Felicitysolar®

Make life full of hope

USER GUIDE

IVGM8KLP2G1-US

IVGM7K6LP2G1-US

IVGM6KLP2G1-US

IVGM5KLP2G1-US

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ABOUT THIS MANUAL

This manual provides installation, operation, maintenance, and troubleshooting instructions for the Felicity Solar IVGM5-8KLP2G1-US Split-Phase Hybrid Inverter.

This document is intended for qualified personnel only.

Read this manual carefully before installing, operating, or servicing the equipment. Failure to follow the instructions and safety precautions in this document may result in equipment damage, serious injury, or death..

APPLICABLE PRODUCT MODELS

This manual applies to the following models:

- IVGM5KLP2G1-US
- IVGM6KLP2G1-US
- IVGM7K6LP2G1-US
- IVGM8KLP2G1-US

IMPORTANT NOTICE

Verify the inverter grid configuration before connecting the system to the utility grid.

The inverter should be configured for 120/240 Vac at 60Hz split-phase operation.

Grid frequency and operating parameters may vary depending on the destination country or utility requirements.

Information included in this Installation Guide speaks only as of the Effective Date and is qualified, in its entirety, by the Disclaimer referred to below and by the terms of any applicable Limited Warranty.

DISCLAIMER

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Felicity Solar retains the right to final interpretation of this document and all related materials pertaining to this product. This document is subject to modifications, updates, revisions, or termination without prior notice.

For the latest product documentation, firmware, and technical information, visit:

https://www.felicitysolar.com

Technical Support:

felicitysupport@felicitysolar.com

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1. Important Safety Instructions

1.1. General Safety

This manual contains important safety instructions that must be followed during installation, operation, and maintenance of the inverter system.

Only qualified personnel are permitted to install, commission, service, or troubleshoot this equipment.

Qualified personnel must:

- Be trained in electrical safety procedures
- Understand the operation of photovoltaic and energy storage systems
- Be familiar with applicable electrical codes and regulations
- Use appropriate personal protective equipment (PPE)

Improper installation or operation may result in:

- Electric shock
- Arc flash
- Fire hazard
- Equipment damage
- Serious injury or death

1.2. Safety Symbols

Symbol	Name	Description
	Danger	Indicates a hazardous situation that will result in serious injury or death if not avoided.
	Warning	Indicates a situation that may result in equipment damage if not avoided
	Electrostatic sensitive	Indicates that damage may occur if not follow the relative requirements
	Hot surface	Indicates a hot surface hazard. Do not touch the sides of the device during operation.
	Earth terminal	Indicates that the inverter must be reliably grounded before operation.
	Caution	Indicates that DC and AC circuit breakers must be disconnected, and at least 5 minutes must elapse before wiring or inspection.
NOTE	Note	Indicates procedures or actions required to ensure proper operation
	CE mark	Indicates that the inverter complies with applicable CE directives.
	EU WEEE mark	Indicates that the product must not be disposed of as household waste.

1.3. Notices

ATTENTION

Read all instructions and cautionary markings in this document and on the equipment before installing this inverter. Failing to follow any of these instructions may also void the limited warranty provided by Felicity Solar.

All installations must conform to the laws, regulations, codes and standards applicable in the jurisdiction of installation.

Before starting an installation, consult a local building or electrical inspector for current requirements. Local codes may vary but are adopted and enforced to promote safe electrical installations. A permit may be needed to do electrical work, and some codes may require an inspection of the electrical work. Felicity Solar is not responsible for system design or installation and makes no representations regarding system performance, reliability or compliance with local or other codes or requirements.

GENERAL

WARNING: Risk of electric shock. Risk of fire. Only qualified electrical personnel should install, troubleshoot, service, or replace the equipment.

WARNING: Risk of electric shock. Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices during installation and service. Turn off all power supplying this equipment before working on or inside equipment and ensure that no charge remains in the equipment. Always use a properly rated voltage sensing device to confirm power is off. Replace all devices, covers, and doors before turning on power to the equipment.

WARNING: Inspect the equipment for damage before installation. Do not install the equipment if it has been damaged in anyway.

WARNING: Do not insert foreign objects into any part of the equipment.

WARNING: Do not expose the equipment or any of its components to direct flame.

WARNING: Do not attempt to open, disassemble, repair, tamper with, or modify the equipment other than what is expressly permitted in this manual. The equipment contains no user-serviceable parts. Contact the installer who installed the equipment for any repairs.

WARNING: Do not connect life-support systems, other medical equipment, or any other use where product failure could lead to injury to persons or loss of life.

CAUTION: Do not use solvents to clean the equipment or expose the equipment to flammable or harsh chemicals or vapors. Do not allow petroleum-based paints, solvents, or sprays to contact nonmetallic parts of the equipment.

CAUTION: Do not use parts or accessories other than those specified for use with the equipment.

INSTALLATION AND USE

WARNING: Risk of electric shock. Risk of fire. Only use electrical system components approved for dry locations.

WARNING: Risk of electric shock. Risk of fire. Ensure that all wiring is correct and that none of the wires are pinched or damaged.

WARNING: Risk of electric shock. Risk of fire. Before making any connections verify that the DC disconnect(s) are in the off position. Double check all wiring before applying power.

WARNING: Risk of electric shock. Improper servicing of the equipment or its components may result in a risk of shock or fire. To reduce these risks, disconnect all wiring before attempting any maintenance or cleaning.

WARNING: Risk of electric shock. Always de-energize the equipment before servicing.

WARNING: Risk of electric shock. Do not use equipment in a manner not specified by the manufacturer. Doing so may cause injury or loss of life, or damage to equipment.

CAUTION: Risk of damage. DO NOT connect the grid to the LOAD output terminal.

CAUTION: Risk of damage. Do not exceed 500Voc on any MPPT on this inverter.

CAUTION: Risk of damage or electric shock. All inverter inputs should only have one conductor connected to them.

NOTE: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

ENVIRONMENTAL CONDITIONSE

WARNING: This equipment is intended for operation in an environment having a minimum temperature of -25°C (-13℉) and a maximum temperature of 60°C (140°F).

WARNING: Install the equipment in a location that prevents damage from flooding. Ensure that no water sources are above or near the equipment, including downspouts, sprinklers, or faucet.

TRANSPORTATION AND HANDLING

WARNING: To protect the equipment and its components from damage when transporting, handle with care. To help prevent damage, leave all equipment in its shipping packaging until it is ready to be installed.

WARNING: Risk of physical injury or death. Use caution when using lifting equipment to move battery modules and components.

WARNING: Risk of physical injury or death. Boxed battery modules.

REQUIREMENTS FOR INSTALLATION PERSONNEL

All work MUST comply with local code, regulations, and industry standards. The installation of this inverter can only be completed by qualified people with appropriate qualifications as determined by the local AHJ.

DO NOT exceed 500Voc on any MPPT on this inverter.

2. Felicity Solar：At First Glance

2.1. Inspect Shipment

The box should include all items shown in the component guide. If there is damage or missing parts, immediately contact Felicity Solar Technical Support at： **felicitysupport@felicitysolar.com**.

2.2. Components

This system includes the following components:

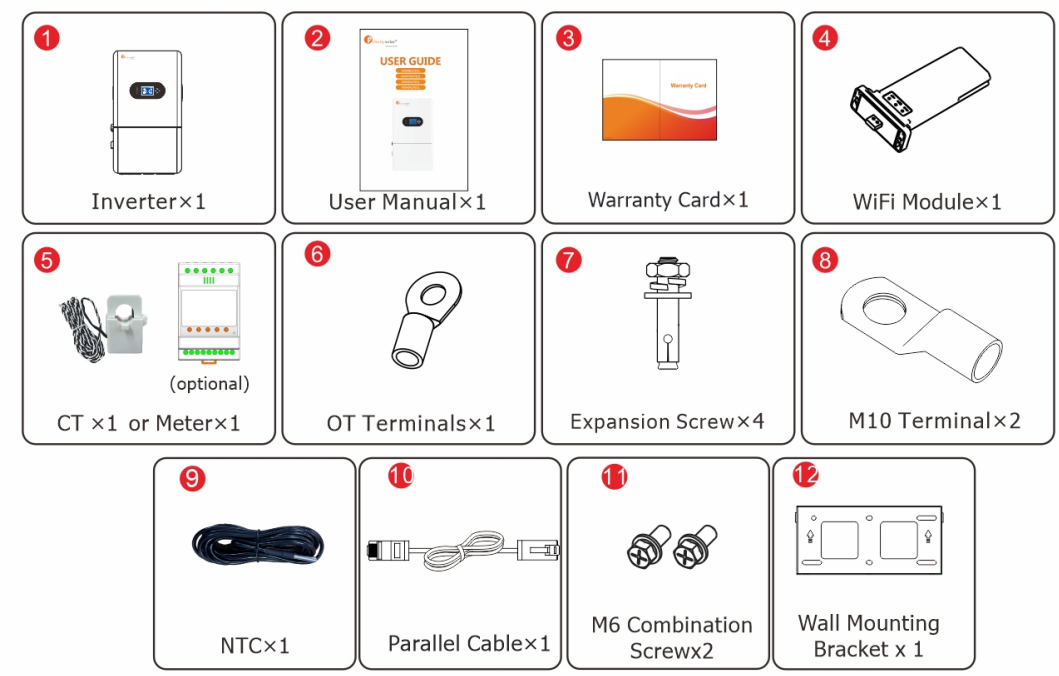


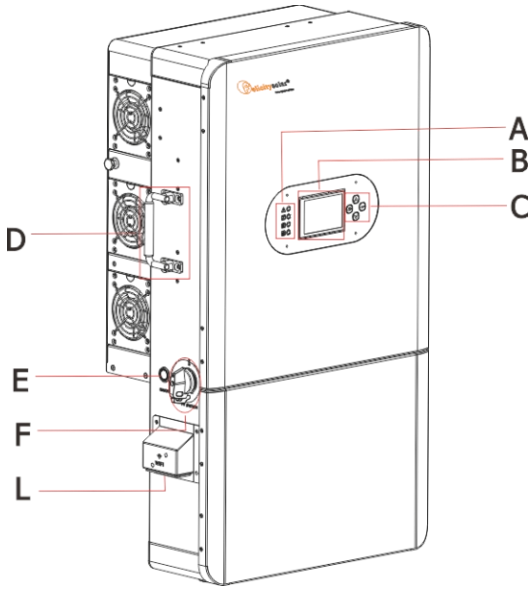
Figure 2.2-1 Components

Component	Name	Description	Quantity
1	Inverter	Inverter	1
2	User manual	User manual	1
3	Warranty card	Warranty card	1
4	WiFi module	For installing the WFI module	1
5	CT	Current transformer（CT sensors）	1
	Meter(optional)	Optional，customized version, please contact Felicity to purchase.	1
6	OT terminals	For external ground connection	1
7	Expansion screw	Used for securing the product's wall mount	4
8	M10 terminal	For crimping BAT cables	2

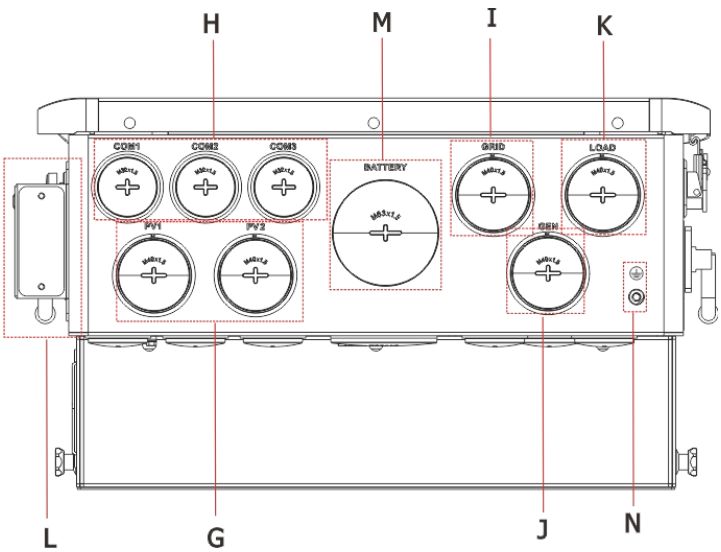
Component	Name	Description	Quantity
9	NTC	Battery temperature sensor	1
10	Parallel cable	Used for parallel wiring	1
11	M6 Combination Screw	Used for inverter installation to secure the inverter.	2
12	Wall Mounting Bracket	Accessories for Wall-Mounting the Inverter	1

Table 2.2-1 Detailed Components List

2.3. Inverter Components and Inputs



Component	Name
A	Inverter Indicators
B	LCD Display
C	Function Buttons
D	Handle
E	Power on/off
F	PV Switch



Component	Name
G	PV Input Interface
H	COM1/2/3 Interface
I	GRID Interface
J	GEN Interface
K	LOAD Interface
L	WIFI Module
M	Battery Input Interface
N	Grounding Point

2.4. Specifications

2.4.1. Dimensions

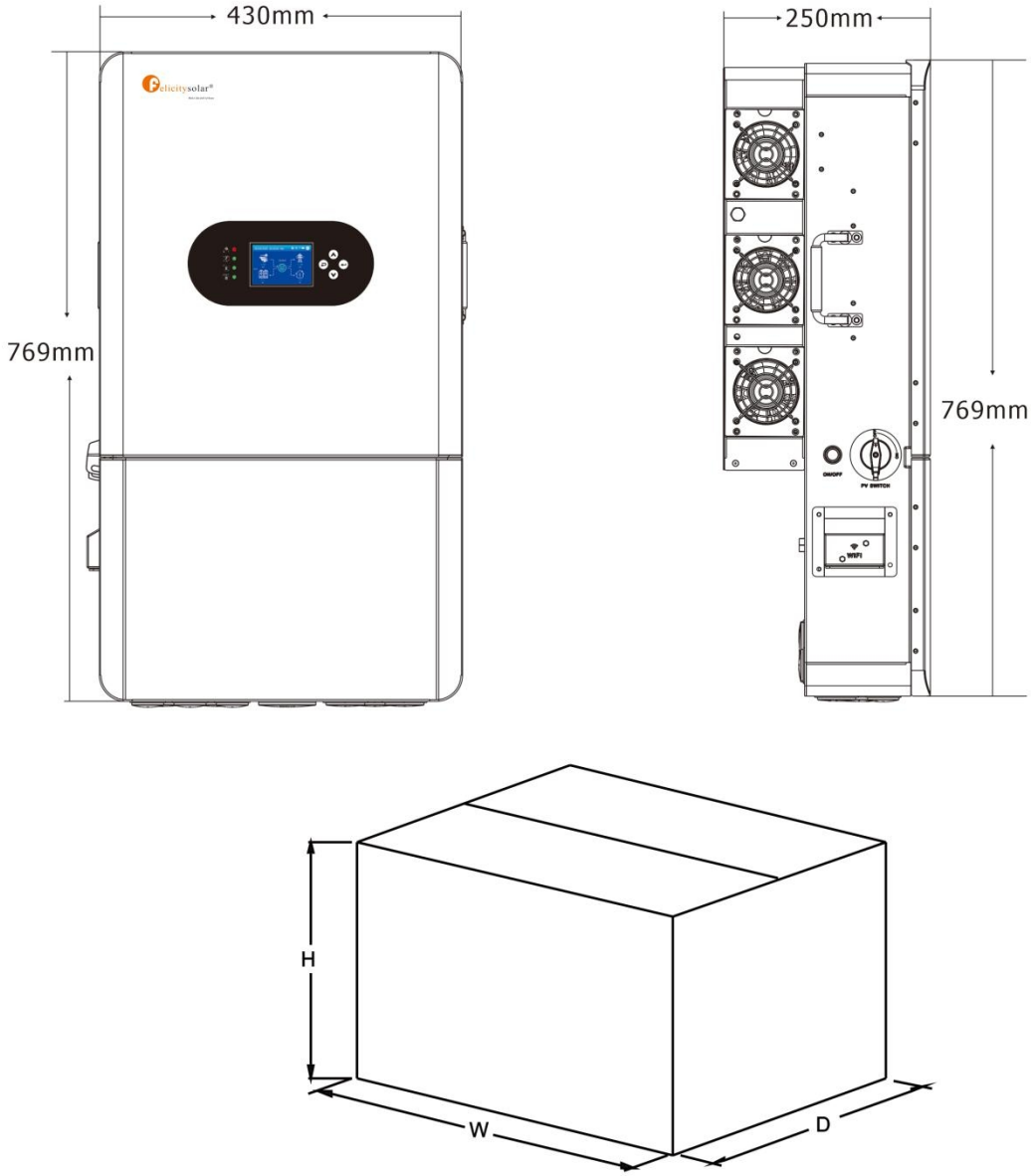


Table 2.4.1-1 Dimensions

Model	H（mm）	W（mm）	D（mm）	Net Weight（KG）	Gross Weight（KG）
IVGM8KLP2G1-US IVGM7K6LP2G1-US IVGM6KLP2G1-US IVGM5KLP2G1-US	383	902	547	33.5	40.5

2.4.2. Datasheet

Model	IVGM5KLP2G1-US	IVGM6KLP2G1-US	IVGM7K6LP2G1-US	IVGM8KLP2G1-US
Battery Input Data				
Battery Voltage Range	40V~60V			
Max.Charging and Discharging Current	120A/120A	135A/135A	190A/190A	190A/190A
Max.Charging and DischargingPpower	5000W	6000W	7000W	8000W
Battery Type	Li-Ion/Lead-acid			
Charging Curve	3 Stages/Equalization			
Charging Strategy for Li-Ion Battery	Self-adaption to BMS			
DC Input Data(PV side)				
Max.Recommended PV power	7500W	9000w	11400W	12000W
Max.PV Voltage	500V			
Start Voltage	100V			
PV Voltage Range	90V~500V			
MPPT Voltage Range	120V~425V			
MPPT Voltage Range for Full Load	290V~425V	230V~425V	230V~425V	230V~425V
Nominal Voltage	380V			
PV Input Current	13A+13A	26A+13A	26A+26A	26A+26A
Max.Shorted Curent	17A+17A	44A+17A	44A+44A	44A+44A
Number of MPP Trackers /Strings per MPP Tracker	2/1+1	2/2+1	2/2	2/2
Grid Data				
Nominal Input Voltage	120/240Va.c(split phase),208Va.c(2/3 phase), 220/230Va.c(single phase)			
Nominal Grid Frequency	50/60Hz			
Max.AC Output Power	5500W	6600W	8360W	8800W
AC Output Rated Current	20.8A	25A	31.7A	33.3A
Max.Output Current	22.9A	27.5A	34.8A	36.7A
Max.Continuous AC Passthrough	40A	40A	50A	50A
Power Factor	>0.99			

Displacement Power Factor	0.8leading..0.8lagging			
THDI	<3%			
AC Output Data(Back Up)				
Rated Output Power	5000w	6000w	7600W	8000w
Max.Output Current	40A	40A	40A	40A
Rated AC Output Voltage	120/240Va.c(split phase),208Va.c(2/3 phase),220/230Va.c(single phase)			
Rated AC Output Frequency	50/60Hz			
Efficiency				
Max.Efficiency	97.6%			
Euro Efficiency	97%			
MPPT Efficiency	99.9%			
Protection				
Output over current protection	Integrated			
Output over power protection	Integrated			
Output Shorted Protection	Integrated			
Anti-islanding Protection	Integrated			
GFCI Protection	Integrated			
Arc Fault Circuit Interrupter(AFCI)	Integrated			
Insulation Resistor Detection	Integrated			
General Data				
Operating Temperature Range	-25 ° ℃~60 ° ℃,>45℃ Derating			
Protection Degree	NEMA 4X IP65			
Relative Humidity	0%~95%			
Cooling Concept	Smart cooling			
Noise(dB)	<35 DB			
Altitude	2000m			
Communication	RS232&RS485			
BMS Communication	CAN&RS485			
Monitor Module	Wi-Fi/GPRS			
Display	LCD+LED			

Installation Style	Wall-mounted
Warranty [1]	10 years
Grid Regulation*	IEEE 1547-2018 & 1547a-2020 & 1547.1-2020 (SRD V2.0), UL 1741-2021 (UL1741SB), UL1699B
Safety Regulation	UL 1741, CSA C22.2 No 107.1-16
EMC	47 CFR FCC Part 15
Net Weight	33.5KG
Gross Weight	40.5KG
Product Dimension	430×654×243MM
Package Dimension	902×547×383MM
Surge Protection	DC Type II / AC Type III
[1]Conditions apply,refer to Felicitysolar Warranty policy.	

2.5. Connection Requirements

2.5.1. Inverter Torque Values for Terminals

Do not use impact drivers to tighten any fasteners on the Felicity Solar

All wire runs should be sized to be at or below a 2.5% current drop at full load. Wire size must comply with your local electrical code.

Field Wiring

Field Wiring Terminal	Description	Torque[in-lb]	Torque[Nm]
M	Battery Input Interface	177.00 in-lb	20.0N.m
J	GEN Interface	17.70 in-lb	2.0N.m
K	LOAD Interface	17.70 in-lb	2.0N.m
N	Grounding Point	24.78 in-lb	2.8N.m

Table 2.5.1-1Field wiring

2.5.2. Sensors and Communications Requirements

Component	Wire Size Range	Max Distance
BMS Communications	CAT.5E 24AWG/ 0.205 mm²	2m extendable
Smartmeter Communication	CAT.5E or better	100m
RJ45 Parallel Communication	CAT.5E 24AWG/ 0.205 mm²	2m extendable

Table 2.5.2-1 Sensors and communications requirements

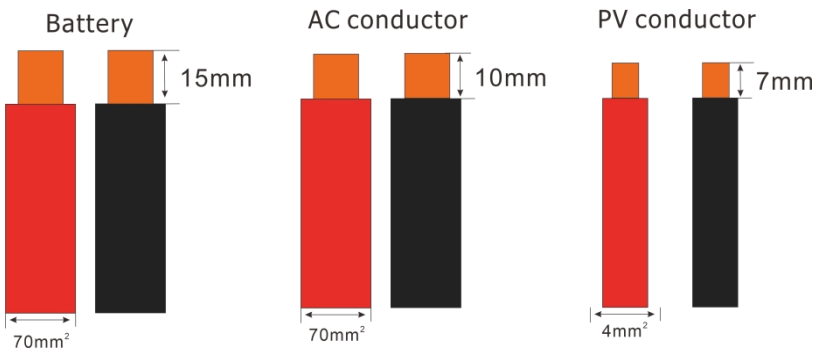


Figure 2.5.2-1 Power Cables Stripping Lenth

2.5.3. CT Sensors (Included)

1. Split core current transformer (CT) dimension:(mm)
2. Standard cable length is 4m.

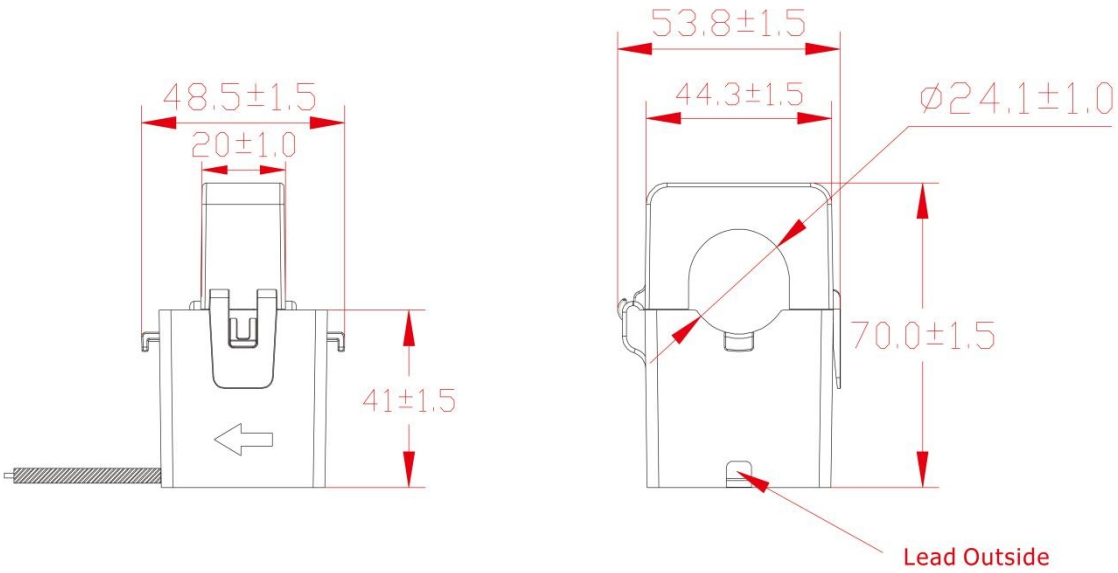


Figure 2.5.3-1 CT Specifications

3. Mechanical Installation

3.1. Installation Requirements

Install the inverter in a clean, dry, and well-ventilated location.

The installation area must:

- Be protected from direct sunlight
- Be free from corrosive gases
- Allow sufficient airflow
- Prevent unauthorized access
- Provide adequate maintenance clearance

3.2. Mounting Clearances

Considering the dimensions of the inverter, find a suitable location for the system. There must be at least 450mm of vertical clearance and 500mm of side clearance for proper heat dissipation.

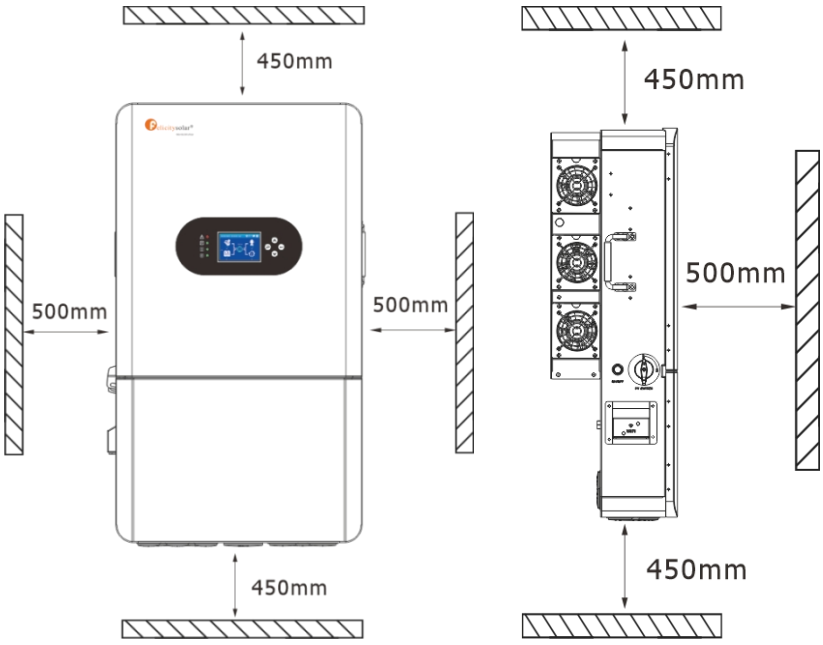


Figure 3.2-1 Installation space of one inverter

Unauthorized modifications are strictly prohibited. Any damage to the equipment caused by failure to install according to this instruction manual will not be covered under warranty.PROTECT THE LCD SCREEN from direct exposure to UV light.

Mount the inverter in the optimal orientation as shown on below.

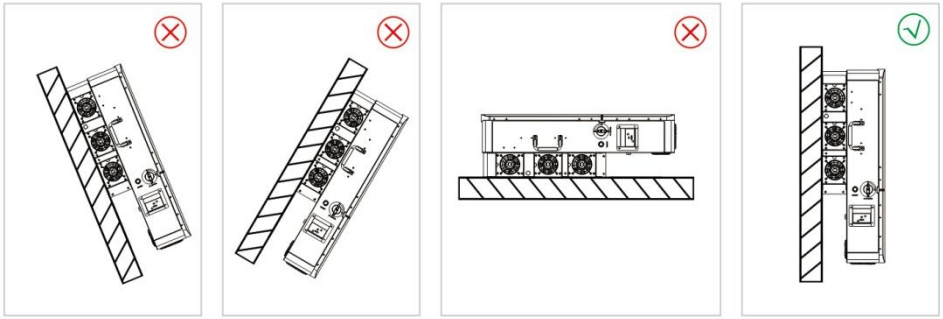


Figure 3.2-2 Installation Orientation

In case a different anchorage is required, calculate the support needed to properly hold the weight of the equipment.

Damage to the LCD Screen due to direct sunlight exposure will not be covered by warranty.

