ENWALL

Encap Storage System 16kWh 48V, Enserver 10kW, Three Phase

User Manual

P/N: ENW-16k-48-10k-3P-X-X-X_1V0_GEN1

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Document HISTORY

Issue 01 (17-03-2025)

First release

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SAFETY INSTRUCTIONS

SAFETY GUIDELINES

1. PERSONAL SAFETY

- Always wear proper personal protective equipment (eyes protection, gloves, and safety shoes).

2. GENERAL GUIDELINE

- Do not subject the ENWALL Module to strong impact.
- To reduce risk of electric shock, disconnect all wires before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to "Installation" section of this manual for the details.
- Grounding instructions - the ENWALL Module should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this ENWALL Module.
- Never cause AC output and DC input short circuited. Do not connect to the mains when DC input short circuits.
- Do not crush or puncture the ENWALL Module.
- Do not place the ENWALL Module near a heat source, such as a fireplace.
- Do not disassemble the ENWALL Module under any circumstances.
- Ensure precautions to prevent short-circuit under all circumstances.
- Do not touch the terminals with conductors while the ENWALL Module is charging. Serious burns, shock, or material fusing may occur.
- Protect surrounding electrical components from incidental contact.
- Do not drop the ENWALL Module. Internal damage may occur that will not be visible.
- In case the Module is physically damaged for any reason, do not install and energize the Module under any circumstances and immediately contact your Reseller.

3. ENWALL MODULE OPERATING ENVIRONMENT

- Location: Indoor/Outdoor
- Operating Temperature Range: -30°C to 70°C (For continuous operations outside this range, please consult your Resellers or Enercap).
- Operating Humidity: Non-Condensing

4. ENWALL MODULE CLEANING

- Disconnect the power before cleaning.

5. STORAGE ENVIRONMENT

- Do not store the ENWALL Module at temperature greater than 70°C.

6. DISPOSAL

- Do not dispose the ENWALL Module in fire.
- Do not dispose this ENWALL Module as unsorted municipal waste. Please use a separate collection facility or contact the supplier from whom this Module was purchased. Please make sure discarded electrical waste is properly recycled per applicable regulations to reduce environmental impact.

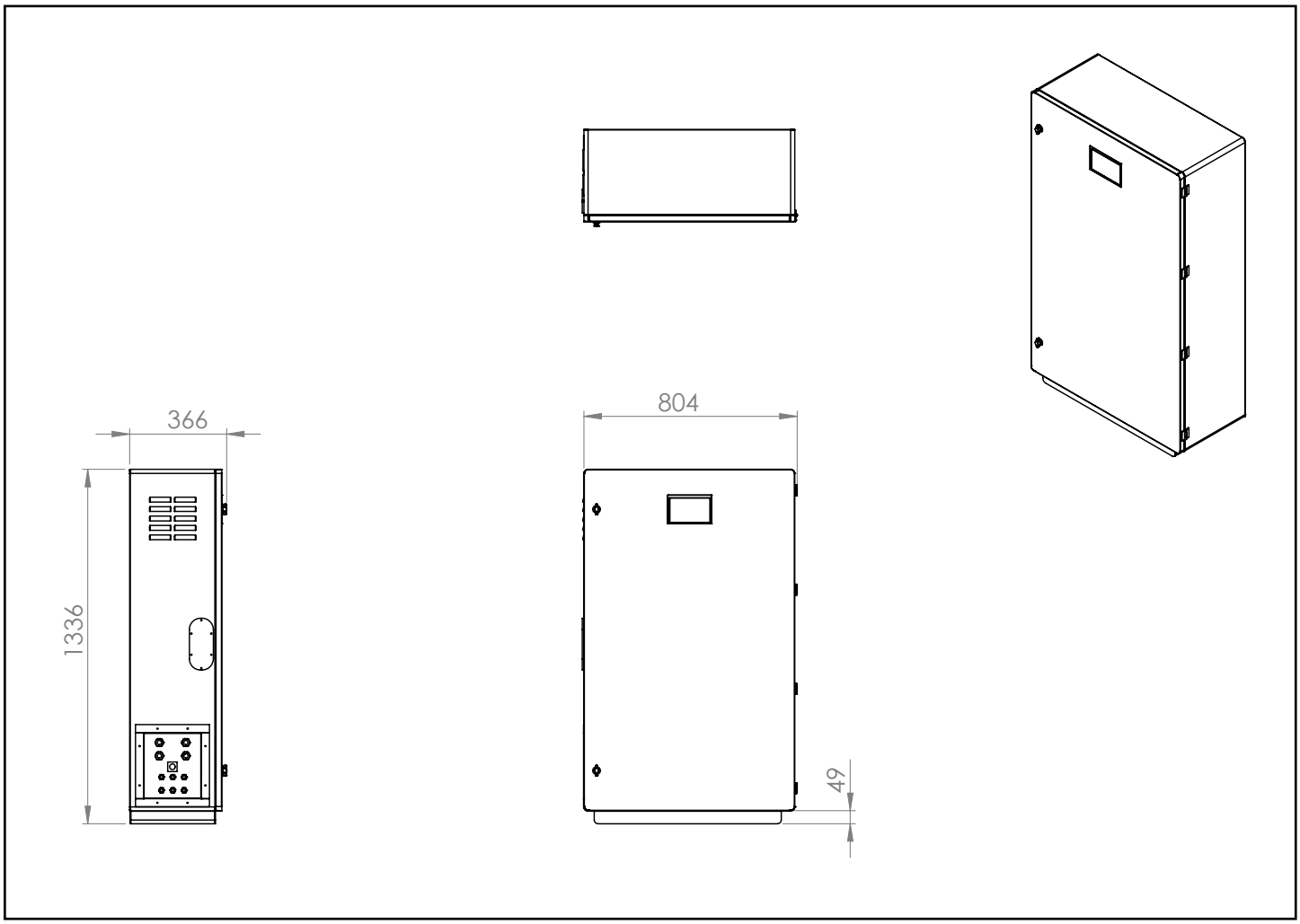
INTRODUCTION

ENWALL is Enercap's latest integrated energy storage system designed for the home and light commercial facilities. ENWALL comes with Enercap's patent ENCAP and ENSERVER cutting-edge technology. The ENWALL system can be charged by the grid, solar, wind, or genset in either standalone grid-tied, standalone off-grid, grid-tied hybrid, or off-grid hybrid mode. It can switch automatically between modes as the need arises. Using the safest energy storage technology, the system can operate in very high or low temperatures without the need for heating or cooling and has a very high AC and DC round trip efficiency. ENWALL has a direct connection to PV, the Grid, Wind, or GENSETS. The system will automatically detect outages, can power your home or electric vehicle, and will charge as soon as any of the inputs is available. ENWALL will store energy for long periods without depletion of energy through idle discharge or thermal runaway of energy through idle discharge or thermal runaway.

