

SunBox Series 10.0

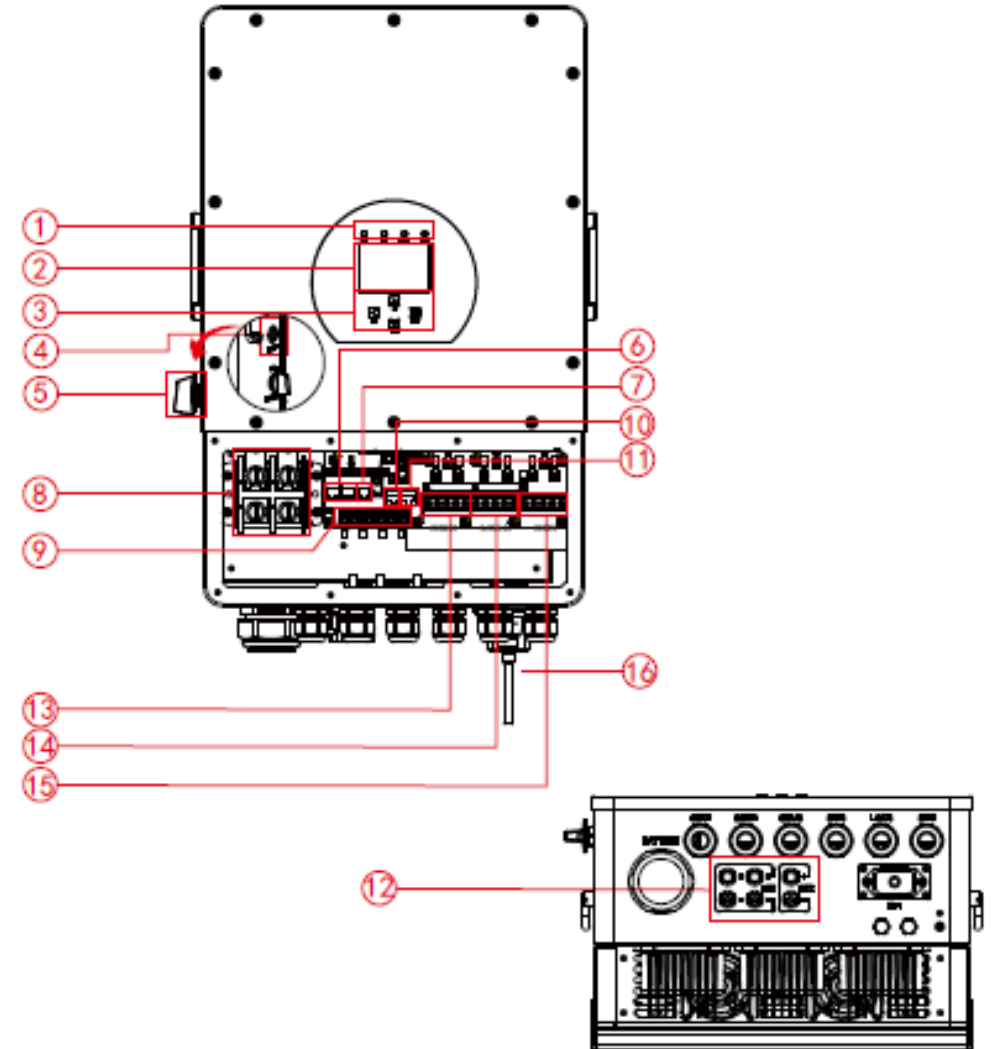
Three phase Hybrid Series 48V 10.0

Quick Setting Guide



# Equipment's general description

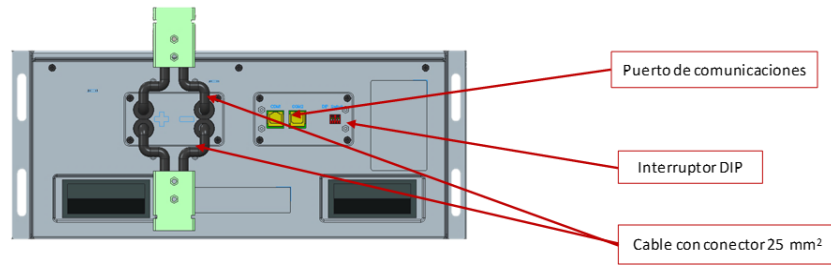
- |                             |                            |
|-----------------------------|----------------------------|
| 1. Inverter indicators      | 11. BMS port               |
| 2. LCD display              | 12. PV input with two MPPT |
| 3. Function buttons         | 13. Grid                   |
| 4. DC switch                | 14. Generator input        |
| 5. Power on/off button      | 15. Load                   |
| 6. Parallel port            | 16. WiFi Interface         |
| 7. Meter-485 port           |                            |
| 8. Battery input connectors |                            |
| 9. Function port            |                            |
| 10. ModeBUS port            |                            |



# Connections

## 1. Battery connection(Lithium Series 5,1kWh)

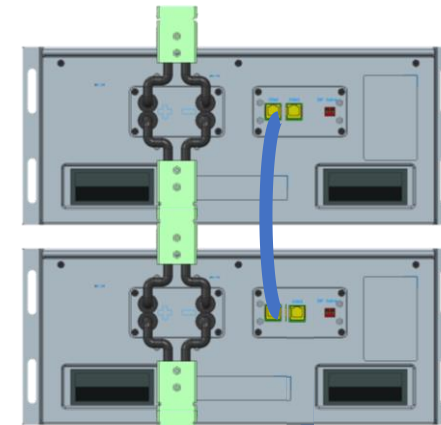
- Connection between batteries



Batteries can be connected in parallel.

It's needed that batteries are connected to ground.

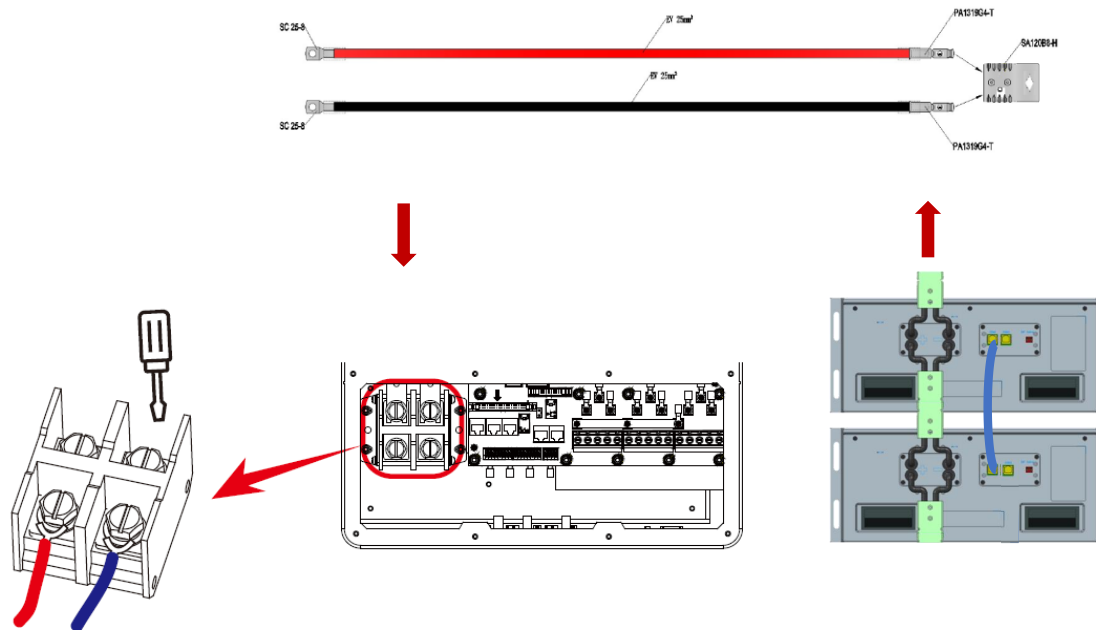
It's advisable to connect all batteries to the same ground point.



# Connections

## 1. Battery connection(Lithium Series 5,1kWh)

- Inverter connection



- Battery feed must be connected to the inverter by a cable of 25 mm<sup>2</sup>.
- Unscrew terminals and adjust the connectors to the battery, the pin up the terminals with a screwdriver.
- Make sure that terminals are tight with a torque of 5.2 N.M.

# Connections

## 1. Battery connection(Lithium Series 5,1kWh)

- Communication setting

a) DIP's setting



Master battery:

0101

Intermediate battery:

0001

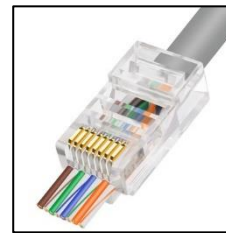
Last battery:

1101

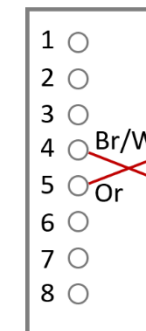
\* When using only one battery, set the Last battery DIP's.

\* When using only two batteries, skip the Intermediate battery DIP's.

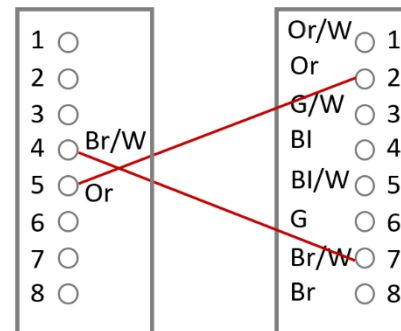
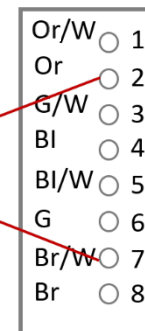
b) RJ45 connection



