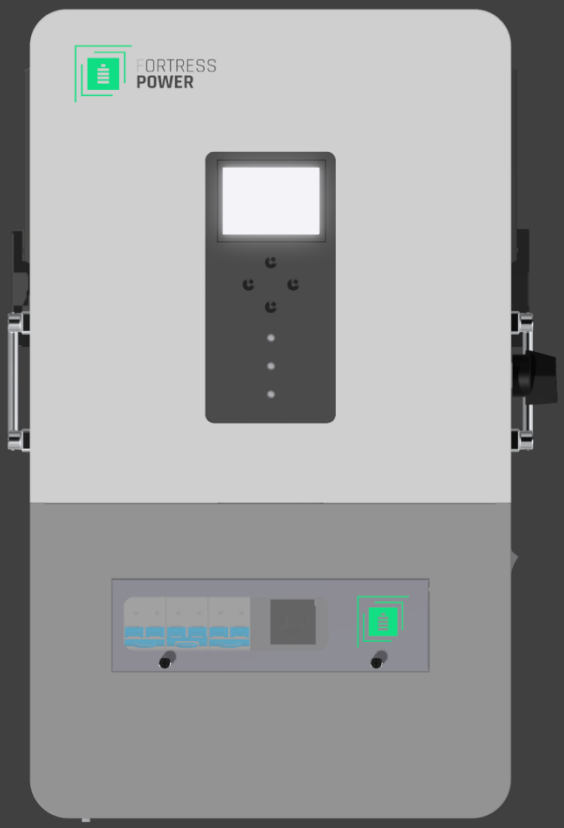
SOLO 6.5kW
INSTALLATION MANUAL
Step 1



Important: Verify the system configuration before installing. A proper system design is required for warranty purposes. Improper system configuration will void the warranty.
Always verify with the updated manuals at https://www.fortresspower.com/products/solo65.

Let’s Build Energy Freedom Together

Installing your Energy Storage System can bring challenges when sourcing all other required components to do the installation. Don’t worry, we will make your journey easier.

When you see this symbol, you can do a quick search on the Internet for the component that is referencing it to

Have Fun!

1. ABBREVIATIONS

A = Amperes

AC = Alternating Current

Ah = Amperes hour(s)

AWG = American Wire Gauge

BAT = Battery

BMS = Battery Management System

CAN = Controller Area Network

CC = Constant Current (Bulk)

CCV = Closed Circuit Voltage

°C = Degrees Celsius

CT = Current Transformer

CV = Constant Voltage (Absorption)

DC = Direct Current

EPS=Emergency Power Supply (Backup)

ESS = Energy Storage System

EOL = End of Life

°F = Degrees Fahrenheit

HV = High Voltage

HVCO = High Voltage Cut-Off

I/O = Input or Output

ISC = Short Circuit Current

IP-Ingress Protection

in = Inches

lb. = Pounds

LED = Light Emitting Diode

LFCO = Low Voltage Cut-Off

LFP = Lithium Ferro Phosphate

LN1 = AC Line 1

LN2 = AC Line 2

LV = Low Voltage

m = Meters

mA = milliamperes

mV = millivolts

N = Neutral

NEC = National Electric Code

NEMA = The National Electrical Manufacturers Association

NFPA = National Fire Protection Association

NO = Normally Open

NC = Normally Closed

OCV = Open Loop Voltage

OSHA = Occupational Safety and Health Administration

OT = Over Temperature

OV = Over Voltage

PE = Protective Earth (Ground)

RSD= Rapid Shut Down

PV = Photovoltaic

R = Electrical Resistance (Ohms)

RS485 = Recommended Standard 485

SOC = State of Charge

SOC = State of Health

UT = Under Temperature

UV = Under Voltage

V = Voltage

VAC = Volts Alternating Current

VDC = Volts Direct Current

VPP = Virtual Power Plant

W = Watts (Power)

2. CHANGE LOG

VERSION	CHANGE DESCRIPTION
	•
	•
	•
	•
	•
	•

3. SAFETY

3.1 SAFETY INSTRUCTION

General Safety Instructions

Safety regulations have been strictly observed in the design and testing of the inverter. Prior to any work, carefully read all safety instructions and always observe them when working on or with the inverter. The installation must adhere to all applicable national or international standards or regulations. Incorrect operation or work may cause:

- injury or death to the operator or a third party
- damage to the inverter and other properties belonging to the operator or a third party.

3.2 PROTECTIVE FEATURES

#	PROTECTION FUNCTION	DESCRIPTION
1	PV current-limiting protection	When the charge current or power of the configured PV array exceeds the rated current and power of the inverter, it will charge at the rated current and power
2	PV overvoltage protection	If the PV voltage exceeds the maximum allowable value of hardware, the inverter will report the fault, and stop the step-up of PV to output sine AC waves
3	Reverse charge protection at night	At night, as the battery voltage is greater than that of the PV module, it will prevent the battery from discharging to the PV module
4	Grid input overvoltage protection	When the Grid voltage of each phase exceeds 140 VAC per line, it will stop Grid from charging, and switch it to inverter output
5	Grid input under-voltage protection	When the Grid voltage of each phase is lower than 90 VAC per line, it will stop Grid from charge, and switch it to inverter output
6	Battery overvoltage protection	When the battery voltage reaches the overvoltage disconnect voltage threshold, it will automatically stop PV and Grid from charging the battery, thus preventing damage to the battery due to overcharge
7	Battery under-voltage protection	When the battery voltage reaches the low voltage disconnect voltage threshold, it will automatically stop discharging the battery, thus preventing damage to the battery due to over discharge
8	Battery overcurrent protection	When the battery current exceeds the allowable range of hardware, the inverter will turn off the output, and stop discharging the battery
9	AC output short-circuit protection	When a short-circuit fault occurs at the load output terminal, it will immediately turn off the output of AC voltage. Only after manually powering on the device, normal output restores
10	Heat sink over-temperature protection	When the internal temperature of the inverter is too high, the inverter will stop charging and discharging; when the temperature returns to normal, the inverter will charge and discharge again
11	Overload protection	After overload protection is triggered, the inverter output will be restored after 3 min, and after 5 times of overload, the output will be off until the inverter is restarted. (102%< load <110%): An error will be reported, and the output will be turned off after 5 min. (110%< load <125%): An error will be reported, and the output will be turned off after 10s. Load >125%: An error will be reported, and the output will be turned off after 5s.
12	AC backward protection	Prevent the Grid of battery inverter backward to bypass AC input
13	Bypass overcurrent protection	Built-in circuit breaker for AC input overcurrent protection
14	Bypass wiring error protection	When the phase of the two bypass inputs is different from that of the inverter split phase, the inverter will prohibit connecting to the bypass, thus preventing the power failure or short circuit of load when connecting to the bypass

DANGER

Dangers of High Voltages and Large Current

- Beware of high PV voltage. Please turn off the DC switch of PV Panel output before and during the installation to avoid electric shock.
- Beware of high grid voltage. Please turn off the AC switch at the grid connection before and during the installation to avoid electric shock.
- Beware of large current of the battery output. Please turn off the battery module before and during the installation to avoid electric shock.
- Do not open the inverter when it's working to avoid electric shock and damage from live voltage and current from the system.
- Do not operate the inverter when it's working, only the LCD and buttons can be touched in limited cases by qualified personnel,
- Other parts of the inverter can be touched when the inverter is in a safe state (e.g., fully shutdown).
- Do not connect or disconnect any connections (PV, battery, grid, communication etc.) of the inverter when it's operating.
- Make sure the inverter is well grounded. An operator should make sure he is well protected by reasonable and professional insulation measurements (e.g., personal protective equipment (PPE).
- Inspect relevant existing wiring on-site of the installation is in good condition before installation, operation, or maintenance.
- Inspect that connections are good between the inverter and PV, battery, and grid during installation to prevent damage or injuries caused by bad connections.

Important Safety Notifications

There are various safety issues that must be carefully conveyed prior to and after the installation, as well as during future operation and maintenance. The following are important safety notifications for the operator, owner, and user of this product under normal conditions of use.

WARNING

Avoid Misoperation and Inappropriate Usage

- All the work of this product design, installation, operation, setting, configuration, and maintenance must be carried out by qualified personnel as required.
- All connections must be in accordance with local and national regulations and standards.
- The inverter and system can inter-connect with the utility grid only if the utility grid permits it.
- All the warning labels or nameplates on the inverter must be clearly visible and must not be removed, covered, or pasted.
- The installation should consider the safety of future users when choosing the right position and location as specified in this manual.
- Please keep the children away from touching or misusing the inverter and relevant systems.
- Beware of hot surfaces during inverter operation, the inverter and some parts of the system could be hot when working, please do not touch the inverter surface or most of the parts when they are working. During inverter working states, only the LCD and buttons could be touched.

Notice

- Please carefully read this manual before any work is carried out on this inverter, the installation, please keep this manual carefully stored and easy to access at any time.

- The qualified personnel should have had training in the installation and commissioning of the electrical system as well as dealing with hazards, knowledge of the manual and other related documents. As the installer or operator, they are required to be familiar with local regulations and directives.

- No Hardware alterations are allowed to the exterior or interior shell of the inverter. Doing so will void the warranty.

4. INTRODUCTION

4.1 ABOUT FORTRESS POWER

Our mission is to provide compact, user-friendly, and affordable energy storage solutions using the latest technology for all homes and businesses. Fortress solar energy storage batteries can easily integrate with new and existing PV systems and work with a wide range of existing inverter and charge controller manufacturers for ease in system design.

Contact Information

Corporate Headquarter Address: 2010 Cabot Blvd West, STE L
Langhorne, PA 19047
United States

Website: www.fortresspower.com
Phone: US: (877) 497-6937
LATAM: (215) 710-8960

4.2 WARRANTY SUPPORT

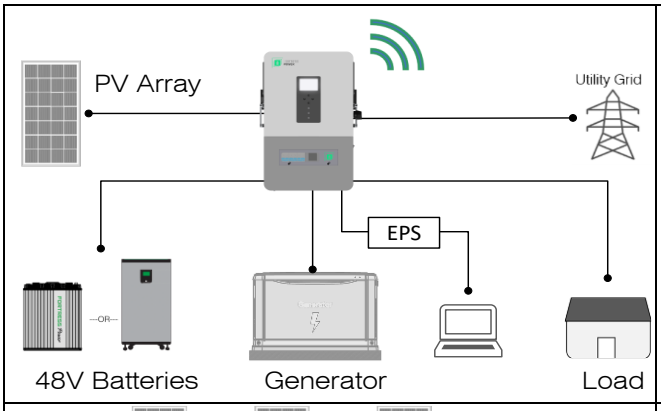
Unless otherwise submitting a Fortress warranty through the Guardian hub, please submit your SOLO 6.5kW warranty here: https://fortresspower.com/warranty
Beyond this product manual, you may also find our inverter guides useful to system installation and commissioning: https://support.fortresspower.com/portal/en/kb/inverter-guides

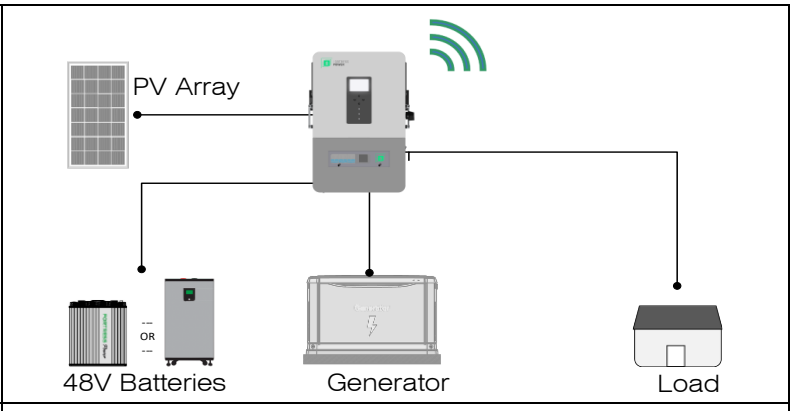
Beyond that, please find additional resources within our Support Portal https://support.fortresspower.com/portal/en/kb

- Create a support ticket.
- Inverter Guides
- Product Manuals
- Firmware Updates
- Warranty Submittal
- System Design
- Application Notes
- Scheduled Meetings
- Accessories

4.3 SYSTEM SOLUTION

This product and its associated system are suitable for the following system applications (system diagram):





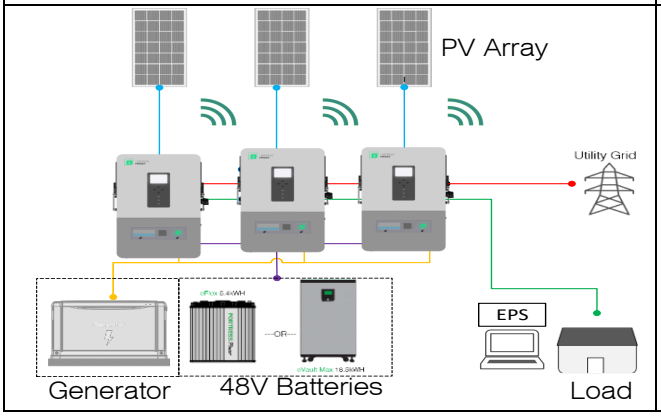


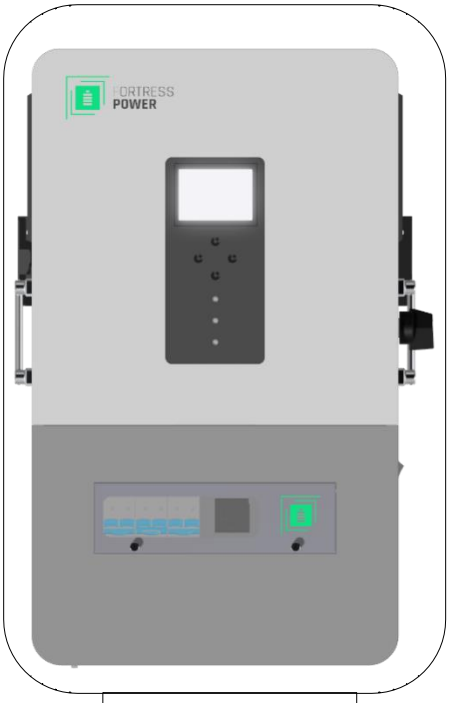
DIAGRAM NUMBER	APPLICATIONS
1	On-Grid, Backup, Zero Export (Does not support Net-Metering, or Export to the Utility Grid)
2	Off-Grid
3	3 Phase/ Parallel System

5. Data Sheet

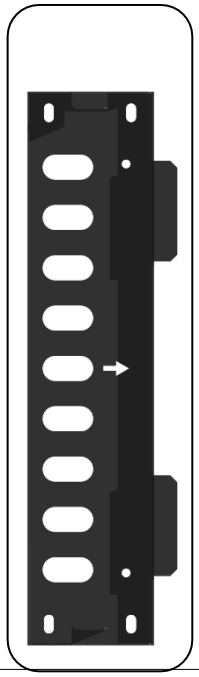
MODEL	FP-SOLO-6.5K
PV	
PV MAX. DC VOLTAGE	550VDC
PV INPUT VOLTAGE RANGE	125-550VDC
MAX DC SHORT CURRENT	25/25ADC
MAX USABLE DC CURRENT	18/18ADC
MAX DC POWER	5000+5000 (10000W)
MPPT VOLTAGE RANGE	150-450VDC
MPPT EFFICIENCY	99.9%
BATTERY	
BATTERY NOMINAL VOLTAGE	48VDC
BATTERY TYPE	Lithium
BATTERY VOLTAGE RANGE	40-60VDC
MAX CHARGE/ DISCHARGE CURRENT	140ADC/150ADC
MAX CHARGE/DISCHARGE POWER	6500W/6500W
MAX CHARGE FROM PV	140ADC
MAX CHARGE FROM AC SOURCE	80ADC
AC GRID INPUT	
NOMINAL AC INPUT VOLTAGE	120VAC 120VAC/240VAC 120VAC/208VAC 127VAC/220VAC
AC INPUT RANGE	130VAC-280VAC
FREQUENCY	50Hz or 60Hz
MAX AC PASSTHROUGH POWER	9600W
AC BACKUP OUTPUT	
UPS NOMINAL VOLTAGE	120VAC 120VAC/240VAC 120VAC/208VAC 127VAC/220VAC
UPS MAX OUTPUT POWER @120VAC @240VAC @208VAC	6500W 6500W 5636W
UPS NOMINAL CURRENT @240VAC @208VAC	27.1A 27.1A
SWITCHING TIME	10ms
FREQUENCY	50Hz or 60Hz
PEAK POWER OUTPUT	13000VA for 5s
NOMINAL GENERATOR INPUT VOLTAGE	120VAC 240VAC 208VAC
GENERATOR	
GENERATOR FREQUENCY	50Hz or 60Hz
MAX AC GENERATOR INPUT POWER	9600W
MAX CHARGING POWER TO BATTERY	4000W
GENERAL	
INGRESS PROTECTION	IP20
OPERATING AMBIENT TEMPERATURE RANGE	14-122°F(>115°F Derating)-10-50°C(>45°C Derating)
MAX PARALLEL UNITS	6
COMMUNICATION	RS485, CAN, USB, Dry Contact,
EXTERNAL MODULE	WIFI/GPRS
WEIGHT	50.7lbs (23kg)
DIMENSIONS	16.14*27.13*6.1 (in)----410x689x155 (mm)
NOISE	60dB
COOLING METHOD	Intelligent Fans
ROUND TRIP EFFICIENCY	93%
POWER FACTOR	1
THDV	<3%
TOPOLOGY	Transformer-less
ALTITUDE LIMITATION PERFORMANCE	>2000M

*ALTITUDE LIMITATION PERFORMANCE INCLUDE MAX CHARGING, DISCHARGING, ACTIVE POWER AND BACKUP OUTPUT KW	
IDLE CONSUMPTION	80W
SAFETY	
PV INPUT CURRENT LIMITING PROTECTION PV INPUT OVER-VOLTAGE PV NIGHT REVERSE CURRENT PROTECTION AC INPUT OVERVOLTAGE PROTECTION AC INPUT UNDER-VOLTAGE PROTECTION BATTERY OVER-VOLTAGE PROTECTION BATTERY UNDER-VOLTAGE PROTECTION BATTERY OVER-CURRENT PROTECTION AC OUTPUT SHORT-CIRCUIT PROTECTION HEAT SINK OVER-TEMPERATURE PROTECTION INVERTER OVER-LOAD PROTECTION.	
CERTIFICATIONS AND COMPLIANCE	RoHs/EN61000-6-1/EC61000-6-3/FCC 15 class B/IEC62109-1/IEC62109-2/UL1741

6. UNBOXING



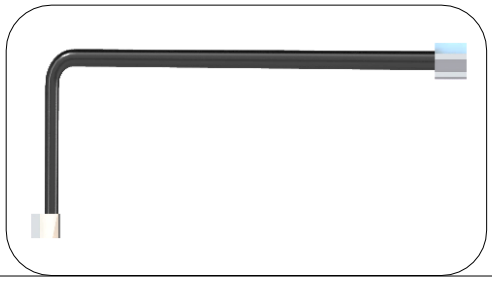
Solo 6.5kW Inverter



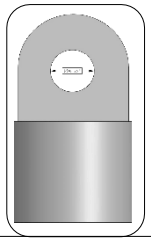
Wall Mount Bracket

Installation/ User Manual

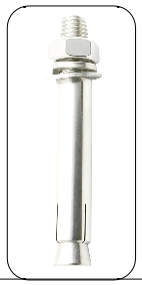
Dongle



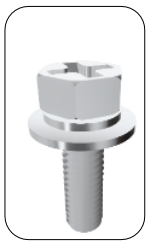
Inverter to Inverter Communication Cable x1



2/0 Lug Terminals
0.25"stud size x2



Expansion Screw x4



Phillips screw
M6*10mm
x2+2extra

Black Screws x4

7. Requirements

7.1 Breaker, Cable and Torque Requirements

***Please use the following Cable Gauge for the following included breakers for each system connection.**

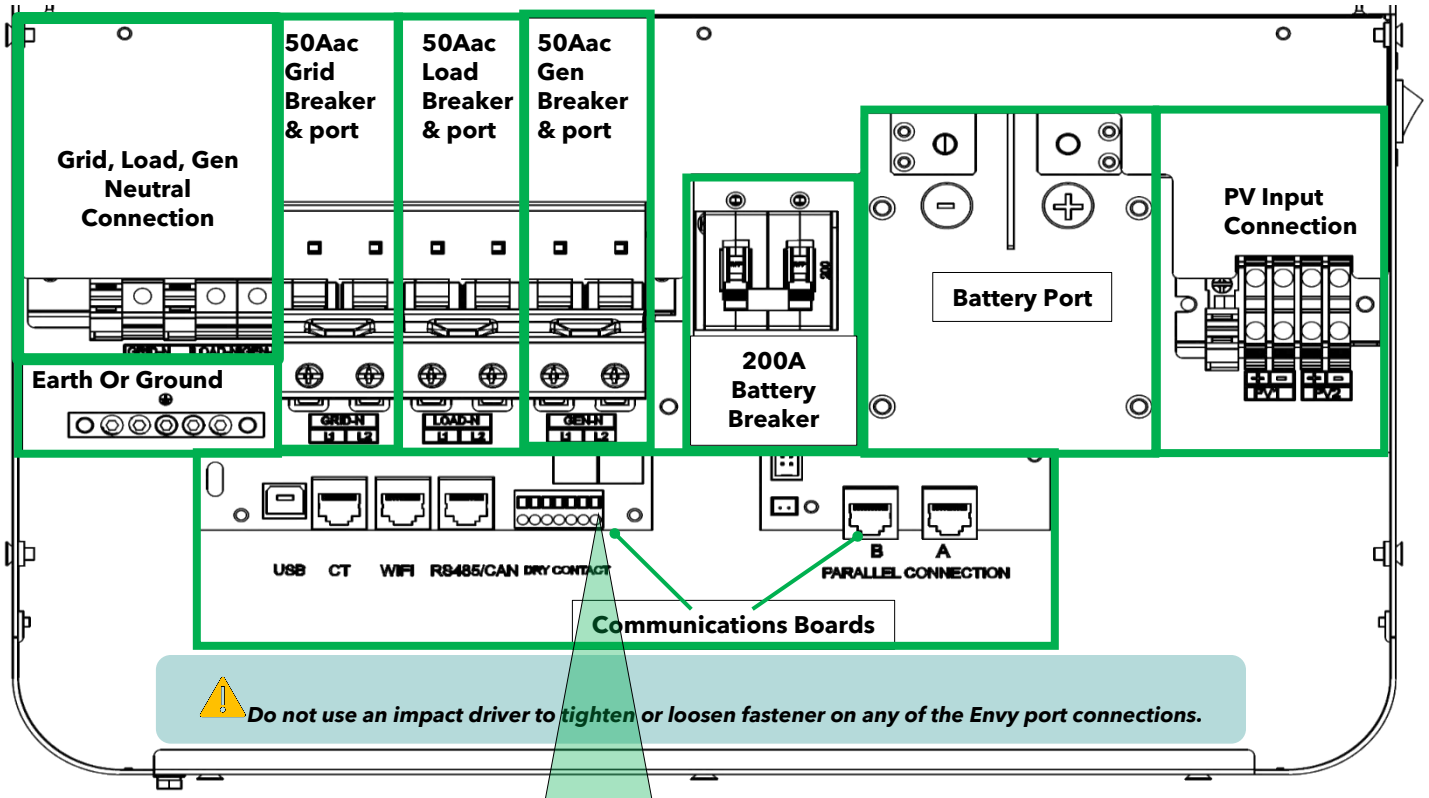
INCLUDED		CABLE GAUGE (AWG) REQUIRED	TERMINAL TYPE	TORQUE
LOAD BREAKER	2 Pole 50Aac	6 AWG	N/A Screw Method	2N.M
GENERATOR BREAKER	2 Pole 50Aac	6 AWG	N/A Screw Method	2N.M
GRID BREAKER	2 Pole 50Aac	6 AWG	N/A Screw Method	2N.M
BATTERY BREAKER	160Adc	2/0 AWG	Lug Terminal	4N.M
PV DISCONNECT	N/A	10 AWG	N/A Screw Method	1.5N.M
DRY CONTACT	N/A	16-24 AWG	Push clamp	N/A