3.3. Mounting Procedure

- ✧ Use the Wall Mounting Bracket to mark the drilling positions.
- ✧ Drill four holes at the marked positions using an appropriate drill bit (see figure below), to a depth of 55–60 mm.
- ✧ Align the wall mounting bracket with the 4 holes on the wall and secure it to the wall with 4 expansion screws（included）

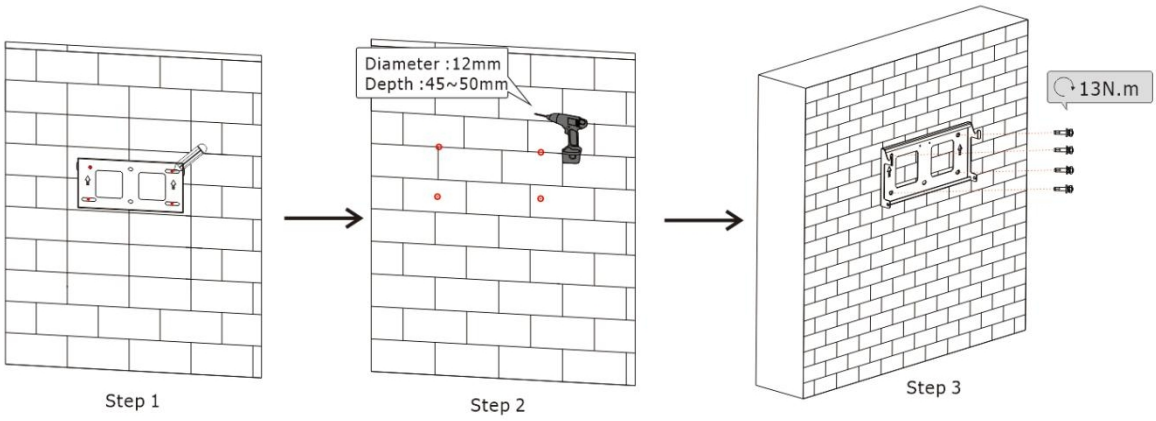


Figure 3.3-1 Install Wall Mounting Bracket

- ✧ Carefully lift the inverter and align the protruding mounting studs on its side with the “V”-shaped slots on the upper part of the wall mounting bracket. Lower the inverter so that the studs are securely seated in the slots.
- ✧ Adjust the inverter position until the lower holes of the mounting bracket align with the side holes of the inverter. Secure the inverter to the bracket using the supplied M6 combination screws.

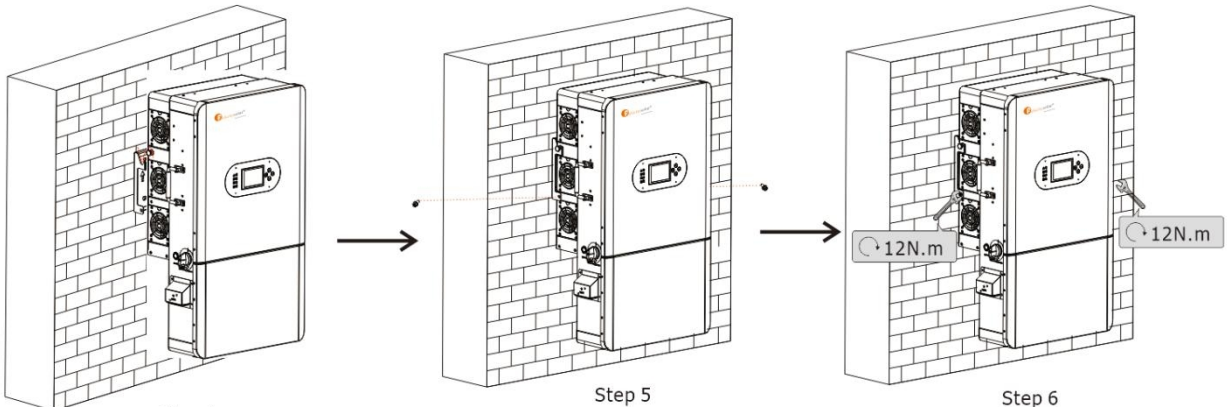


Figure 3.3-2 Install Inverter

Ensure the inverter is firmly supported during installation to prevent dropping.

Damage to the inverter caused by improper installation is not covered under warranty.

4. Electrical Connections

4.1. General Requirements

All electrical work must be performed by qualified personnel.

Before making electrical connections:

- Turn OFF all external disconnect devices.
- Verify that all circuits are de-energized.
- Confirm conductor sizing and breaker ratings.
- Ensure compliance with local electrical codes.

4.2. Backup Circuits

The LOAD connected service panel is called the Essential Loads Panel.

You must keep the Essential Loads Panel within the limitations of the unit:

Please refer to section **2.4.2 Datasheet** for specific values.

Verify that every load circuit power (P=V*I) does not surpass the limits.

Single System Install

A. FOR PARTIAL BACKUP: Connect the output of the back-feed breaker or line side tap (depending on the point of interconnection) to the GRID terminal.

An external disconnect must be installed between the interconnection and the Felicity Solar. Size the disconnect according to code.

Connect the LOAD output to the Essential Loads Panel. Follow electric code to select proper wire gauge.

B. FOR WHOLE-BUSINESS BACKUP: Connect the utility grid directly to the GRID terminal.

An external disconnect must be installed between the grid and the Felicity Solar. Size the disconnect according to code.

Connect the LOAD output to the Main Service Panel. Follow electric code to select proper wire gauge.

It’s possible to connect a generator or an AC coupled source, such as string or micro inverters, to the GEN terminal of the inverter. Only one AC source can be connected to the GEN terminal at a time.

Please refer to section 2.4.2 Datasheet for specific specifications

4.3. Grounding Requirements

The inverter must be permanently connected to the protective earth (PE) system.

Improper grounding may result in:

- Electric shock hazard
- Equipment malfunction
- Communication interference
- Fire hazard

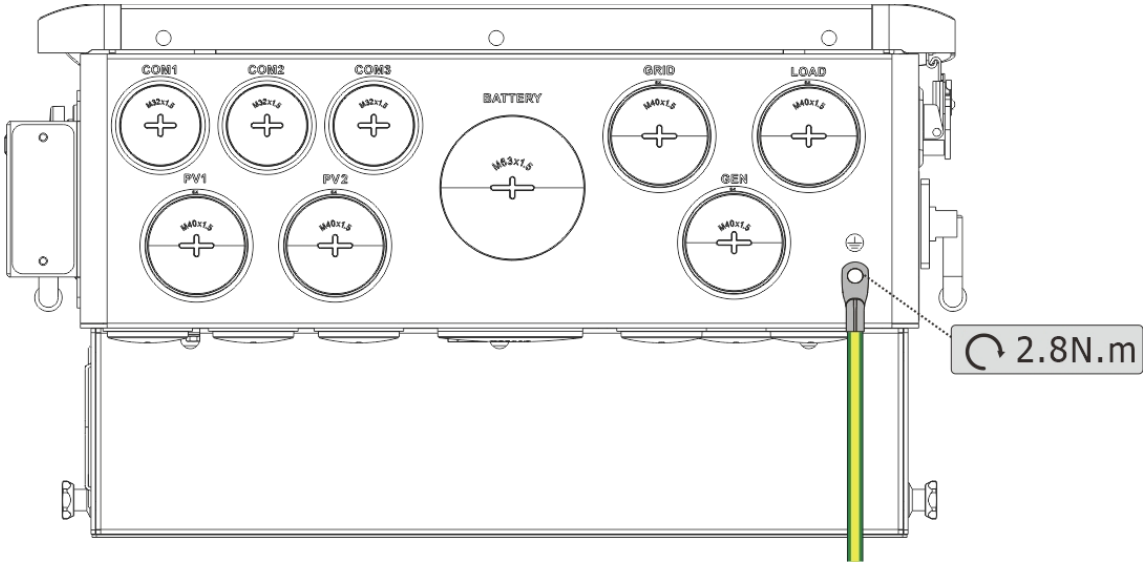


Figure 4.3-1 Case Grounding

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

Warning:

Inverter has built-in leakage current detection circuit. The type A RCD can be connected to the inverter for protection according to the local laws and regulations. If an external leakage current protection device is connected, its operating current must be equal to 10mA/KVA or higher, for this series of inverter it should be 300mA or higher, otherwise inverter may not work properly

4.4. Integrating Batteries

It's best practice to not mix battery banks of different make, model, age, or chemistry. This can have an adverse effect on performance, and in some cases could be hazardous.

1. Inverter must be OFF while you connect the batteries.

2. Depending on the battery voltage&current limits on section 2.4.2 Datasheet, wire up the battery bank in the possible configurations

3. Battery breakers must be OFF when wiring. If your battery bank does not have internal breakers, maintain the necessary safety measures when handling.

This is a 48VDC nominal system. DO NOT connect the inverter to any other battery configuration. If you use 12V batteries, you MUST NOT exceed 4 batteries in series.

DO NOT reverse polarity. The system will be damaged, and warranty voided!

4.4.1. Multi-Terminal Installation

You must use both positive and negative terminals as shown in the illustration. If you are connecting multiple batteries in parallel to the inverter, it is recommended to use a busbar or another suitable combiner for balanced battery charge and discharge. This configuration also ensures that you can charge and discharge at the maximum rate.

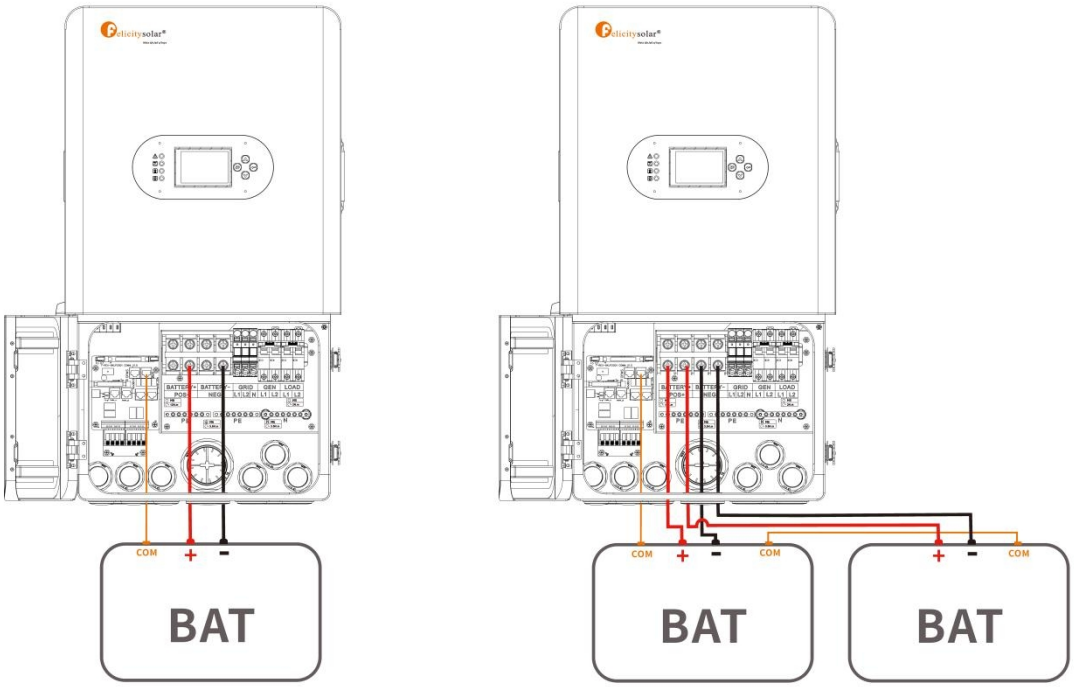


Figure 4.4.1-1 Battery Connection

Important **NOTE**: Multi-system installation

ALL parallel inverters MUST connect to a single battery bank. Otherwise, the system will NOT operate properly. DO NOT use separate battery banks in parallel systems.

4.4.2. Wiring Steps

Step 1： Prepare a suitable battery cable and breaker according to below table

Inverter Model	DC Breaker Specification	Wire Size
IVGM8KLP2G1-US IVGM7K6LP2G1-US	250A	35 AWG *2 / 0.016mm² *2
IVGM6KLP2G1-US IVGM5KLP2G1-US	150A	25 AWG *2 / 0.162mm² *2

Table 4.4.2-1 Battery Cable and Breaker

Step 2： Make battery terminals，Strip cable coat, revealing 15mm length of metal core.Use special crimper to compress battery terminal tightly.

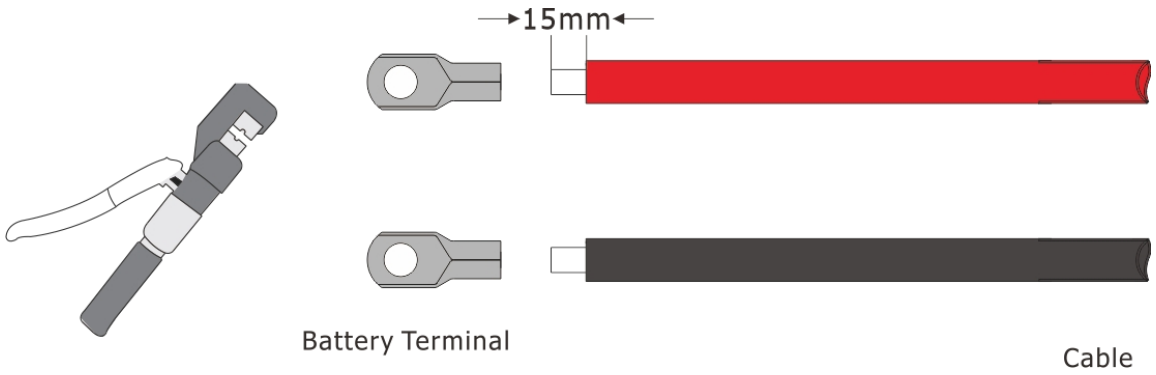


Figure 4.4.2-1 Battery Cable Preparation

Step 3： Connect the battery terminal to the inverter. Ensure that the battery polarity is connected correctly.

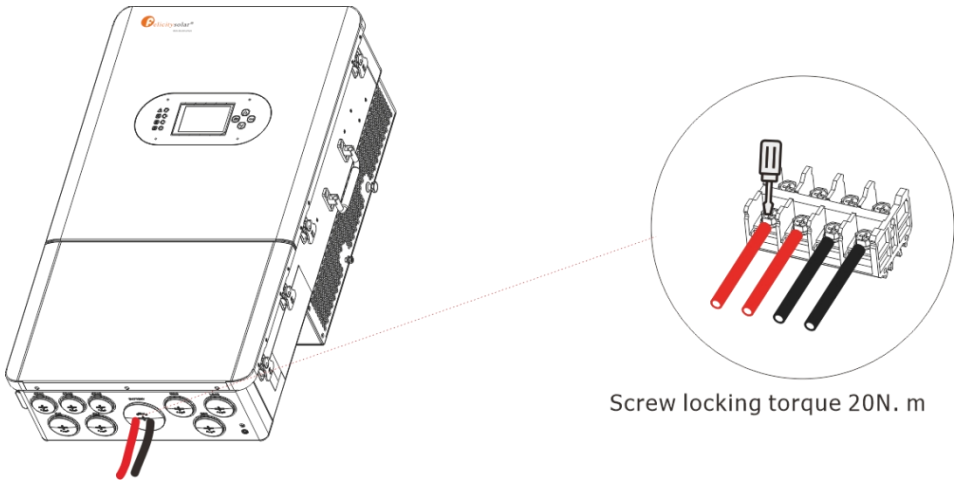


Figure 4.4.2-2 Secure Battery Terminal

4.5. Battery Communication

RJ-45 Configurations

This inverter achieves battery communications through a single RJ-45 port labeled “BMS” .

This port combines the RS-485 and CANBus pin configurations shown below. Please refer to the instruction manual for the corresponding model for specific battery connection methods.）

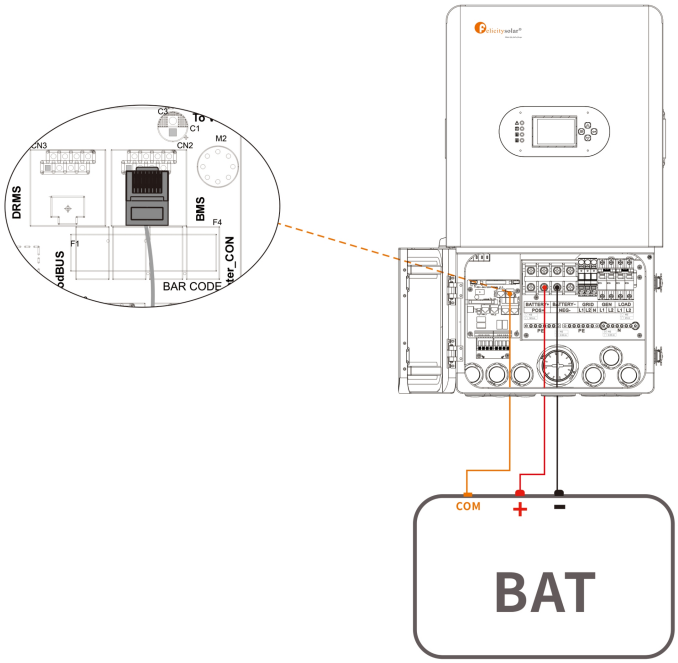


Figure 4.5-1 Battery Communication

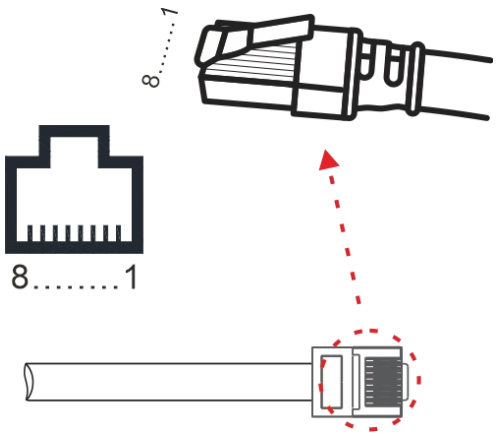
Position	Function	
1	/	
2	/	
3	CANL	
4	CANH	
5	BMS/485B	
6	BMS/485A	
7	/	
8	/	

Table 4.5-1 Battery RS-485 and CANBus Pin Configurations

Any damage caused by the improper use of the communication protocols will not be covered by warranty.

4.6. Connecting PV Modules

Please refer to section 2.4.2 Datasheet to configure the appropriate number of PV panels according to different models.

PV Source Circuit max voltage of 500VDC; damage can occur with PV strings whose open-circuit voltage exceeds 500VDC

NOTE: Strings in parallel on the same MPPT must have the same designed open-circuit voltage (Voc); otherwise, the system will be limited to the lowest string voltage.

• PV1 A/B must have the same Voc.

• If the solar panels are oriented in different directions and connected in the same MPPT, there will be a loss of PV efficiency.

NOTE: According to NEC Art. 690.43, exposed non-current-carrying metal parts of PV module frames, electrical equipment, and conductor enclosures of PV systems must be connected to an equipment grounding conductor. All grounding conductors and grounding electrodes should be installed according to NEC Art. 690.47 or as required by the AHJ.

For ground-mounted arrays, Felicity Solar recommends installing an auxiliary grounding electrode placed near the array to ensure optimal earth-to-ground resistance of the grounding system. This auxiliary electrode must follow the requirements of NEC Art 250.54

4.6.1. Pre-connection Steps

✧ Turn OFF the grid supply main switch (AC).

✧ Turn OFF the DC isolator.

✧ Ensure all PV cables are properly prepared.

Safety Instructions

PV modules exposed to sunlight generate voltage. Series-connected modules can produce hazardous high voltage.

Before connecting DC inputs, ensure:

✧ The inverter is powered OFF

✧ The PV array is covered or isolated

Failure to do so may result in electric shock.

Warning

Do not disconnect PV under load.

Do not turn off the DC isolator while current is flowing.

Electrical Limits

Verify that the PV string open-circuit voltage (Voc) does not exceed the inverter's maximum PV input voltage.

Ensure Correct Polarity:

PV+ (positive)

PV− (negative)

4.6.2. Cable Requirements

To reduce the risk of overheating or injury, use the recommended cable size:

Inverter Model	Recommended Wire Size	Cross-sectional Area
IVGM8KLP2G1-US **IVGM7K6LP2G1-US** **IVGM6KLP2G1-US** **IVGM5KLP2G1-US**	10–12 AWG	4 mm² (10 mm²)

Cable selection shall comply with local electrical regulations.

4.6.3. PV Cable Installation

Step 1: Cable Preparation

Strip insulation: 7 mm

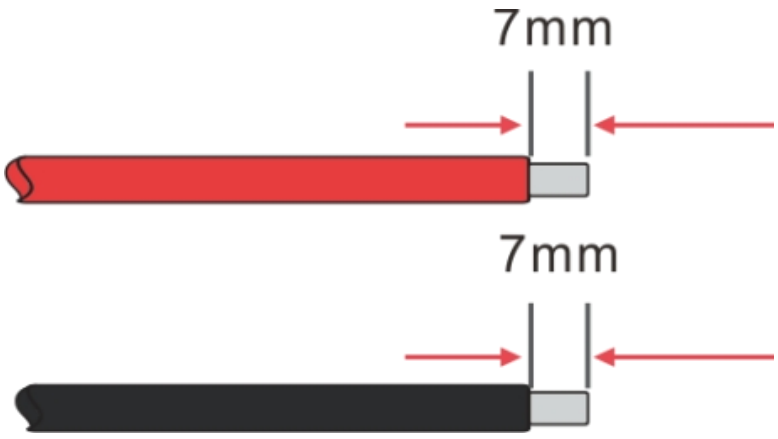


Figure 4.6.3-1 PV Cables Preparation

Step 2: Connection to Inverter

Turn the terminal upwards,insert the cable,and then press down to fix the cable.

“click” sound indicates correct insertion

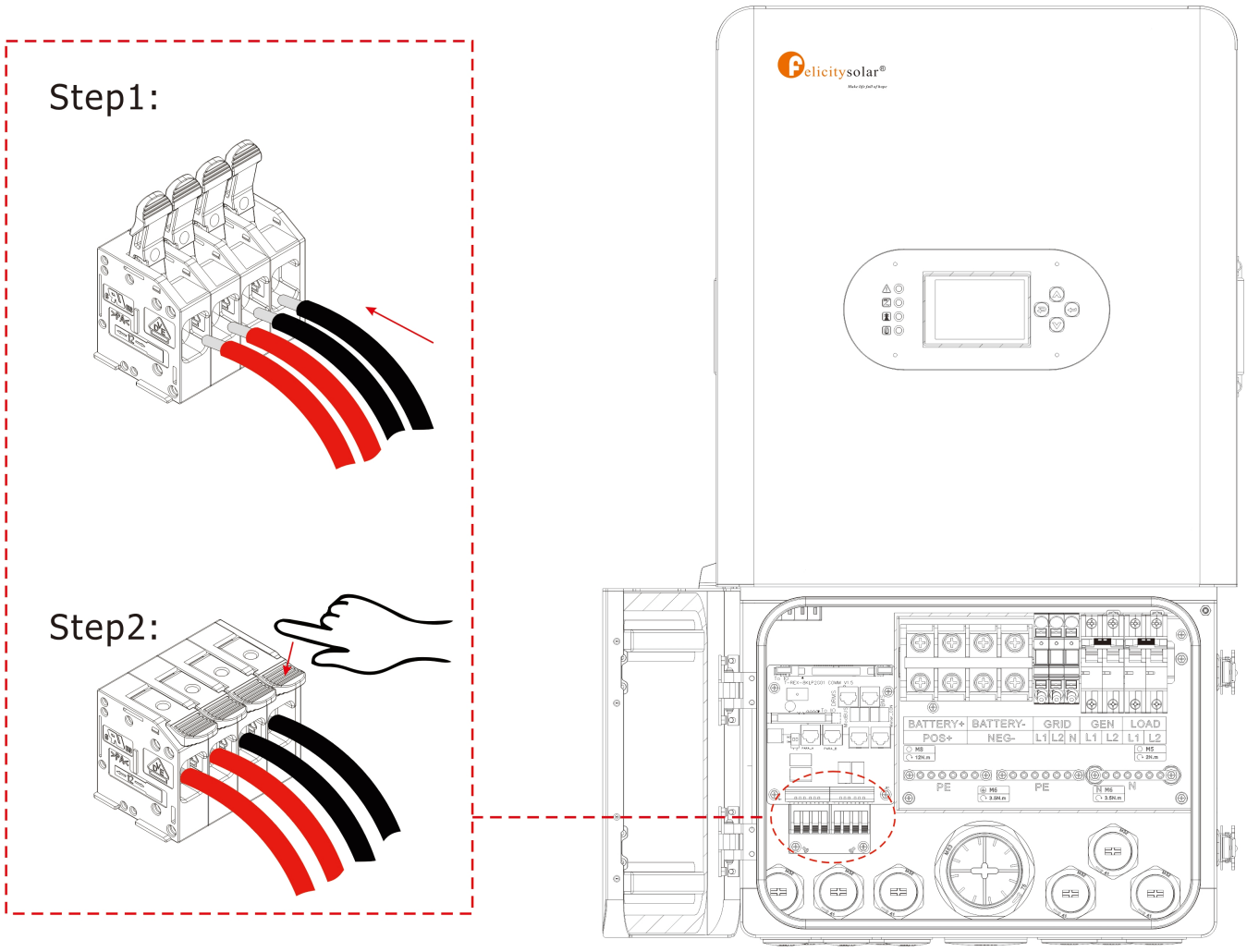


Figure 4.6.3-2 PV Connection

Sunlight hits the panels to create voltage, and high voltages in series can be life-threatening. Therefore, before connecting the DC input line, it is necessary to shield the solar panel with opaque material and put the PV switch in the "OFF" state, otherwise, the high voltage of the inverter may lead to a life-threatening situation.

4.7. Grid, Load and Gen Port Connection

4.7.1. Pre-Installation Requirements

Before connecting the system, dedicated AC circuit breakers must be installed:

- Between the inverter and the grid
- Between the backup load and the inverter

This ensures:

Safe disconnection during maintenance

Protection against overcurrent

Breaker selection must comply with local regulations.

The recommended ratings are based on the inverter's maximum continuous AC passthrough current， you can refer to section 2.4.2 Datasheet for specific value

The backup-side breaker may be selected according to the actual total load current.

Safety Warning

- All wiring must be carried out by qualified personnel only
- Use appropriate AC cables that meet local standards
- **Using recommended cable specifications reduces the risk of injury and equipment damage**

4.7.2. Circuit Breaker Selection

Inverter Model	Recommended Breaker
IVGM8KLP2G1-US IVGM7K6LP2G1-US IVGM6KLP2G1-US IVGM5KLP2G1-US	40A

Table 4.7.2-1 Backup Load Side Breaker

Inverter Model	Recommended Breaker
IVGM8KLP2G1-US IVGM7K6LP2G1-US IVGM6KLP2G1-US IVGM5KLP2G1-US	63A

Table 4.7.2-2 Grid Side Breaker

4.7.3. Port Definitions

The inverter includes three terminal sections:

Label	Description
Grid	Grid connection (bi-directional input/output, similar to a grid-tied inverter)
Load	Connection for essential loads (lighting, security systems, internet, etc.)
Gen	Generator connection

Table 4.7.3-2 Port Definitions

Ensure that input and output terminals are not misconnected.

4.7.4. Cable Specifications (Bypass Mode)

Inverter Model	Gauge	Cross-sectional Area
IVGM8KLP2G1-US **IVGM7K6LP2G1-US** **IVGM6KLP2G1-US** **IVGM5KLP2G1-US**	6 AWG	13.3 mm^2

Table 4.7.4-1 Cable Specifications (Bypass Mode)

Important Notes

- Circuit breakers must comply with below standards：

  UL 489 (External circuit breakers for main circuits)

  UL 1077 (Miniature circuit breakers for internal use)
- All installation work must be performed by qualified personnel
- Disconnect all AC power sources before wiring

4.7.5. Wiring Procedure

1) Power Off
   Turn off all AC breakers and ensure the system is fully de-energized
2) Identify Ports
   Locate and confirm Grid, Load, and Gen terminals
3) Prepare Cables
4) Strip Insulation (~10 mm)
5) Press the Orange Terminal Button
6) Insert the Conductor and Release the Button
7) Connect Wires：Ensure all connections are secure and properly tightened
8) Apply Start Delay (if required)

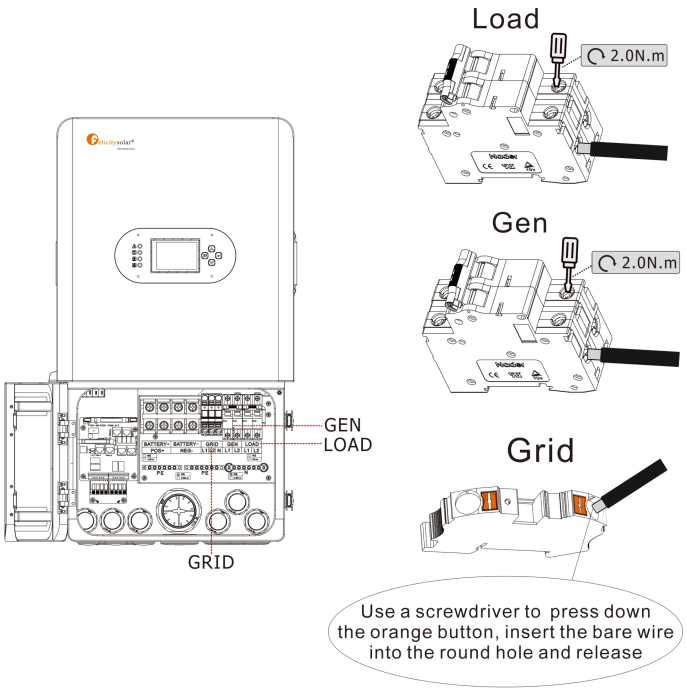


Figure 4.7.5-1 Grid，Load and Gen Connection

Some appliances must not restart immediately after a power outage:

Air conditioners: allow refrigerant pressure to stabilize

Refrigerators: protect compressor operation

Freezers: maintain cooling balance

Water pumps: avoid voltage fluctuation damage

NOTE: If no delay is configured, the inverter may trigger overload protection.