Inverter



Battery



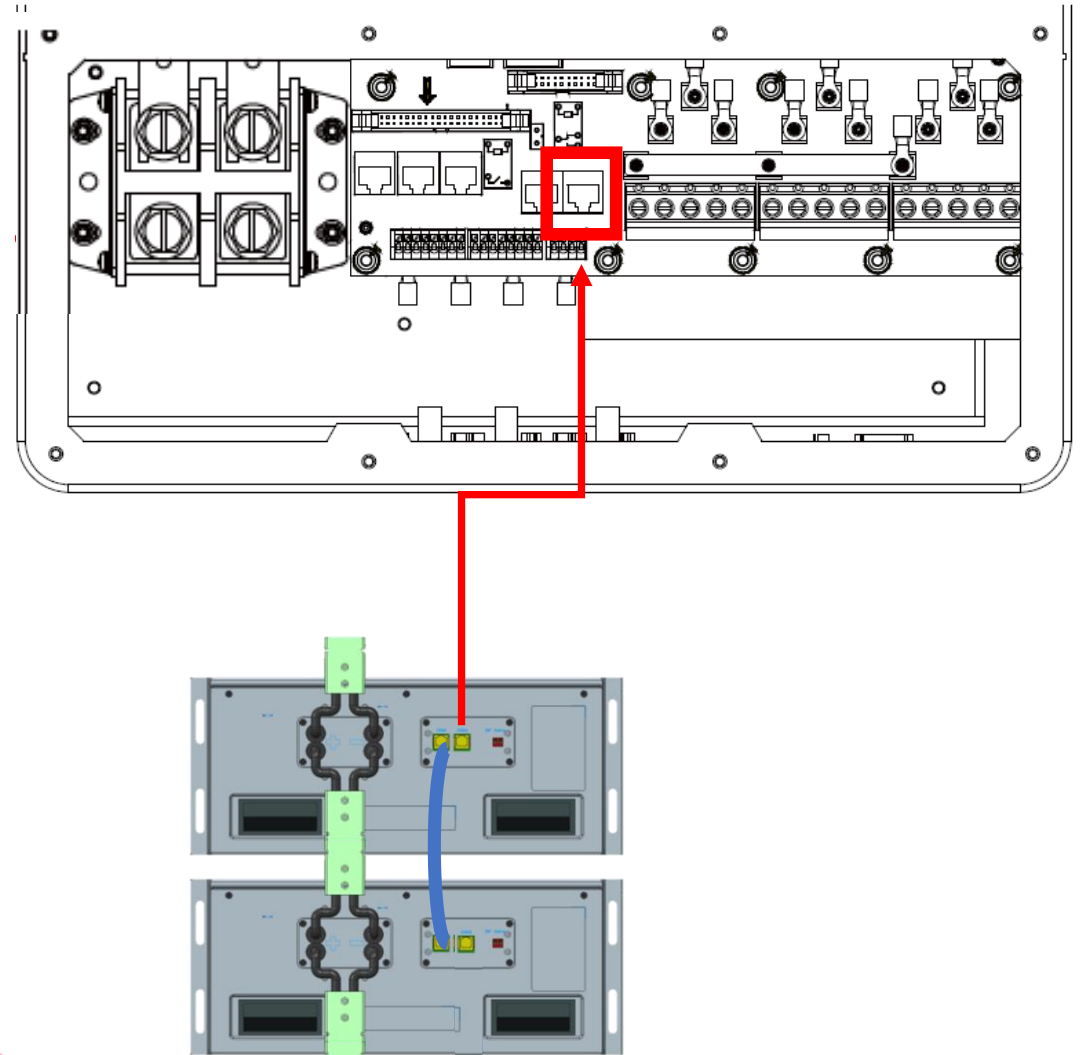
# Connections

## 1. Battery connections (Lithium Series 5,1kWh)

- Communication settings

### c) Battery-Inverter

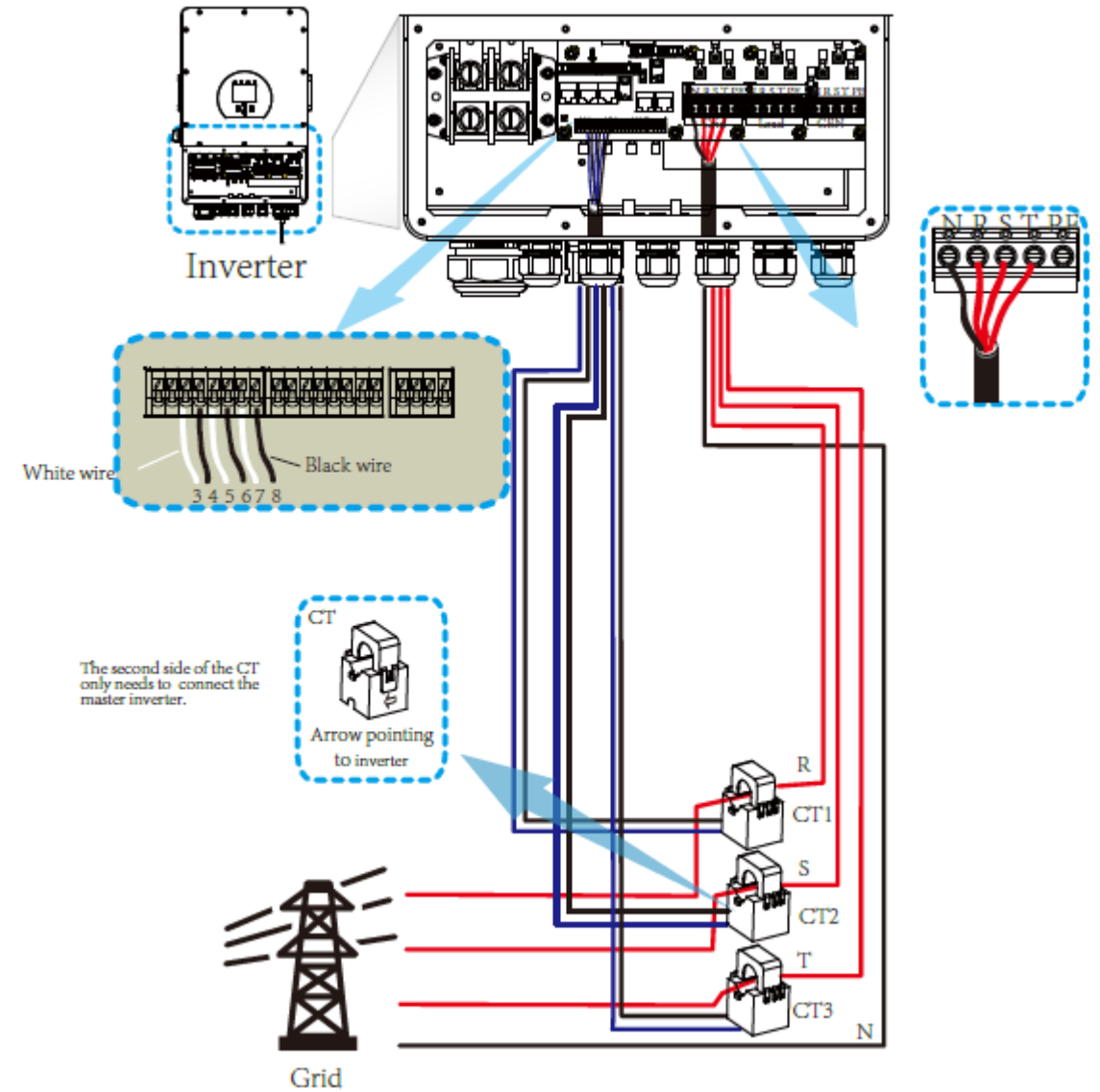
Battery communication connector is connected to the inverter CAN port.



# Connections

## 2. AC input/output connection

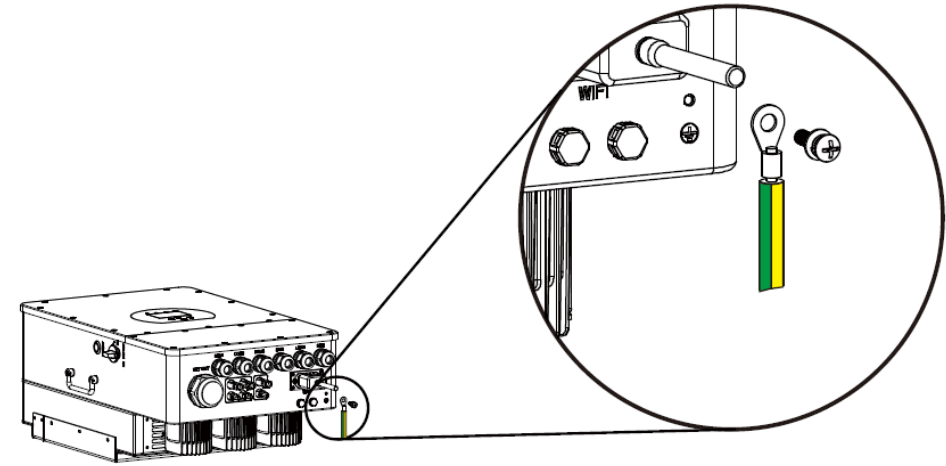
- Install a switch of AC of 32 A independently from inverter and input's power supply.
- Cable of 6 mm<sup>2</sup>.



# Connections

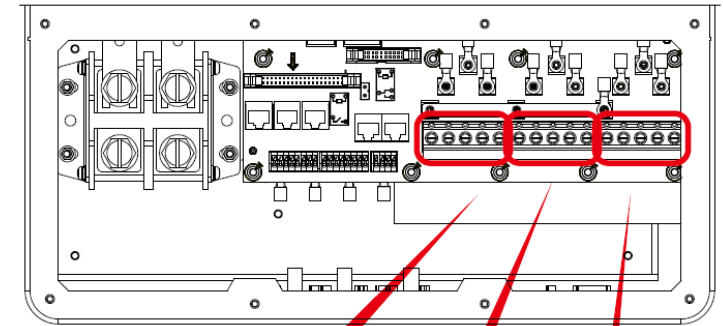
## 3. Ground connection

Connect ground cable to the picture point, which avoids the electric discharge in case the conductor from the original installation fails.



## 4. Gen Port and Back-Up connection

- Gen Port: Makes possible to connect a generator system, a programmable load, or other on-grid inverter.
- Back-Up: Feed to essential equipment in case of grid fall.
- Grid: Connection to grid.