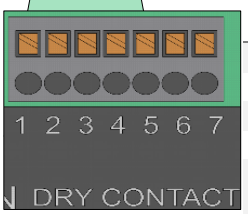
REQUIRED	Description
RSD NORMALLY CLOSED BUTTON	Number of poles depend on the number of inverters
ADDITIONAL 2/0 LUG TERMINALS	Used to Connect the other end of the cables to a busbar when multiple batteries are to an external busbar
DC AND AC CABLES	Size and length are Defendant on number of inverters and batteries being installed. Please refer to the wiring Diagrams

Note: Cable gauge also will depend on connection distance

8. Inside the Wire Cabinet

8.1 Connection Ports

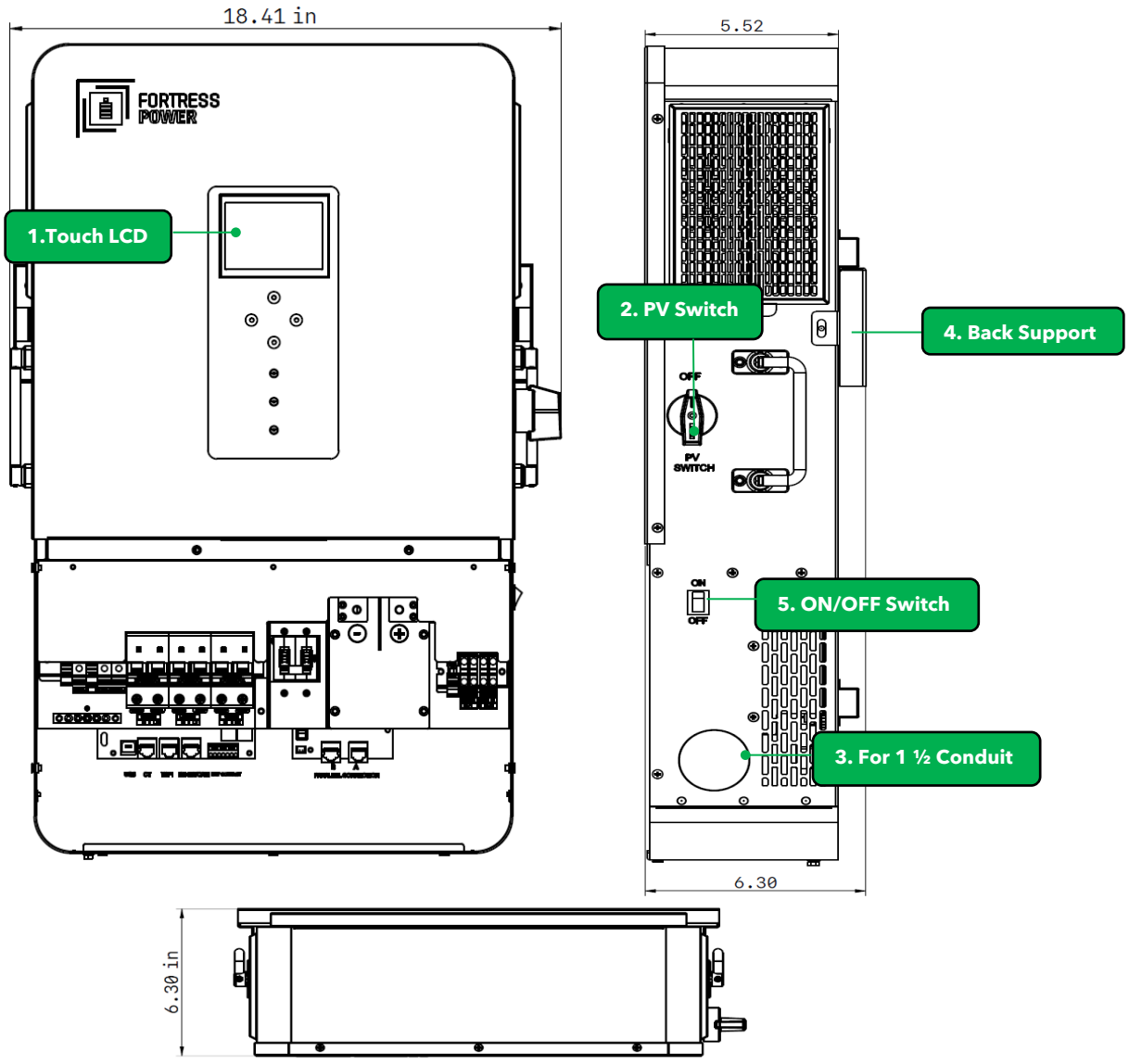




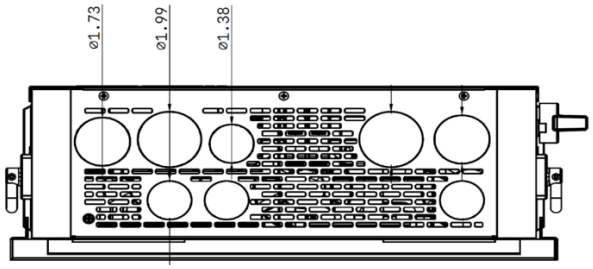
PINS	DRY CONTACT FUNCTION	NOTES
1	Ground	N/A
2	RSD	+12 (max 0.5A)
3-4	Reserved	Reserved
5&7	Dry Contact: Generator Start	Normally Open
5&6	Dry Contact: Based on Generator Start parameters	Normally Closed

9. SOLO DIMENSIONS

9.1 ENCLOSURE SPECIFICATIONS



9.2 KNOCKOUT PORT DIMENSIONS+



The holes are labeled in this manual to function only as guidance. You may the hole for other modular functions

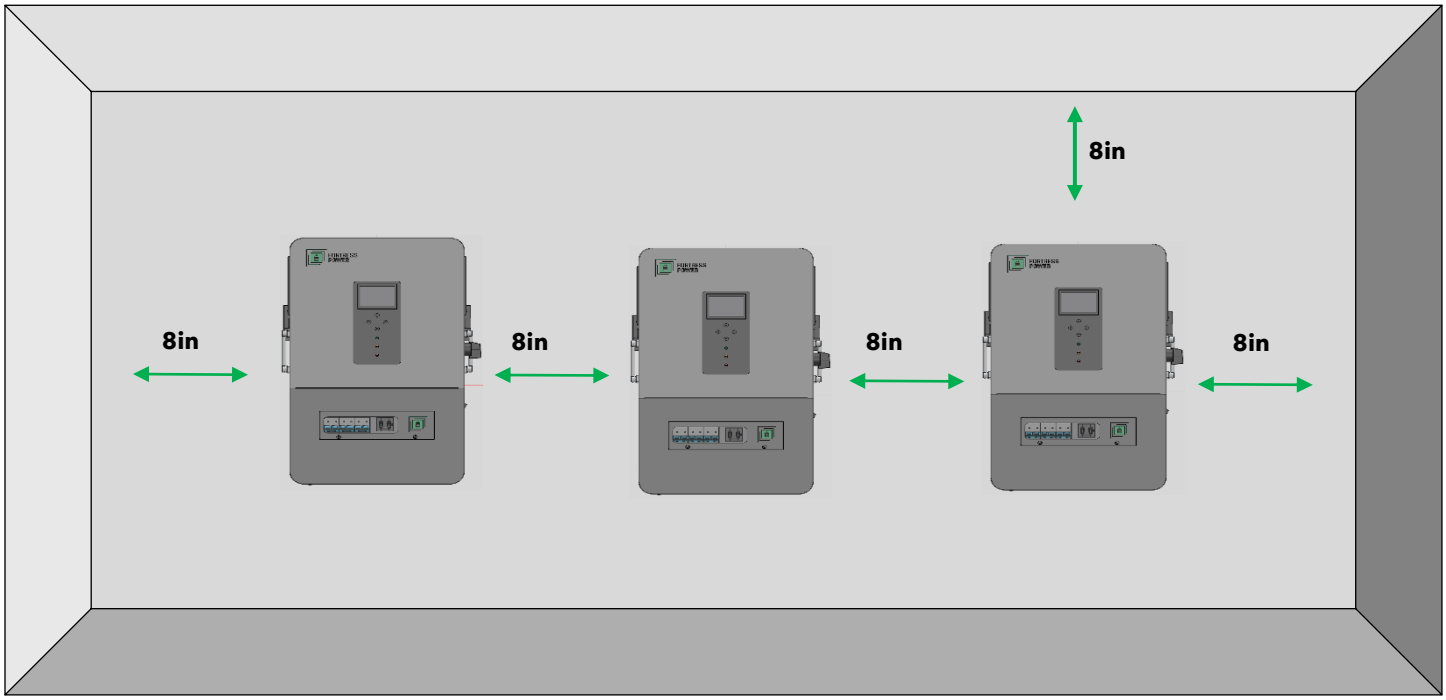
HOLE DESCRIPTION	WHOLE SIZE (INCHES)	STANDARD CONDUIT SIZE NEEDED (INCHES)
COM 1& 2	1.38	1
AC SIDE	1.73,1.99,1.38	1¼ , 1½, 1
PV	1.73, 1.42	1 ¼
BATTERY, LOAD, GRID	1.99	1 ½

10. Installation

10.1 Mechanical Installation

10.1.1 Spacing Requirements

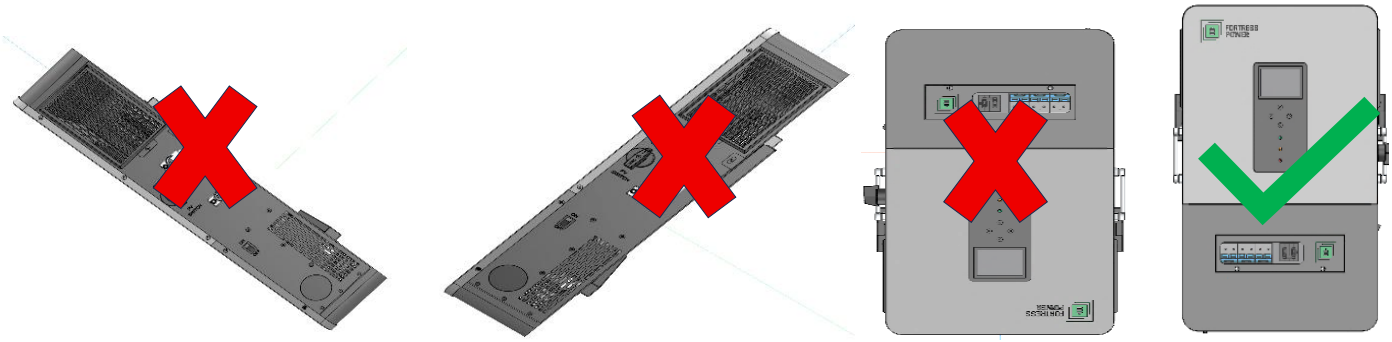
Please maintain the minimum clearances when using multiple inverters in parallel as presented below for adequate heat dissipation. A wireway, cabinet, or any sort of equipment can be mounted below the inverter's knockout section.



10.1.2 Location and Orientation

- **The inverter is allowed to be installed only indoors unless you use an outdoor enclosure.**
- **Ambient temperature: -10°C–55°C (14°F–131°F) operating temperature range**.
- **Consider Using Fortress Power Enclosure to mitigate for outdoor installations and extreme weather conditions.**
- **The inverter should be installed upright on a vertical surface.**

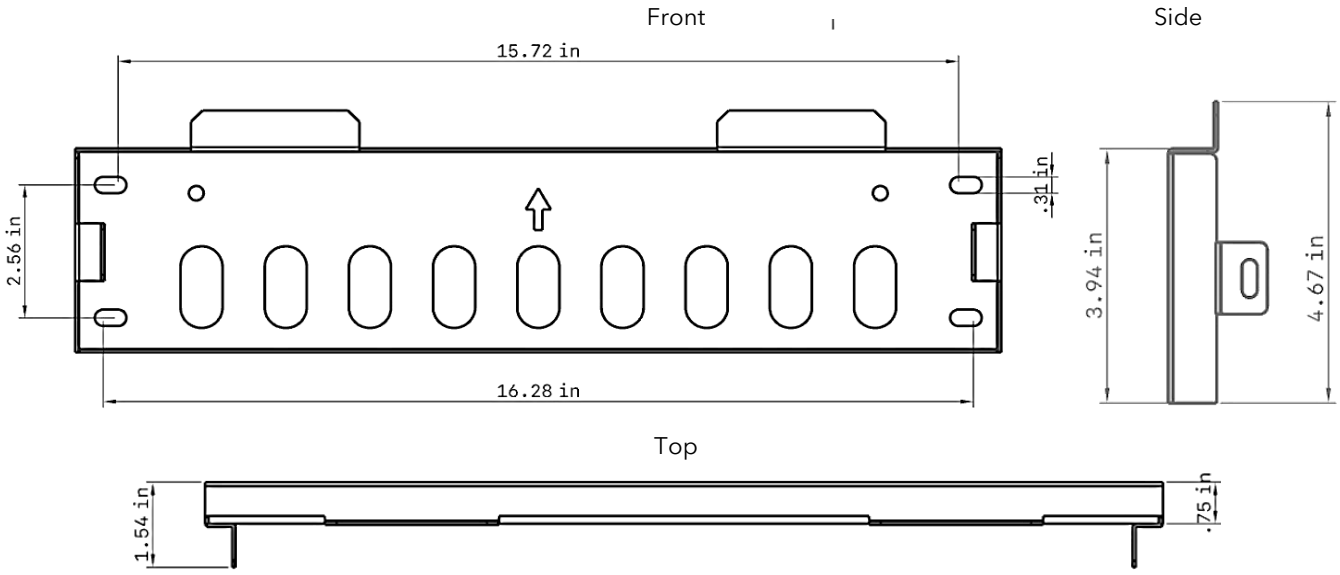
Accepted Configurations are as Follow:



10.1.3 Wall mounting

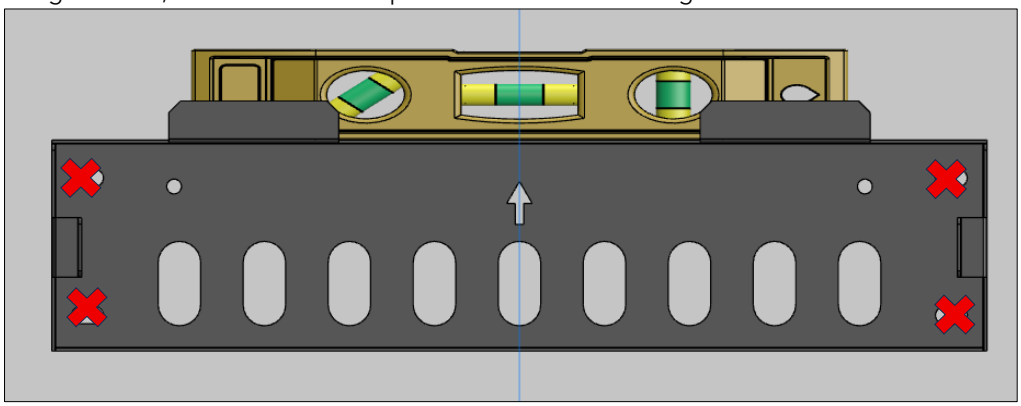
The mounting wall should be strong enough to bear the weight of the inverter.

The inverter is wall-mounted type and should be installed on a vertical, solid mounting surface, such as wood studs, brick, or concrete wall. One or two people may be needed to install the inverter due to its weight.



The mounting steps are as below:

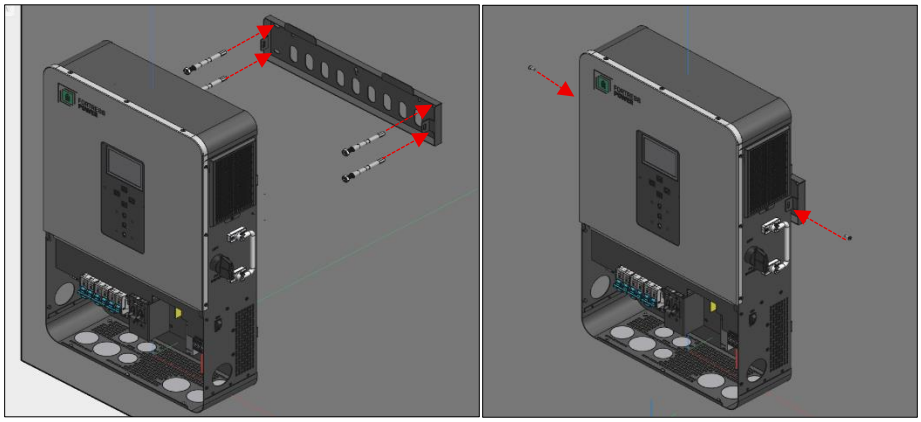
1. Using a leveler, mark the drill holes positions with the mounting bracket.



2. Drill 4 X 8mm(5/16inch) diameter holes, making sure the depth of the holes is deeper than 50mm(2inches).
3. Install and tighten the expansion bolts into the holes.
4. Then use the corresponding nuts and washers (packaged together with the expansion bolts) to install and fix the wall-mounting bracket on the wall.
5. Hang the inverter onto the wall-mounting bracket.
6. Lock the inverter on the wall using 2 self-tapping screws on the top of the inverter.

For installation on wood studs

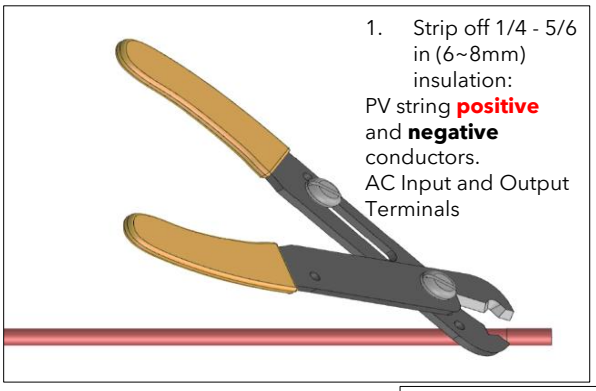
Fasten the mounting bracket on the studs with 4 wood screws, then hang the inverter onto the bracket and lock the inverter on the wall with 2 self-tapping screws.



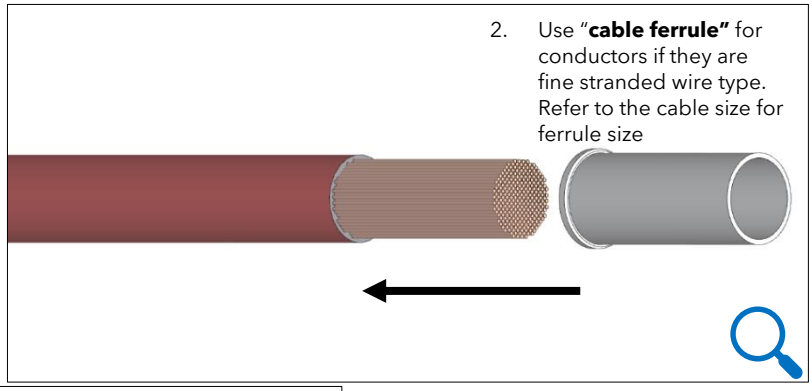
11. ELECTRICAL INSTALLATION

11.1 PREPARING THE CONDUCTORS

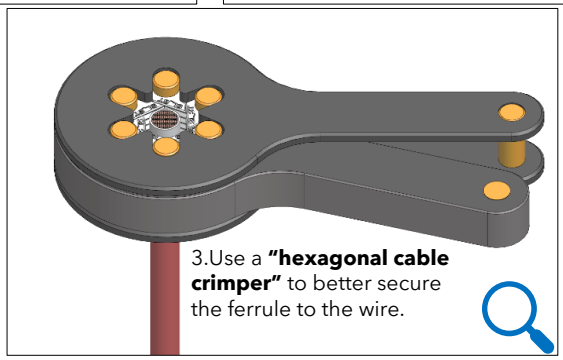
The recommended cable sizes are for reference only. For large distance between the PV array and the inverter, or between the inverter and the battery, it is advisable to use conductors with a larger cross-sectional area. This will help minimize voltage drop and ensure optimal system performance. To maintain system efficiency and comply with best practices, it is recommended to limit voltage drop to **no more than 3%** for feeders and branch circuits, as advised in the **NEC Informational Note to 210.19(A)(1)** and **215.2(A)(1)**.