4.7.6. Grounding of Gird，Load and Gen

Connect the PE (Protective Earth) conductor properly

Recommended tightening torque: 2.0 N·m

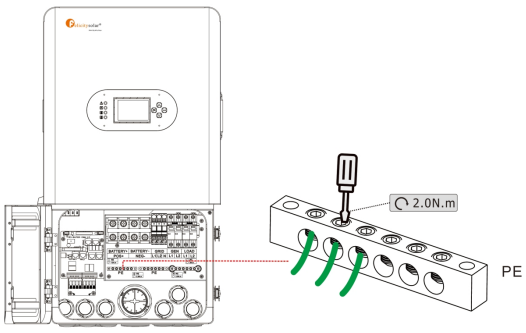


Figure 4.7.6-1 Grounding of Gird，Load and Gen

4.8. Function Port Definition

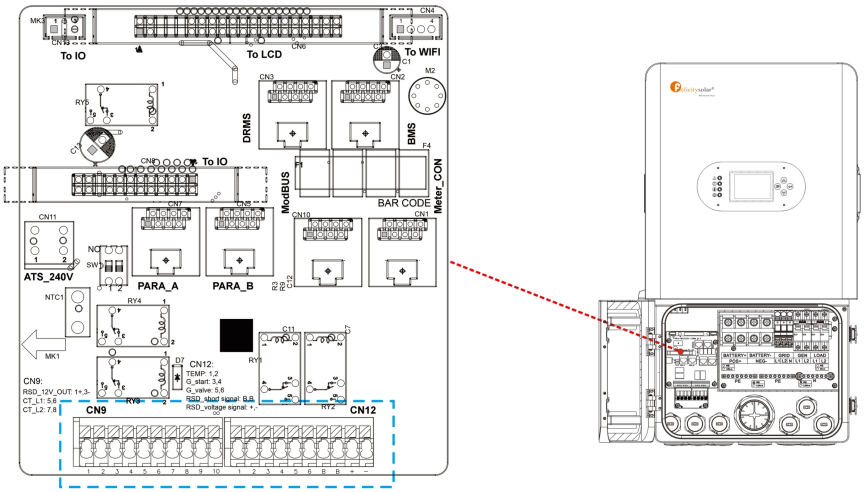
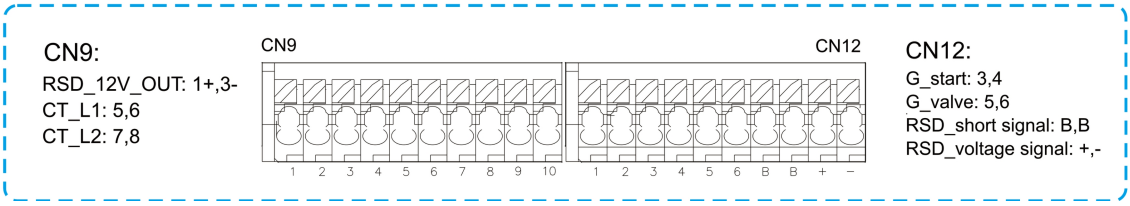


Figure 4.8-1 Function Port Definition

Position	Function
BMS	BMS:RS 485 or CAN port for battery communication.
PARA_A	Parallel communication port 1(CAN interface).
PARA_B	Parallel communication port 2(CAN interface).
DRMS	For Australia market only.
Meter	For meter communication(RS485 interface).
SW1 In parallel	Turn the DIP switch of the first and last inverter to:ON,and the other machines to OFF
Modbus	For troubleshooting purposes only and should be operated by a professional under our guidance.

Table 4.8-1 Function Port Definition



RSD 12V out (CN9:1,3): When battery is connected and the inverter is in "ON" status, it will provide 12vdc,Imax 400ma.

CT_L1 (CN9:5,6): current transformer (CT1) for “zero export to CT" mode clamps on L1 when in split phase system.

CT_L2 (CN9:7,8): current transformer (CT2) for “zero export to CT" mode clamps on L2 when in split phase system

TEMP(CN12:1,2):temperature sensor for lead acid battery.

G-start (CN12:3, 4): dry contact signal for startup the diesel generator. When the "GEN signal" is active, the open contact (GS) will switch on(no voltage output).

G-valve(CN12:5,6): This function is reserved.It is not recommended..

RSD_Short Signal(CN12:B,B)/RSD Voltage Signal(CN12:+, -): when the terminal “B"&“B” is short-circuited with additional wire connection, or there’s 12Vdc input at the terminal “+ &- “, then the 12Vdc of RSD+ & RSD- will disappear immediately, and the inverter will shutdown immediately.

ATS_240V： If the conditions are met, it will output 240Vac,Imax 800mA.

4.9. DRMS Connection

4.9.1. Overview

The DRMS (Demand Response Mode System) interface is designed to meet grid compliance requirements in:

- Australia / New Zealand (AS/NZS 4777 – DRED)
- Europe (Remote Shutdown function)
- A factory-installed resistor plug is inserted by default.

Do not remove the resistor plug unless an external control cable is connected. Improper removal may lead to abnormal inverter operation

4.10. Debugging Connectio

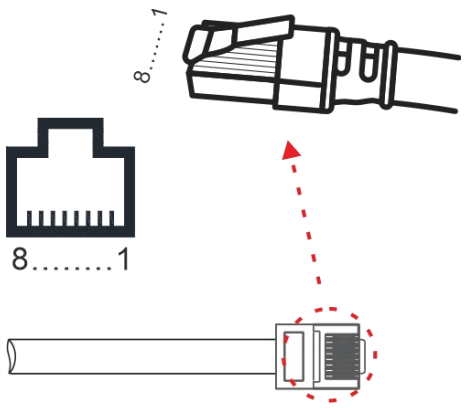
Position	Function	
1	PC_485_B	
2	PC_485_A	
3	GND_COM	
4	/	
5	/	
6	GND_COM	
7	PC_485_A	
8	PC_485_B	

Figure 4.10-1 Connect to DRMS Port

4.11. Accessories

4.11.1. NTC-Temperature Sensor

1. Place the sensor on the battery as shown below.
2. Secure with tape and place away from the battery terminals to prevent overheating.

3. This sensor has no polarity. The temperature sensor helps perform voltage charging adjustments and capacity calculations due to changes in temperature.

NOTE: Lithium Batteries DO NOT require external temperature sensor.

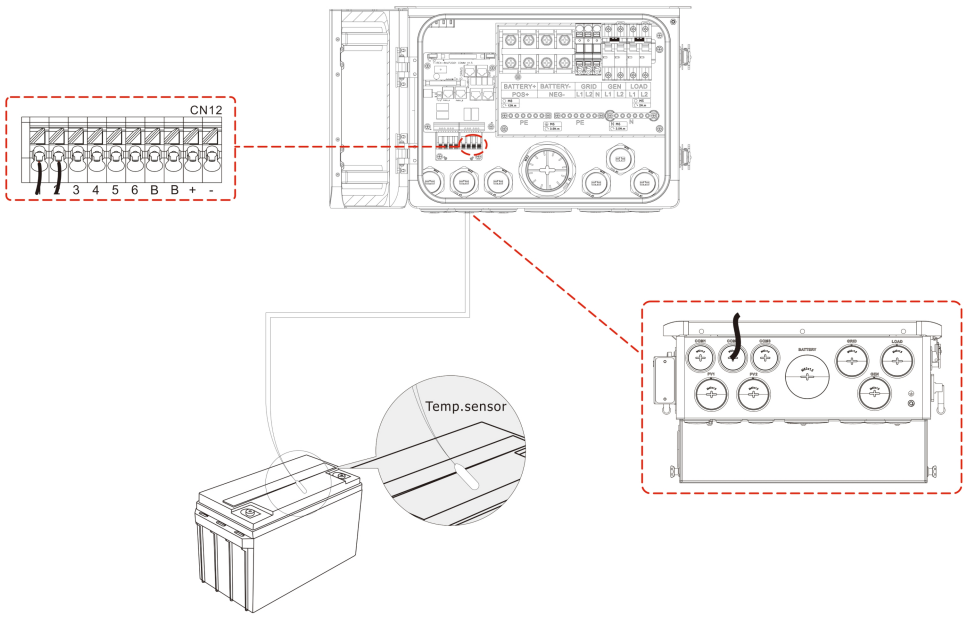


Figure 4.10.1-1 Battery Temperature Sensor

4.11.2. WiFi module

Remote monitoring and software updates require an internet connection through the WI-FI/Bluetooth

Compatible with Wi-Fi & Bluetooth

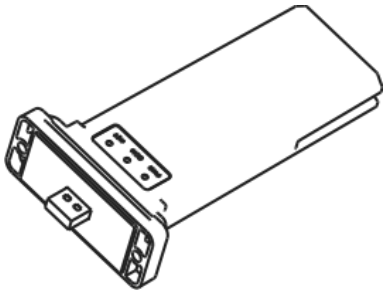


Figure 4.11.2-1 WiFi Module

For detailed WiFi configuration steps, please refer to the WiFi module manual.

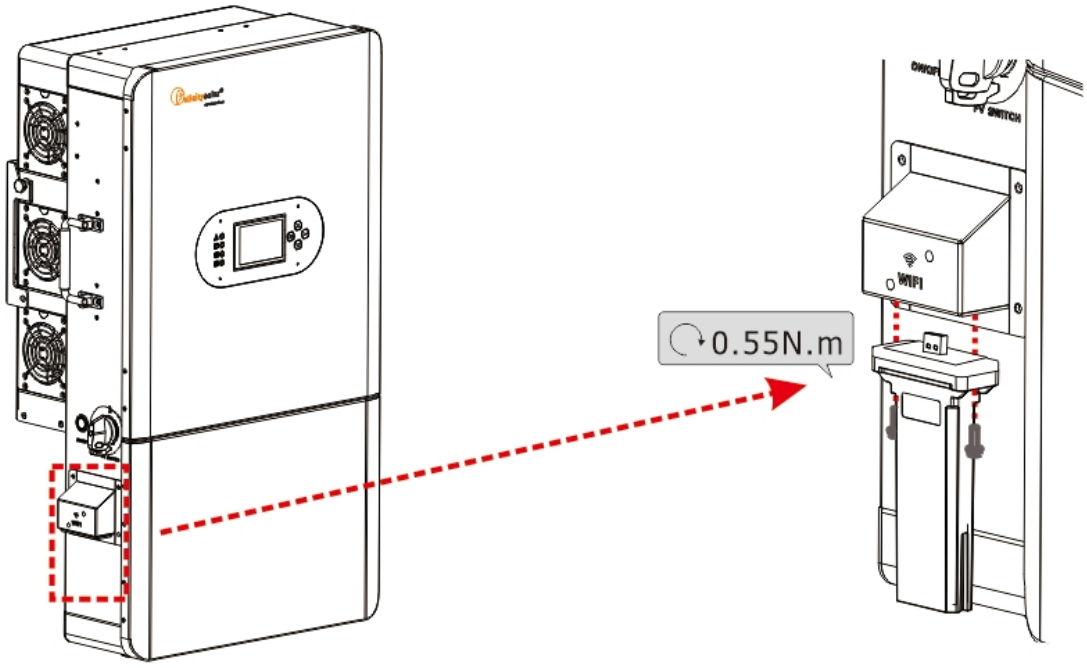


Figure 4.11.2-2 Install WiFi Module

4.12. Limit Sensors (CT sensors)

The CT sensors (or limit sensors) enhance system capabilities by enabling the use of the system work modes known as “Zero Export To CT” (Meter Zero) and “Grid Peak Shaving” . The CTs will measure and calculate total load demand which the inverter will then use to accurately supply and offset all existing loads (Meter Zero).

Please use the standard length CT cable; do not extend it yourself, otherwise it will affect the accuracy of the detected data.

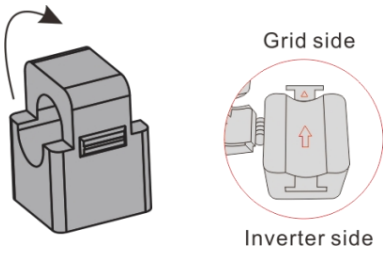


Figure 4.12-1 CT Direction

Wiring the CT sensor

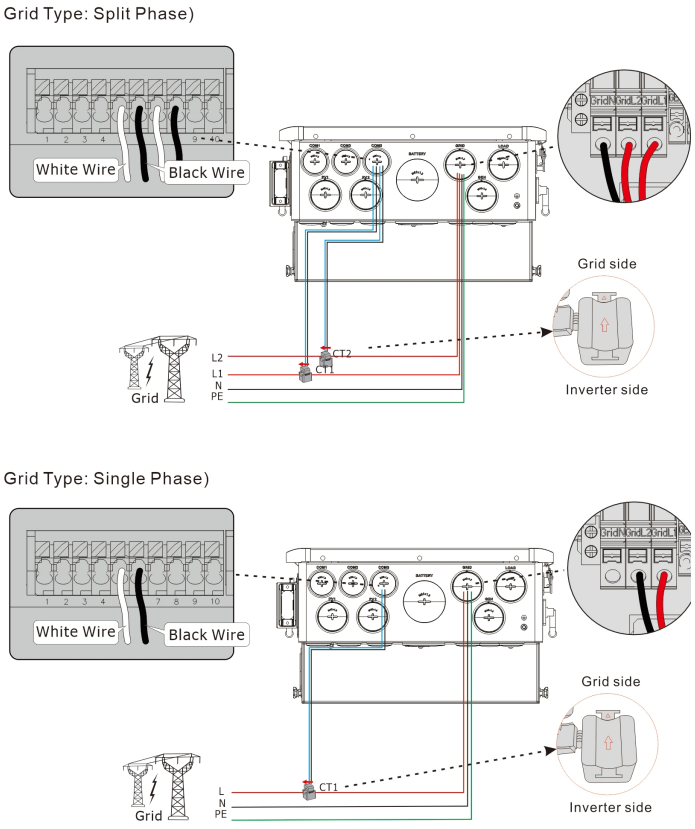


Figure 4.12-2 CT Wiring

CT1(+/-): current transformer (CT1) for"zero export to CT"mode clamps on L1 when in split phase system.

CT2(+/-): current transformer (CT2) for"zero export to CT"mode clamps on L2 when in split phase system.

NOTE: For single phase (5/6/7.6/8kW, 230Vac), 1 pcs CT is needed only, and the secondary side of the CT should be connected to CT1(+/-).

4.13. Smart Meter Connection

Currently, only CHINT and Eastron customized meters are supported. Please contact Felicity to purchase.

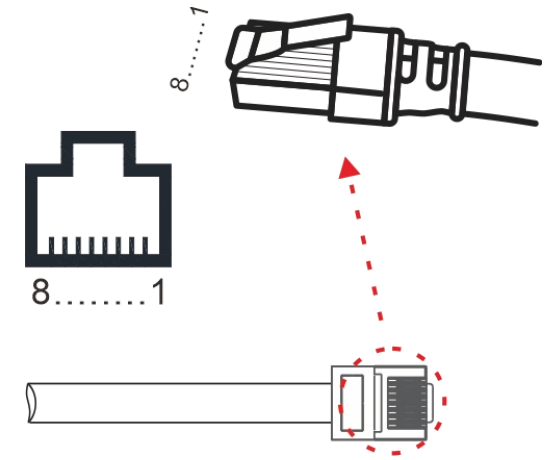
Position	Function	
1	METER_485_B	
2	METER_485_A	
3	GND-COM	
4	METER_485_B	
5	METER_485_A	
6	GND-COM	
7	METER_485_A	
8	METER_485_B	

Table 4.13-1 Smart Meter & RS485 Interface

The Smart Meter is optional for IVGM system installation, used to detect grid voltage and current direction and magnitude, further to instruct the operation condition of IVGM inverter via RS485 communication.

