ac�ve power.

**P(PF):** It is used to adjust the inverter PF according to the set ac�ve power.

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

**Lock-in/Pn 50%**: When the inverter output ac�ve power is less then 50% rated power, it won't enter the P(PF) mode.

**Lock-out/Pn 50%**: When the inverter output ac�ve power is higher then 50% rated power, it will enter the P(PF) mode.

Note : only when the grid voltage is equal to or higher than 1.05�mes of rated grid voltage, then the P(PF) mode will take eﬀect.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Grid Setting/LVRT  L/HVRT | | | | | |
|  |  |  |  |  | Grid |
| HV3 | 0% | HV3\_T | 30.24s |  | Set7 |
|  |  |  |  |  |  |
| HV2 | 0% | HV2\_T | 0.04s |  |  |
| HV1 | 0% | HV1\_T | 22.11s |  |  |
| LV1 | 0% | LV1\_T | 22.02s |  |  |
| LV2 | 0% | LV2\_T | 0.04s |  |  |

**Reserved:** This func�on is reserved.It is not recommended.

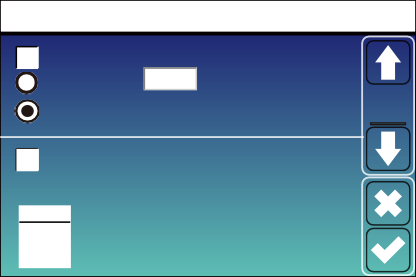
#### Generator Port Use Setup Menu

|  |  |
| --- | --- |
| GEN PORT USE  Mode  Generator Input GEN connect to Grid input  Rated Power PORT  8000W Set1  SmartLoad Output On Grid always on  AC Couple Frz High  55.00Hz  OFF 151.0V  Micro Inv Input ON 154.0V  Ml export to Grid cutoff | **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 u�lizes the Gen input connec�on as an output which only receives power when the ba�ery SOC  is above a user programmable threshold.  **e.g. ON: 100%, OFF: 95%:** When the ba�ery bank SOC reaches 100%, Smart Load Port will switch on automa�cally and power the load connected. When the ba�ery bank SOC < 95% , the Smart Load Port will switch oﬀ automa�cally. |
| **Smart Load OFF Ba�**   * Ba�ery SOC at which the Smart load will switch oﬀ.   **Smart Load ON Ba�**   * Ba�ery SOC at which the Smart load will switch on. 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.  **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 ba�ery SOC exceeds se�ng value, Microinveter or grid-�ed inverter will shut down.  ＊**Micro Inv Input ON**: when the ba�ery SOC is lower than se�ng value, Microinveter or grid-�ed inverter will start to work.  **AC Couple Frz High:** If choosing“Micro Inv input”, as the ba�ery SOC reaches gradually se�ng value (OFF), during the process, the microinverter output power will decrease linear. When the ba�ery SOC equals to the se�ng value (OFF), the system frequency will become the se�ng value (AC couple Frz high) and the Microinverter will stop working.  MI export to grid cutsoﬀ: Stop expor�ng power produced by the microinverter to the grid.  ＊**Note**: Micro Inv Input OFF and On is valid for some certain FW version only. | |

* 1. **Advanced Func�on Setup Menu**

|  |  |
| --- | --- |
| Advanced Function  Solar Arc Fault ON Backup Delay 0s  Clear Arc\_Fault Func  Set1  System selfcheck Gen peak-shaving  DRM 2000：1 CT Ratio  Signal Island Mode BMS\_Err\_Stop  Asymmetric phase feeding CEI Report | **Solar Arc Fault ON:** This is only for US.  **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:** Reserved  **BMS\_Err\_Stop:** When it is ac�ve, if the ba�ery BMS failed to communicate with inverter, the inverter will stop working and report fault. |
| **Signal island mode:** If "Signal island mode" is checked and When inverter is in oﬀ-grid mode, the relay on the Neutral line (load port N line) will switch ON then the N line (load port N line) will bind to inverter ground.  Inverter  Load port  Shell  L1 L2 L3 N  Ground cable  Relay  **Asymmetric phase feeding:** If it was checked, the excess PV energy that feeds into the grid will be balanced on the three phase. | |

Advanced Function



Parallel

Modbus SN

Master

Slave

Paral. Set3

EX\_Meter For CT

Meter Select

No Meter 0/3

CHNT

Eastron

00

**Ex\_Meter For CT:** when using zero-export to CT mode, the hybrid inverter can select EX\_Meter For CT func�on and use the diﬀerent meters.e.g.CHNT and Eastron.