1. Strip off 1/4 - 5/6 in (6~8mm) insulation:
PV string **positive** and **negative** conductors.
AC Input and Output Terminals



2. Use "**cable ferrule"** for conductors if they are fine stranded wire type. Refer to the cable size for ferrule size



3.Use a **"hexagonal cable crimper"** to better secure the ferrule to the wire.

Improper connections may result in creating a hotspot or arcing point on the PV ports, damage the inverter and/or cause fire. Please double check that there are no loose fine stranded wires

11.2 PV COMPONENTS AND CONNECTION

The PV connection of this hybrid inverter is the same as that of a traditional on-grid solar inverter (string inverter). The inverter has 2 MPPTs. For MPPT1 and MPPT2, users can connect 1 string of maximum 500V Voc. All two MPPTs work independently. All these strings are to be connected directly to the Inverter.

Please double check the lowest ambient temperature of the installation location. The rated Voc on solar panel nameplate is obtained at 25℃. As the ambient temperature drops, the Solar panel Voc increases. Please ensure the Maximum solar string voltage corrected at the lowest temperature does not exceed the inverter's maximum recommended input voltage of 500V.

Over voltage will damage the inverter. Do not use a PV combiner. Using a PV combiner may affect or cause permanent damage to the inverter. Do not use a PV combiner as this may cause damage to the inverter.

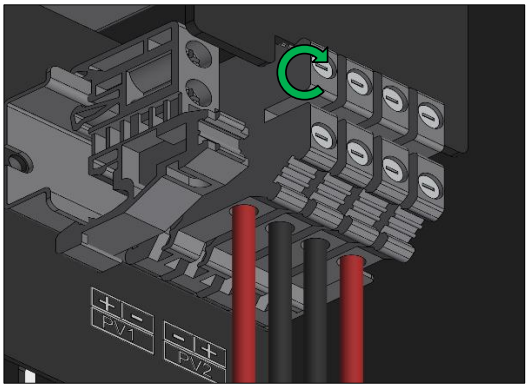
When users connect 2 strings to MPPT1, make sure the two strings have the same quantity of solar panels. The inverter's MPPT1/MPPT2/ max short circuit current is 18A/18A. It is optional to Protect the MPPT inputs by installing 25-amp fuse breakers

PV CABLE SIZE	MINIMUM CABLE VOLTAGE RATING
10-8AWG	600V

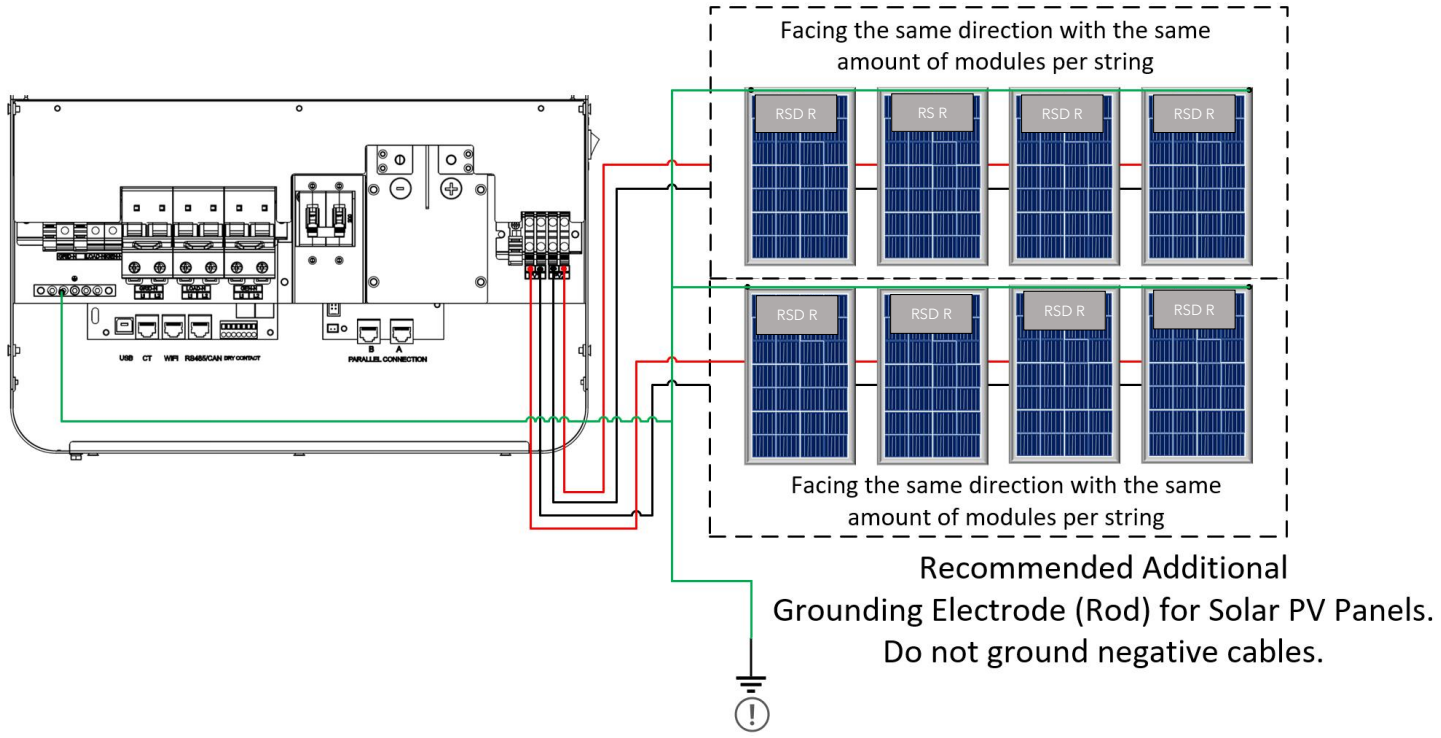
PV Connection Procedure

1.Take appropriate measures to ensure that the conduit and conduit fittings are fastened reliably and seal the cable entry holes.

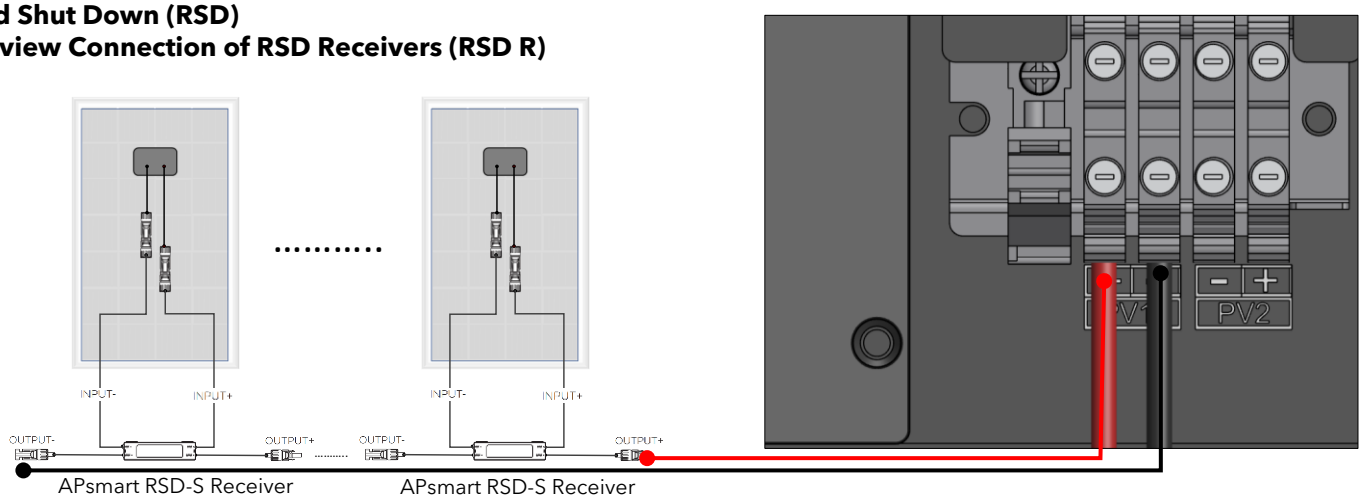
2. Insert the conduit fitting into the opening for PV connection and tighten it from the inside using the counter nut.
3. Route the PV conductors through the conduit fitting and into the inverter.

Unscrew the PV input. Insert the ferruled cable into the circular port. Ensure that the cables are connected correctly and securely by slightly pulling the cables.	

PV Connection Diagram



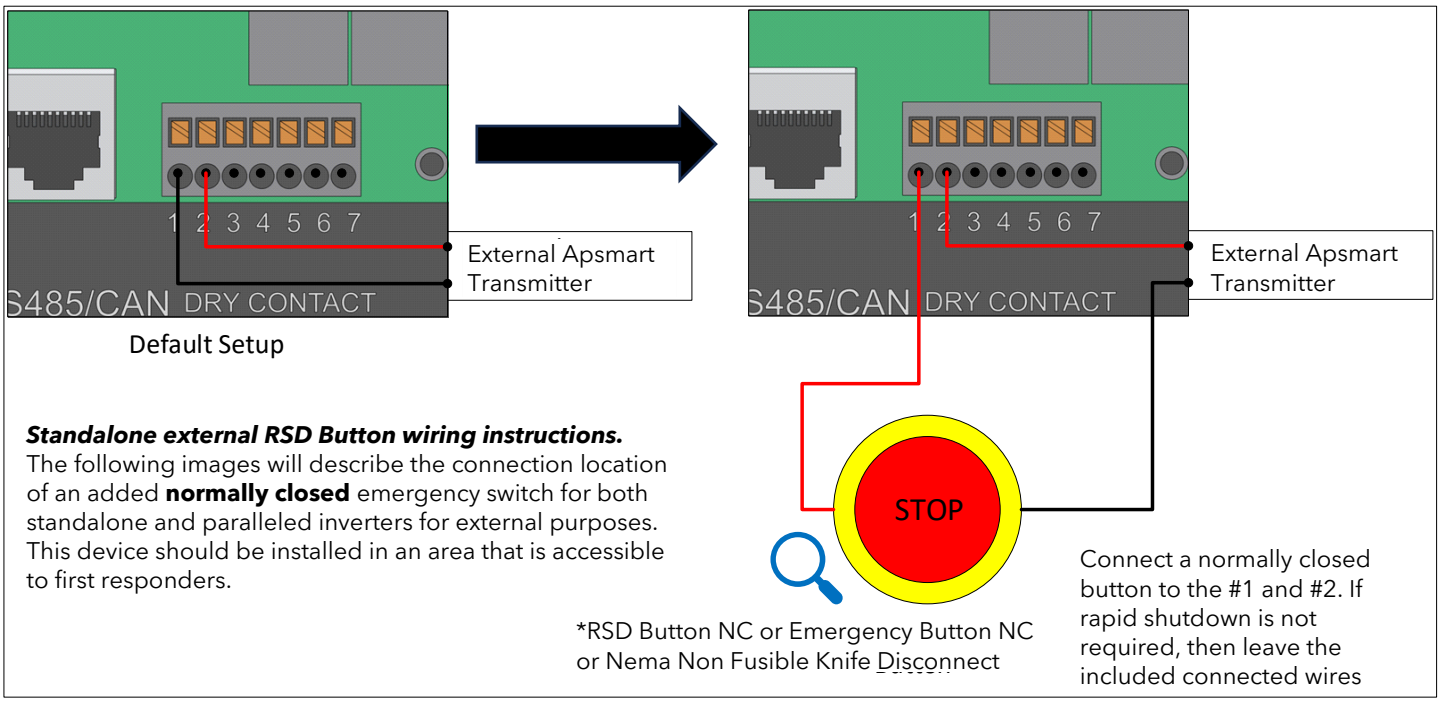
Rapid Shut Down (RSD)
Overview Connection of RSD Receivers (RSD R)



The Inverter **DOES NOT** include an **APsmart Rapid Shutdown Transmitter**, the **APsmart Rapid Shutdown System Transmitter** and **APsmart RSD-S/RSD-D receivers** (not included) work together as a rapid shutdown solution for PV modules. For more information on how to connect the APsmart receiver please refer to the RSD-S and RSD-D Installation Quick guide. The Transmitter sends a signal to the RSD- receivers, enabling the PV modules to remain connected and continue supplying energy while the Transmitter is powered on. When the Transmitter is switched off by the Emergency RSD button, the RSD receivers automatically enter rapid shutdown mode, halting energy production. This solution is compliant with the **2017** and **2020** specifications of the **NEC 690.12** and supports **SUNSPEC** signaling for rapid shutdown.

11.2.1 External RSD emergency Switch

The inverter Requires an external normally closed RSD button to be connected at the port 1 and 2 at the Dry Contact section. If an emergency occurs, simply activate the **"RSD STOP"** button. This will immediately cease the RSD power supply, causing the inverter to shut down the AC output, and reducing the voltage of the PV conductor to below **30V** within a timeframe of **30 seconds.**

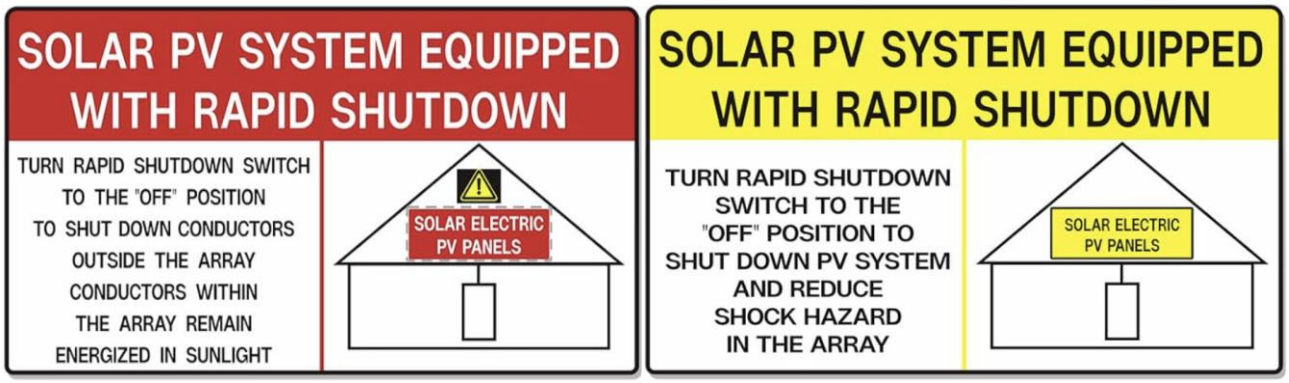


Standalone external RSD Button wiring instructions.
The following images will describe the connection location of an added **normally closed** emergency switch for both standalone and paralleled inverters for external purposes. This device should be installed in an area that is accessible to first responders.

*RSD Button NC or Emergency Button NC or Nema Non Fusible Knife Disconnect

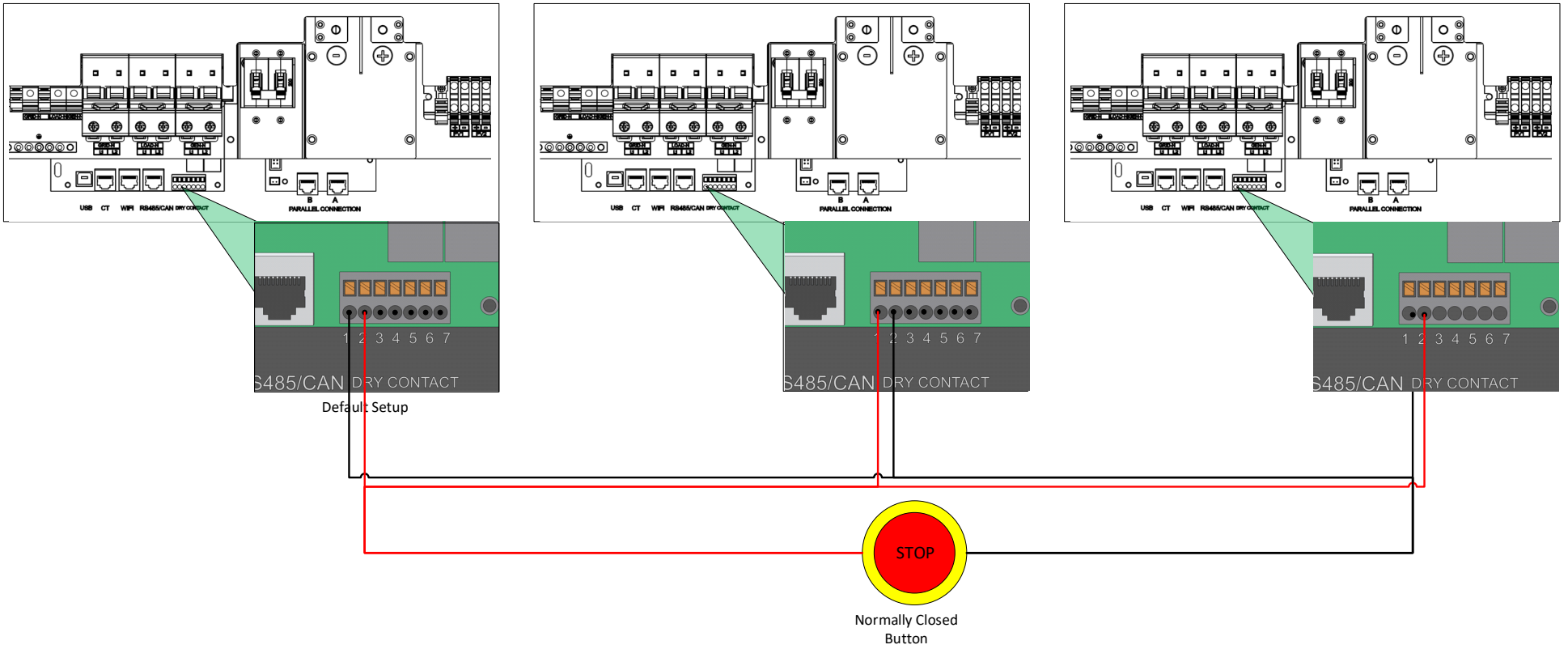
Connect a normally closed button to the #1 and #2. If rapid shutdown is not required, then leave the included connected wires

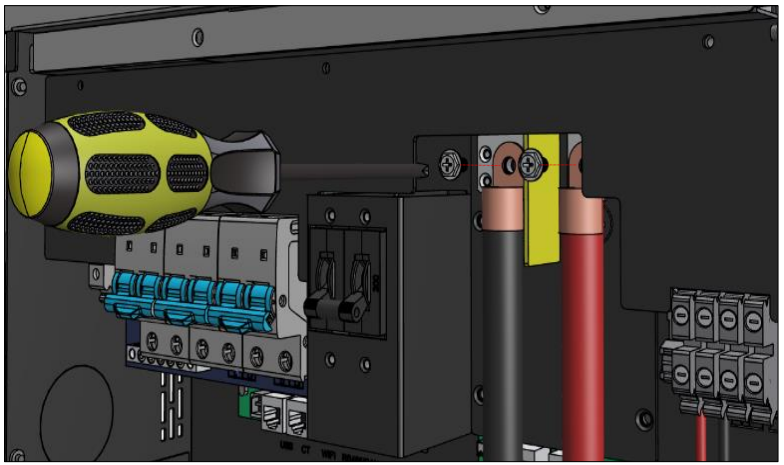
NOTE: Rapid Shut Down will be mandated depending on your jurisdiction.
***Rapid Shut Down button must be Labeled so that first responder can identify it in the event of an emergency.**
Please refer to the image below for a Rapid Shutdown label that is typically used.



Rapid Shut Down button in parallel mode

Run one small wires from each inverters' port 1 to one side of the RSD button and one small wire from each inverters port 2 to the other side of the RSD button.





11.3 Battery Connection

11.3.1 Connection requirements:

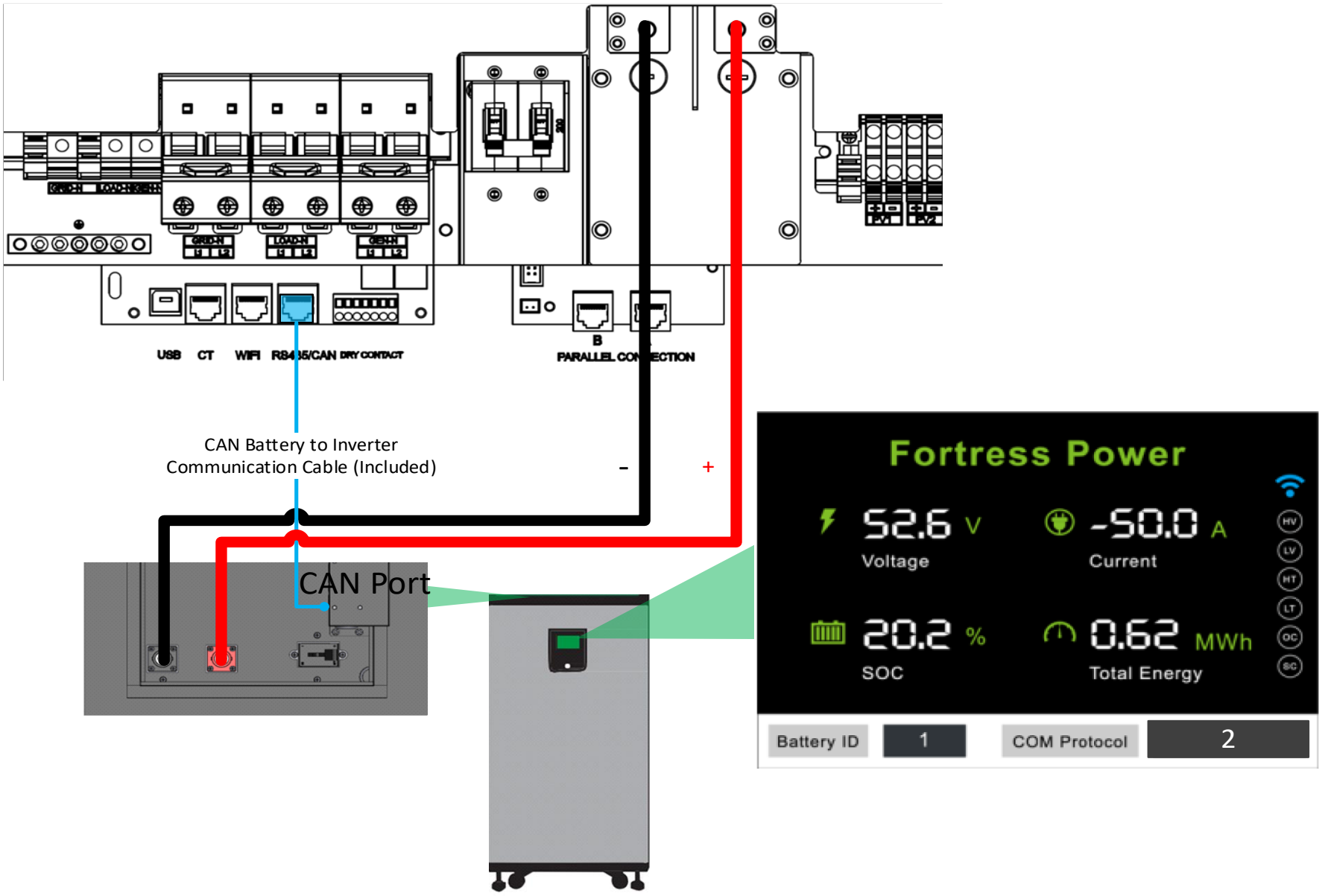
1. Strip 1/4-5/16 inch insulation from the cable end and crimp a ring terminal lug to the cable ends.