ENWALL Features

- Built in 10kW Enserver and 16kWh Encap Module.
- 230V/400V three phase pure sine wave enserver.
- Self-and feed-in to the grid.
- Auto restart while AC is recovering.
- Programmable supply priority for Energy Storage System (ESS) or grid.
- Programmable multiple operation modes: On grid, off grid and UPS.
- Configurable ESS charging current/voltage based on applications by LCD setting.
- Configurable AC/Solar/Generator Charger priority by LCD setting.
- Compatible with mains voltage or generator power.
- Overload/over temperature/short circuit protection.
- Smart ESS charger design for optimized ESS performance
- With limit function, prevent excess power overflow to the grid.
- Supporting WIFI monitoring and build-in 2 strings for 1 MPP tracker, 1 string for 1 MPP tracker.
- Smart settable three stages MPPT charging for optimized ESS performance.
- Time of use function.

ENWALL DIMENSIONS:



BASIC SYSTEM ARCHITECTURE

The following illustration shows basic application of the ENWALL MODULE.

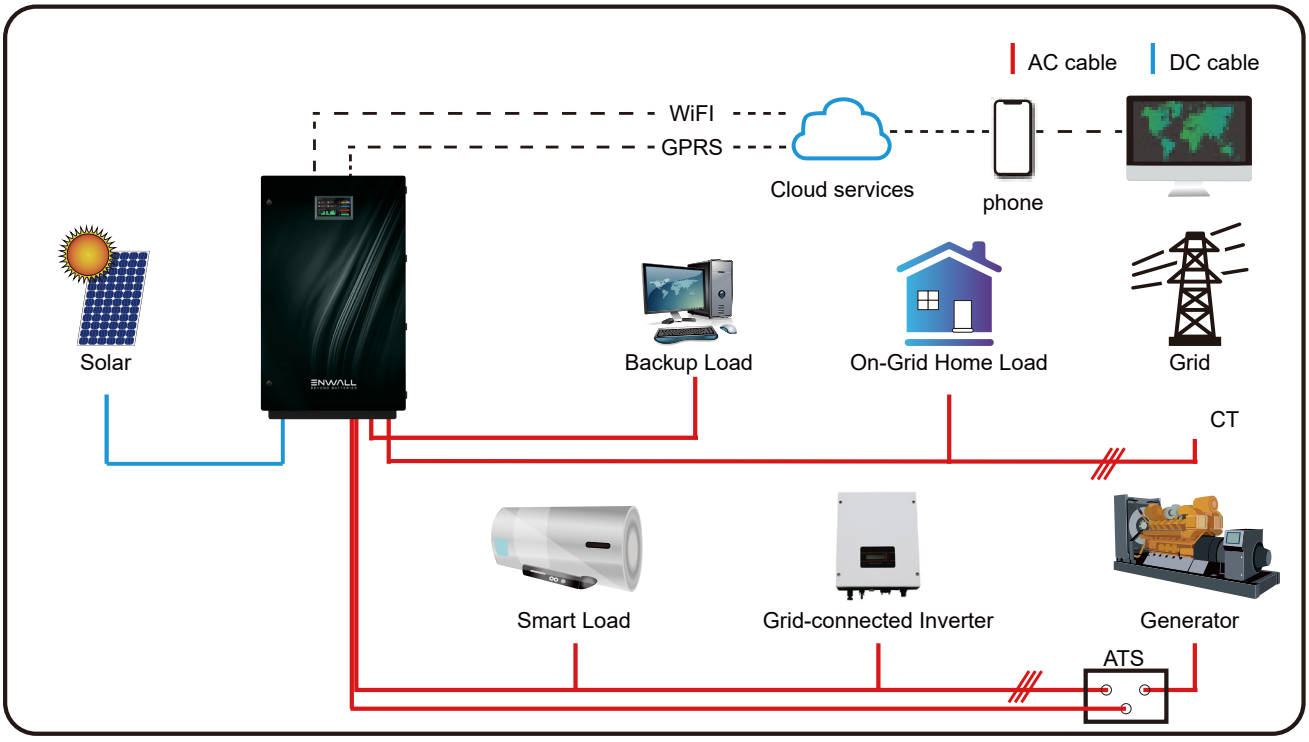
It also includes following devices to have a complete running system.

- Generator or Utility

- PV modules

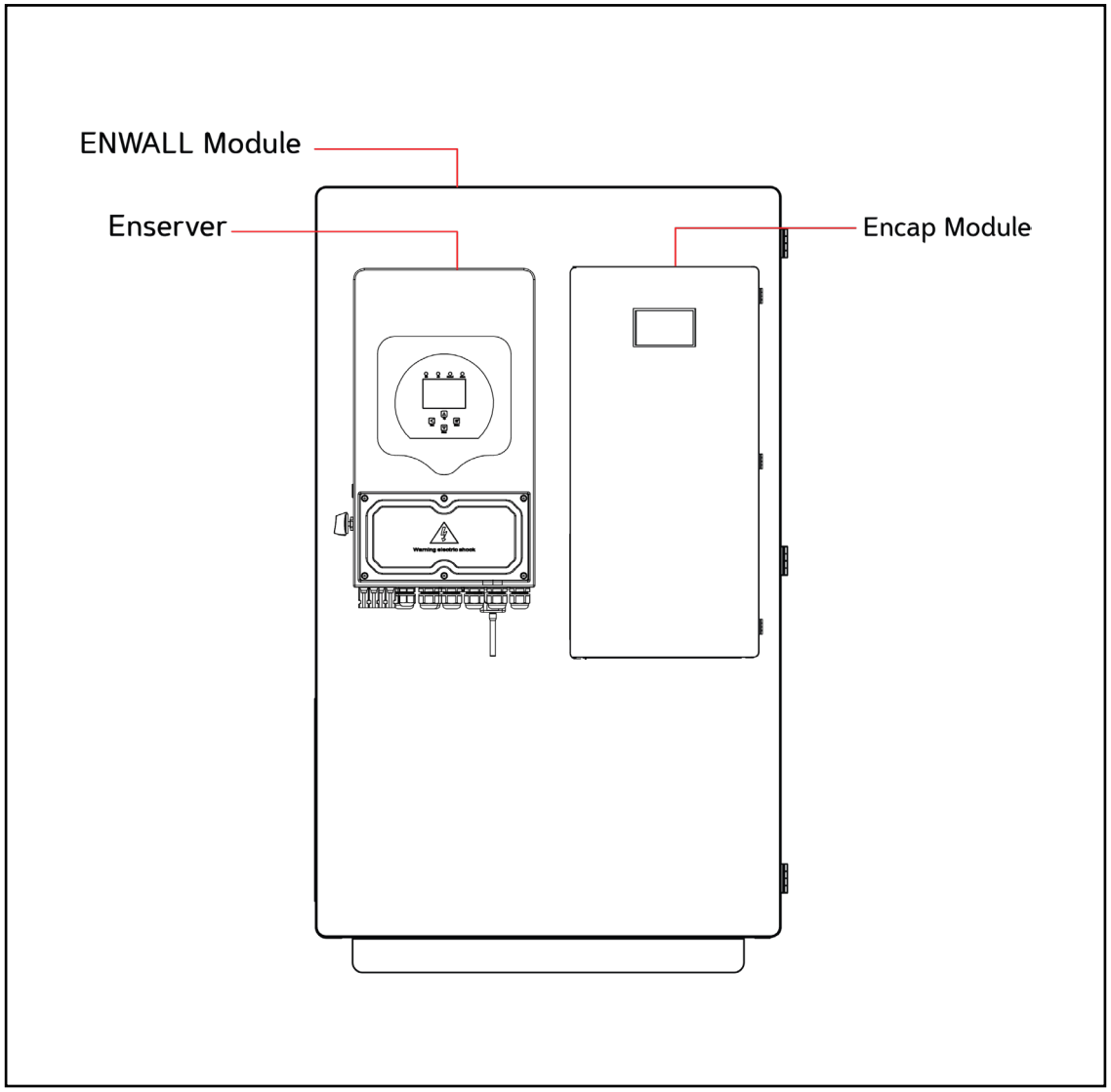
Consult with your system integrator for other possible system architectures depending on your requirements.