* 1. **Device Info Setup Menu**

|  |  |
| --- | --- |
| Device Info. | |
| Inverter ID: 2102199870 Flash |  |
| HMI: Ver 1001-8010 MAIN:Ver2002-1046-1707 |  |
| Alarms Code Occurred | Device |
| F13 Grid\_Mode\_changed 2021-06-11 13:17 | Info |
| F23 Tz\_GFCI\_OC\_Fault 2021-06-11 08:23 |  |
| F13 Grid\_Mode\_changed 2021-06-11 08:21 |  |
| F56 DC\_VoltLow\_Fault 2021-06-10 13:05 |  |

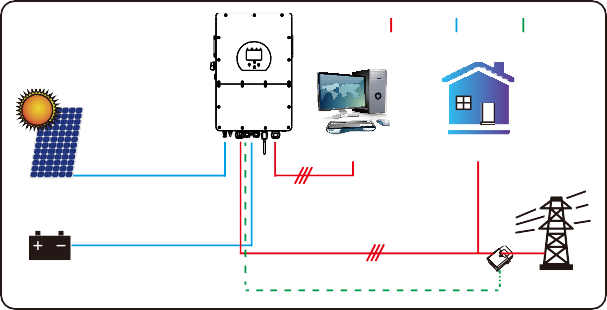
**This page show Inverter ID, Inverter version and alarm codes.**

**HMI:** LCD version

**MAIN:** Control board FW version

## Mode

**Mode I:Basic**



AC cable DC cable COM cable

Backup Load On-Grid Home Load

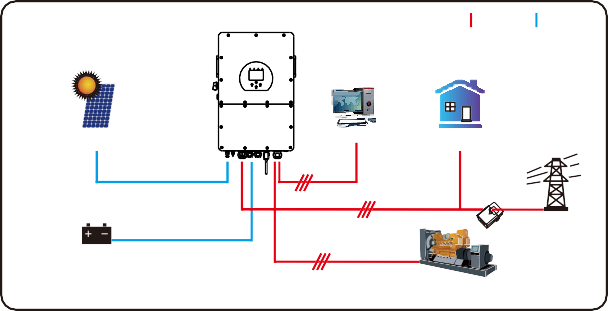
Solar

Battery

CT

Grid

**Mode II: With Generator**



AC cable DC cable

Solar

Backup Load On-Grid Home Load

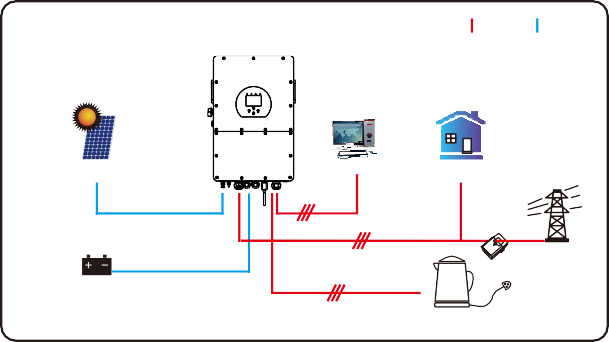
Grid

Battery

Generator

CT

**Mode III: With Smart-Load**



AC cable DC cable

Solar

Backup Load On-Grid Home Load

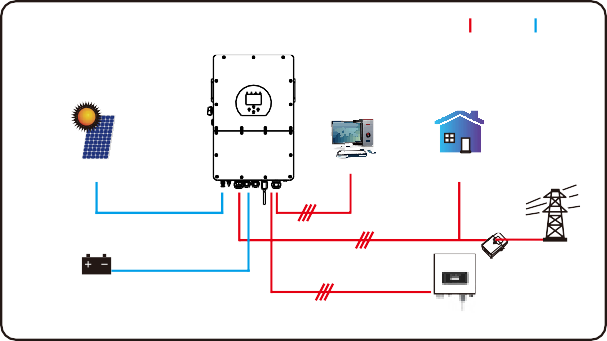
Grid

Battery

Smart Load

CT

**Mode IV: AC Couple**



On-Grid+AC couple

AC cable DC cable

Solar

Backup Load On-Grid Home Load

Grid

Battery

On-Grid Inverter

CT



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

## Limita�on of Liability

In addi�on to the product warranty described above, the state and local laws and regula�ons provide ﬁnancial compensa�on for the product's power connec�on (including viola�on of implied terms and warran�es). The company hereby declares that the terms and condi�ons of the product and the policy cannot and can only legally exclude all liability within a limited scope.

