

Version: 1.3

MN 15-12KW-AIO

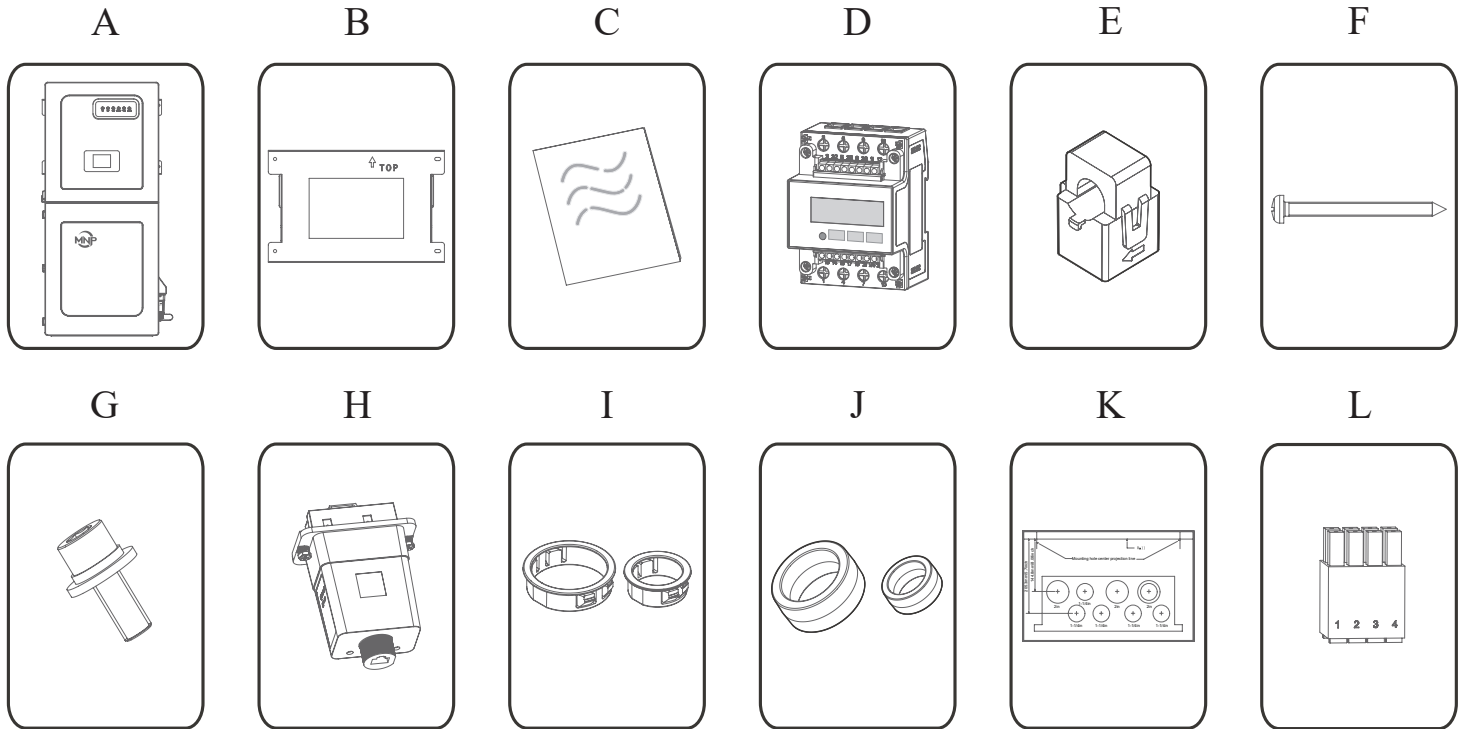
All in one Inverter/Charger System



QUICK INSTALLATION GUIDE

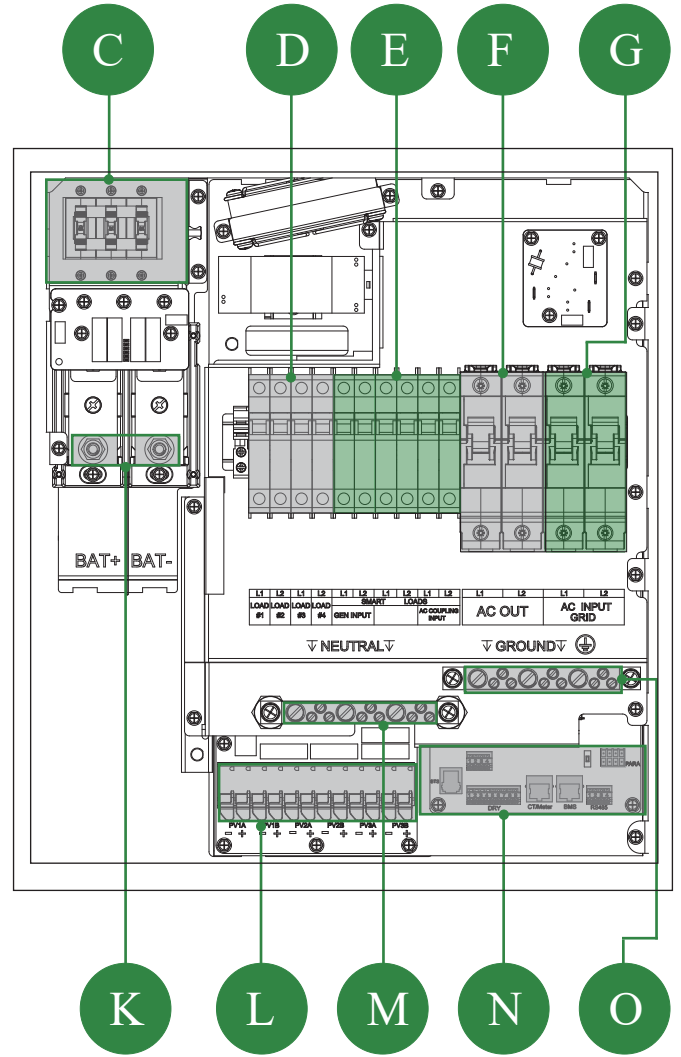
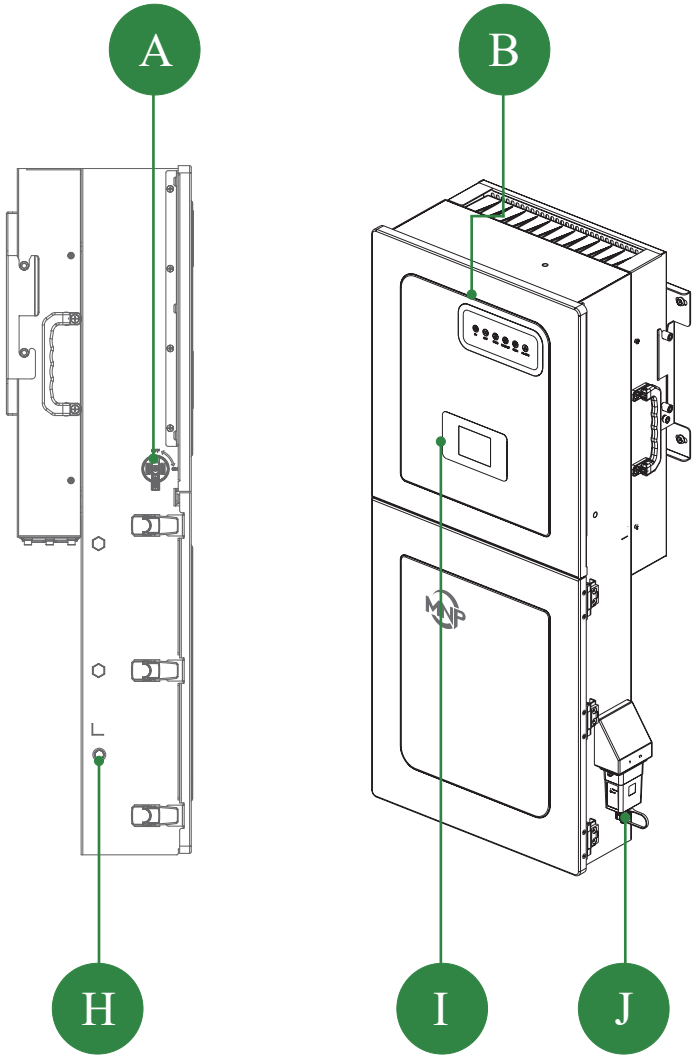
1. MNPower AIO Inverter: At a First Glance

The box should include all items shown in the component guide. If there is damage or missing parts, immediately call the phone number (USA) 1-877-600-6688.



| Component | Description | Quantity |
|-----------|--|--|
| A | Inverter | 1 |
| B | Mounting Bracket | 1 |
| C | File Package | 1 |
| D | Meter (Optional) | 1 |
| E | CT | 2 |
| F | M6 Self-tapping Screw | 4 |
| G | M6 Security Screw | 1 |
| H | Wi-Fi/Ethernet Dongle | 1 |
| I | Bushing Ring (φ : 67.5 mm & φ : 49 mm) | 3 (φ : 67.5 mm) 6 (φ : 49 mm) |
| J | Toroid (φ : 5 mm for battery & φ : 30 mm for ground of grid) | 2 |
| K | Gutter Template | 1 |
| L | PARA Plug | 1 |