4.13.1. CHINT Smart Meter

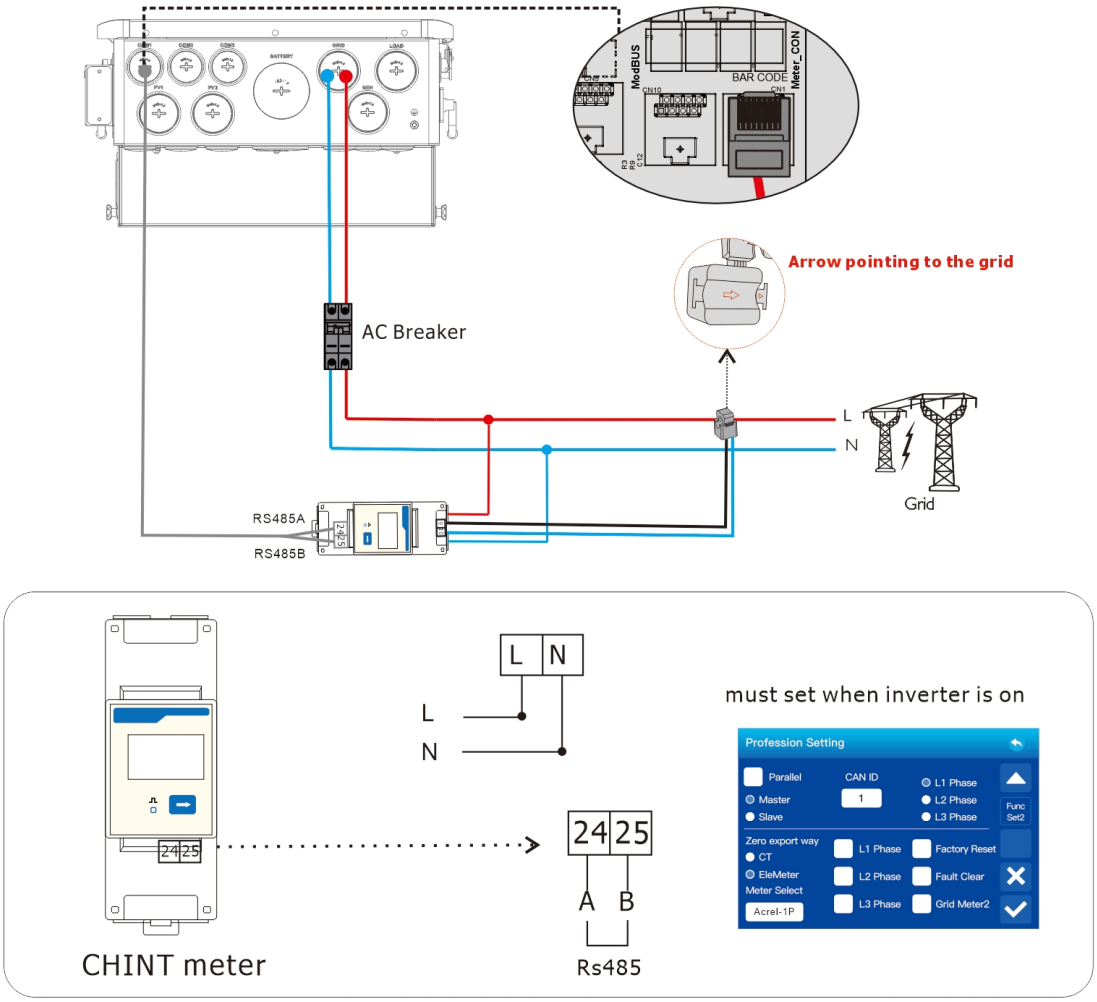


Figure 4.13.11-1 Single Phase Smart Meter With External CT

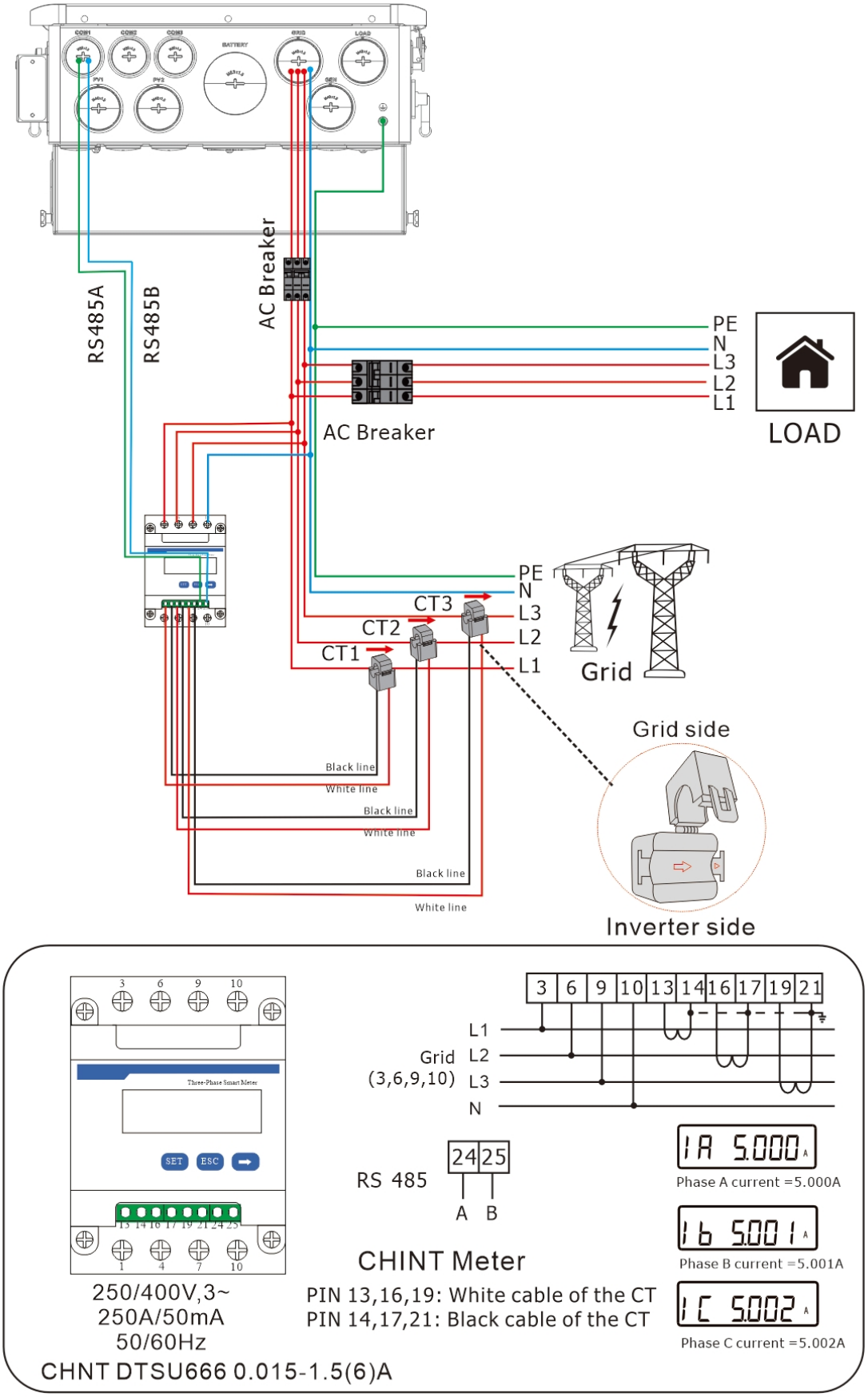


Figure 4.13.1-2 Three Phase Smart Meter With External CT

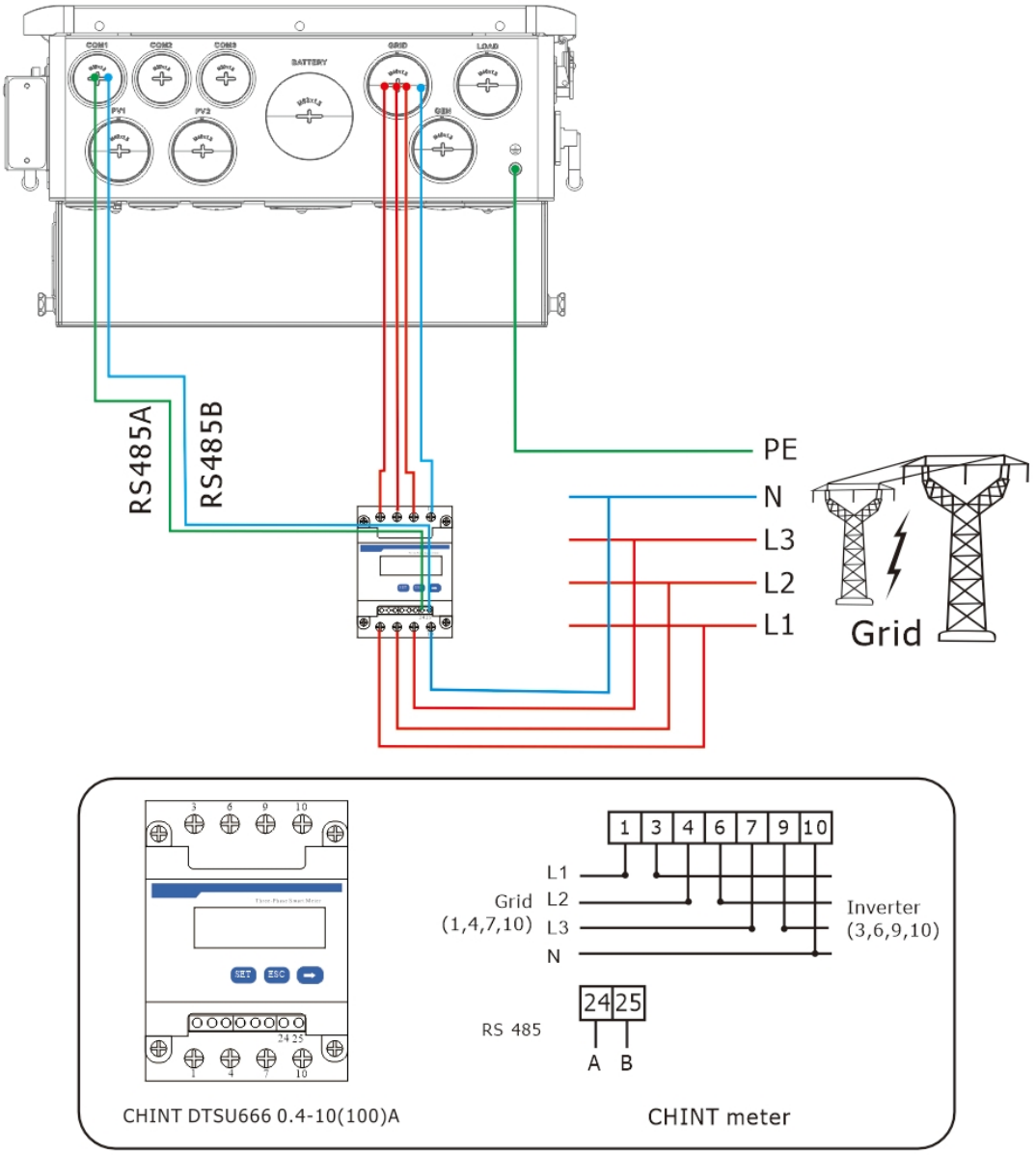


Figure 4.13.1-3 Three Phase Smart Meter Without External CT

4.13.2. Eastron Smart Meter

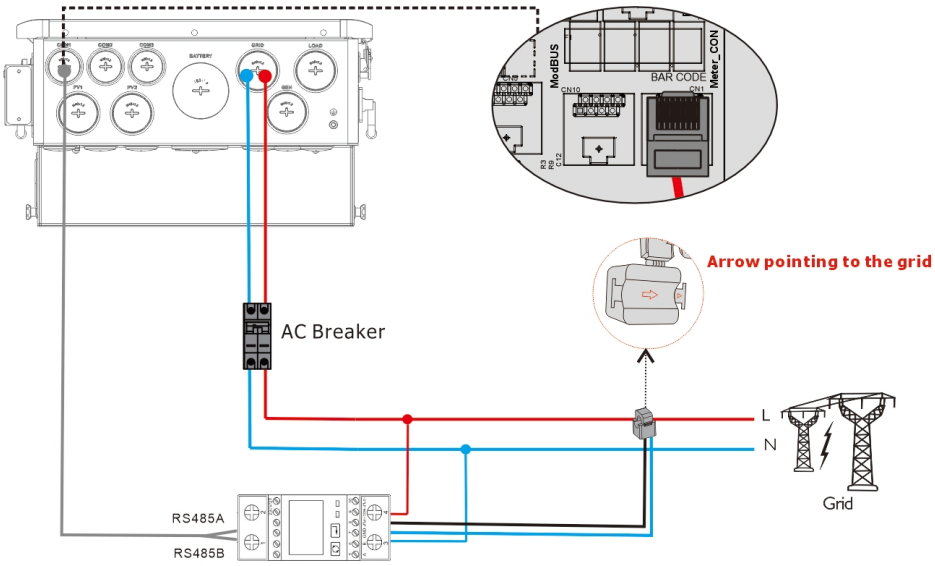


Figure 4.13.21-1 Single Phase Smart Meter With External CT

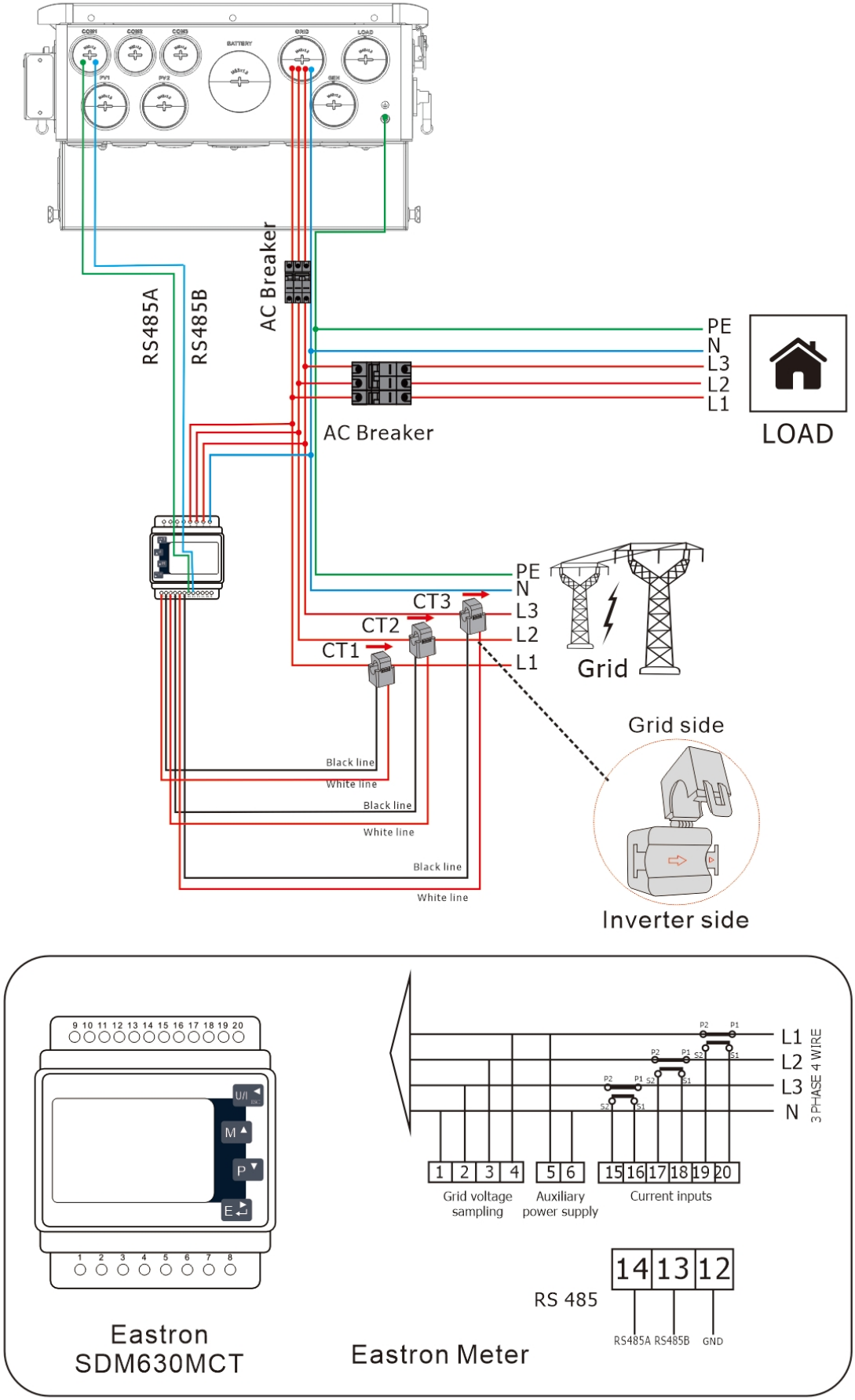


Figure 4.13.2-2 Three Phase Smart Meter With External CT

5. Commissioning

NOTE: TURN ON the inverter with at least one power source: Battery, PV, or Grid.

5.1. Pre-Startup Inspection

1. Check the voltage of the battery bank

A. Voltage of the battery must be between 40VDC-60VDC.

B. If applicable,turn ON internal switches of the batteries. Measure individual voltages.

C. Verify that the voltage of the battery bank at the Inverter terminals is adequate.

DO NOT reverse polarity. DO NOT turn OFF battery disconnect if any current is flowing into or out of the battery.

2. Check the voltage of each PV input circuit

A. Voc must not exceed 500VDC.

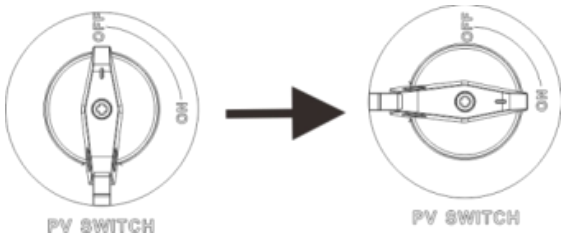
B. Input voltage must be above the startup voltage of 100VDC.

C. Do not ground PV+ or PV-.

D. Verify polarity in each PV string. Backward polarity will measure 0Vdc by the Inverter and will cause long-term damage.

E. **NOTE:** PV alone turns LCD screen only. Inverter requires grid and/or batteries to operate, otherwise an "NO BAT" message will appear.

F. PV DC disconnect switch on the side of the inverter will turn the PV ON or OFF.



3. Check GRID input voltage

A. Use the "GRID" terminals to measure AC voltage with a multimeter.

B. Measure line (L) to neutral (N) voltages on "GRID" terminals. Ensure 120VAC on all phases.

C. Measure line (L) to line (L) voltages on "GRID" terminals. Ensure 240VAC. (If voltage reading is close to 220V or 210V, verify if grid is single-phase or three-phase instead).

D. Verify that voltage between Neutral and Ground is 0VAC.

E. Verify that voltage between "GRID" L1 and " LOAD" L1 is 0V. Do the same for L2.

5.2. Power ON the Inverter | Single Inverter Systems

Follow the instructions below for your power source.

Powering up from a Battery bank. (Recommended)

A. Turn ON the battery breaker(s).

B. PRESS the power button to the ON position.Until inverter LCD and battery LED lights up and displays battery data

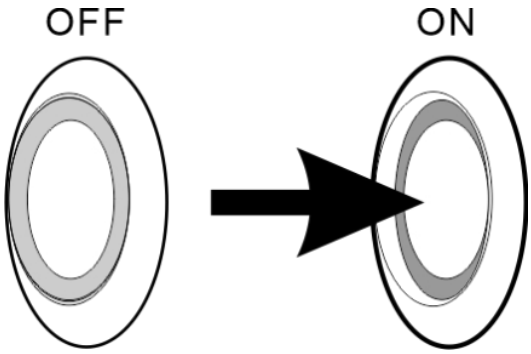


Figure 5.2-1 Turn on Inverter

C. PROGRAM the settings on the inverter according to your Battery and GRID type. The unit is programmed in Split Phase 110/220V by default.

D. Turn ON the external GRID disconnect. Wait for GRID LED indicator to turn on.

F. Turn ON the PV DC disconnect switch. Wait for the PV icon appear on LCD.

G. Turn ON the GEN breakers.

H. Turn ON the LOAD breakers

Powering up from the Grid

A. Turn ON the external “GRID” disconnect and wait for “GRID” LED indicator to turn on. Do NOT press the power button yet.

B. PROGRAM the settings on the inverter according to your GRID type. The unit is programmed in Split Phase 110/220V by default.

C. PRESS the power button to the ON position.

D. Turn ON the PV DC disconnect switch. Wait for the PV icon appear on LCD.

E. Wait for the “ DC/AC” LED indicator to turn on. This may take a few minutes.

F. Turn ON the internal “ LOAD” breaker.

NOTE：

If your system does not have a PV source, you can skip steps D and E. Under these conditions, the inverter will operate in pass-through mode only.

If no battery bank is connected to the inverter, the GEN port will be disabled as it requires the battery SOC% to open and close the internal GEN port relays.

When connecting to the grid, if any of the following situations occur, please temporarily disconnect the battery connection to avoid over-discharge, and immediately contact the Felicity official support team:

1. Incorrect grid phase sequence connection – The inverter will report W38/F96.

2. Excessive grid frequency or voltage fluctuations – The inverter will report W33-W36.

3. Incorrect grid settings – Please refer to Chapter 7.8 Grid Setup to check the grid settings.

5.3. Power ON the Inverter | Parallel Install

Powering up from a Battery bank

1. Ensure that the parallel wiring and DIP switch settings are correct as shown in "9.Wiring Diagrams" on page 73.

2. Turn ON the battery breakers for all of the units

3. PRESS the power button to the ON position in all units; Until each inverter LCD and battery LED lights up and displays battery data.

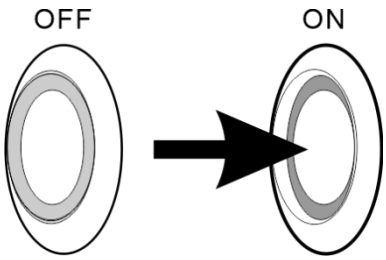


Figure 5.3-1 Turn on Inverter

4. PRESS the power button to the OFF position in all units，inverter will enter Standby mode

5. PROGRAM the following parameters of each units one by one

- Grid Code
- Grid Type
- Grid Voltage
- Grid Frequency
- CAN ID（From master to slave, set them sequentially from 1 to 10）

6. After confirming that the parameters listed in step 4 are set for each inverter, enable Parallel mode for each units. Then confirm that the Parallel System Host or Slave Flag is displayed on the LCD of each unit and there are no error messages.

7. PROGRAM remains parameter on the "Master" unit. The parallel communication will copy the settings from the “ Master” unit to all “Slave” units. It’s not necessary to program remains settings in each unit.

8. PRESS the power button to the ON position in all units，until all inverter LCD show up “Off Grid” icon

- **VERIFY the GRID and Battery parameters are properly transferred from the " Master" unit to the "Slave" units. Wait for the LCD and BAT LED to light up on each unit. This may take a few minutes.**

9. Turn ON the external "GRID" disconnect/breakers. Wait for GRID LED indicator to turn on for all units
10. Turn ON the PV DC disconnect switch for all units. Wait for the PV icon to appear on LCD for all units.
11. Turn ON the GEN breakers.
12. Turn ON the LOAD breakers.

Powering up from the Grid

1. Parallel communication CANNOT be established without a Battery Bank. In these systems, it's not necessary to activate parallel operation for the inverters.

2. The powering-up process is the same as the one described for single inverter systems in "5.2.Power ON the Inverter | Single Inverter Systems-Powering up from the Grid" on page 35.

5.4. Power OFF the Inverter | Single Inverter Systems

1. TURN OFF all LOAD breakers and disconnects
2. TURN OFF all GEN breakers and disconnects
3. TURN OFF the built-in PV DC disconnect switch on the side of the inverter.
4. TURN OFF all GRID breakers and disconnects

3. PRESS the power button, make sure it is in the OFF position. The LCD screen will turn off after a few seconds.

4. TURN OFF the battery breakers.

5. Wait a moment (~1 min) to make sure the inverter is completely de-energized.

5.5. Power OFF the Inverter | Parallel Install

Perform the following steps sequentially, first on the master device, then on the slave device

1. TURN OFF all LOAD breakers and disconnects
2. TURN OFF all GEN breakers and disconnects
3. TURN OFF the built-in PV DC disconnect switch on the side of the inverter.
4. TURN OFF all GRID breakers and disconnects

3. PRESS the power button, make sure it is in the OFF position. The LCD screen will turn off after a few seconds.

4. TURN OFF the battery breakers of all units

5. Wait a moment (~1 min) to make sure the inverter is completely de-energized.

6. Troubleshooting

Perform troubleshooting according to the solutions in the table below. Contact the after-sales service if these methods do not work.

Collect the information below before contacting the after-sales service, so that the problem scan be solved quickly.

- Inverter SN
- Inverter Usage Duration
- System On-Site Status (with attached images or videos)
- Detailed Problem Description (with attached images or videos)

6.1. Warning Code

The inverter's Fault LED does not remain lit, but an error code flashes on the screen.

In most cases, these codes indicate warnings rather than actual faults

Warning Code	Warning Information	Trouble Shooting
18	Battery Under Voltage Alarm	Battery voltage is too low, the battery should be charged
19	Battery Open Circuit Alarm	Battery open, check battery wiring
20	Battery SOC Low Alarm	Battery SOC is too low, battery should be recharged
21	BMS communication Alarm	Abnormal communication between battery and inverter in non-SOC mode, check battery and inverter wiring.
22	Battery Under Voltage Alarm or Battery SOC Low Alarm	Battery voltage is too low or Battery SOC is too low, the battery should be charged
33	Grid Over Voltage Alarm	Grid voltage is too high, check if the grid voltage is within the normal range
34	Grid Under Voltage Alarm	Grid voltage is too low, check if the grid voltage is within the normal range
35	Grid Over Frequency Alarm	Grid frequency is too high, check if the grid frequency is within the normal range
36	Grid Under Frequency Alarm	Grid frequency is too low, check if the grid frequency is within the normal range
38	Grid Reverse Sequence Alarm	Grid phase sequence reversed, check grid phase sequence wiring
43	Active Islanding Alarm	When the power grid experiences an AC power outage, the device detects islanding proactively.
44	Low Voltage Crossing Alarm	Entering LVRT at grid connection, the inverter absorbs reactive power from the grid
48	Buckup Overload Alarm	The load is overloaded and should be reduced
57	Gen Over Voltage Alarm	Generator voltage is too high, check whether the generator voltage is within the normal range
58	Gen Under Voltage Alarm	Generator voltage is too low, check whether the generator voltage is within the normal range

Warning Code	Warning Information	Trouble Shooting
59	Gen Over Frequency Alarm	Generator frequency is too high, check whether the generator frequency is within the normal range
60	Gen Under Frequency Alarm	Generator frequency is too low, check whether the generator frequency is within the normal range
62	Gen Reverse Sequence Alarm	Generator phase sequence reversed, check generator phase sequence wiring
67	GEN Over Load Alarm	Please check whether the load on backup port exceeds the generator specifications.
83	Radiator over-temperature derating alarm	The inverter will reduce power if the heat sink temperature is too high.
86	Fan1 Failed Alarm	Fan 1 malfunction, check fan for proper functioning
87	Fan2 Failed Alarm	Fan 2 malfunction, check fan for proper functioning
91	Push-button shutdown alarm	Ensure "Power on/off button is on "ON" position
92	Remote Shutdown Alarm	Indicate inverter has entered standby mode
93	Flash is not burned	Flash is not burned, contact Felicity's official technical support team.

6.2. Fault Code

The inverter's Fault indicator light is solid red, and a fault code is flashing on the screen.

Please follow the steps in the table below.

If the issue persists, contact Felicity's official technical support team immediately

Fault Code	Fault Information	Trouble Shooting
05	PV over current fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
17	Arc Fault	1.Check PV module cable connection and clear the fault (To manually clear, please enable "Clear Arc_Fault"); 2. If the fault still exists, please contact us for help;
18	PV short circuit fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
25	Battery over voltage fault	1. Check the Battery voltage is in the range of standard voltage in specification; 2. Check whether Battery cables are firmly and correctly connected; 3. Seek help from us, if can not go back to normal state;
27	Battery over Current fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
28	Battery hardware overcurrent	1. Restart the system 2.3 times; 2,If the fault still exists, please contact us for help;
31	LLC over Current fault of hardware	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
32	BMS communication fault	1. Check whether BMS communication cable is firmly and correctly connected; 2. Seek help from us, if can not go back to normal state;
35	BUCK-BOOST Current sensor fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
37	LLC soft start failure	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
40	BAT short circuit	1. Check whether the battery port is in short circuit; 2,If the fault still exists, please contact us for help;
41	BUS over voltage fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
43	BUS under voltage fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
44	BUS voltage unbalance fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;

Fault Code	Fault Information	Trouble Shooting
49	INV over Current of software	1. Please check whether the load power is within the range; 2. Restart and check whether it is in normal; 3. Seek help from us, if can not go back to normal state;
50	AC voltage DC component fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
53	INV over voltage fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
55	INV under voltage fault	1. Please check whether the load power is within the range; 2. Restart and check whether it is in normal; 3. Seek help from us, if can not go back to normal state;
56	INV short circuit fault	1. Please check the connection of buckup is firmly and correctly; 2. Restart and check whether it is in normal; 3. Seek help from us, if can not go back to normal state;
57	Grid overload fault	1. Please check whether the load power is within the range; 2. Restart and check whether it is in normal; 3. Seek help from us, if can not go back to normal state;
58	Buckup overload fault	1. Please check whether the load power is within the range; 2. Restart and check whether it is in normal; 3. Seek help from us, if can not go back to normal state;
65	Heatsink high temperature fault	1. Check whether the work environment temperature is too high; 2. Turn off the inverter for 15mins and restart; 3. Seek help from us, if can not go back to normal state;
67	Main and auxiliary DSP communication fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
68	MCU communication fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
69	Eeprom fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
70	AC leakage current sensor fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
71	AC leakage current fault	1. Check PV side cable ground connection; 2. Restart the system 2~3 times; 3. If the fault still exists, please contact us for help;
72	Grid Relay open circuit fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
74	INV Relay self check fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
76	GEN Relay self check fault	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;

Fault Code	Fault Information	Trouble Shooting
77	PV Insulation Impedance fault	1. Check the connection of PV panels and inverter is firmly and correctly; 2. Check whether the PE cable of inverter is connected to ground; 3. Seek help from us, if can not go back to normal state;
78	Grid wrong Connect to buckup	1. Check whether Backup cables are firmly and correctly connected; 2. Restart the system 2~3 times; 3. Seek help from us, if can not go back to normal state;
79	Generator port is connected to the generator or Grid when the mode is the smart load mode	1. Check whether GEN cables are firmly and correctly connected; 2. Restart the system 2~3 times; 3. Seek help from us, if can not go back to normal state;
82	NTC open circuit	1. Restart the system 2~3 times; 2. If the fault still exists, please contact us for help;
83	AFCI module communication failure or self-test failed	1. Check the wiring of the AFCI module; 2. Check that the AFCI module is operating properly; 3. If the fault still exists, please contact us for help;
85	External CT Sensor Fault	1. Check the connection of CT is firmly and correctly; 2. Seek help from us, if can not go back to normal state;
86	system parameters change	Grid setting or Bat setting change, and the system will restrat after 20ms
87	RSD fault	1.Please check whether External RSD signal triggers shutdown; 2.If not, restart the inverter; 3.If the fault still exists, please contact us for help.
88	Parallel system error	1.Please check whether other inverter is in error state; 2.Restart the system; 3.If the fault still exists, please contact us for help
89	Parallel Can Communication failure	1. Check whether Parallel cables are firmly and correctly connected; 2. Restart the system 2~3 times; 3. Seek help from us, if can not go back to normal state;
90	Parallel Host Lost	1. Check whether Parallel cables are firmly and correctly connected; 2. Restart the system 2~3 times; 3. Seek help from us, if can not go back to normal state;
91	Parallel Sync Signal lost	1. Check whether Parallel cables are firmly and correctly connected; 2. Restart the system 2~3 times; 3. Seek help from us, if can not go back to normal state;
92	Parallel Version is inconsistent	1. Check whether Parallel cables are firmly and correctly connected; 2. Restart the system 2~3 times; 3. Seek help from us, if can not go back to normal state;

Fault Code	Fault Information	Trouble Shooting
93	Parallel Setting is inconsistent	1. Check whether Parallel cables are firmly and correctly connected; 2. Check whether the software version of the inverter is same;; 3. Restart the system 2~3 times; 4. Seek help from us, if can not go back to normal state;
94	CAN ID Conflict	1.Please check whether CAN ID of different inverters is same, 2.Please check whether there are two masters in one phase;
95	Parallel PWM signal lost	1.Please check whether the parallel cables are well-connected. 2.Restart the system; 3.If the fault still exists, please contact us for help.
96	Phase sequence abnormal	1.Please check whether the grid wires are well-connected; 2.Please check whether the grid phase sequence is correct, 3.Restart the system; 4.If the fault still exists, please contact us for help.

7. User Interface

7.1. LED Indicators

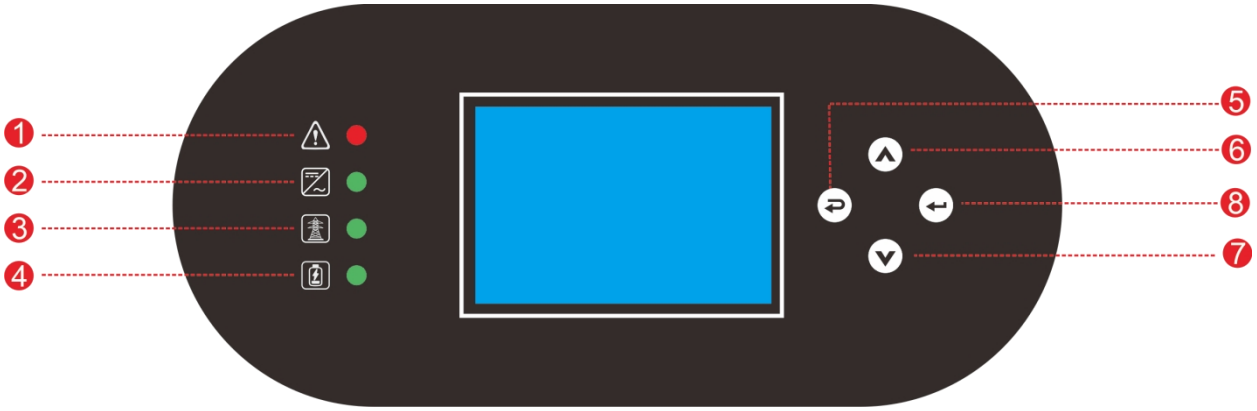


Figure 4.1-1 LED Indicators

Numeber	LED Indicator		Messages
1	Fault	Red led solid light	Fault
2	DC/AC	Green led solid light	Inverter operation normal
3	GRID	Green led solid light	Grid connection normal
4	BATTERY	Green led solid light	Battery connection normal

Table 4.1-1 LED Indicators

Numeber	Function Key	Description
5	Esc	To exit setting mode
6	Up	To go to previous selection
7	Down	To go to next selection
8	Enter	To confirm the selection

Table 4.1-2 Function Key

***Fully energizing the unit constitutes at least:**

a. DC Solar panels AND Grid OR

b. Batteries only

7.2. Main Menus

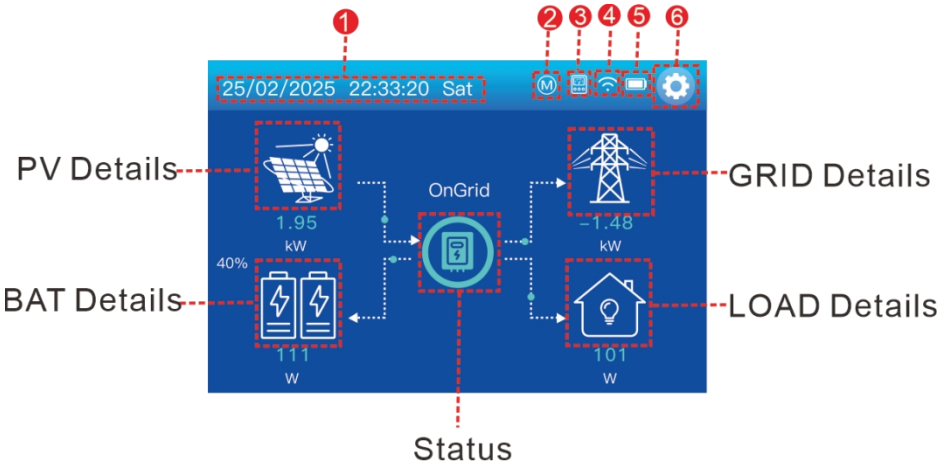


Figure 4.3-1 Main menus

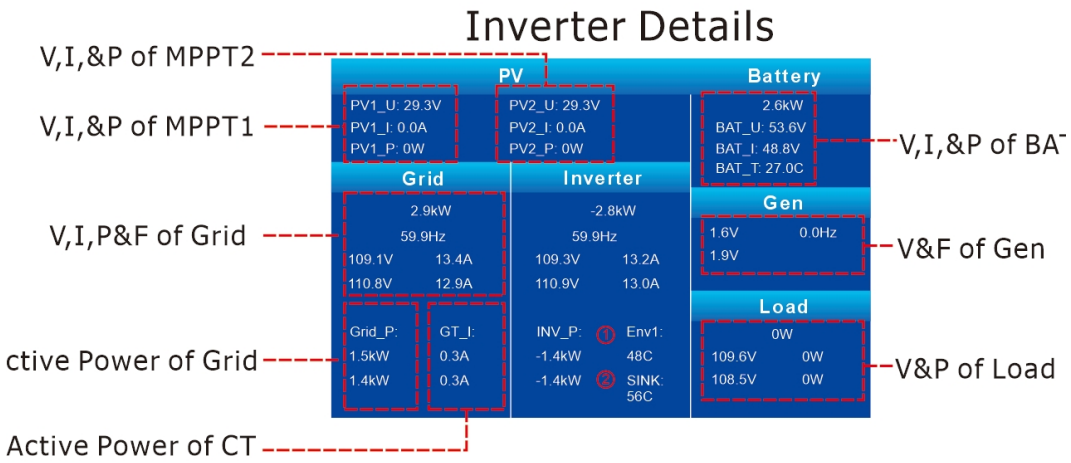
Numeber/Icon Name	Messages
1	Day/Month/Year,time
2	Parallel System Host or Slave Flag
3	Smart Meter Communication Success
4	WIFI Communication Success
5	Battery BMS Sommunication Success
6	System Setup Icon，Press It to Enter Basic Setting, Battery Setting, Grid Setting, Work Mode Setting, Gen Setting, Profession Setting and Alarm Info
Status Icon	If it turns into red and shows "fault", it means the inverter has errors . If it turns into yellow，it means the inverter has warning.And the error or warning message will display under this icon(detail info can be viewed in the System Alarm Info)

Table 4.3-1 Main menus

The main screen showing the info including Solar, Grid, Load and Battery. Its also displaying the energy flow direction by arrow.

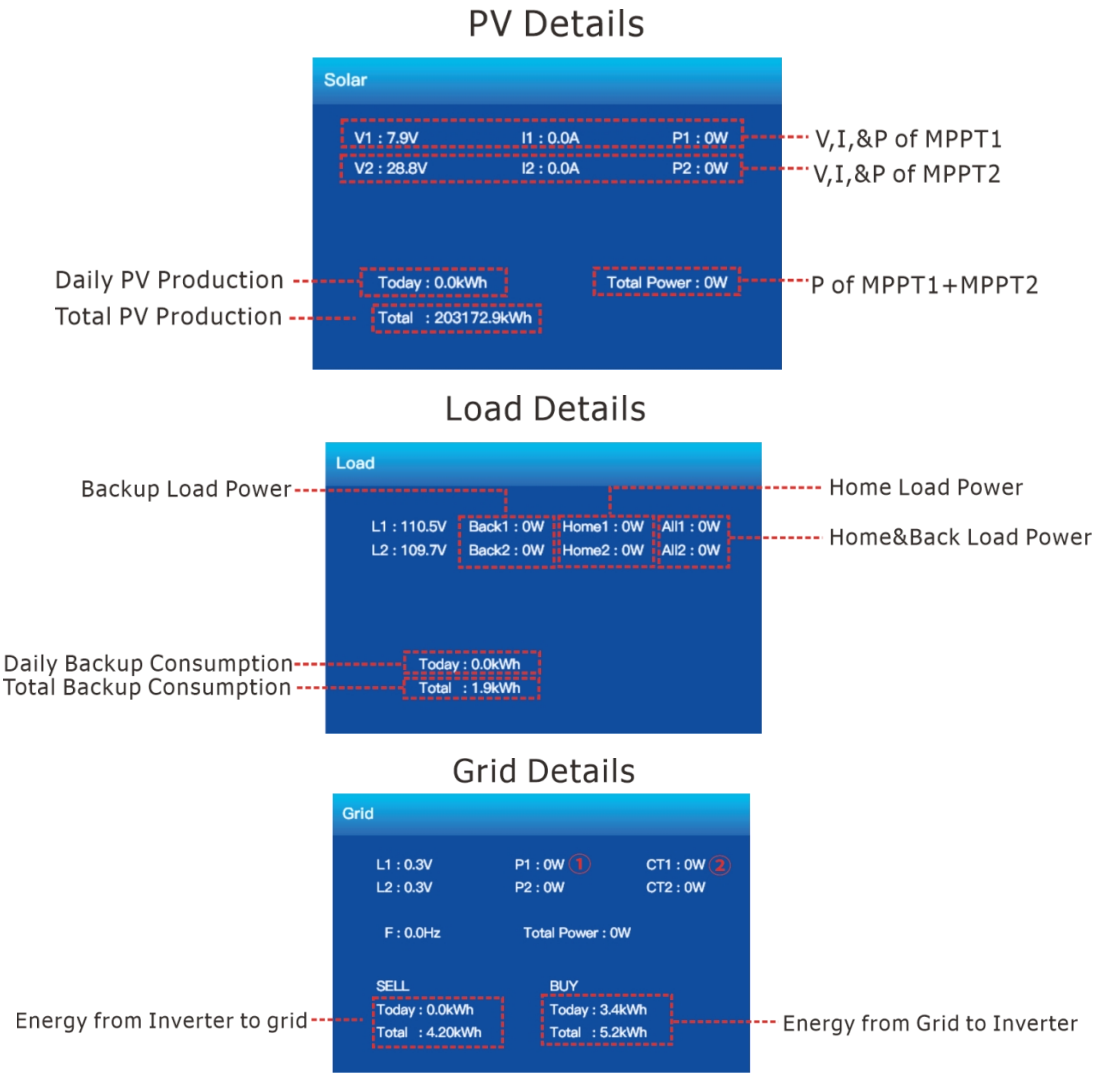
- PV power and Load power always keep positive.
- Grid power negative means sell to grid, positive means get from grid.
- Battery power positive means charge, negative means discharge.
- Load power positive means discharge,negative means get from Load.