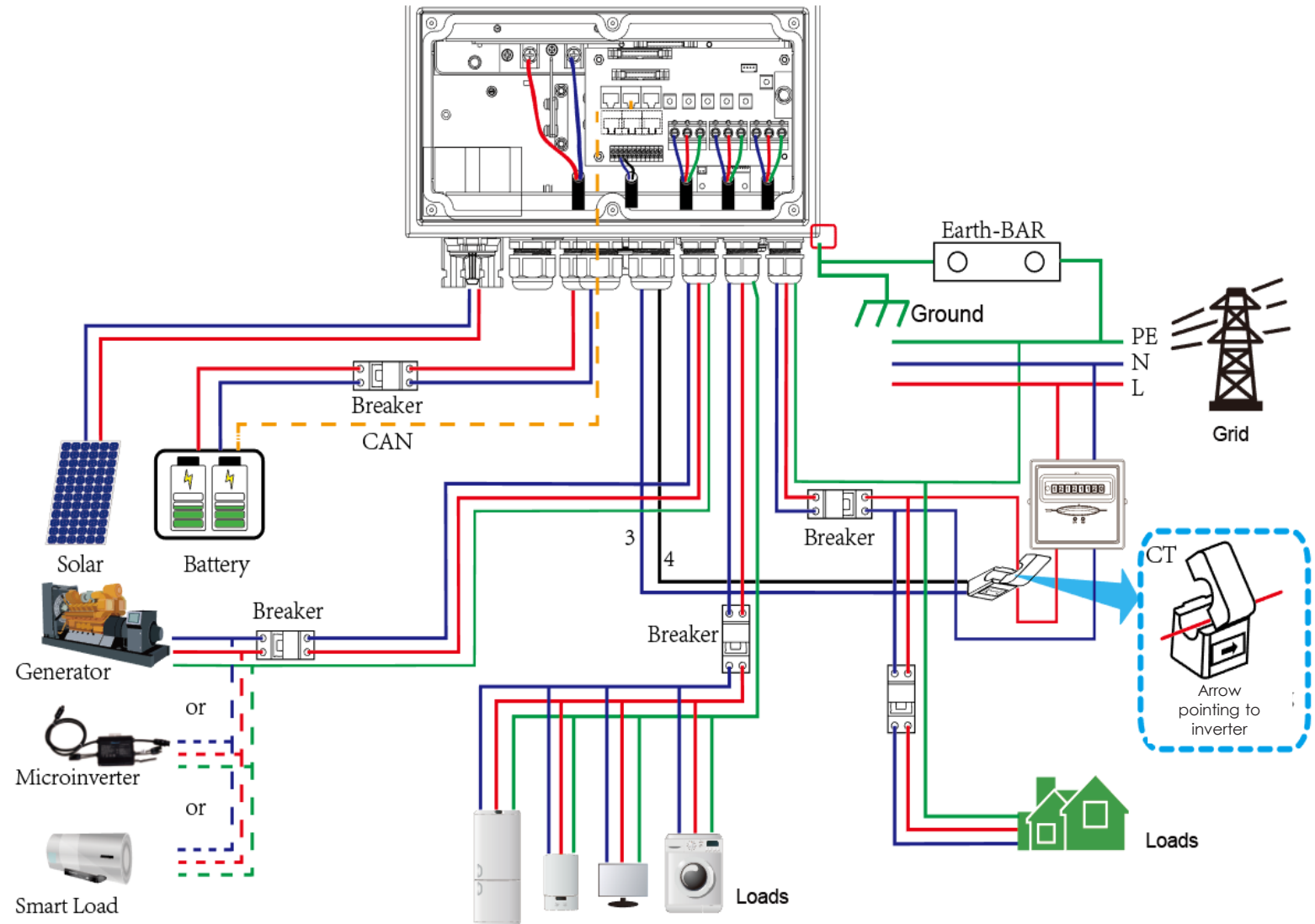


**Red      Back-Up      Gen-Port**



# Connections

## 5. General connections



# Inverter Setting

## 1. ON/OFF Power



## 2. Visualization panel

INDICATORS

LCD SCREEN

FUNCTION KEYS



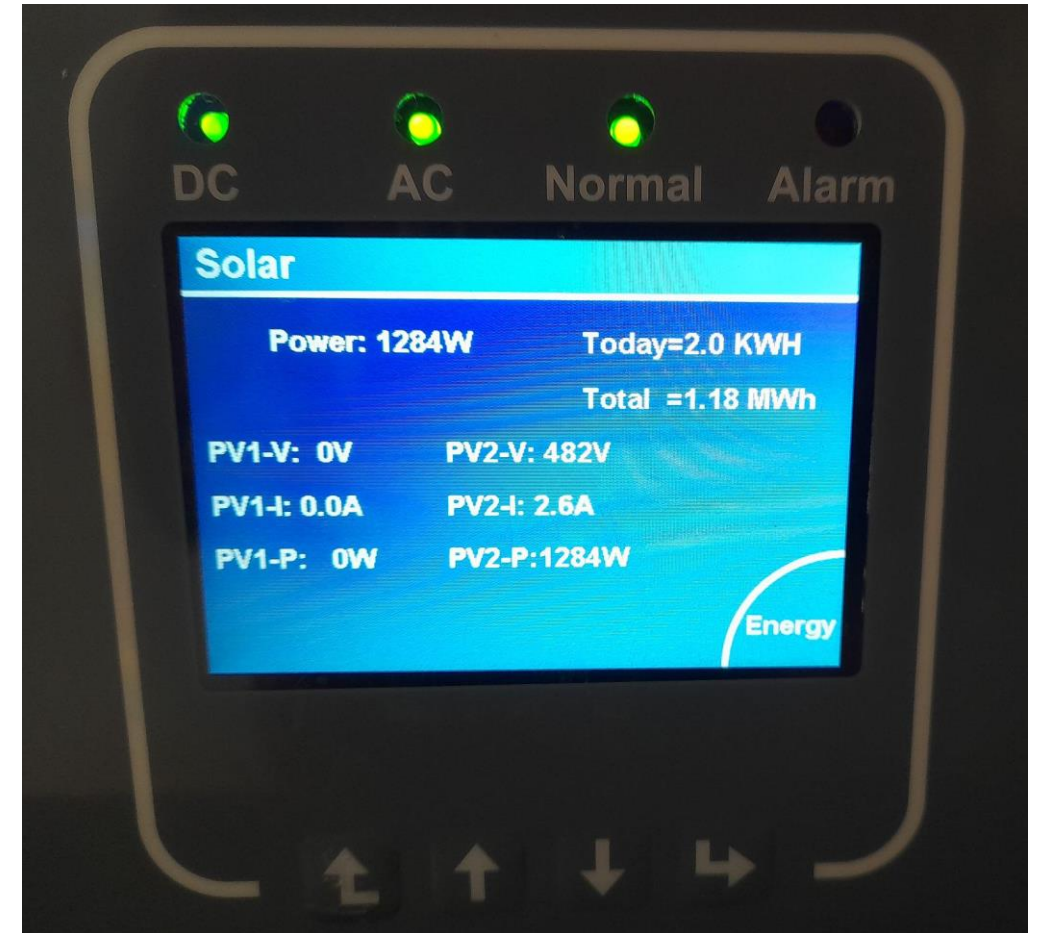
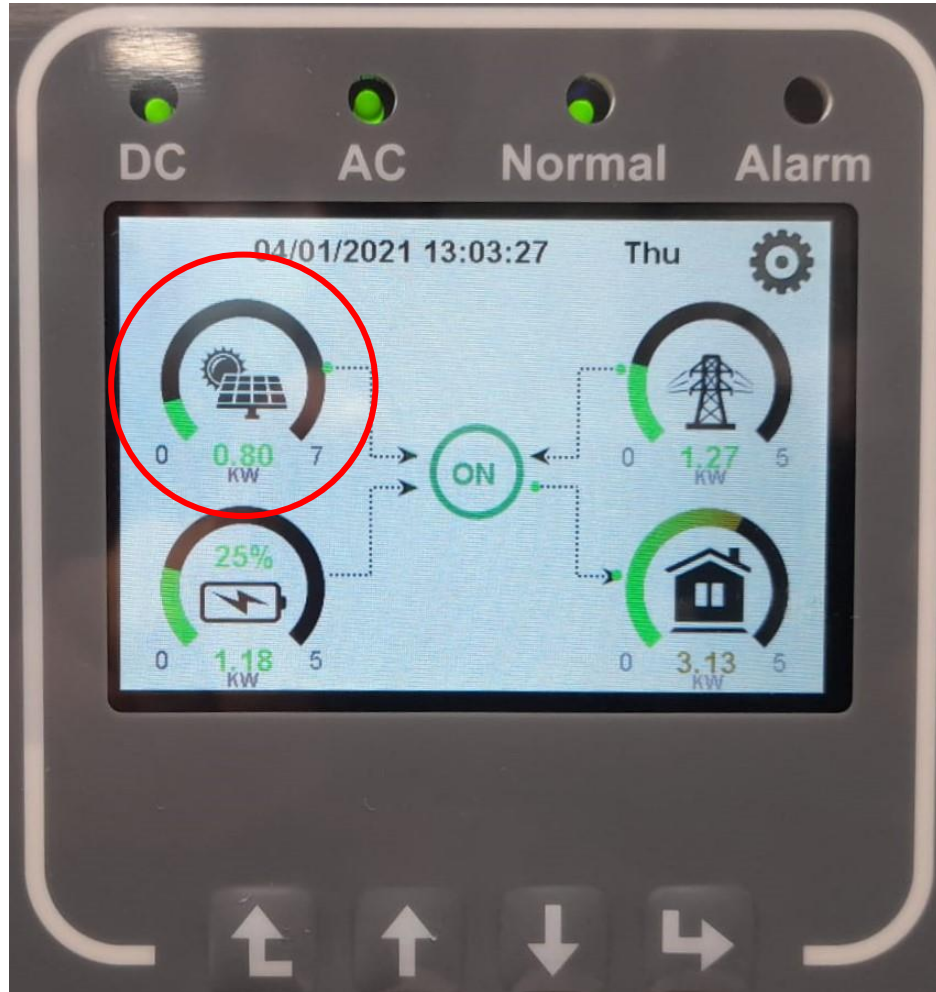
	Indicador LED	Mensajes
CC	Static green Led	FV OK Connection
CA	Static green Led	Red OK Connection
Regular	Static green Led	OK Operation Inverter
Alarm	Static red Led	Error Alarm

Function Key	Description
Esc	To quit setting mode
Up	To go to any section
Down	To go to next section
Enter	To confirm selection