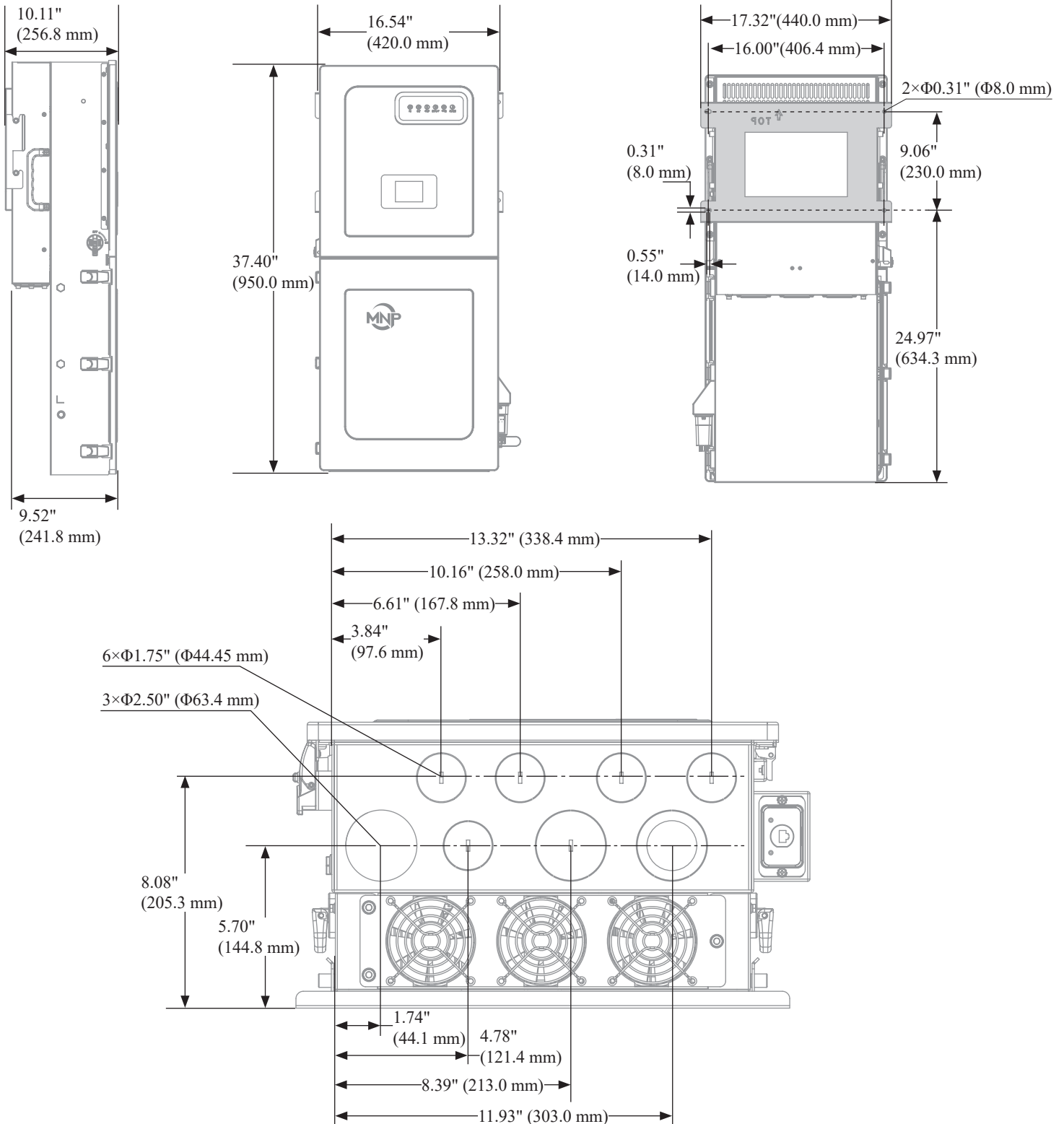
1.1 General Description



| Component | Description |
|-----------|--|
| A | PV switch |
| B | LED screen |
| C | 300 amp Hydraulic/magnetic Bat. breaker |
| D | Two 15 A & two 20 A / 240 V AC Load brkrs |
| E | 120/240 V AC Smart load brkrs 60+30+50 A OR 60 A Gen input+ 30 A Smart Load+50 A AC coupling--Use each dual breaker as a load or input and program accordingly |
| F | 100 A / 120/240V AC OR 120/208 V AC AC OUT |
| G | 100A / 120/240 V AC OR 120/208V AC AC IN |
| H | ON/OFF Button |
| I | LCD screen |

| Component | Description |
|-----------|---|
| J | Wi-Fi / Ethernet dongle |
| K | 5/16-18UNC Battery connection terminals |
| L | PV connection terminal block |
| M | Neutral Busbar |
| N | Communication connection ports (RS485, BMS, DRM, CT, DRY, RSD, PARA) |
| O | Ground Busbar |

1.2 Specifications




| Terminal | Torque [lb-in] | Torque [N·m] |
|---|--|--|
| LOAD (#1/#2/#3/#4) | 20 lb-in | 2.5 N·m |
| Smart loads breaker/Gen input/AC coupling | 20 lb-in | 2.5 N·m |
| AC out | 35 lb-in | 4 N·m |
| Neutral / Ground (Busbar) | 50 lb-in (7/16-20 UNF) / 26 lb-in (1/4-28 UNF) | 5.6 N·m (7/16-20 UNF) / 2.9 N·m (1/4-28 UNF) |
| AC Input Grid | 35 lb-in | 4 N·m |
| Battery Connection | 126 lb-in | 15 N·m |

1.3 Wire Gauge Guide

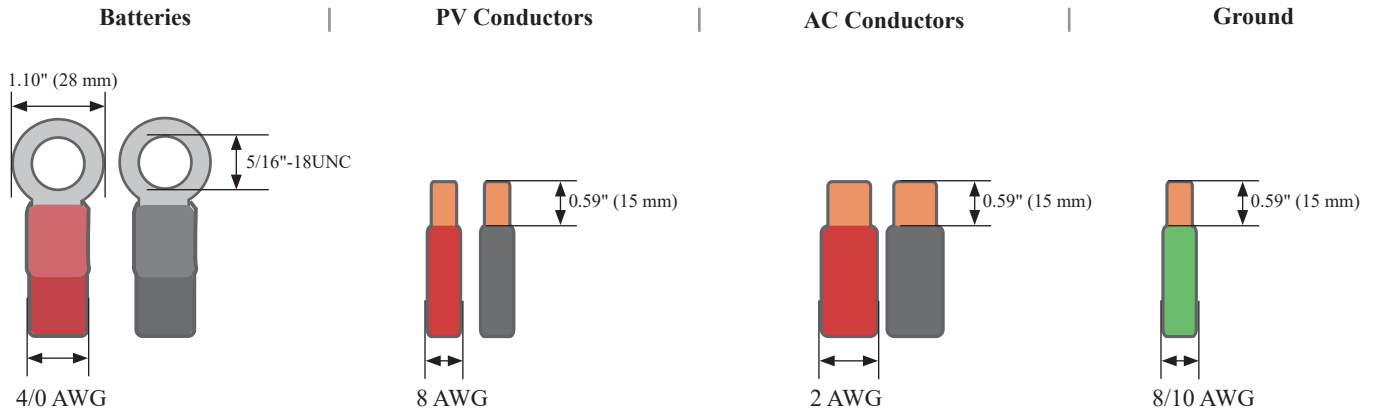
1. AC Input/Outputs:

- “AC INPUT GRID” Terminal 100 A MAX passthrough, 2 AWG conductor.
- “AC OUTPUT” Terminal 100 A MAX passthrough, 2 AWG conductor.
- Backed up Sub-panel may have more than 100 amps of load circuits although the utility pass through current is limited to 100 amps continuous per leg. Inverter output current when inverting is limited to 47.5 amps is continuous per leg.

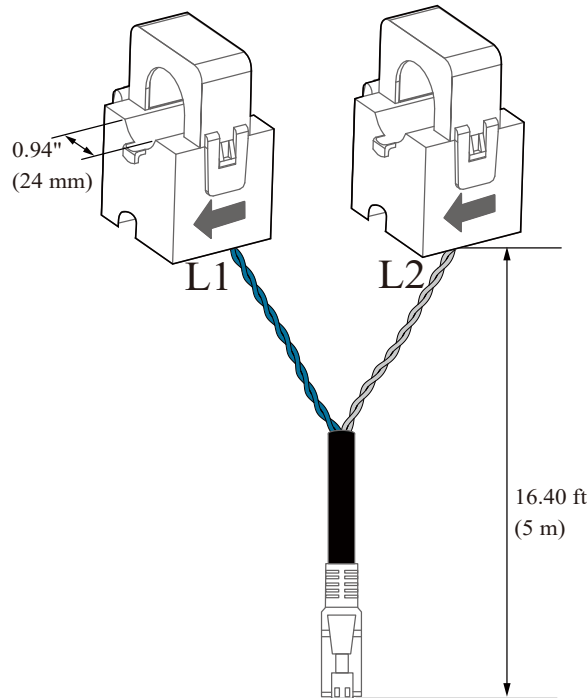
 Wire gauge should be selected in compliance with your local electrical code.

2. **SENSORS CT:** 16.40 ft [5 m] included.

3. **BATTERY CABLES:** 4/0 AWG THHN / Max Charge and Discharge limited to 260 A.

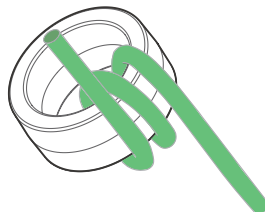


CT Sensors (Included)



Ground Toroid (φ 30 mm)

The ground cable of the Grid needs to be wrapped around the toroid twice, as shown below.



2. Installation

2.1 Mounting the MN 15-12KW-AIO

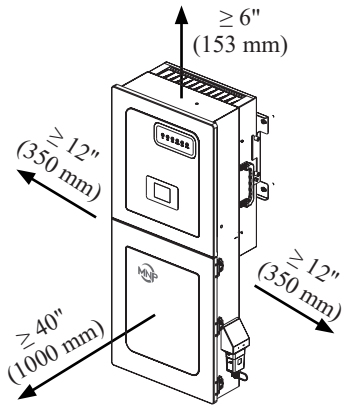


Figure 1: Mounting clearances

A. The system weight is 101.85 lb. (46.2 kg).

B. Considering the dimensions of the inverter, find a suitable location for the system(s). There must be at least 6 in [15 cm] of vertical clearance for proper heat dissipation.



Heat transfer and cooling are done from bottom to top at a rate of 525 W/hr.

C. The MNPower MN 15-12KW-AIO has a NEMA 3R enclosure that is rated for outdoor installation but can also be installed indoors.

D. **⚠️ PROTECT THE LCD SCREEN** from direct exposure to UV light.

E. Mount the MNPower inverter and ensure the unit is leveled and properly seated.

F. Securely attach the inverter to the mounting surface. You may need expansion plugs or anchors for concrete. In case a different anchorage is required, calculate the support needed to properly hold the weight of the equipment.

G. Remove the sticker on the bottom of the equipment before mounting. Use gutter template to mark the installation location on the wire guard.