7.3. Details Screen



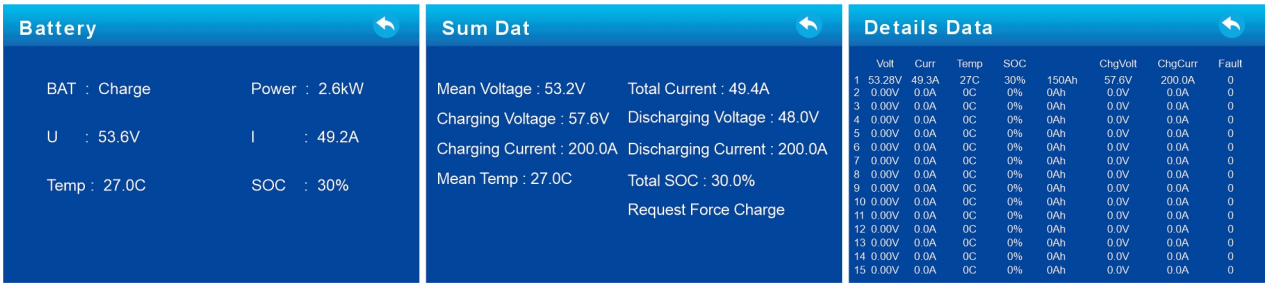
①Envi: Ambient temperature inside the machine.

②SINK: Heat-sink temperature.

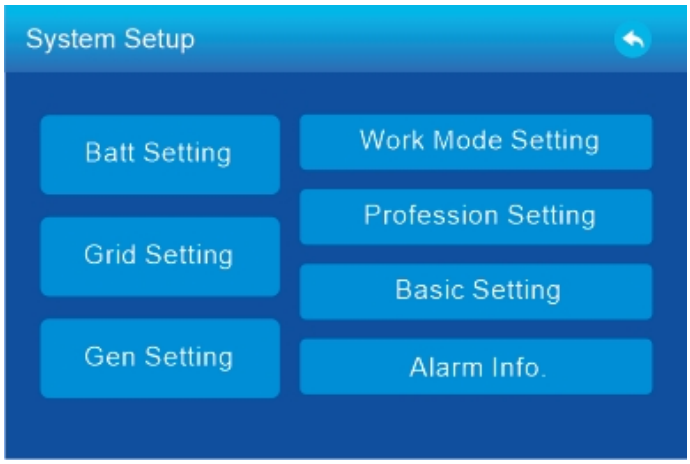


①P: Power detected using internal sensors on AC grid in/out breaker.

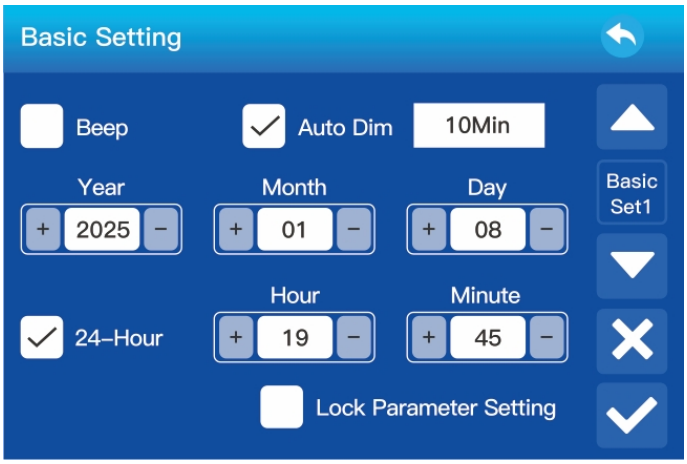
②CT: Power detected by the external current sensors.



7.4. System Setup Menu



7.5. Basic Setup



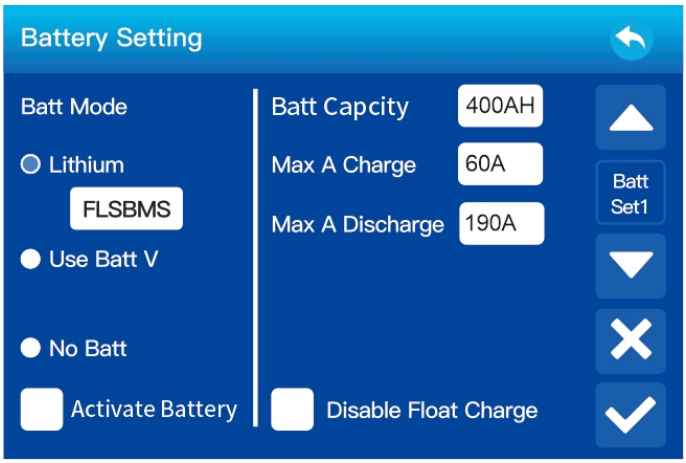
Beep: Used to turn on or off the beep sound in inverter's alarm status.

Lock Parameter Setting: All setting parameters cannot be set up when it is active.

Lock Parameter Setting Password: 123456

Auto Dim: The backlight of LCD will power off after the set time.

7.6. Battery Setup



Batt Capacity: This function is reserved.It is not recommended..

Lithium: Use SOC for all battery related settings.

Lithium Mode: This is the BMS communication protocol code which can be confirmed on the “Felicity Solar Approved Battery list ” base on the battery model you are using.

Use Batt V: Use battery voltage for all battery related settings.

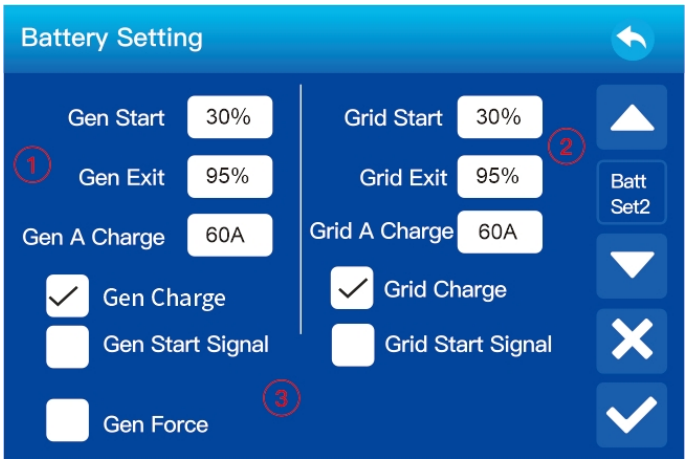
No Batt: tick this item if no battery is connected to the system.

Max A Charge/ Discharge: Max battery charge/dischargecurrent(0-120A for 5kW model,0-135A for 6kW model,0-190A for 7.6kW/8K model)

- For AGM and Flooded, we recommend Ah battery size x 20%=Charge/Discharge amps.
- For Lithium, we recommend Ah battery size x 50%=Charge/Discharge amps.
- For Gel, follow manufacturer' s instructions.

Activate Battery: This feature will help recover a battery that is over discharged by slowly charging from the solar array or grid.

Disable Float Charge: For the lithium battery with BMS communication, the inverter will keep the charging voltage at the current voltage when the BMS charging current requested is 0. It is used to help prevent battery from being overcharged.



Gen Charge Setup①+③

Gen Start : Percent SOC below 30% system will Auto Start a connected generator to charge the battery bank.

Gen Exit: When the battery SOC or voltage reaches a preset Gen exit point, the inverter will disconnect the generator.

Gen A Charge: The maximum charging current that the generator can support.

Gen Charge: Use the power of diesel generator to charge the battery.

Grid Charge Setup②

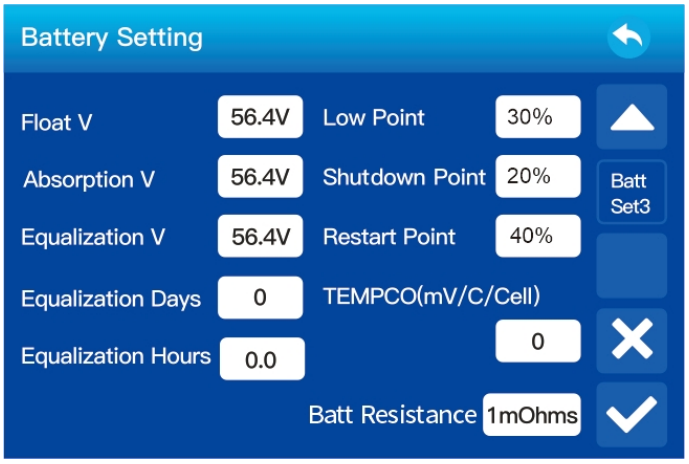
Grid Start : When battery SOC or voltage drop to this set value, inverter will start the generator connected to the grid port automatically to charge the battery.

Grid Exit: When battery SOC or voltage above to this set value, inverter will stop using generator connected to the grid port to charge the battery.

Grid A Charge: maximum charging current when only use the power fed from the grid port of inverter as the power source, which means using the power of grid or the power of generator connected to the grid port.

Grid Charge: It's allowed to use power fed from the grid port, which includes grid or generator connected to the grid port, to charge the battery.

Grid Start Signal: When a generator is connected to the grid port of hybrid inverter, this 'Grid signal' can be used to control the dry contact to start or stop the generator.



Float V: Battery full charge voltage.

Absorption V: Battery constant charge voltage.

Equalization V: This function is reserved.It is not recommended.

Equalization Days: This function is reserved.It is not recommended.

Equalization Hours: This function is reserved.It is not recommended.

Low Point : The inverter will alarm if the SOC below this value.

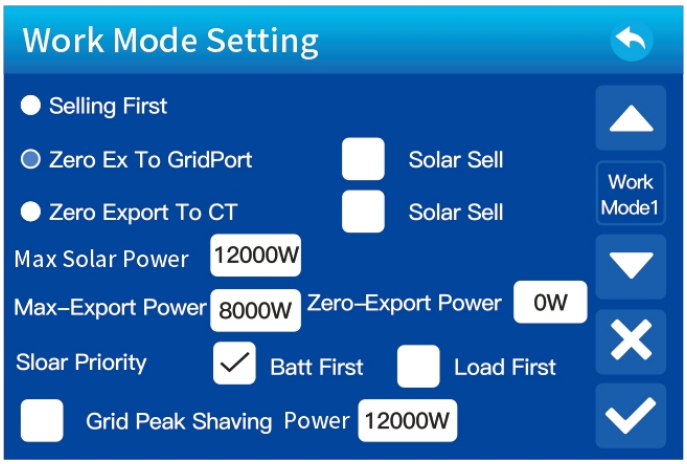
Shutdown Point: The inverter will be shut down if the SOC below this value and the solar power can only be used to charge the battery.

Restart Point: The inverter will power the load with battery if the SOC upto this value.

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

Batt Resistance: This function is reserved.It is not recommended.

7.7. Work Mode Setup



7.7.1. Selling First

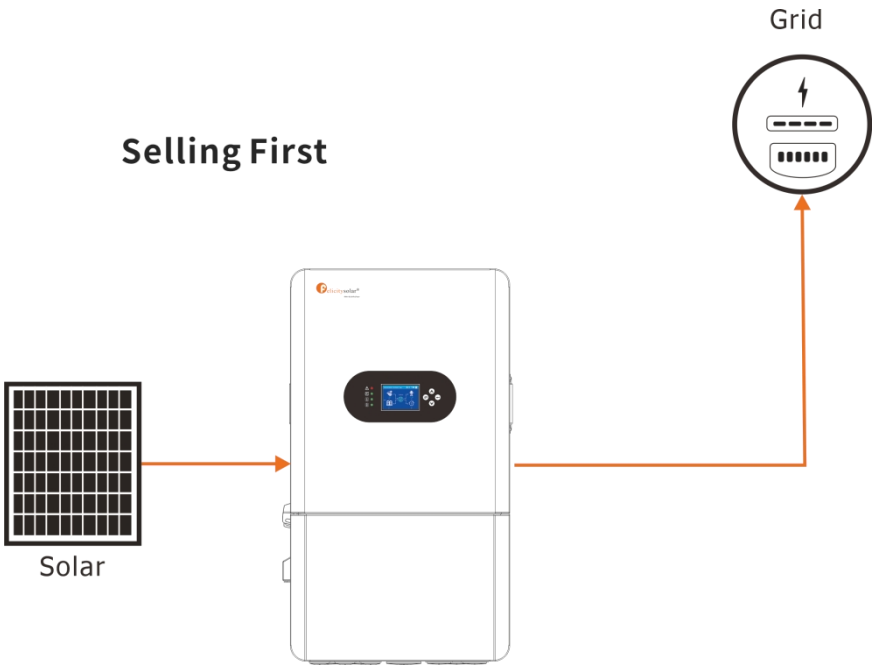
The inverter will produce as much power as it has available from PV array according to the programming.

General Description

a. This mode allows your inverter to sell back to the grid all the excess power generated from the PV arrays without limitation.

b. The inverter will only show loads connected to the BACKUP LOAD terminal.

c. The inverter will measure all power in/out of the GRID terminal as grid consumption or grid sell back.



Max Solar Power: The maximum PV input power allowed.

Max-Export Power: Allowed the maximum output power to flow to grid.

7.7.2. Selling First+TOU

If Time Of Use is active, the battery energy also can be sold into grid.

The PV energy will be used to power the load and charge the battery and then excess energy will flow to grid.

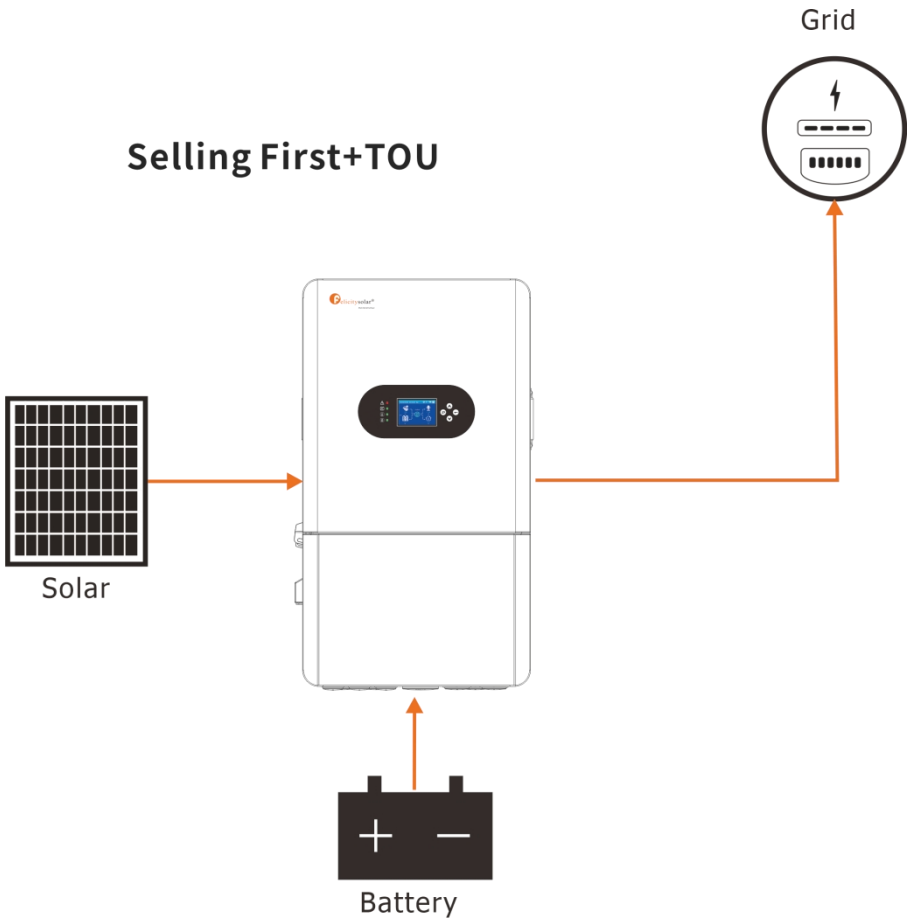
Power source priority for the load is as follows:

1.Solar Panels.

2.Grid. when Solar Priority tick Batt First.

3.Battery (until programable SOC discharge is reached).

when Solar Priority tick Load First and disable Grid charge.



7.7.3. Zero Ex To GridPort:

This mode limits the solar production to cover BACKUP LOAD demand (essential loads panel) exclusively. In this mode, the system disregards loads in the main service panel and will not deliver power to the GRID terminal.

General Description：

• The inverter will cover only the loads connected to the “BACKUP LOAD” terminal.

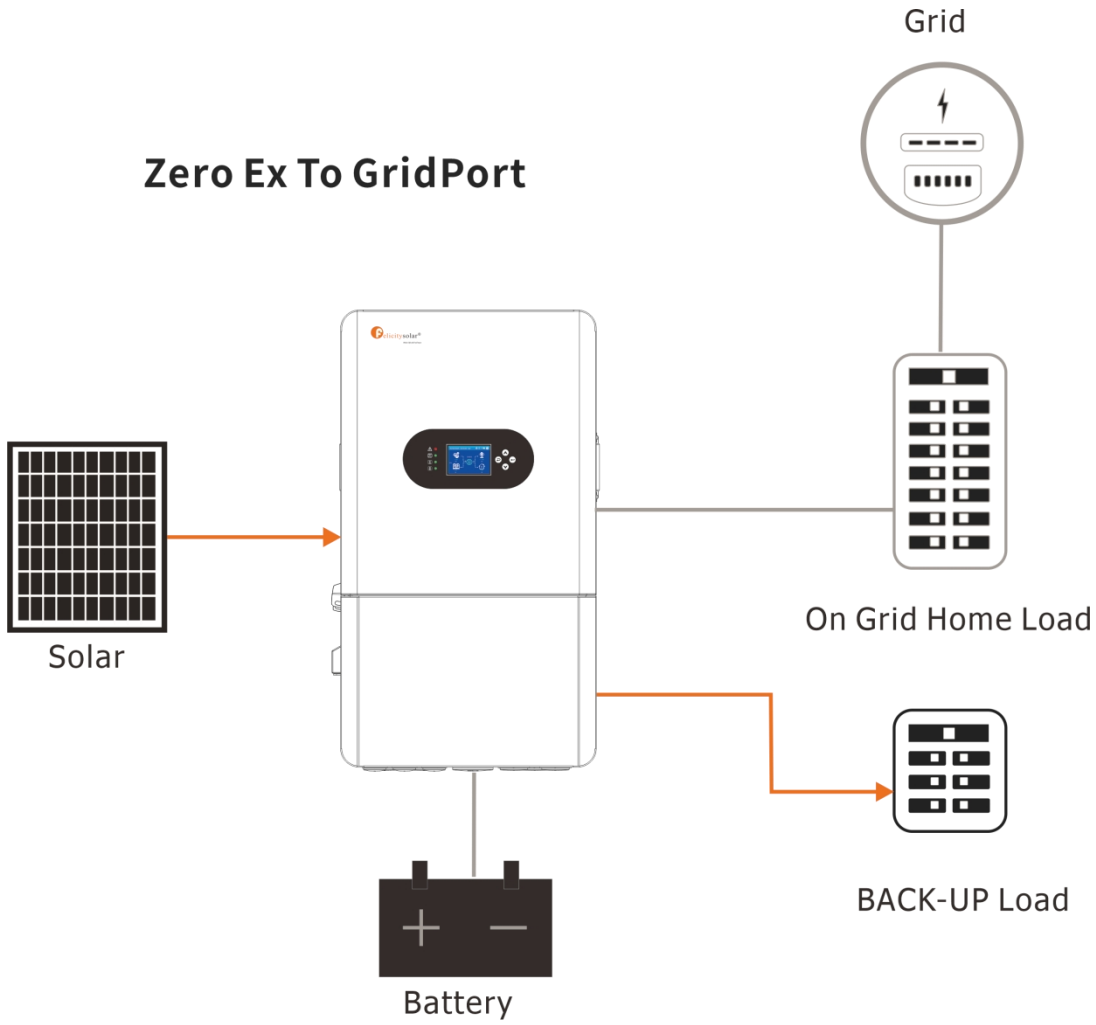
• It will NOT produce more power than the load demand.

• This work mode will NOT deliver power to the “GRID” terminal (will NOT sell back).

• The loads reported by the inverter will be from only the essential loads panel (“BACKUP LOAD” terminal).

• This system work mode is recommended for off-grid applications.

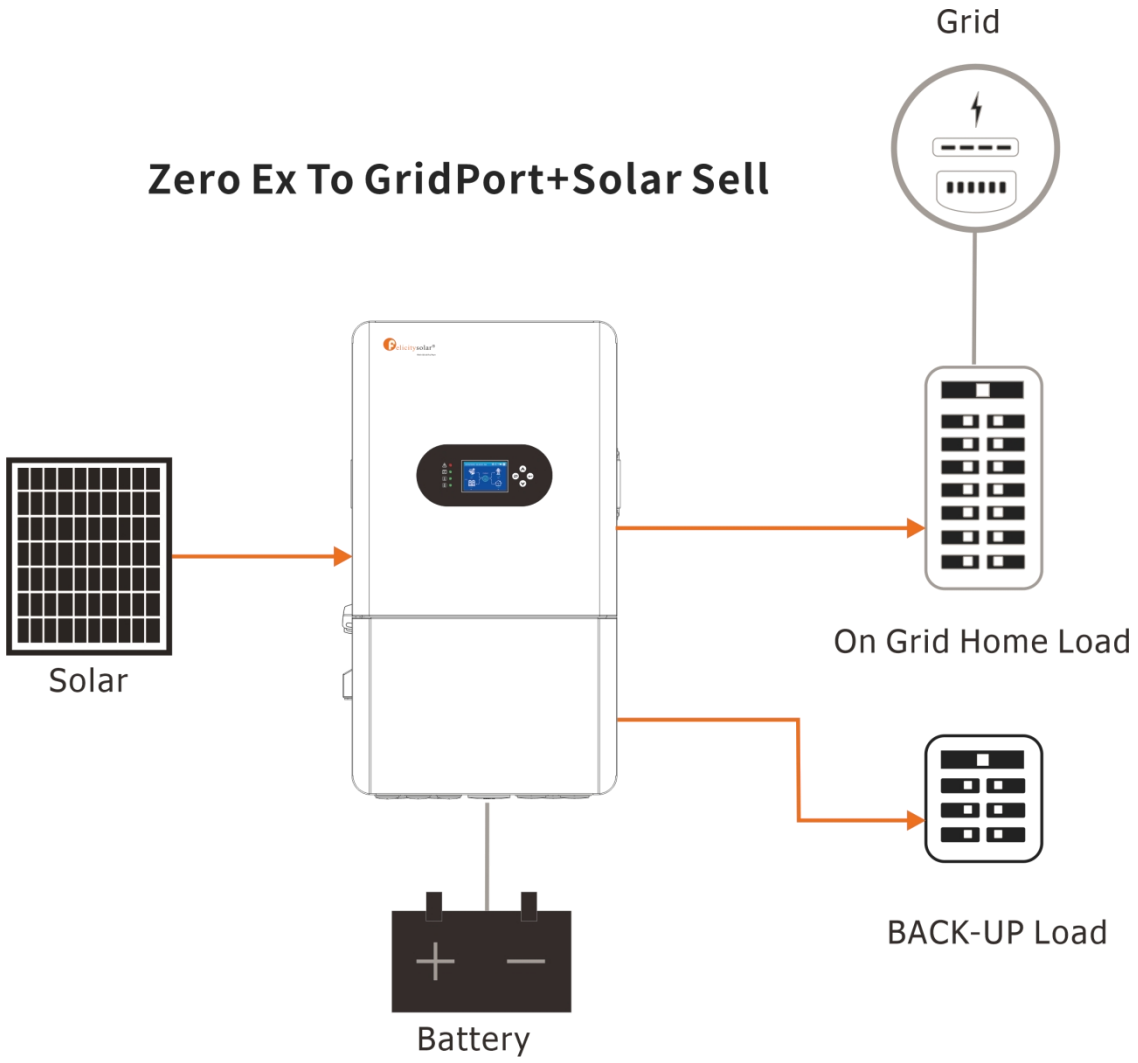
• **Energy Priority:** 1. Solar PV Power | 2. Batteries | 3. Generator | 4. Grid Power.



7.7.4. Zero Ex To GridPort+Solar Sell.

This mode will NOT limit solar production to BACKUP LOAD demand. The inverter delivers power to the BACKUP LOAD terminal(essential loads panel) + excess power to the GRID terminal(main service panel AND grid); however, it will track LOAD demand and sell excess solar only up to a programmable limit(Max-Export Power）.

GRID loads cannot be measured, only the total output through the GRID terminal. This mode is recommended for single inverter systems or for whole-home backup installations.



7.7.5. Zero Export To CT:

This mode limits the energy produced by the inverter to satisfy the home demand (essential loads panel + main service panel). In this mode, the inverter delivers power to the BACKUP LOAD terminal (essential loads panel) + the GRID terminal (main service panel).

CT sensors MUST be installed. These sensors measure load consumption in the main service panel to offset total load demand and prevent selling to the utility. This system work mode is useful for users who don't have a permit to sell back. See "4.11 Limit Sensors (CT sensors)" on page 33 for instructions on installing external CTs.

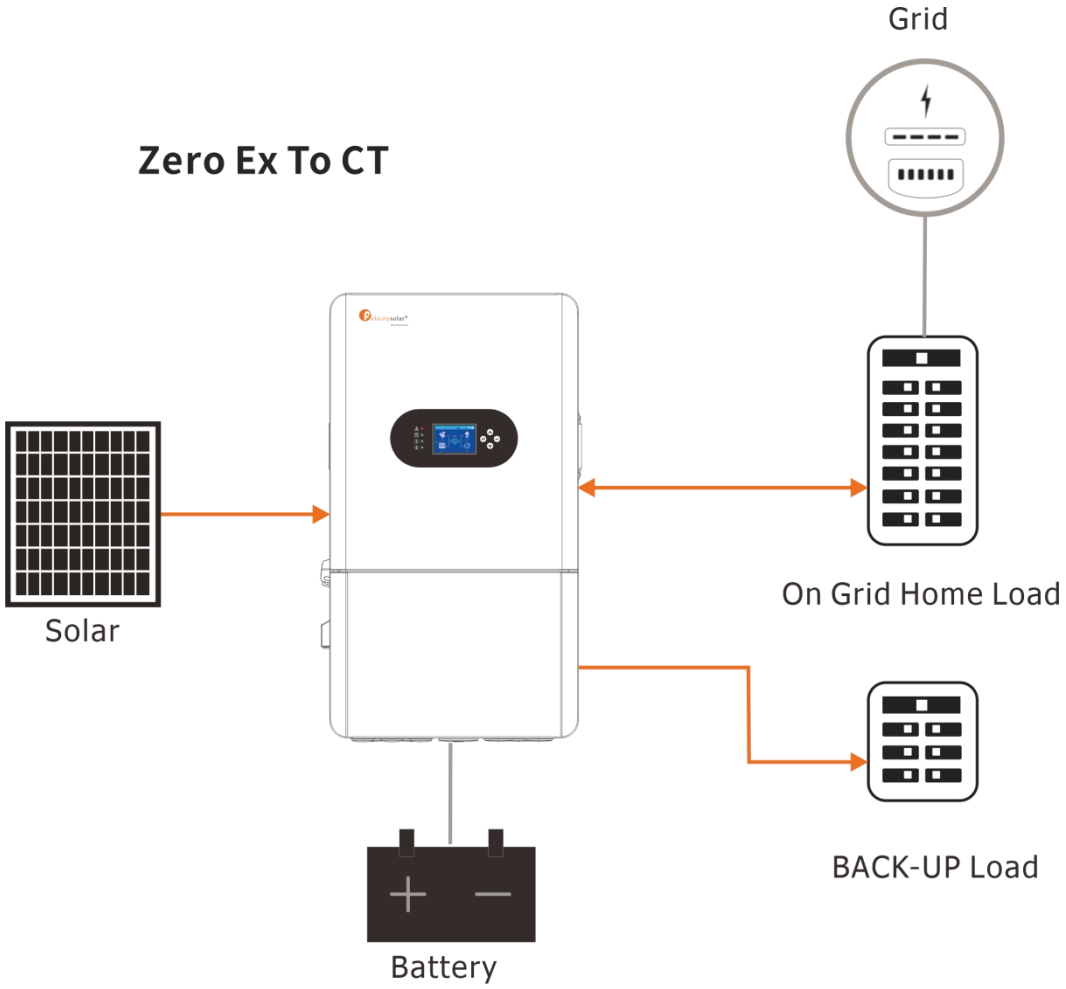
General Description

1. Power is delivered to the whole home without selling the excess solar back to the utility (this is required if there's no permit to sell back from the utility company).

