NEOVOLTA

NV7600 & NVPlus 10.2 LFP Battery

NV7600

Installation Manual

NVPLUS 10.2

For support scan here

800.364.5464
NEOVOLTA.COM

V1.04022626

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About This Manual

This manual describes the product information, guidelines for installation, operation and maintenance. This manual does not include complete information about the photovoltaic (PV) system.

How to Use This Manual

Read this manual and other related documents before operating the inverter. Documents must be easily accessible at all times and stored. The contents of this manual may be periodically updated or revised due to product development. The information in this manual is subject to change without notice.

If you have any questions, or anything that it is not clear for you during installation, wiring, and/or operation, please contact us at 800.364.5464.

1. Safety Introductions

Labels description

Label	Description
	Caution, risk of electric shocksymbolindicates important safety instructions, which if not correctly followed, could result in electric shock.
	The DC input terminals of the inverter must not be grounded.
	Surface high temperature. Do not touch the inverter case when this label is present.
	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.
	CE mark of conformity
	Please read the instructions carefully before use.
	Symbol for the marking of electrical and electronics devices according to Directive 2022/96/EC. Indicates that the device, accessories and the packaging must not be disposed as unsorted municipal waste and must be collected separately at the end of the usage. Please follow Local Ordinances or Regulations for disposal or contact an authorized representative of the manufacturer for information concerning the decommissioning of equipment.

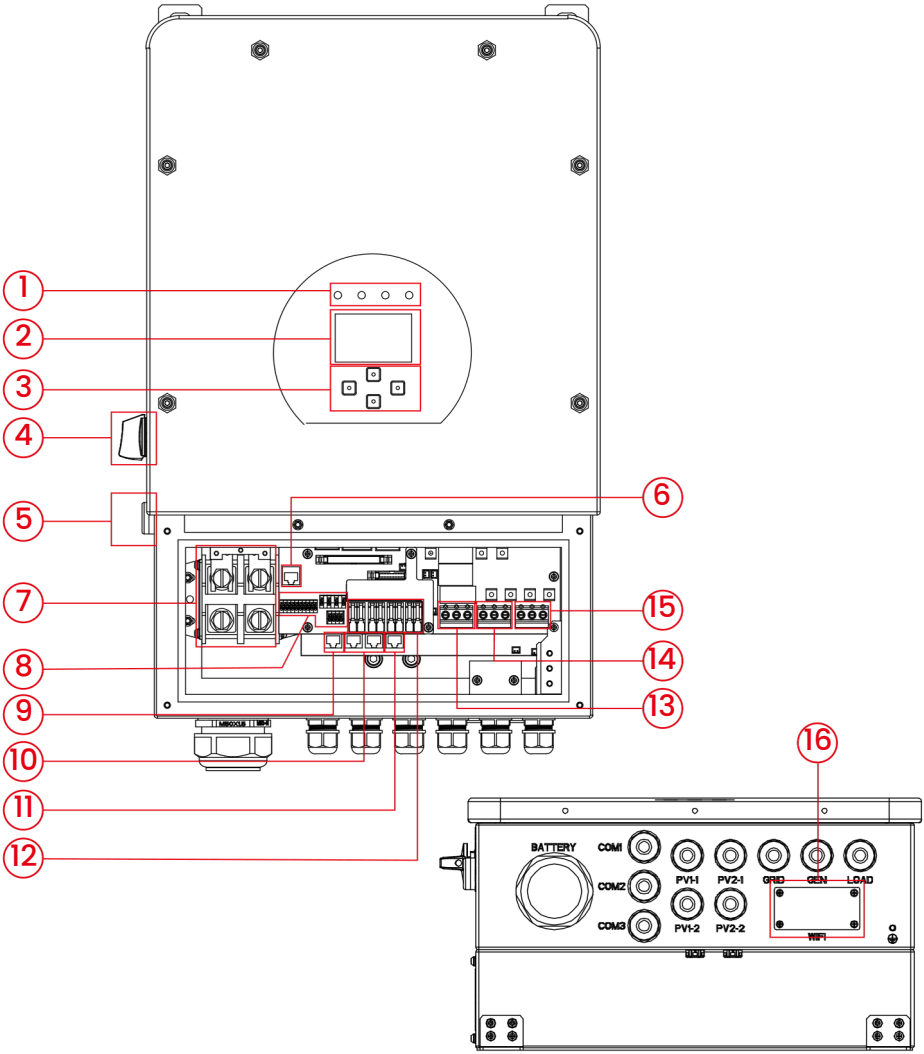
- This chapter contains important safety and operating instructions. Read and keep this manual for future reference.
- Before using the inverter, please study this manual including the instructions and warning signs for the battery.
- Do not disassemble the inverter. If the inverter needs maintenance. Please, 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 attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- Caution: Only a certified Nevolta installer can install this device with the battery.
- Never charge a frozen battery.
- For optimal operation of this inverter, please follow the required specifications to select the appropriate cable size(s).
- Exercise caution when working with metal tools on or around the batteries. Dropping a tool can cause a spark or a short circuit in the batteries or other electrical parts: metal tools could even cause an explosion.
- Please strictly follow the installation procedures when you want to disconnect AC or DC terminals. Please refer to the "Installation" section of this manual for the details.
- For grounding - This inverter should be connected to a permanently grounded wiring system. Comply with local requirements and regulations for the installation of inverter.
- Never short-circuit the AC output and DC input.
- Do not connect the inverter to the mains if the DC input short circuits.

2. Product Introductions

This is a multifunctional inverter, combining the functions of inverter, solar charger and battery charger, to offer uninterruptible power support with portable size. Its comprehensive LCD display offers an easily configurable button operation, with battery charging, AC/solar charging, and acceptable input voltage based on different applications.

2.1 Product Overview

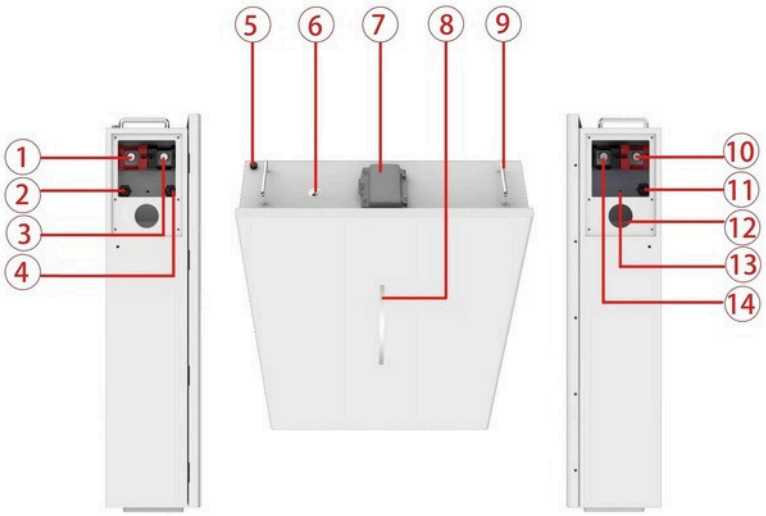
NV7600



1: Inverter Indicators
2: LCD Display
3: Function Buttons
4: DC Switch
5: Power On/Off button
6: BMS 485 port
7: Battery Input Connectors
8: Function Port
9: Meter_CON port
10: Parallel port
11: DRM Port
12: PV Input
13: Grid
14: Generator Input
15: Load
16: WiFi Interface

NV Plus 10.2 LFP Battery

This section details the interface functions on the battery's front and side panels.



1. Battery Positive +	8. Battery Indicators (RUN, ALM, SOC)
2. Inverter CAN/RS485 port PCS	9. Handle
3. Battery Negative -	10. Battery Positive +
4. Parallel Communication Port IN	11. Parallel Communication Port OUT
5. Breather Valve	12. Rubber Plug - Conduit Connection
6. BMS Switch	13. Grounding Bolt
7. Micro Battery Output Breaker	14. Battery Negative -

BMS Switch
Turn the battery BMS ON/OFF with the battery breaker. When the battery breaker is in the OFF position, there is no power output.

PCS
Inverter communication terminal: (RJ45 port) follow the CAN protocol (baud rate: 500K), used to output battery information to the inverter.

Definition of PCS Port Pin

No.	PCS Port Pin
1	485-B
2	485-A
3	--
4	CANH
5	CANL
6	--
7	485-A
8	485-B

IN Parallel Communication Terminal: (RJ45 port) Connect “out” Terminal of Previous battery for communication between multiple parallel batteries.

Definition of IN Port Pin

No.	PCS Port Pin
1	CANL
2	CANH
3	DI+
4	DI-
5	DI-
6	DI+
7	CANH
8	CANL

OUT Parallel Communication Terminal: (RJ45 port) Connect “IN” terminal of the next battery for communication between multiple parallel batteries.

Definition of Out Port Pin

No.	Out Port Pin
1	CANL
2	CANH
3	DO+
4	DO-
5	DO-
6	DO+
7	CANH
8	CANL

LED Status Indicators Instructions
Error Condition : Red light on the right and green led on the left remain steadily illuminated, indicating the equipment is protected.

SOC : Battery capacity indicator, white light strip.

Condition	Error	SOC 0%~20%	SOC 0%~40%	SOC 0%~60%	SOC 0%~80%	SOC 0%~100%
SOC						
Power off	OFF					
Charge	OFF	Show SOC & highest LED blink				
Discharge or Idle	OFF	Show SOC & long bright				
Alarm	OFF	Other LEDs are same as above.				
System error/Protect						
Upgrade	Running green LED light top to bottom					
Critical Error	Blink Slowly					

Grounding bolt: Used to connect the battery to protective earth (PE).

BMS function:

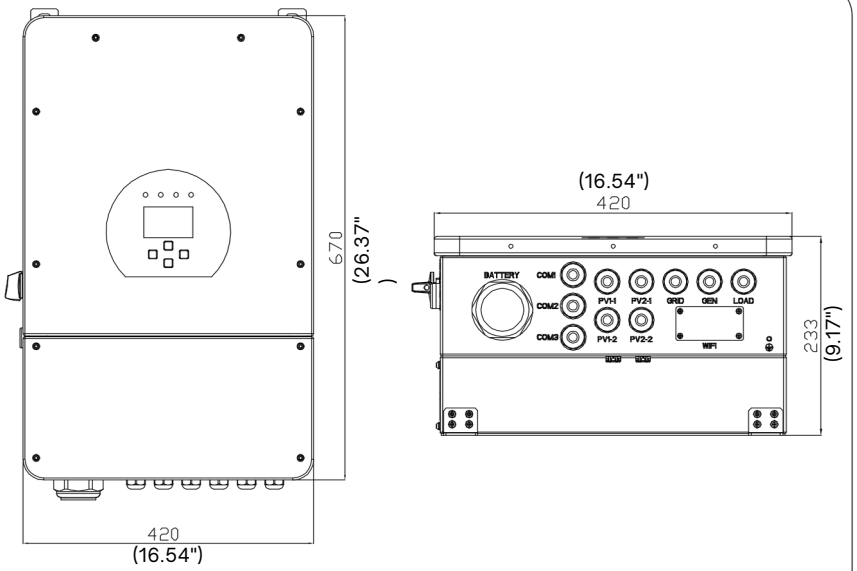
Protection and Alarm	Management and Monitor
Charge/Discharge End Charge	Intelligent Protect Mode
Over Voltage Discharge Under	Intelligent Charge Mode
Voltage Charge/Discharge Over	Protect, Charge Current Limit
Current High/Low	Intelligent Protect Mode
Temperature(cell/BMS) Short	Intelligent Protect Mode
Circuit	Protect

Soft rubber tube plug: Provides waterproof protection.

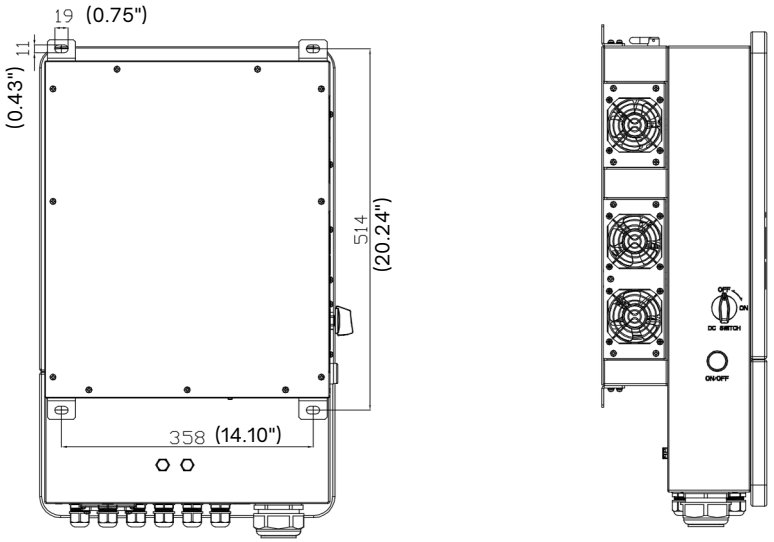
Pressure release valve
Maintains equipment and piping pressure within the specified range to prevent overpressure and accidents.

2.2 Product Size

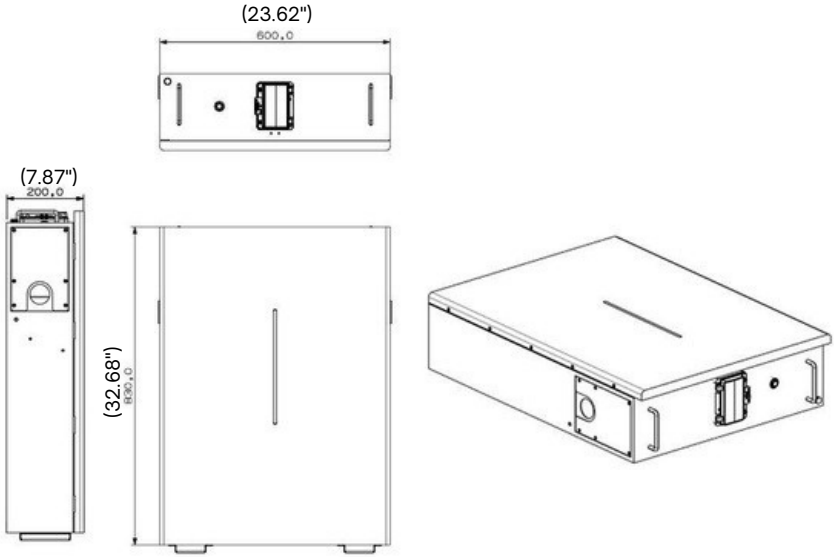
NV7600



Inverter Size



NV Plus 10.2 LFP Battery

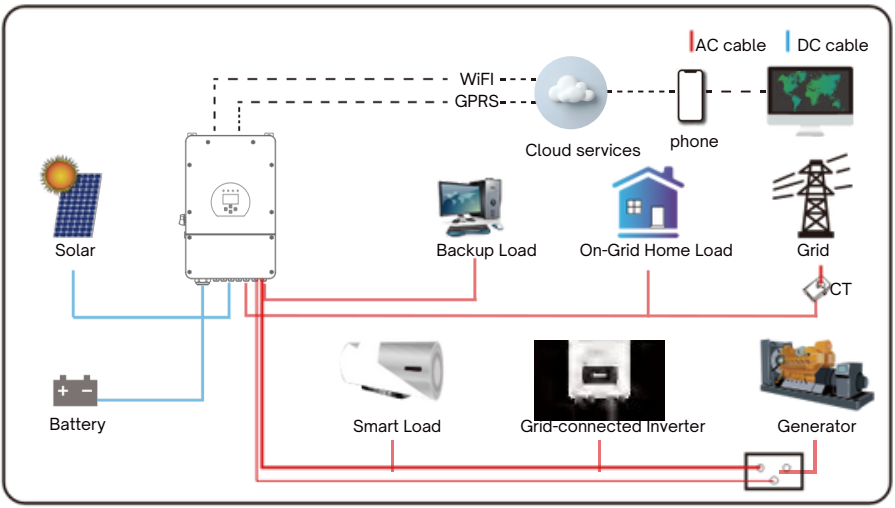


2.3 Product Features

- Self-consumption and feed-in to the grid.
- Auto restart while AC is recovering.
- Programmable supply priority for battery or grid.
- Programmable multiple operation modes: On grid, Off grid and UPS.
- Configurable battery charging current/voltage based on applications by LCD setting.
- Configurable AC/Solar/Generator charge priority by LCD setting.
- Compatible with utility or generator power.
- Overload/over temperature/short circuit protection.
- Smart battery charger design for optimized battery performance.
- Self Consumption.
- With limit function, prevent excess power overflow to the grid.
- Supporting WIFI monitoring and build-in 2 strings of MPP trackers
- Smart three-stage MPPT charging for optimized battery performance.
- Time of use function.
- Smart Load Function.

2.4 Basic System Architecture

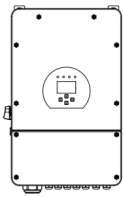
The illustration displays the inverter's fundamental application, including necessary components for a complete system, such as a generator, utility power, or PV modules. Consult with your system integrator for alternative system setups based on your needs. This inverter is capable of powering various home or office appliances, including refrigerators and air conditioners.



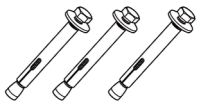
3. Installation

3.1 Parts List

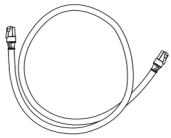
Check all the equipment prior to installation to ensure no parts are damaged. Your package should include:



Hybrid inverter x1



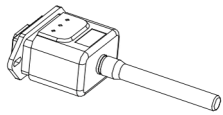
Stainless steel anti-collision bolt M8×80 x4



Parallel communication cable x1

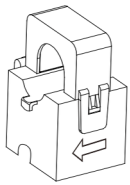
L-type Hexagon wrench x1

User manual x1



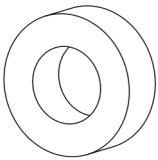
Wi-Fi-Plug(optional) x1

Battery temperature sensor x1

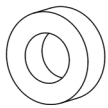


Sensor Clamp x2

Stainless steel mounting screws M4*12 x2



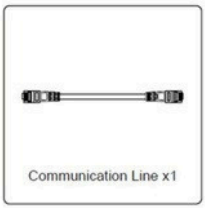
Magnetic ring for battery x 1

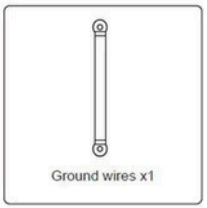


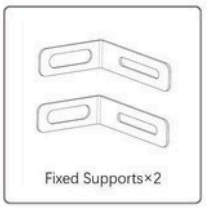
Magnetic ring x3*

*One for BMS communication cable, and another two for AC wires.

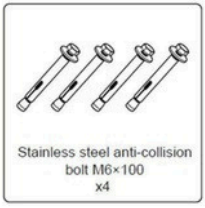

Battery pack x1


Communication Line x1


Ground wires x1

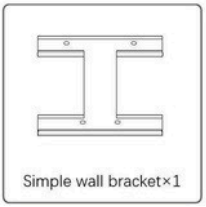

Fixed Supports×2

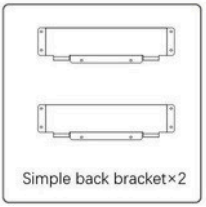

RW-F10.2-B PCable×1


Stainless steel anti-collision bolt M6×100 x4


Hanging Board mounting screws M6×10×10

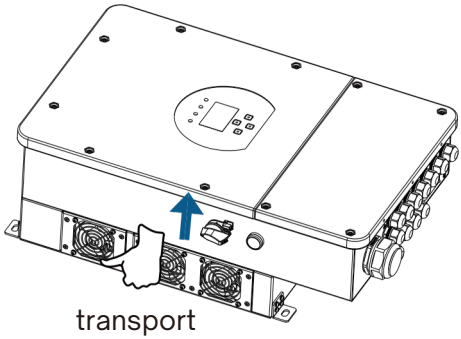
User Manual×1


Simple wall bracket×1


Simple back bracket×2

3.2 Product Handling Requirements

Remove the inverter from its packaging at its intended installation site.



transport

CAUTION: Incorrect handling can lead to personal injury!

- Use a sufficient number of people to carry the inverter, based on its weight. Installers should wear protective gear, such as impact-resistant shoes and gloves.
- Placing the inverter directly on a hard surface may damage its metal casing. Place protective materials, like a sponge pad or foam cushion, underneath the inverter.
- Move the inverter with one or two people or use a suitable transport tool.
- Carry the inverter using its handles. Do not lift or move it by the terminals.