4×Φ0.18" (4.5 mm) ↓ 2.30" (60 mm)

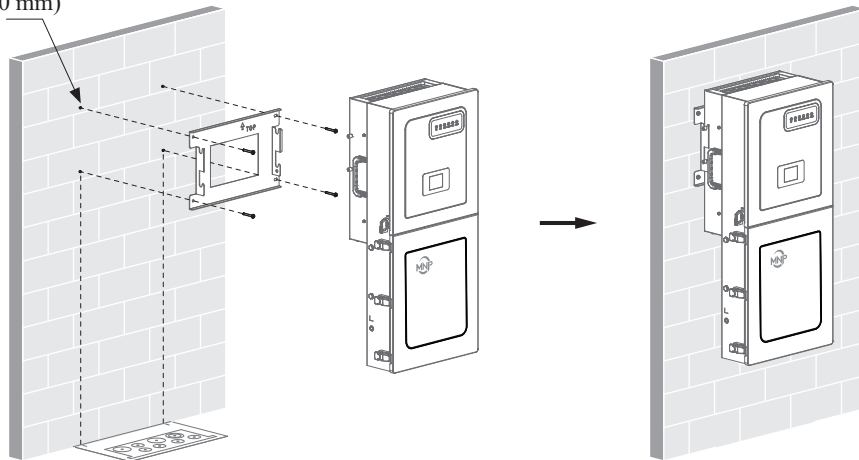


Figure 2: Wall mount

H. Use the bushing rings as needed.

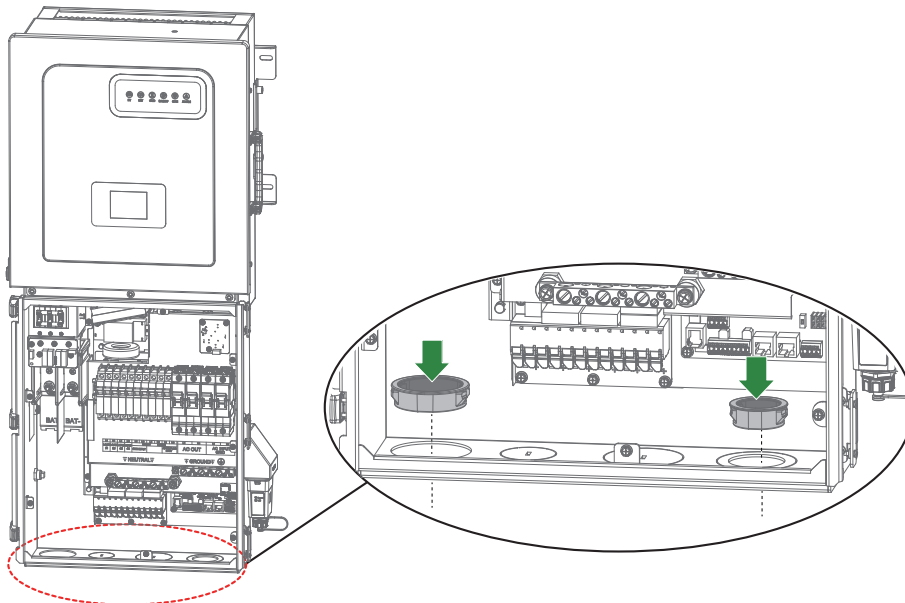


Figure 3: Bushing ring installation

I. Mount the inverter in a permitted position, as shown below.

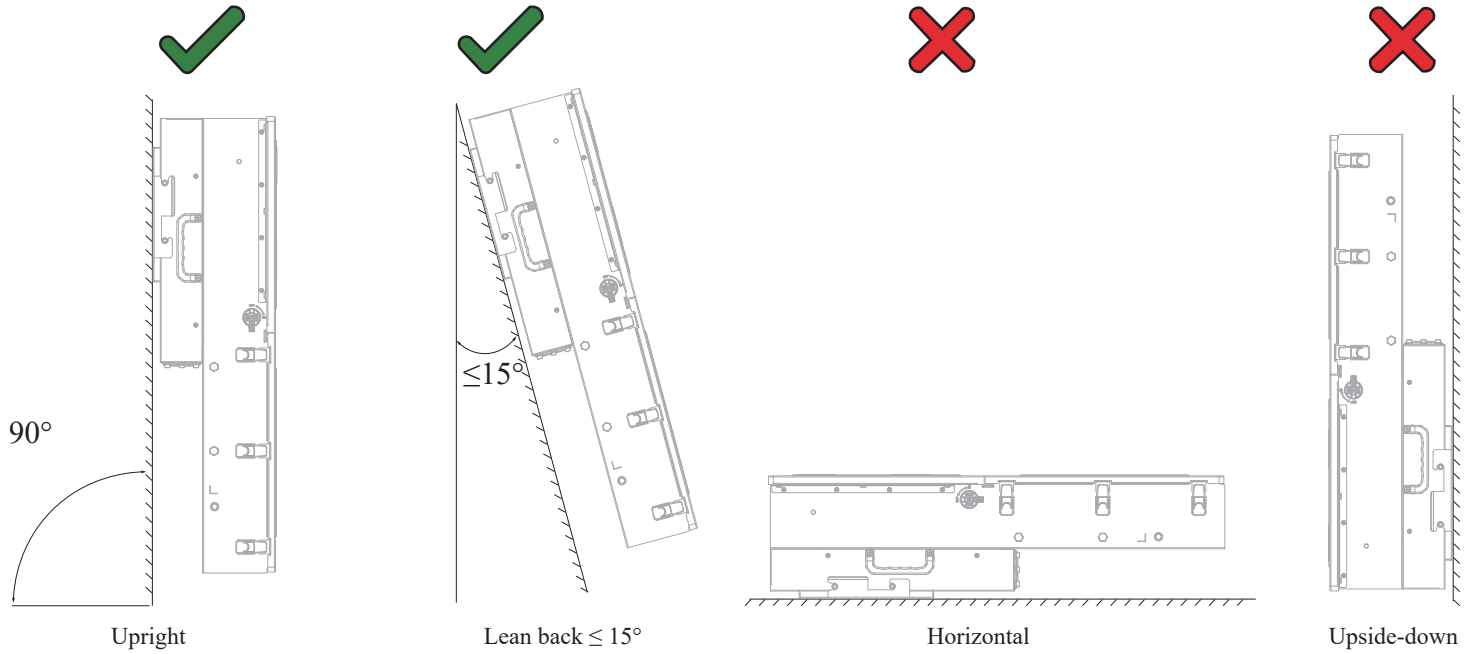


Figure 4: Permitted and prohibited mounting positions

2.2 Removing Insulation Cover

Before electrical connections, remove the grounding cable and insulation cover from the wiring area temporarily, as shown in figure below.

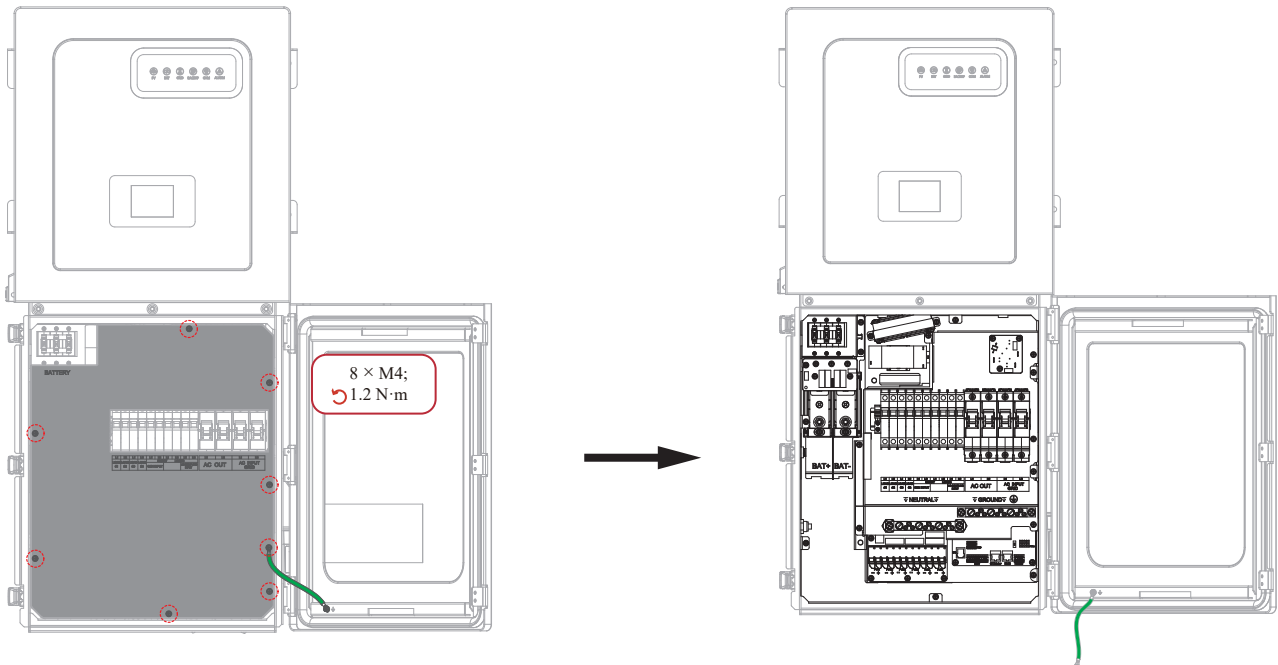


Figure 5: Removing insulation cover and grounding cable



After the electrical connections are complete, if no other connections are made in the wiring area, replace the insulation cover and ensure the grounding cable is well-connected again.

2.3 Connecting PV Modules



The inverter has 3 independent MPPTs and each can handle up to 2 PV strings. Each MPPT can operate at a current of 30 A / 22 A / 22 A (self-limiting) and a MAX Voc of 600 V.

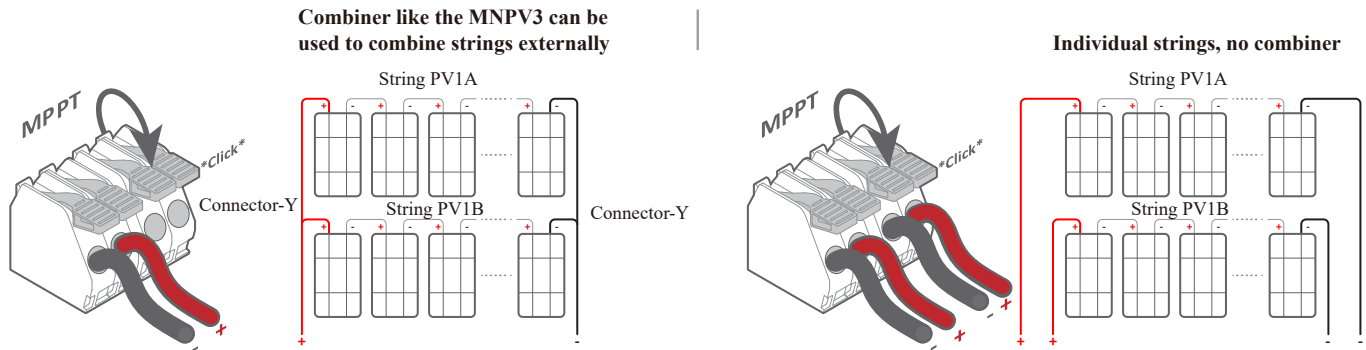


Figure 6: MPPT wiring and PV configurations

2.4 Integrating Batteries

Battery Toroid

Install the battery toroid (provided) on battery input wires, as shown in the following figure. Battery (+) and (-) cables must go through the toroid simultaneously. These toroids are for EMI suppression.