|  |  |  |
| --- | --- | --- |
| ***Error code*** | ***Description*** | ***Solutions*** |
| F01 | DC\_Inversed\_Failure | 1，Check the PV input polarity 2，Seek help from us, if can not go back to normal state. |
| F07 | DC\_START\_Failure | 1，The BUS voltage can t be built from PV or battery. 2，Restart the inverter, 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;   1. If it remains same, turn on DC and AC switch for one minute, then turn on the DC and AC switch.; 2. Seek help from us, if can not go back to normal state. |
| F15 | AC\_OverCurr\_SW\_Failure | 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 normal; 3. Seek help from us, if can not go back to normal state. |
| F16 | GFCI\_Failure | Leakage current fault 1, Check the PV side cable ground connection 2, Restart the system 2-3 times 3, if the fault still existing, please contact us for help. |
| F18 | Tz\_Ac\_OverCurr\_Fault | AC side over current fault   1. Please check whether the backup load power and commonload power are within the range; 2. Restart and check whether it is normal; 3. Seek help from us, if cannot go back to normal state. |
| F20 | Tz\_Dc\_OverCurr\_Fault | DC side over current fault   1. Check PV module connection and battery connection; 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. If it remains same, turn on DC and AC switch for one minute, then turn on the DC and AC switch.; 4. Seek help from us, if can not go back to normal state. |

|  |  |  |
| --- | --- | --- |
| ***Error code*** | ***Description*** | ***Solutions*** |
| F21 | Tz\_HV\_Overcurr\_fault | BUS over current. 1, Check the PV input current and battery current setting   1. Restart the system 2~3 times. 2. If the fault still exists, please contact us for help. |
| F22 | Tz\_EmergStop\_Fault | Remotely shutdown 1, it tells the inverter is remotely controlled. |
| F23 | Tz\_GFCI\_OC\_Fault | 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\_Fault | 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 | BusUnbalance\_Fault | 1. Please wait for a while and check whether it is normal; 2. When the load power of 3 phases is big different, it will report the F26.   3 .When there’s DC leakage current, it will report F26   1. Restart the system 2~3 times. 2. Seek help from us, if can not go back to normal state. |
| F29 | Parallel\_Comm\_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.But when all inverters are in ON status, it will disappear automatically; 3. If the fault still exists, please contact us for help. |
| F34 | AC\_Overload\_Fault | 1, Check the backup load connection, make sure it is in allowed power range  2, If the fault still exists, please contact us for help |
| F41 | Parallel\_system\_Stop | 1, Check the hybrid inverter work status. If there’s 1pcs hybrid inverter shutdown, all hybrid inverters will report F41 fault.  2, If the fault still exists, please contact us for help |
| F42 | Parallel\_Version\_Fault | Grid voltage fault   1. Check whether the AC voltage is within grid standard protection limits.; 2. Check whether grid AC cables are firmly and correctly connected; 3. Seek help from us, if can not go back to normal state. |

|  |  |  |
| --- | --- | --- |
| ***Error code*** | ***Description*** | ***Solutions*** |
| F47 | AC\_OverFreq\_Fault | 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\_UnderFreq\_Fault | 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. |
| F52 | DC\_VoltHigh\_Fault | BUS voltage is too high   1. Check whether battery voltage is too high; 2. check the PV input voltage, make sure it is within the allowed range; 3. Seek help from us, if can not go back to normal state. |
| F53 | DC\_VoltLow\_Fault | BUS voltage is too 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. |
| F54 | BAT2\_VoltHigh\_Fault | 1. Check the battery 2 terminal voltage is high; 2. Restart the inverter 2 times and restore the factory settings; 3. Seek help from us, if can not go back to normal state. |
| F55 | BAT1\_VoltHigh\_Fault | 1. Check the battery 1 terminal voltage is high; 2. Restart the inverter 2 times and restore the factory settings; 3. Seek help from us, if can not go back to normal state. |
| F56 | BAT1\_VoltLow\_Fault | 1. Check the battery 1 terminal voltage is low; 2. Restart the inverter 2 times and restore the factory settings; 3. Seek help from us, if can not go back to normal state. |
| F57 | BAT2\_VoltLow\_Fault | 1. Check the battery 2 terminal voltage is low; 2. Restart the inverter 2 times and restore the factory settings; 3. Seek help from us, if can not go back to normal state. |
| F58 | Battery\_comm\_Lose | 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 |
| F62 | DRMs0\_stop | 1, the DRM function is for Australia market only; 2, Check the DRM function is active or not; 3, Seek help from us, if can not go back to normal state after restart the system. |
| 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 | Heatsink\_HighTemp\_Fault | Heat sink temperature is too high   1. Check whether the working 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 informa�on