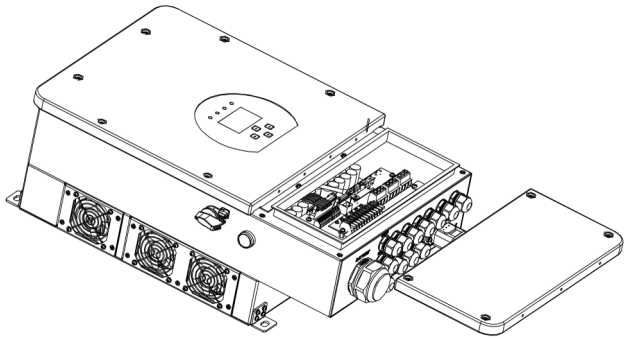
3.3 Mounting Instructions

Installation Precaution

This hybrid inverter is designed for outdoor use (IP65). Please make sure the installation site meets the following conditions:

- Not in direct sunlight
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television Antenna or antenna cable.
- Not higher than altitude of about 2000m (6562 ft) above sea level.
- Not in environment of precipitation or humidity(>95%)

To ensure proper function and product longevity, protect the device from direct sunlight, rain, and snow accumulation during installation and operation. Prior to wiring, remove the metal cover by unscrewing and detaching it as illustrated below.

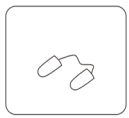


Installation Tools

Installation tools refer to the following recommended equipment and tools for installation.

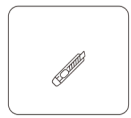

Protective Goggles

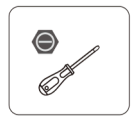

Anti-Dust Mask


Earplugs

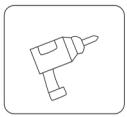

Work Gloves


Work Shoes


Utllity Knife

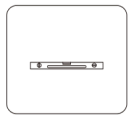

Slotted Screwdriver


Cross Screwdriver

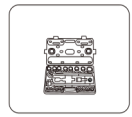

Percussion Drill


Pliers


Marker


Level

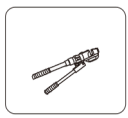

Rubber Hammer

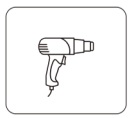

Socket Wrenches Set

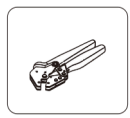

Anti-Static Wrist Strap

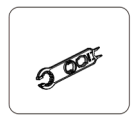

Wire Cutter


Wire Stripper


Hydraulic Pliers


Heat Gun


Crimping Tool 4-6mm²


Solar Connector Wrench

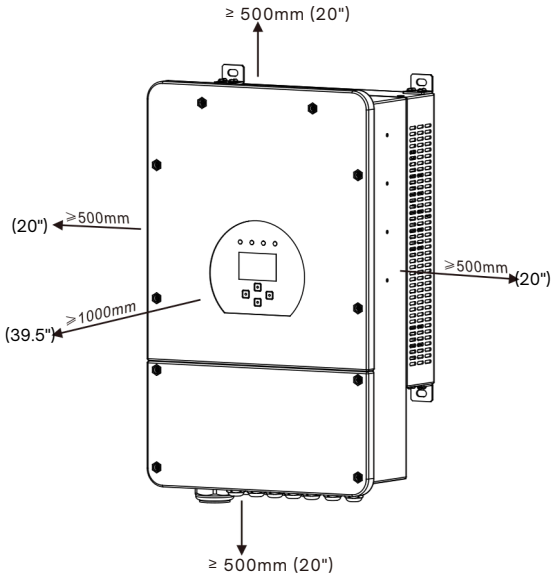

Multimeter ⩾1100 Vdc


RJ45 Crimping Plier


Cleaner

Considering the following before selecting an installation location:

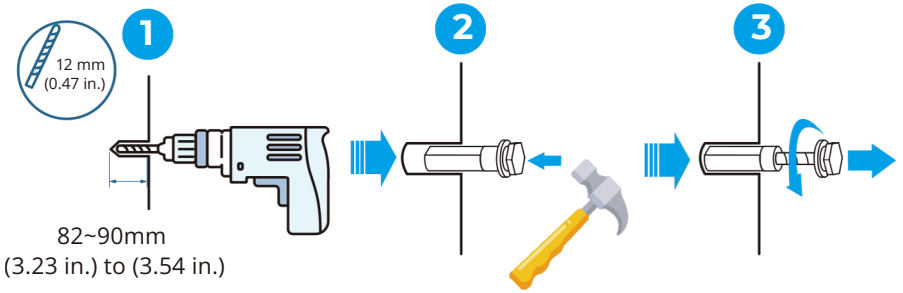
- Select a vertical wall with sufficient load-bearing capacity for the installation, such as concrete or other non-flammable surfaces.
- Install this inverter at eye level to allow the LCD display to be readable at all times.
- The ambient temperature recommended is between -40°F to 140°F (-40°C to 60°C) to ensure optimal operation.
- Be sure to keep the installation area clear as shown in the diagram to guarantee sufficient heat dissipation and work space.

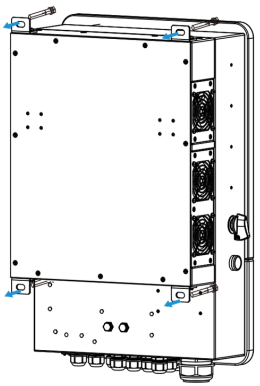


For proper air circulation to dissipate heat, allow a clearance of approx. 20" (508mm) into the side and approx. 20" (508mm) above and below the unit and 39.5" (1003.3mm) to the front.

Inverter Installation Caution: This inverter is heavy! Exercise caution when unpacking and lifting.

1. Select the recommended drill bit (see illustration). Drill four holes on the wall with a depth of 3.23-3.54" (82.04mm - 89mm).,
2. Using a suitable hammer, insert the expansion bolts into the drilled holes.
3. Carefully lift and position the inverter, aligning the hanger with the installed expansion bolts. Secure the inverter to the wall.
4. Tighten the screw heads of the expansion bolts to complete the mounting process.





3.4 Battery Connection

For safety and regulatory adherence, a dedicated DC over-current protection or disconnection mechanism must be installed between the battery and the inverter. While some setups might not need switching devices, over-current protection remains mandatory. Consult the typical amperage values in the table provided to determine the appropriate fuse or circuit breaker rating.

Model	*Wire Size*	*Cable(mm 2)*	*Torque Value(max)*
5kW	1AWG	35	16.9Nm
6kW	0AWG	50	20.3Nm
7.6kW max 190Adc	2/0AWG	70	28.2Nm
10kW	4/0AWG	95	28.2Nm
12kW	250kcmil	120	36.7Nm

Chart 3-2 Cable size

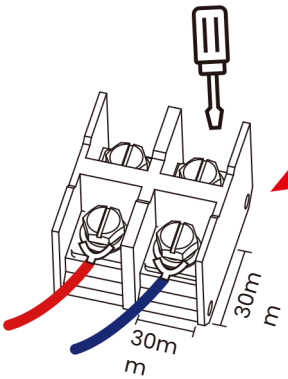
All wiring must be performed by a professional in accordance with the NEC and local codes.

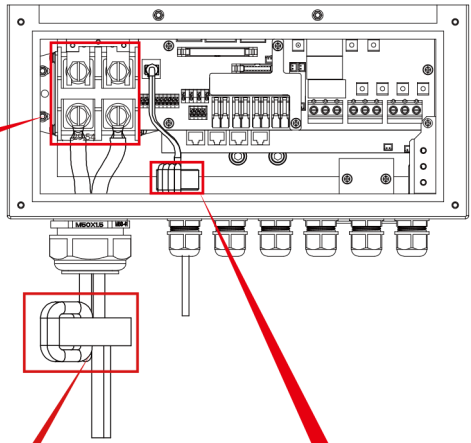
Connecting the battery with a suitable cable is important for safe and efficient operation of the system. To reduce the risk of injury, refer to Chart 3-2 for recommended cables.

Follow these steps to connect the battery:

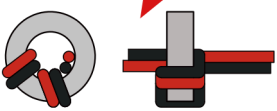
1. Select a battery cable with the correct connector that securely fits the battery terminals.
2. Using a suitable screwdriver, loosen the bolts, attach the battery connectors, and then tighten the bolts to a torque of 24.5Nm with the screwdriver or a socket wrench.
3. Ensure that the polarity is correctly matched at both the battery and the inverter.

NV7600

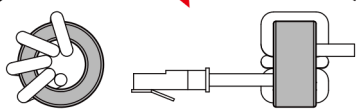




For 7.6 model, battery connector screw size: M10



Pass the battery power cable through the magnetic ring and wrap it around the magnetic ring two times.

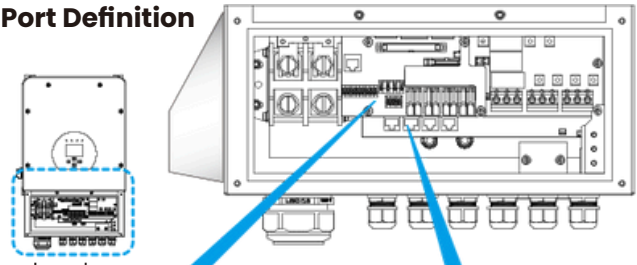


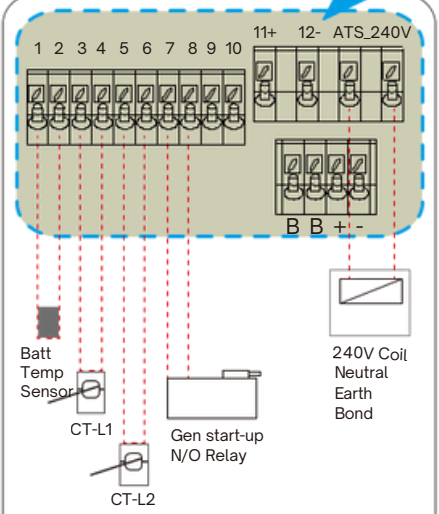
Pass the BMS communication cable through the magnetic ring and wrap it around the magnetic ring four times.

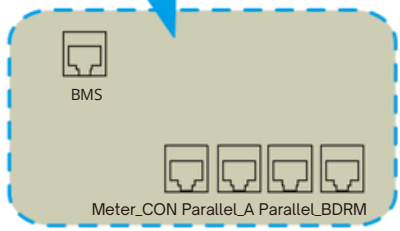
Note: for NV7600 Model just pass the 2/0 AWG battery cables form the NVPlus-10.2 battery straight through the magnetic rings. No loop required.

3.4.1 Function Port Definition

NV7600







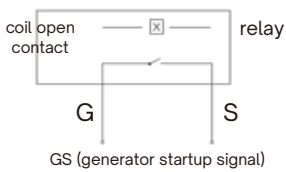
BMS port for battery communication. Meter_CON: for energy meter communication. Parallel A: Parallel communication port 1 (CAN interface).

Parallel B: Parallel communication port 2 (CAN interface).

DRM: It is used to accept the external input signal(Digital input).

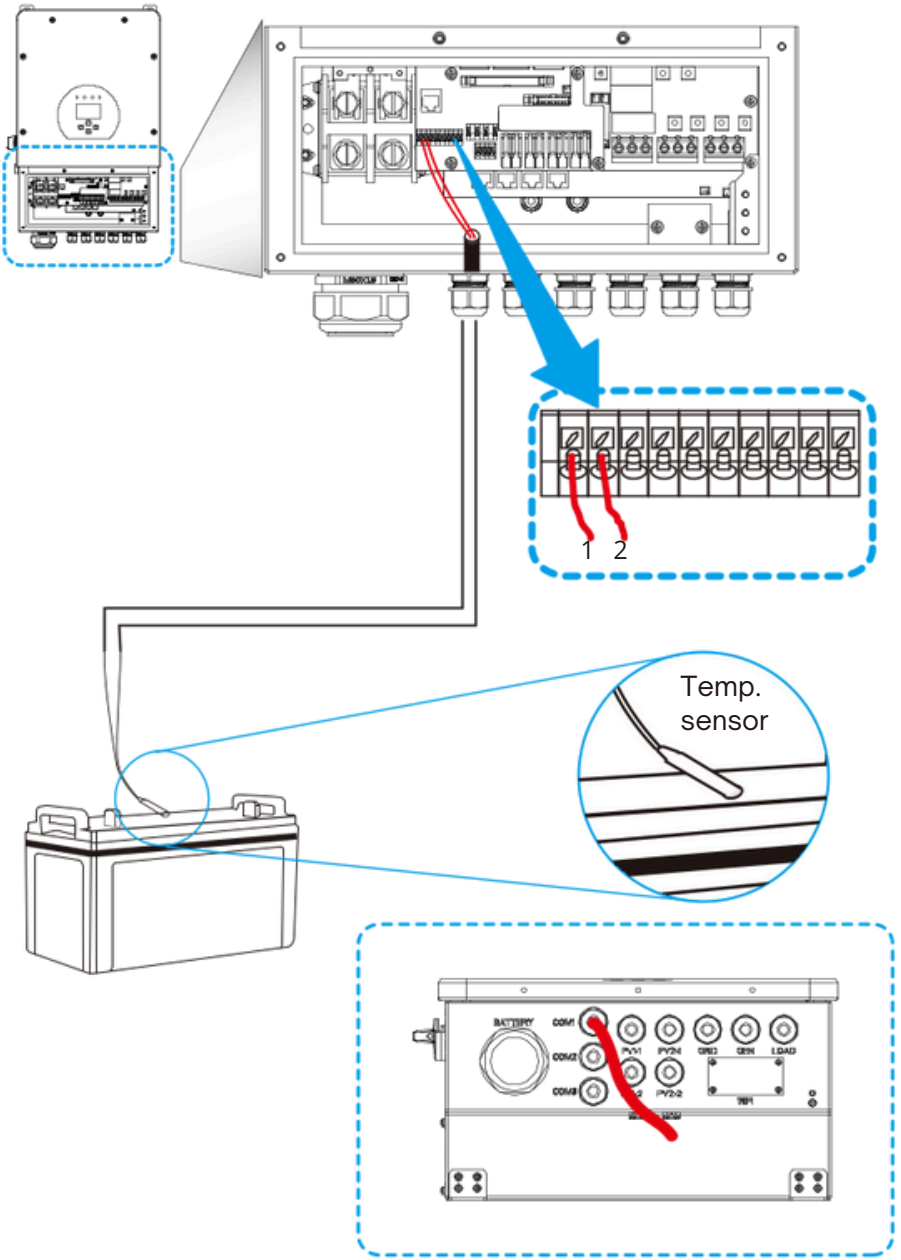
TEMP (1,2): battery temperature sensor for lead acid battery.
CT-L1 (3,4): current transformer (CT1) for “zero export to CT”mode clamps on L1 when in split phase system.
CT-L2 (5,6): current transformer (CT2) for “zero export to CT” mode clamps on L2 when in split phase system.
G-start (7,8):dry contact signal forstartup ofgenerator (2-wiresignal connection).
When the"GEN signal"is active, the open contact(GS) willswitch on (no voltage output).
G-valve (9,10): reserved.
RSD_12V_out(11+,12-): When battery is connected and the inverter is in "ON" status, it will provide 12Vdc.
ATS_240V: If the conditions are met, it will output 230Vac.

RSD_Short Signal/RSD_Voltage Signal(B,B/+,-): when the terminal “B” & “B” is short-circuited with additional wire connection, or there’s 12Vdc input at the terminal “+ & - “, then the 12Vdc of RSD+ & RSD- will disappear immediately, and the inverter will shutdown immediately.



3.4.2 Temperature Sensor Connection for Lead-Acid Battery

NV7600



3.5 Grid Connection and Backup Load Connection

- Before connecting to the grid, a separate AC breaker must be installed between the inverter and the grid, and 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 NV7600 model, the recommended AC breaker for the backup load is 60A, and the recommended AC breaker for the grid is 60A.
- There are three terminal blocks with "Grid" "Load" and "GEN" markings. Do not connect the power input terminals to the output terminals, or vice versa.

Important Safety and Installation Notes:

- In the final installation, ensure a UL listed circuit breaker is installed with the equipment.
- All wiring must be performed by qualified personnel.
- For system safety and efficient operation, using only THHN/THWN-2 copper wires for the AC connection.
- To minimize the risk of injury, use the recommended cable as specified below.

Grid Connection and Backup Load Connection (Copper wires only)

Model	*Wire Size*	*Cable(mm 2)*	*Torque Value(max)*
5kW	8AWG	8.4	2.8Nm
7.6kW	6AWG	13.3	4.0Nm
10/12kW	4AWG	21.1	4.0Nm

Grid connection and backup load connection (Copper wires) (bypass)

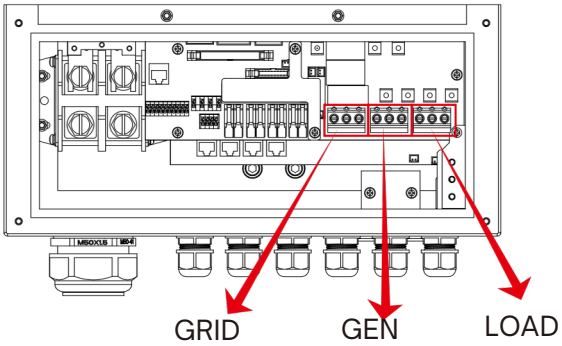
Model	*Wire Size*	*Cable(mm 2)*	*Torque Value(max)*
5kW	8AWG	8.4	2.8Nm
7.6kW	6AWG	13.3	4.0Nm
10/12kW	4AWG	21.1	4.0Nm

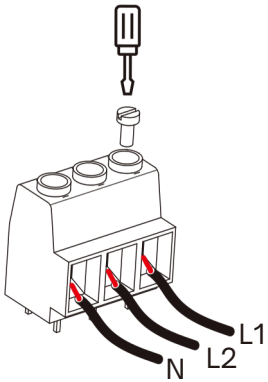
Chart 3-3 Recommended Size for AC wires

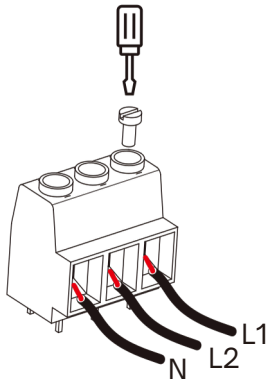
Complete the following steps to implement AC input/output connections:

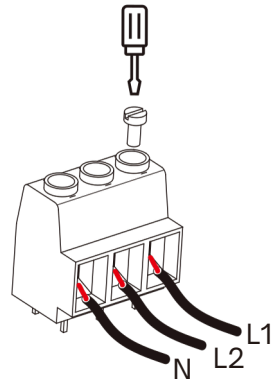
1. Before making a Grid, Load and Gen port connection, be sure to turn off the AC breaker or disconnect first..
2. Remove insulation sleeve 10mm (0.5") length, unscrew the bolts. For GRID port, just insert the wires into the terminals according to polarities indicated on the terminal block. For GEN and Load ports, thread the wires through the magnetic ring first then insert these wires into the terminals according to polarities indicated on the terminal block. Tighten the terminal screws and make sure the wires are completely and safely connected.

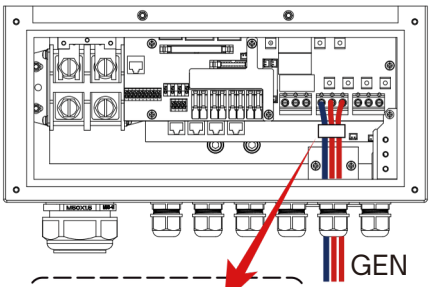
NV7600

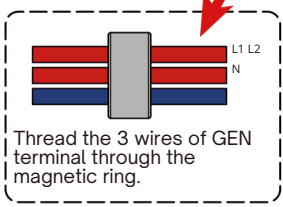






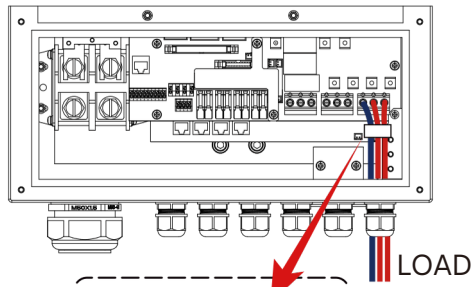


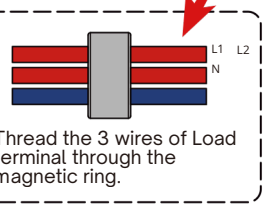




Thread the 3 wires of GEN terminal through the magnetic ring.