2. External CT sensors are required for proper operation of this system work mode.

3. Monitored loads will be the sum of the main service panel + essential loads panel.

4. **Energy Priority:** 1. Solar PV Power | 2. Batteries | 3. Generator| 4. Grid Power

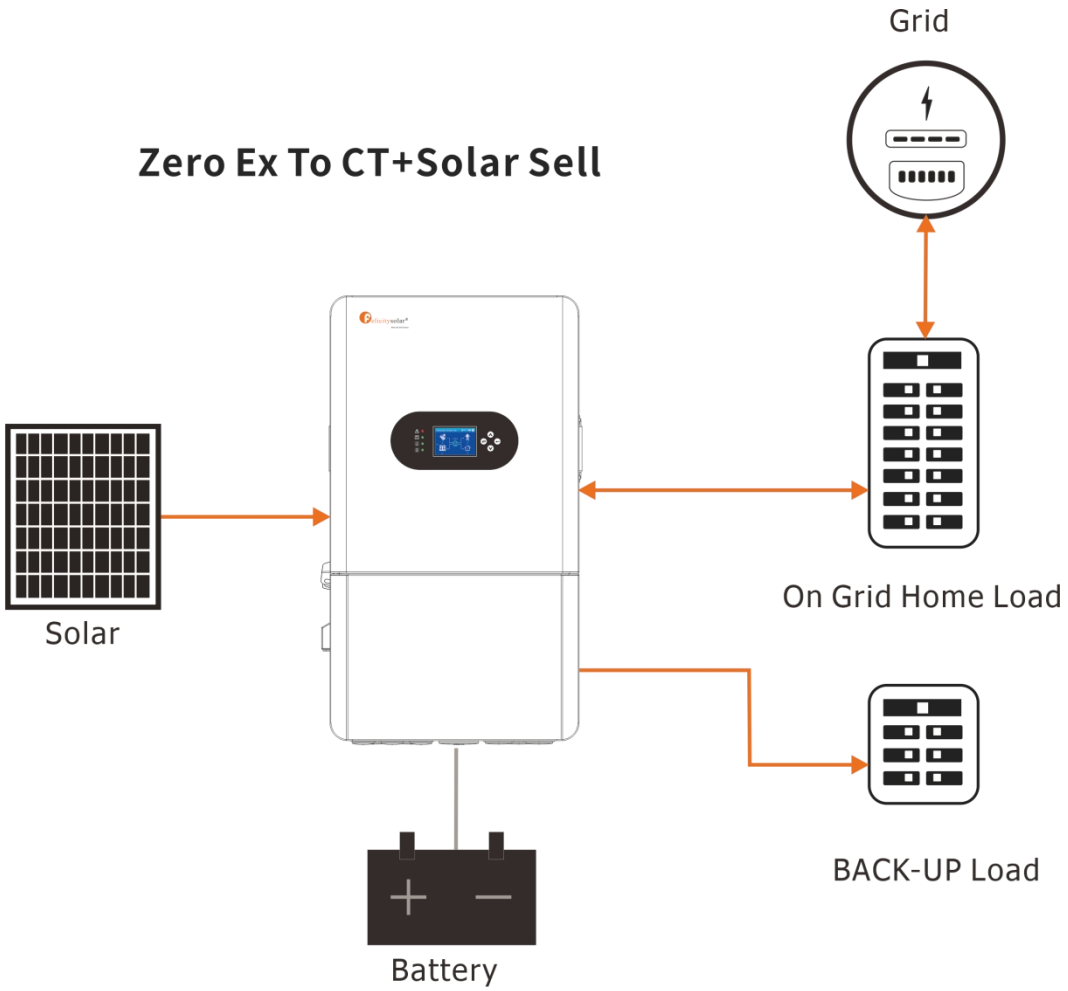


7.7.6. Zero Export To CT+Solar Sell:

This mode will NOT limit solar production to home demand. In this mode, the inverter delivers power to the BACKUP LOAD terminal (essential loads panel) + excess power to the “GRID” terminal (main service panel AND grid).

The Inverter will monitor grid sell and load consumption simultaneously (with +/- 3% error from CT sensors). The CT sensors MUST be installed. The inverter will sell excess solar power up to a programmable limit(Max-Export Power）.

See ”4.11 Limit Sensors (CT sensors)” on page 33 for correct placement of external CTs



Zero-Export Power: for Zero Ex To GridPort or Zero Export To CT, and the “Solar sell” is not active. It tells the grid output power threshold to ensure the hybrid inverter won' t feed power to grid.Recommend to set it as 20-100W to ensure the hybrid inverter won' t feed power to grid.

Solar Priority: Priority of PV power usage.

Batt First: PV power is firstly used to charge the battery and then used to power the load. If PV power is insufficient, grid will make supplement for battery and load simultaneously.

Load First: PV power is firstly used to power the load and then used to charge the battery. If PV power is insufficient, Grid will provide power to load, but neither the battery power to load nor the Grid charge to battery.

7.7.7. Grid Peak Shaving

1. To use Peak-shaving on a generator, the equipment MUST be connected to the “GRID” terminal of the inverter.

2. Peak-shaving helps reduce grid consumption during peak demand by utilizing battery backup power. It can also be used to prevent generator overload above a specified power threshold.

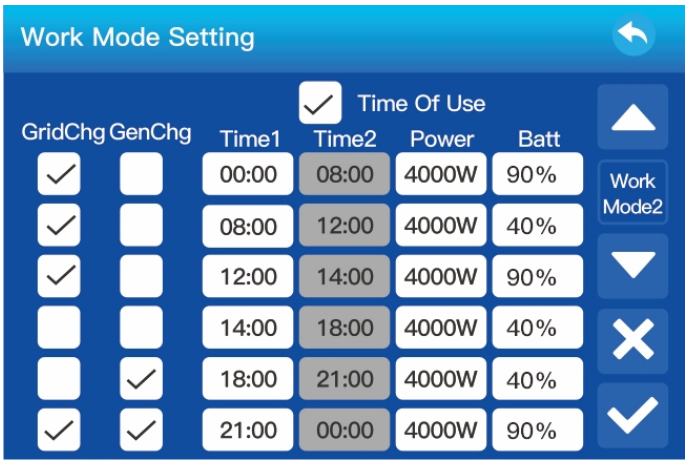
3. Install the CT sensors on grid / generator lines L1, L2. The arrows on the CTs MUST point toward the GRID.

4. The IVGM INVERTER supplies power from the batteries whenever the “Power” threshold is met.

5. This mode will automatically adjust the "Grid Charge” amperage (A) to avoid generator overloads during battery charging.

6. Grid Peak-Shaving will automatically enable “Time of Use” and MUST be configured.

7.7.8. Time Of Use:

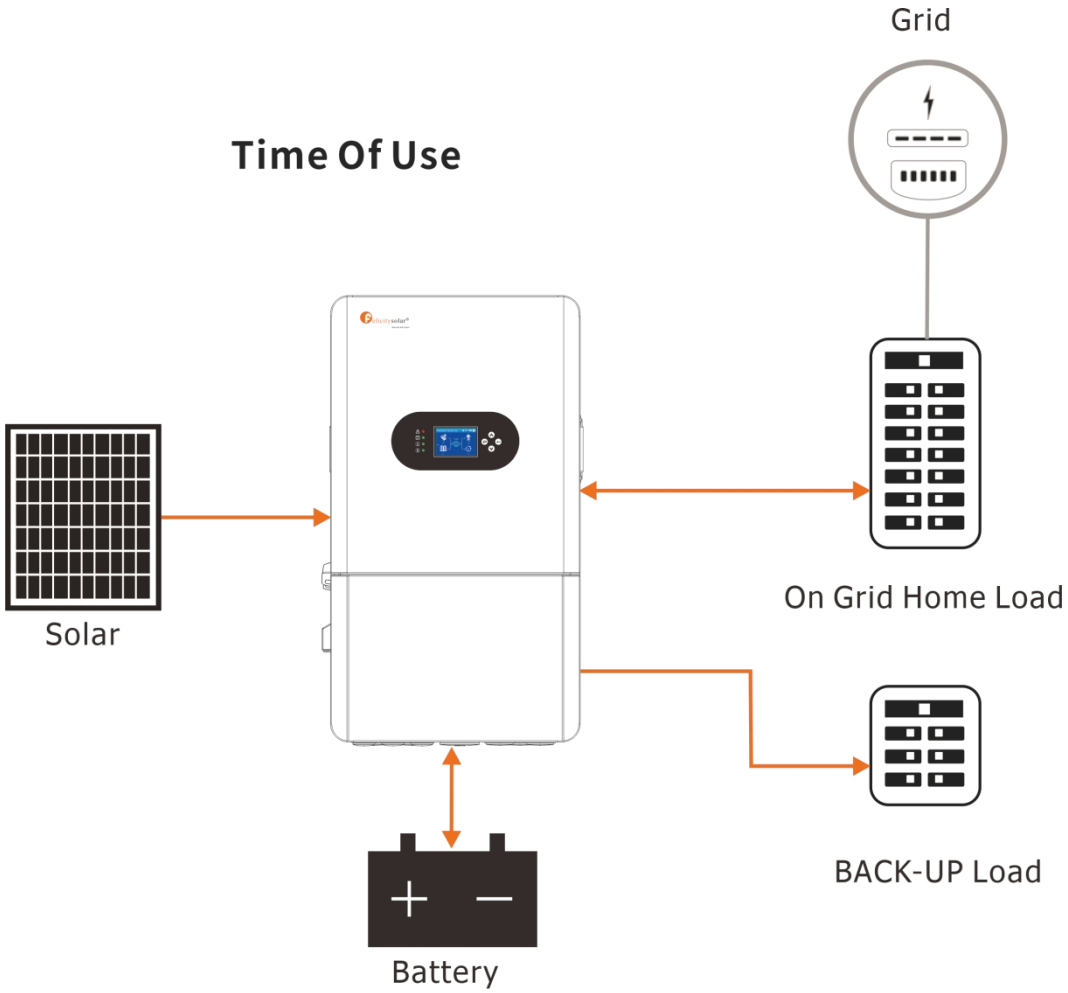


This mode combined with Limited Power to Home or Limited Power to Load lets you use battery backup power to reduce consumption from the grid during specific time intervals. Battery power will cover load demand at a programmable power rate Power(W) down to a programmable Batt (V/%SOC). You can configure six different time intervals over a 24-hour period to cover a wide range of battery discharge or charge behaviors.

General Description

- Uses battery power to reduce the power consumption during user defined time intervals.
- Power (W) dictates the rate at which the battery discharges to assist with load demand.
- Batt (V or %) dictates the lower discharge limit or upper charge limit.

Energy Priority: Solar PV Power | 2. Batteries (down to programmed discharge V or %) | 3. Generator | 4. Grid Power



NOTE: when tick Selling First and click Time Of Use, the battery power can be sold into grid.

Charge Source: select grid or diesel generator to charge the battery.

GridChg: Use grid to charge the battery in a time period.

GenChg: Use diesel generator to charge the battery in a time period.

NOTE: If tick Grid and Gen at the same time, Grid is priority. and only the Gen Charge Enable or Grid Charge Enable is tick in Battery Setting, can the corresponding Gen or Grid tick take effect.

Time1: real time, range of 00:00-24:00.

Power: Max.discharge power of battery allowed.

Batt(V or SOC %): Battery SOC % or voltage at when the action is to happen.During the current time period, If the actual SOC or voltage of the battery is lower than the target value, the battery needs to be charged by the ticked source. If the actual SOC or voltage of the battery is higher than the target value, the battery can discharge, and when the solar power is not enough to power the load or the "Selling First "is enabled, the battery will discharge to feed to grid.

For Example:

During 00:00-08:00,

if battery SOC is lower than 90%, it will use grid to charge the battery until battery SOC reaches 90%.

During 08:00-12:00,

if battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%. At the same time, if battery SOC is lower than 40%, then grid will charge thebattery SOC to 40%.

During 12:00-14:00,

if battery SOC is lower than 90%, it will use grid to charge the battery until battery SOC reaches 90%.

During 14:00-18:00,

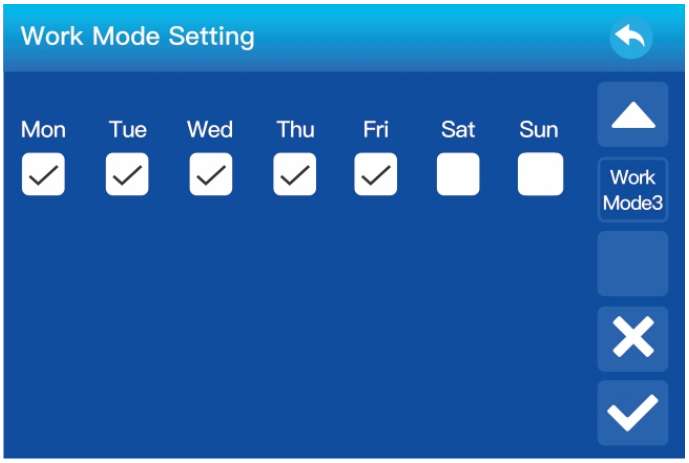
when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.if battery SOC is lower than 40%, neither the diesel generator nor the grid will charge the battery.

During 18:00-21:00,

when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%. At the same time, if battery SOC is lower than 40%, then diesel generator will charge the battery SOC to 40%.

During 21:00-00:00,

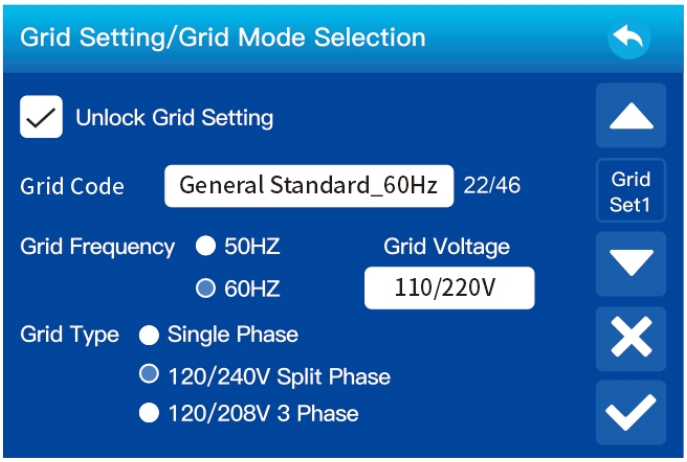
if battery SOC is lower than 90%, it will use grid or diesel generator to charge the battery until battery SOC reaches 90%.



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

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

7.8. Grid Setup



Unlock Grid Settng: Before changing the grid parameters, please enable this with password of **123456**. Then it is allowed to change the grid parameters.

Grid Code:

0: Germany_VDE4105,

2: General Standard_50Hz,

3: General Standard_60Hz,

4: Italy_CEI_021_2019,

5: Britain_G99,

6: Australia_A,

7: New Zealand_AS4777,

8: South African_NRS097,

9: Netherland_EN 50549-1,

10: Brazil,

11: En50549,

12: Poland_NC_RFG,

13: Czech_CSN 50549-1,

14: Austria_R25:2020-03,

15: Austria_OVE-directive_R25,

16: Spain_NTS_2021,

17: Spain_UNE217001,

18: Netherland.

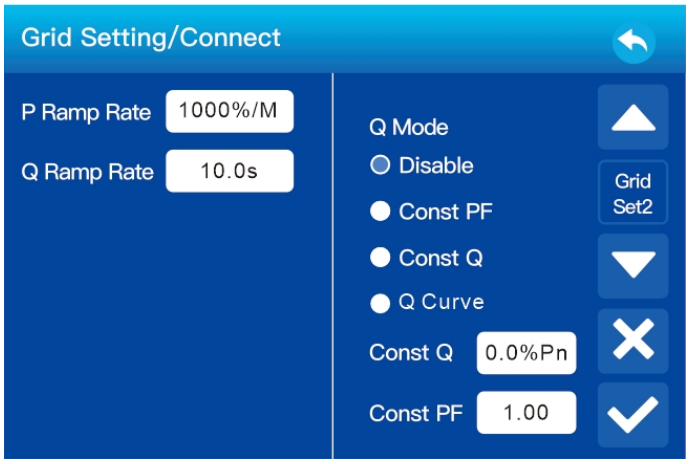
19: UL1741 & IEEE1547

Grid Type: The output type of the inverter in off-grid mode.

Grid Voltage:

Grid Type	Single Phase	120V/240V Split Phase	120V/208V 3 Phase
Gird Voltage	230V	110/220V	120/208V
	220V	120/240V	127/220V
	240V	100/200V	
	200V		
	120V		
	127V		

Table 7.8-1 Grid Voltage

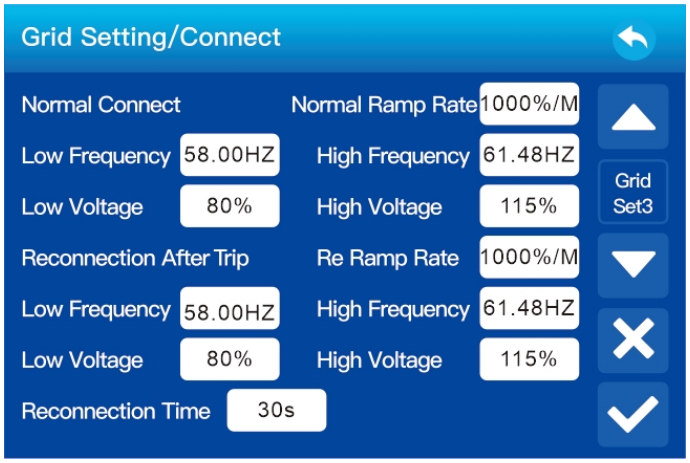


P Ramp Rate: It is the power ramp response to the active power reference in normal running.

Q Ramp Rate: It is the power ramp response to the Reactive power reference in normal running.

Const Q: Setting the reactive power value. Const Q >0 means Inverter output capacitive reactive power, Const Q <0 means Inverter output Inductive reactive power.

Const PF: Setting the power factor(cos φ)value. Const PF>0 means Inverter output Inductive reactive power(or inverter will absorb capacitive reactive power from the power grid),Const PF<0 means Inverter output capacitive reactive power.



Normal Connect: The allowed grid voltage/frequency range when the inverter operates normally.

Normal Ramp Rate: It is the startup power ramp.If the grid frequency is lower than the set point, the inverter disconnects the grid.

High Frequency: If the grid frequency is higher than the set point, the inverter disconnects the grid.

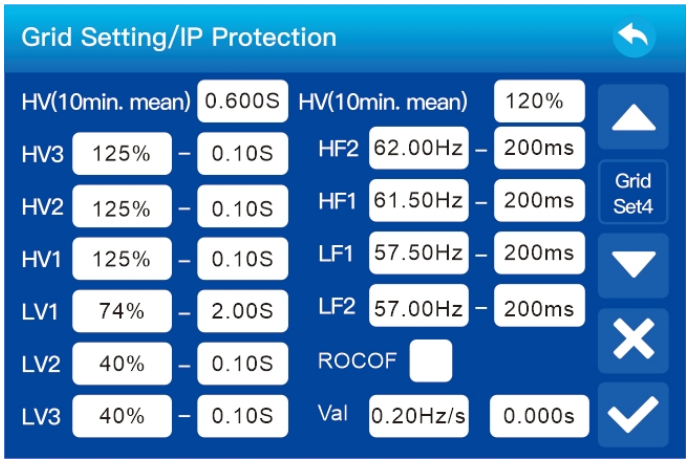
Low Voltage: If the grid voltage is lower than the set point, the inverter will disconnect the grid.

Low Voltage: If the grid voltage is higher than the set point, the inverter will disconnect the grid.

Reconnect After Trip: The allowed grid voltage/frequency range for the inverter connects the grid after the inverter trip from the grid.

Re Ramp Rate: It is the reconnection power ramp.

Reconnection Time: The waiting time for the inverter connects the grid again after tripping.



HV1: Level 1 overvoltage protection point;,

HV2: Level 2 overvoltage protection point;

HV3: Level 3 overvoltage protection point.

LV1: Level 1 undervoltage protection point;

LV2: Level 2 undervoltage protection point;

LV3: Level 3 undervoltage protection point.

HF1: Level I over frequency protection point;

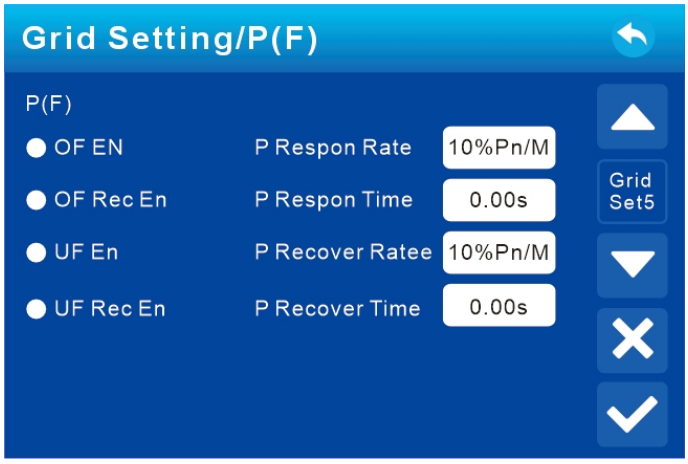
HF2: Level2 over frequency protection point;

HF3: Level 3 over frequency protection point.

LF1: Level I under frequency protection point;

LF2: Level2 under frequency protection point;

LF3: Level 3 under frequency protection point.



F(P): It's used to adjust the output active power of inverter according to grid frequency.

Droop Over F: percentage of nominal power per Hz

For example, "Start freq F=50.2Hz, Stop freq F=51.2Hz.

Droop F=40%PE/Hz" when the grid frequency reaches51.2Hz, the inverter will decrease its active power at Droop F of 40%. And then when grid system frequency is less than 50.2Hz, the inverter will stop decreasing output power. For the detailed setup values, please follow the local grid code.

Start Over F: Indicates the start of mains overfrequency derating.

Stop Over F: Indicates the end point of the mains over frequency derating.

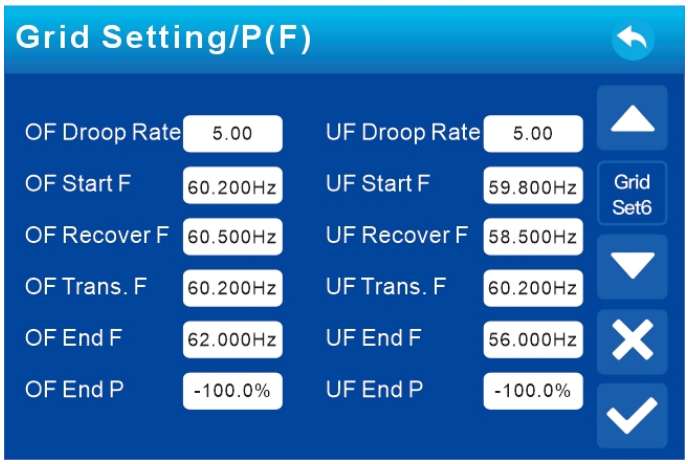
Start Delay T: delay time of mains frequency response.

Droop Under F: Percentage of under frequency power rise per Hz.

Start Under F: Indicates the start of the mains under frequency rise.

Stop Under F: Indicates the end point of the mains under frequency rise.

Stop Delay T: Delay time for stopping mains frequency response.



P(U): It is used to adjust the inverter's active power according to the set grid voltage

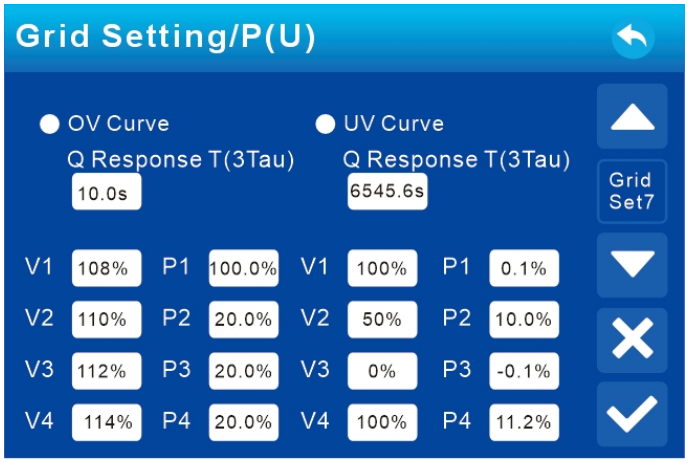
Q(U): It is used to adjust the inverter's reactive power according to the set grid voltage.These two functions are used to adjust inverter's output power (active power and reactive power) when grid voltage changes.

Lock-in/Pn 5%: When the inverter active power is less than 5% rated power, the V(Q) mode will not take effect.

Lock-out/Pn 20%: If the inverter active power is increasing from 5% to 20% rated power, the V(Q) mode will take effect again.

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

For example: V1=108%, Q1=0%. When the grid voltage reaches 108% of the rated grid voltage inverter will output reactive power that accounts for 0% of the rated power. For the detailed setup values, please follow the local grid code.



P(Q): it is used to adjust the output reactive power of inverter according to the set active power.

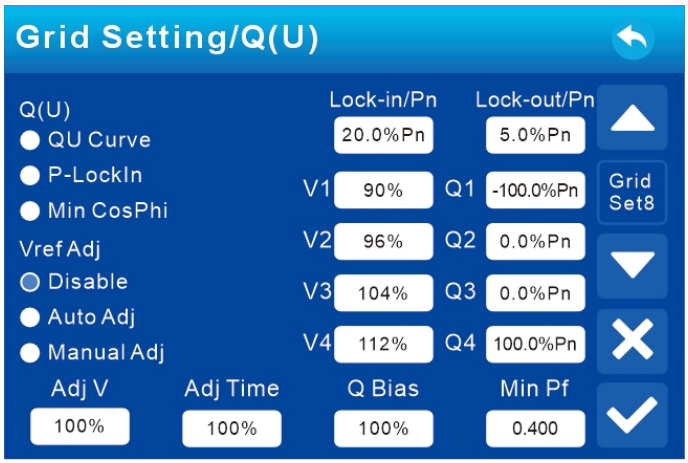
P(PF): It is used to adjust the PF of inverter according to the set active power.For the detailed setup values, please follow the local grid code.

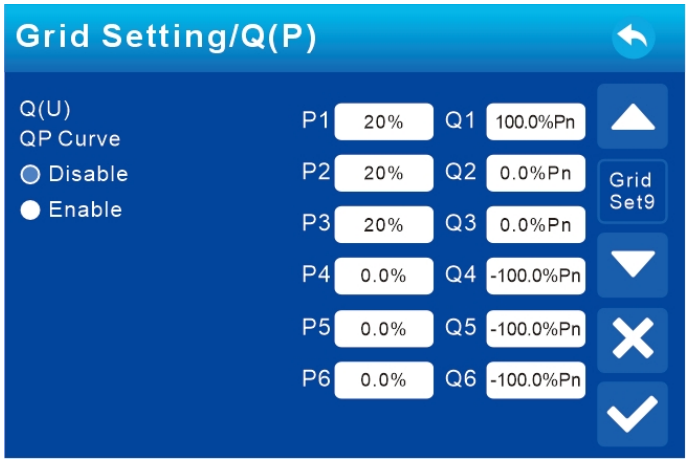
Lock-in/Pn 50%: When the output active power of inverter is less than 50% of inverter's rated power, it won't enter the P(PF) mode.