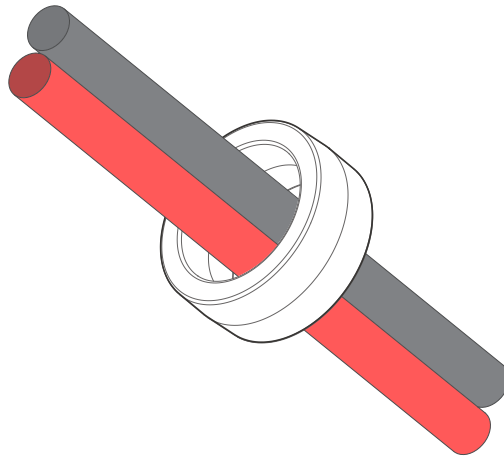


Figure 7: Battery toroid

2.5 Integrating Sensors and Accessories

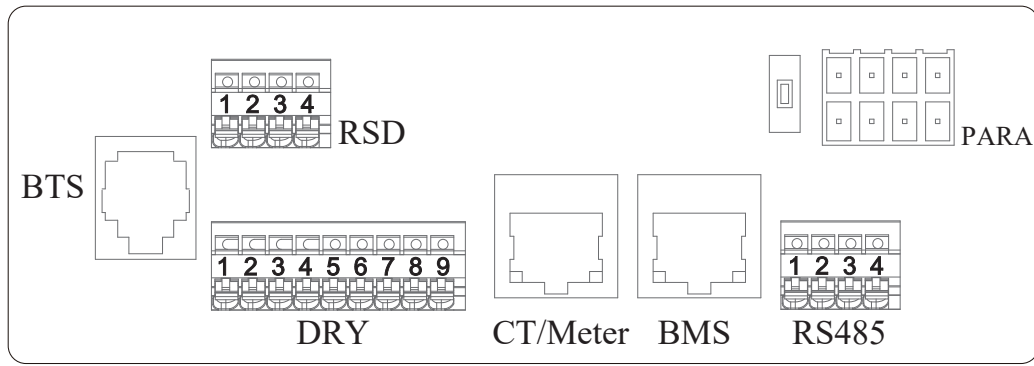


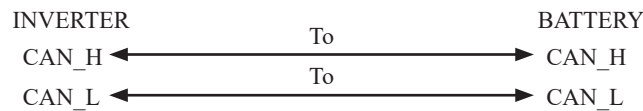
Figure 8: Communication wiring area

- **BTS:** Battery temperature sensor, not polarity sensitive. Used for voltage compensation for Lead Acid batteries.
- **RSD:** Rapid shutdown control.
 - (Pin 3, 4): For Pin 4 (Remote off) and Pin 3 (GND), normally open dry contact for EPO (emergency power off button).
 - (Pin 1, 2): For Pin 1 (12 Vdc) and Pin 2 (GND), 12 Vdc power supply (100 mA max, 12 Vdc, 1.2 W) for RSD transmitters. The built-in transmitter is SunSpec compatible.
- **DRY:** Generator control, Remote off control, DI/DO control.
 - (Pin 1, 2): Normally open relay for generator two-wire start. Applied voltage/current signal must be less than 30 Vdc / 1 A.
 - (Pin 7): Remote off control. Used for inverter Remote off switch connection.
 - (Pin 8, +9): Temperature sensor terminal of lead-acid battery.
 - (Pin 3, 4, 5, 6): Not in use.
- **CT/METER:** Meter communication or Grid current sensor.
- **BMS:** Lithium battery communication interface.
- **PARA:** Parallel communication. A matched resistance switch for parallel communication.
- **RS485:** RS485 communication.



Please ensure that the inverter is used strictly in accordance with the electrical specifications defined above; failure to do so may result in damage to the inverter.

BMS Port (CAN/RS485, Only for Lithium Battery)



This manual ONLY illustrates the pinout sequence of BMS at INVERTER SIDE. For details about the pinout sequence at battery side, see the user manual of the battery you use, and the following pinout diagram of battery side is only for illustration.

| Pin | RS485 | CAN |
|-----|---------|-------|
| 1 | RS485_A | -- |
| 2 | RS485_B | -- |
| 3 | GND_S | GND_S |
| 4 | -- | CAN_H |
| 5 | -- | CAN_L |
| 6 | GND_S | GND_S |
| 7 | GND_S | GND_S |
| 8 | GND_S | GND_S |

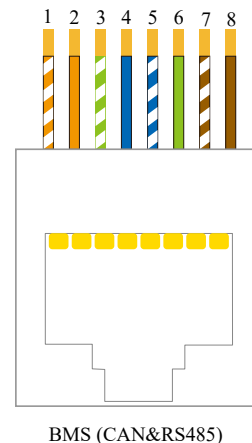


Figure 9: BMS pinouts configuration

Wi-Fi / Ethernet Dongle (Antenna)

- A. Unscrew the cover. (Figure 10a)
- B. Insert Wi-Fi/Ethernet dongle into the port firmly. (Figure 10b)
- C. Secure the Wi-Fi/Ethernet dongle. (Figure 10c)
- D. Take the waterproof connector out of the package and prepare the network cable with network. Insert the network cable. (Figure 10d)

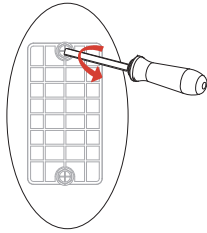


Figure 10a: Unscrew the cover

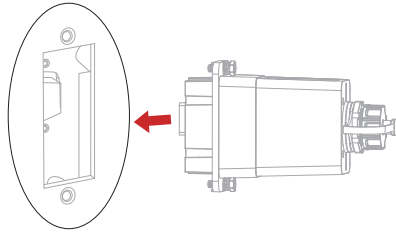


Figure 10b: Insert the Wi-Fi/Ethernet dongle

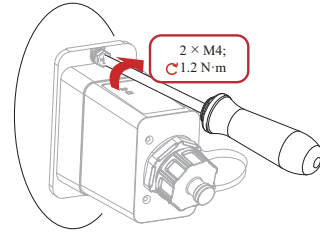


Figure 10c: Secure the Wi-Fi/Ethernet dongle

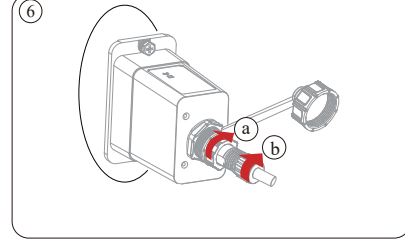
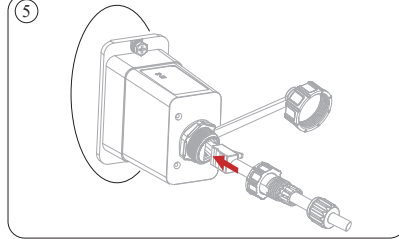
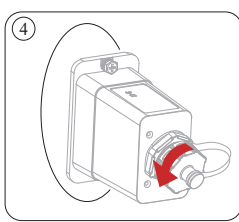
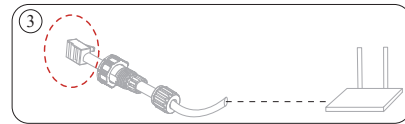
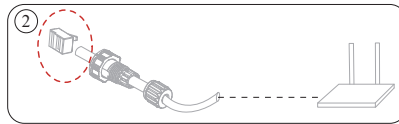
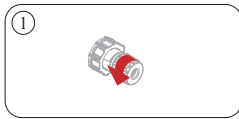


Figure 10d: Insert the network cable

2.6 Limit Sensors (CT/Meter)

The CT/Meter will measure and calculate the demand in the Main Service Panel which the MNPower MN 15-12KW-AIO will then use to accurately supply and offset all home loads.

CT Sensor Size

- MNPower inverter includes two 0.94" (24 mm) CT sensors (150 A, 3000:1).
- MNP offers one 0.94" (24 mm) CT sensor (500 A, 100:1) and one meter (DTSU666) upon request.
- Default CT ratio is 3000:1.



Unless authorized, DO NOT change CT Ratio or warranty will be voided.



Wire gauge is the only metric used to determine size of CTs. Contact sales at 1-877-600-6688 to purchase bigger CT sensors.

CT Sensors for Stand-alone application

- Connect CT1 from phase L1 to pin 7 (White-Brown), 8 (Brown).
- Connect CT2 from phase L2 to pin 6 (Green), 5 (White-Blue).

| Pin | Function Description |
|-----|----------------------|
| 1 | -- |
| 2 | -- |
| 3 | RS485_A |
| 4 | RS485_B |
| 5 | CT2- |
| 6 | CT2+ |
| 7 | CT1+ |
| 8 | CT1- |

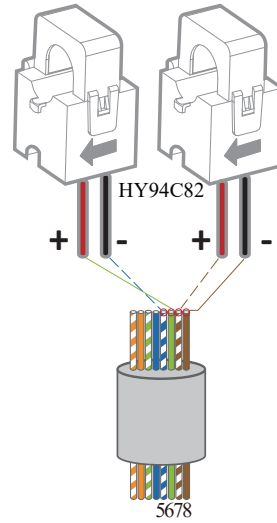



Figure 11: CT sensors for stand-alone application

CT+Meter for Parallel Systems

-  CT+meter sensors are essential for stacking, which is highly recommended for multi-system installs.
- Please contact sales at 1-877-600-6688 to purchase the meter and bigger CT.

| Pin | Function Description |
|-----|----------------------|
| 1 | -- |
| 2 | -- |
| 3 | RS485_A |
| 4 | RS485_B |
| 5 | -- |
| 6 | -- |
| 7 | -- |
| 8 | -- |

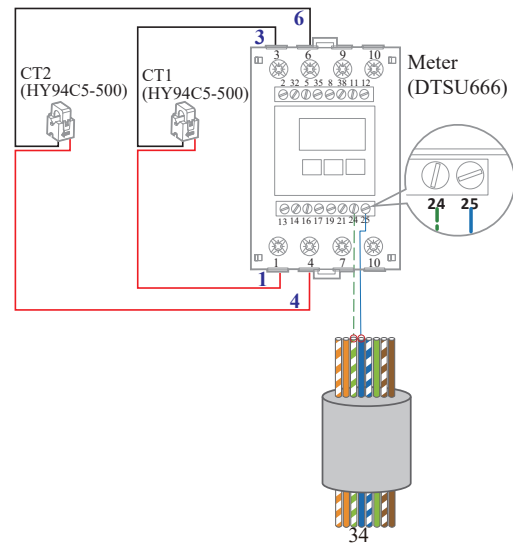


Figure 12: CT+meter for parallel systems

CT+Meter for Parallel Systems 120/208 V 3-Phase

- The three-phase system requires three CTs and 1 meter.
- Please contact sales at 1-877-600-6688 to purchase the meter and bigger CT.