Note: For the NV7600 Model, loop the wires once around the magnetic rings.





Thread the 3 wires of Load terminal through the magnetic ring.

Be sure that AC power source is disconnected before atempting to wire the inverter.

AC Output Wire Connections:

1. Connect the AC output wires to the terminal block, ensuring correct polarity as indicated. Tighten the terminals securely.
2. Make sure to connect the corresponding neutral ("N") wires and protective earth ("PE") wires to their designated terminals.
3. Verify that all wires are securely fastened.

Appliances like air conditioners may require at least 2-3 minutes to restart in order to have enough time to balance refrigerant gas inside the circuit. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check with the manufacturer of the air conditioner to verify if it is equipped with a time-delay function before installation.

Otherwise, this inverter will trigger overload fault and cut off output to protect your appliances: this can still sometimes cause internal damage to the air conditioner.

3.6 PV Connection

For system safety and efficient operation, it is crucial to install a separate DC circuit breaker between the inverter and PV modules before making any connections. Ensure appropriate cables are used for PV module connections, and to minimize the risk of injury, use the recommended cable size as indicated below.

Model	*Wire Size*	*Wire (mm 2)*
7.6kW	10AWG	6

Chart 3-4 Cable size

To avoid malfunction, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. When using PV modules, please ensure the PV+ and PV- from the solar panel are not connected to the system ground bar.

It is recommended to use a PV junction box with surge protection. Otherwise, it will cause damage to the inverter in the event of lightning.

When choosing suitable PV modules, ensure the following parameters are considered:

1. The open-circuit voltage (Voc) of the PV string must not surpass the inverter's maximum PV array open-circuit voltage at the coldest anticipated temperature at the installation site.
2. The open-circuit voltage (Voc) of the PV modules should exceed the minimum start voltage of the inverter.
3. All PV modules used with the inverter must have a Class A rating certification according to IEC 61730 standards.

Inverter Model	7.6kW
PV Input Voltage, Voc Max.	500V
PV Array MPPT Voltage Range	150V-425V
No. of MPP Trackers	2
No. of Strings per MPP Tracker	2+2

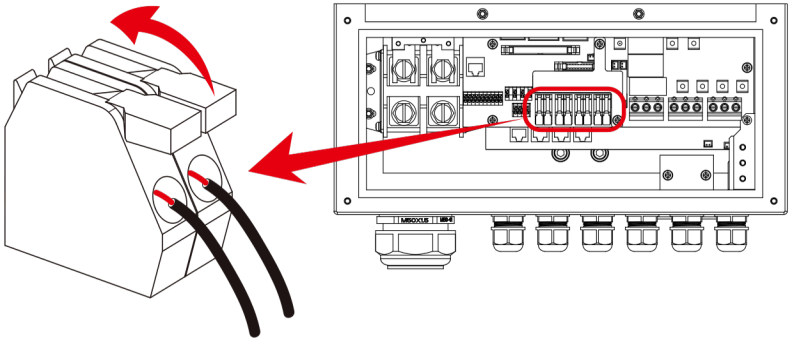
Chart 3-5

3.6.2 PV Module Wire Connection

To connect the PV modules, follow these steps:

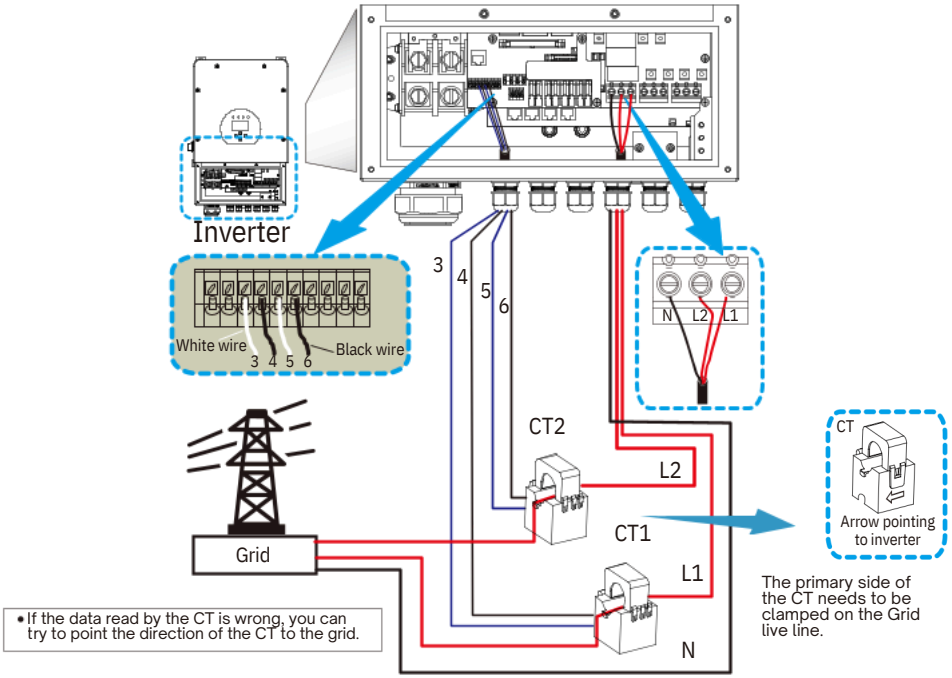
1. Strip 10 mm (0.5") of insulation from the ends of both the positive and negative conductors.
2. It is recommended to attach a crimp sleeve to the stripped ends of the positive and negative wires using an appropriate crimping tool.
3. Verify the correct polarity of the wiring from the PV modules and the PV input connectors. Then, connect the positive (+) wire to the positive (+) pole of the PV input connector and the negative (-) wire to the negative (-) pole of the PV input connector. Securely close the connector, ensuring all wires are firmly attached.

NV7600



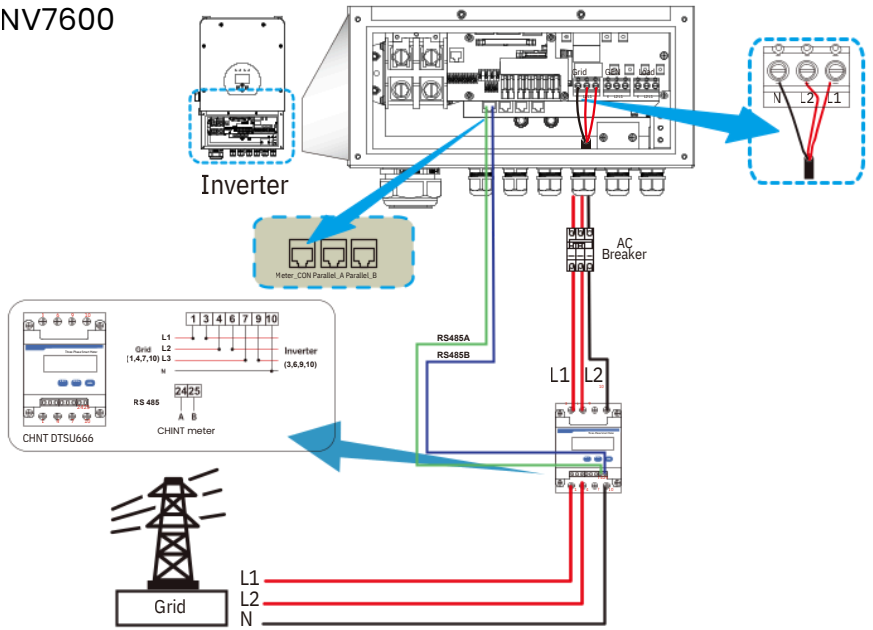
3.7 CT Connection

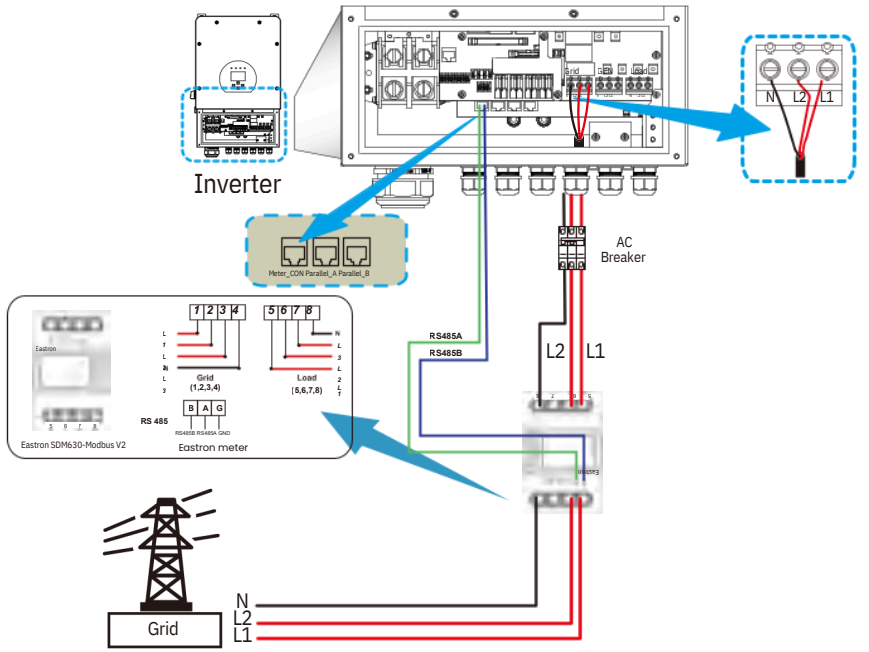
NV76000



3.7.1 Meter Connection

NV7600



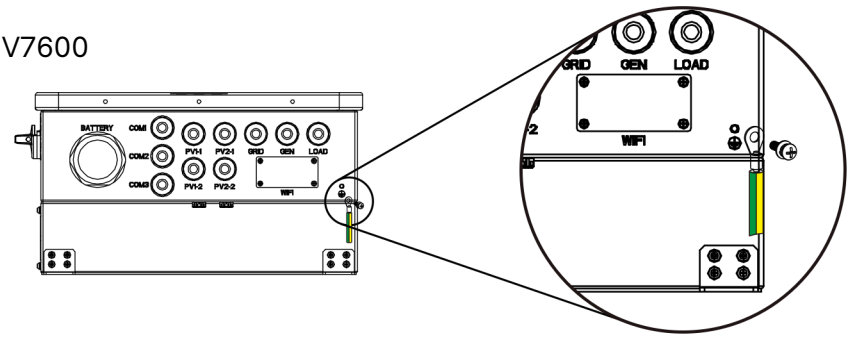


Note: When the inverter is in the off-grid state, the Neutral conductor needs to be connected to the ground.

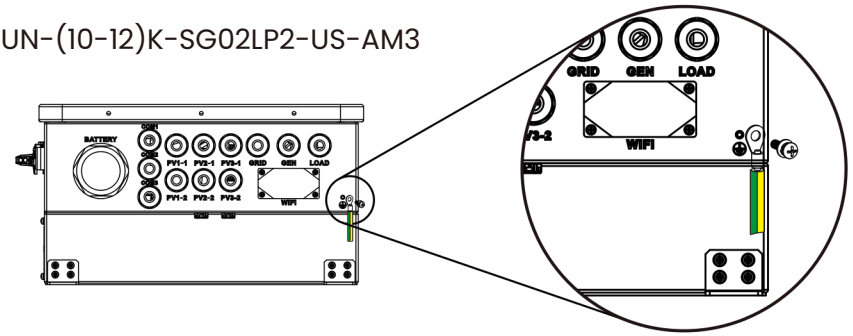
3.8 Aux Ground Connection

The ground cable shall be connected to the ground plate on the outside of the inverter. This will prevent electric shock if the original ground conductor fails.

NV7600



SUN-(10-12)K-SG02LP2-US-AM3



Earth connection (Copper wires)

Model	Wire Size	Cable(mm 2)	Torque Value(max)
5/6kW	6AWG	13.3	4.0Nm
7.6/8/10k	4AWG	21.2	4.0Nm
W 12kW	3AWG	26.7	4.0Nm

Earth connection (Copper wires) (bypass)

Model	Wire Size	Cable(mm 2)	Torque Value(max)
5/6kW	6AWG	13.3	4.0Nm
7.6/8/10kW	4AWG	21.2	4.0Nm
12kW	3AWG	26.7	4.0Nm

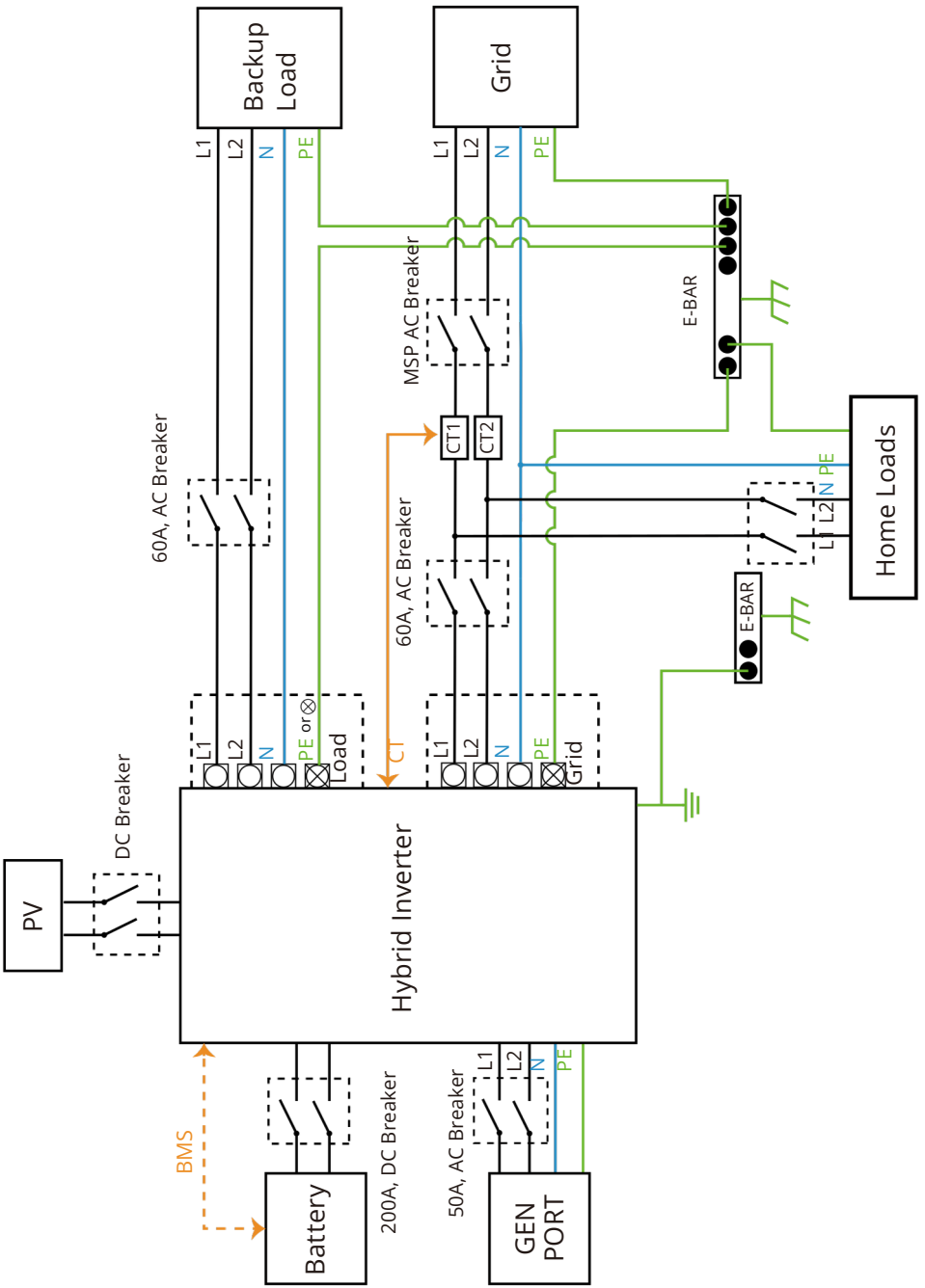
Warning:

The Inverter has a built-in leakage current detection circuit. The type A RCD can be connected to the inverter for protection according to local laws and regulations. If an external leakage current protection device is connected, its operating current must be equal to 300 mA or higher, otherwise the inverter may not work properly.

3.9 Wi-Fi Connection

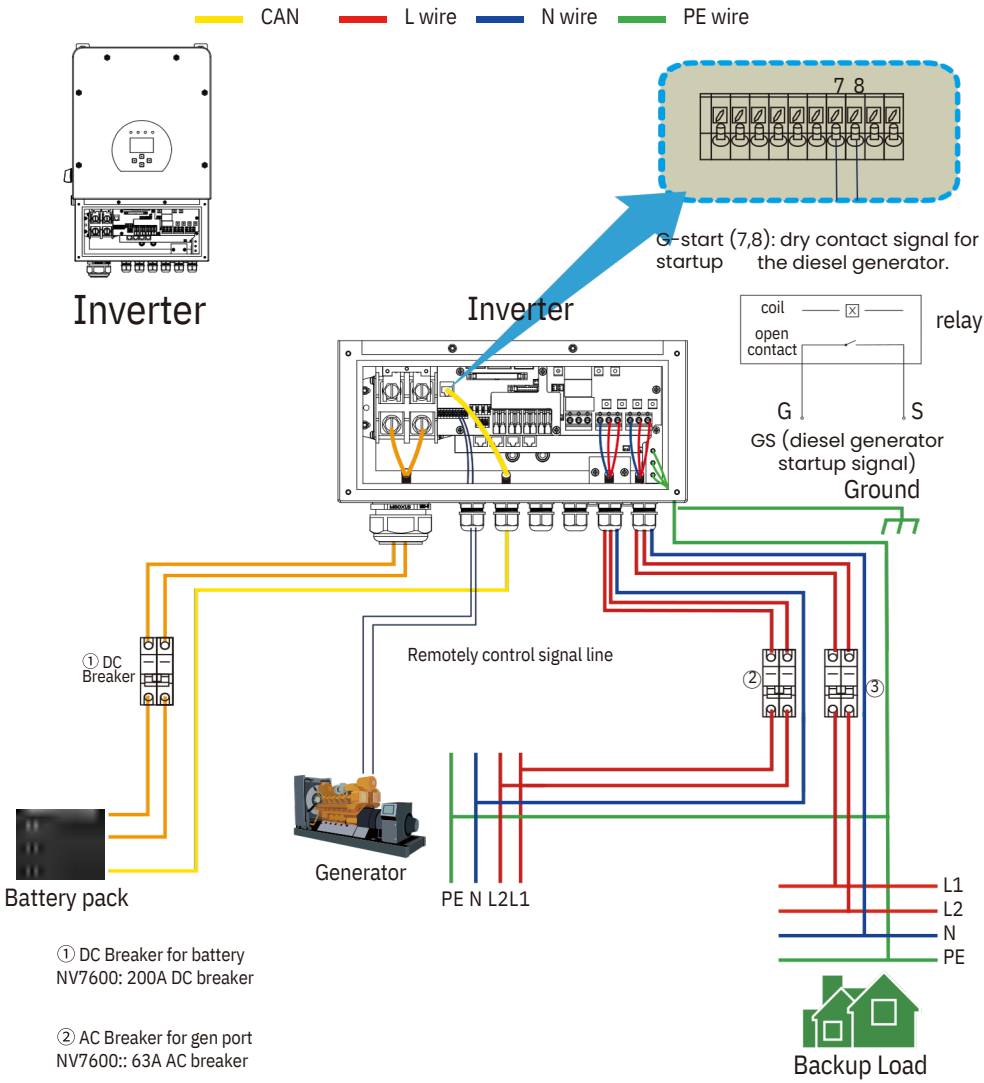
For the configuration of the Wi-Fi plug, please refer to illustrations of the Wi-Fi Plug. The Wi-Fi plug is not a standard configuration, it's optional.