The ENWALL Module can power all kinds of appliances in home or office environment, including motor type appliances such as refrigerator and air conditioner.

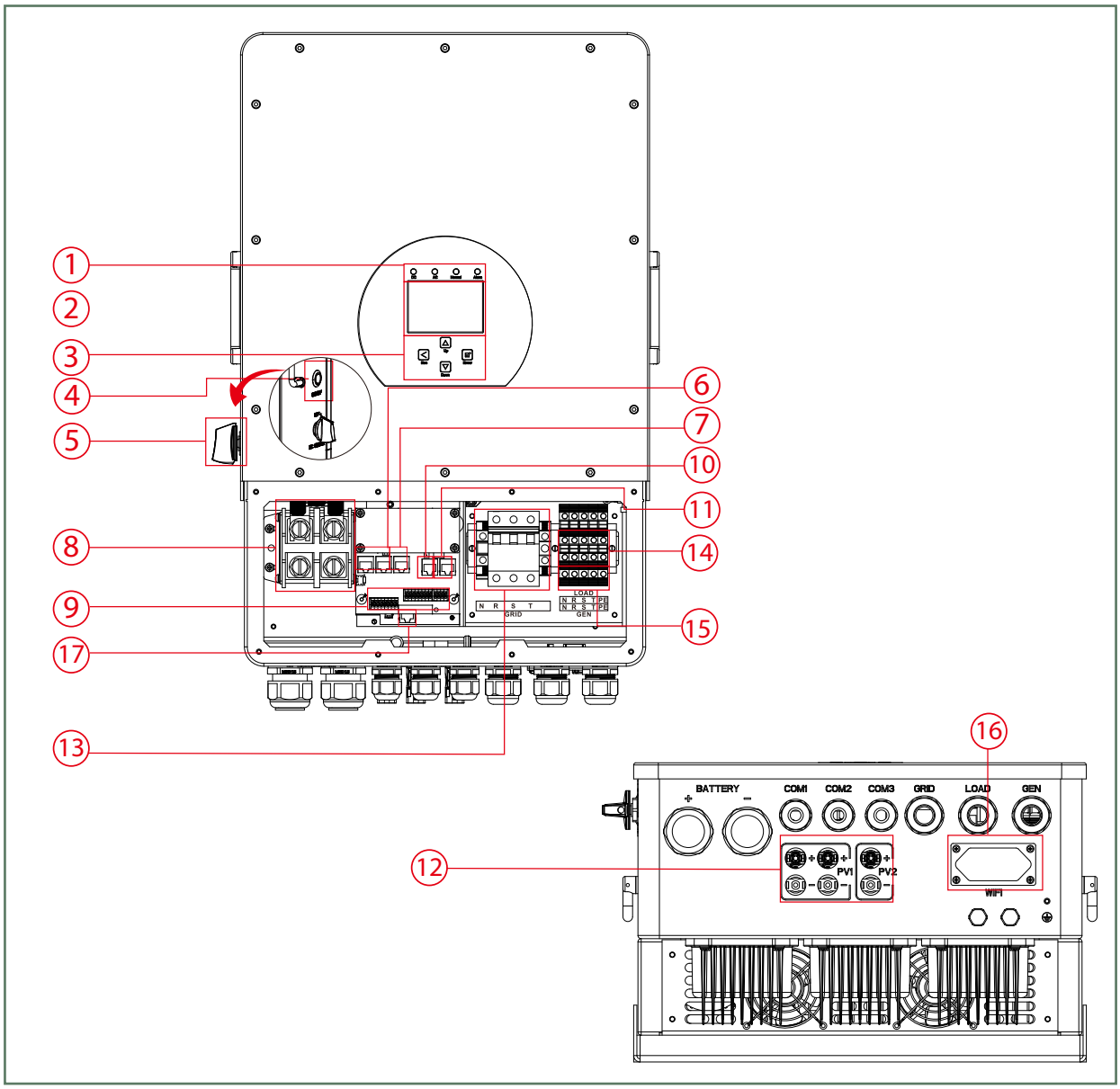


ENWALL MODULE OVERVIEW

The ENWALL Module is a multi functional device, combining functions of 10kW enserver, 16kWh Energy Storage System (ESS), solar charger and ESS charger to offer uninterrupted power support. Its comprehensive LCD display offers user configurable and easy accessible button operation such as ESS charging, AC/solar charging, and acceptable input voltage based on different applications.



ENSERVER OVERVIEW



1: Enserver Indicators	7: Meter-485 port	13: Circuit breaker of Grid*
2: LCD display	8: Battery input connectors	14: Load
3: Function Buttons	9: Function port	15: Generator input
4: Power on/off button	10: Modbus port	16: WiFi Interface
5: DC switch	11: BMS port	17: DRM port
6: Parallel port	12: PV input with two MPPT	

* for some hardware versions, the circuit breaker of Grid is not existed

MECHANICAL INSTALLATION

MOUNTING INSTRUCTIONS

1. INSTALLATION PRECAUTION

The ENWALL Module is designed for outdoor use(IP65), Please make sure the installation site meets below conditions:

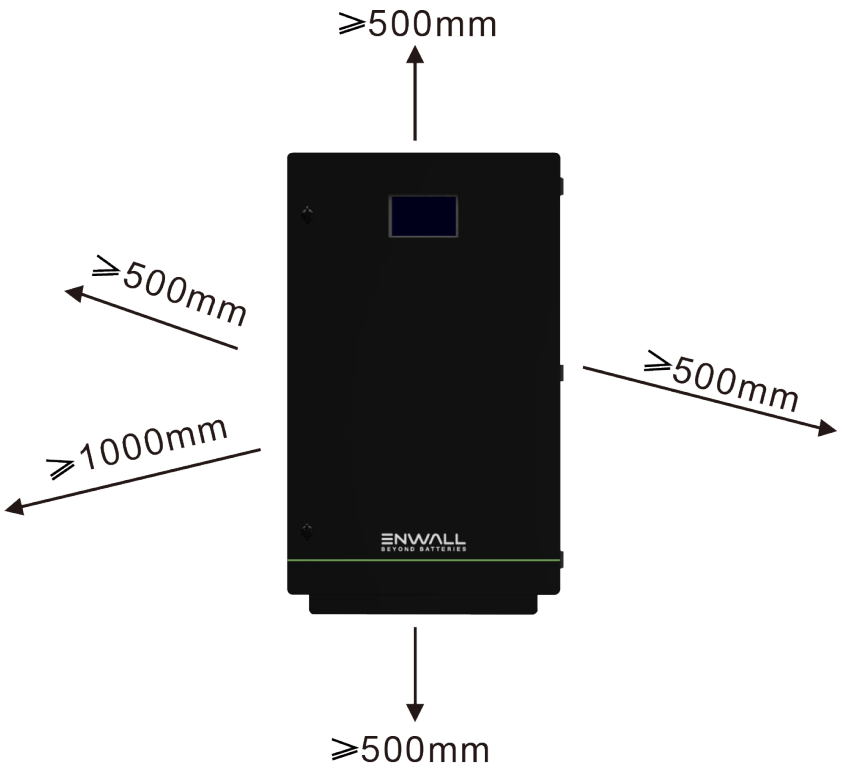
- Not in direct sunlight
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television Antenna or antenna cable.
- Not higher than altitude of about 2000 meters above sea level.
- Not in environment of precipitation or humidity(>95%)
- Please AVOID direct sunlight, rain exposure, snow laying up during installation and operation.