2. Route the battery power cable, connect positive to BAT+, negative to BAT-.

3.Secure and fastened the crimped terminal lug at the battery input port as depicted in the image below.

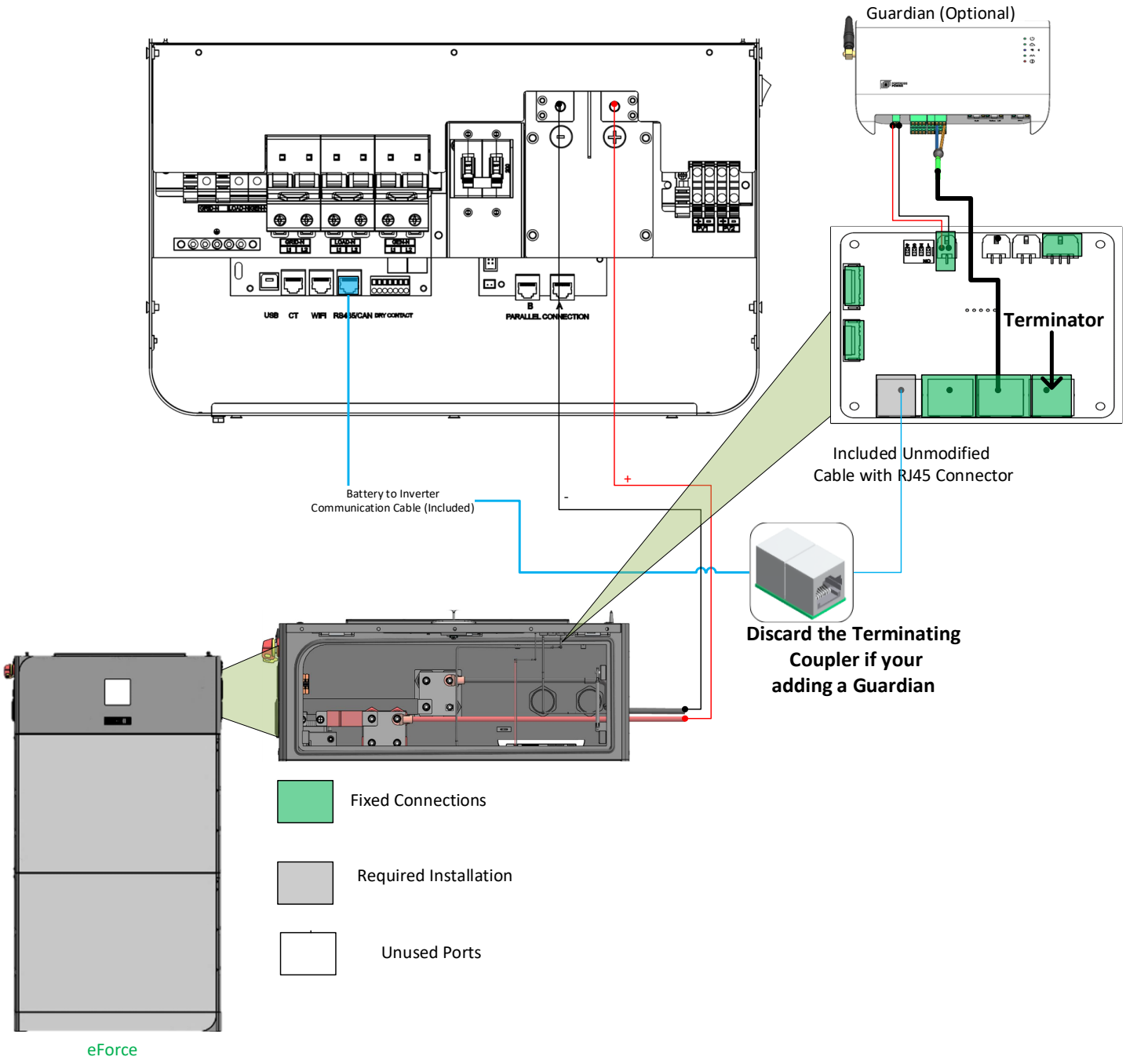
4. Fix the cable gland in place.
For best practice, install a copper busbar when paralleling two or more lithium batteries together.

Connection with eVault Max



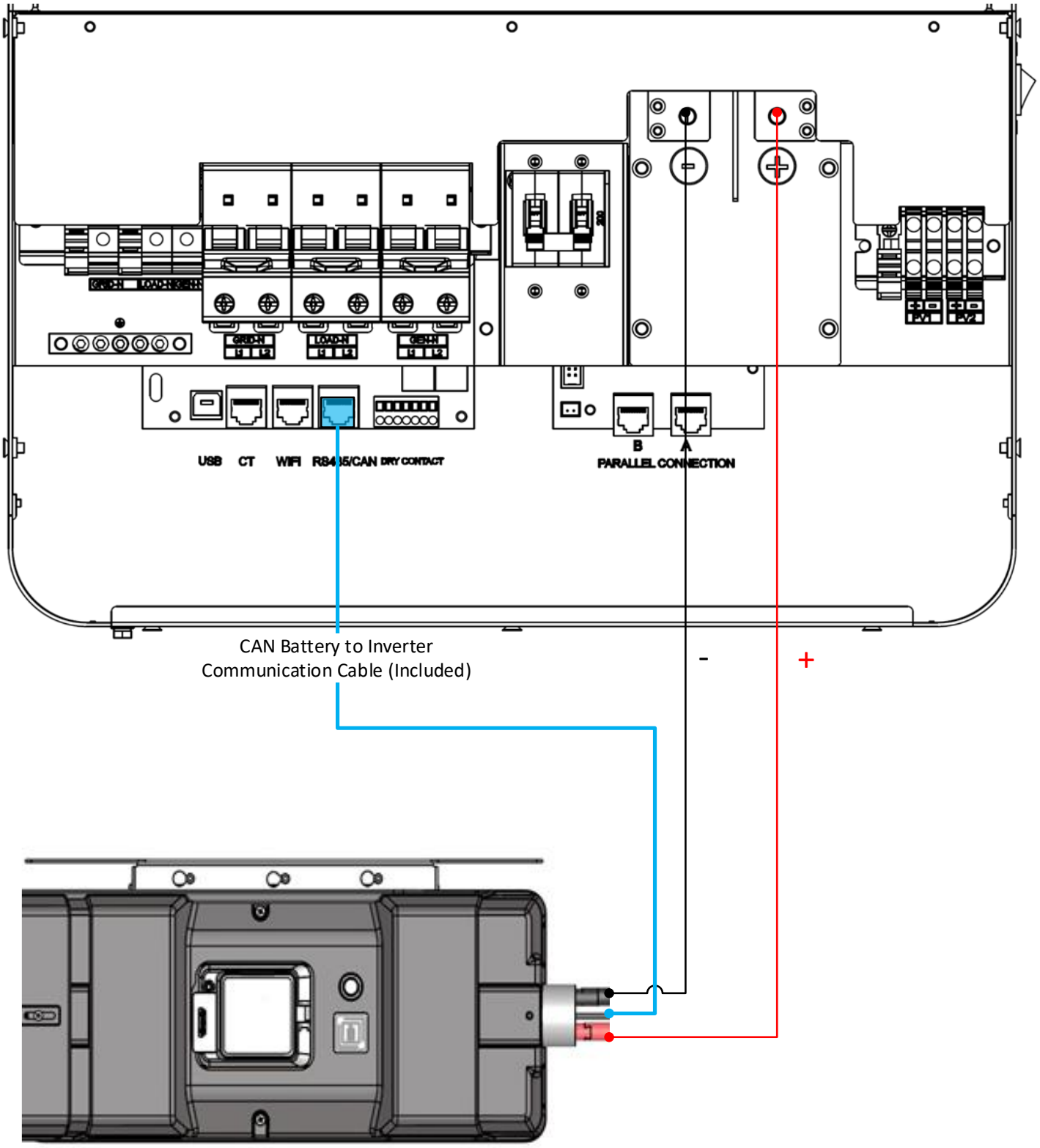
Reverse Polarity may damage the inverter. Do not make connections with battery breaker on or battery energized

Connection with eForce



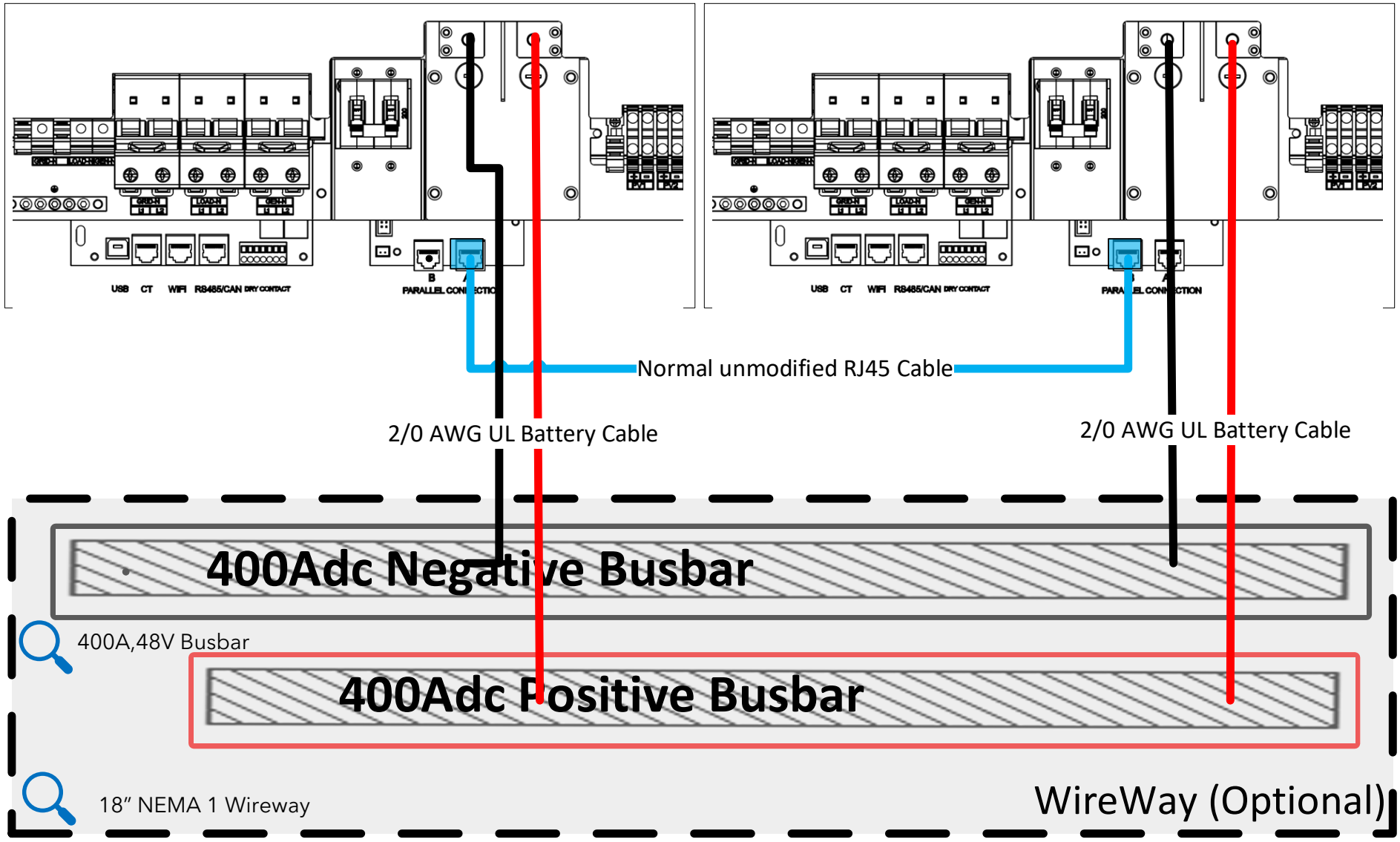
Reverse Polarity may damage the inverter. Do not make connections with battery breaker on or battery energized

Connection with eFlex Max



Reverse Polarity may damage the inverter. Do not make connections with battery breaker on or battery energized

Connect the included paralleling cables between inverters on the parallel connection ports. Some Fortress Power batteries such as the eForce or eBoost do not require a busbar when using less than 3 inverters since the batteries already include it when purchasing the eWay.



Minimum Battery to inverter Ratio and Cable connection Requirements

Use 2/0 UL Battery or Welding Cable to connect each inverter to a busbar

USE #2 UL BATTERY OR WELDING CABLE TO CONNECT EACH BATTERY TO A BUSBAR

SOLO 6.5K (QTY)	Additional Busbar (Rating)	**eFlex Max 5.4kWh** Minimum Battery (Qty)
1	200A (Not needed if you purchase the wall mount kit)	2
2	400A minimum	3
3	600A minimum	5
4	800A minimum	6
5	1000A minimum	8
6	1200A minimum	9

SOLO 6.5K (QTY)	ADDITIONAL BUSBAR (RATING)	**EFORCE 9.6KWH** MINIMUM BATTERY (QTY)
1	n/a	1(1 eWay)
2		1+1 separated (2 eWays)
3		2+1 (3 eWays)
4	800A minimum	2+2+1 (3 eWays)
5	1000A minimum	2+2+2 (3 eWays)
6	1200A minimum	2+2+2+1 (4 eWays

USE #2 UL BATTERY OR WELDING CABLE TO CONNECT EACH BATTERY TO A BUSBAR

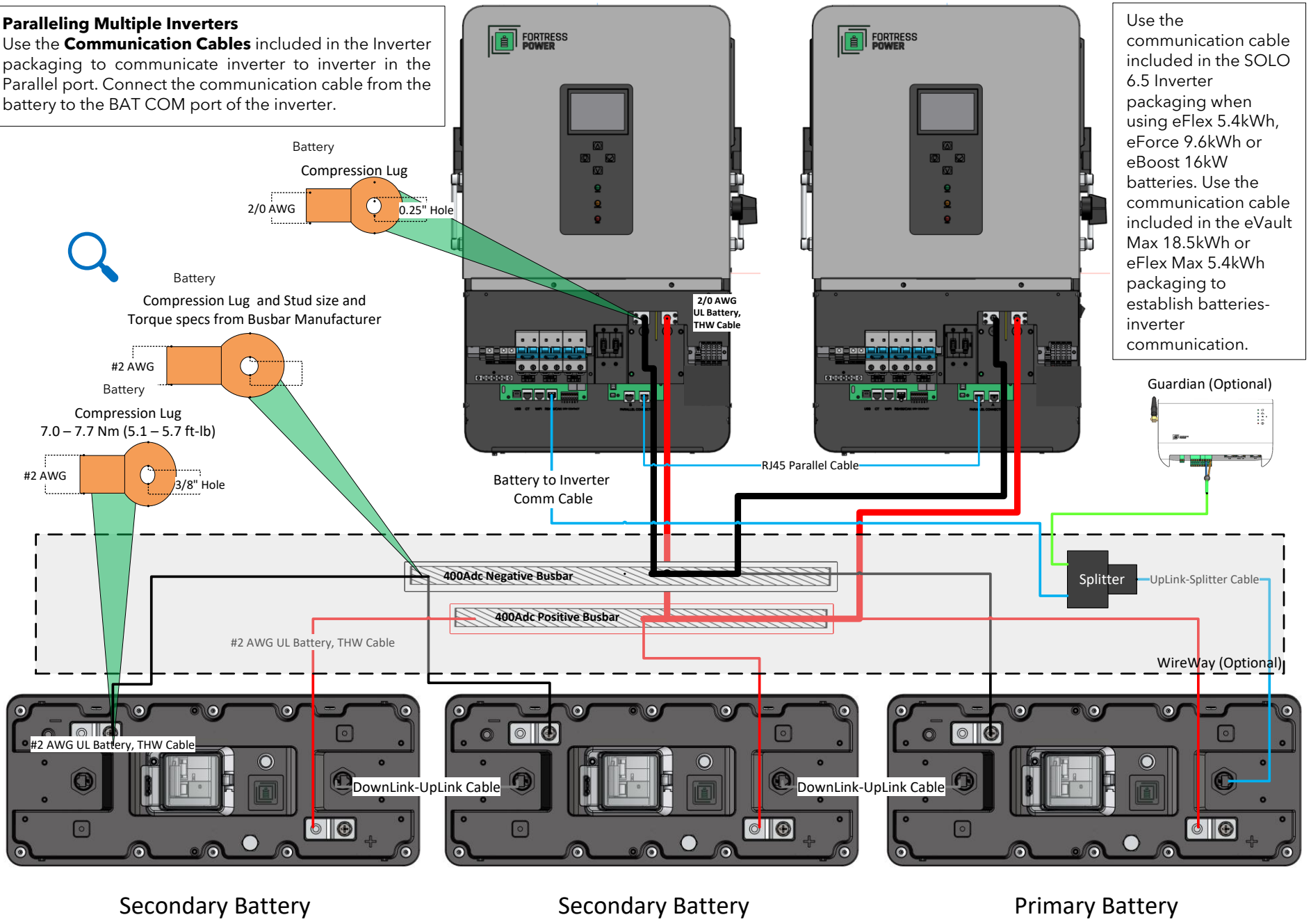
SOLO 6.5K (QTY)	Additional Busbar (Rating)	**eVault Max 18.5kWh** Minimum Battery (Qty)
1	200A	1
2	400A minimum	2
3	600A minimum	2
4	800A minimum	3
5	1000A minimum	3
6	1200A minimum	4

SOLO 6.5K (QTY)	ADDITIONAL BUSBAR (RATING)	**EBOOST 16KWH** MINIMUM BATTERY (QTY)
1	n/a	1
2		2
3		2
4	800A minimum	3
5	1000A minimum	3
6	1200A minimum	4

11.4 Paralleling Example using eFlex Max

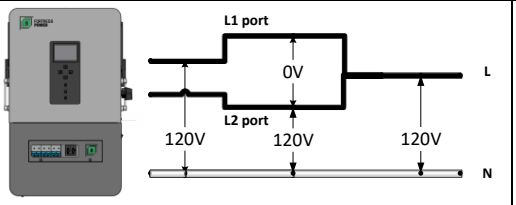
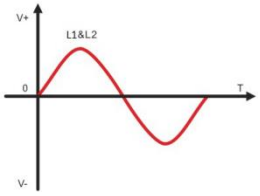
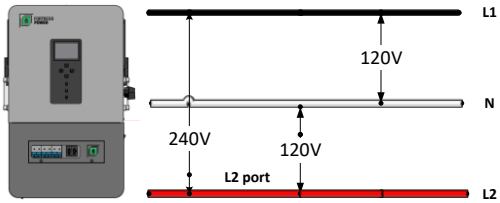
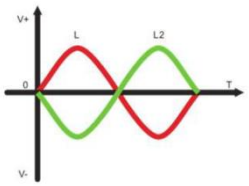
Paralleling Multiple Inverters
Use the **Communication Cables** included in the Inverter packaging to communicate inverter to inverter in the Parallel port. Connect the communication cable from the battery to the BAT COM port of the inverter.

Use the communication cable included in the SOLO 6.5 Inverter packaging when using eFlex 5.4kWh, eForce 9.6kWh or eBoost 16kW batteries. Use the communication cable included in the eVault Max 18.5kWh or eFlex Max 5.4kWh packaging to establish batteries-inverter communication.



11.5 AC CONNECTION

Output Voltage supported by the Solo 6.5kW inverter

Voltage(AC)	Power	Configuration	Sinewave	Phase angle	Notes
Nominal:120V Range:100-120V	6500W			0°	Suitable for only 120V Loads
Nominal: 120/240 Range: 200-240V	6500W			180°	Suitable for homes that have 240V Splitphase or 208V* three phase loads when adding 3 inverters
*Also supports: 120/208 3 Phase with 3 inverters minimum 127/220 3 Phase with 3 inverters minimum					
Only use a generator with the same nominal voltage that was set at the inverter. Failure to do So may cause damage to the inverter and void your warranty.					