3.10 Wiring System for Inverter



3.11 Typical Application Diagram of Generator

NV7600



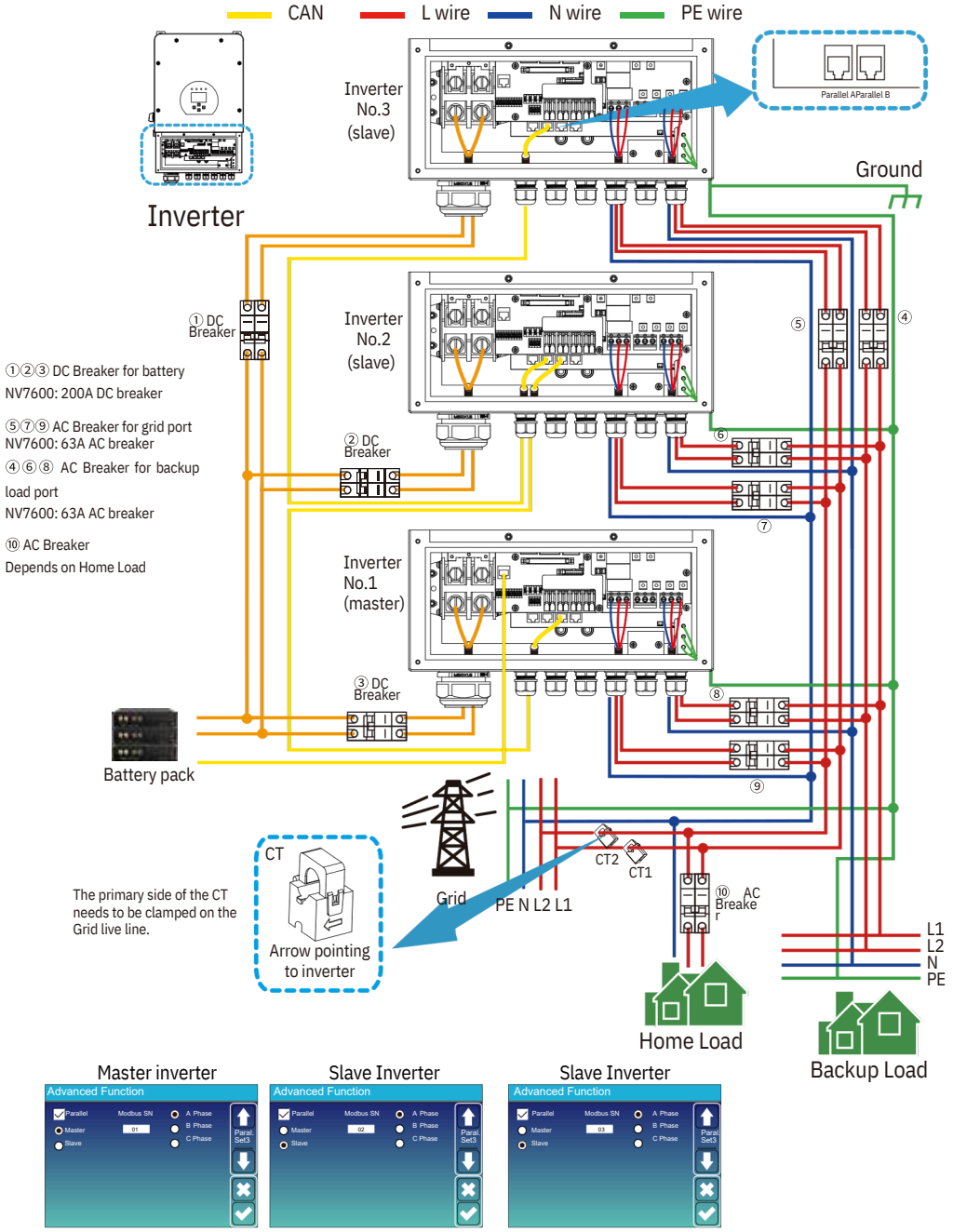
① DC Breaker for battery
NV7600: 200A DC breaker

② AC Breaker for gen port
NV7600:: 63A AC breaker

③AC Breaker for backup load port
NV7600:: 63A AC breaker

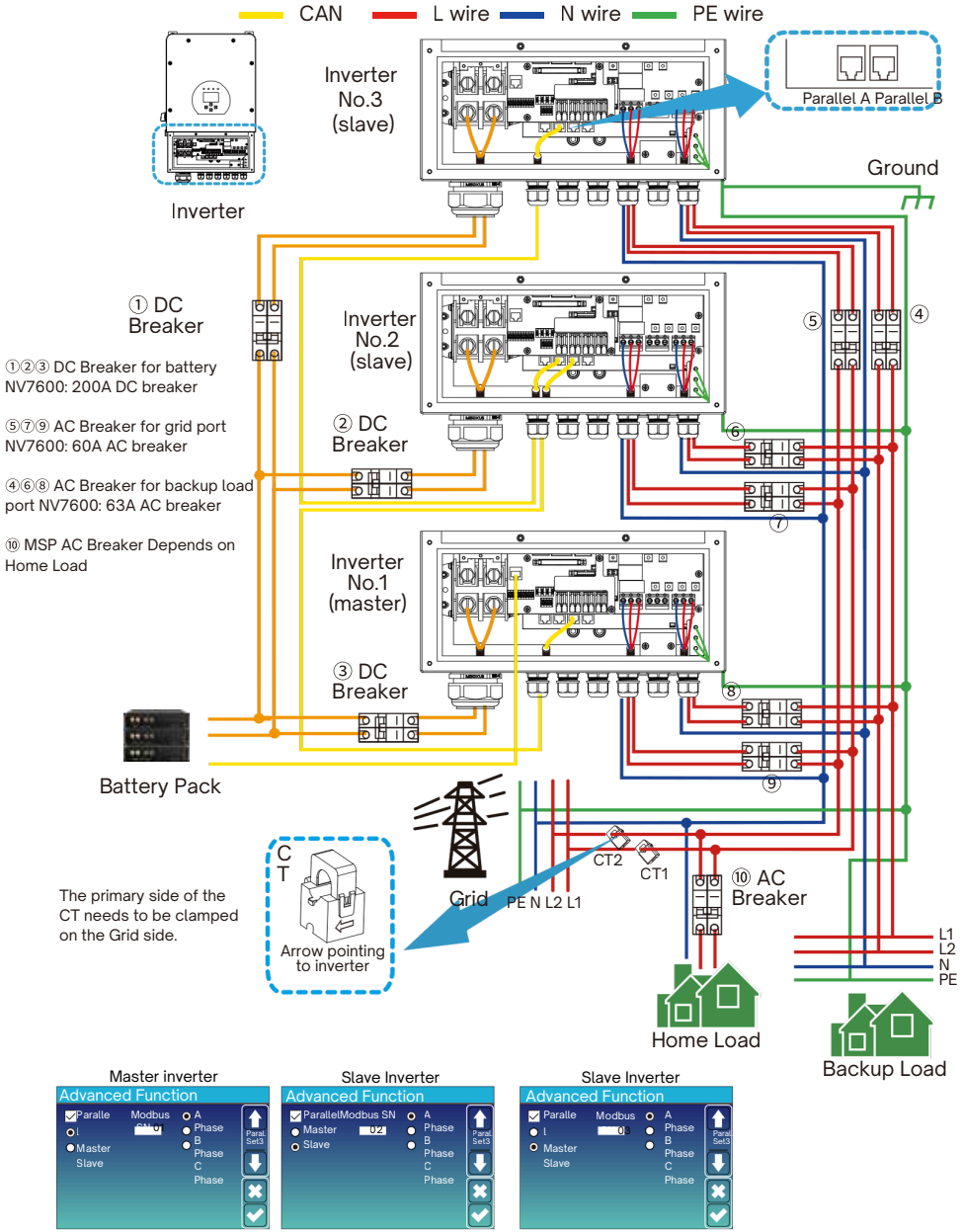
3.12 Split Phase (120/240Vac) Parallel Connection Diagram

NV7600



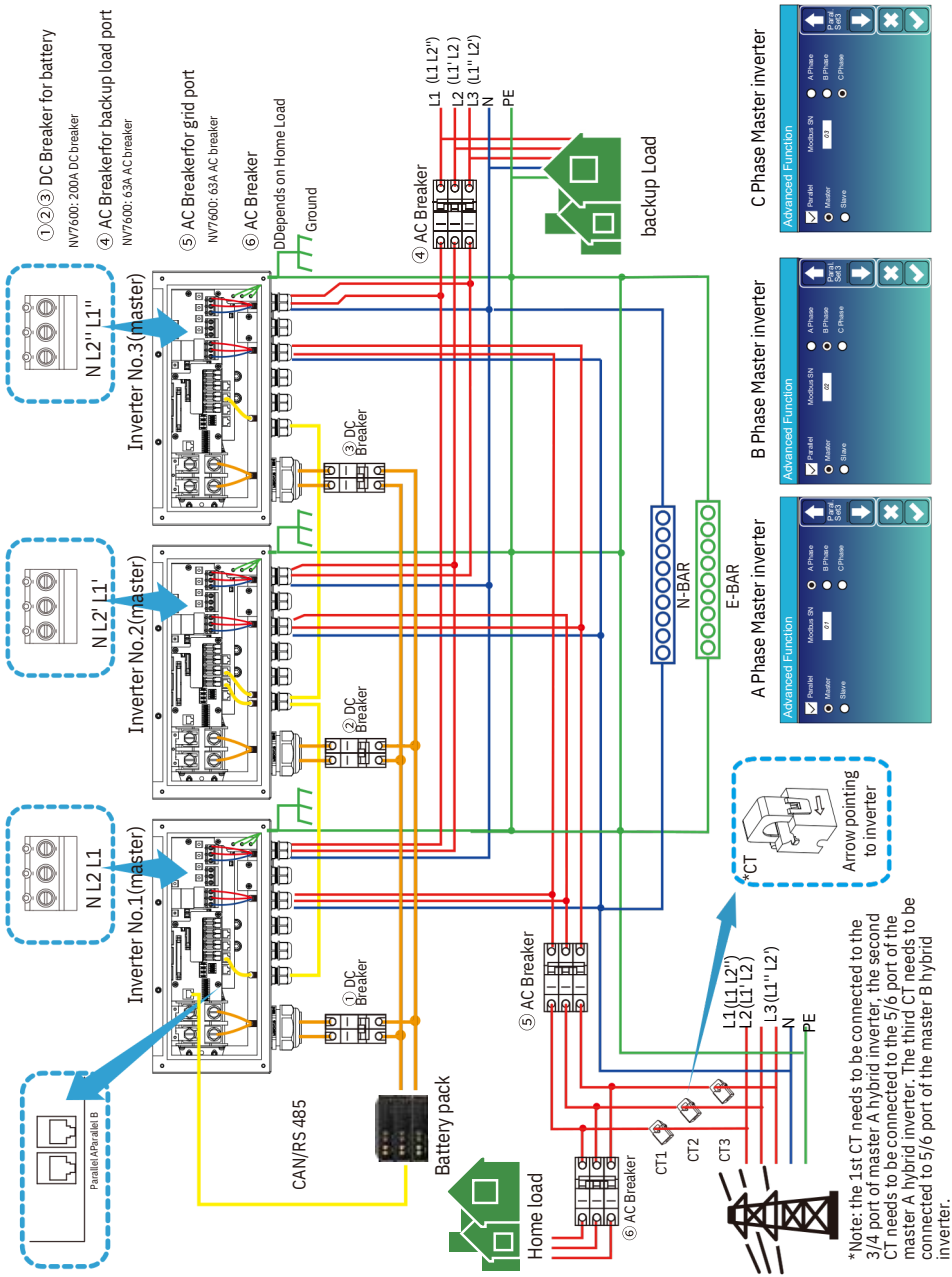
3.13 Split Phase (120/240Vac) Parallel Connection Diagram

NV7600

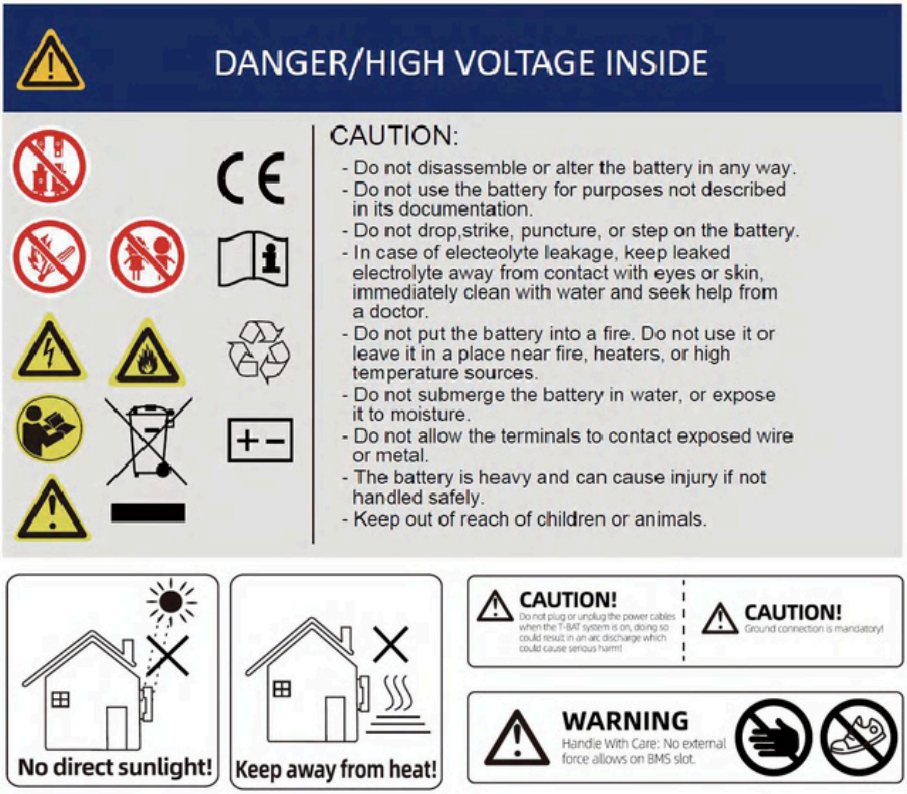


3.14 Three Phase (120/208Vac) Parallel Connection Diagram

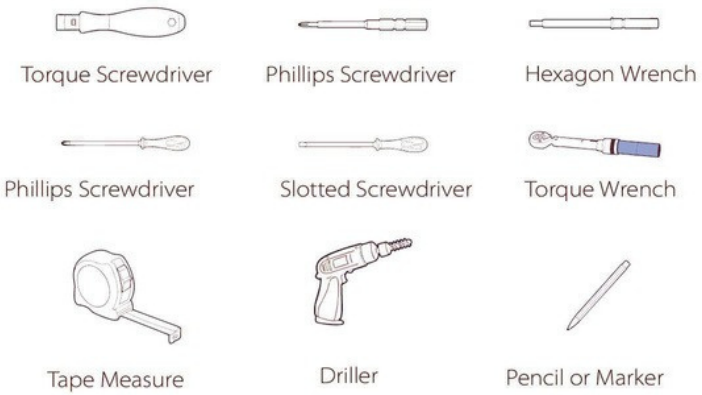
NV7600



Preparations for Installation Explanation of Symbol



Tools These tools are required to install the battery.



IMPORTANT: To avoid electric shock or short circuits, always use properly insulated tools.

- If insulated tools are unavailable, completely cover all exposed metal surfaces of the tools, except for the tips, with electrical tape.

Recommended Safety Gear: It is recommended to wear the following safety gear when working with the battery pack.

Mounting instructions Installation Precaution Lithium battery is designed for outdoor use (IP65).
Please make sure the installation site meets below conditions:

- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not higher than altitude of about 3000 meters above sea level.
  Not in an environment of precipitation or humidity (>95%).
- Not in standing water.

Installation Location Make sure that the installation location meets the following conditions:

- Battery enclosure is not in contact with dirt vegetation or standing water.
- The area is completely waterproof. The wall is flat and level. There are no flammable or explosive materials. The ambient temperature is within the range from -20°C to 50°C (-4°F to 122°F).
- The temperature and humidity are maintained at a constant level.
- There is minimal dust and dirt in the area.
- The distance from the heat source is more than 2 m (6.56 ft).
- The distance from the air outlet of the inverter is more than 0.5 m (1.64 ft).
- Do not cover or wrap the battery.
- Do not place battery where children and pets can interact with battery.
- If possible, avoid direct sunlight.
- There are no mandatory ventilation requirements for the battery module, but please avoid the installation in confined areas. The aeration shall avoid high salinity, humidity, or temperature.
- Recommended minimum distance above grade 4in.

CAUTION

If the ambient temperature is outside the operating range, the battery pack stops operating to protect itself. The optimal temperature range for the battery pack to operate is 15°C to 35°C (59°F to 95°F). Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

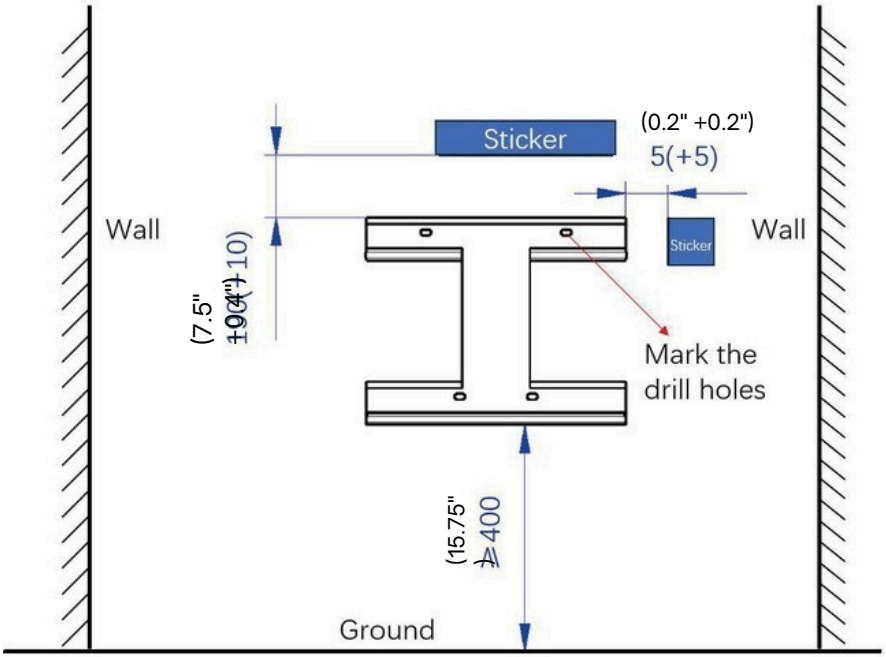
Mounting the Battery

CAUTION

Remember that this battery is heavy! Please be careful when lifting it out of the package.

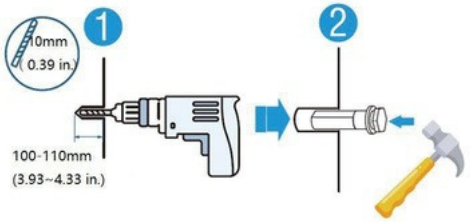
Wall-Mounted method

- Keep a distance of more than 400 mm (15.75") from the ground to the bottom of the wall bracket. After fixing the wall bracket, put a sticker on the right side between 75 mm and 80 mm, (2.95" and 3.15"). And a sticker on the top of it between 180 mm and 200 mm, (7.1" and 7.87"). Mark the drill hole location at the appropriate location. The installation location description should meet the size requirements of the figure below:



- Choose the recommend drill head (as shown in Figure 5-1) to drill 4 holes on the wall,100mm -110mm (3.94" - 4.33") deep.

- Use a proper hammer to fixing the hanging plate to the wall, fit the expansion bolt(M6*100) into the holes, as shown in Figure 5-1.



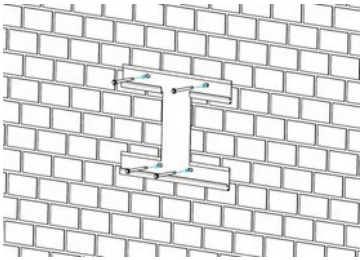


Figure 5-1

- Using the ten M6 screws, secure the mounting bracket to the rear of the battery as illustrated in Figure 5-2.