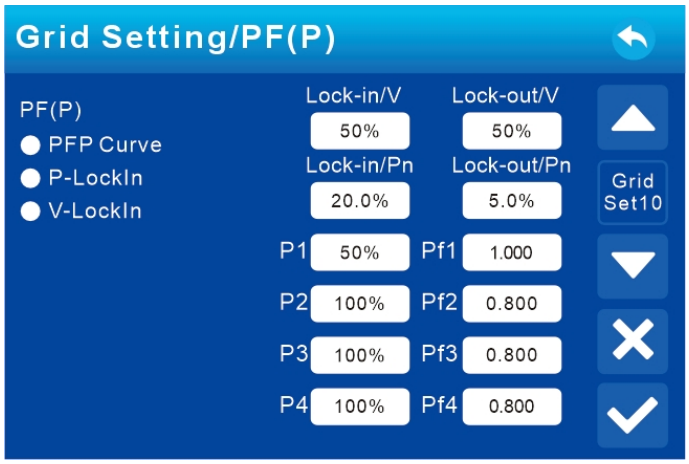
Lock-out/Pn 50%: When the output active power of inverter is higher than 50% of inverter's rated power,it will enter the P(PF) mode.

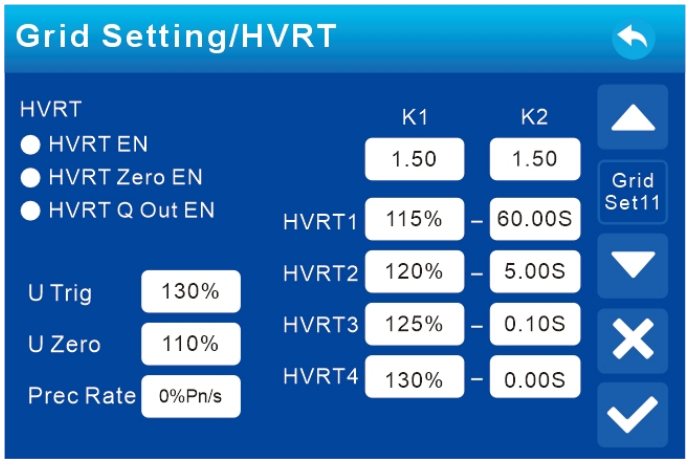
NOTE : only when the grid voltage is equal to or higher than 1.05 times of the rated grid voltage, then the P(PF)mode will take effect.

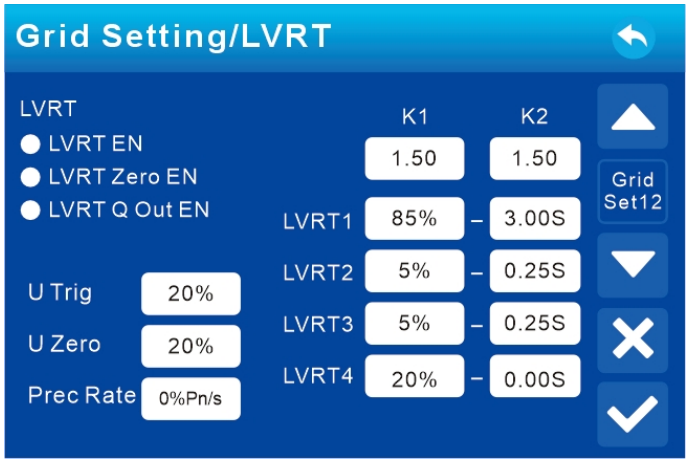
Reserved: This function is reserved.It is not recommended.



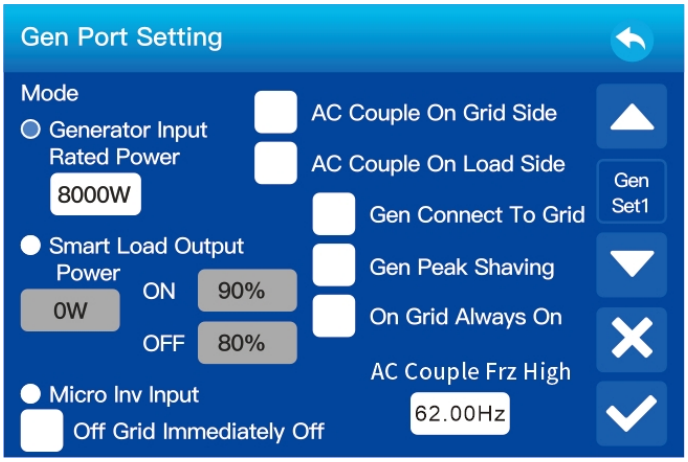

Grid Setting/Q(P)
Q(U)
QP Curve
Disable
Enable
P1 20% Q1 100.0%Pn
P2 20% Q2 0.0%Pn
P3 20% Q3 0.0%Pn
P4 0.0% Q4 -100.0%Pn
P5 0.0% Q5 -100.0%Pn
P6 0.0% Q6 -100.0%Pn
Grid Set9


Grid Setting/PF(P)
PF(P)
PFP Curve
P-LockIn
V-LockIn
Lock-in/V 50%
Lock-out/V 50%
Lock-in/Pn 20.0%
Lock-out/Pn 5.0%
P1 50% Pf1 1.000
P2 100% Pf2 0.800
P3 100% Pf3 0.800
P4 100% Pf4 0.800
Grid Set10


Grid Setting/HVRT
HVRT
HVRT EN
HVRT Zero EN
HVRT Q Out EN
U Trig 130%
U Zero 110%
Prec Rate 0%Pn/s
K1 K2
1.50 1.50
HVRT1 115% – 60.00S
HVRT2 120% – 5.00S
HVRT3 125% – 0.10S
HVRT4 130% – 0.00S
Grid Set11


Grid Setting/LVRT
LVRT
LVRT EN
LVRT Zero EN
LVRT Q Out EN
U Trig 20%
U Zero 20%
Prec Rate 0%Pn/s
K1 K2
1.50 1.50
LVRT1 85% – 3.00S
LVRT2 5% – 0.25S
LVRT3 5% – 0.25S
LVRT4 20% – 0.00S
Grid Set12

7.9. Gen Setup



Generator Input Rated Power: allowed Max. power from diesel generator.

AC Couple On Grid Side: This function is reserved.It is not recommended.

AC Couple On Load Side: Use the Load port as an AC couple input port, which can be connected with micro-inverter or other Grid-Tied inverter.

Gen Connect To Grid: connect the diesel generator to the grid input port.

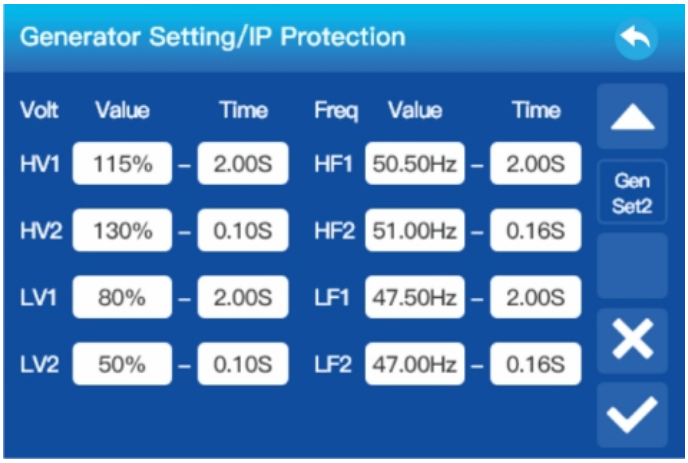
Gen Peak Shaving: Limit the maximum output power of the generator to the set rated power , the rest of power consumption will be provided by inverter to ensure that the generator will not overload.

On Grid Always On: When click "on Grid always on" the smart load will switch on when the grid is present.

AC Couple Frz High: If choosing "Micro Inv Input", as the battery SOC reaches gradually setting value (OFF), During the process, the microinverter output power will decrease linear. When the battery SOC equals to the setting value (OFF) the system freguency will become the setting value (AC Couple Fre High) and the Microinverter will stop working. Stop exporting power produced by the microinverter to the grid.

Smart Load Output: This mode utilizes the Gen input connection as an output which only receives power when the battery SOC and PV power is above a user programmable threshold.

e.g.Power=500W,ON: 100%, OFF=95%: When the PV power exceeds 500W, and battery bank SOC reaches 100%, Smart Load Port will switch on automatically and power the load connected. When the battery bank SOC<95% or PV power< 500w, the Smart Load Port will switch off automatically.



HV1: Level 1 overvoltage protection point and protection time;

HV2: Level 2 overvoltage protection point and protection time;

LV1: Level 1 undervoltage protection point and protection time;

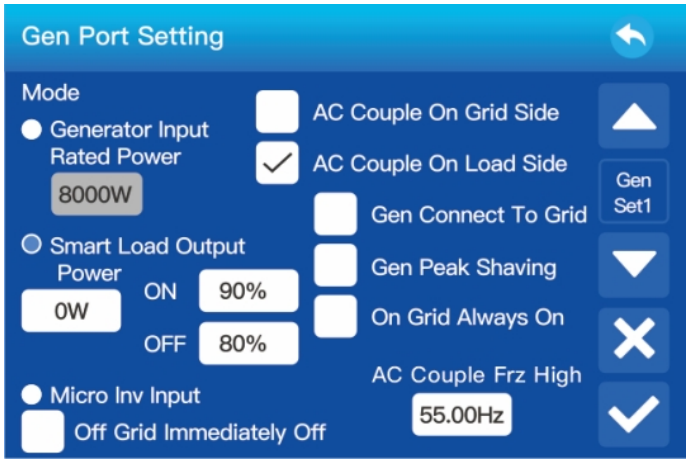
LV2: Level 2 undervoltage protection point and protection time;

HF1: Level 1 over frequency protection point and protection time;

HF2: Level 2 over frequency protection point and protection time;

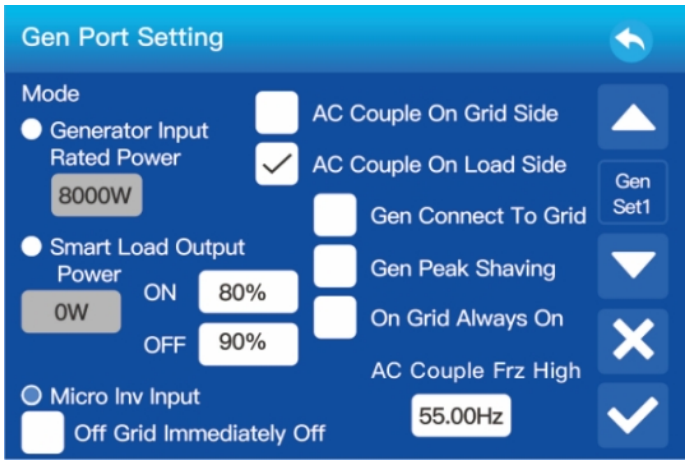
LF1: Level 1 under frequency protection point and protection time;

LF2: Level 2 under frequency protection point and protection time.



Smart Load OFF Batt： Battery SOC or voltage at which the Smart load will switch off.

Smart Load ON Batt： Battery SOC or voltage at which the Smart load will switch on.



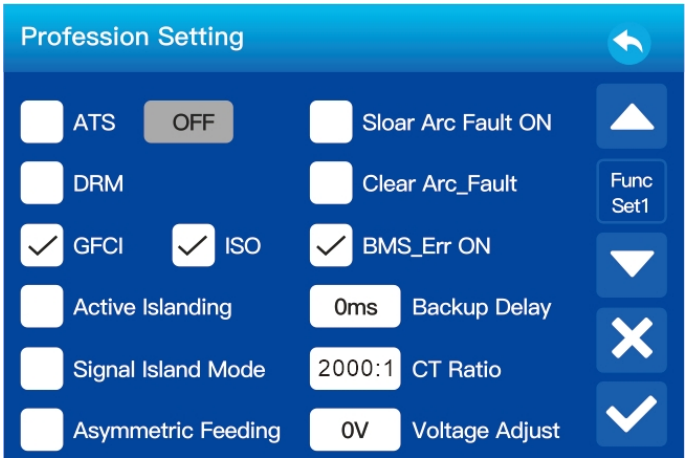
Micro Inv Input: Use the GEN port as an AC couple input port which can be connected with micro-inverter or other Grid-Tied inverter.

***Micro Inv Input ON:** When the hybrid inverter operates in off-grid mode and the SOC or voltage of battery drops to this set value,the relays on GEN port of hybrid inverter will turn to normally closed(ON), then the Grid-Tied inverter will generate solar power and feed into hybrid inverter. When the hybrid inverter operates in on-grid mode, this parameter will be invalid, the relays on GEN port of hybrid inverter will always be normally closed(ON),Grid-Tied inverter can operate normally.

***Micro Inv Input OFF:** When the hybrid inverter operates in off-grid mode and the SOC or voltage of battery upto this set value,the relays on GEN port of hybrid inverter will turn to normally open (OFF), then the Grid-Tied inverter will Stop to work. When the hybrid inverter operates in on-grid mode, this parameter will be invalid, the relays on GEN port of hybrid inverter will always be normally closed(ON),Grid-Tied inverter can operate normally.

Off Grid Immediately Off: the smart load will stop working immediately when the grid is disconnected if this item is active.

7.10. Profession Setup



ATS: It is related with ATS port voltage. it is better in "uncheck" position.

DRM: Only for AS4777 standard.

GFCI: the ground-fault circuit interrupter function.

ISO: the PV and the battery wiring terminals Positive to ground and negative to ground insulation impedance detection.

Active Islanding: Active islanding detection enable or not.

Asymmetric Feeding: This function is reserved.It is not recommended.

Sloar Arc Fault ON: Arc Detection and Protection Function, if the arc intensity exceeds the threshold,a fault will be triggered. If the arc intensity drops below the threshold and remains for 5 minutes, the fault will be automatically restored. After 5 arc fault events, the fault will be latched and can only becleared manually.(To manually clear, please enable "Clear Arc_Fault").

BMS_Err ON: When it is active, if the battery BMS failed to communicate with inverter, the inverter will stop working and report fault.

Backup Delay: When the grid cuts off, the inverter will output power after the set time.

For example, backup delay: 600ms. the inverter will give output power after 600ms when the grid cuts off.

CT Ratio: The CT ratio of the zero-export to CT mode,(Standby mode effective).

Voltage Adjust: if the inverter is working at off grid, we can adjust the output voltage by Voltage Adjust.

Signal Island Mode:when "signal island mode" is checked and the inverter connects the grid, the ATS port voltage will be 0. When "signal island mode" is checked and the inverter disconnected from the grid, the ATS port voltage will output 240Vac voltage. With this feature and outside NO type relay,it can realize N and PE disconnection or bond.

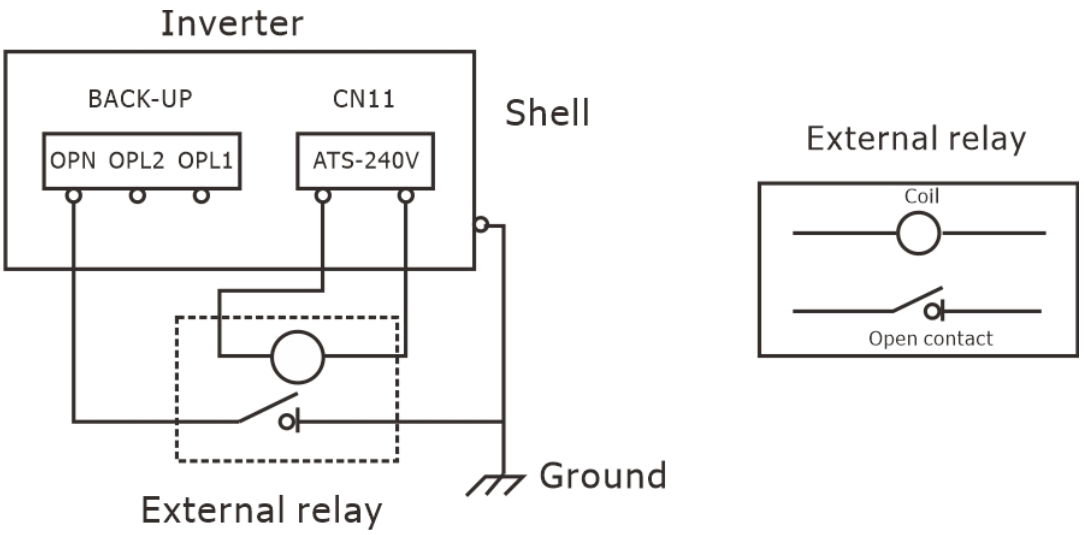
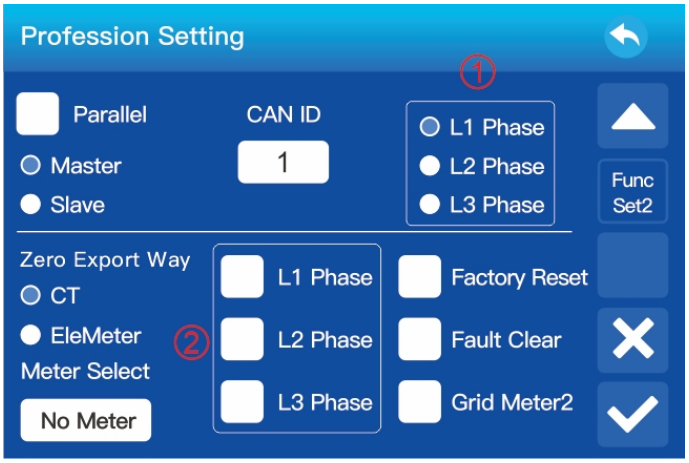


Figure 7.10-1 Application of Signal Island Mode



Parallel: To expand system capacity, click the parallel. In a parallel system, there can only be one Master for one phase, and the others must be set as Slaver, set a unique CAN ID to each inverter, the CAN ID is from 1 to 10.

Master: Select any hybrid inverter in the parallel system as the master inverter, and the master inverter needs to manage the working mode of the parallel system.

Slave: Set the other inverters managed by the master inverter as slave inverter.

①Parallel System Output Phase Selection.

L1: Used for three-phase parallel.

L2: Used for three-phase parallel.

L3: Used for three-phase parallel.

CAN ID: The Modbus address of each inverter, should be different.

Ele Meter For CT: when using zero-export to CT mode, the hybrid inverter can select Ele Meter For CT function and so far we only support CHINT & Eastron smart meter.For specific meter connection methods, please refer to section 4.12 Smart Meter Connection.

Meter Select: Select the corresponding meter type according to the meter installed in the system.

Zero Export Way: To CT mode can be used to select anti-reverse current mode for inverter, either CT or electric meter.

②Parallel System CT Phase Line Selection

L1: This function is reserved.It is not recommended.

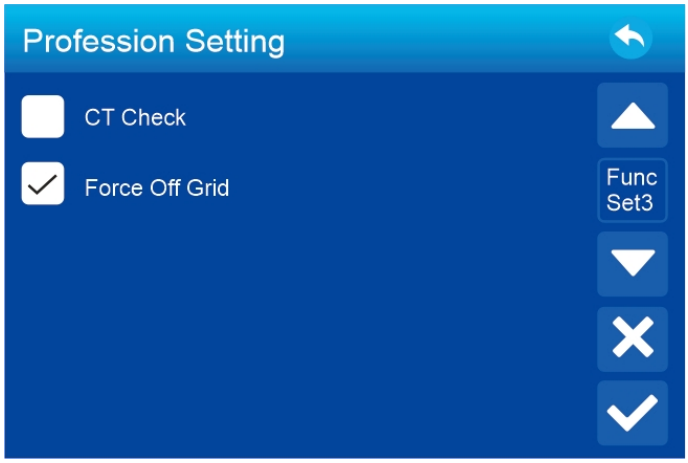
L2: This function is reserved.It is not recommended.

L3: This function is reserved.It is not recommended.

Factory Reset: If selected, enter the password first(Password:123456); Deselect it, you do not need to enter a password.

Fault Clear: When it is active，the inverter will restart.

Grid Meter2: When there's a string inverter AC couple at the grid or load side of hybrid inverter and there's a meter installed for the string inverter, then the hybrid inverter LCD will show the string inverter output power on its PV icon. Please make sure the meter can communicate with the hybrid inverter successfully.



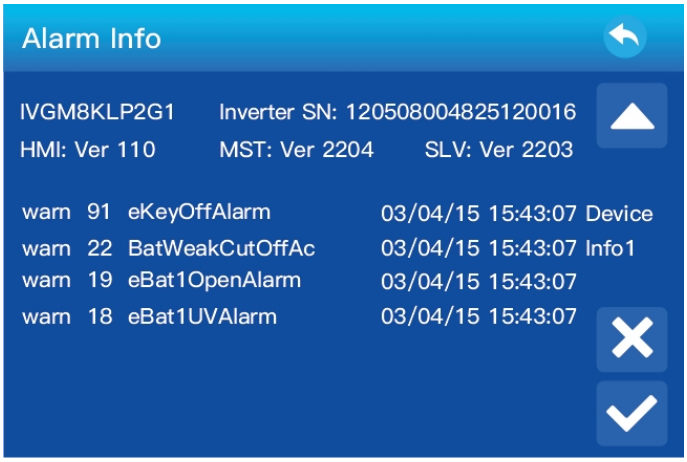
Force Off Grid：When "Force Off Grid" is checked, the forced grid disconnection function is activated. When the battery's current SOC/voltage is less than "Grid Start", the grid allows charging; when the battery is charged to a level greater than "Grid Exit", the grid is forcibly disconnected, and the inverter enters off-grid mode.

Please refer to Chapter 7.6 Battery Setup for above setting on Page 47.

CT Check: CT One-click Self-check.

CT Self-adaptive: CT one-click adaptive self-test; when checked, the CT can automatically adjust the phase sequence and orientation.

7.11. Device Info Menu



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

HMI: LCD version

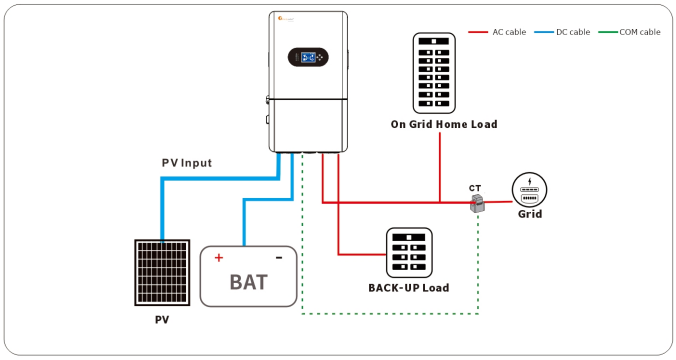
MST: Master DSP Software Version

SLV: Slave DSP Software Version

8. System Application

8.1. Basic Mode

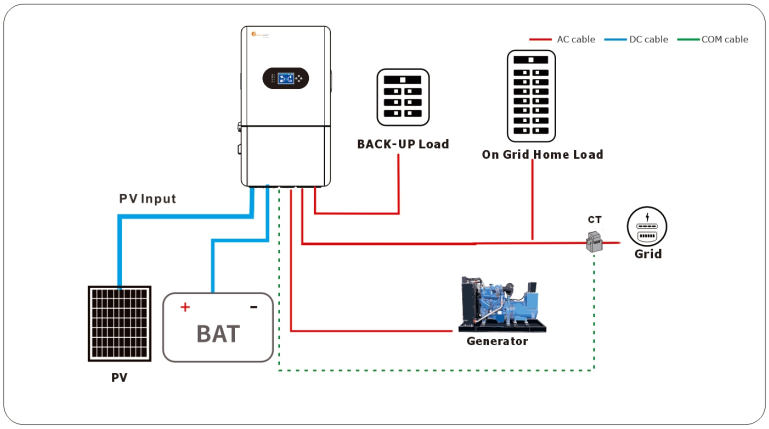
Mode I:Basic

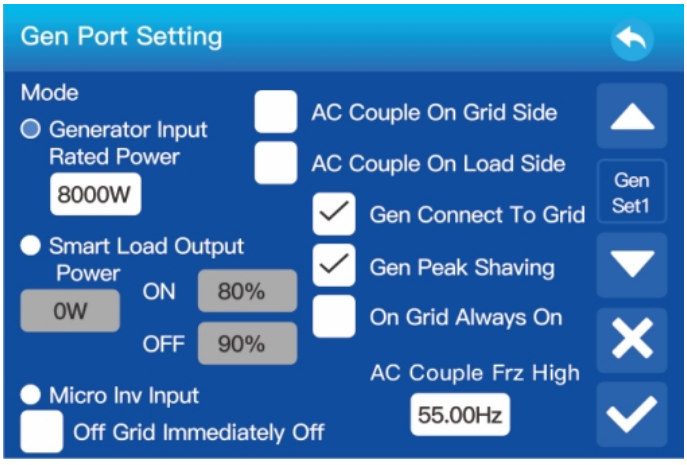


With Export to CT mode,the hybrid inverter can provide power not only to the home load on the main side, but also to the critical load on the backup side.And excess energy feeds to Grid.

8.2. Generator Mode

Mode II:With Generator





Generators Greater than 8kW (On "GEN" Input)

1. 100A rated GEN Relay.
2. A THD (Total Harmonic Distortion) of less than 15% is required for stable operation.

Generators Greater than 8kW(On "GRID" Input)

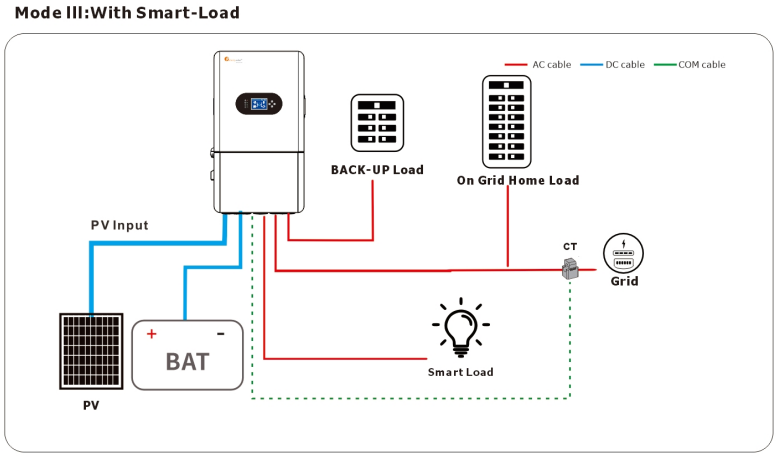
1. Optimal way to integrate generators for Off-Grid or Grid-Tied systems with automatic or manual transfer switches.

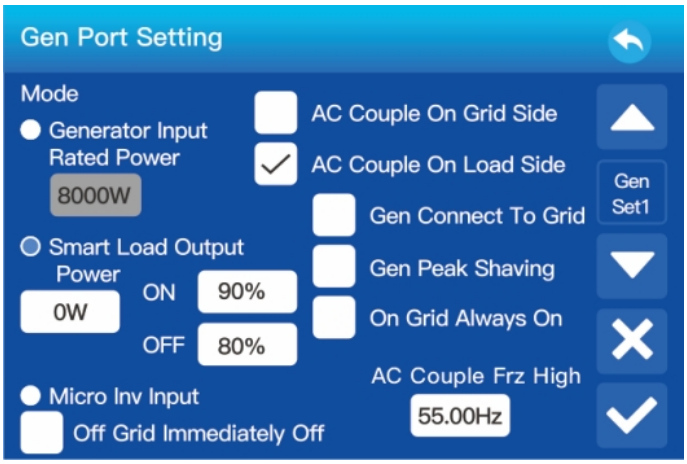
2. Programming "GEN Connect to Grid Input" and generator connected to grid port.

3. DO NOT use "Sell to Grid" when generator is connected to the GRID input, can cause potential damage the generator.

Installation of CT sensors on generator lines is only required if "Peak Shaving" is intended to be used.

8.3. Smart Load Mode





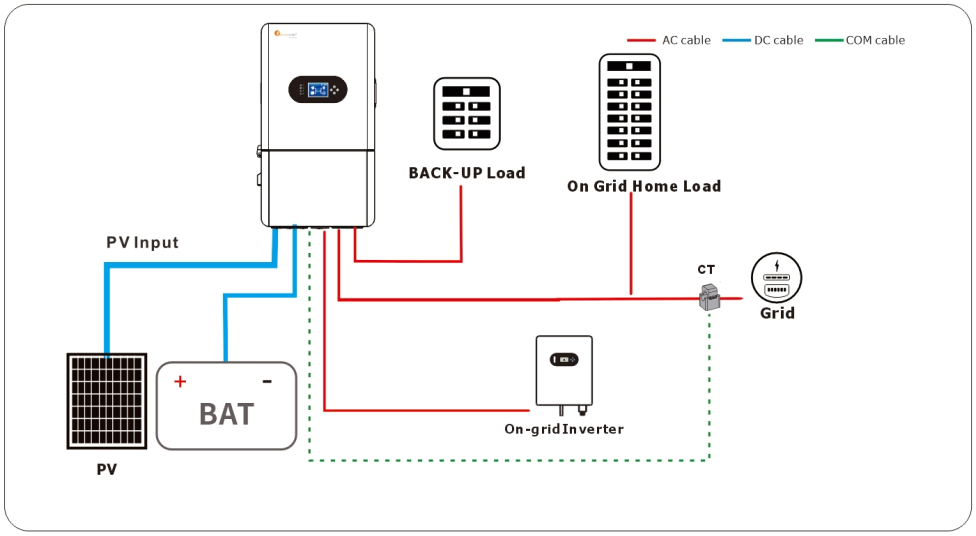
1. This mode uses the "Generator" input as a load output that delivers power when the battery exceeds a user programmable threshold or when the IVGM INVERTER is connected to the grid.