2. LOCATION REQUIREMENTS:

Considering the following points before selecting where to install:

- Please select a vertical wall with load-bearing capacity for installation, suitable for installation on concrete or other non-flammable surfaces.
- Install this Enwall Module at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature is recommended to be between -30~60°C to ensure optimal operation.

For proper air circulation to dissipate heat, allow a clearance of approximately 50cm to the side and approximately 50cm above and below the unit. And 100cm to the front.



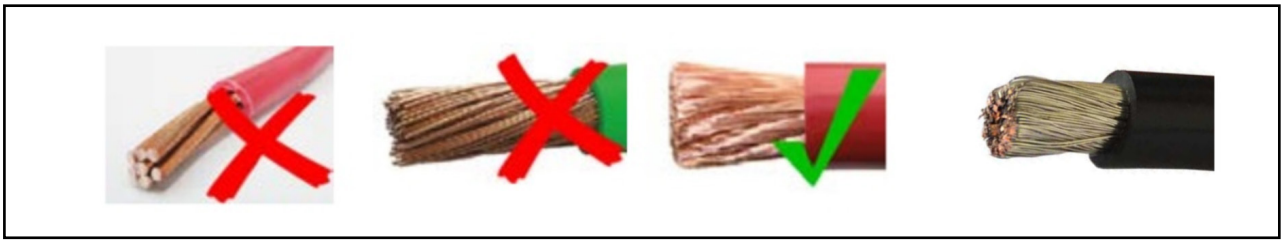
ELECTRICAL INSTALLATION

1. ESS CONNECTION

1.1 CABLE SIZE:

When selecting cables avoid these mistakes:

- Don't use cables with coarse strands.
- Don't use non-flexible cables.
- Don't use AC cables.



For a quick and general calculation for cables up to 5 meters use this formula:

Current / 3 = cable size in mm²

For example: if the current is 200A, then the cable needs to be: 200/3 = 66mm^2

Our recommended DC ESS cable size that needs to be used for the ENWALL Module is as follows:

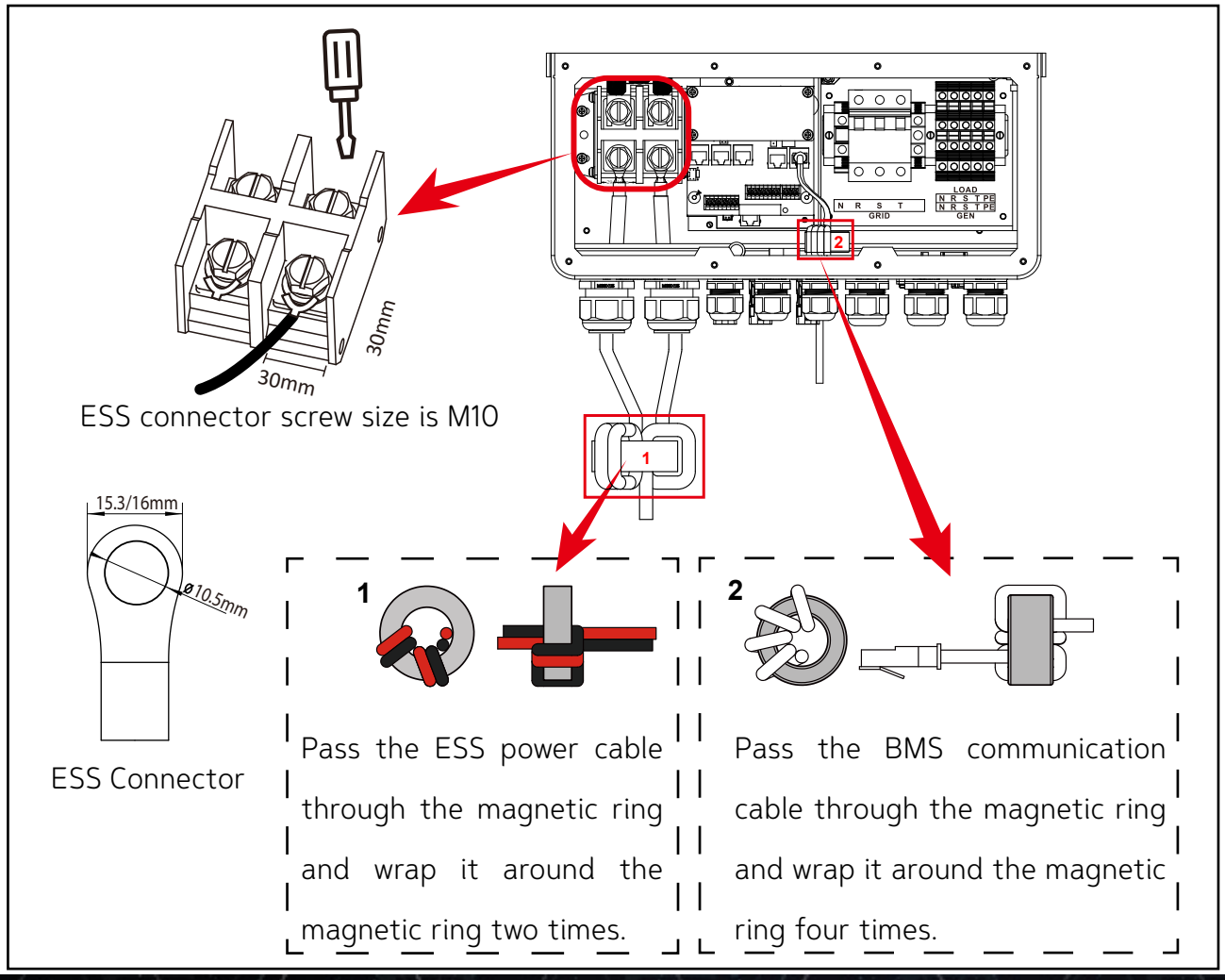
Enserver Capacity	ESS Capacity	Wire Size	Cable(mm^2)	Torque Value (max)
10kW	16kWh	4/0AWG	95	24.5Nm

1. All wiring must be performed by a professional person.
2. Connecting the ESS with a suitable cable is important for safe and efficient operation of the system. To reduce the risk of injury, refer to above table for recommended cables.