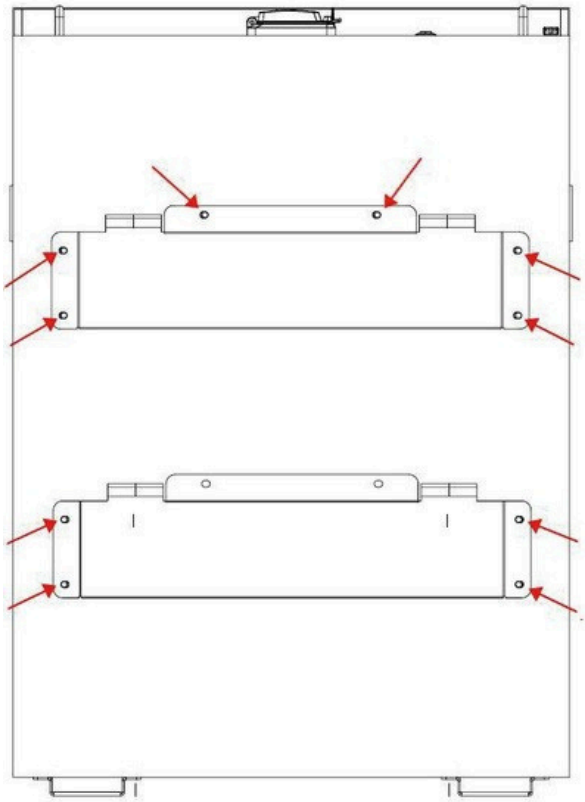


Figure 5-2

- Align the NVPlus-10.2 with the sticker on the wall bracket and push it into place.
- Secure the mounting by tightening the screw in front of the expansion bolt.
- Hold the battery and place it on the mounting plate after the bracket is fixed to the wall.
- Ensure the upper and lower hooks on the battery backplate properly engage with the mounting bracket, as shown in figure 5.3.

Figure 5-3

Floor-Mounted Method

- Use the 4 screws of M6*10 to fix the left and right retaining ears to the back of the battery, as shown in Figure 5-4.

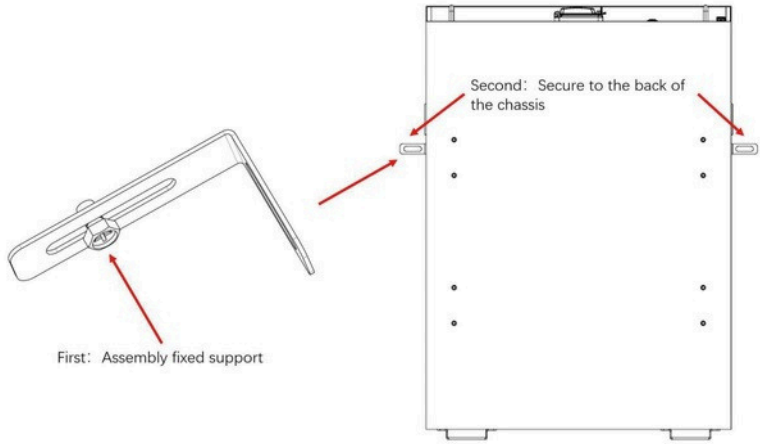


Figure 5-4

- Stand the battery on the side of the wall, mark the location of the mounting hole. Choose the recommended drill head (as shown in the below picture) to drill 2 holes on the wall,100-110 mm (3.94" - 4.33") deep, as shown in Figure 5-2 and Figure 5-5.

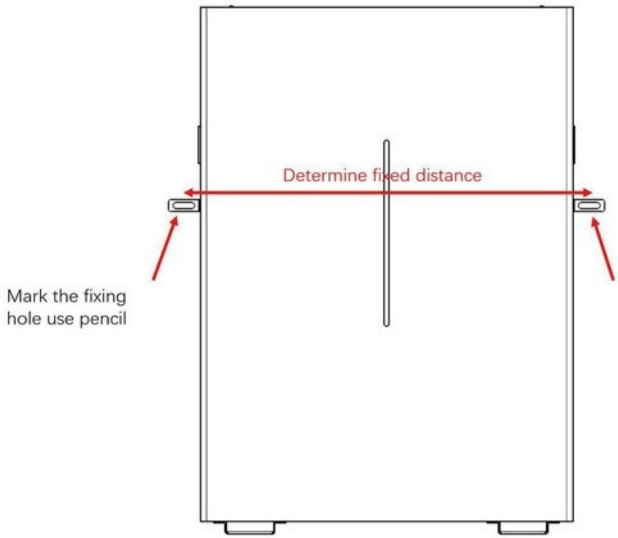


Figure 5-5

- Use a proper hammer to fix the battery to the wall, fit the expansion bolt into the holes, as shown in Figure 5-2.

- Adjust the left and right screws to the appropriate position to ensure that the battery is perpendicular to the ground, as shown in Figure 5- 6.

Figure 5-6

Batteries in Parallel

Approved Inverter and Battery Configurations per UL9540 Report

The following inverter and battery configurations have been certified in accordance with the UL9540 standard:

- A maximum of four (4) NV7600 inverters may be connected in parallel.
- A maximum of five (5) NVPlus-10.2 batteries may be configured in parallel.

For systems that incorporate more than two (2) NV7600 inverters and/or more than three (3) NVPlus-10.2 batteries, the installation of a common battery DC bus is required to ensure compliance, operational efficiency and system safety.

Inverter and Battery Configuration Guidelines:

The following inverter and battery pairings are supported within standard system parameters:

- (1) NV7600 inverter with (1) NVPlus-10.2 battery
- (1) NV7600 inverter with (2) NVPlus –10.2batteries
- (1) NV7600 inverter with (3) NVPlus-10.2 batteries
- (1) NV7600 inverter with (4) NVPlus-10.2 batteries
- (2) NV7600 inverters with (3) NVPlus-10.2 batteries

Note: The internal DC bus of each battery is rated for a maximum current of 250A.

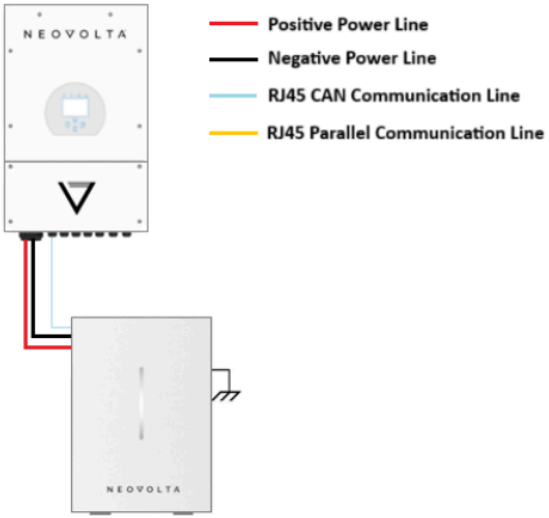
It is recommended to install at least three (3) NVPlus-10.2 batteries when configuring two (2) NV7600 inverters to ensure full backup power capability.

Configurations Requiring a Common Battery DC Bus:

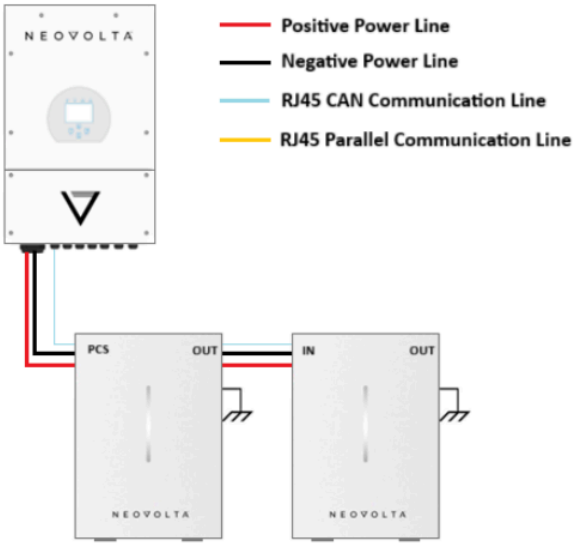
For the following configurations, the use of a common battery DC bus is required:

- (2) NV7600 inverters with (4) or (5) NVPlus-10.2 batteries
- (3) NV7600 inverters with (4) or (5) NVPlus-10.2 batteries
- (4) NV7600 inverters with (5) NVPlus-10.2 batteries

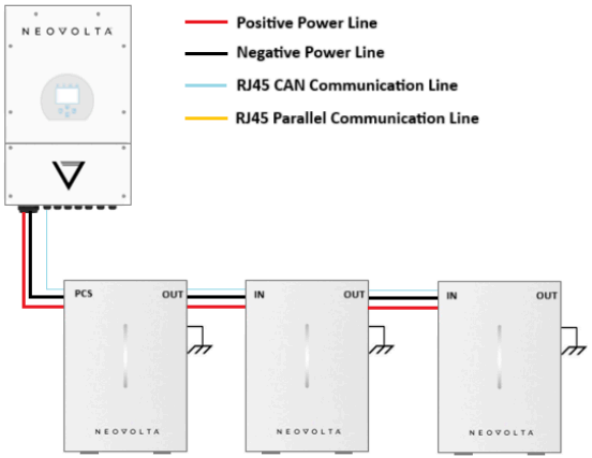
(1) NV7600 Inverter with (1) NVPlus-10.2 Battery



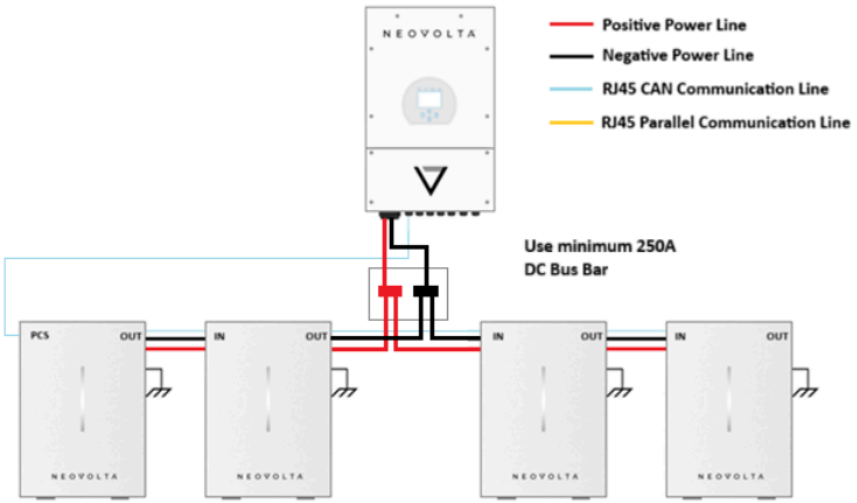
(1) NV7600 Inverter with (2) NVPlus-10.2 Batteries



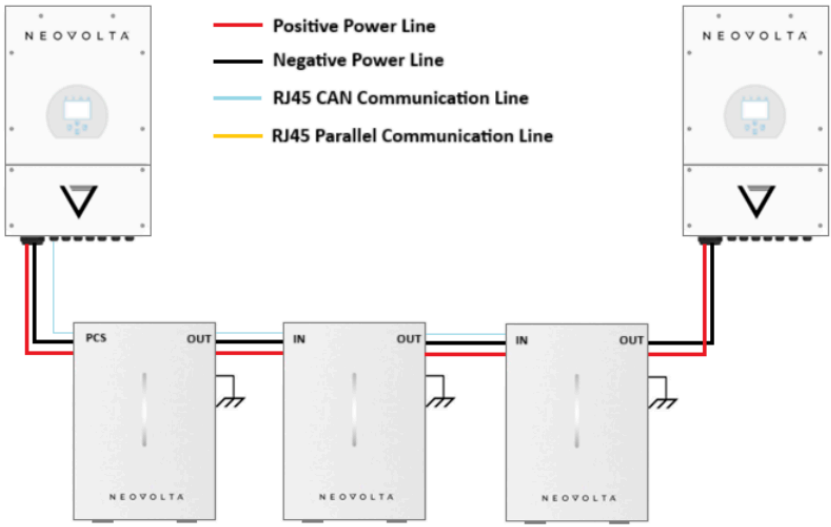
(1) NV7600 Inverter with (3) NVPlus-10.2 Batteries



(1) NV7600 Inverter with (4) NVPlus-10.2 Batteries

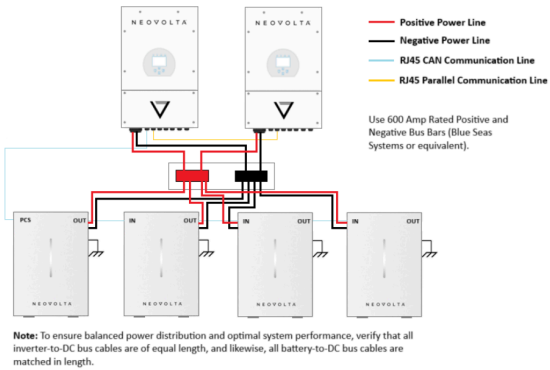


(2) NV7600 Inverters with (3) NVPlus-10.2 Batteries



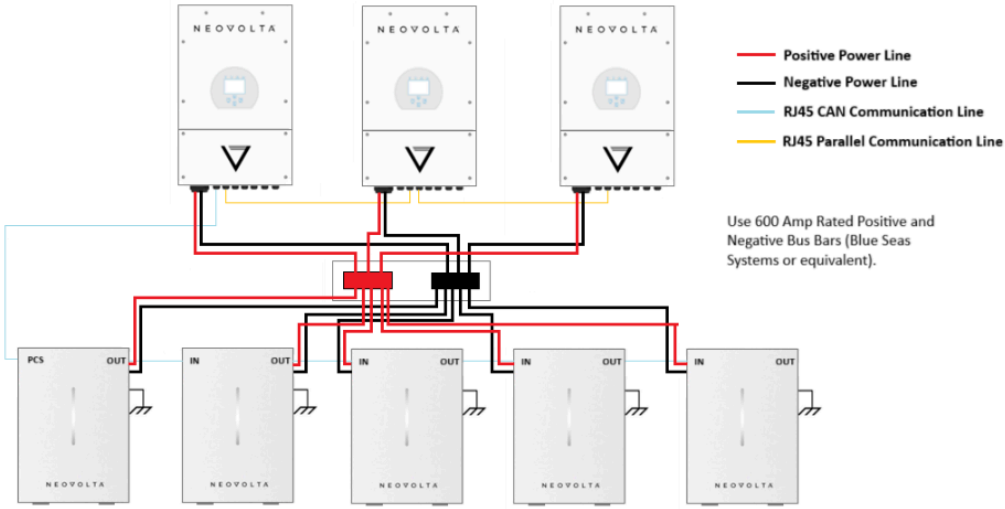
Note: The Battery Management System (BMS) communication cable should be connected from the master inverter to the PCS port on the first battery. Subsequent batteries must be interconnected via their respective IN and OUT communication ports.

(2) NV7600 Inverters with (4) or (5) NVPlus-10.2 Batteries



Note: The Battery Management System (BMS) communication cable should be connected from the master inverter to the PCS port on the first battery. Subsequent batteries must be interconnected via their respective IN and OUT communication ports.
Battery terminals located on either side of each unit may be used for direct connection to the common DC bus.

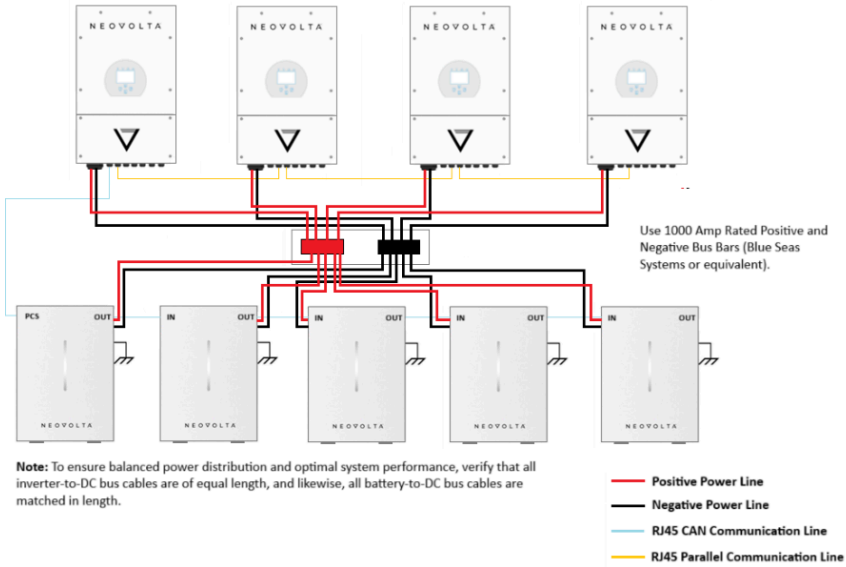
(3) NV7600 Inverters with (3) NVPlus-10.2 Batteries



Note: To ensure balanced power distribution and optimal system performance, verify that all inverter-to-DC bus cables are of equal length, and likewise, all battery-to-DC bus cables are matched in length.

Note: The Battery Management System (BMS) communication cable should be connected from the master inverter to the PCS port on the first battery. Subsequent batteries must be interconnected via their respective IN and OUT communication ports.
Battery terminals located on either side of each unit may be used for direct connection to the common DC bus.

(4) NV7600 Inverter with (5) NVPlus-10.2 Batteries



Note: The Battery Management System (BMS) communication cable should be connected from the master inverter to the PCS port on the first battery. Subsequent batteries must be interconnected via their respective IN and OUT communication ports.
Battery terminals located on either side of each unit may be used for direct connection to the common DC bus.

Visual Inspection of the Connections

After connecting the battery, check for:

- Positive and negative cables are connected with correct polarity.
- Connections at both positive and negative terminals are secure.
- All bolts are tightened properly.
- Cables are secured and neatly arranged.
- The protective cover is in place.
- The BMS cable from the inverter to the first battery is connected.
- The MBS interconnection between batteries is complete.

Activate the Battery

- Bush the BMS ON/OFF switch in ward to power on the battery BMS.
- Confirm the battery system is functioning normally by observing the flashing green working light on the battery's front panel.
- Turn ON the battery breaker.

4. Operation

4.1 Power ON/OFF

To power on the unit after proper installation and secure battery connections, press the ON/OFF button on the left side of the NV7600. If the system is connected to PV or grid power without batteries and the ON/OFF switch is off, the LCD will still illuminate and display "OFF" in the center of the screen. In this state, the system can still operate if you turn on the ON/OFF button of the NV7600 and select the "NO battery" option in the setting menu.

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

LED Indicator		*Message*
DC	Green led solid light	PV Connection normal
AC	Green led solid light	Grid Connection normal
Normal	Green led solid light	Inverter operating normal
Alarm	Red led solid light	Malfunction or warning

Chart 4-1 LED indicators

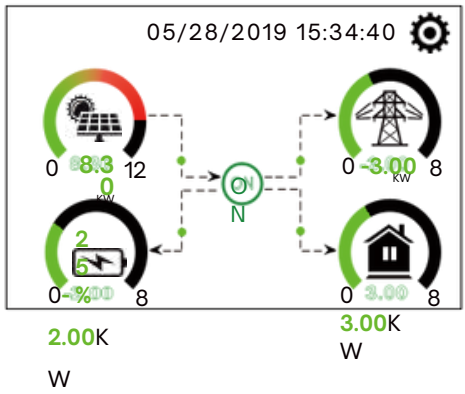
Function Key	*Description*
Esc	To exit seting mode
Up	To go to previous selection
Down	To go to next selection
Enter	To confirm the selection

Chart 4-2 Function Buttons

5. LCD Display Icons

5.1 Main Screen

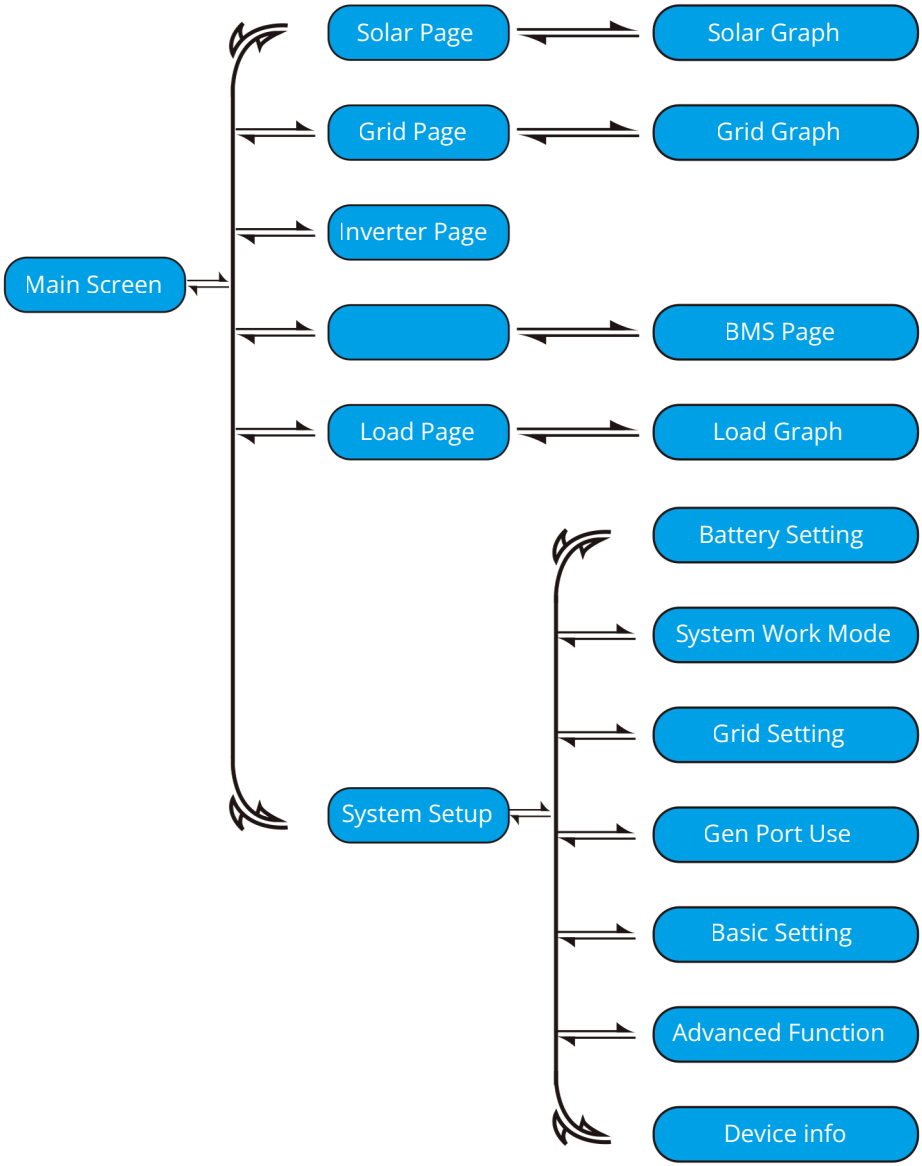
The LCD is a touchscreen - The screen below shows the overall information for the inverter.