2. When "Smart Load Output" is enabled, the "GEN" input turns into an output to power high power loads such as a water heater, irrigation pump, AC unit, pool pump, or any other load.

3. When "On Grid Always On" is enabled, the "GEN" terminal will always output power as long as the grid is connected, regardless of battery charge.

8.4. AC Couple Mode

Mode IV: AC Couple



This inverter is a system that supports the addition of AC coupled solar panels. The max solar input power can be expanded by coupling micro or string inverters into the “GEN” or “GRID” terminals.

A full AC coupled solar system is not recommended as power control and monitoring is limited. Having DC coupled modules or a combination of DC coupled and AC coupled solar panels is always preferred.

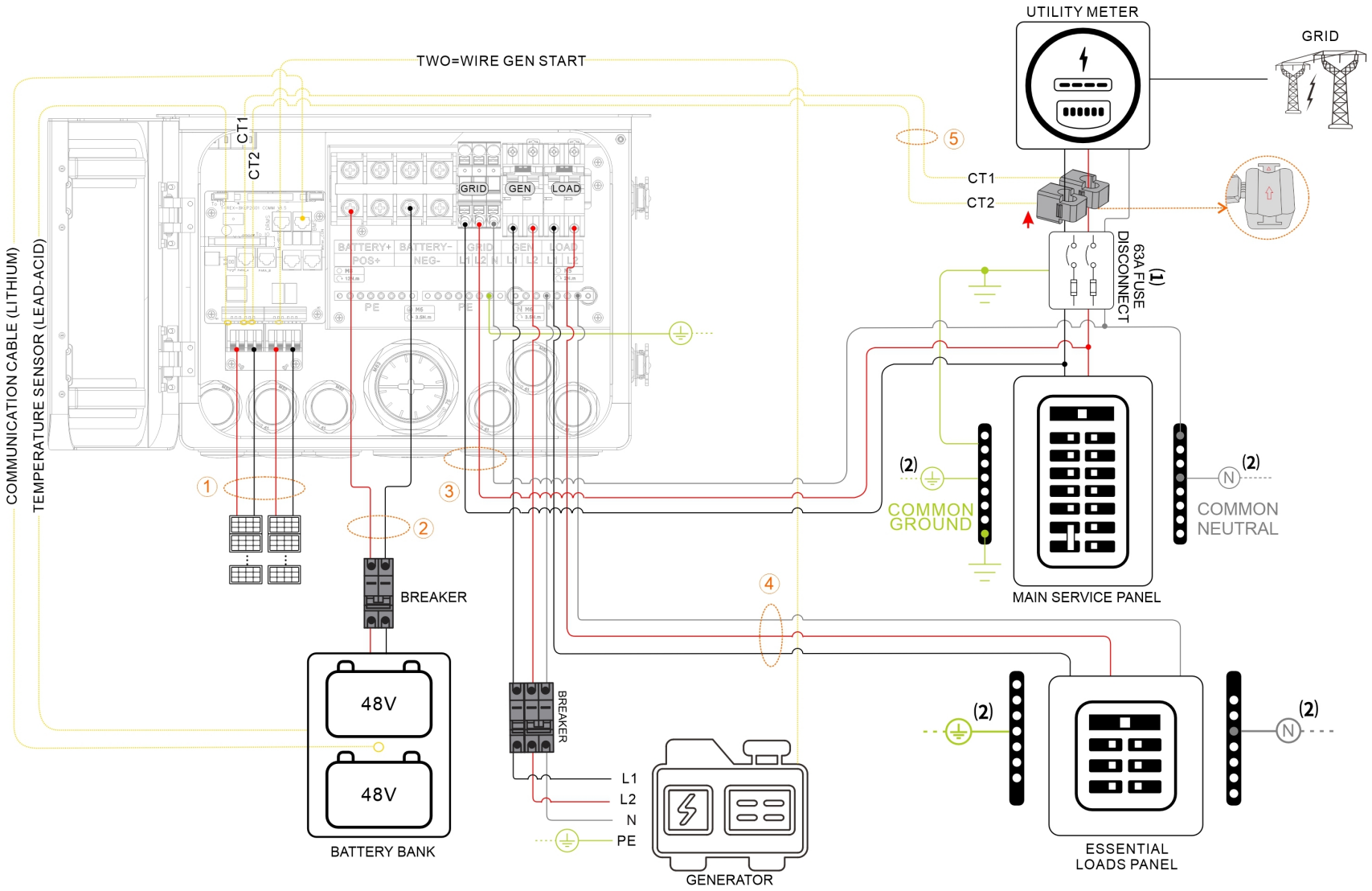
AC coupled inverters need to be either UL 1741SA or UL 1741 certified. This certification confirms the inverters’ ability to disconnect from the grid based on frequency and ensures that the Felicity Solar will safely be able to frequency shift to control the AC coupled production.

Batteries are REQUIRED to AC couple solar panels to the “GEN” and “GRID” terminal. The AC coupled inverters can still produce solar power even during grid outage events or in Off-Grid systems. Furthermore, the total AC coupling production will be monitored.

9. Wiring Diagrams

 **The following diagrams are general use cases. Installers are reminded that adherence to local electrical codes and regulations is mandatory. While these diagrams offer general guidance, they may not encompass all variations and specifics required by local codes. Consult with relevant authorities and ensure compliance before proceeding with any installation. The diagrams presented herein are not exhaustive and should not be relied upon solely for permitting or warranty verification. Installers are encouraged to exercise caution, seek professional advice when necessary, and undertake installations with due diligence and in accordance with established electrical standards and regulations.**

Standard Wiring Diagram



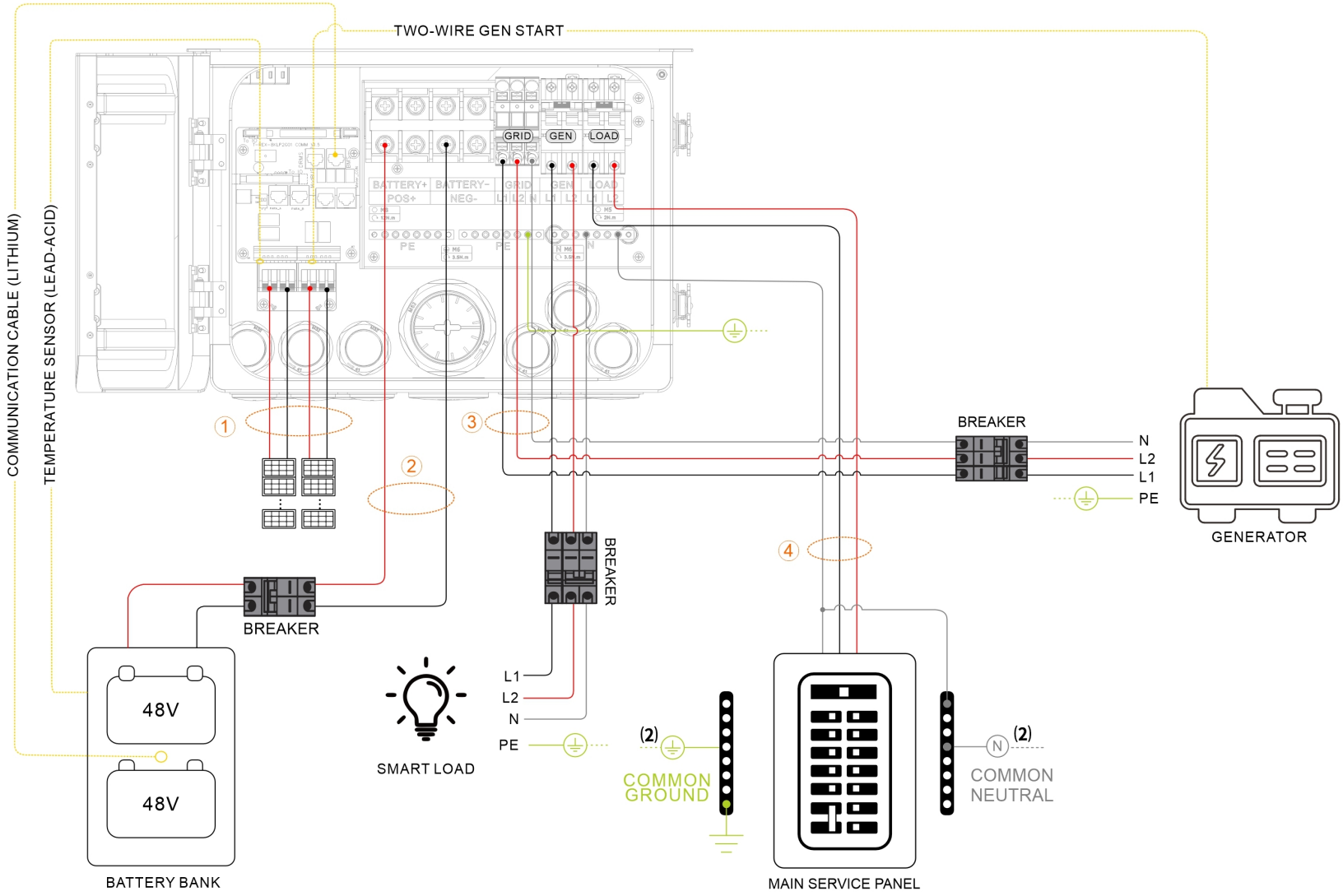
SENSORS/COMMUNICATIONS
L1-(AC)NEGATIVE-(DC)
L2-(AC)POSITIVE-(DC)
NEUTRAL
GROUND

(1) SIZE OF DISCONNECT WILL DEPEND ON REQUIRED PASSTHROUGH CURRENT AND LOCAL CODE REQUIREMENTS
(2) THESE SYMBOLS REPRESENT ACOMMON NEUTRAL/GROUND CONNECTION. DO NOT CONFUSE WITH GROUNDING ROD
* TO ACHIEVE THIS MODE, THE GRID PORT MUST CONNECT TO UTILITY

WIRE GAUGE GUIDE

LABEL	CONDUCTOR
①	MAX 10 AWG / 5.26mm²
②	MAX 2 AWG / 33.62mm²
③	MAX 6 AWG / 13.30mm²
④	MAX 6 AWG / 13.30mm²
⑤	MAX 22 AWG / 0.325mm²

Standard Wiring Diagram-Generator in Grid



SENSORS/COMMUNICATIONS
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L2-(AC)POSITIVE-(DC)
NEUTRAL
GROUND

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③	MAX 6 AWG / 13.30mm²
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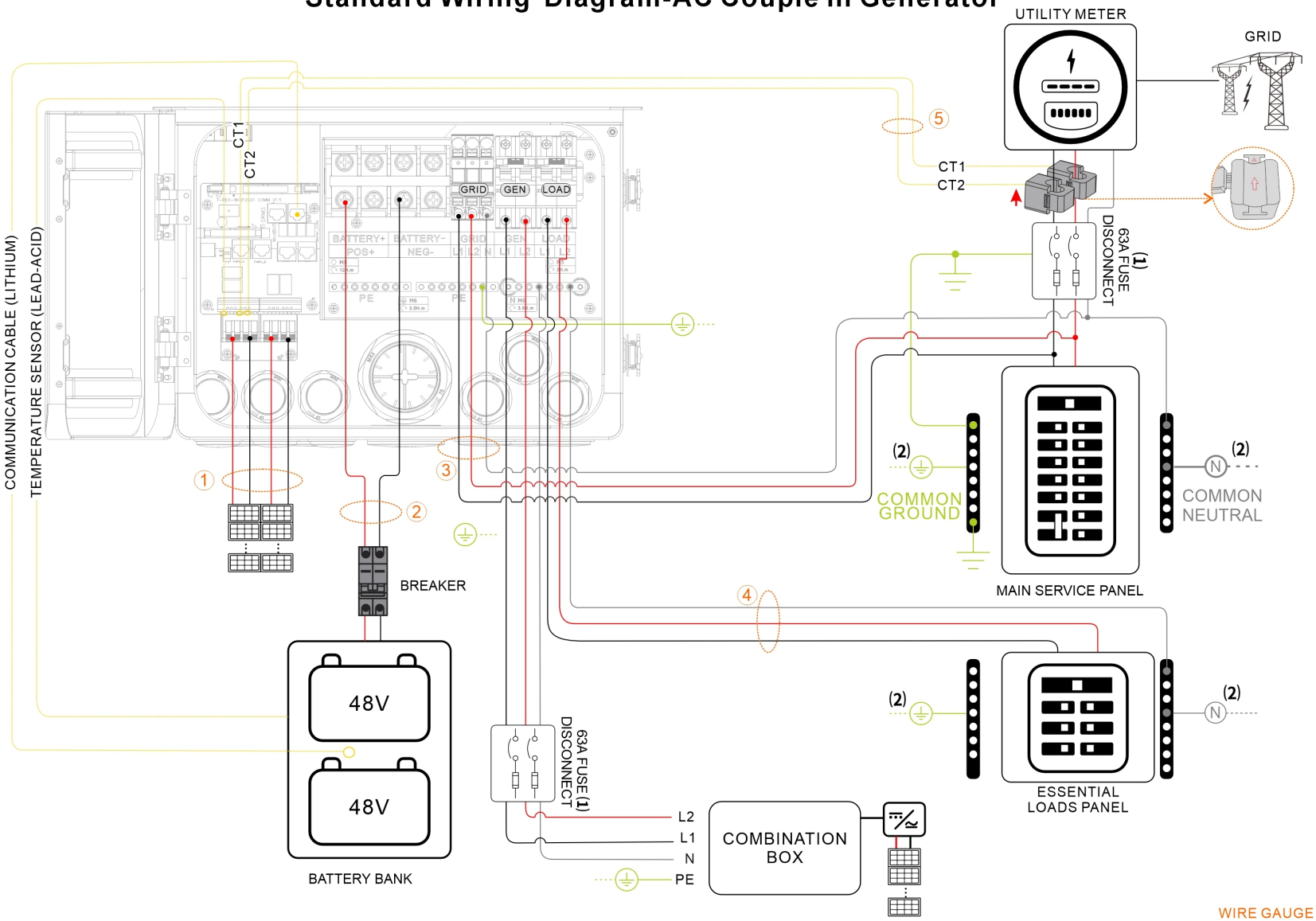
Standard Wiring Diagram-AC Couple in Generator



SENSORS/COMMUNICATIONS
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L2-(AC)POSITIVE-(DC)
NEUTRAL
GROUND

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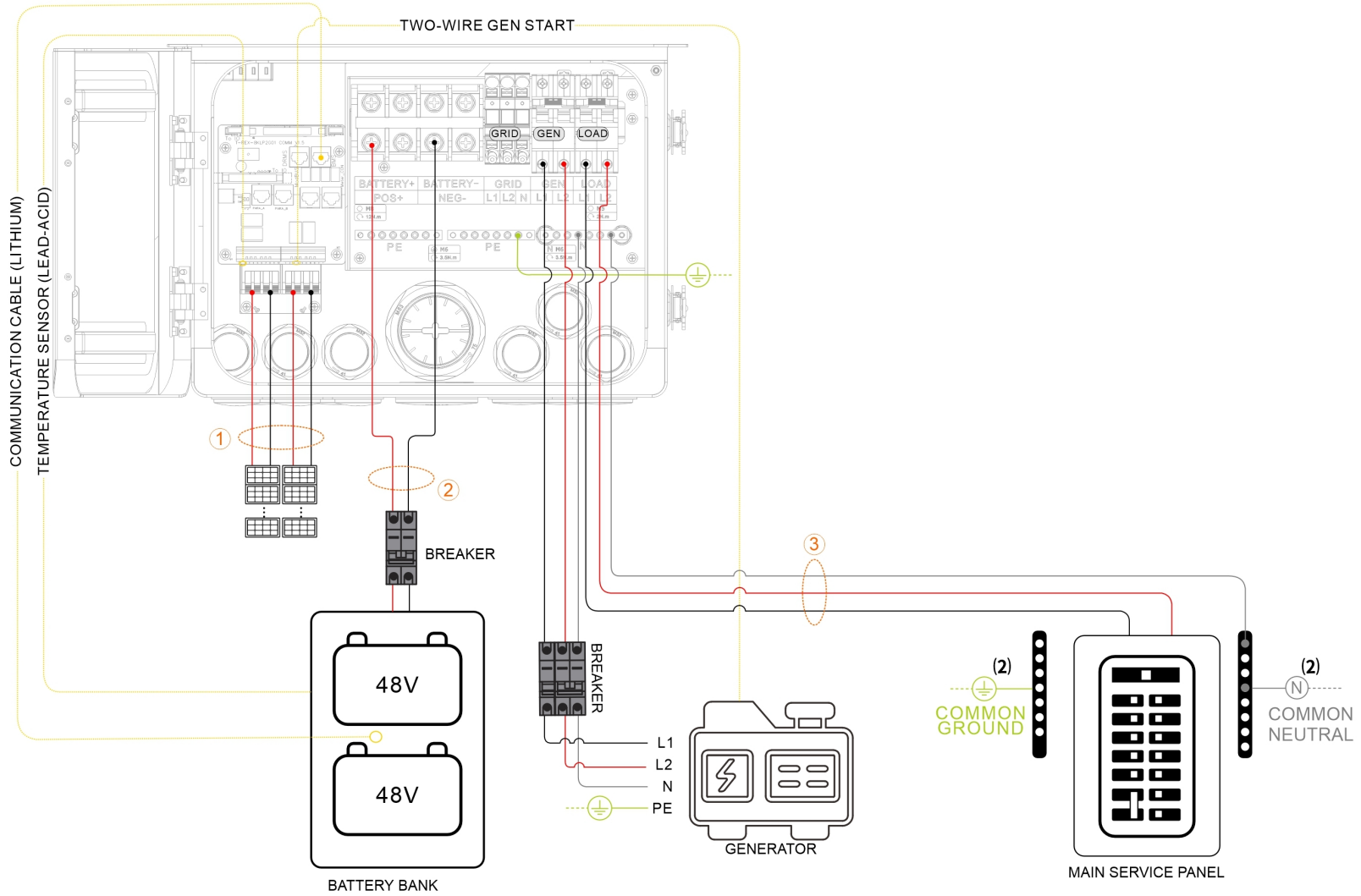
③	MAX 6 AWG / 13.30mm²
④	MAX 6 AWG / 13.30mm²
⑤	MAX 22 AWG / 0.325mm²

Standard Wiring Diagram-Off Grid



SENSORS/COMMUNICATIONS
L1-(AC)NEGATIVE-(DC)
L2-(AC)POSITIVE-(DC)
NEUTRAL
GROUND

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WIRE GAUGE GUIDE

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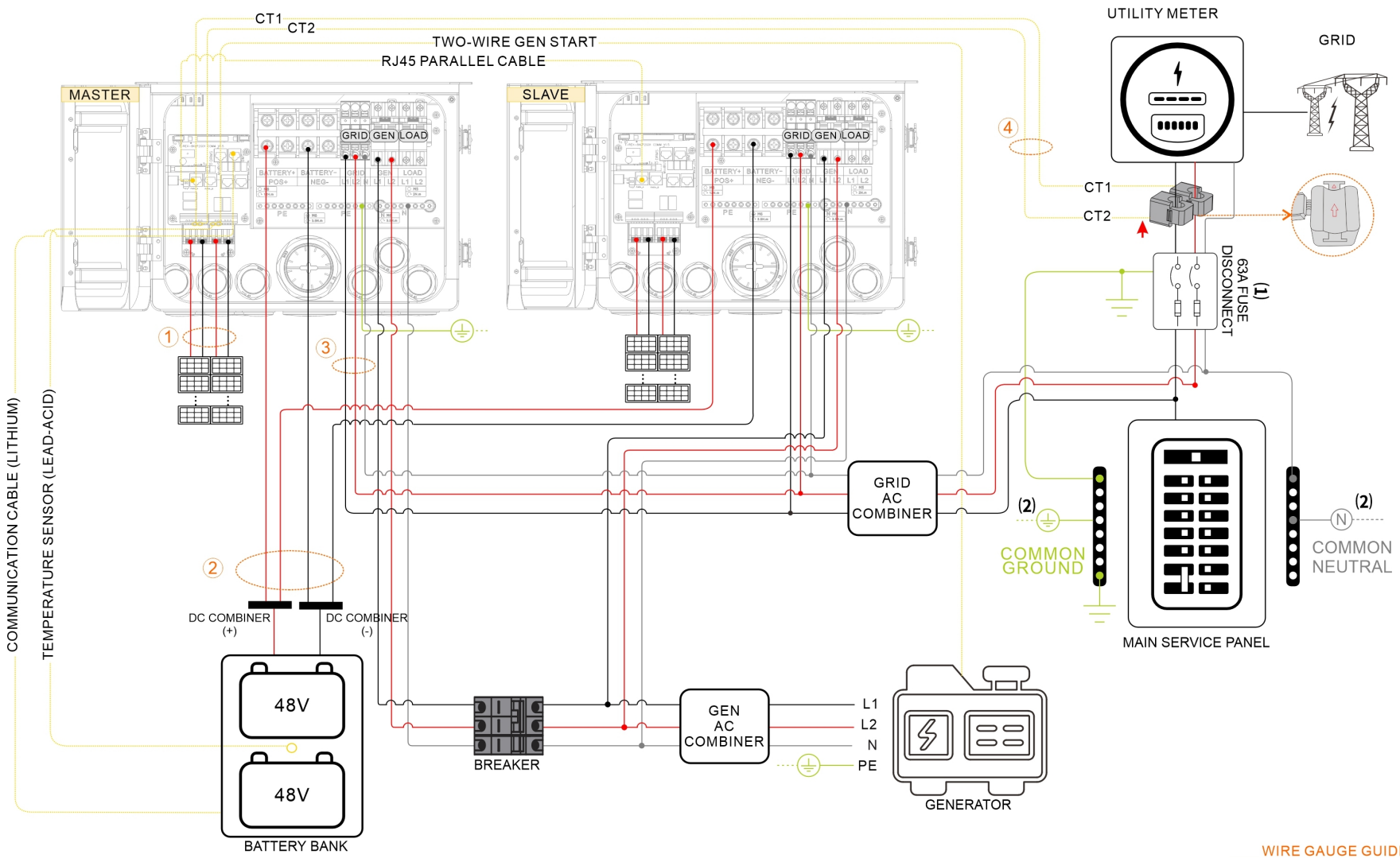
②	MAX 2 AWG / 33.62mm²
③	MAX 6 AWG / 13.30mm²

Standard Wiring Diagram-Split Phase Parallel



SENSORS/COMMUNICATIONS
L1-(AC)NEGATIVE-(DC)
L2-(AC)POSITIVE-(DC)
NEUTRAL
GROUND

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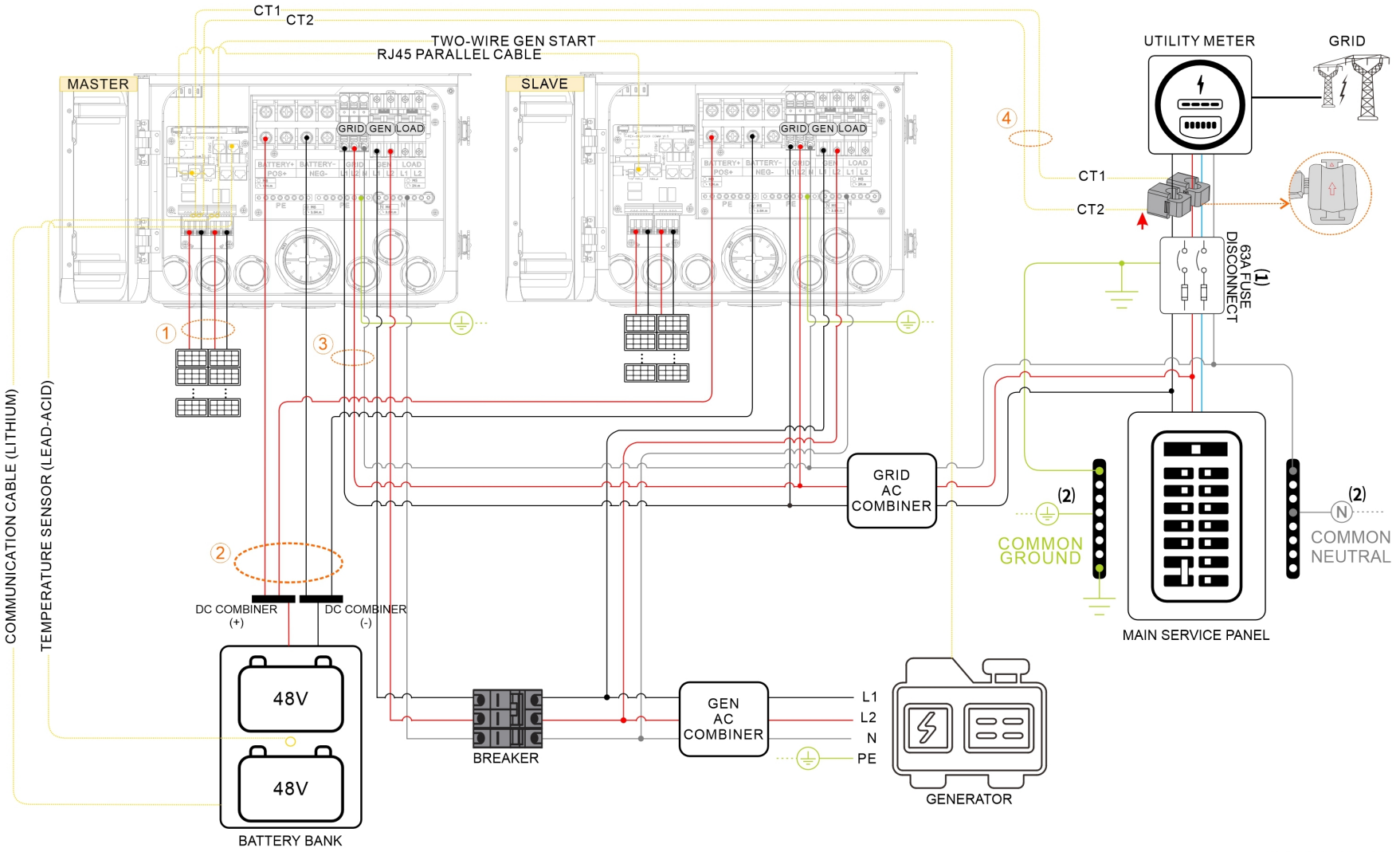
* TO ACHIEVE THIS MODE, THE GRID PORT MUST CONNECT TO UTILITY

WIRE GAUGE GUIDE

LABEL	CONDUCTOR
①	MAX 10 AWG / 5.26mm²
②	MAX 2 AWG / 33.62mm²
③	MAX 6 AWG / 13.30mm²
④	MAX 22 AWG / 0.325mm²

Standard Wiring Diagram-2/3 Phase Parallel



SENSORS/COMMUNICATIONS
L1-(AC)NEGATIVE-(DC)
L2-(AC)POSITIVE-(DC)
L3
NEUTRAL
GROUND

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WIRE GAUGE GUIDE

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③	MAX 6 AWG / 13.30mm²
④	MAX 22 AWG / 0.325mm²

10. Maintenance

10.1. Storage Conditions

If the inverter will not be installed immediately:

- Store in the original packaging
- Keep in a dry and ventilated location
- Avoid direct sunlight and moisture exposure
- Prevent mechanical impact or vibration

10.2. Routine Inspection

Perform periodic inspections to ensure safe and reliable operation.

Inspection items include:

- Loose electrical connections
- Cable damage
- Ventilation blockage
- Corrosion or moisture ingress
- Abnormal noise or odor

10.3. Cleaning

Use a dry cloth or soft brush to remove dust from ventilation areas.

Do not use:

- Solvents
- Abrasive cleaners
- High-pressure water
- Corrosive chemicals

Failure to strictly follow the storage, inspection, and cleaning procedures may result in equipment damage, performance degradation, or safety hazards.

Any damage, malfunction, or loss arising from improper storage, inadequate maintenance, unauthorized cleaning methods, or failure to comply with the specified instructions shall not be covered under warranty, and the manufacturer shall bear no liability whatsoever.

11. Warranty

As to warranty terms, please refer to <FelicitySolar Warranty Policy >.Under the guidance of our company, customers return our products so that our company can provide service of maintenance or replacement of products of the same value. Customers need to pay the necessary freight and other related costs. Any replacement or repair of the product will cover the remaining warranty period of the product. If any part of the product or product is replaced by the company itself during the warranty period, all rights and interests of there placement product or component belong to the company.

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

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

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

12. Decommissioning and Disposal

12.1. Equipment Removal

Before removing the inverter from service:

- Disconnect the utility grid.
- Disconnect PV inputs.
- Disconnect battery connections.
- Wait at least 5 minutes for internal discharge.
- Verify zero voltage before handling conductors.

12.2. Disposal Requirements

Dispose of the inverter in accordance with local regulations for electronic equipment and electrical waste.

 Do not dispose of electronic equipment with household waste.