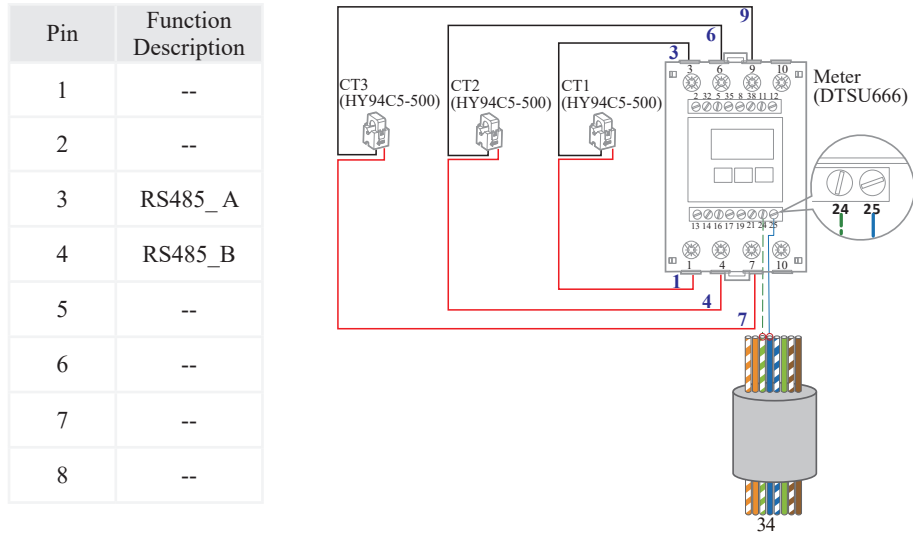


Figure 13: CT+meter for parallel systems 120V/208V three-phase

2.7 Parallel Communication

It is necessary to turn the matched resistance switch of inverter No. 1 (i.e., inverter 1 in figure below) and inverter No. N (i.e., inverter N) to “ON” and others to “1” in parallel connection mode. See Section 4 "Diagram 02" for more information on parallel wiring.

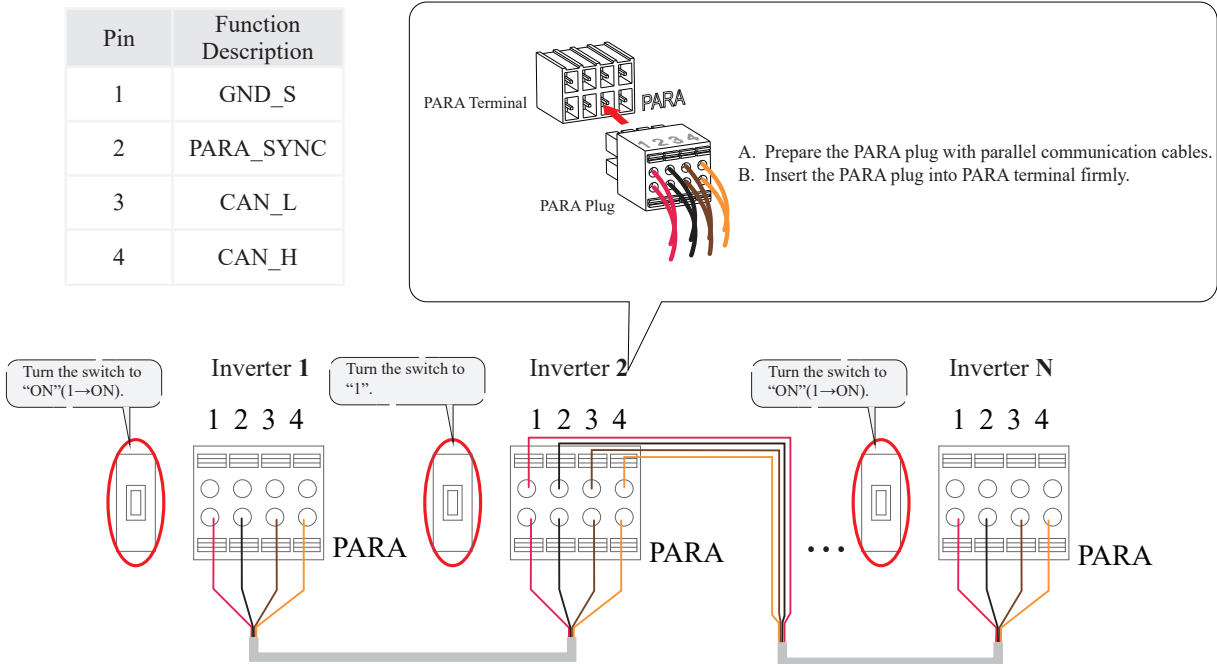


Figure 14: Parallel communication pinouts configuration

2.8 Power ON MNPover MN 15-12KW-AIO

- Power on the PV.
- Power on the battery from the battery breaker and any external battery switches or breakers.
- Power on the AC INPUT GRID breaker.
- Connect the cell phone App via Bluetooth and click the Power ON in the App for the first time. Or you can hold the ON/OFF button on the side of the inverter for 5s in this step when performing subsequent startup. Cell phone app instructions are on the side of the inverter & on the quick start guide.
- Power on the AC OUT breaker.
- Power on the SMART LOAD breakers.
- Please wait 5 minutes for the inverter to start as it makes systems checks.**
- When changing modes or changing smart load settings, you must put the inverter in standby and wait 5 minutes to restart.**
- If an error is identified, you must clear the error to recover and wait 5 minutes to restart.**

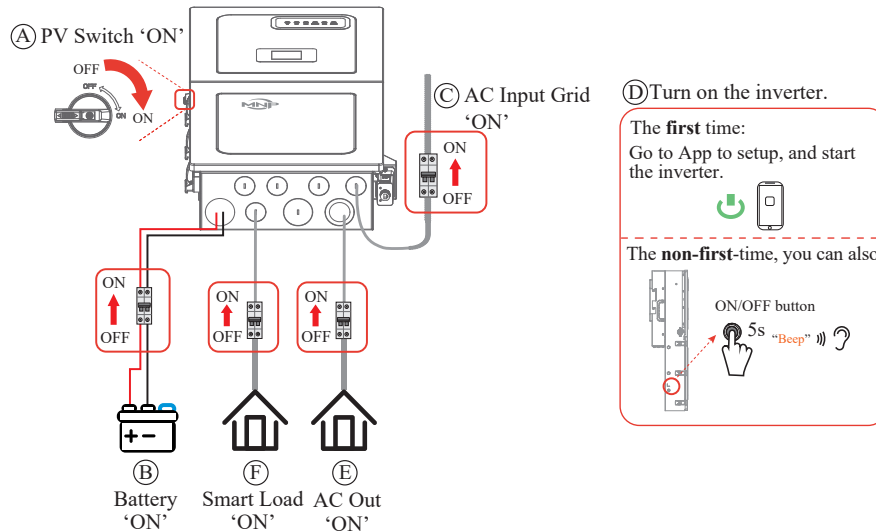


Figure 15: Power-on procedure

2.9 Power Off Sequence

- Power off the AC OUT breaker.
- Power off the SMART LOAD breakers.
- Connect the cell phone App via Bluetooth and click the Power OFF on the App. Or you can hold the ON/OFF button on the side of the inverter for 5 seconds in this step when performing subsequent shutdown.
- Power off the AC INPUT GRID breaker.
- Power off the battery from the battery breaker and any external battery switches or breakers.
- Power off the PV.
- To disconnect the inverter cables, please wait at least **5 minutes** before touching them.

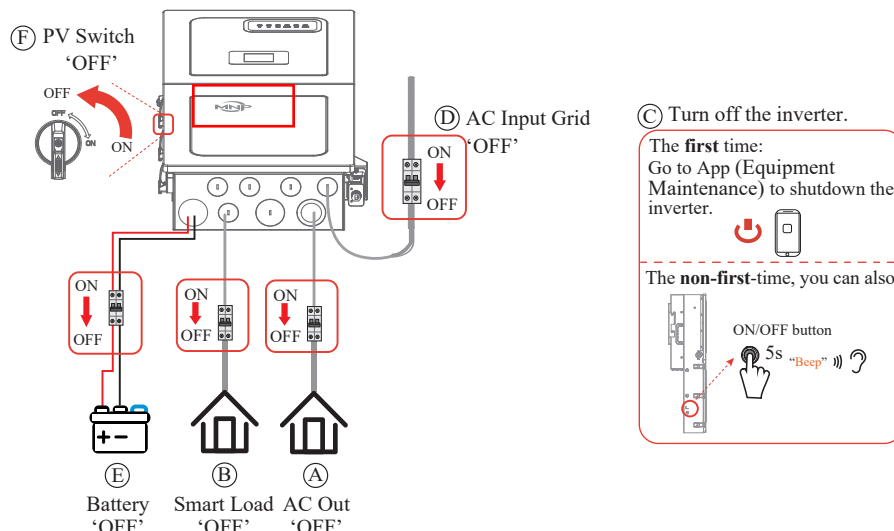


Figure 16: Power-off procedure

3. User Interface


1. Download App

- Scan the QR code to download the App **MidNite Pro**.