11.5.1 GRID CONNECTION

Types of Feed in AC Connection

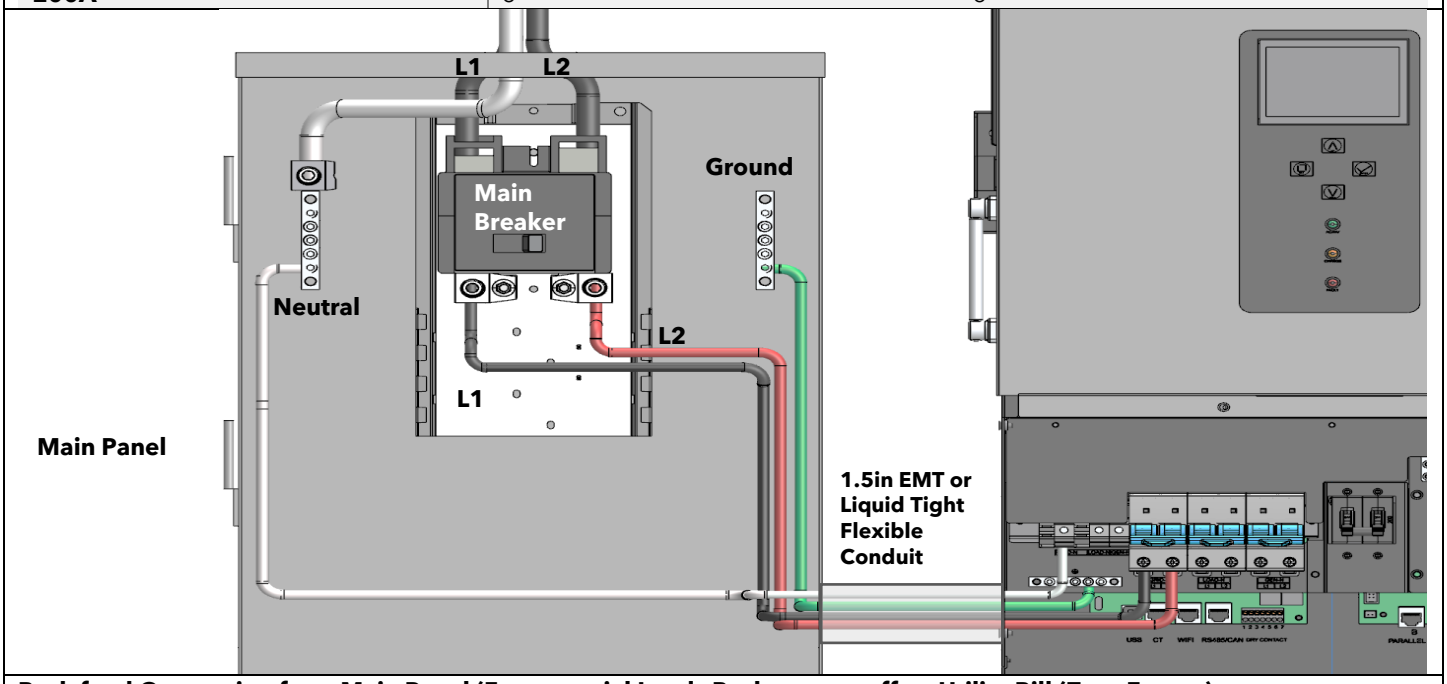
Use these drawings as guide for the type of connection based on the application. Please Follow the wiring diagram section. You still need to consult a professional certified electrician electric and always adhere to the Authority Having Jurisdiction.

Always turn off the feed in breakers before performing the installation.

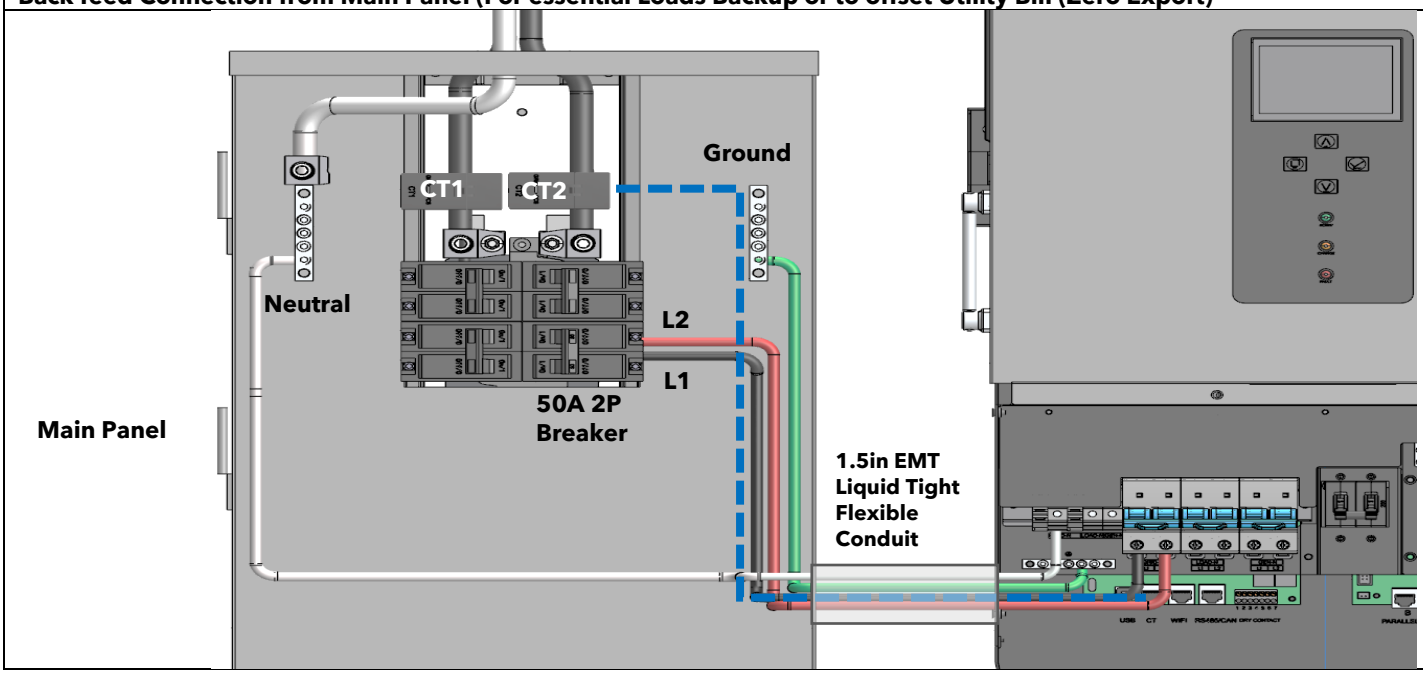
Whole Home Back Up (For Whole home backup, Offset utility bills, Off Grid)

To avoid potential Overload issues, we recommend the following configurations based on the property's breaker size. Inverters have internal current sensing and therefore do not need an external CT unless there are multiple inverters in parallel or using a back feed connection from the main panel.

FOR HOMES WITH MAINBREAKER SIZE	RECOMMENDED QTY. OF INVERTERS FOR PASSTHROUGH	QTY. OF INVERTERS FOR PASSTHROUGH FOR TRUE BACKUP
40-70A	1	2
100A	2	3
200A	3	6



Back feed Connection from Main Panel (For essential Loads Backup or to offset Utility Bill (Zero Export)

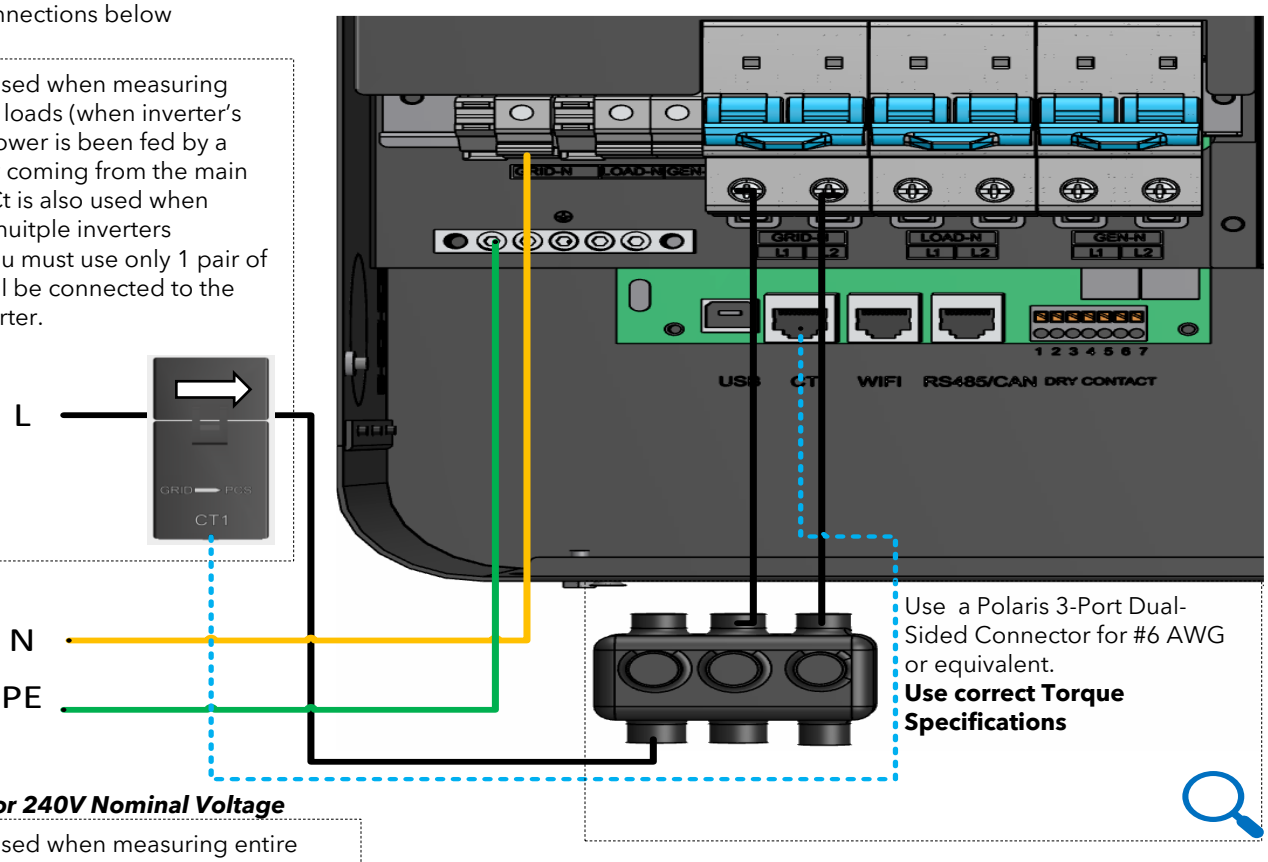


Ground Neutral Bond

Make a bond connection between the Neutral and Ground at the Main Breaker Panel or you may also only make the bond once at the Utility Meters with breaker attached if applicable.

Connection for 120V Nominal Voltage
Follow the connections below

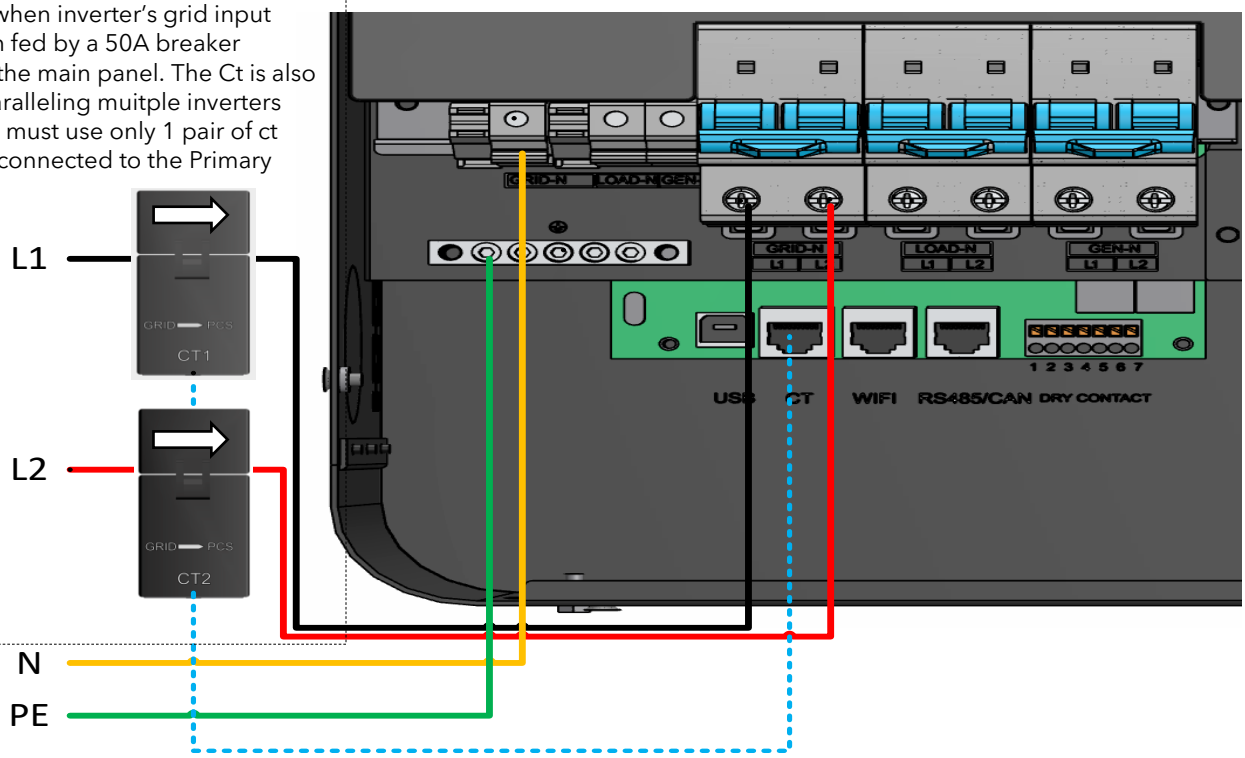
CT* is only used when measuring entire home loads (when inverter's grid input power is been fed by a 50A breaker coming from the main panel. The Ct is also used when paralleling muitple inverters together. You must use only 1 pair of CT which will be connected to the Primary Inverter.



Use a Polaris 3-Port Dual-Sided Connector for #6 AWG or equivalent.
Use correct Torque Specifications

Connection for 240V Nominal Voltage

CT* is only used when measuring entire home loads (when inverter's grid input power is been fed by a 50A breaker coming from the main panel. The Ct is also used when paralleling muitple inverters together. You must use only 1 pair of ct which will be connected to the Primary Inverter.



*Not included with the Solo product.

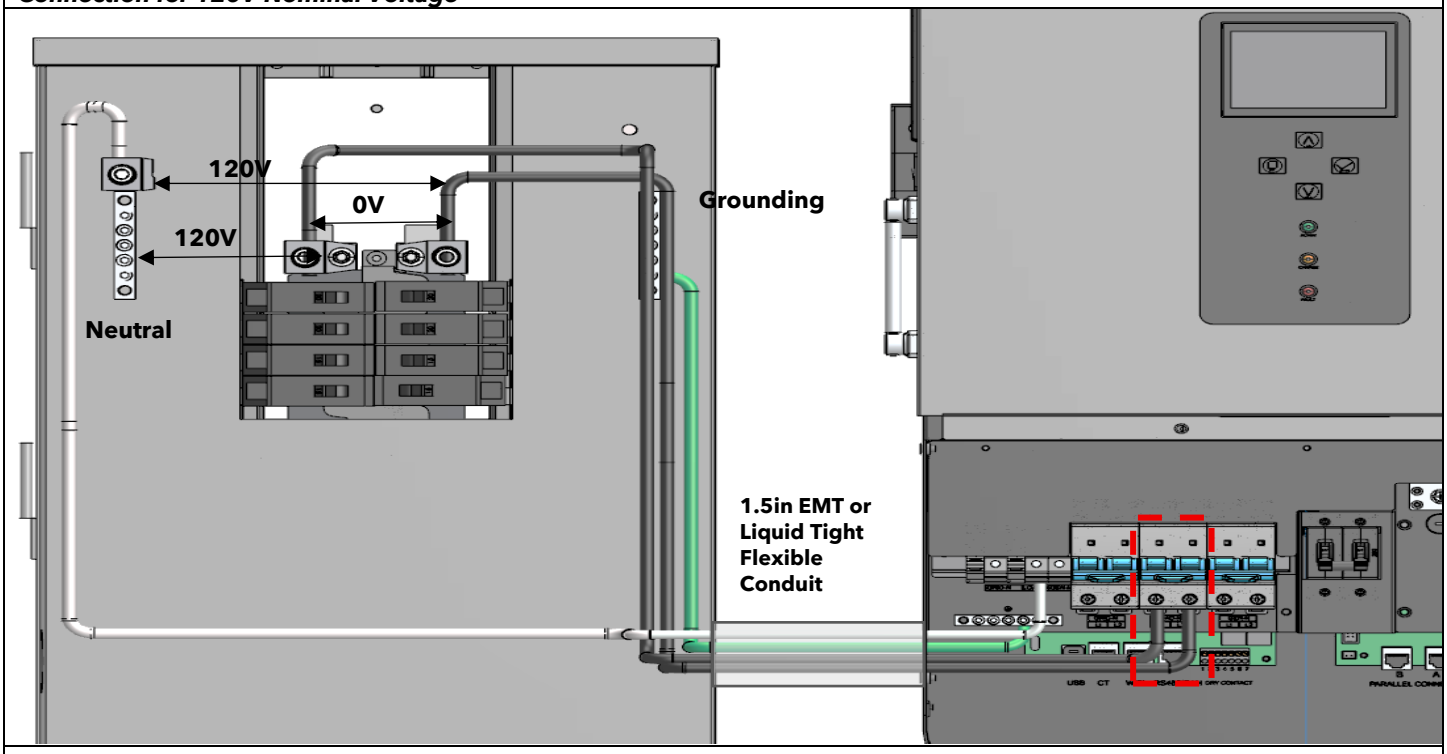
11.5.2 Load Port Connection

Types of AC Voltage Connection

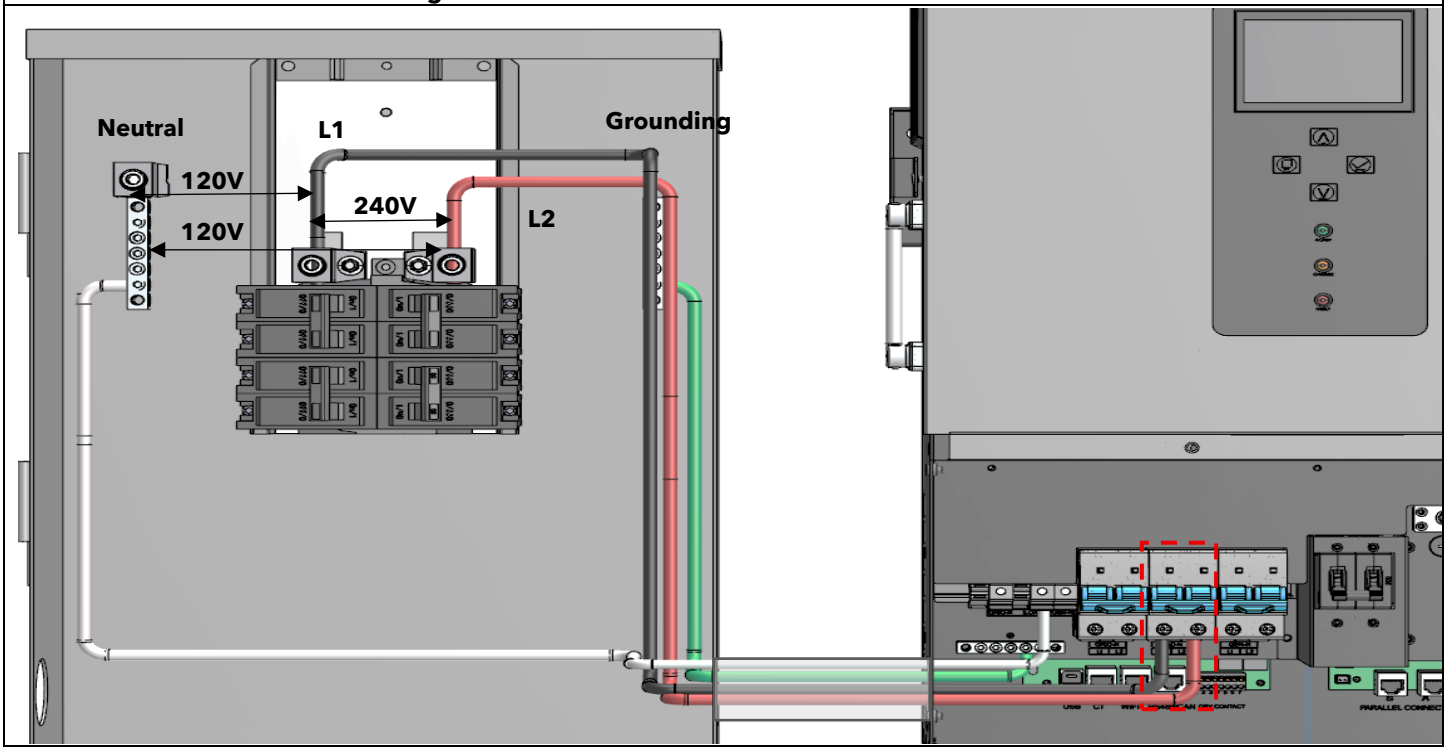
Use these drawings as guide for the type of connection based on the application. Please Follow the wiring diagram section. You still need to consult a professional certified electrician electric and always adhere to the Authority Having Jurisdiction.

Always turn off the feed in breakers before performing the installation.