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 transporta�on of equipment；
* Damage caused by incorrect installa�on or commissioning；
* Damage caused by failure to comply with opera�on instruc�ons, installa�on instruc�ons or maintenance instruc�ons；
* Damage caused by a�empts to modify, alter or repair products；
* Damage caused by incorrect use or opera�on；
* Damage caused by insuﬃcient ven�la�on of equipment；
* Damage caused by failure to comply with applicable safety standards or regula�ons；
* Damage caused by natural disasters or force majeure (e.g. ﬂoods, lightning, overvoltage, storms, ﬁres, etc.)

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

## Datasheet

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***Model*** | ***SUN-5K- SG01HP3-***  ***EU-AM2*** | ***SUN-6K- SG01HP3-***  ***EU-AM2*** | ***SUN-8K- SG01HP3-***  ***EU-AM2*** | ***SUN-10K- SG01HP3-***  ***EU-AM2*** | ***SUN-12K- SG01HP3-***  ***EU-AM2*** | ***SUN-15K- SG01HP3-***  ***EU-AM2*** | ***SUN-20K- SG01HP3-***  ***EU-AM2*** |
| ***Battery Input Date*** | | | | | | | |
| Ba�ery Type | Li-Ion | | | | | | |
| Ba�ery Voltage Range(V) | 160~700 | | | | | | |
| Max. Charging Current(A) | 37 | | | | | | |
| Max. Discharging Current(A) | 37 | | | | | | |
| Number of ba�ery input | 1 | | | | | | |
| Charging Strategy for Li-lon Ba�ery | Self-adap�on to BMS | | | | | | |
| ***PV String Input Data*** | | | | | | | |
| Max. DC Input Power(W) | 6500 | 7800 | 10400 | 13000 | 15600 | 19500 | 26000 |
| Max. DC Input Voltage (V) | 1000 | | | | | | |
| MPPT Range(V) | 150-850 | | | | | | |
| Start-up Voltage(V) | 180 | | | | | | |
| Full Load DC Voltage Range (V) | 195-850 | 195-850 | 260-850 | 325-850 | 340-850 | 420-850 | 500-850 |
| Rated DC Input Voltage (V) | 600 | | | | | | |
| PV Input Current(A) | 20+20 | 20+20 | 20+20 | 20+20 | 26+20 | 26+20 | 26+26 |
| Max.PV Isc(A) | 30+30 | 30+30 | 30+30 | 30+30 | 39+30 | 39+30 | 39+39 |
| No. of MPPT Trackers | 2 | | | | | | |
| No. of Strings Per MPPT Tracker | 1 | 1 | 1 | 1 | 2+1 | 2+1 | 2 |
| ***AC Output Data*** | | | | | | | |
| Rated AC Output and UPS Power(W) | 5000 | 6000 | 8000 | 10000 | 12000 | 15000 | 20000 |
| Max. AC Output Power(W) | 5500 | 6600 | 8800 | 11000 | 13200 | 16500 | 22000 |
| Peak Power(oﬀ grid) | 1.5 �me of rated power, 10 S | | | | | | |
| AC Output Rated Current(A) | 7.6/7.3 | 9.1/8.7 | 12.2/11.6 | 15.2/14.5 | 18.2/17.4 | 22.8/21.8 | 30.4/29.0 |
| Max. AC Current(A) | 8.4/8.0 | 10/9.6 | 13.4/12.8 | 16.7/16 | 20/19.2 | 25/24 | 33.4/31.9 |
| Max. Three-phase Unbalanced  Output Current（A） | 13 | 13 | 18 | 22 | 25 | 30 | 35 |
| Max. Con�nuous AC Passthrough(A) | 40 | | | | 80 | | |
| Power Factor | 0.8 leading to 0.8 lagging | | | | | | |
| Output Frequency and Voltage | 50/60Hz; 3L/N/PE 220/380, 230/400Vac | | | | | | |
| Grid Type | Three Phase | | | | | | |
| Total Harmonic Distor�on (THD) | <3% (of nominal power) | | | | | | |
| DC current injec�on | <0.5% ln | | | | | | |
| ***Eﬃciency*** | | | | | | | |
| Max. Eﬃciency | 97.60% | | | | | | |
| Euro Eﬃciency | 97.00% | | | | | | |
| MPPT Eﬃciency | >99% | | | | | | |
| ***Protection*** | | | | | | | |
| PV Input Lightning Protec�on | Integrated | | | | | | |
| An�-islanding Protec�on | Integrated | | | | | | |
| PV String Input Reverse Polarity Protec�on | Integrated | | | | | | |
| Insula�on Resistor Detec�on | Integrated | | | | | | |
| Residual Current Monitoring Unit | Integrated | | | | | | |
| Output Over Current Protec�on | Integrated | | | | | | |
| Output Shorted Protec�on | Integrated | | | | | | |
| Over Voltage Category | DC Type II / AC Type III | | | | | | |
| Ba�ery Over Current Protec�on | Fuses | | | | | | |