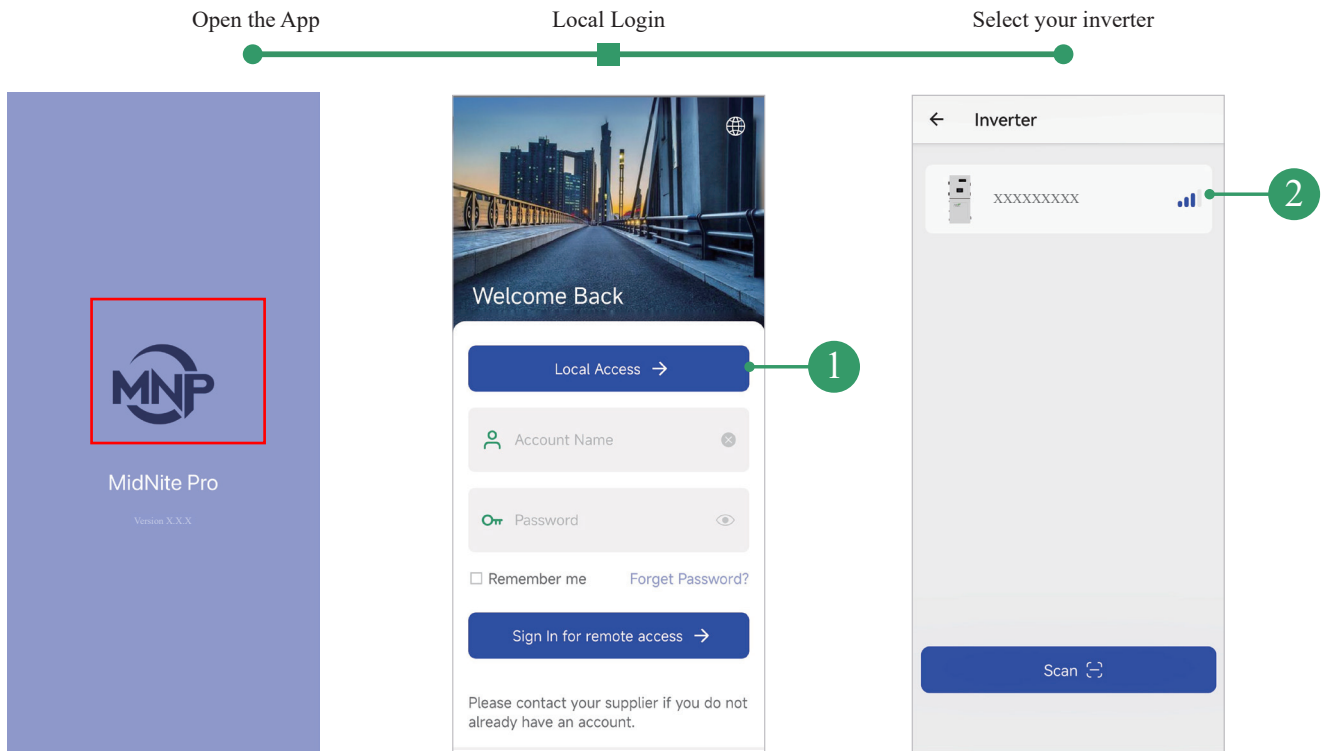
Figure 17: MidNite Pro QR Code

- Download the App from the App Store or Google Play

 Before using the local setting, the App should access some permissions. (You can allow them when you install the App or grant permissions in your own phone setting.) When the App asks for permission, please click Allow.


2. Local Login

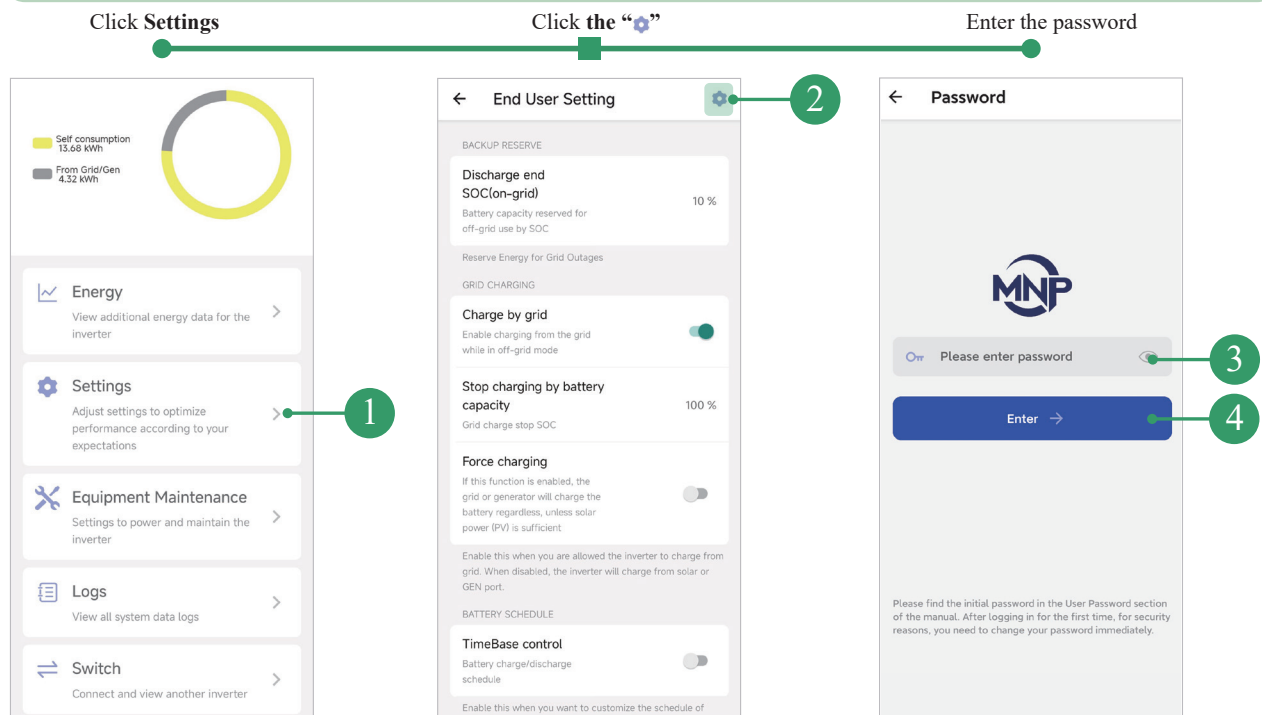
Open the Bluetooth on your own phone and the App, then do as shown in the following diagram.



3. Administrator Setting

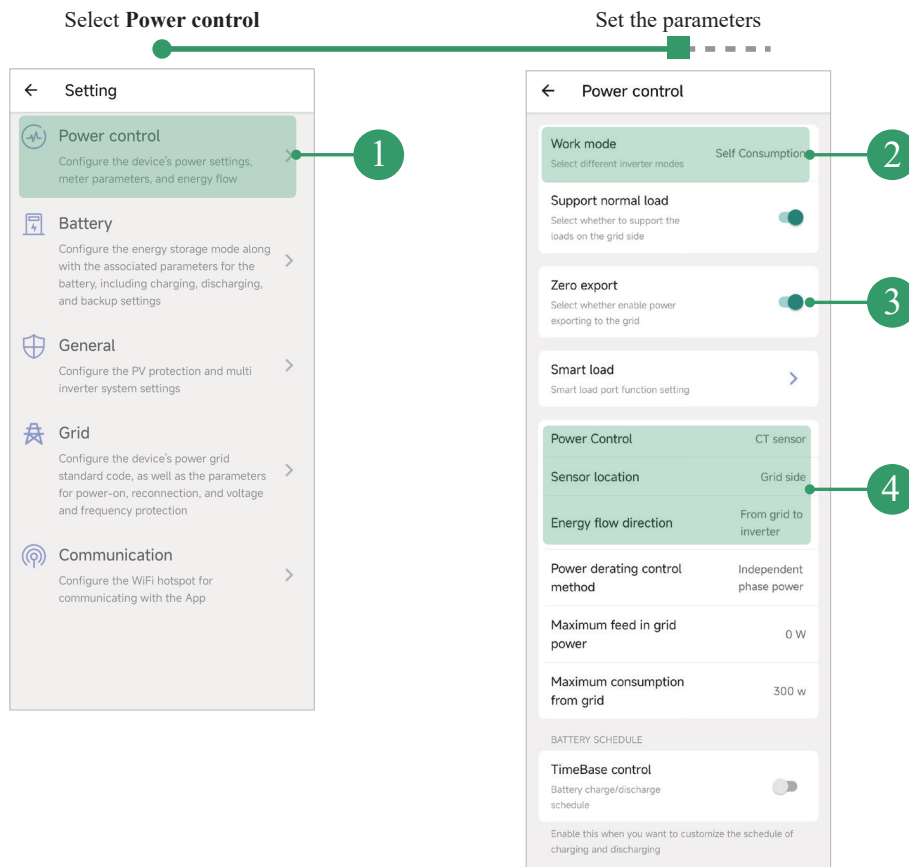
From the **Home** page, navigate to "Settings" menu. Change your access level to set more parameters.

 The initial password is 'superadmin'.
After logging in for the first time, for security reasons, you need to change your password immediately.

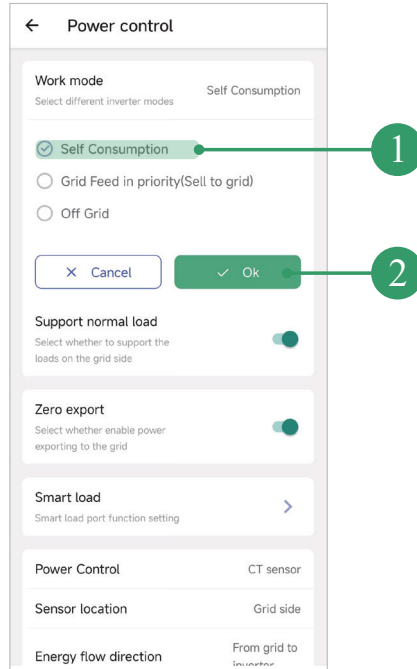


4. Set the Parameters

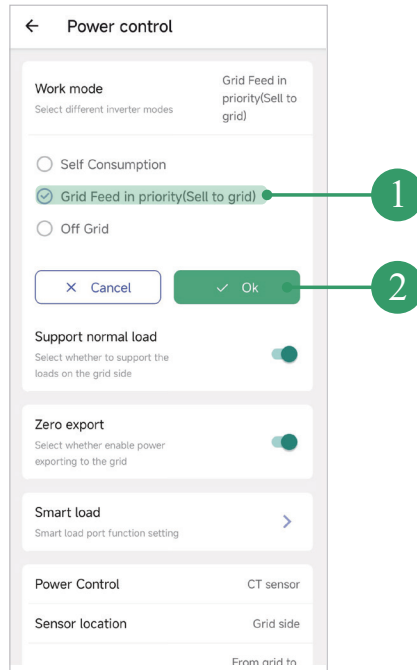
A. In the **Setting** page, follow the diagram below to configure the work mode and power control settings. If you intend to sell surplus energy back to the grid, make sure to disable the Zero Export feature; otherwise, keep it enabled.