1.2 STEPS TO CONNECT ESS:

Please follow below steps to implement ESS connection:

1. Please choose a suitable cable with correct connector which can well fit into the ESS terminals.
2. Use a suitable screwdriver to unscrew the bolts and fit the ESS connectors in, then fasten the bolt by the screwdriver, make sure the bolts are tightened with torque of 24.5 N.M in clockwise direction.
3. Make sure polarity at both the ESS and enserver is correctly connected.



1. Installation must be performed with care.

2. Before making the final DC connection or closing DC breaker/ disconnect, be sure positive(+) must be connected to positive(+) and negative(-) must be connected to negative(-). Reverse polarity connection on ESS will damage the enserver.

2. GRID CONNECTION AND BACKUP LOAD CONNECTION

2.1 PRECAUTIONS

- Before connecting to the grid, a separate AC breaker must be installed between the enserver and the grid, and also between the backup load and the enserver. This will ensure that the enserver can be securely disconnected during maintenance and fully protected from over current. The recommended AC breaker for the load port and grid port is 63A.
- There are three terminal blocks with "Grid" "Load" and "GEN" markings. Please do not misconnect input and output connectors.

All wiring must be performed by a qualified personnel. It is very important for system safety and efficient operation to use appropriate cable for AC input connection.

2.2. CABLE SIZE

To reduce risk of injury, please use the proper recommended cable as below.

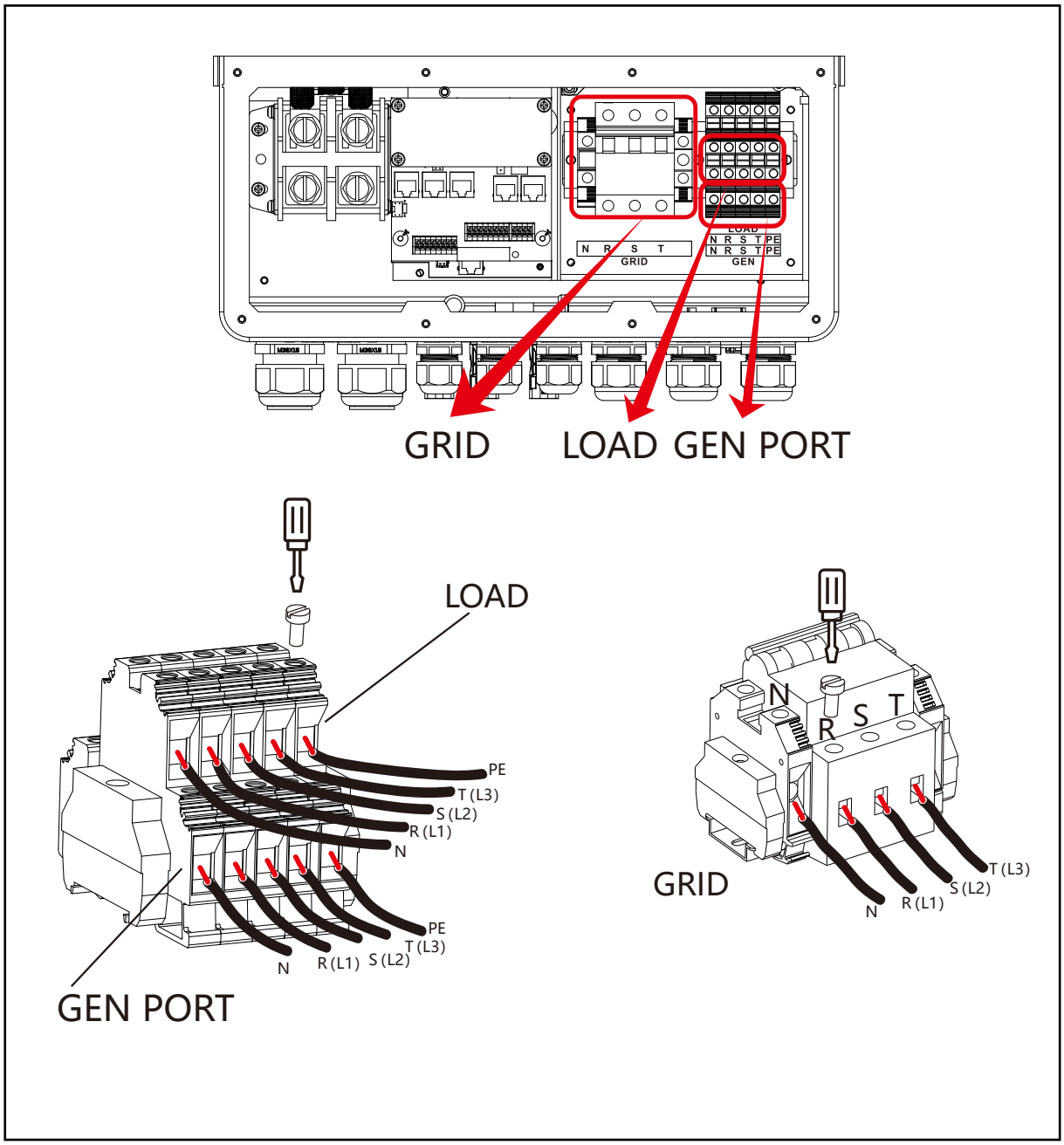
Enserver Capacity	Wire Size	Cable(mm^2)	Torque Value (max)
10kW	8AWG	6	1.2Nm

2.3. STEPS TO CONNECT GRID:

Please follow below steps to implement AC input/output connection:

1. Before making Grid, load and Gen port connection, be sure to turn off AC breaker or disconnecter first.

2. Remove insulation sleeve 10mm length, unscrew the bolts, insert the wires according to polarities indicated on the terminal block and tighten the terminal screws. Make sure the wires are completely and safely connected.



Be sure that AC power source is disconnected before attempting to wire it to the unit.

3. Then, insert AC output wires according to polarities indicated on the terminal block and tighten terminal. Be sure to connect corresponding N wires and PE wires to related terminals as well.

4. Make sure the wires are securely connected.

Appliances like air conditioners need at least 2-3 minutes to restart to allow the refrigerant gas inside the system to stabilize. If a power outage occurs and power is restored too quickly, it can damage your connected appliances. To prevent this, check with the air conditioner manufacturer to ensure it has a built-in time-delay function before installation. Otherwise, this enserver will activate an overload fault and cut off the power to protect your appliance, but in some cases, internal damage to the air conditioner may still occur.

3. PV CONNECTION

3.1 PRECAUTIONS

Before connecting to PV modules, please install a separately DC circuit breaker between enserver and PV modules. It is very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size as below.

3.2. CABLE SIZE

To reduce risk of injury, please use the proper recommended cable size as below.

Enserver Capacity	Wire Size	Cable(mm^2)
10kW	12AWG	2.5

1. To avoid any malfunction, do not connect any PV modules with possible current leakage to the enserver. For example, grounded PV modules will cause current leakage to the enserver. When using PV modules, please ensure the PV+ & PV- of solar panel is not connected to the system ground bar.
2. Please use PV junction box with surge protection. Otherwise, it will cause damage on enserver when lightning occurs on PV modules.