Connection for 120V Nominal Voltage



Connection for 240V Nominal Voltage

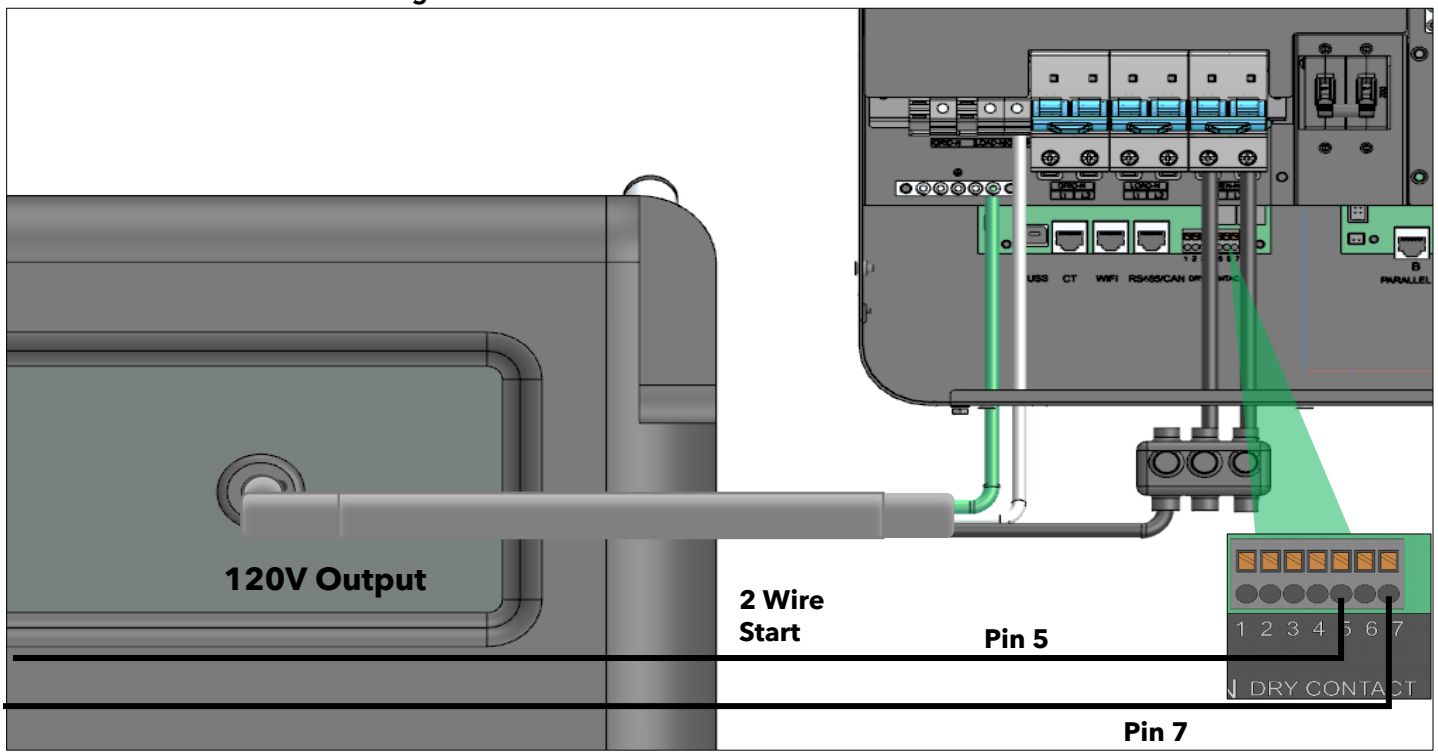


11.5.3 GENERATOR CONNECTION

The minimum recommended **continuous output generators rating** is **4kW**. This number will double depending on the amount of inverters being installed.

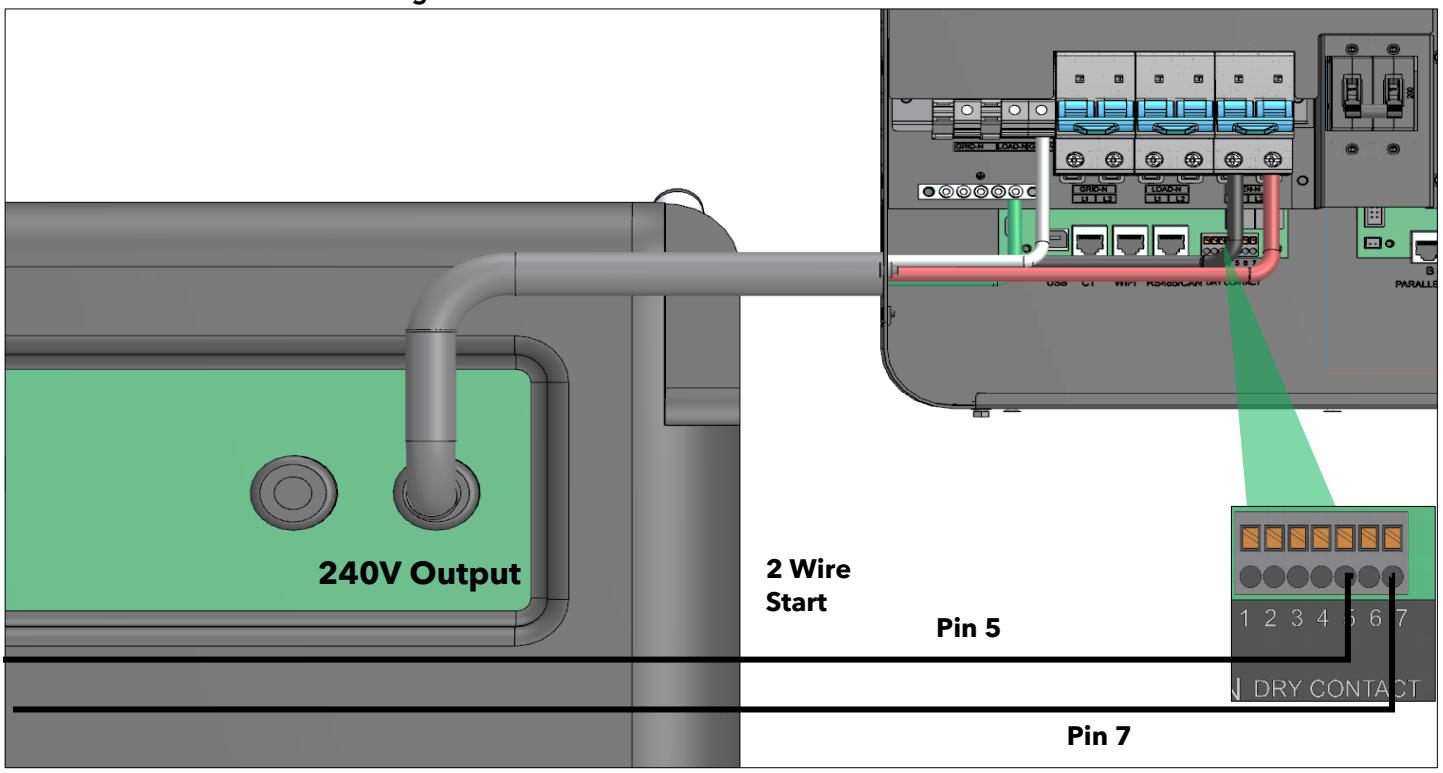
When Programming the LCD make sure to Set the correct generator charging power to avoid generator from throttling.,

Connection for 120V Nominal Voltage



Split the Line (Hot) lead connection so that it may be connected to the L1 and L2 port of the Solo inverter. Make sure to Set the inverter for 120V when programming on LCD interface.

Connection for 240V Nominal Voltage



This hybrid inverter can work with a generator. There are Gen ports on the inverter for generator connection. Generator requirements: the generator should be neutral bonded type, with **240V/120V**, or **120/208V 3 phase** when 3 inverters are connected to generate a 3-phase output. When the generator starts, all the loads connected to EPS Load will be supplied by the generator while simultaneously charging the batteries.

The pass-through relay capability of the generator is 40A. When the generator is on, please ensure the total load and charge current will not exceed 40A. The generator start signal shall be connected to the COM board GEN Nominal Open Pin 5 and 7), or Nominal Close (Pin 5 and Pin 6) port if users want to start generator remotely.

12. COMMISSIONING AND POWERING DOWN SEQUENCE

THERE ARE MULTIPLE LOCATIONS for these Breakers / Switches

- **Battery and Grid, Generator, Load breakers are inside the SOLO 6.5kW Wire Bay**.
- **PV disconnect switch is on the side of the SOLO 6.5kW**.

12.1 START UP THE INVERTER

Before proceeding, place all AC and DC breakers off

1. Switch ON the Battery Breaker inside the inverter and external battery if applicable.
    a. Turn on the battery system.
    b. Turn on the switch on the right side of the inverter.
        i.If the Inverter does not power up, Stop and correct the issue until it powers up
2. Program the parameters in the LCD screen
    a. Inverter Programming
        i.LCD programming is detailed in the user manual.
    b. Battery communication
        i.Confirm battery voltage, SOC.
    c. PV connection
        i.Prior to turning it on, make sure there is no reverse polarity. Confirm PV voltage per MPPT.
3. Turn on PV Switch on the Inverter.
4. Switch ON the Load Breaker inside the inverter.
    a. Turn on small loads and gradually increase to higher loads as needed.
5. Turn on Grid Breaker and Gen Breaker if applicable

12.2SHUT DOWN THE INVERTER.

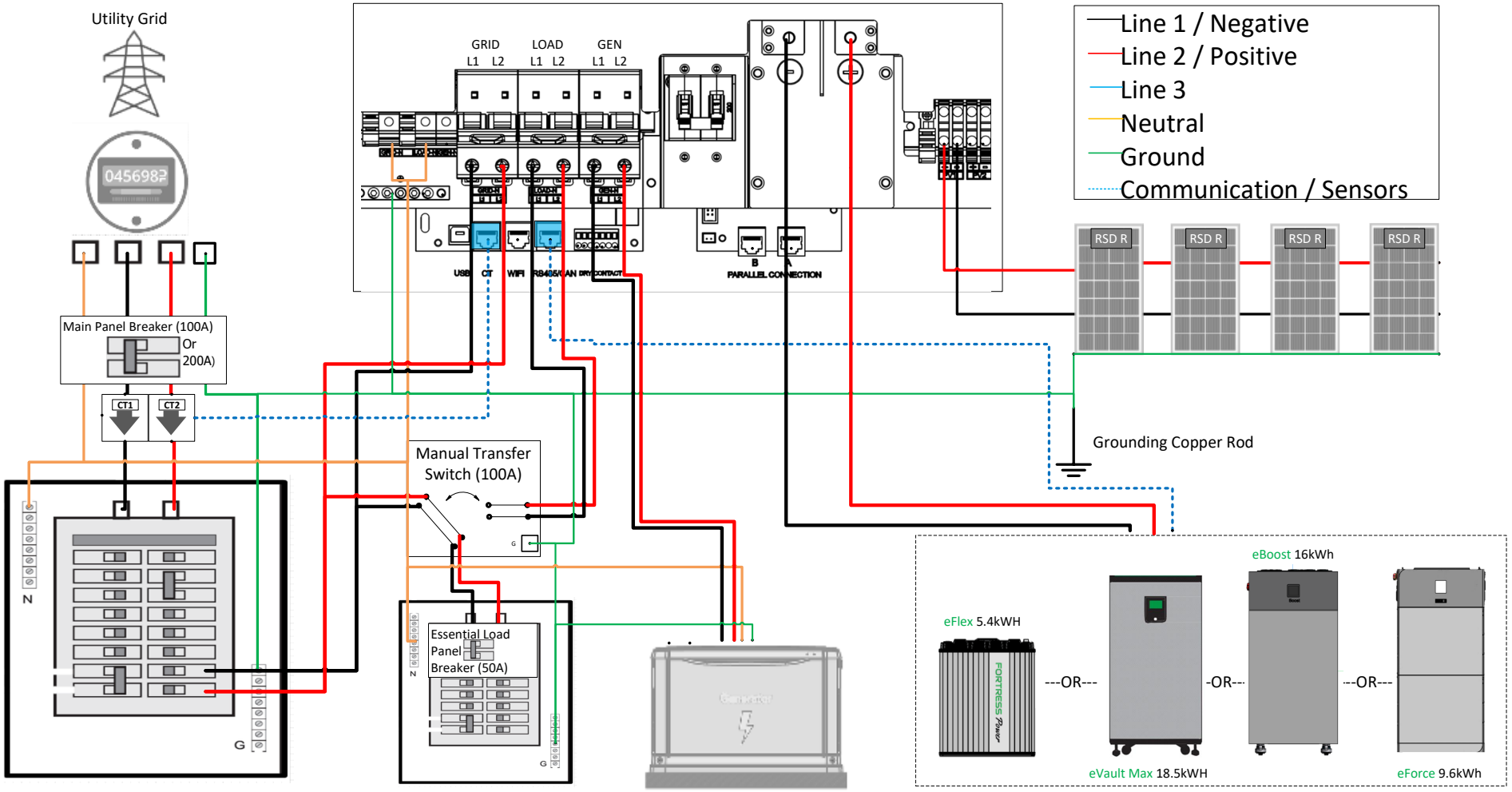
Danger: Do not disconnect the battery, PV, and AC input power under load. If there is an emergency issue, and you must shut down the inverter, please follow the steps below.

1. Power loads off
2. Turn Off Generator breaker.
2. Turn OFF the Grid breaker that feeds inverter.
3. Switch OFF the Load breaker inside the inverter.
4. Turn OFF PV Switch on the side of the inverter.
5. Switch OFF the Battery breaker inside the inverter.

∠. Wait for the LCD to turn off.

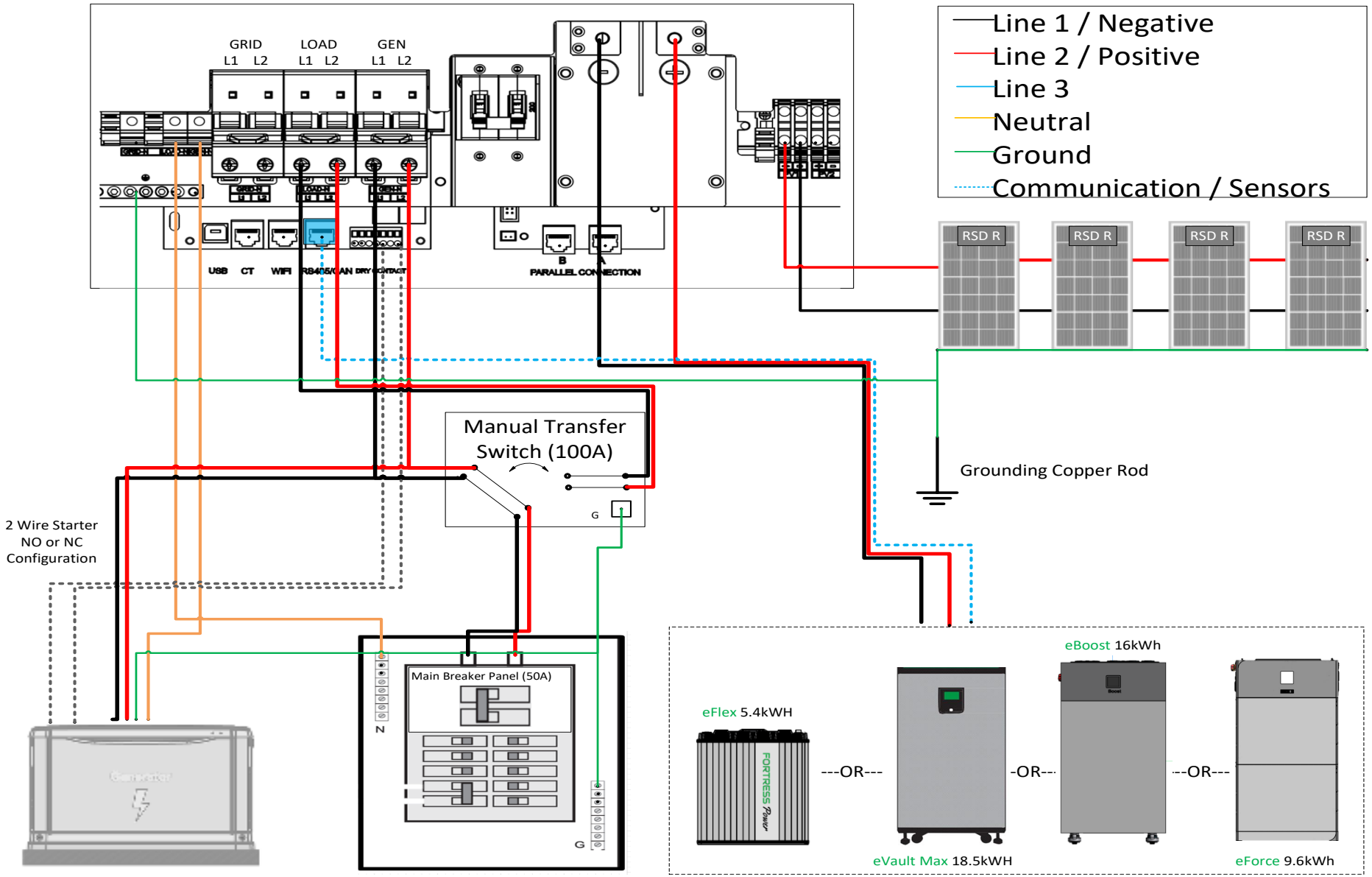
13. Typical Use Case Wiring Diagrams

13.1.1 Essential Loads Backup Applications with Backfeeder Connection (Split-Phase Service 120/240V)



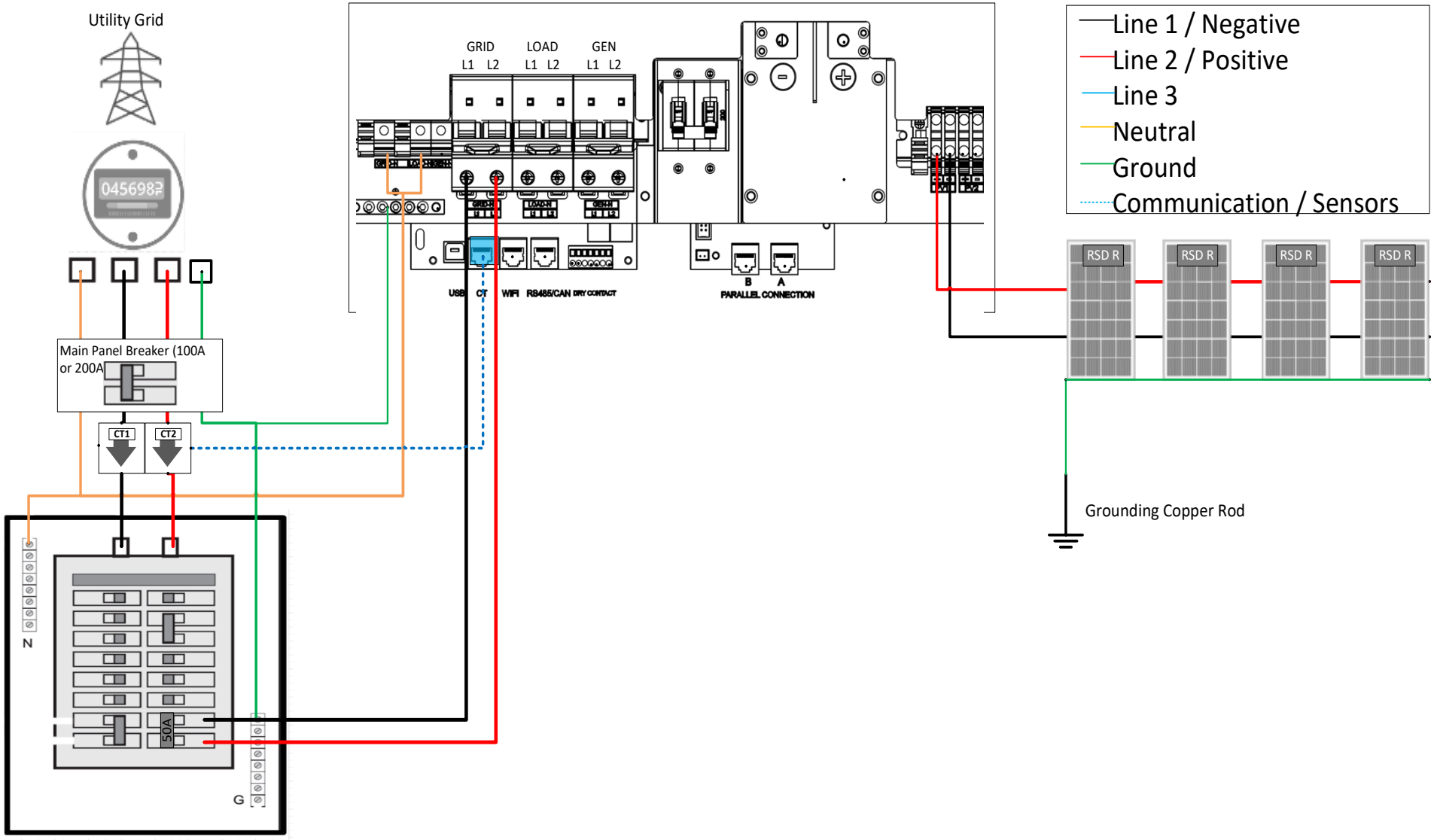
There should be only one Neutral to Ground Bond established on the supply side of the electrical system.
For requirements of connection safety, please refer 2020/2023 NEC 705.11 or 2017 NEC 705.12A
Always adhere to your local jurisdiction guidelines and make sure that an Electrician makes all electrical connections.
This Schematic is only a depiction of the functional ports.

13.1.2 Off Grid Applications Connection (split-phase service 120/240V)



There should be only one Neutral to Ground Bond established at the Load panel of the electrical system.
Always adhere to your local jurisdiction guidelines and make sure that an Electrician make all electrical connections.
For requirements of connection safety, please refer 2020/2023 NEC 705.11 or 2017 NEC 705.12A
This Schematic is only a depiction of the functional ports.