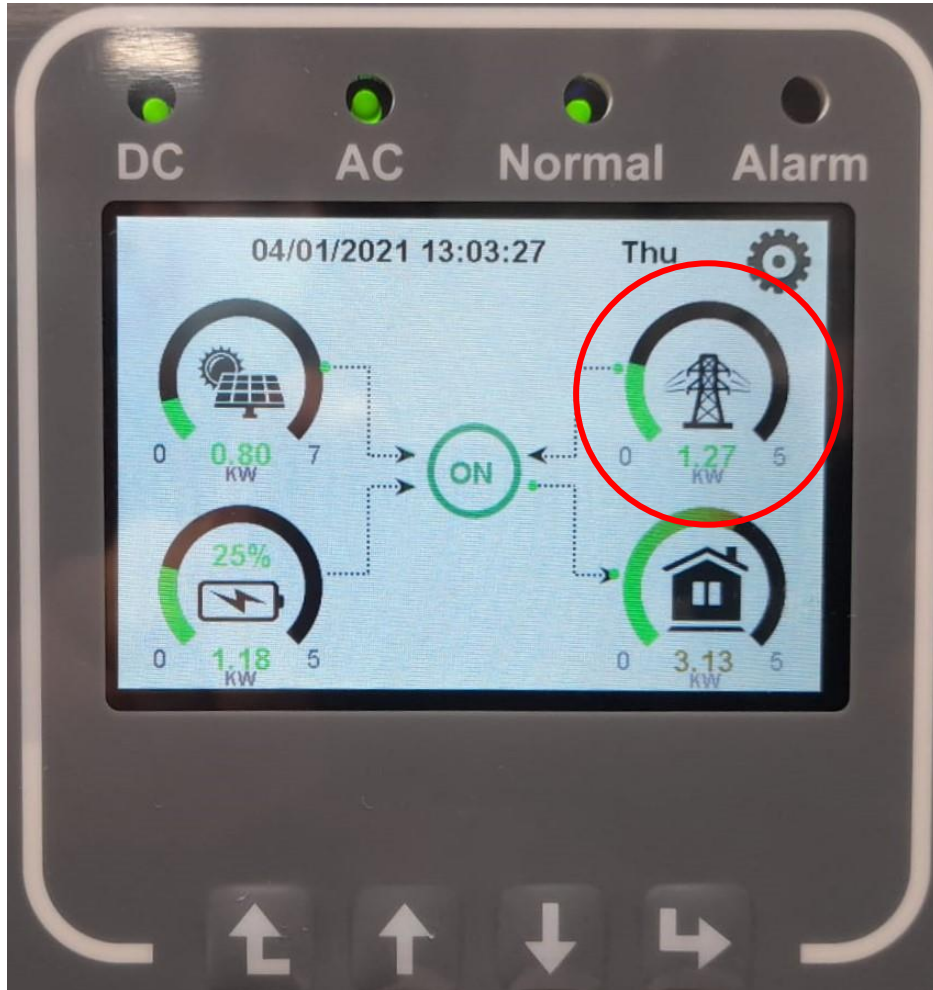
# Main Screen



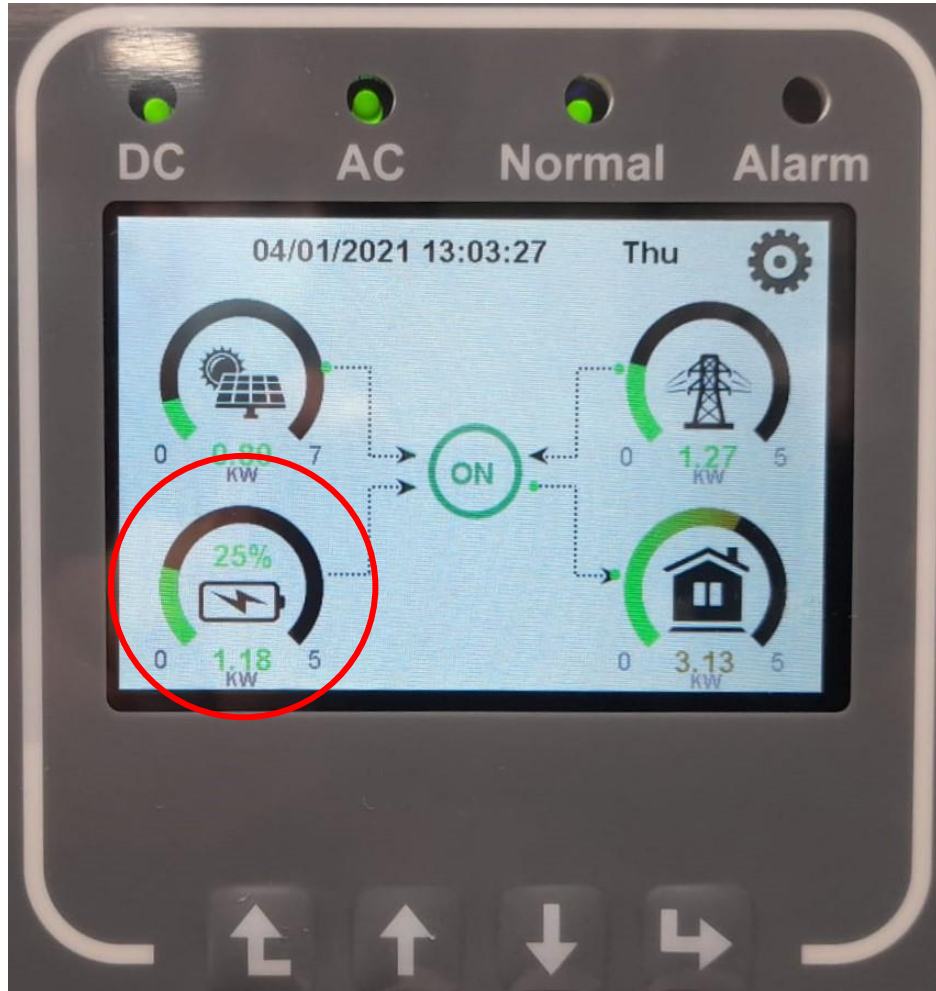
# Panels Information



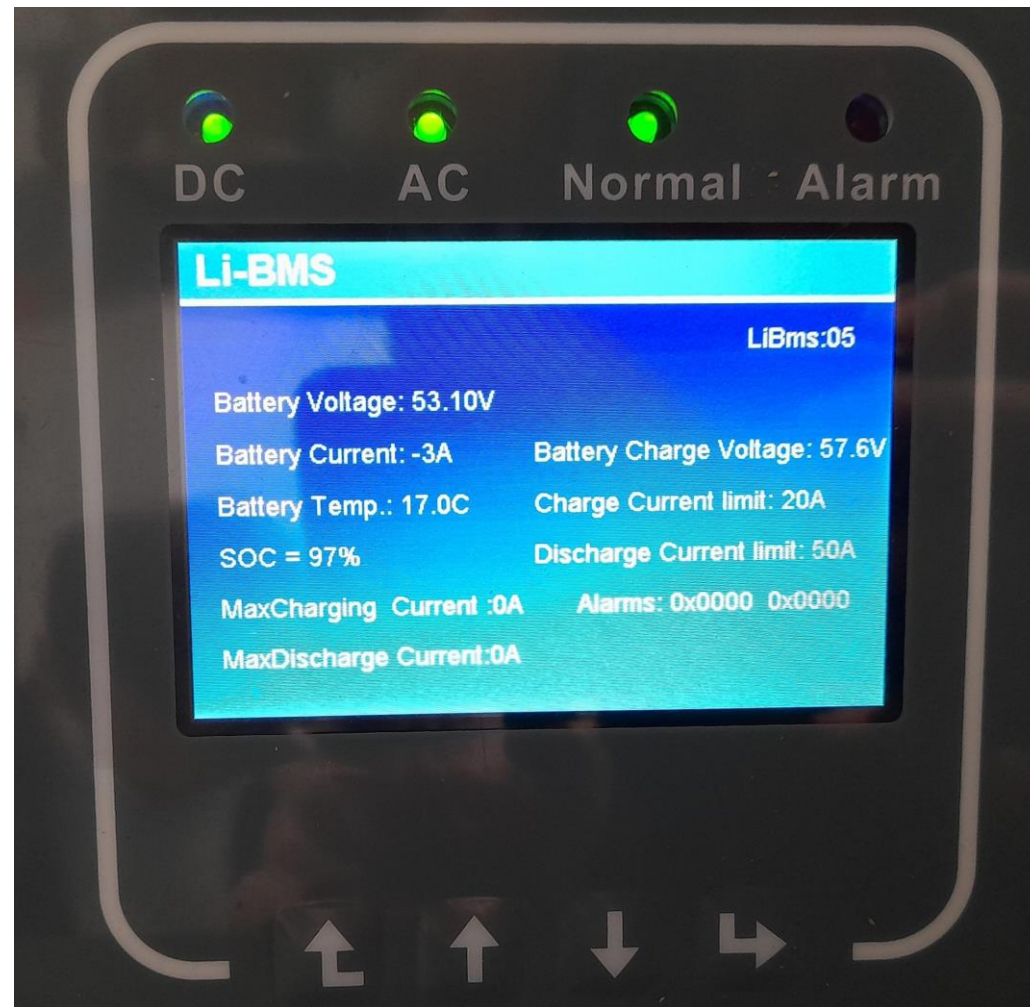
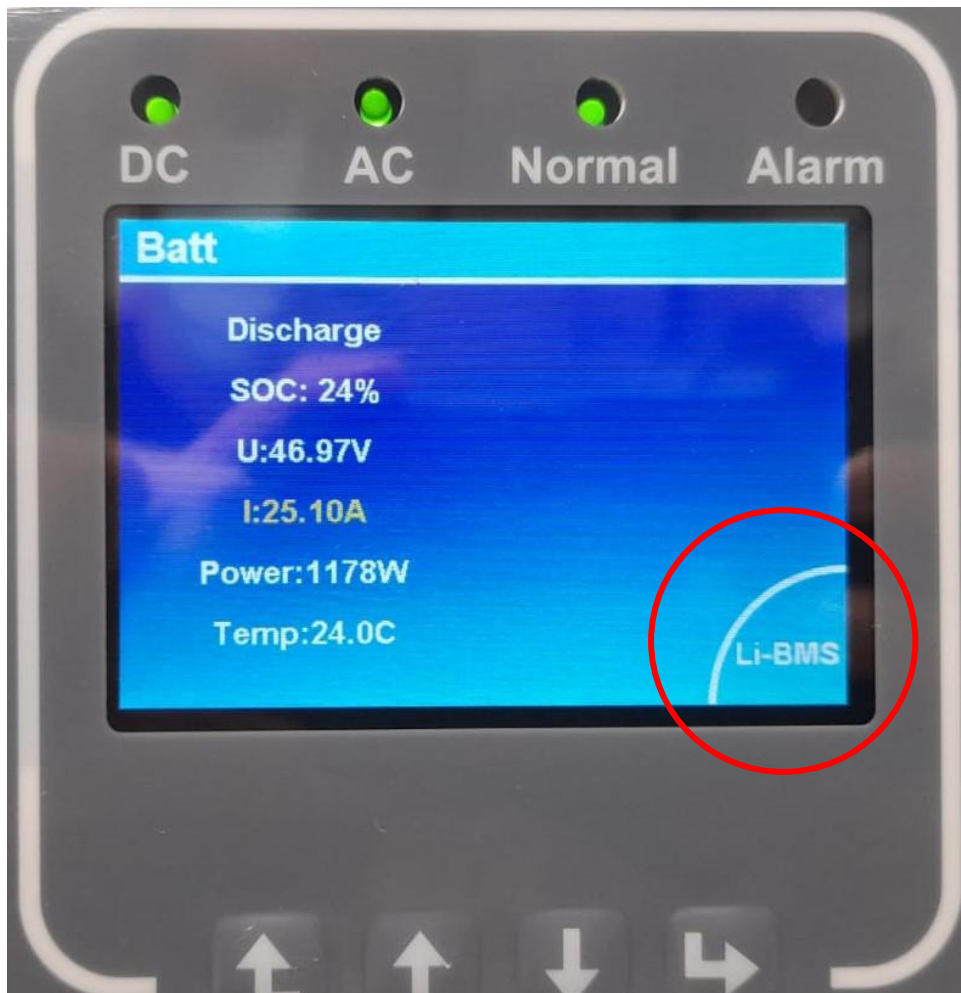
# Grid Information



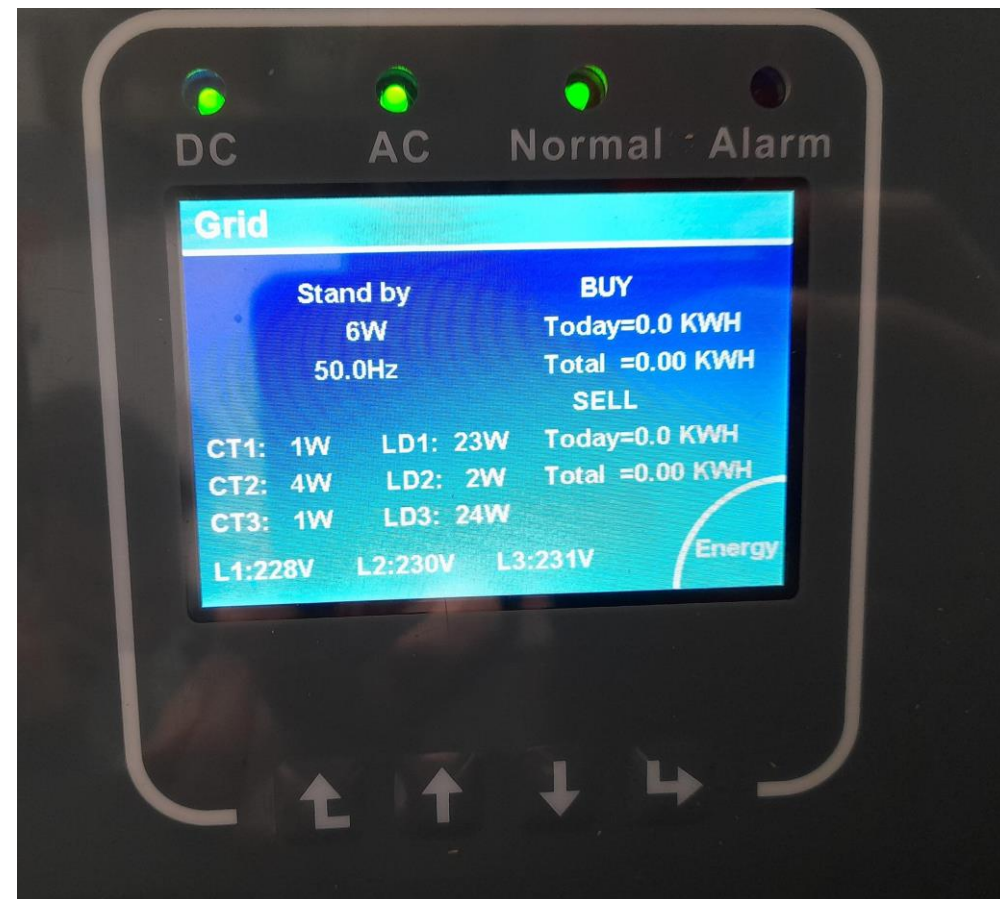
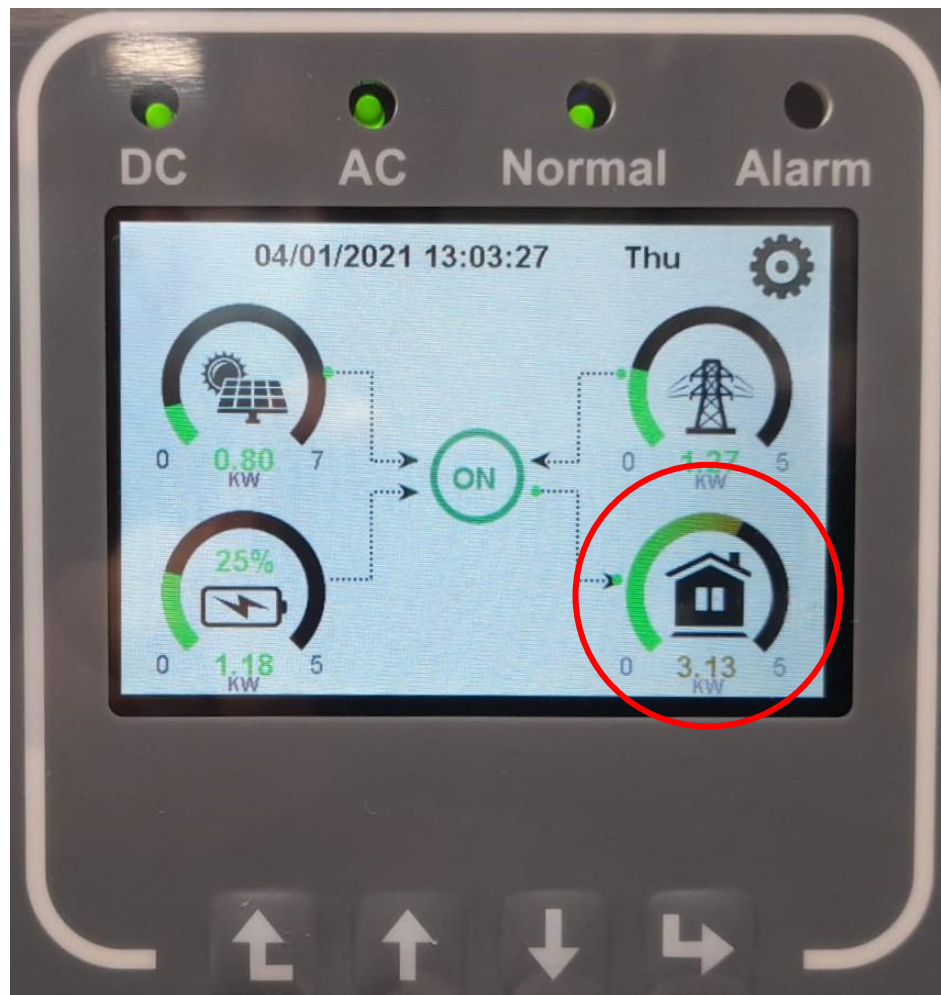
# Battery Information