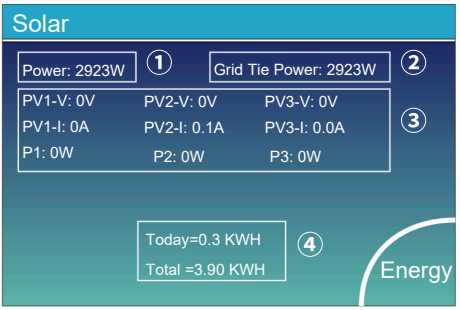
1. The icon in the center of the home screen indicates that the system is in Normal operation. If it turns into "comm./F01~F64" , this means the inverter has communication errors or other errors, the error message will display under this icon (F01-F64 errors, detailed error info can be viewed in the System Alarms menu).
2. The time is displayed at the top of the screen.
3. System Setup Icon - Press the gear button in the upper right corner of the screen. Here, you will enter the system setup screen which includes Basic Setup, Battery Setup, Grid Setup, System Work Mode, Generator Port Use, Advanced Function and Li-Batt info.
4. The main screen shows the Solar, Grid, Load and Battery info. It will also display the energy flow direction by arrow. When the power is a high level, the color on the panels will change from green to red to show the system info vividly on the main screen.

- PV power and Load power must always be positive.
- If Grid power is negative, the system will sell to the grid, positive means the system will take from the grid.
- Battery power negative means charge, positive means discharge.

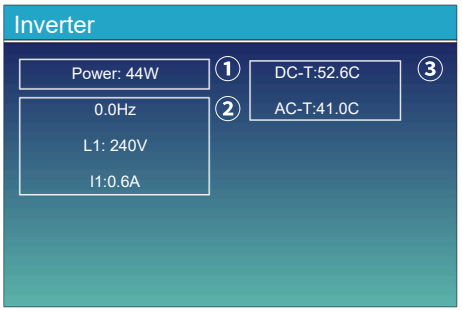
5.1.1 LCD Operation Flow Chart



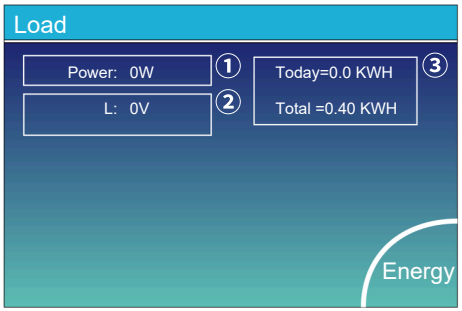
5.2 Solar Power Curve



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

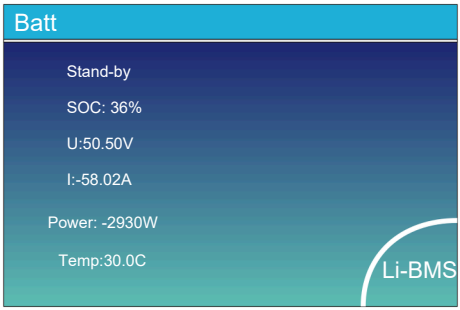


This is Inverter detail page.
①Inverter Generation.
②0.0Hz: frequency after DC/AC.
Voltage, Current, Power for each Phase.
③*DC-T: mean DC-DC temperature,
AC-T: mean Heat-sink temperature.
*Note: this part info is not available for some LCD FW.



This is Load detail page.
①Load Power.
②Voltage, Power for each Phase.
③Load consumption for Day and Total. When you check "Selling First" or "Zero export to Load" on system work mode page, the information on this page is about backup load which connect on Load port of hybrid inverter.
When you check "Zero export to CT"on the system work mode page, the information on this page is including backup load and home load. Press the "Energy " button to enter into the power curve page.

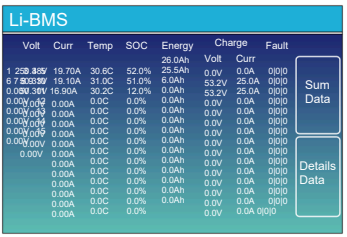
This is Grid detail page.
①Status, Power, Frequency.
②L1&L2: Voltage for each Phase
CT1&CT2: External Current Sensor Power
LD1&LD2: Internal Current Sensor Power.
③BUY: Energy from Grid to Inverter,
SELL: Energy from Inverter to Grid.
Press the "Energy " button to enter into the power curve page.



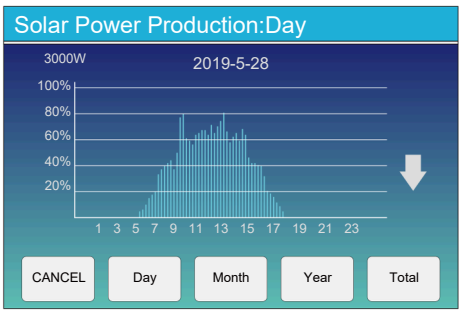
This is the Battery detail page.

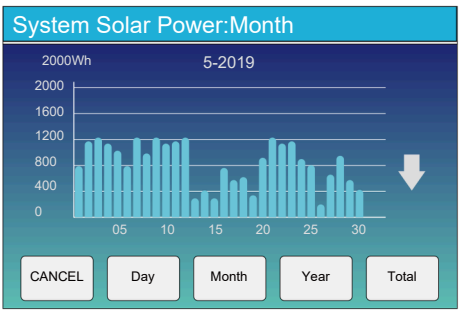
if a Lithium Battery is present, you can enter the BMS page.

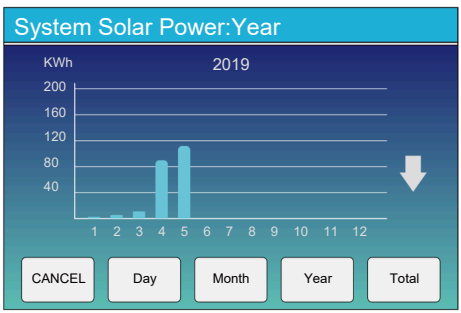
Request Force Charge: It indicates the BMS requests hybrid inverter to charge the battery actively.

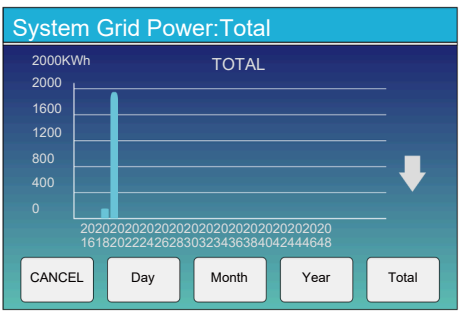


5.3 Curve Page-Solar, Load, and Grid



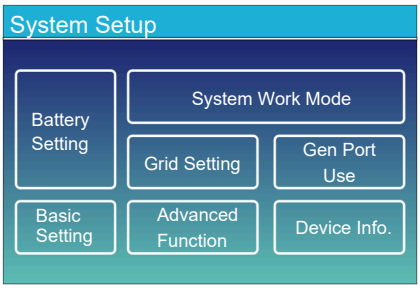






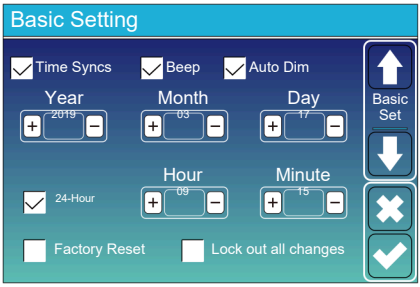
Solar power curve for daily, monthly, yearly and totals can be roughly checked on the LCD; for a more accurate read on power generation, please check on the monitoring system. Click the up and down arrows to check the power curve of a different period.

5.4 System Setup Menu

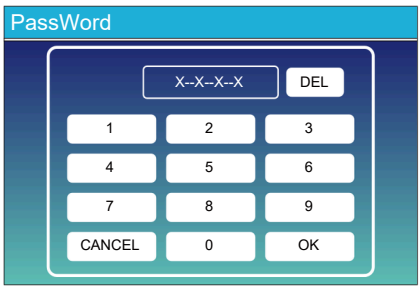


This is the System Setup page.

5.5 Basic Setup Menu



Factory Reset: Reset all parameters of the inverter.
Lock out all changes: Enable the menu for selling parameters that requires locking and cannot be set up. Enter a password as indicated to enable, before performing a successful factory reset and locking the systems.
The default password for factory settings is 9999 and 7777 for lockout.

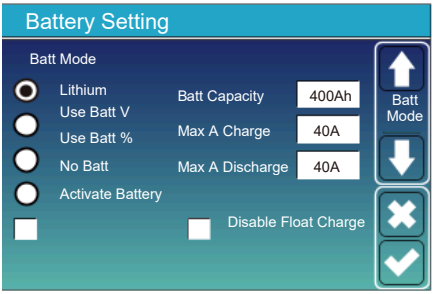


Factory Reset Password: 9999

Lock out all changes Password: 7777

System self check: After Checking this item, input the password, 1234

5.6 Battery Setup Menu

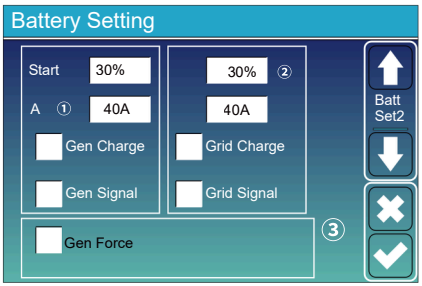


Battery capacity: Indicates the Neovolta hybrid inverter battery bank size.
Use Batt V: Use Battery Voltage for all the settings (V).
Use Batt %: Use Battery SOC for all the settings (%).
Max. A charge/discharge: Max battery charge/discharge current(0-90A for 3.6kW model, 0-120A for 5kW model, 0-135A for 6kW model, 0-190A for 7.6/8kW model, 0-220A for 10kW model, 0-250A for 12kW model).
For AGM and Flooded, we recommend Ah battery size x 20%= Charge/Discharge amps.

- For Lithium, we recommend Ah battery size x 50% = Charge/Discharge amps.
- For Gel, follow manufacturer' s instructions.

No Batt: tick this item if no battery is connected to the system.

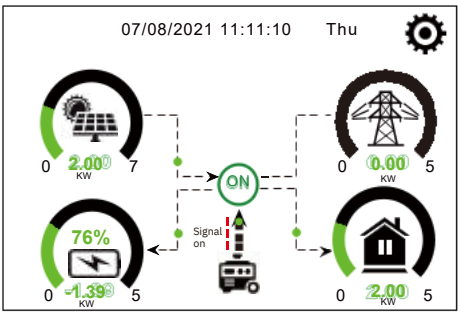
Active battery: This feature will help recover a battery that is over discharged by slowly charging from the solar array or grid.
Disable Float Charge: For the lithium battery with BMS communication, the inverter will keep the charging voltage at the current voltage when the BMS charging current requested is 0. It is used to help prevent battery from being overcharged.



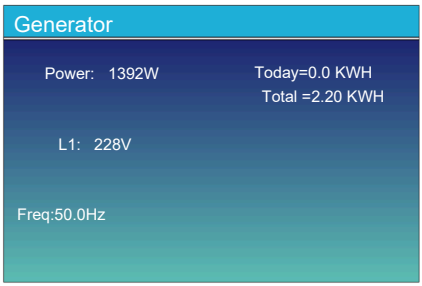
This is Battery Setup page. ①③

Start =30%: Percent S.O.C at 30% system will AutoStart a connected generator to charge the battery bank.
A = 40A: Charge rate of 40A from the attached generator in Amps.
Gen Charge: uses the gen input of the system to charge battery bank from an attached generator.
Gen Signal: A normally open relay that closes when the Gen Start signal state is active.
Gen Force: When the generator is connected, it will start the generator without meeting other conditions.

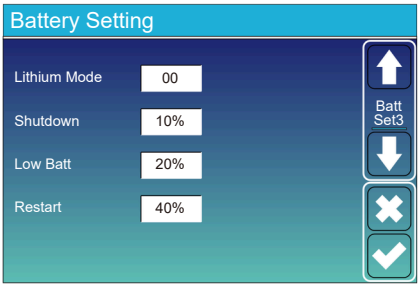
Select Grid Charge.
② Start =30%: No use, just for customization.
A = 40A: It indicates the Current that the Grid charges the Battery.
Grid Charge: It indicates that the grid charges the battery.
Grid Signal: Disable.



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

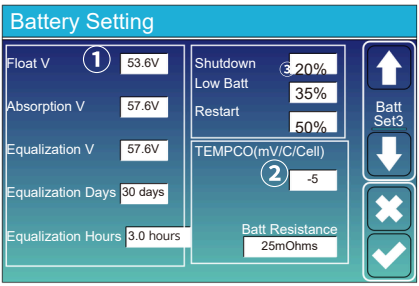


This page tells generator output voltage, frequency, power. And, how much energy is used from generator.



Lithium Mode: This is BMS protocol. Please reference the document (Approved Battery).
Shutdown 10%: It indicates the inverter will shutdown if the SOC below this value.
Low Batt 20%: It indicates the inverter will alarm if the SOC below this value.

Restart 40%: AC Output will resume when the Battery voltage reaches 40%



There are 3 stages of charging the Battery

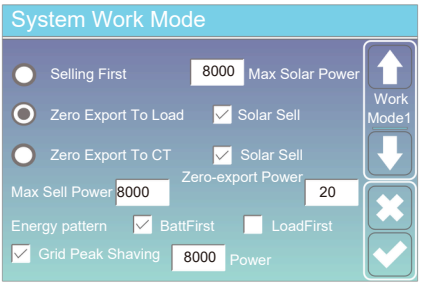
For certified Installers:.

① Shutdown 20%: The inverter will shutdown if the SOC below this value.
② Low Batt 35%: The inverter will alarm if the SOC is below this value.
③ Restart 50%: Battery SOC at 50% AC output will resume.

Recommended battery settings

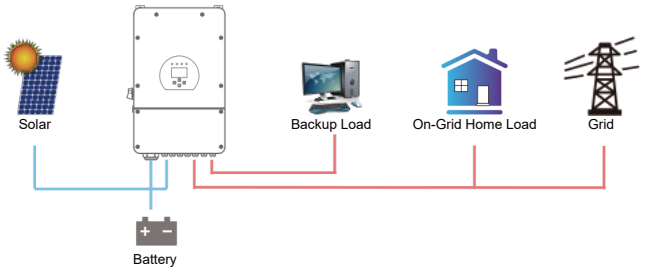
Battery Type	*Absorption Stage*	*Float Stage*	*Equalization Voltage (every 30 days 3hr)*
AGM (or PCC) Gel	14.2V (57.6V)	13.4V (53.6V)	14.2V (57.6V)
Wet	14.1V (56.4V)	13.5V (54.0V)	
Lithium	14.7V (59.0V)	13.7V (55.0V)	14.7V (59.0V)
	Follow its BMS voltage parameters		

5.7 System Work Mode Setup Menu

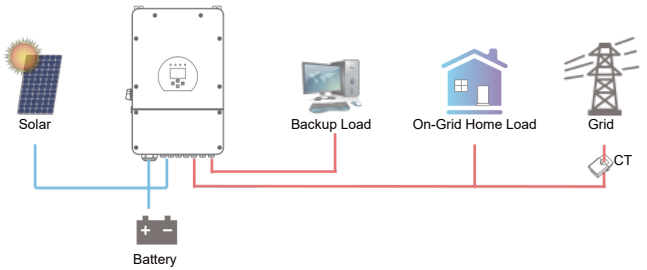


Work Mode
Selling First: This mode allows the hybrid inverter to sell back any excess power produced by the solar panels to the grid. If time of use is active, the battery energy also can be sold to the grid.
The PV energy will be used to power the load and charge the battery and then excess energy will flow to the grid. Power source priority for the load is as follows:
1. Solar Panels
2. Grid
3. Batteries (until programable % discharge is reached)

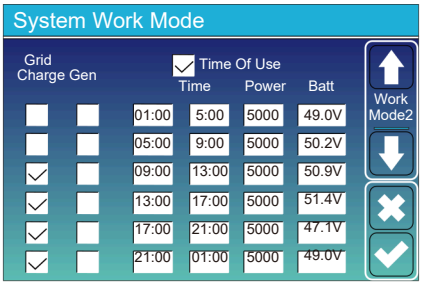
Zero Export To Load: The hybrid inverter will only provide power to the connected backup load. The hybrid inverter will neither provide power to the home load nor sell power to grid. The built-in CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the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



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

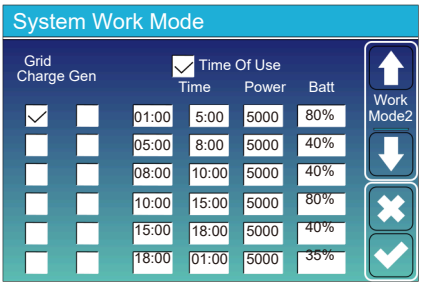


Solar Sell: “Solar sell” is for Zero export to load or Zero export to CT: when this item is active, the surplus energy can be sold back to grid. When it is active, PV Power source priority usage is as follows: load consumption and charge battery and feed into grid.
Max. sell power: Allowed the maximum output power to flow to grid.
Zero-export Power: for zero-export mode, it tells the grid output power. Recommend to set it as 20-100W to ensure the hybrid inverter won' t feed power to grid.
Energy Pattern: PV Power source priority.
Batt First: PV power is firstly used to charge the battery and then used to power the load. If PV power is insufficient, grid will make supplement for battery and load simultaneously.
Load First: PV power is firstly used to power the load and then used to charge the battery. If PV power is insufficient, grid will make supplement for battery and load simultaneously.
Max Solar Power: allowed the maximum DC input power.
Grid Peak-shaving: when it is active, grid output power will be limited within the set value. If the load power exceeds the allowed value; it will take PV energy and battery as supplement. If it still can’t meet the load requirement, grid power will increase to meet the load needs.



Time of use: Used to program when to use grid or generator power to charge the battery, and when to discharge the battery to power the load. Only select "Time Of Use" then the following items (Grid, charge, time, power etc.) will take effect.
Note: When in selling first mode and click time of use, the battery power can be sold into grid.
Grid charge: Utilize grid to charge the battery in a time period.
Gen charge: Utilize diesel generator to charge the battery in a time period.
Time: Real time, range of 01:00-24:00.
Power: Max. discharge power of battery allowed.
Batt (V or SOC %): Battery SOC % or voltage when the action is to happen.