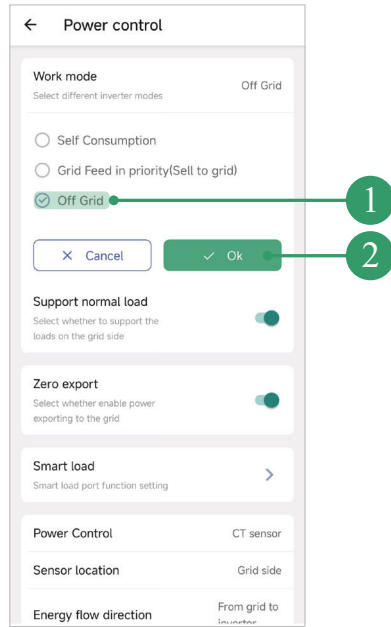


Work Mode: Self Consumption

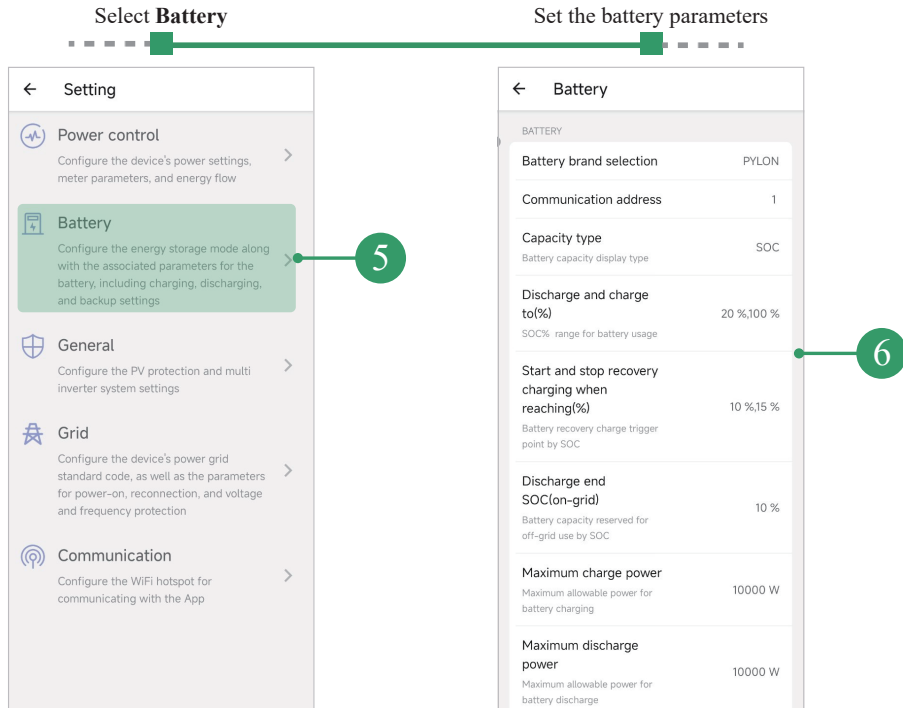


Work Mode: Grid Feed in Priority (Sell to Grid)

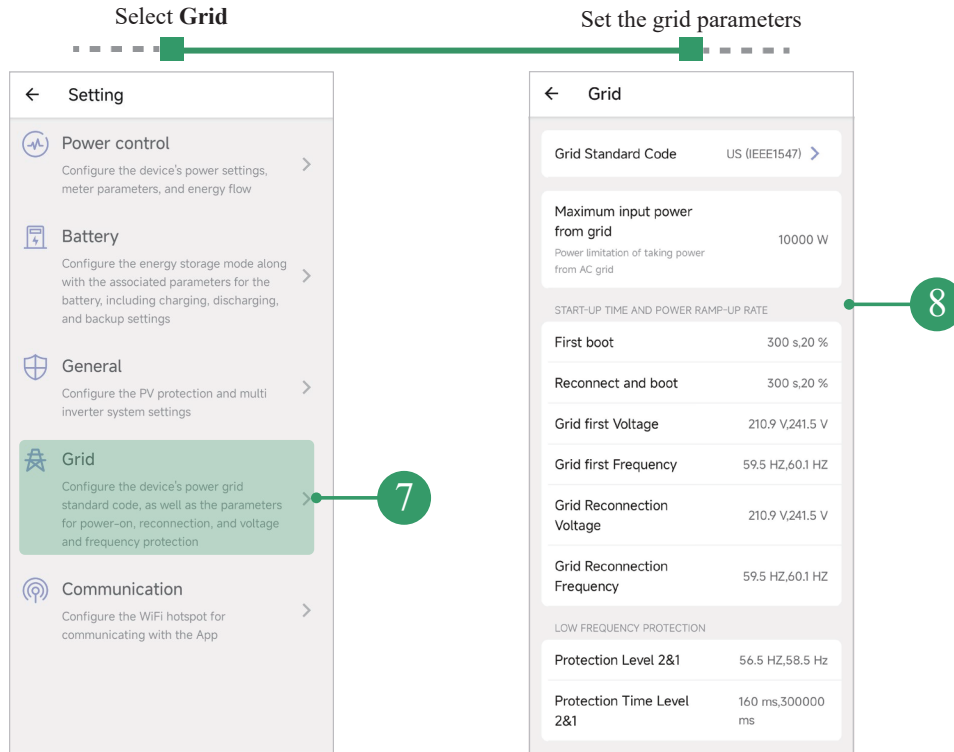




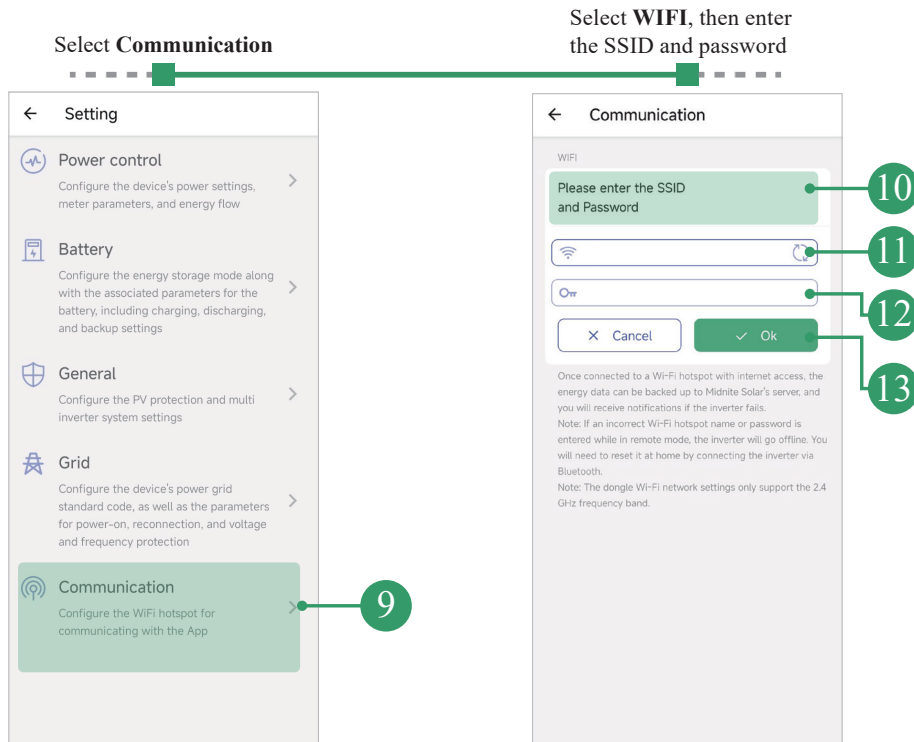
B. Go back to the **Setting** page and follow the diagram below to configure the battery parameters.



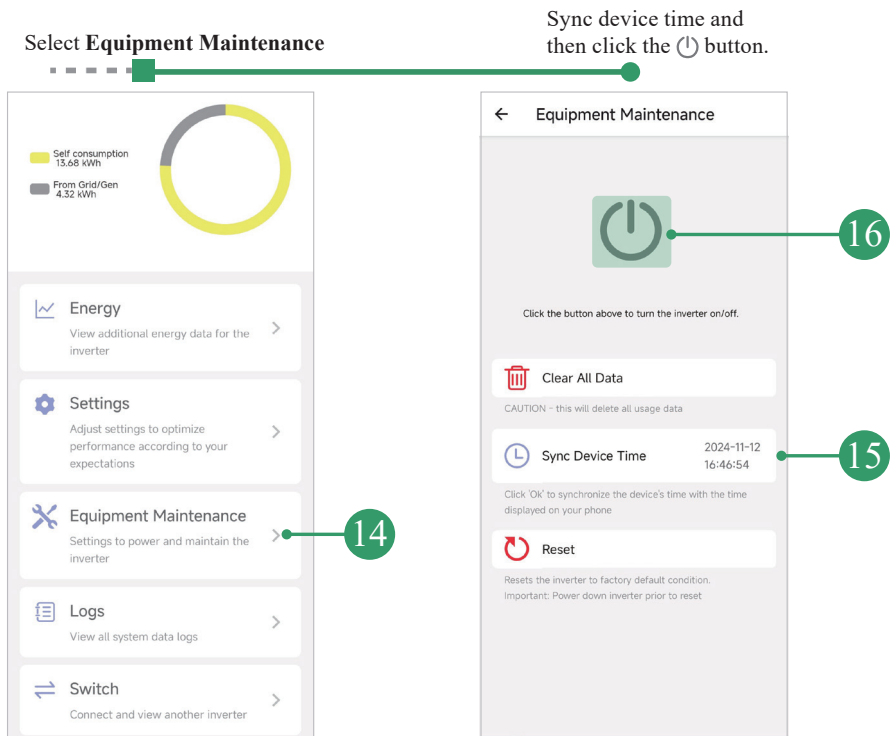
C. Go back to the **Setting** page and follow the diagram below to configure the grid parameters.