# Battery Information

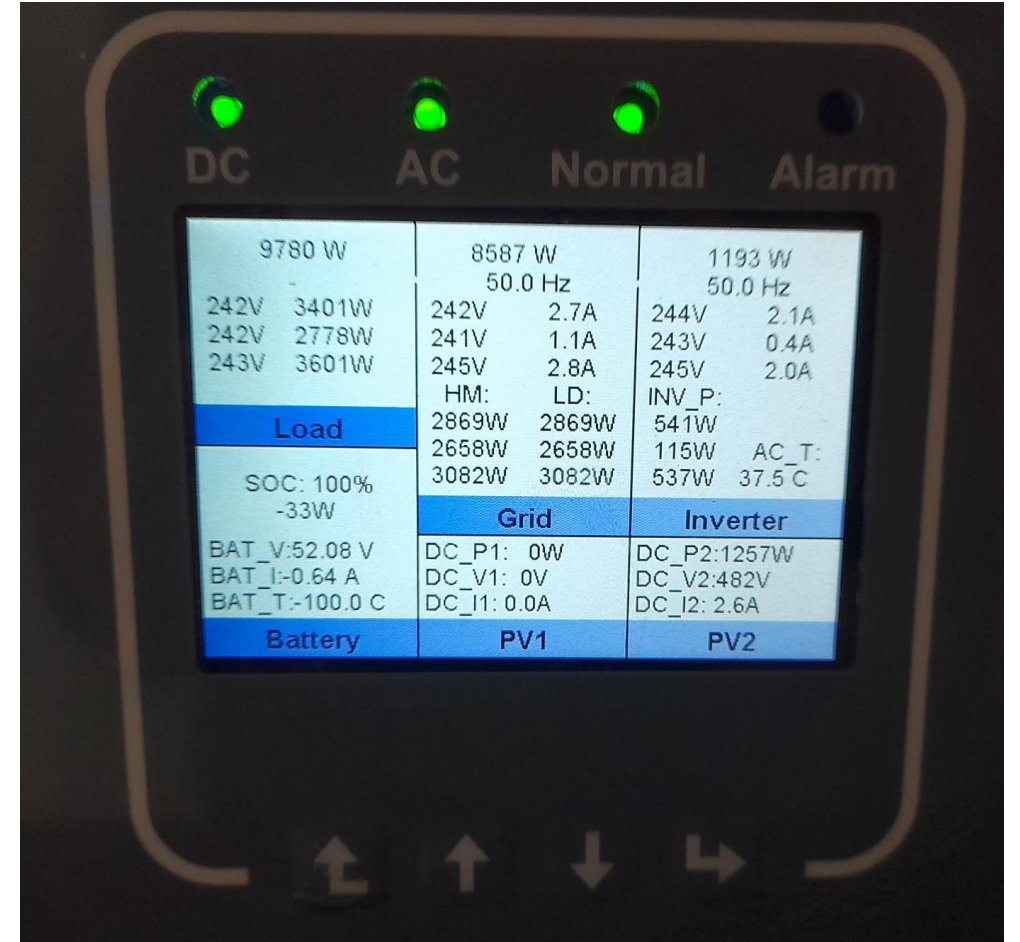


# Charge Information

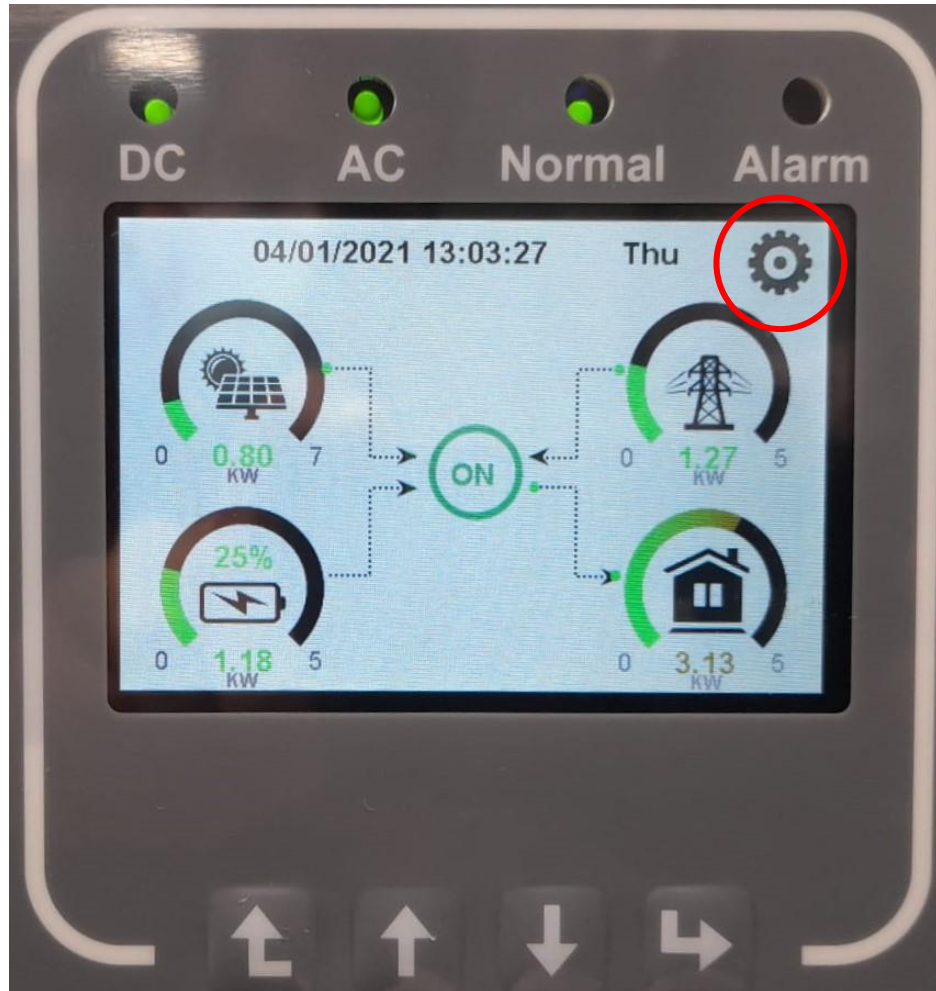




# Inverter Information



# Settings



# Battery Setting



# Battery Settings 1/3

## 1 Battery of 48V 2,4 KWh

- Batt Capacity: 50 Ah
- Max A Charge: 25 A
- Max A Discharge: 25 A

## 1 Battery of 5,1 KWh

- Batt Capacity: 100 Ah
- Max A Charge: 50 A
- Max A Discharge: 50 A

## 2 Batteries of 5,1 KWh

- Batt Capacity: 200 Ah
- Max A Charge: 100 A
- Max A Discharge: 100 A



# Battery Settings 2/3

## Menú:

- 1 Generator
  - 2 Grid
  - 3 Time
- **Start:** 15%-10% capacity level to start load.
  - **A:** Battery charge current. **40 A** Gen/ **35 A** Network.



# Battery Settings 3/3

- **Lithium Mode: 00** BMS Protocol.
- **Shutdown: 10%** The inverter turns off when battery reaches indicated point.
- **Low batt: 10%** It indicates the inverter will alarm if the SOC below this value.
- **Restart: 50% (Offgrid mode)** Percentage of battery to turn on inverter back.



# System Work Mode



# System Work Mode 1/2

- **Selling first:** Delivery to grid first **NO**
- **Zero Export to Load:** Output power adjusts to Backup charge **NO**
- **Zero Export to CT:** System adjusts production to summary of the charges (Grid and Backup) **YES**
- **Solar Sell:** Sell energy surplus. **YES**
- **Max Sell Power:** Maximum output power **5000 W**
- **Zero-export Power:** Recommend to set it as 20-100W to ensure the hybrid inverter won't feed power to grid. (for zero-export mode).
- **Batt First:** Energy from plates is used to charge batteries first.
- **Load First:** Energy from PV is used for charge and only later for batteries.
- **Grid Peak Shaving:** Power limit to take from grid. **8000W**





# System Work Mode 2/2

- **Enable:** Enables system to work on time periods **YES**
- **SOC2:** Reserves battery. **10%**
- **GPS Grid peak shaving:** Establishes power limit to take from network in a time period. **5000W**
- **SOC1:** Reserves battery to guarantee the power limit to take from network compliance. **10%**
- **Start/End:** Start and ending of that period.
- **GM- General Mode:** Mode to supply energy consumed from batteries and plates.
- **BU Back Up Mode:** No discharge battery mode.
- **CH Charge Mode:** Charge battery mode.

### System Work Mode

			SOC2	9%	Enable	<input checked="" type="checkbox"/>	↑ Work Mode3 ↓ ✕ ✓
GM	BU	CH	SOC1	GPS	START	END	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%	20000	00:45	06:30	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%	20000	06:30	09:00	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%	20000	09:00	11:00	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%	20000	11:00	12:00	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%	20000	12:00	18:00	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%	20000	18:00	00:45	

# Standards configurations (1/2)

For using the GM Mode, we recommend to configure this parameters this way:

- SOC1: 10%
- SOC2: 9%
- GPS: always above your home or instalation consumption

### System Work Mode

GM	BU	CH	SOC1	SOC2	GPS	START	END	Enable
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%	9%	20000	00:45	06:30	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%		20000	06:30	09:00	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%		20000	09:00	11:00	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%		20000	11:00	12:00	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%		20000	12:00	18:00	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10%		20000	18:00	00:45	

Work Mode3

↑

↓

✕

✓

# Standards configurations (2/2)

When we attempt to make the setting of the system work mode, we can find ourselves in 4 different scenarios:

- **Production > Consumption (Battery discharged):**

In this case, the excess energy will be used to charge the batteries.

- **Production > Consumption (Battery charged):**

In this case, the excess energy will be sold to grid.

- **Production < Consumption (Battery discharged):**

In this case, the lack of energy will be collected from the grid.

- **Production < Consumption (Battery charged):**

In this case, the excess energy will be collected from the battery.



# Grid Setting



# Grid Settings 1/2

- **Grid mode:** Grid mode **General standard (Spain)**.
- **Grid Type:** Grid voltage **220V single phase (Spain)**.



# Grid Settings 2/2

- **Grid Frequency:** Grid frequency 50 Hz (Spain)

## Default settings:

- **Reconnection Time:** 180s
- **PF:** 1.000
- **Grid HZ High:** 51,5 Hz
- **Grid HZ Low:** 47,5 Hz
- **Grid Vol High:** 265 V
- **Grid Vol Low:** 185 V



# Gen Port Settings



# Gen Port Use

- **Generator Input:** Generator function.
  - **GEN connect** to grid input: Generator connected to input grid 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.
  - **On Grid always on:** Always energized.
  - **Power:** Power limit of PV modules as of if battery charge is above or equal to ON value, Smart is activated. If battery is below to OFF or plate power is below limit Smart mode is activated.  
ON/OFF:
- **Micro Inv Input:** Microinverter connected to that output will displug if battery vcharge is above o equal to ON value and Will reconnect if it's below OFF value.