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

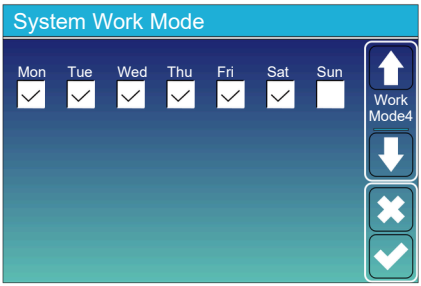


During 05:00-08:00 and 08:00-10:00, when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

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

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

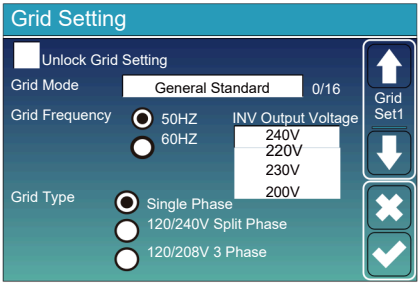
During 18:00-01:00, when battery SOC is higher than 35%, hybrid inverter will discharge the battery until the SOC reaches 35%.



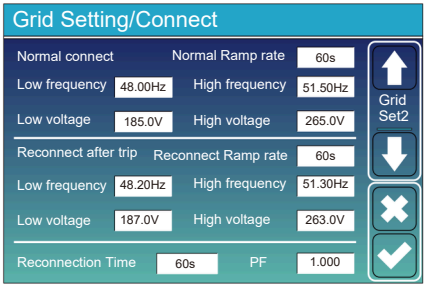
It allows users to choose which day to execute the setting of “Time of Use”.

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

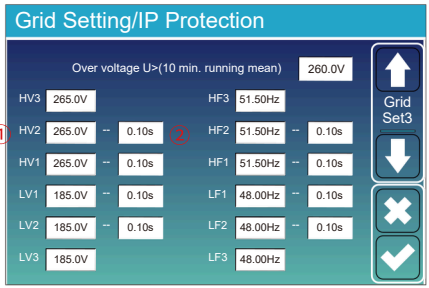
5.8 Grid Setup Menu



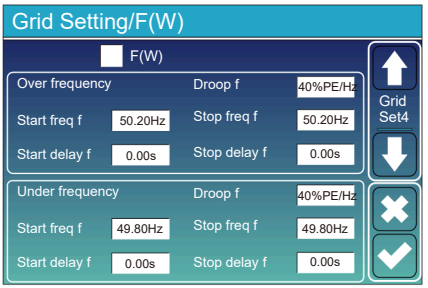
Unlock Grid Setting: before changing the grid parameters, please enable this with password of 7777. Then the grid parameters can be changed.
Grid Mode: General Standard、UL1741 & IEEE1547 CPUC RULE21、SRD-UL-1741、CEI 0-21、EN50549_CZ、Australia_A、Australia_B、Australia_C、New Zealand VDE4105、OVE_Directive_R25、EN50549_CZ_PPDS_L16A、NRS097、G98/G99、G98/G99_NI、ESB Networks (Ireland). Please follow the local grid code and then choose the corresponding grid standard.



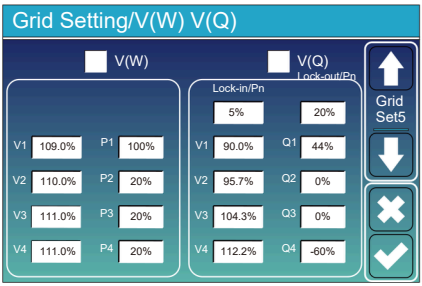
Normal connect: The allowed grid voltage/frequency range when the inverter first time connect to the grid.
Normal Ramp rate: It is the startup power ramp.
Reconnect after trip: The allowed grid voltage /frequency range for the inverter connects the grid after the inverter trip from the grid.
Reconnect Ramp rate: It is the reconnection power ramp.
Reconnection time: The waiting time period for the inverter connects the grid again.
PF: Power factor which is used to adjust inverter reactive power.



①HV1: Level 1 overvoltage protection point;
HV2: Level 2 overvoltage protection point;
②0.10s—Trip time.
HV3: Level 3 overvoltage protection point.
LV1: Level 1 undervoltage protection point;
LV2: Level 2 undervoltage protection point;
LV3: Level 3 undervoltage protection point.
HF1: Level 1 over frequency protection point;
HF2: Level 2 over frequency protection point;
HF3: Level 3 over frequency protection point.
LF1: Level 1 under frequency protection point;
LF2: Level 2 under frequency protection point;
LF3: Level 3 under frequency protection point.

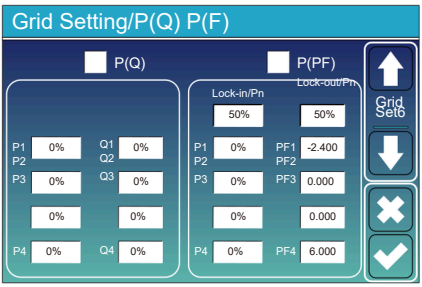


FW: this series inverter is able to adjust inverter output power according to grid frequency.
Droop f: percentage of nominal power per Hz For example, “Start freq f>50.2Hz, Stop freq f<50.2, Droop f=40%PE/Hz” when the grid frequency reaches 50.2Hz, the inverter will decrease its active power at Droop f of 40%. And then when grid system frequency is less than 50.2Hz, the inverter will stop decreasing output power. For the detailed setup values, please follow the local grid code.



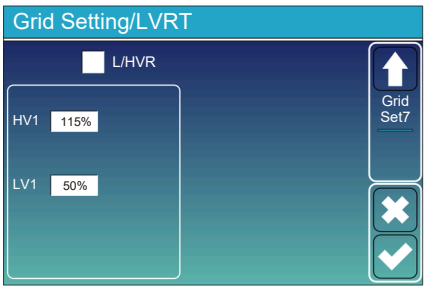
V(W): It is used to adjust the inverter active power according to the set grid voltage.
V(Q): It is used to adjust the inverter reactive power according to the set grid voltage.
This function is used to adjust inverter output power (active power and reactive power) when the grid voltage changes.
Lock-in/Pn 5%: When the inverter's active power is less than 5% rated power, the VQ mode will not take effect.
Lock-out/Pn 20%: If the inverter active power is increasing from 5% to 20% rated power, the VQ mode will take effect again.

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



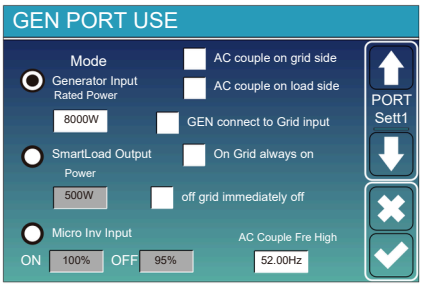
P(Q): It is used to adjust the inverter reactive power according to the set active power.
P(PF): It is used to adjust the inverter PF according to the set active power.
For the detailed setup values, please follow the local grid code.

Lock-in/Pn 50%: When the inverter output active power is less then 50% rated power, it won't enter the P(PF) mode.
Lock-out/Pn 50%: When the inverter's output active 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 times of rated grid voltage, then the P(PF) mode will take effect.



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

5.9 Generator Port Use Setup Menu



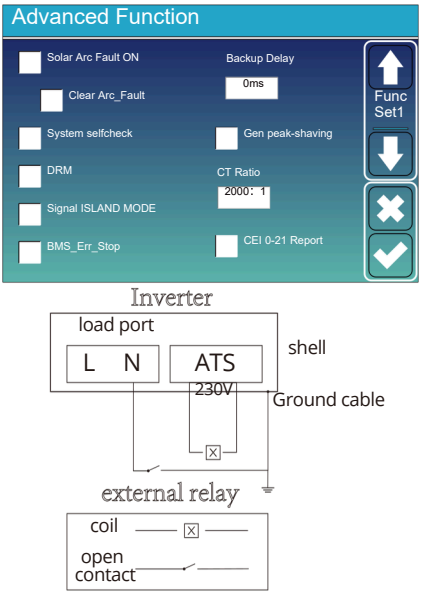
Generator input rated power: allowed Max. power from diesel generator.
GEN connect to grid input: connect the diesel generator to the grid input port.
Smart Load Output: This mode utilizes the Gen input connection as an output which only receives power when the battery SOC and PV power is above a user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

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

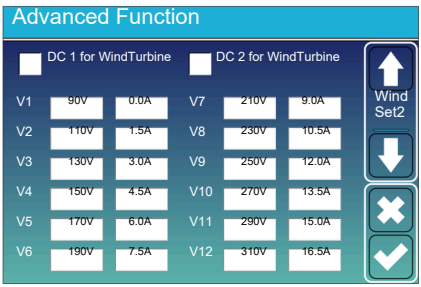
Smart Load ON Batt
- Battery SOC at which the Smart load will switch on. Also, the PV input power should exceed the setting value (Power) simultaneously and then the Smart load will switch on.

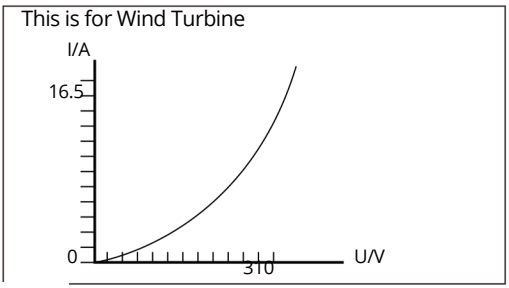
On Grid always on: When click "on Grid always on" the smart load will switch on when the grid is present.
off grid immediately off: the smart load will stop working immediately when the grid is disconnected if this item is active.
Micro Inv Input: To use the Generator input port as a micro-inverter on grid inverter input (AC coupled), this feature will also work with "Grid-Tied" inverters.
∗Micro Inv Input OFF: when the battery SOC exceeds setting value, Microinverter or grid-tied inverter will shut down.
∗Micro Inv Input ON: when the battery SOC is lower than setting value, Microinverter or grid-tied inverter will start to work.
AC Couple Fre High: If choosing "Micro Inv input", as the battery SOC reaches gradually setting value (OFF), During the process, the microinverter output power will decrease linear. When the battery SOC equals to the setting value (OFF), the system frequency will become the setting value (AC couple Fre high) and the Microinverter will stop working. Stop exporting power produced by the microinverter to the grid.
∗Note: Micro Inv Input OFF and On is valid for some certain FW version only.
∗AC couple on load side: connecting the output of on-grid inverter at the load port of the hybrid inverter. In this situation, the hybrid inverter will not be able to show the load power correctly.
∗AC couple on grid side: this function is reserved.
∗Note: Some firmware versions don't have this function.

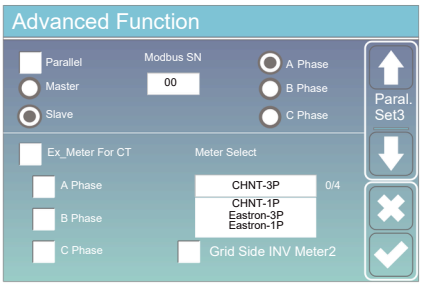
5.10 Advanced Function Setup Menu



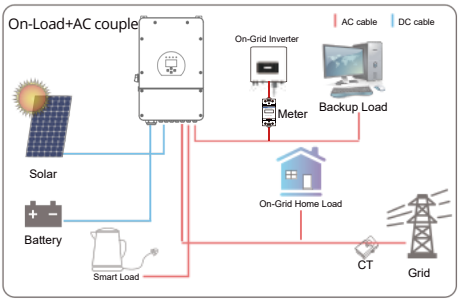
Solar Arc Fault ON: This is only for US.
System selfcheck: Disable. this is only for factory.
Gen Peak-shaving: Enable When the power of the generator exceeds the rated value of it, the inverter will provide the redundant part to ensure that the generator will not overload.
DRM: For AS4777 standard
Backup Delay: When the grid cuts off, the inverter will give output power after the setting time. For example, backup delay: 3ms. the inverter will give output power after 3ms when the grid cuts off. Note: for some old FW version, the function is not available.
BMS_Err_Stop: When it is active, if the battery BMS failed to communicate with inverter, the inverter will stop working and report fault.
Signal ISLAND MODE: when "signal island mode" is checked and the inverter connects the grid, the ATS port voltage will be 0. When "signal island mode" is checked and the inverter disconnected from the grid, the ATS port voltage will output 230Vac voltage. With this feature and outside NO type relay, it can realize N and PE disconnection
or bond.
More details, please refer to the left side picture.

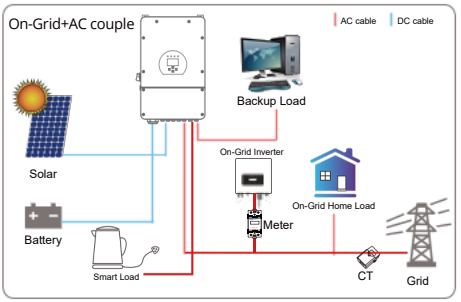


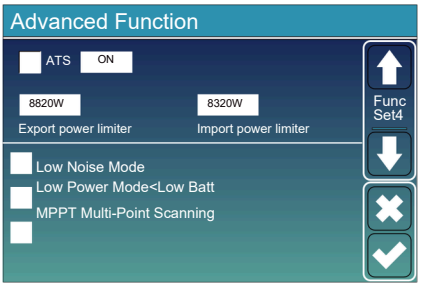




Ex_Meter For CT: when in Three phase system with CHNT Three phase energy meter (DTSU666), click corresponding phase where hybrid inverter is connected. e.g. when the hybrid inverter output connects to A phase, please click A Phase.
Meter Select: select the corresponding meter type according to the meter installed in the system.
Grid Side INV Meter2: when there's a string inverter AC couple at the grid or load side of hybrid inverter and there's a meter installed for the string inverter, then the hybrid inverter LCD will show the string inverter output power on its PV icon. Please make sure the meter can communicate with the hybrid inverter successfully.



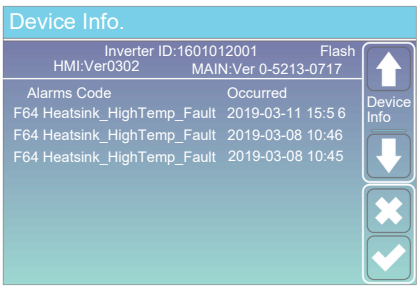




ATS: Related to ATS port voltage. It is better in the "unchecked" position.
Export power limter: It is used to setup the allowed the maximum output power to flow to grid.
Import power limiter: When active, the grid output power will be limited. Its priority is lower than "grid peak shaving" if the "grid peak shaving" is selected.
Low Noise Mode: In this mode, the inverter will work in "low noise mode".
Low Power Mode<Low Batt: when selected and when battery SOC is less than "Low Bat" value, the self-consumption power of inverter will be from grid and battery simultaneously. If unselected, the self-consumption power of inverter will be mainly from grid.

MPPT Multi-Point Scanning: The system checks whether the PV current and voltage are operating at the maximum power point. If not, it adjusts the current and voltage to track the maximum power point.

5.11 Device Info Setup Menu

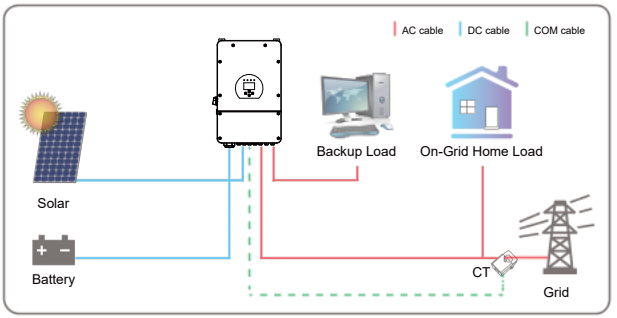


This page show Inverter ID, Inverter version and alarm codes.

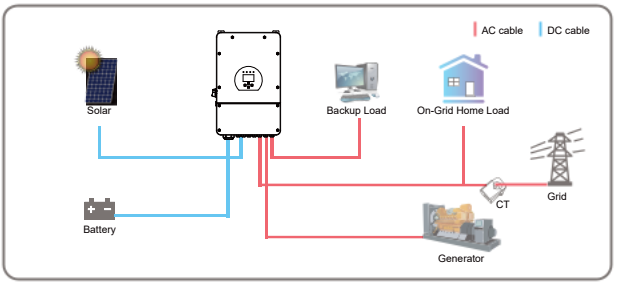
HMI: LCD version MAIN: Control board FW version

6. Mode

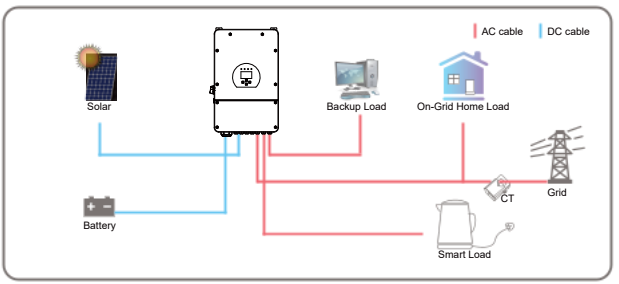
Mode I:Basic



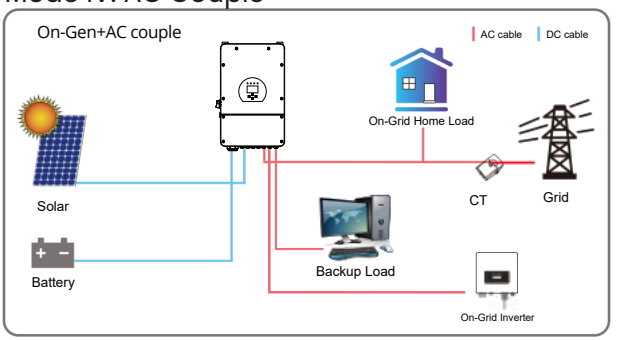
Mode II: With Generator

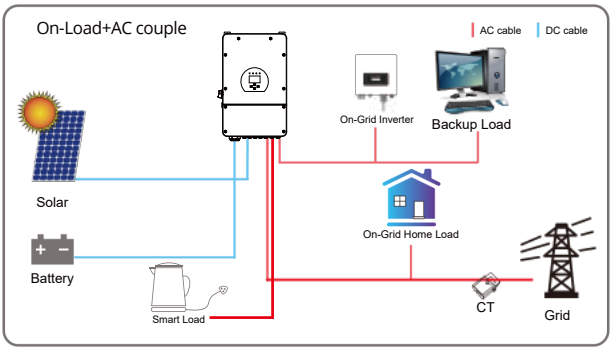


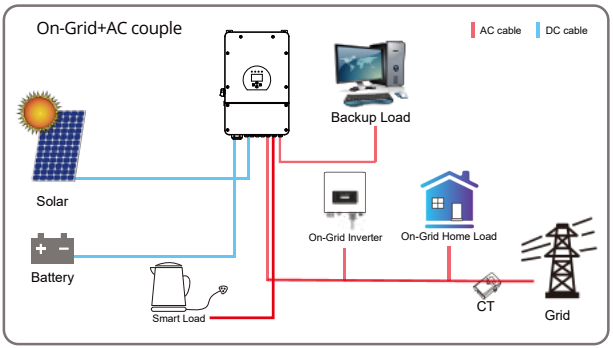
Mode III: With Smart-Load



Mode IV: AC Couple







The first priority power of the system is always the PV power, then second and third priority power will be the battery bank or grid according to the settings. The last power backup will be the Generator if it is available.

7. Fault Information and Processing

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

If any of the fault messages listed in Table 7-1 appear on your inverter and the fault has not been removed after restarting, please contact your local dealer or service center. You need to have the following information ready.