D. Go back to the **Setting** page and follow the diagram below to connect to a Wi-Fi hotspot with internet access.



E. Go back to the **Home** page and follow the diagram below to sync device time, then turn on the inverter.

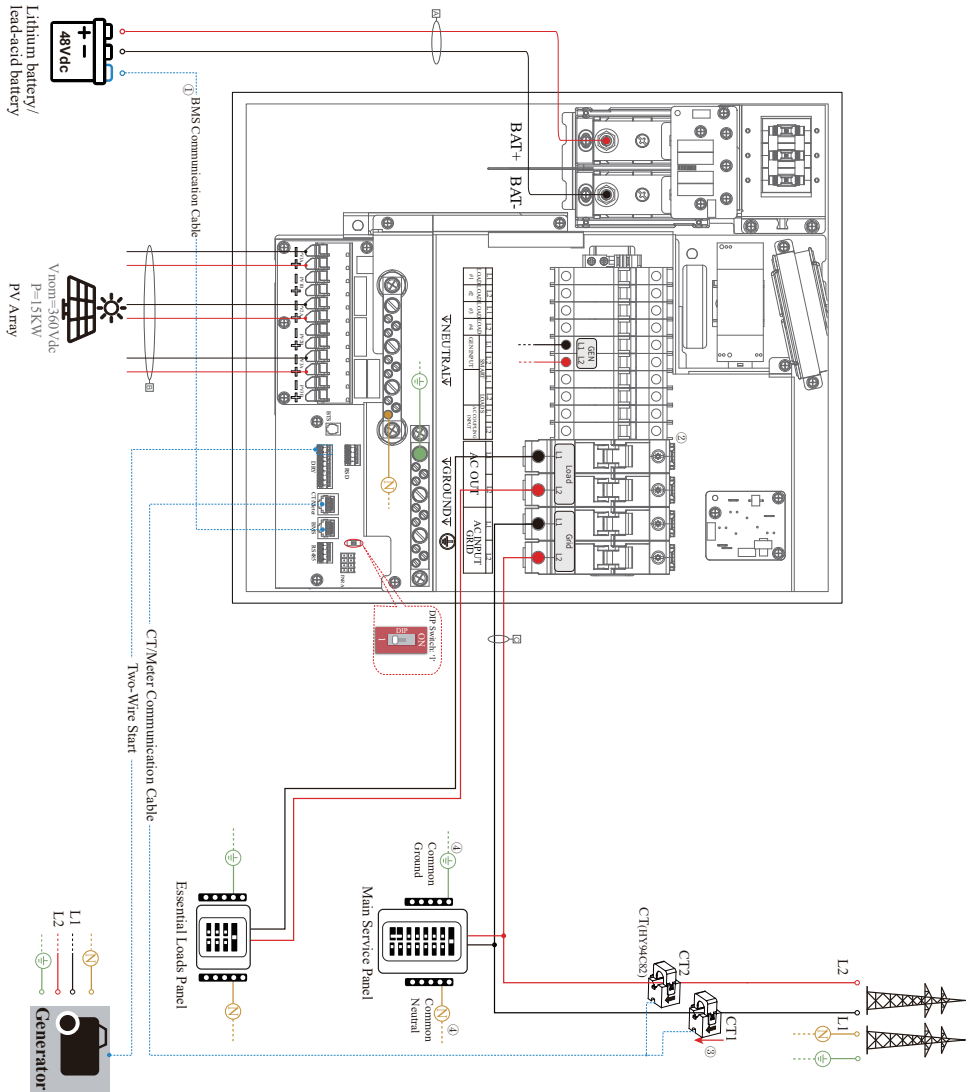


4. Wiring Diagrams



These wiring diagrams are examples of common use-cases for MNPower inverters. Diagrams must meet local electrical code and authorized jurisdiction requirements.

MNPower MN 15-12KW-A10
Standard Wiring Diagram



- ① BMS is only for lithium battery. When applying standalone lithium battery connection, each inverter should be connected to BMS COM cable.
- ② The DC/AC breakers specification please refer to TABLE 1.
- ③ The arrow indicates the current in CT flows from the grid to the inverter.
- ④ These symbols represent a common neutral/ground connection.



TABLE 1

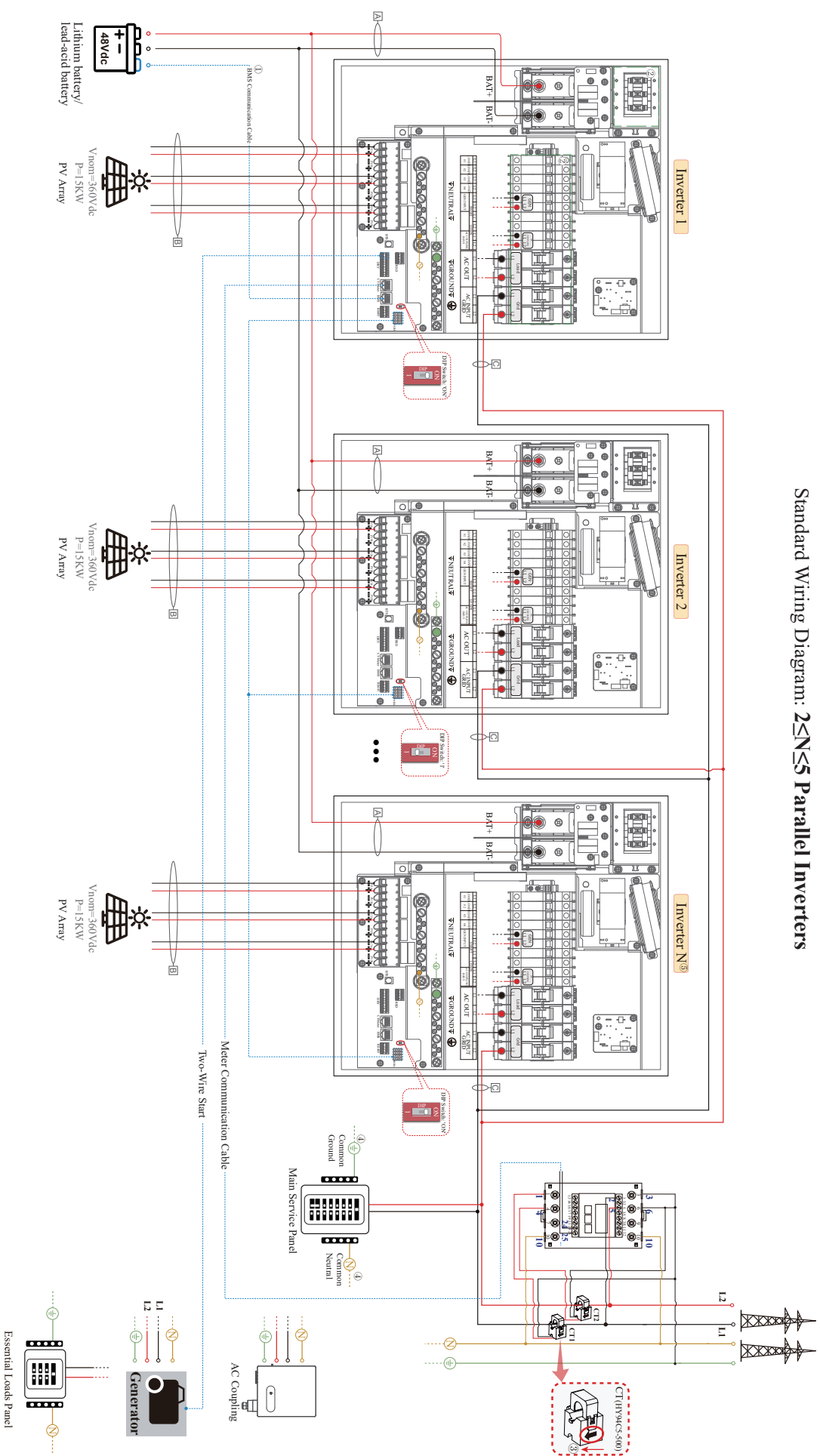
| LOCATION | SPECIFICATION | WIRE GAUGE GUIDE (COPPER) |
|----------------------|---------------|---------------------------|
| Battery side(DC) | 300A/80VDC | 4/0 AWG |
| GEN side(AC) | 60A/480VAC | 8 AWG |
| Smart loads | 30A/480VAC | 2 AWG |
| AC Coupling | 50A/480VAC | |
| AC in Grid/AC out | 100A/240VAC | |
| Load 1 L1/Load 2 L2 | 15A/240VAC | |
| Load 3 L1/Load 4 L2 | 20A/240VAC | |
| Normal load side(AC) | | |

TABLE 2

| LABEL | CONDUCTOR |
|-------|-----------|
| A | 4/0 AWG |
| B | 8 AWG |
| C | 2 AWG |

Diagram 01

Standard Wiring Diagram: 2≤N≤5 Parallel Inverters



- (AC) L1 (DC) PV- (DC) BATT-
- (AC) L2 (DC) PV+ (DC) BATT+
- NEUTRAL
- GROUND
- COM

- ① BMS is only for lithium battery. When applying standalone lithium battery connection, each inverter should be connected to BMS COM cable.
- ② The DC/AC Breakers specification please refer to TABLE 1.
- ③ The arrow indicates the current in CT flows from the grid to the inverter.
- ④ (N) (⊕) These symbols represent a common neutral/ground connection.
- ⑤ When there are only two inverters in the parallel system, refer to inverter 1 and inverter N for wiring and DJP switch settings.

TABLE 1 BREAKER SPECIFICATION

| LOCATION | SPECIFICATION |
|-----------------------|------------------|
| Battery side (DC) | 300 A / 80 V DC |
| GEN side (AC) | 60 A / 480 V AC |
| Smart loads | 30 A / 480 V AC |
| AC Coupling | 50 A / 480 V AC |
| AC Input Grid/AC out | 100 A / 240 V AC |
| Load 1 L1 / Load 2 L2 | 15 A / 240 V AC |
| Load 3 L1 / Load 4 L2 | 20 A / 240 V AC |
| Normal load side(AC) | 20 A / 240 V AC |

TABLE 2 WIRE GAUGE GUIDE (COPPER)

| LABEL | CONDUCTOR |
|-------|-----------|
| A | 4/0 AWG |
| B | 8 AWG |
| C | 2 AWG |

Depends on required post-shipment system and local code requirements.

NOTE