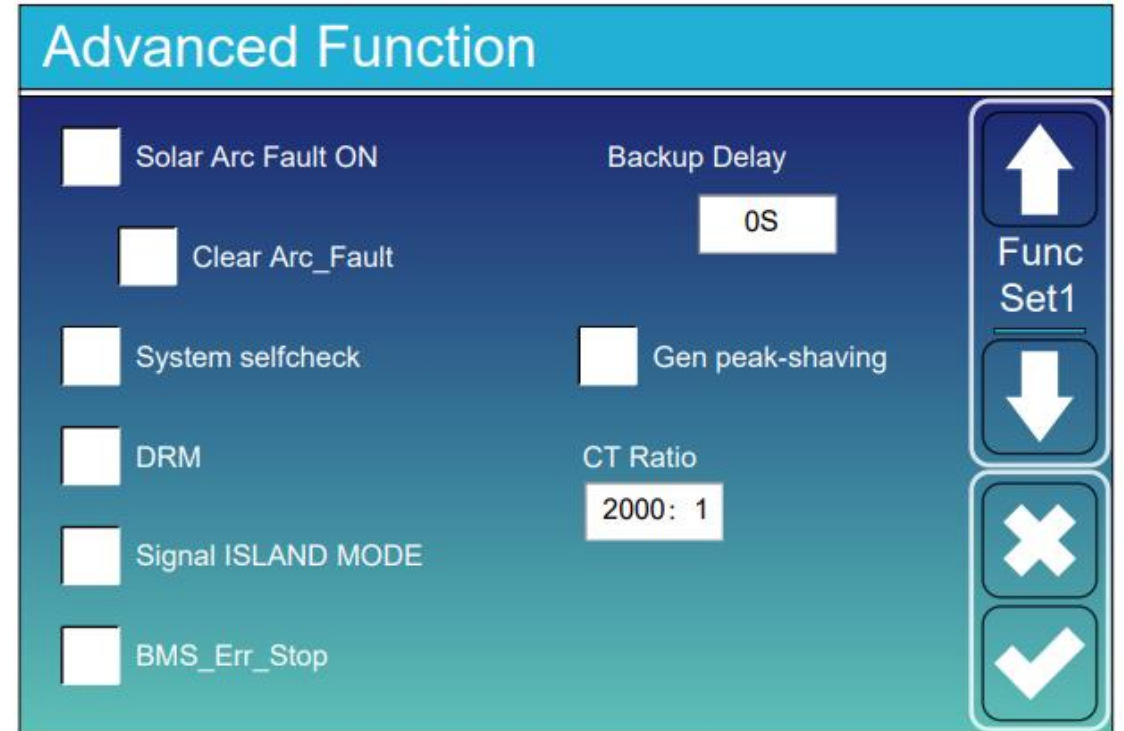


# Advanced Functions



# Advanced Function 1/2

- **Solar Arc Fault On:** USA Market.
- **System Selfcheck:** For fabrication check.
- **Gen peak Shaving:** When consumption overcomes generator power level, inverter will provide energy demand.
- **DRM: 10%** Charge current of battery. Gen/ Red
- **BMS\_Err\_Stop:** If the battery BMS fails in communicating with inverter, inverter stops and reports an error.



# Advanced Function 2/2

- Function's use for 3-phase grid, an inverter for each line.

### Advanced Function

<input type="checkbox"/> Parallel	Modbus SN
<input checked="" type="radio"/> Master	<input type="text" value="00"/>
<input checked="" type="radio"/> Slave	

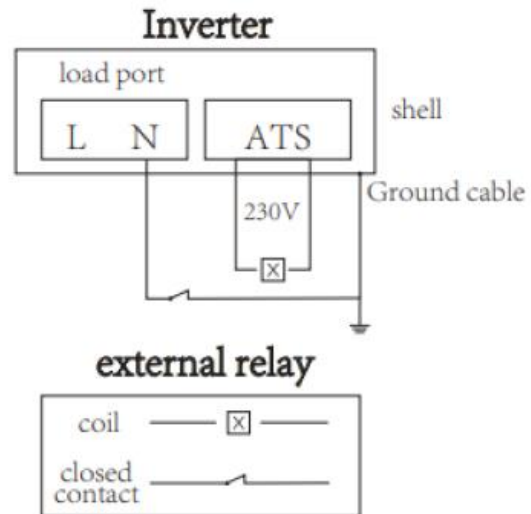
---

<input type="checkbox"/> EX_Meter For CT	Meter Select
	<input type="text" value="No Meter"/> 0/3
	<input type="text" value="CHNT"/>
	<input type="text" value="Eastron"/>

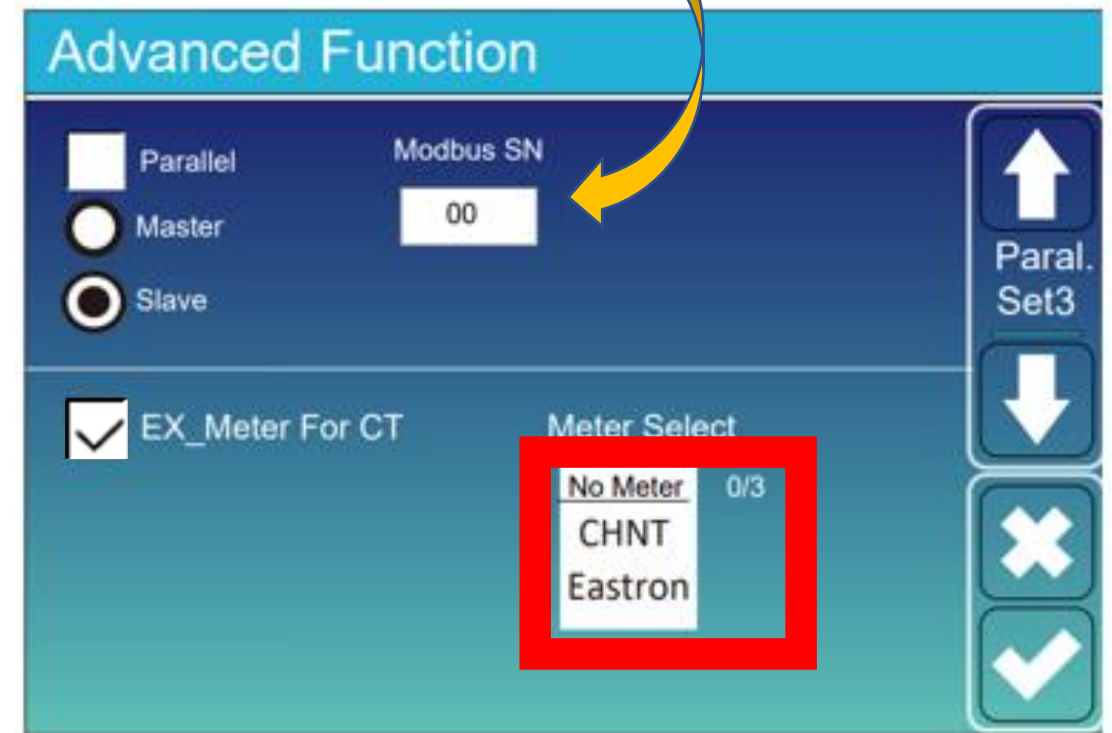
Paral.  
Set3

# Advanced Function 2/2

- In case of multiple equipment in parallel, choose: parallel, establish a master inverter and slaves, and modify mudbus SN



We have to assign a Modbus SN number to each inverter



# System Information



# System Information



# Basic Settings



# Basic Settings





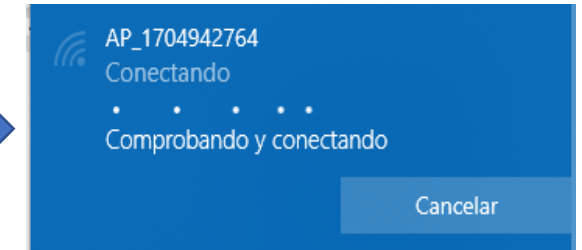
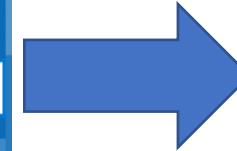
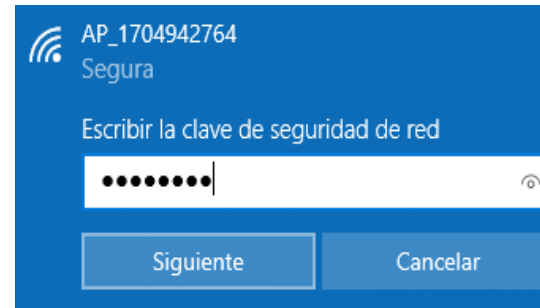
# Inverter settings

## 5. Cloud connection

### Step 1: Connect to INVERTER wifi

With an electronic device which operates wifi (PC, Tablet, Smartphone...) the connection with the hybrid inverter wifi is established (HI):

- Open wireless network connection
- Make click to see available Wireless networks
- Choose the corresponding device you want to connect with.



- Network name to select is AP\_ Number of the serial of the HI.
- Enter the password which appears on the register and select the option of connecting.
- The default password for hybrid inverters appears on the label.

# Inverter settings

## 5. Cloud connection

### Step 2: Connection settlement with the recorder

Once connected to Wifi:

- Enter your internet browser.
- Enter this on the browser: 10.10.100.254.
- Write user name and password. They are both 'admin' by default..
- Once in the "Status" page, recorder general information can be seen.

The screenshot shows a web browser window at the address 10.10.100.254/index\_cn.html. A modal dialog box titled "Iniciar sesión" is overlaid on the page. The dialog contains the following text: "http://10.10.100.254 necesita un nombre de usuario y una contraseña. Tu conexión con este sitio web no es privada", a text input field with "admin" entered, a password input field with "Contraseña" and "\*\*\*\*\*" shown, and two buttons: "Cancelar" and "Iniciar sesión". A large blue arrow points from the "Iniciar sesión" button to the "Status" page in the background. The "Status" page displays a sidebar menu with options: Wizard, Quick Set, Advanced, Upgrade, Restart, and Reset. The main content area shows inverter information:

- Inverter information	
Inverter serial number	2006284117
Firmware version (main)	---
Firmware version (slave)	---
Inverter model	---
Rated power	--- W
<b>Current power</b>	<b>--- W</b>
Yield today	6552.10 kWh
Total yield	19.7 kWh
Alerts	---
Last updated	1

Below this are sections for "+ Device information" and "+ Remote server information". On the right side of the interface, there is a "Help" section with the following text:

**Help**

The device can be used as a wireless access point (AP mode) to facilitate users to configure the device, or it can also be used as a wireless information terminal (STA mode) to connect the remote server via wireless router.

**Status of remote server**

◆ Not connected: Connection to server failed last time. If under such status, please check the issues as follows:

- (1) check the device information to see whether IP address is obtained or not;
- (2) check if the router is connected to internet or

At the bottom of the page, it says "Web Ver:1.0.24".

# Inverter settings

## 5. Cloud connection

### Step 2: Connection settlement with the recorder

Follow the fast setting assistant making click on “Wizard”. Choose the Wireless net you need to connect and make click on “Next”.

Status

**Wizard**

Quick Set

Advanced

Upgrade

Restart

Reset

**Please select your current wireless network:**

Site Survey

SSID	BSSID	RSSI	Channel
<input type="radio"/> AP_1704942764	9C:D8:63:71:9C:50	100	12
<input type="radio"/> Solar-WiFi19B00055	98:D8:63:8B:55:CC	100	1
<input type="radio"/> vodafone7A38	74:DA:88:B:1F:5E	45	1
<input type="radio"/> TP-LINK_8D10	7C:8B:CA:B9:8D:10	37	11
<input type="radio"/> RMNTRNS	90:3A:72:32:C5:58	30	8
<input type="radio"/> RMNTRNS	34:FA:9F:2C:CA:E8	25	3
<input type="radio"/> DIRECT-35-HP	E6:E7:49:26:F6:35	23	6
<input type="radio"/> PageWide MFP P57750	E6:E7:49:26:F6:35	23	6
<input type="radio"/> TURBO-E	F0:E4:A2:3E:53:9A	16	1
<input type="radio"/> TURBO	D8:47:32:3D:83:6	6	11

★Note: When RSSI of the selected WiFi network is lower than 15%, the connection may be unstable, please select other available network or shorten the distance between the device and router.

**Refresh**

**Add wireless network manually:**

Network name (SSID)  
(Note: case sensitive)

Encryption method **Disable** ▼

**Next**

1 2 3 4

**Help**

The setup wizard will assist you to complete the device setting within one minute.

# Inverter settings

## 5. Cloud connection

### Step 2: Connection settlement with the recorder

- Enter the password from the selected net, choose “Enable” to get an IP direction automatically and make click on “Next”.
- Upgrade the security setting of the Wifi selecting the options that are on the list and make click on “Next”.

The image displays two screenshots of a web interface for inverter settings, showing the 'Wizard' step for connection settlement and the 'Enhance Security' step.