|  |  |
| --- | --- |
| ***Certiﬁcations and Standards*** | |
| Grid Regula�on | VDE4105,IEC61727/62116,VDE0126,AS4777.2,CEI 0 21,EN50549-1, G98,G99,C10-11,UNE217002,NBR16149/NBR16150 |
| EMC/Safety Regula�on | IEC62109-1/-2, NBT32004-2018, EN61000-6-1,EN61000-6-2, EN61000-6-3, EN61000-6-4 |
| ***General Data*** | |
| Opera�ng Temperature Rande(℃) | -40~60℃, >45℃ Dera�ng |
| Cooling | Smart cooling |
| Noise(dB) | ≤55 dB |
| Communica�on with BMS | RS485; CAN |
| Weight(kg) | 30.5 |
| Cabinet size(mm) | 408W×638H×237D (Excluding connectors and brackets) |
| Protec�on Degree | IP65 |
| Installa�on Style | Wall-mounted |
| Warranty | 5 years |

1. **Appendix I**

Deﬁni�on of RJ45 Port Pin for BMS1

|  |  |
| --- | --- |
| No. | RS485 Pin |
| 1 | 485\_B |
| 2 | 485\_A |
| 3 | GND\_485 |
| 4 | CAN-H1 |
| 5 | CAN-L1 |
| 6 | GND\_485 |
| 7 | 485\_A |
| 8 | 485\_B |

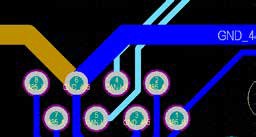
Deﬁni�on of RJ45 Port Pin for BMS2

|  |  |
| --- | --- |
| No. | RS485 Pin |
| 1 | 485\_B |
| 2 | 485\_A |
| 3 | GND\_485 |
| 4 | CAN-H2 |
| 5 | CAN-L2 |
| 6 | GND\_485 |
| 7 | 485\_A |
| 8 | 485\_B |

Deﬁni�on of RJ45 Port Pin for Meter

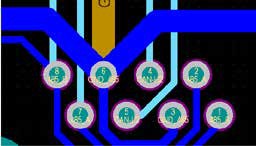
|  |  |
| --- | --- |
| No. | Meter-485 Pin |
| 1 | METER-485\_B |
| 2 | METER-485\_A |
| 3 | GND\_COM |
| 4 | METER-485\_B |
| 5 | METER-485\_A |
| 6 | GND\_COM |
| 7 | -- |
| 8 | -- |

BMS1 Port



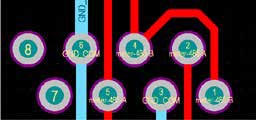
BMS2 Port

12345678



Meter Port

12345678



Deﬁni�on of RJ45 Port Pin for RS485

12345678

RS485 Port

|  |  |
| --- | --- |
| No. | RS485 Pin |
| 1 | Modbus-485\_B |
| 2 | Modbus-485\_A |
| 3 | GND\_485 |
| 4 | -- |
| 5 | -- |
| 6 | GND\_485 |
| 7 | Modbus-485\_A |
| 8 | Modbus-485\_B |



### RS232

|  |  |
| --- | --- |
| No. | WIFI/RS232 |
| 1 |  |
| 2 | TX |
| 3 | RX |
| 4 |  |
| 5 | D-GND |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 | 12Vdc |



5 4 3 2 1

9 8 7 6

WIFI/RS232

This RS232 port is used to connect the wiﬁ datalogger

## Appendix II

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



Lead Outside



Ver: 2.2, 2023-04-08



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