3.3 PV MODULE SELECTION:

When selecting proper PV modules, please be sure to consider below parameters:

1) The open-circuit voltage (Voc) of the PV modules must not exceed the maximum PV array open-circuit voltage of enserver.

2) Open circuit Voltage (Voc) of PV modules should be higher than minimum` start voltage.

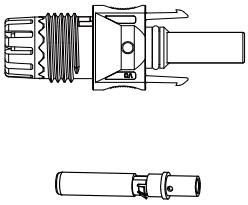
3)The PV modules connected to this enserver shall be Class A rating certified according to lEC 61730.

Enserver Model	10kW
PV Input Voltage	550V (160V-800V)
PV Array MPPT Voltage Range	200V-650V
No. of MPP Trackers	2
No. of Strings per MPP Tracker	2+1

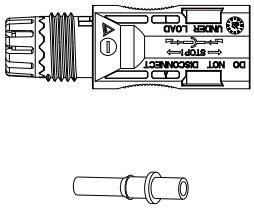
3.4 PV MODULE WIRE CONNECTION:

1. Switch the Grid Supply Main Switch(AC) OFF.
2. Switch the DC lsolator OFF.
3. Assemble PV input connector to the enserver.

1. When using PV modules, please ensure the PV+ & PV- of solar panel is not connected to the system ground bar.
2. Before connection, please make sure the polarity of the output voltage of PV array matches the “DC+” and “DC-” symbols.
3. Before connecting enserver, please make sure the PV array open circuit voltage is within the 800V of the enserver.



DC+ male connector



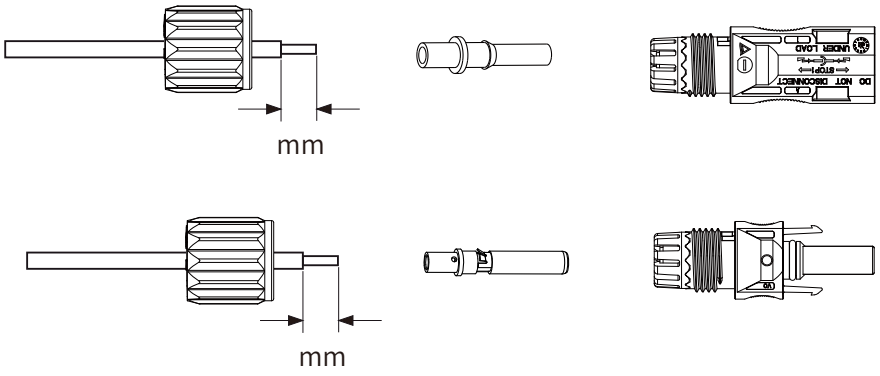
DC- female connector

Please use approved DC cable for PV system.

Cable Type	Cross section (mm^2)	
	Range	Recommended value
Industry generic PV cable	2.5-4.0 (12-10AWG)	2.5(12AWG)

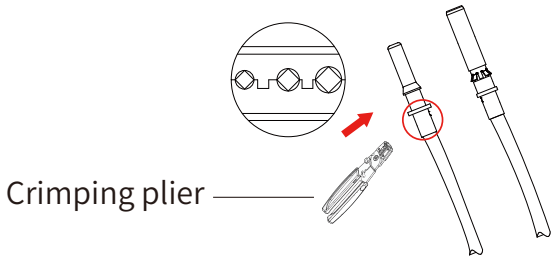
The steps to assemble the DC connectors are listed as follows:

a) Strip off the DC wire about 7mm, disassemble the connector cap nut (see picture below).



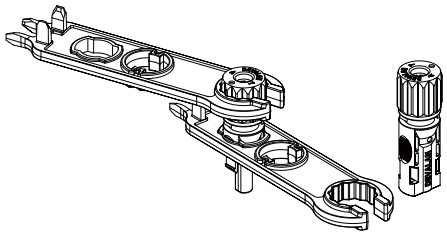
Disassemble the connector cap nut

b) Crimping metal terminals with crimping pliers as shown in picture below;



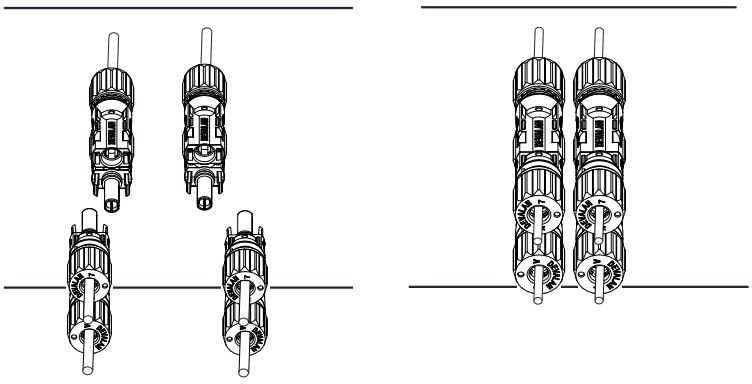
Crimp the contact pin to the wire

c) Insert the contact pin to the top part of the connector and screw up the cap nut to the top part of the connector.



Connector with cap nut screwed on

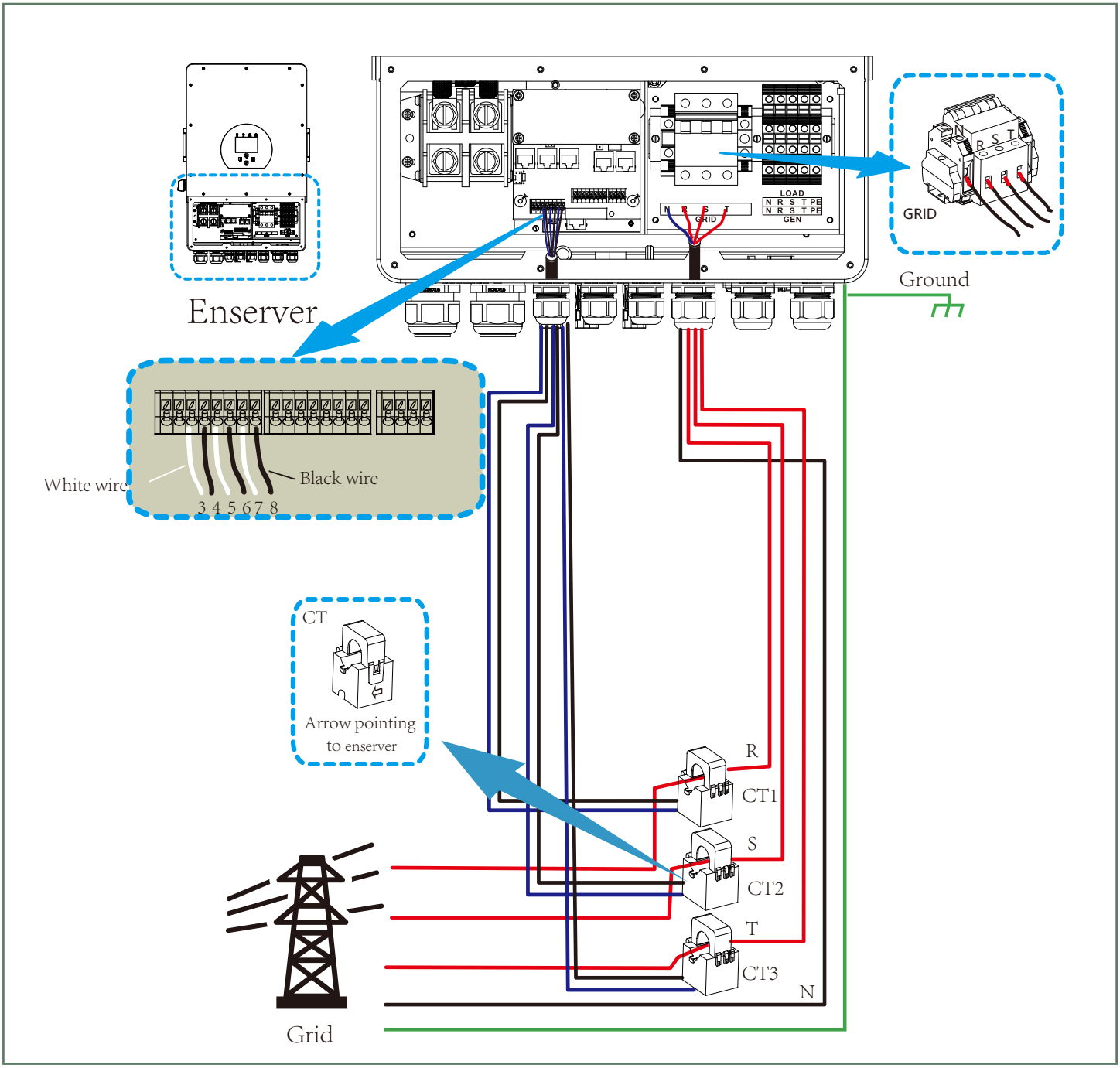
d) Finally insert the DC connector into the positive and negative input of the enserver, shown as picture below;