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

Error code	Description	Solutions
F08	GFDI _Relay_Failure	1. When the inverter is in Split phase(120/240Vac) or three-phase system (120/208Vac) system, the backup load port N line needs to connect ground. 2. If the fault still exists, please contact us for help.
F13	Working mode change	1. When the grid type and frequency are changed it will report F13. 2. When the battery mode is changed to “No battery”, 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 F13 is shown. 5. If the code remains the same, turn off the DC switch and AC switch and wait for one minute, then turn on the DC/AC switch. 6. Seek help from us, if the inverter cannot go back to its normal state.
F18	AC over current fault of hardware	AC side over current fault 1. Please check whether the backup load power and common load power are within the correct range. 2. Restart and check whether it is in normal. 3. Seek help from us, if the inverter cannot go back to its normal state.
F20	DC over current fault of the hardware	DC side over current fault 1. 1Check PV module connect and battery connect; 2. When in the off-grid mode, the inverter startup with big power load, it may report F20. Please reduce the load power connected; 3. Turn off the DC switch and AC switch and then wait one minute, then turn on the DC/AC switch again; 4. Seek help from us, if can not go back to normal state.
F22	Tz_EmergStop_Fault	Please contact your installer for help.
F23	AC leakage current is transient over current	Leakage current fault 1. Check PV side cable ground connection. 2. Restart the system 2~3 times. 3. If the fault still exists, please contact us for help.
F24	DC insulation impedance failure	PV isolation resistance is too low 1. Check the connection of PV panels and inverter is firmly and 2. Check whether the PE cable of inverter is connected to ground; 3. Seek help from us, if can not go back to normal state.
F26	The DC busbar is unbalanced	1. Please wait for a while and check whether it is normal; 2. When the hybrid in split phase mode, and the load of L1 and load of L2 is big different, it will report the F26. 3. Restart the system 2~3 times. 4. Seek help from us, if can not go back to normal state.
F29	Parallel CANBus fault	1. When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting; 2. During the parallel system startup period, inverters will report F29; when all inverters are in ON status, it will disappear automatically. 3. If the fault still exists, please contact us for help.

Error code	Description	Solutions
F34	AC Overcurrent fault	1.Check the backup load connected, make sure it is in allowed power range; 2.If the fault still exists, please contact us for help.
F35	No AC grid	No Utility 1.Please confirm grid is lost or not; 2.Check the grid connection is good or not; 3.Check the switch between inverter and grid is on or not; 4.Seek help from us, if can not go back to normal state.
F41	Parallel system stop	1.Check the hybrid inverter working status. If there's 1 pcs hybrid inverter is in OFF status, the other hybrid inverters may report F41 fault in parallel system. 2.If the fault still exists, please contact us for help.
F42	AC line low voltage	Grid voltage fault 1.Check the AC voltage is in the range of standard voltage in specification; 2.Check whether grid AC cables are firmly and correctly connected; 3.Seek help from us, if can not go back to normal state.
F47	AC over frequency	Grid frequency out of range 1.Check the frequency is in the range of specification or not; 2.Check whether AC cables are firmly and correctly connected; 3.Seek help from us, if can not go back to normal state.
F48	AC lower frequency	Grid frequency out of range 1.Check the frequency is in the range of specification or not; 2.Check whether AC cables are firmly and correctly connected; 3.Seek help from us, if can not go back to normal state.
F56	DC busbar voltage is too low	Battery voltage low 1.Check whether battery voltage is too low; 2.If the battery voltage is too low, using PV or grid to charge thebattery; 3.Seek help from us, if can not go back to normal state.
F58	BMS communication fault	1.it tells the communication between hybrid inverter and battery BMS disconnected when"BMS_Err-Stop" is active; 2.if don't want to see this happen, you can disable "BMS_Err-Stop" item on the LCD; 3.If the fault still exists, please contact us for help.
F63	ARC fault	1.ARC fault detection is only for US market; 2.Check PV module cable connection and clear the fault; 3.Seek help from us, if can not go back to normal state.
F64	Heat sink high temperature failure	Heat sink temperature is too high 1.Check whether the work environment temperature is too high; 2.Turn off the inverter for 10mins and restart; 3.Seek help from us, if can not go back to normal state.

Chart 7-1 Fault information

Under the guidance of our company, customers can return our products so that we can provide service, maintenance or replacement of products of the same value. Customers are required to pay the necessary shipping costs. See warranty for details on what is covered for repair or replacement. All rights and interests for the replacement product or component belong to the company.

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

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

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

8. Limitation of Liability

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

Troubleshooting
To determine the status of the battery system, users must use the additional battery status monitoring software to examine the protection mode. Refer to the installation manual about using this monitoring software. Once the user knows the protection mode, refer to the following sections for solutions.

Table 7-1: Troubleshooting

Fault Type	Fault Generation Condition	Possible Causes	Troubleshooting
BMS fault	The cell voltage sampling circuit is faulty. The cell temperature sampling circuit is faulty.	The welding point for the cell voltage sampling is loose or disconnected. The voltage sampling terminal is disconnected. The fuse in the voltage sampling circuit is blown. The cell temperature sensor has failed.	Replace the battery
Electrochemical cell fault	The voltage of the cell is low or unbalanced.	Due to large self- discharge, the cell over discharges to below 2.0V after long term storage. The cell is damaged by external factors, and short circuits, pinpricks, or crushing occur.	Replace the battery
Overvoltage protection	The cell voltage is greater than 3.65 V in charging state. The battery voltage is greater than 58.4V.	The busbar input voltage exceeds the normal value. Cells are not consistent. The capacity of some cells deteriorates too fast, or the internal resistance of some cells is too high.	If the battery cannot be recovered due to protection against abnormality contact local engineers to rectify the fault.
Under voltage protection	Thebatteryvoltageis lessthan44.8V. Theminimumcell voltageislessthan 2.8V	The mains power failure has lasted for a long time. Cells are not consistent. The capacity of some cells deteriorates too fast or the internal resistance of some cells are too high.	If the battery cannot be recovered due to protection against abnormality contact local engineers to rectify the fault.

Charge or discharge high temperature protection	The maximum cell temperature is greater than 60 ◦ C (140 ◦ F)	The battery ambient temperature is too high. There are abnormal heat sources around	If the battery cannot be recovered due to protection against abnormality contact local engineers to rectify the fault.
Charge low temperature protection	The minimum cell temperature is less than 0 ◦ C (32 ◦ F)	The battery ambient temperature is too low.	If the battery cannot be recovered due to protection against abnormality contact local engineers to rectify the fault.
Discharge low temperature protection	The minimum cell temperature is less than -20 ◦ C (-4 ◦ F)	The battery ambient temperature is too low.	If the battery cannot be recovered due to protection against abnormality contact local engineers to rectify the fault.

By checking the above data and sending the data to our service personnel, the service personnel of our company will offer a solution after receiving the data.

Inspection, Cleaning, and Maintenance

General Information

- The battery product is not fully charged. It is recommended that the installation be completed within 3 months after arrival.
- During the maintenance process, do not re-install the battery in the battery product. The performance of the battery will be reduced.
- Disassembly or opening of any battery in this product is strictly prohibited.
- After the battery product is over-discharged, it is recommended to charge the battery within 48 hours. The battery product can also be charged in parallel. After the battery product is connected in parallel, the charger only needs to connect to the output port of any product battery.
- Never attempt to open or dismantle the battery! The inside of the battery does not contain serviceable parts.
- Disconnect the Li-Ion battery from all loads and charging devices before performing cleaning and maintenance activities
- Place the enclosed protective caps over the terminals before cleaning and maintenance to avoid the risk of unintended contact with the terminals.

Inspection

- Inspect for loose and/or damaged wiring and contacts, cracks, deformities, leakage, or damage of any other kind. If the battery is damaged, it must be replaced. Do not attempt to charge or use a damaged battery. Do not touch the liquid from a ruptured battery.
- Regularly check the battery's state of charge. Lithium Iron Phosphate batteries will slowly self-discharge when not in use or while in storage.
- Consider replacing the battery with a new one if you note either of the following conditions:
  - The battery run time drops below 70% of the original run time.
  - The battery charge time increases significantly.

Cleaning

If necessary, clean the Li-Ion battery with a soft, dry cloth. Never use liquids, solvents, or abrasives to clean the Li-Ion battery.

Maintenance

The Li-Ion battery is maintenance free. Charge the battery to approximately > 80% of its capacity at least once every year to preserve the battery's capacity.

Storage

- The battery product should be stored in a dry, cool, and cool environment.
- Generally, the maximum storage period at room temperature is 6 months. When the battery is stored for over 6 months, it is recommended to check the battery voltage. If the voltage is higher than 51.2V, it can continue to store the battery. In addition, it is needed to check the voltage at least once a month until the voltage is lower than 51.2V. When the voltage of the battery is lower than 51.2V, it must be charged according to the charging strategy.
- The charging strategy is as follows: discharge the battery to the cutoff voltage with 0.2C(40A) current, then charge with 0.2C(40A) current for about 3 hours. Keep the SOC of the battery at 40%-60% when stored.
- When the battery product is stored, high temperatures should be avoided keep the battery away from explosive and flammable areas.

9. Datasheet

Model	NV5000	NV6000	NV7600	NV8000	*SUN-10K-SG02LP2-US-AM3*	*SUN-12K-SG02LP2-US-AM3*
Battery Input Data						
Battery Type	Lead-acid or Lithium-ion					
Battery Voltage Range(V)	40-60					
Max. Charging Current(A)	120	135	190	190	220	250
Max. Discharging Current(A)	120	135	190	190	220	250
Charging Strategy for Li-Ion Battery	Self-adaption to BMS					
Number of Battery Input	1					
PV String Input Data						
Max. PV Input Power(W)	7500	9000	11400	12000	15000	18000
Max. PV Input Voltage(V)	500 125					
Start-up Voltage(V)	125-500					
PV Input Voltage Range(V)	150-425					
MPPT Voltage Range(V)						
Full Load MPPT Voltage Range(V)	300-425	200-425				
Rated PV Input Voltage(V)	370					
Max. Operating PV Input Current(A)	20+20		26+26		26+26+26	
Max. Input Short-Circuit Current(A)	44+44		44+44		44+44+44	
No. of MPP Trackers/No. of Strings MPP Tracker	2/2+2				3/2+2+2	
Max. Inverter Backfeed Current to The Array	0					
AC Input/Output Data						
Rated AC Input/Output Active Power(W)	5000	6000	7600	8000	10000	12000
Max. AC Input/Output Apparent Power(VA)	5000	6000	7600	8000	10000	12000
Peak Power (off-grid)(W)	2 times of rated power, 10s					
Rated AC Input/Output Current(A)	20.9	25	31.7	33.4	41.7	50
Max. AC Input/Output Current(A)	20.9	25	31.7	33.4	41.7	50
Max. Continuous AC Passthrough (grid to load)(A)	35	40	50	50	60	60
Rated Input/Output Voltage/Range(V)	120/240V; 208V 0.88Un-1.1Un					
Grid Connection Form	2L+N+PE					
Rated Input/Output Grid Frequency/Range Power	60Hz/55Hz-65Hz					
Factor Adjustment Range	0.9-1					
Total Current Harmonic Distortion THDi	<3% (of nominal power)					
DC Injection Current	<0.5%In					
Efficiency						
Max. Efficiency	97.60%					
CEC Efficiency	96.50%					
MPPT Efficiency	>99%					
Equipment Protection						
DC Polarity Reverse Connection Protection	Yes					
AC Output Overcurrent Protection	Yes					
AC Output Overvoltage Protection	Yes					
AC Output Short Circuit Protection	Yes					
Thermal Protection DC	Yes					
Terminal Insulation Impedance Monitoring	Yes					

DC Component Monitoring Ground Fault	Yes
Current Monitoring Arc fault circuit	Yes
interrupter (AFCI) Power Network	Optional
Monitoring	Yes
Island Protection Monitoring	Yes
Earth Fault Detection	Yes
DC Input Switch	Yes
Overvoltage Load Drop Protection	Yes
Residual Current (RCD) Detection Surge	Yes
Protection Level	TYPE II(DC), TYPE II(AC)
Interface	
Display	LCD+LED
Communication Interface	RS232, RS485, CAN
Monitor Mode	GPRS/WIFI/Bluetooth/4G/LAN(optional)
General Data	
Operating Temperature Range	-40 to +60℃, >45℃ Derating
Permissible Ambient Humidity	0-100%
Permissible Altitude	2000m
Noise	<45 dB
Ingress Protection(IP) Rating	NEMA 3R, IP65
Inverter Topology	Non-Isolated
Over Voltage Category	OVC II(DC), OVC IV(AC)
Cabinet size(W*H*D) [mm]	420W×670H×233D (Excluding connectors and brackets)
Weight(kg)	35.6
Warranty	15 year Warranty
Type of Cooling	Intelligent Air Cooling
Grid Regulation	IEEE 1547.1,SRD V2.0
Safety EMC/Standard	FCC,UL 1741

Technical Data

ystem Model	NVPlus-10.2

System Specification	
Rated AC Input/Output Active Power (W)	7600/7600
Rated Input/Output Voltage/Range (Vac)	120/240/208,0.88Un-1.1Un
Rated Input/Output Grid Frequency/Range (Hz)	60/55-65
Grid Connection Form	2L+N+PE
Recommended Energy Configuration	10kWh(2 modules Min.)
Max. Charging/Discharging Current (A)	190/190
Battery Operating Voltage (Vdc)	44.8-57.6
Battery Chemistry	$LiFePO_4$
IP Rating of Enclosure	IP65 (after stacking)
System Certification	UL1973,UL9540A,UL9540,FCC,UL1741
Permissible Altitude	3000m
Permissible Ambient Humidity	0-100%
Battery Module Technical Specification (AI-W5.1-B)	
Built-in Circuit Breaker	125A 2P,60Vdc
Nominal Voltage (V)	51.2
Nominal Battery Module Energy (kWh)	5.12
Scalability	Max.6 pcs stacked per string(Max.6 string in parallel)
Battery ModuleDimension(W x Dx H,mm)	720x255x350
Battery PDU Dimension (W x D x H,mm)	720x255x228
Battery Base Dimension (W x D x H,mm)	720x255x68
Battery Module Weight Appr. (kg)	53
Operating Temperature Range	Charge: -20 to 55 °C(with heater) / Discharge:-20 to 55 °C
Cycle Life	≥6000(@25 °C ± 2 °C,0.5C/0.5C,70%EOL)
Battery Module Certification	UL1973,UL9540A,FCC,UN38.3

Technical Data

Inverter Module Technical Specification (NV7600)	
Max. PV Input Power (W)	11400
Max. PV Input Voltage (V)	500
Start-up Voltage (V)	125
MPPT Voltage Range (V)	150-425
Max.Input Short-Circuit Current(A)	44+44
Max.Operating PV Input Current (A) No. of MPPT	26+26
rackers/No.of Strings MPPT racker	2/2+2
Max.AC Input/Output Apparent Power (W/VA)	7600/8360
Peak Power(off-grid）(W)	2times of rated power,10s
Rated AC Input/Output Current(A)	31.7
Max.AC Input/Output Current (A)	34.8
Max.Continuous AC Passthrough(grid to load）(A)	50
Power Factor Adjustment Range	0.9-1
Total Current Harmonic Distortion THD	3%
DC Injection Current	<0.5%In
Display	Touch color LCD,Wi-Fi
Operating Temperature Range (°C)	-40 to 60(>45°C derating)
Over Voltage Category	OVC II(DC),OVC IV(AC)
Dimension (W x D x H,mm/ in)	720x255x440/ 16.5 x 26.4 x 9.2"
Weight Appr.(kg/ lbs)	38/ 66
Communication with BMS	CAN
Safety EMC/ Standard	UL1741, FCC
Grid Regulation	IEEE 1547-2018,IEEE 1547.1-2020,UL 1699B,UL 1998
Max.Efficiency	97.60%
CEC Efficiency	96.50%
MPPT Efficiency	>99%

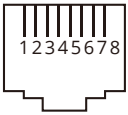
10.Appendix I

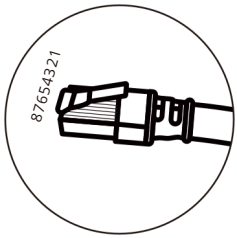
NV5000, NV6000, NV7600, NV8000

Definition of RJ45 Port Pin for BMS

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

BMS Port

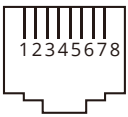


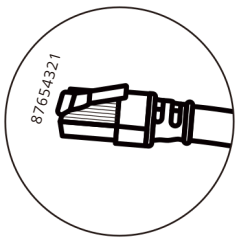


This port is used to connect the energy meter. Note: some hardware versions hybrid inverter don't support conenc&#65533;ng the energy meter

No.	Meter_CON Pin
1	SUNSPE-485_B
2	SUNSPE-485_A
3	--
4	--
5	--
6	--
7	SUNSPE-485_A
8	SUNSPE-485_B

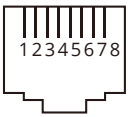
Meter_CON port

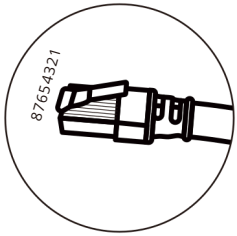




No.	DRM Pin
1	DRM1/5
2	DRM2/6
3	DRM3/7
4	DRM4/8
5	REF-GEN/0
6	D-GND
7	NetJ4_7
8	NetJ4_7

DRM Port



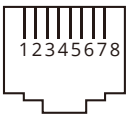


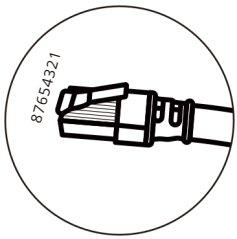
SUN-(10-12)K-SG02LP2-US-AM3

Definition of RJ45 Port Pin for BMS

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

BMS 485/CAN Port

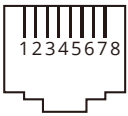


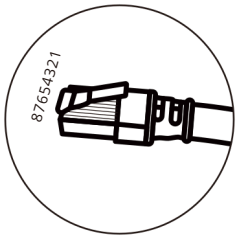


This port is used to connect the energy meter.

No.	Meter Pin
1	METERB
2	METERA
3	--
4	METERB
5	METERA
6	GND_2
7	METERA
8	METERB

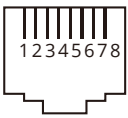
Meter_CON Port

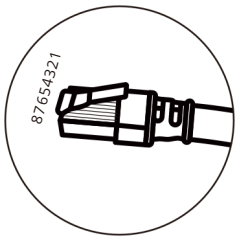




No.	DRM Pin
1	DRM1/5
2	DRM2/6
3	DRM3/7
4	DRM4/8
5	REF-GEN/0
6	D-GND
7	NetJ4_7
8	NetJ4_7

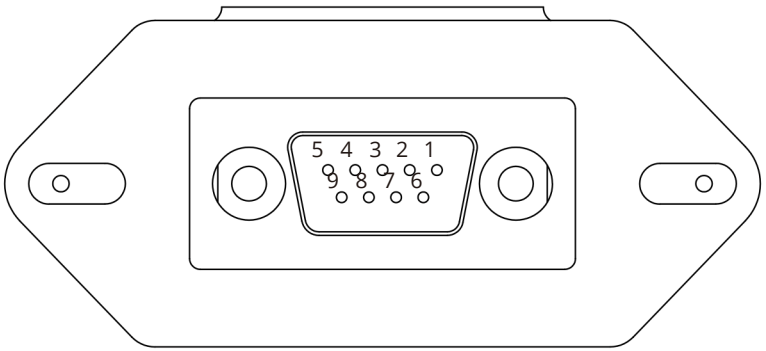
DRM Port





RS232

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

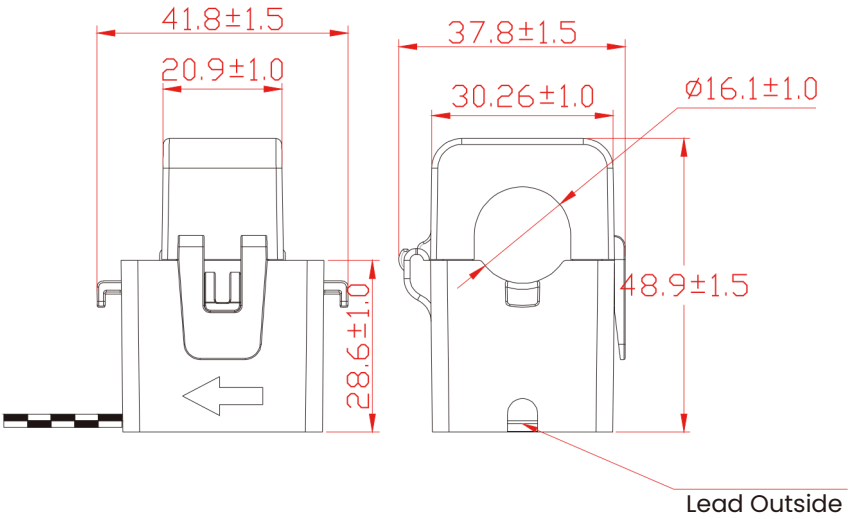


WIFI/RS232

This RS232 port is used to connect the wifi datalogger

11.Appendix II

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



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