**Top Screenshot: Connection Settlement**

**Status**  
**Wizard**  
Quick Set  
Advanced  
Upgrade  
Restart  
Reset

**Please fill in the following information:**

Password (8-64 bytes)  
(Note: case sensitive)   
 Show Password

Obtain an IP address automatically  Enable

IP address

Subnet mask

Gateway address

DNS server address

1 2 3 4

**Help**  
Most systems support the function of DHCP to obtain IP address automatically. Please select disable and add it manually if your router does not support such function.

**Bottom Screenshot: Enhance Security**

**Status**  
**Wizard**  
Quick Set  
Advanced  
Upgrade  
Restart  
Reset

**Enhance Security**

You can enhance your system security by choosing the following methods

Hide AP

Change the encryption mode for AP

Encryption mode

Change the user name and password for Web server

Current user name

New user name (Max. 15 characters)

Re-enter user name

New password (Max. 15 characters)

Re-enter password

1 2 3 4

**Help**  
Change the encryption mode for AP  
If you set password for the AP network, you will need to enter the password to connect to AP.

Change the user name and password for Web server  
If you change the username and password for the web server, you will need to enter the new username and password to get access to the setting page.

# Inverter connection

## 5. Cloud connection

### Step 2: Connection settlement with the recorder

- If the setting is successfully made, it will move to the next page where you need to make click on “OK” to restart.
- If the restart is successfully made, a message will appear indicating so, if not, the page needs to be refreshed.

Status	<p><b>Setting complete!</b></p> <p>Click OK, the settings will take effect and the system will restart immediately.</p> <p>If you leave this interface without clicking OK, the settings will be ineffective.</p> <p><input type="button" value="Back"/> <input type="button" value="OK"/></p> <p>1 2 3 <b>4</b></p>	<b>Help</b>
<b>Wizard</b>		After clicking OK, the system will restart immediately.
Quick Set		
Advanced		
Upgrade		
Restart		
Reset		

Status	<p><b>Setting complete! Please close this page manually!</b></p> <p>Please login our management portal to monitor and manage your PV system. (Please register an account if you do not have one.)</p> <p>To re-login the configuration interface, please make sure that your computer or smart phone and our device are in the same network segment, and enter the new IP address of the device to access the interface.</p>	<b>Help</b>
<b>Wizard</b>		★Note: The IP address of the device may have changed, please refer to User Manual to check the procedures to obtain the new IP address.
Quick Set		
Advanced		
Upgrade		
Restart		
Reset		

# Inverter connection

## 5. Cloud connection

### Step 2: Connection settlement with the recorder

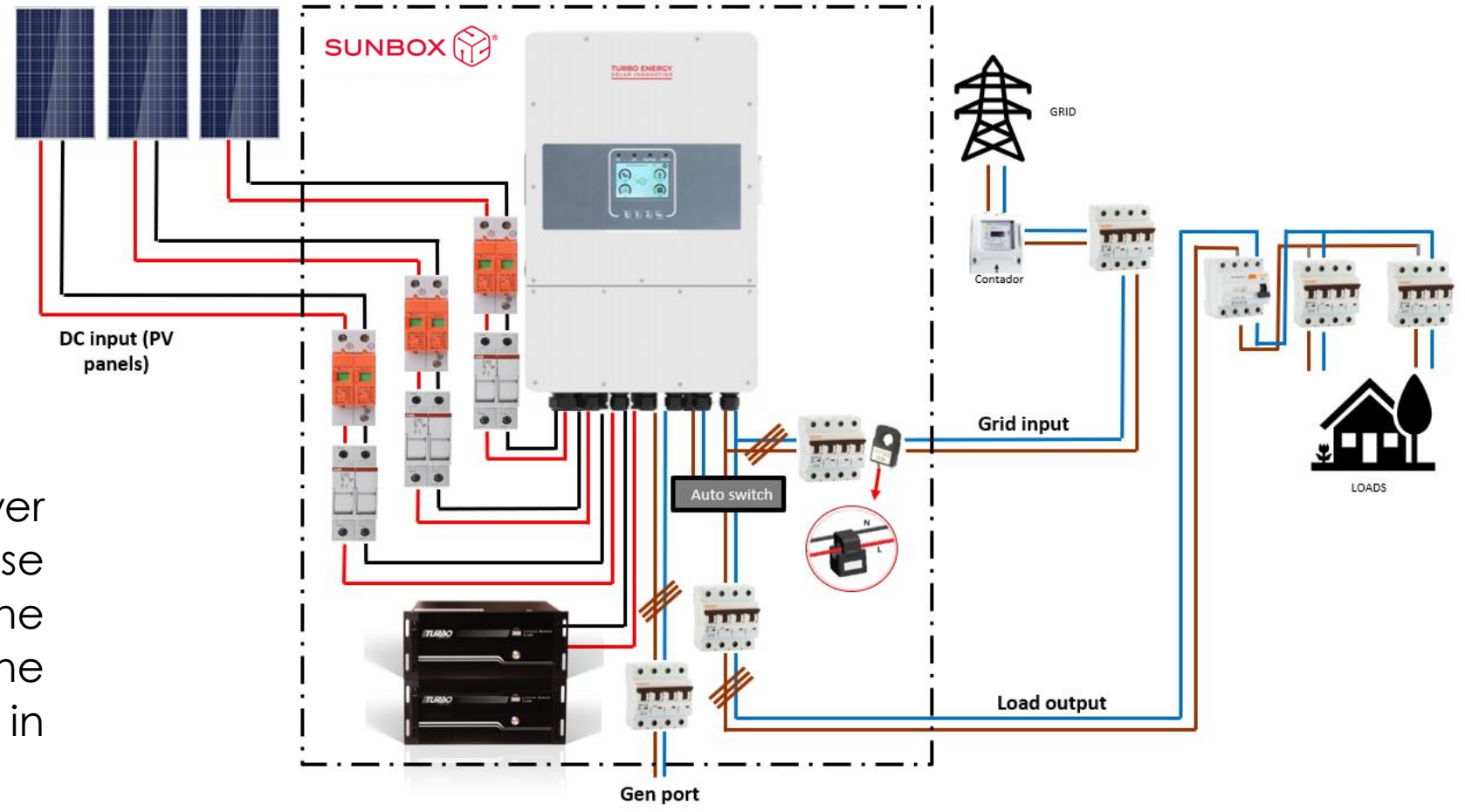
- Log in again on the “Status” page. After reload the web page and verify the network connection state of the recorder.

Status		Help
Wizard	- Inverter information	<p>The device can be used as a wireless access point (AP mode) to facilitate users to configure the device, or it can also be used as a wireless information terminal (STA mode) to connect the remote server via wireless router.</p> <p>Status of remote server</p> <ul style="list-style-type: none"><li>◆Not connected: Connection to server failed last time. If under such status, please check the issues as follows: (1) check the device information to see whether IP address is obtained or not; (2) check if the router is connected to internet or not; (3) check if a firewall is set on the router or not.</li><li>◆Connected: Connection to server successful last time;</li><li>◆Unknown: No connection to server. Please check again in 5 minutes.</li></ul>
Quick Set	Inverter serial number 1911294008	
Advanced	Firmware version (main) ---	
Upgrade	Firmware version (slave) ---	
Restart	Inverter model ---	
Reset	Rated power --- W	
	Current power --- W	
	Yield today 6553.30 kWh	
	Total yield 1722.2 kWh	
	Alerts ---	
	Last updated 0	
	- Device information	
	Device serial number 1704942764	
	Firmware version LSW3_14_FFFF_1.0.40	
	Wireless AP mode Enable	
	SSID AP_1704942764	
	IP address 10.10.100.254	
	MAC address 9C:D8:63:71:9C:50	
	Wireless STA mode Enable	
	Router SSID TURBO-E	
	Signal Quality 1%	
	IP address 192.168.8.122	
	MAC address 98:D8:63:71:9C:50	
	- Remote server information	
	Remote server A Connected	
	Remote server B Not connected	

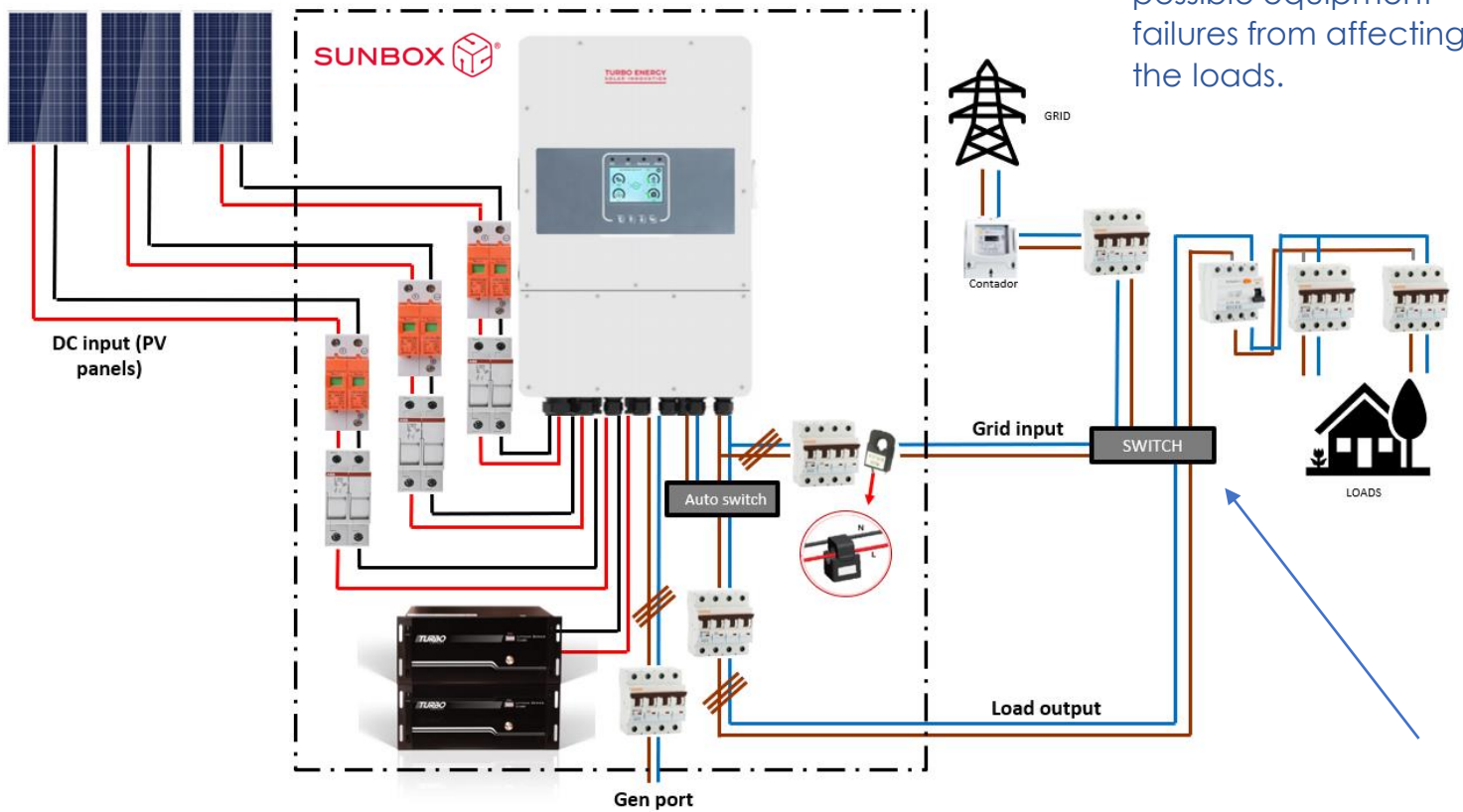
Remote server A connected:  
Signal quality must be more than 30%

### Option 1

For load currents lower than 32A per phase (around 7.2kW), the general connection of the SunBox will be as shown in the following diagram:



It is the simplest configuration and avoids manipulation of the load connections. As all the power from the network passes through the equipment (Load output) and it distributes the energy, it implies that the maximum current of the loads is 32A per phase in self-consumption mode (around 7.2kW), and 32A per phase and 10kW in total when there is no grid.