DC input connection

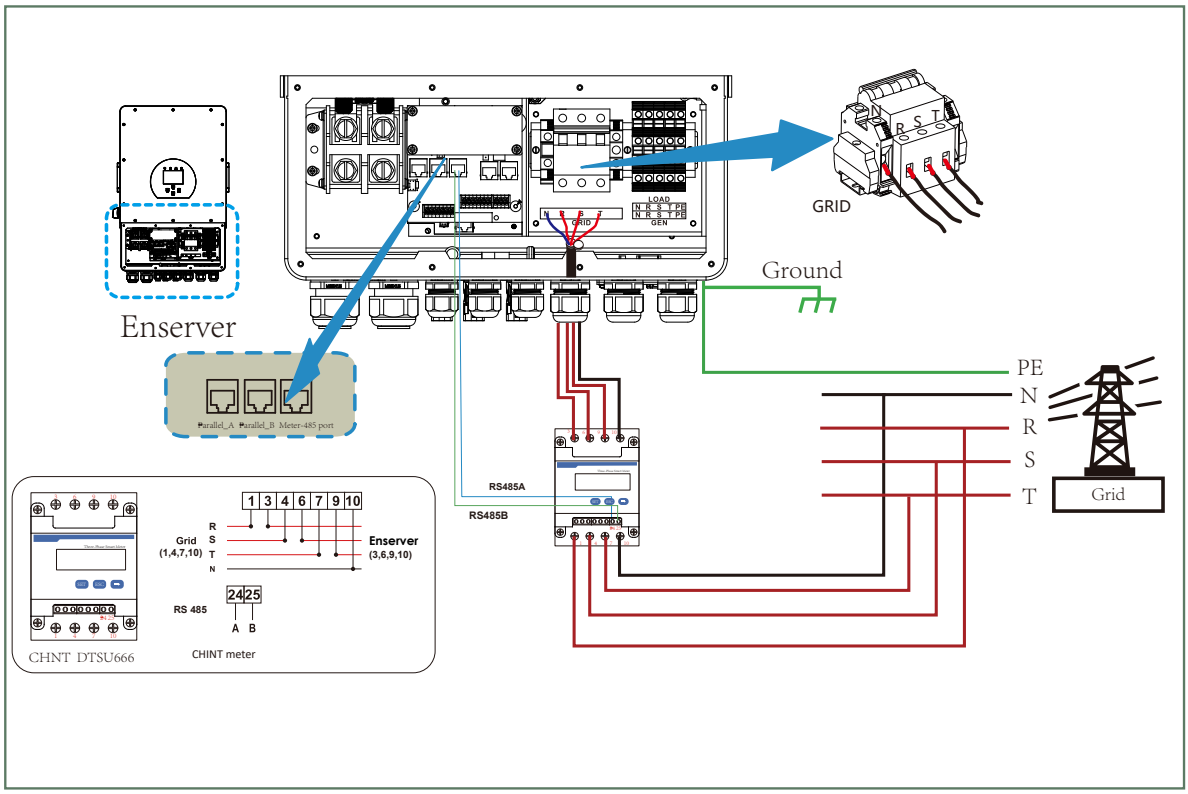
1. Sunlight shines on the panel will generate voltage, high voltage in series may cause danger to life. Therefore, before connecting the DC input line, the solar panel needs to be blocked by the opaque material and the DC switch should be 'OFF', otherwise, the high voltage of the inverter may lead to life threatening conditions.
2. Please use its own DC power connector from the enserver accessories. Do not interconnect the connectors of different manufacturers. Maximum DC input current should be 20A, if exceeds, it may damage the enserver.