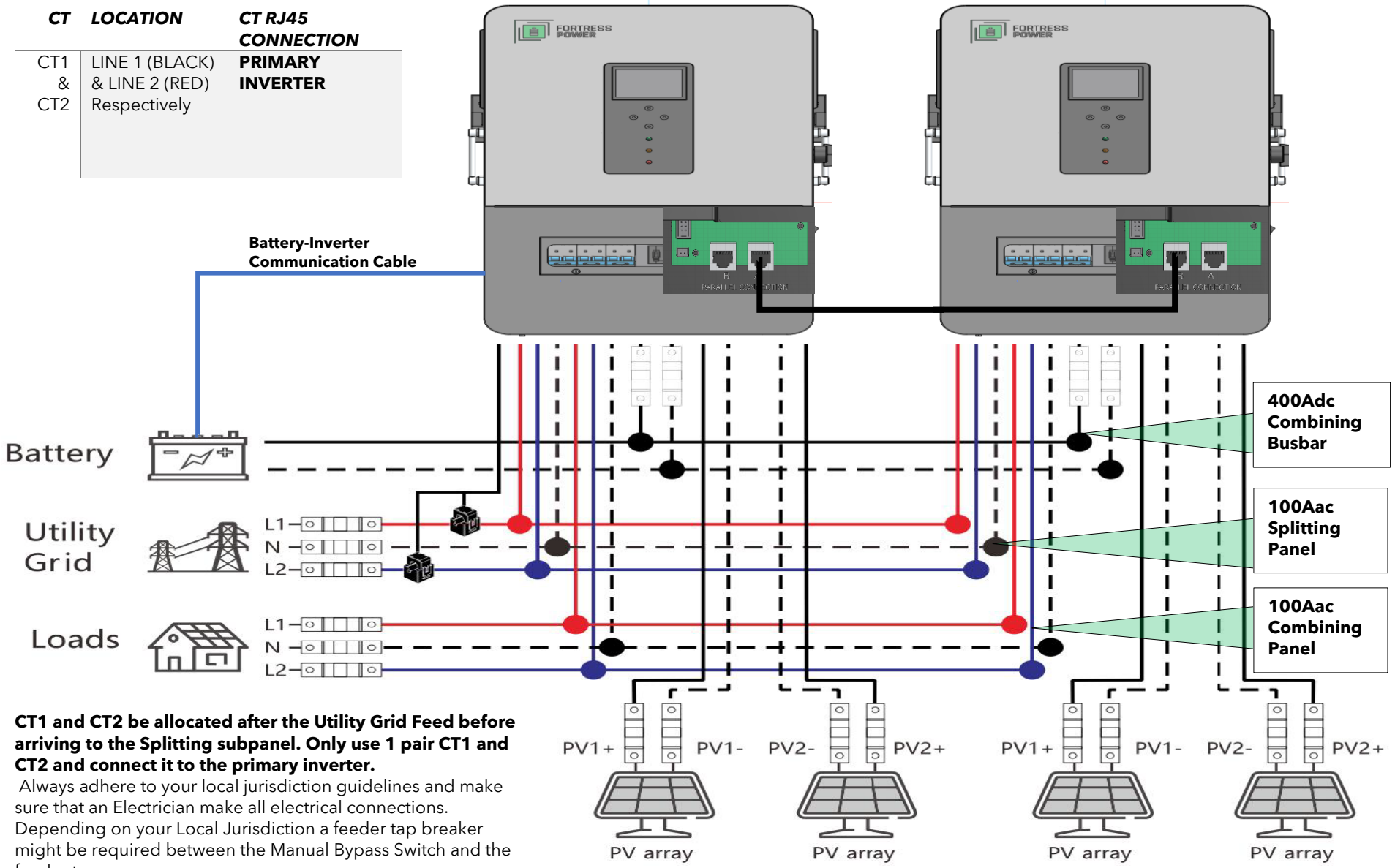
13.1.3 BATTERY LESS CONNECTION (SPLIT-PHASE SERVICE 120/240V)



There should be only one Neutral to Ground Bond established on the supply side of the electrical system.
Always adhere to your local jurisdiction guidelines and make sure that an Electrician make all electrical connections.
For requirements of connection safety, please refer 2020/2023 NEC 705.11 or 2017 NEC 705.12A. This Schematic is only a depiction of the functional ports.

13.1.4 Paralleled Systems Applications with a Feeder tap Connection (split-phase service 120/240V)

CT	LOCATION	CT RJ45 CONNECTION
CT1 & CT2	LINE 1 (BLACK) & LINE 2 (RED) Respectively	**PRIMARY INVERTER**



CT1 and CT2 be allocated after the Utility Grid Feed before arriving to the Splitting subpanel. Only use 1 pair CT1 and CT2 and connect it to the primary inverter.

Always adhere to your local jurisdiction guidelines and make sure that an Electrician make all electrical connections. Depending on your Local Jurisdiction a feeder tap breaker might be required between the Manual Bypass Switch and the feeder tap.

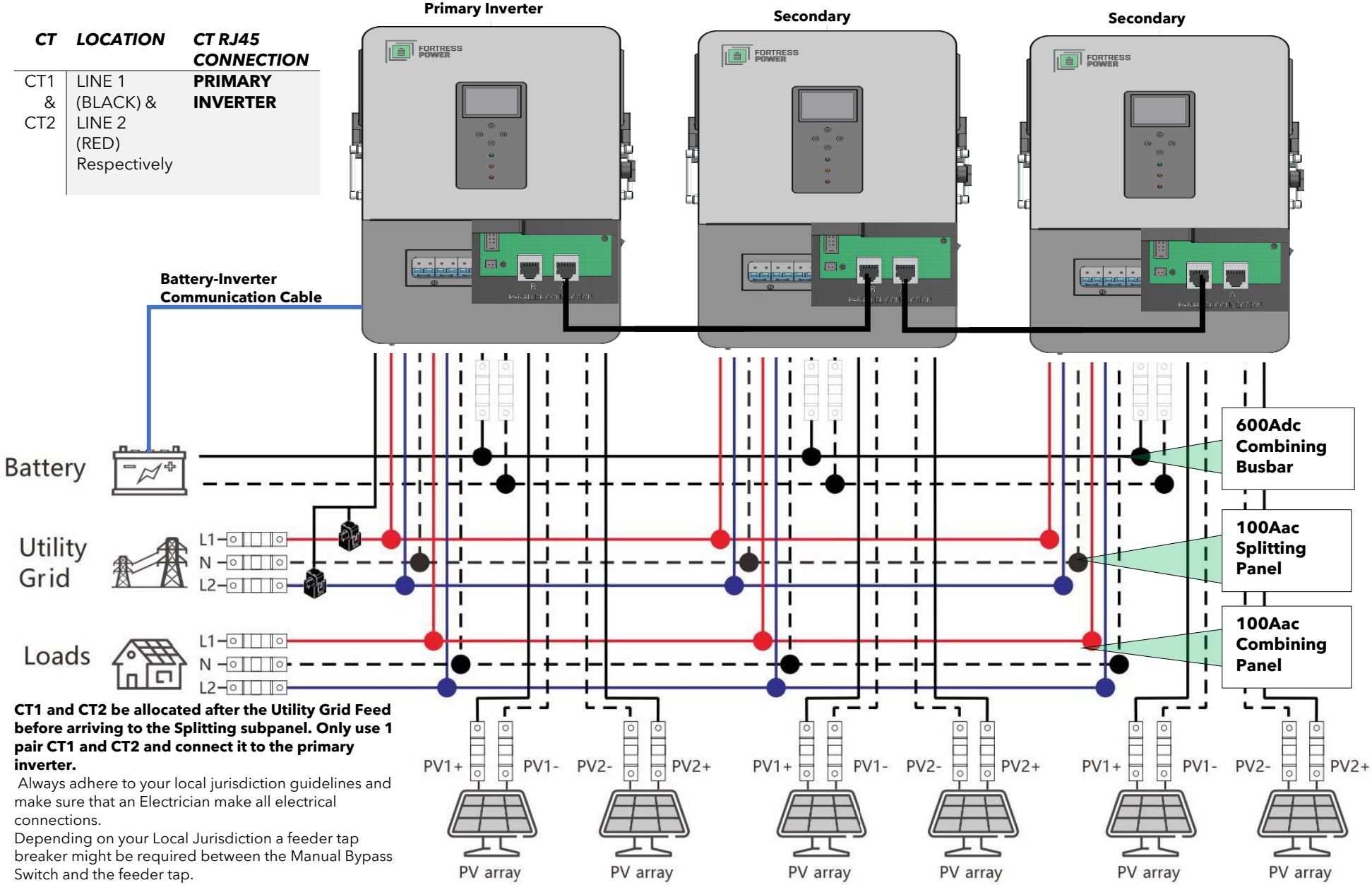
For requirements of connection safety, please refer 2020/2023 NEC 705.11 or 2017 NEC 705.12A

To set the inverters in parallel mode, make the following changes on the LCD:

1.Set the item [31] to PAL, and set the item [68] to 180°.

2.When setting the item [38] to "120 V," the L1-L2 voltage is 240 V, and the L1-N voltage is 120 V, L2-N voltage is 120V

CT	LOCATION	CT RJ45 CONNECTION
CT1 & CT2	LINE 1 (BLACK) & LINE 2 (RED) Respectively	**PRIMARY INVERTER**



CT1 and CT2 be allocated after the Utility Grid Feed before arriving to the Splitting subpanel. Only use 1 pair CT1 and CT2 and connect it to the primary inverter.

Always adhere to your local jurisdiction guidelines and make sure that an Electrician make all electrical connections.

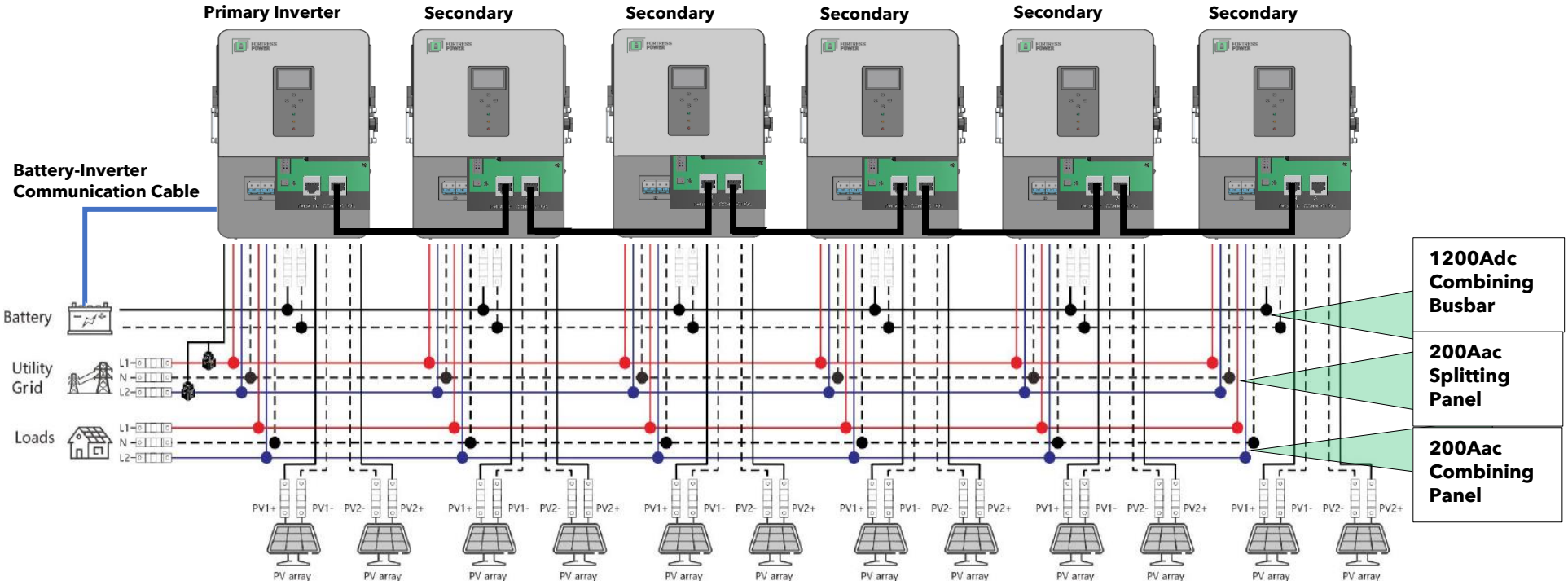
Depending on your Local Jurisdiction a feeder tap breaker might be required between the Manual Bypass Switch and the feeder tap.

For requirements of connection safety, please refer 2020/2023 NEC 705.11 or 2017 NEC 705.12A

To set the inverters in parallel mode, make the following changes on the LCD:

1.Set the item [31] to PAL, and set the item [68] to 180°.

2.When setting the item [38] to "120 V," the L1-L2 voltage is 240 V, and the L1-N voltage is 120 V, L2-N voltage is 120V



CT	*LOCATION*	*CT RJ45 CONNECTION*
CT1 & CT2	LINE 1 (BLACK) & LINE 2 (RED) Respectively	**PRIMARY INVERTER**

CT1 and CT2 be allocated after the Utility Grid Feed before arriving to the Splitting subpanel. Only use 1 pair CT1 and CT2 and connect it to the primary inverter.

Always adhere to your local jurisdiction guidelines and make sure that an Electrician make all electrical connections. Depending on your Local Jurisdiction a feeder tap breaker might be required

To set the inverters in parallel mode, make the following changes on the LCD:

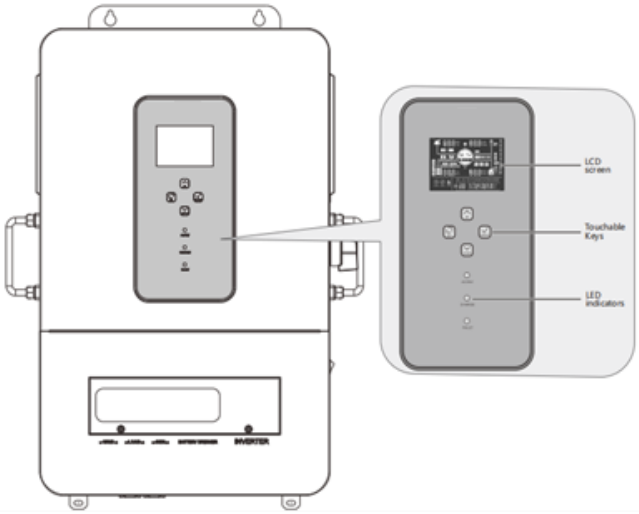
1.Set the item [31] to PAL, and set the item [68] to 180°.

2.When setting the item [38] to "120 V," the L1-L2 voltage is 240 V, and the L1-N voltage is 120 V, L2-N voltage is 120V

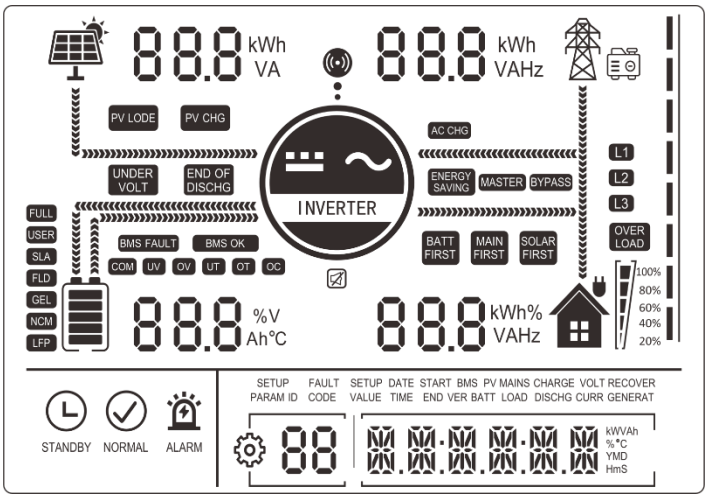
14. LCD Interface

14.1 LCD Display and Buttons

The operation and display panel of the inverter includes one LCD screen, three indicators, and four physical buttons.



Inverter



Display

Physical button	
Physical button	**Description**
SET	Enter/Exit the setup menu
UP	Go to the next option
DOWN	Go to the previous option
ENTER	Confirm/Enter the option in setup menu

LED Indicator		
Indicator	**Color**	**Description**
AC/INV	Green	Normally ON: Grid bypass output
		Flash: inverter output
CHARGE	Yellow	Normally ON: charging completed
		Flash: charging
FAULT	Red	Normally ON: level-1 fault Flash: level-2 fault OFF: level-3 or level-4 fault

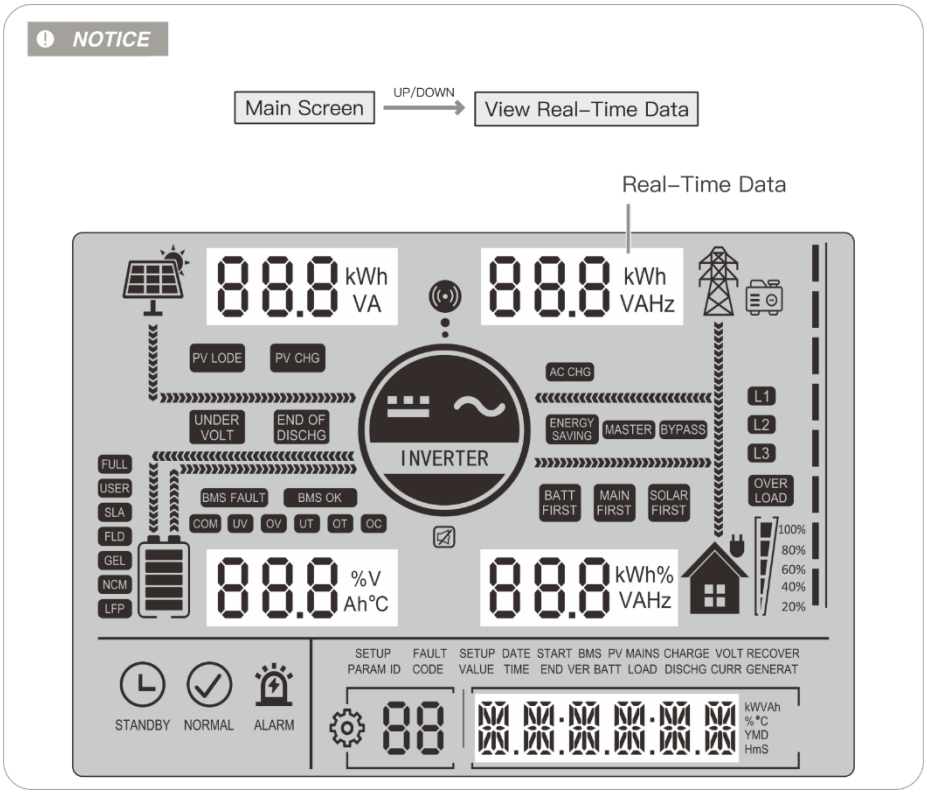
14.1.1 Icon Definition

ICON	DESCRIPTION	ICON	DESCRIPTION
	PV panel		Grid
	Battery		Generator

	The inverter is working		Load
	The inverter is communicating with the data collector		The buzzer is in mute mode
	Power flow direction		
STANDBY	The inverter is in standby mode	NORMAL	The inverter is working normally
ALARM	There is a fault		Settings
	Load power: 80%–100%		SOC: 80%–100%
	Load power: 60%–79%		SOC: 60%–79%
	Load power: 40%–59%		SOC: 40%–59%
	Load power: 20%–39%		SOC: 20%–39%
	Load power: 5%–19%		SOC: 5%–19%
UNDER VOLT	Battery under-voltage	END OF DISCHG	Battery over-discharge
OVER LOAD	Overload	BMS FAULT	BMS fault
COM	System communication error	UV	System undervoltage
OV	System overvoltage	UT	System under temperature
OT	System overtemperature	OC	System overcurrent
FULL	Battery full power	USER	User-defined battery
SLD	Sealed lead-acid battery	FLD	Flooded lead-acid battery
GEL	Gel lead-acid battery	NCM	Ternary Li-ion battery
LFP	LFP Li-ion battery	**ECO**	Energy-saving mode
PVLOAD	PV power is loading	**PVCHG**	PV power is charging the battery
ACCHG	AC input power is charging the battery	**GRID FIRST**	The output mode of the inverter is Grid first
BYPASS	The output mode of the inverter is Grid bypass	**SOLAR FIRST**	The output mode of the inverter is PV first
BATT FIRST	The output mode of the inverter is battery first		

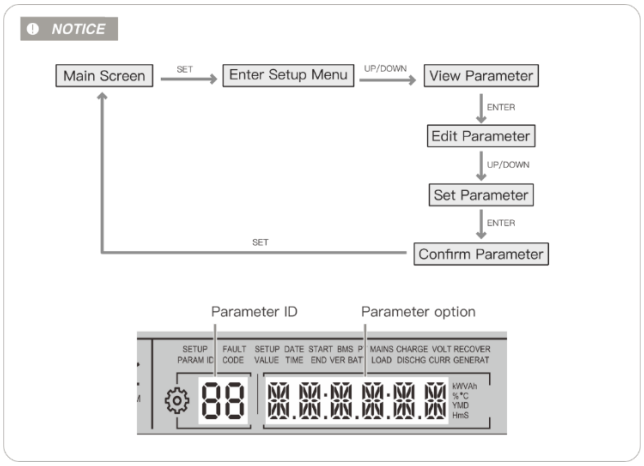
14.1.2 REAL-TIME PARAMETERS VIEW

On the screen, press the UP/DOWN button to view real-time data of the inverter in operation



PAGE	PV	BATTERY	AC INPUT	LOAD	GENERAL
1	PV input voltage	Battery voltage	Grid input voltage	Single-phase voltage	Current time
2	PV input current	Battery current	Grid input current	Single-phase current	Current date
3	PV input power	Battery voltage	Grid total input power	Single-phase active power	PV gross generation
4	PV generation for the day	Battery current	Grid charging capacity for the day	Single-phase apparent power	Total load consumption
5	PV heat sink temperature	Heat sink temperature	Grid frequency	Inverter output frequency	RS485 address
6	Rated open circuit voltage	Rated battery voltage	Bus voltage	Rated output frequency	Software version
7	Maximum PV charge current	Maximum battery charges current	Maximum Grid charge current	Total output active power	/
8			/	Total output apparent frequency	/

14.1.3 SETTINGS



Settings Flow Diagram

NOTICE

If you are using a lithium battery that communicates directly with the inverter, please skip all battery voltage settings (parameters 04 to 07), as these will be automatically managed through the communication protocol.

For all settings with the ID COLUMN COLOR ___ you must set the inverter into standby mode. To achieve this, you must have either energize the PV port or the grid port by turning on the breakers/disconnect. Battery ports may be energized. Then proceed to turn off the switch located on the right-side inverter.

If the only source available is battery power, then follow these steps:

1. While the inverter is on, scroll to the setting that needs to be changed.

2. Then turn off the switch at the right side of the inverter and immediately switch the parameters. You have approximately 10 seconds before the inverter is completely deenergized.
3. Remember to click set on the change made so that the change can be applied.