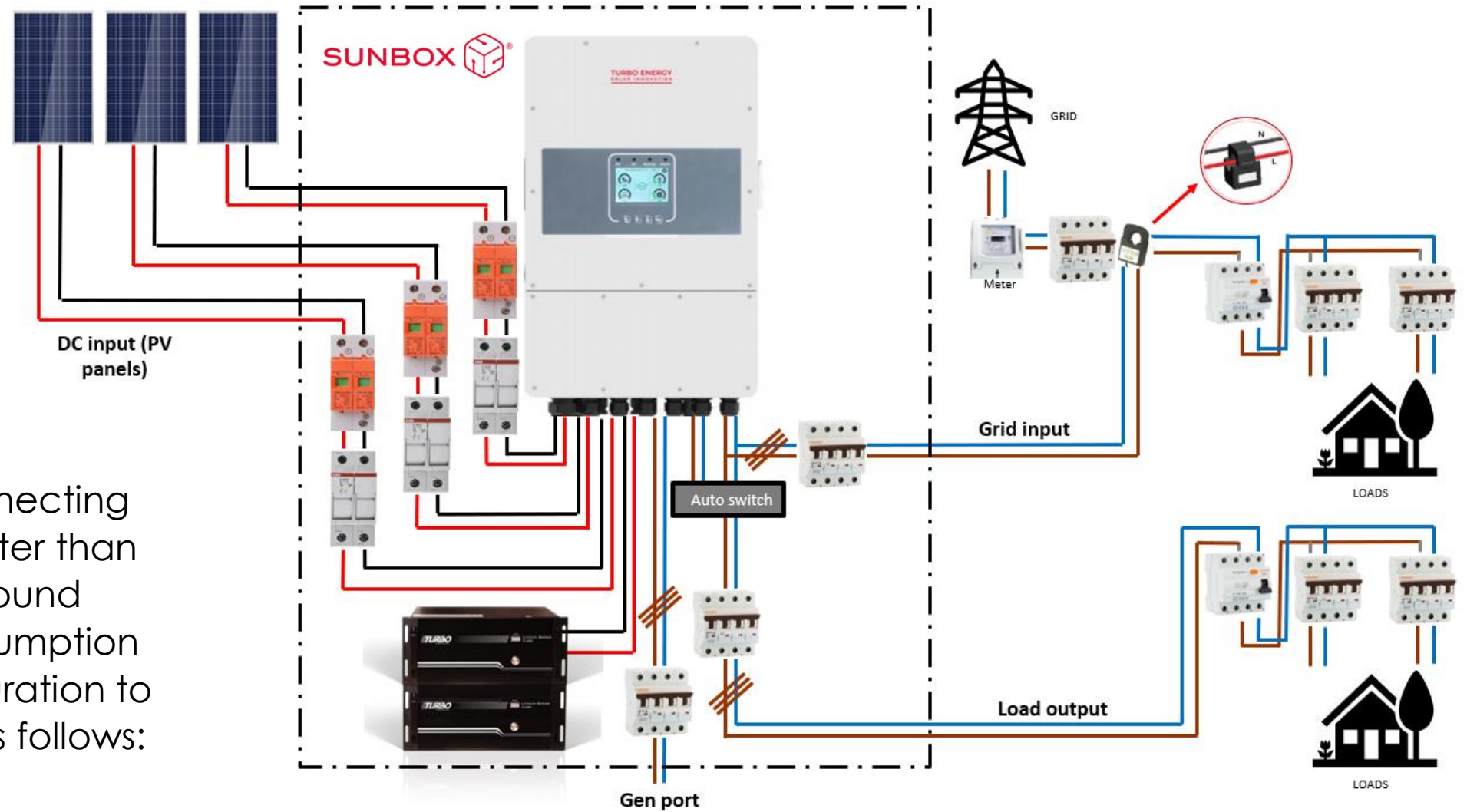


Optionally, a manual switch can be installed between the loads and the network to prevent possible equipment failures from affecting the loads.

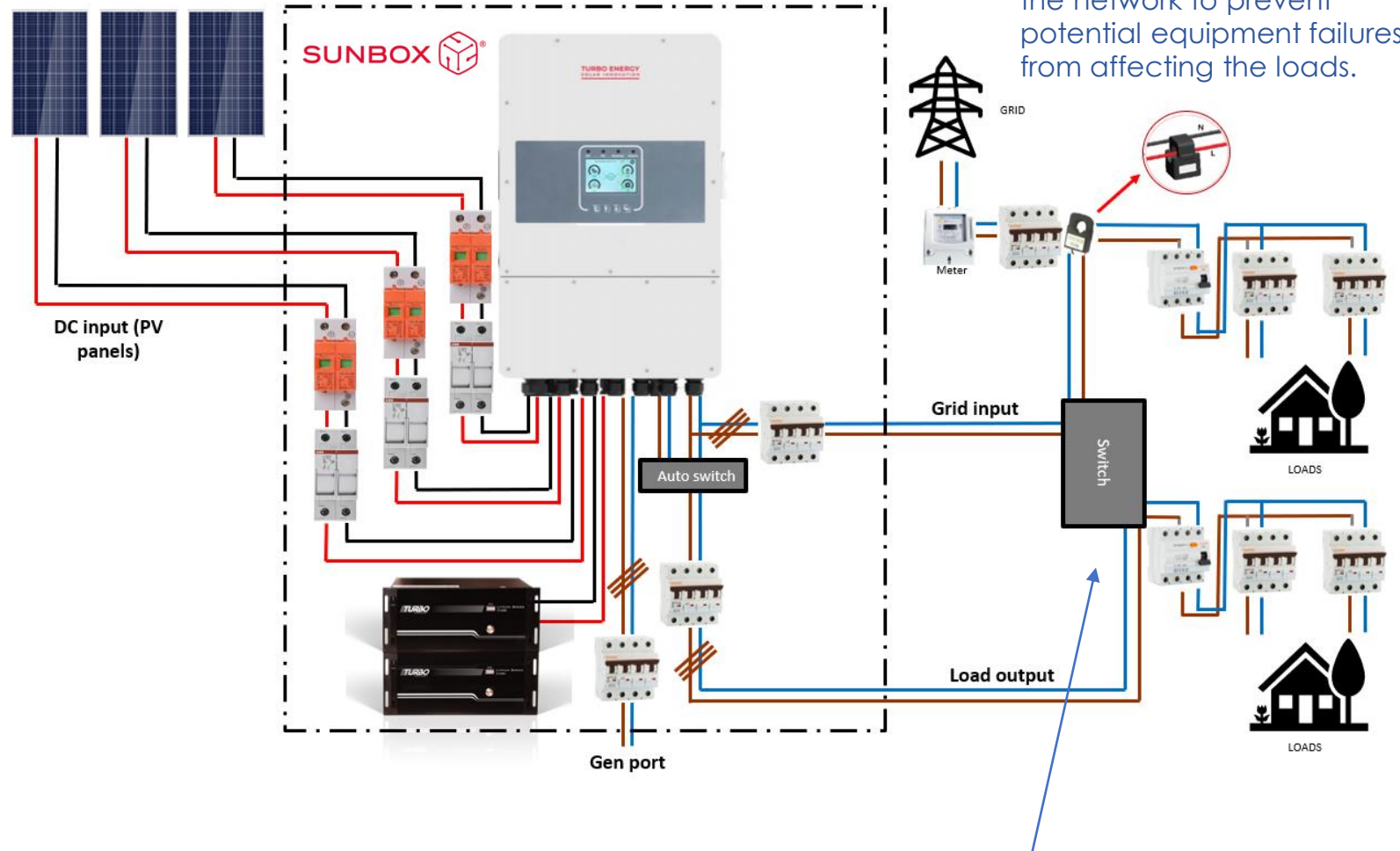


## Option 2

In the case of connecting load currents greater than 32A per phase (around 7.2kW) in self-consumption mode, the configuration to be carried out is as follows:

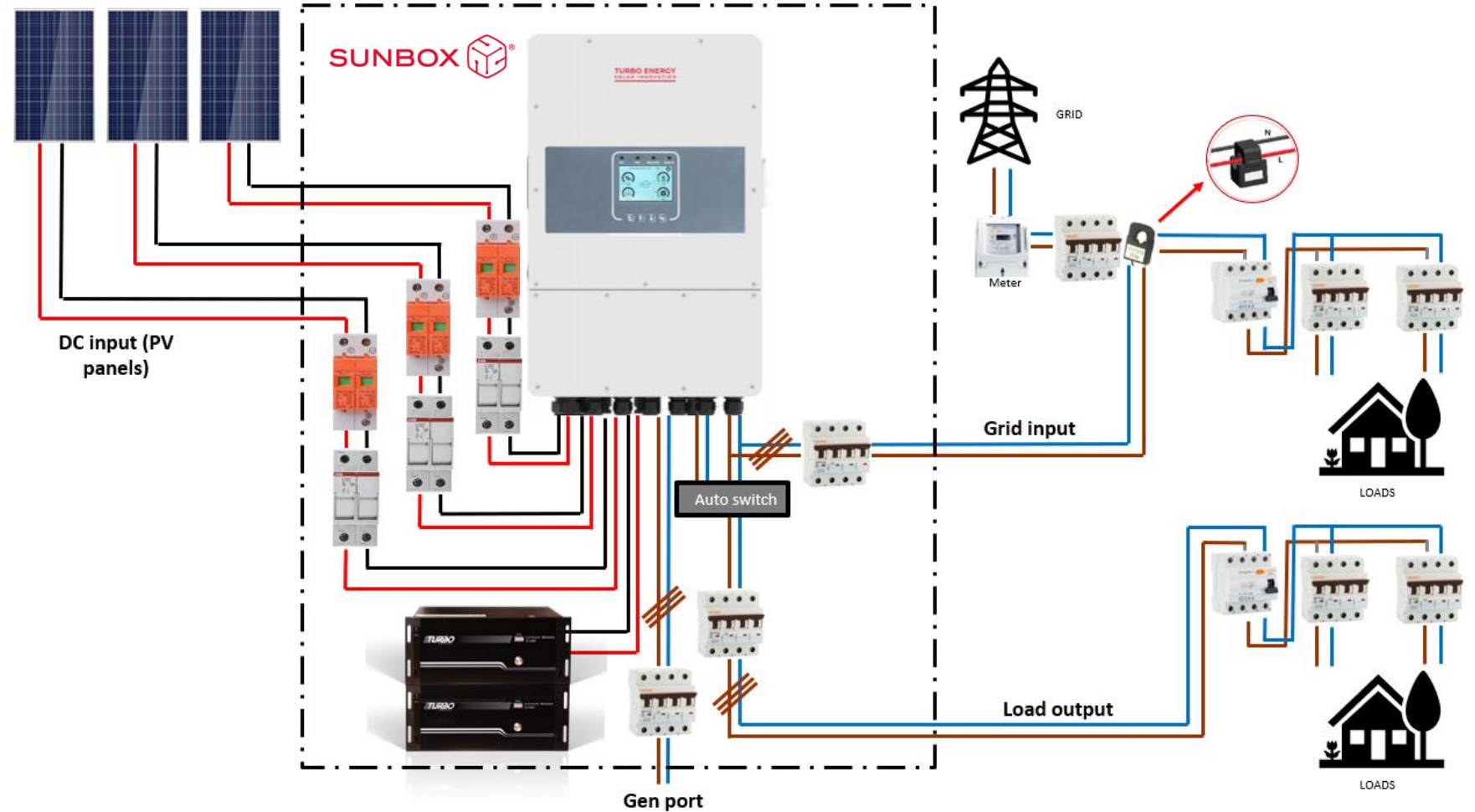


In this way, we have a series of critical loads connected to the Load output (up to a maximum of 32A per phase) that will allow the panels and / or batteries to supply them with energy despite a grid failure. The rest of the loads above 32A per phase must be connected on the grid side.



Optionally, a manual switch can be installed between the Load-side (critical) loads and the network to prevent potential equipment failures from affecting the loads.

In the case of not needing to connect critical loads and wanting to simplify the installation, all the loads can be put on the grid side as follows (but in the event of a grid failure, the loads are left without supply even though there is generation photovoltaic and / or battery):





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