ID	FUNCTION	CONFIGURATION	DESCRIPTION
THE VOLTAGE SETTING LOGIC: 【15】 < 【12】 < 【04】 < 【14】 < 【35】 < 【37】 < 【05】 < 【09/11】			
(WHEN THE BATTERY COMMUNICATE WITH INVERTER, THE VOLTAGE SETTING DO NOT NEED TO BE SET)			
00	Exit	ESC	Exit the setup menu
01	Operation Mode	UTI Backup Mode	Backup Mode (Load Source Priority: PV → Grid → Battery) 1. If PV power is insufficient, the system uses both PV and grid power to support the load. 2. When PV power exceeds the load demand, the excess energy charges the battery. 3. Grid power is only used for charging when the battery is over-discharged (if setting 06 is PV-only charging, the grid will not charge the battery). 4. The battery discharges only in off-grid mode
		SBU Self-Consumption Mode (Default)	Self-Consumption Mode (Load Source Priority: PV → Battery → Grid) 1. PV Power Priority – The system first uses solar (PV) power to supply the load. 2. Battery Backup – If PV power is Insufficient, the system draws power from the battery to support the load. 3. Grid as Last Resort – The system switches to grid power only when the battery voltage drops below the set threshold (Parameter ④). 4. Return to PV/Battery – Once the battery voltage recovers above the set threshold (Parameter ⑤), the system switches back to PV or battery power for load supply.
		SOL	Self-Consumption Mode (Load Source Priority: PV → Battery → Grid) The PV mode is to be applied first and when the PV power is unavailable or the battery voltage is lower than the set value in the item 4, it will switch to the Grid mode
		SUB Battery Charging Priority Mode	PV and Grid prioritize Charging the Battery 1. PV Priority for Charging – The system prioritizes PV power to charge the battery. 2. Grid-Assisted Charging – If PV power is insufficient, the system uses both PV and grid power for charging (except when Parameter 06 is set to PV-only charging, in which case the grid will not charge the battery). 3. Grid Powers the Load – While the battery is charging, the grid supplies power to the load when PV alone is not sufficient. Hybrid Load Supply – If PV power is enough for charging but insufficient for the load, the system will use both PV and grid power to support the load. Battery Discharges Only in Off-Grid Mode – The battery does not discharge when the system is connected to the grid; it is reserved for off-grid operation only.
02	AC Frequency	60.0 hz (default)	USA (60hz) or 50hz
03	AC input Voltage	UPS (default)	Split phase (120/204V) input phase voltage 90v~140/190~260V back up output voltage 110~120V/220~240V
		APL	Select when you have significant lower voltage than normal grid, input voltage range 80~140V 160V/ output voltage 200~220V
04	Battery On grid Cut off Voltage	51.2 (Default)	When parameter item 01 is set to SBU (Solar-Battery Utility) or SOL (Solar Only) mode, the system prioritizes PV and battery power. Range 40-52V

			However, if the battery voltage drops below the set cut-off point, the power source automatically switches from the inverter to the grid to prevent battery over-discharge.
05	Grid to Battery Voltage Threshold	55.2 (default)	When the parameter item 01 is SBU or SOL and the battery voltage is higher than the threshold, the output switches from mains to inverter. Setting range: 48 V—60 V
06	Grid Charge Setting	SNU (default)	Both PV and grid can charge the battery, with PV as the priority charging source
		OSO	Grid power will not charge battery
07	Battery charge current	90 (default)	Setting range: 0-140A
08	Battery type	USER	Customize setting
		SLD	Sealed lead-acid battery
		FLD	Flooded lead-acid battery
		GEL	Gel lead-acid battery
		L14/L15/L16 (L16 Default)	LFP battery L14/L15/L16, corresponding to 14, 15, and 16 cells in series of LFP batteries when there is no communication
		N13/N14 (NMC)	NMC Li-ion battery N13/N14, corresponding to 13 and 14 Cell in series of ternary Li-ion batteries
		NOb	No battery
09	Battery boost charge voltage	Setting Range 48-58.4 (55.2V default)	Setting Range: 48V – 58.4V Adjustment Step: 0.4V Applicable Battery Types: User-defined or Lithium-Ion Battery
10	Boost charge duration	60min (default)	5 min ~ 300 min
11	Battery floating charge voltage	54 (default)	Setting range: 48 V—58.4 V, with a step of 0.4 V
12	Battery over-discharge Protection voltage (delayed shutdown)	48.4V (default)	Function: When the battery voltage drops below the set threshold and meets the conditions in parameter item 13, the inverter automatically shuts off its output to protect the battery from deep discharge. Setting Range: 40V – 48V Adjustment Step: 0.4V Purpose: Prevents battery damage, extending battery lifespan by avoiding excessive discharge.
13	Battery over-discharge delay time	5 Second (default)	Function: When the battery voltage drops below the threshold set in parameter item 12, the inverter will wait for the delay time set in this parameter before shutting off the output. Setting Range: 5s – 50s Adjustment Step: 5s Purpose: This delay prevents unnecessary shutdowns due to temporary voltage dips, ensuring stable system operation while still protecting the battery from over-discharge
14	Battery under-voltage alarm threshold	50V (default)	When the battery voltage is lower than the threshold, it will give an under-voltage alarm, and the output will not shut down. Setting range: 40 V—52 V, with a step of 0.4 V
15	Battery over discharge protection voltage	48V (default)	Function: When the battery voltage drops below the set threshold, the inverter output shuts down immediately to prevent further discharge Setting Range: 40V – 52V Adjustment Step: 0.4V Applicable Battery Types: User-defined and Lithium-ion Batteries
16	Battery equalization charge	DIS (default)	Disable equalization charge
		ENA	Enable equalization charge, only an available for flooded lead-acid batteries, sealed lead-acid batteries, and user-defined ones
17	Equalization charge voltage	58	Setting range: 48 V—58 V, with a step of 0.4 V, but only available for flooded lead-acid batteries, sealed lead-acid batteries, and user-defined ones
18	Equalization charge duration	120	Setting range: 5 min—900 min, with a step of 5 min, only apply for flooded lead-acid batteries, sealed lead-acid batteries, and user-defined ones
19	Equalization charge delay time	240	Setting range: 5 min—900 min, with a step of 5 min, only available for flooded lead-acid batteries, sealed lead-acid batteries, and user-defined ones
20	Equalization charge interval	30	Setting range: 0 day—30 days, with a step of 1 day, only available for flooded lead-acid batteries, sealed lead-acid batteries, and user-defined ones
21	Equalization charge Enable/Disable	DIS (default)	Stop equalization charge immediately
		ENA	Start equalization charge immediately
22	Energy-saving mode	DIS (default)	Disable energy-saving mode

		ENA	Enable energy-saving mode, and when the load power is below 50 W; it will turn off the inverter output after a 5-minute delay. When it exceeds 50 W, the inverter will automatically restart
23	Overload auto restart	DIS	Disable overload auto restart and when overload occurs, it will turn off the output and the inverter will no longer resume startup
		ENA (default)	Enable overload auto restart, and if overload occurs, the output will be turned off, and after a delay of 3 min, the output will restart. After 5 cumulative attempts, the inverter will no longer resume startup
25	Buzzer alarm	DIS	Disable buzzer alarm
		ENA (default)	Enable buzzer alarm
26	Mode switch prompt	DIS	Disable prompt when the status of the main input source changes
		ENA (default)	Enable prompt when the status of the main input source changes
27	Inverter to bypass switch	DIS	Disable auto switch to Grid for loading in case of inverter overload
		ENA (default)	Enable auto switch to Grid for loading in case of inverter overload
28	Grid charge current	60A (default)	Setting range: 0-80A
30	RS485 communication address	ID: 1	Setting range: 1−254
31	Parallel mode	SIG (default)	Single inverter operation
		PAL	Parallel operation
		2P0/2P1/2P2	Two-phase parallel operation
		Set to "2P0" for the inverter's screens connected to P1 Assuming that the output voltage of the setting item [38] is set to 120 VAC: 1) When all the inverters connected to P2 are set to "2P1" on the screen, the voltage phase difference between P1 and P2 is 120°, the voltage between the hot wire L1 of phase-P1 and the hot wire L2 of phase-P2 is 120*1.732=208 VAC, and the voltage of L1-N and L2-N is 120 VAC. 2) When all the inverters connected to P2 are set to "2P2" on the screen, the voltage phase difference between P1 and P2 is 180°, the voltage between the hot wire L1 of phase-P1 and the hot wire L2 of phase-P2 is120*2=240 VAC, and the voltage of L1-N and L2-N is120 VAC.	
32	RS485 communication function	DIS	Enable PC and Remote Monitoring Protocol
		485	Enable the BMS communication function based on RS485 communication
		CAN (default)	Enable the BMS communication function based on CAN communication
33	BMS communication	Select the corresponding communication protocol in item 33 when you set it to 485 or CAN in item 32 PAC = PACE, RDA = Ruida, AOG = Aoguan, OLT = Oliter, HWD = Sunwoda, DAQ = Daqin, WOW = SRNE, PYL = Pylontech, UOL = Vilion, FP=Fortress Power (default	
34	Limit Power to CT (Optional)	DIS	Disable function,
		Home load	Excess solar energy will be supplied towards the location of the Cts but will not be exported to the utility (Zero Export mode). The Cts shall always be installed in any location between the utility meter and the main panel.
35	Battery under-voltage recovery threshold	52.4 (default)	When the battery is under voltage, the battery voltage needs to be greater than the threshold to restore the AC output of the battery inverter. Setting range: 44 V−54.4 V
37	Battery Recharge voltage	51.2 (default)	After the battery is fully charged, the inverter stops charging and recovers charging when the battery voltage is lower than the threshold. Setting range: 44 V−54 V
38	AC output voltage (turn off inverter switch "19" on page 6)	120V(phase voltage)(default)	Setting range: 100/105/110/120 /127VAC phase voltage The backup port voltage will be changed accordingly. 5.4kw/5.6kw/5.9kw/6.5kw/6.8kw
39	Charge current limit (Communicate with BMS)	LCSET	The maximum battery charge current is not greater than the set value of "07"
		LCBMS (default)	The maximum battery charge current is not greater than the maximum BMS allowed current
		LCINV	The maximum battery charge current is not greater than inverter allowed current
40	Period-1 battery charge start time	00:00:00	Setting range: 00:00:00−23:59:00

41	Period-1 battery charge end time	00:00:00	Setting range: 00:00:00–23:59:00
42	Period-2 Battery charge start time	00:00:00	Setting range: 00:00:00–23:59:00
43	Period-2 battery charge end time	00:00:00	Setting range: 00:00:00–23:59:00
44	Period-3 battery charge start time	00:00:00	Setting range: 00:00:00–23:59:00
45	Period-3 battery charge end time	00:00:00	Setting range: 00:00:00–23:59:00
46	Timed battery charge function	DIS (default)	Disable the function
		ENA	When the timed grid charging/load supply function is enabled, the power supply mode will operate based on the configured parameters and battery state: Operating Modes 1. SBU Mode Activation: ○ The system will operate in SBU mode when timed grid charging is enabled. ○ The inverter will prioritize solar (S) and battery (B) power, supplying loads from these sources. ○ When the system reaches the configured charging period or the battery enters an over-discharge state, it will switch to grid (U) power for battery charging. 2. UTI Mode Activation (With Timed Discharge Enabled): ○ If the timed discharge function is also enabled, the system will switch to UTI mode. ○ In this mode, the inverter: • Uses grid power for battery charging only during the set charging period. • Switches to battery inverter operation during the configured discharge period or if the grid power is lost.
47	Period-1 battery discharge start time	00:00:00	Setting range: 00:00:00–23:59:00
48	Period-1 battery discharge end time	00:00:00	Setting range: 00:00:00–23:59:00
49	Period-2 battery discharge start time	00:00:00	Setting range: 00:00:00–23:59:00
50	Period-2 battery discharge end time	00:00:00	Setting range: 00:00:00–23:59:00
51	Period-3 battery discharge start time	00:00:00	Setting range: 00:00:00–23:59:00
52	Period-3 battery discharge end time	00:00:00	Setting range: 00:00:00–23:59:00
53	Timed battery discharge function	DIS (default)	Disable the function
		ENA	After the timed battery discharge function is enabled, the power supply mode will be changed into UTI, where the system only switches to the power supply of battery inverter during the set discharge period or grid failure
54	Current date	00:00:00	Year/Month/Day Setting range: 00:01:01–99:12:31
55	Current time	00:00:00	Setting range: 00:00:00–23:59:59
56	Leakage current protection enable	DIS	Disable leakage current protection
		ENA	Enable leakage current protection
57	Charge stop current	3 (default)	The charge stops when the charge current is less than the set value (unit: A)
58	SOC setting for discharge alarming	25% (default)	When the capacity is less than the set value, the SOC alarms (unit: %, only available during normal BMS communication)
59	SOC setting for discharge cutoff	20% (default)	When the capacity is less than the set value, the discharge stops (unit: %, only available during normal BMS communication)
60	SOC setting for charge cutoff	99%(default)	When the capacity is greater than the set value, the charge stops (unit: %, only valid during normal BMS communication)
61	SOC setting for switching to grid	30% (default)	When the capacity is less than the set value, it switches to Grid (unit: %, only available during normal BMS communication)
62	SOC setting for switching to inverter output	99% (default)	When the capacity is greater than the set value, it switches to the inverter output mode (unit: %, only available during normal BMS communication)
63	Auto N-PE connection switch function	DIS	Disable auto N-PE connection switch
		ENA	Enable auto N-PE connection switch (enable when this is the first bonding device after meter)
68	AC output phase	0	Single-Phase Mode (0 Mode)

	mode		The output AC voltage of item 38 is 120 V. Phase Difference of L1-L2 = 0°, meaning L1 and L2 are in phase. Since L1/L2 can be connected in parallel, both L1-N and L2-N will maintain 120 V.
		180 (default)	Split-phase mode (120/240) Assuming that the AC output voltage of item 38 is 120 V, the phase difference of L1-L2 is 180°, the phase voltage of L1-N/L2-N is 120 V, and the voltage of L1-L2 is 240 V
		NO N	Without N-wire(When you set"No N",the phase difference is 180°
70	Insulation impedance detection	DIS	Disable detecting insulation impedance value.
		ENA	Enable detecting insulation impedance value.
73	Max charging current by generator	80A (Default)	Setting range: 0-80A
74	Generator input power	4KW (default)	Setting range: 0-10KW
76	CT ratio (optional)	1000	When connect an external CT, enter the current ratio according to CT specification.
77	CT accuracy adjustment	100W	Range 0-500w
79	AFCI check (optional)	DIS (default)	Disable AFCI check function
		ENA	Enable AFCI check function
80	AFCI fault manually clear (optional)	IGNORE (default)	Ignore the AFCI fault report
		CLEAR	Clear the AFCI fault

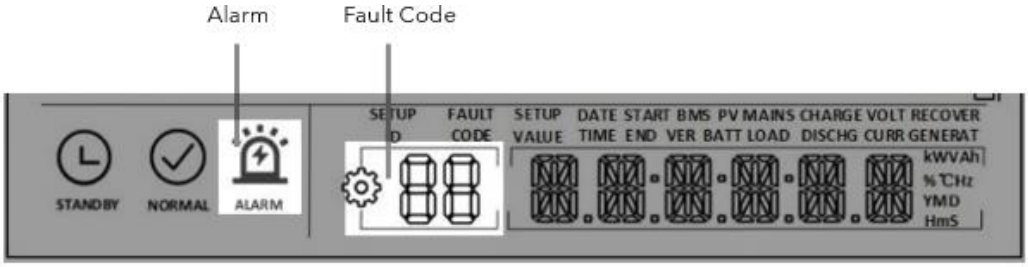
14.2 Troubleshooting Based On LCD Displays

Once there is any warning or fault occurring, users can troubleshoot according to the LED status and the warning/fault information on the LCD.

14.2.1 Fault on the LCD

If the dot on the left of fault item is red, it means the fault is active. When it is grey, it means the fault is inactive.

FAULT CODES



FAULT CODE	MEANING	IMPACT OUTPUT OR NOT	DESCRIPTION	CAUSE	SOLUTION
/	No screen display	n/a	n/a	There is no power input, or the device switch at its bottom is not turned on	Check if the battery air-switch or PV air-switch has been closed; check if the switch is in "ON"; press any button on the screen to exit the screen sleep mode.
01	BatVoltLow	Yes	Battery under-voltage alarm	The battery voltage is lower than the value set in parameter [14]	Charge the battery until the battery voltage exceeds the value set in parameter [14].
02	BatOverCurrSw	Yes	Overcurrent software protection for average battery discharge current		Check if the battery is reliably connected, check if the circuit breaker of the battery is off; ensure that the BMS of the

					lithium-ion battery can communicate normally.
03	BatOpen	Yes	Disconnected battery alarm	The battery is not connected, or the BMS of the lithium-ion battery is in the discharge protection state	Manual reset: Turn off the power, and restart Automatic reset: Charge the battery until the battery voltage is higher than the value set in parameter [35]
04	BatLowEod	Yes	Under-voltage battery discharge stop alarm	The battery voltage is lower than the value set in parameter 12	Charge the battery until the battery voltage exceeds the value set in parameter [14].
05	BatOverCurrHw	Yes	Battery overcurrent hardware protection		
06	BatOverVolt	Yes	Charge overvoltage protection	The battery is in the overvoltage state	Manually turn off the power, and restart. Check if the battery voltage exceeds the limit. If the limit is exceeded, discharge the battery until the voltage is below the overvoltage recovery threshold of the battery
07	BusOverVoltHw	Yes	Bus overvoltage hardware protection		
08	BusOverVoltSw	Yes	Bus overvoltage software protection		
09	PvVoltHigh	Yes	PV overvoltage protection		
10	PvBoostOCSw	No	Boost overcurrent software protection		
11	PvBoostOCHw	No	Boost overcurrent hardware protection		
12	SpiCommErr	Yes	SPI communication fault of master and slave chips		
13	OverloadBypass	Yes	Bypass overload protection	The output power or current of the bypass is overloaded within a certain period	Reduce the load power and restart the device. For more details, please refer to item 11 in Protection Function
14	OverloadInverter	Yes	Inverter overload protection	The output power or current of the inverter is overloaded within a certain period	
15	AcOverCurrHw	Yes	Inverter overcurrent hardware protection		
16	AuxDSpReqOffPWM	Yes	Slave chip OFF request fault		
17	InvShort	Yes	Inverter short-circuit protection		
18	Bussoftfailed	Yes	Bus soft-start failure		
19	OverTemperMppt	No	PV heat sink over-temperature protection	The temperature of the heat sink for PV input exceeds 90°C for 3s	Wait until the temperature of the heat sink is below the over-temperature recovery temperature, when charge and discharge return to normal
20	OverTemperInv	Yes	Inverter heat sink over-temperature protection	The temperature of the heat sink for inverter output exceeds 90°C for 3s	
21	FanFail	Yes	Fan fault	Software detection founds the fan has a fault	Shut down, manually flick the fan, and check if any foreign objects are blocking it
22	EEPROM	Yes	Memory fault		
23	ModelNumErr	Yes	Model setting error		
24	Busdiff	Yes	Positive and negative bus voltage imbalance		
25	BusShort	Yes	Bus short-circuits		
26	Rlyshort	Yes	Inverter AC output backward to bypass AC output	Stuck relay for AC output	Manually shut down, and restart. If the fault occurs again after restarting, contact the after-sales service personnel to repair the inverter
28	LinePhaseErr	Yes	Grid input phase error	The phase of AC input is inconsistent with that of AC output	Ensure that the phase of AC input is the same as that of AC output. For example, if the output is in the split-phase mode, the input shall also be in the split-phase mode.

29	BusVoltLow	Yes	Bus low-voltage protection
30	BatCapacityLow1	Yes	Alarm of battery capacity rate below 10% (taking effect after BMS communication is successful)
31	BatCapacityLow2	No	Alarm of battery capacity rate below 5% (taking effect after BMS communication is successful)
32	BatCapacityLowStop	Yes	Battery low capacity OFF (taking effect after BMS communication is successful)
34	CanCommFault	Yes	Parallel CAN communication fault
35	ParaAddrErr	Yes	Parallel ID (communication address) setting error
37	ParaShareCurrErr	Yes	Parallel current sharing fault
38	ParaBattVoltDiff	Yes	Large battery voltage difference in parallel mode
39	ParaAcSrcDiff	Yes	Inconsistent Grid input source in parallel mode
40	ParaHwSynErr	Yes	Hardware synchronization signal error in parallel mode
41	InvDcVoltErr	Yes	Inverter DC voltage error
42	SysFwVersionDiff	Yes	Inconsistent system firmware version in parallel mode
43	ParaLineContErr	Yes	Parallel connection fault
44	Serialnumbererror	Yes	Failure to set the serial number before leaving factory
45	Errorsettingofsplit-phasemode	Yes	Setting error of setting items in parallel mode
56	Lowinsulation Resistance-fault	No	Abnormally low earth impedance of PV1+, PV2+, and PV-
57	Leakage current Overload-fault	Yes	System current leakage out of the standard
58	BMSComErr	No	BMS communication fault
60	BMSUnderTem	No	BMS under-temperature alarm (taking effect after BMS communication is successful)
61	BMSOverTem	No	BMS over-temperature alarm (taking effect after BMS communication is successful)
62	BMSOverCur	No	BMS overcurrent alarm (taking effect after BMS communication is successful)
63	BMSUnderVolt	No	BMS under-voltage alarm (taking effect after BMS communication is successful)
64	BMSOverVolt	No	BMS overvoltage alarm (taking effect after BMS communication is successful)

15. MAINTENANCE

15.1 BIANNUAL MAINTENANCE RECOMMENDATIONS

To maintain optimal long-term performance of the inverter, it is recommended to conduct the following routine checks twice per year:

Routine Maintenance Checklist

- Ensure unobstructed airflow around the inverter and clean the heat sink to remove any accumulated dust or debris.
- Inspect all exposed wiring for signs of insulation damage due to UV exposure, abrasion, desiccation, or pest activity.
- Confirm that the display indicators accurately reflect the operational status of the inverter. Investigate and resolve any faults or error codes without delay.
- Examine all wiring terminals for signs of corrosion, insulation degradation, overheating, or discoloration. Tighten terminal screws if any looseness is observed.
- Clean the insect-proof mesh and remove any accumulated dirt, corrosion, or insect nesting materials.

16. CONTACT INFORMATION

FORTRESS POWER

Secure your energy

For Technical Support Please Contact us at
Tech-Support Contact Information

Useful Links

- Phone:

Tech Support (877) 497-6937
Tech Support (Spanish) (215) 710-8960

- Support Tickets: https://www.fortresspower.com/support/

Warranty Submittal: https://www.fortresspower.com/warranty/

System Design Tool
SCAN HERE

Updated Documentation
SCAN HERE

https://www.fortresspower.com/products/solo65

NOTES