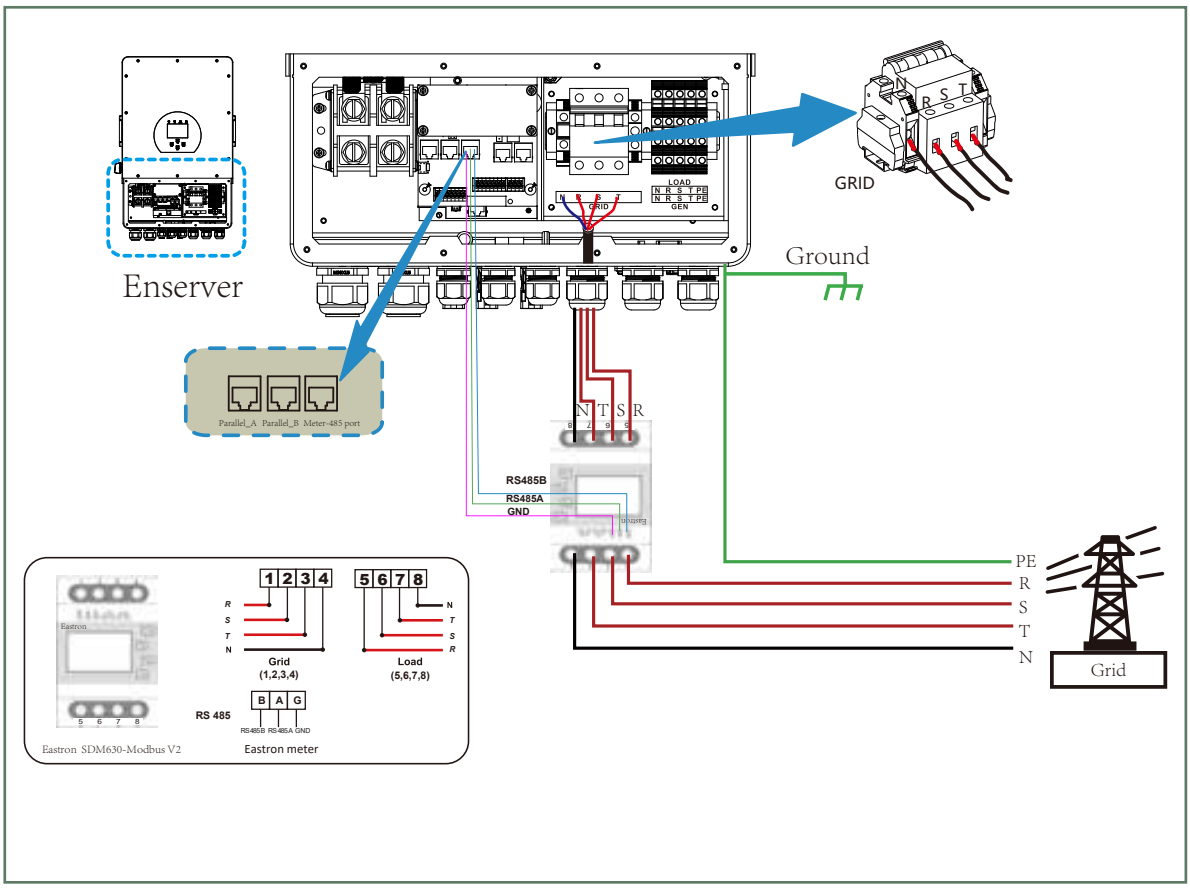
4. CT CONNECTION



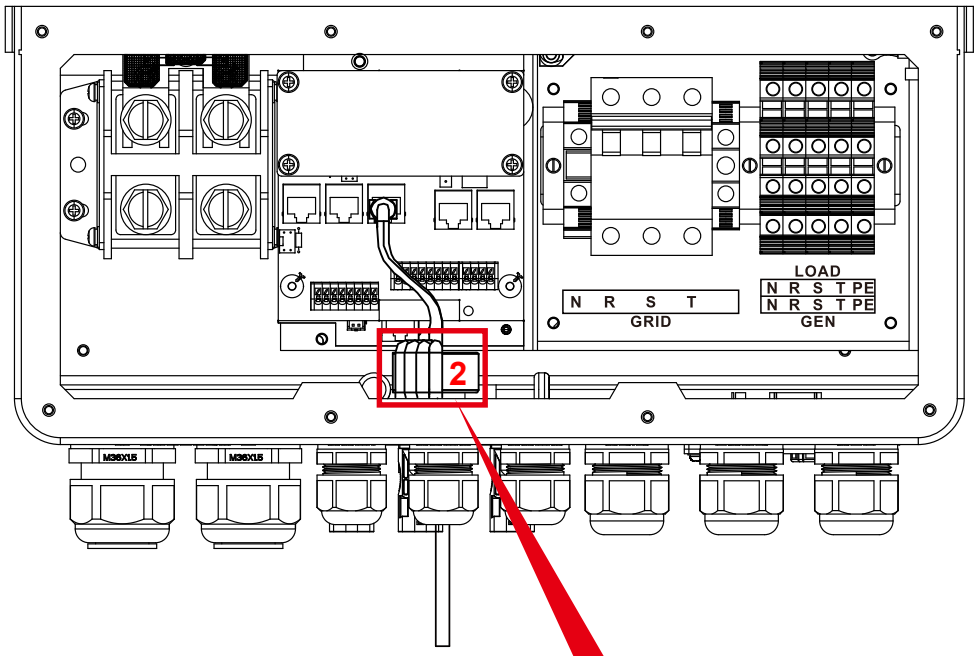
When the reading of the load power on the LCD is not correct, please reverse the CT arrow.

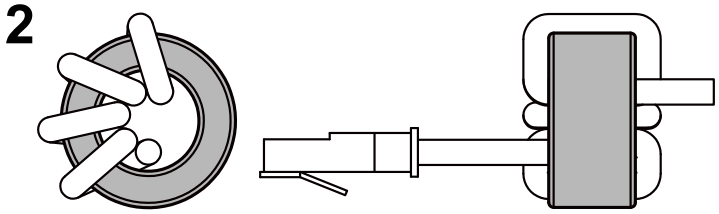
5. METER CONNECTION





When the inverter is in the off-grid state, the N line needs to be connected to the earth.

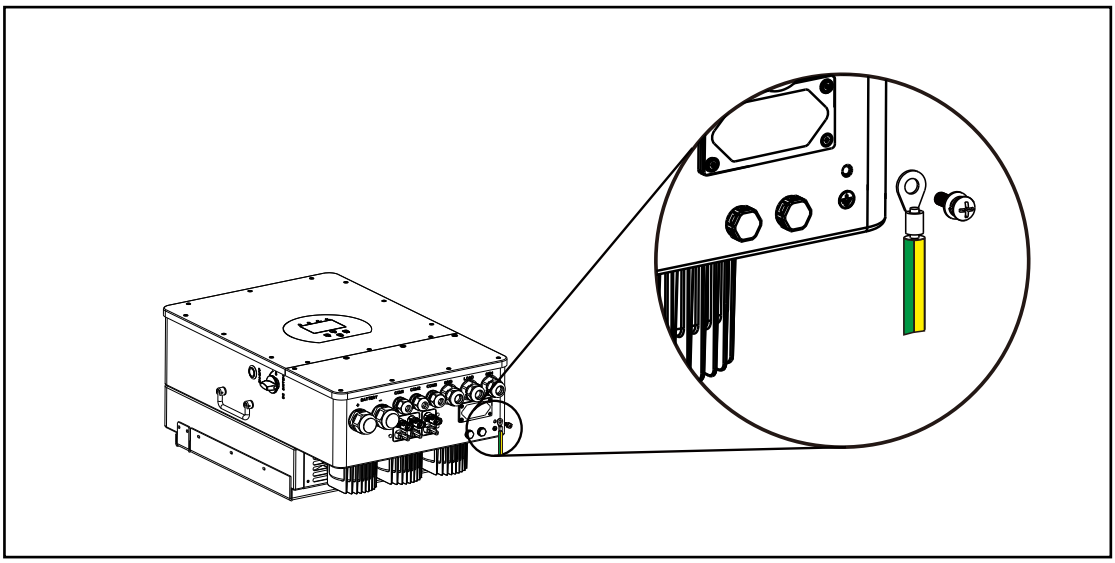




Pass the Meter communication cable through the magnetic ring and wrap it around the magnetic ring four times.

6. EARTH CONNECTION(MANDATORY)

The ground cable must be connected to the ground plate on the grid side to prevent electric shock in case the original protective conductor fails.



Earth connection (Copper wires)

Model	Wire Size	Cable(mm^2)	Torque Value (max)
10kW	8AWG	6	1.2Nm

Earth connection (Copper wires) (Bypass)

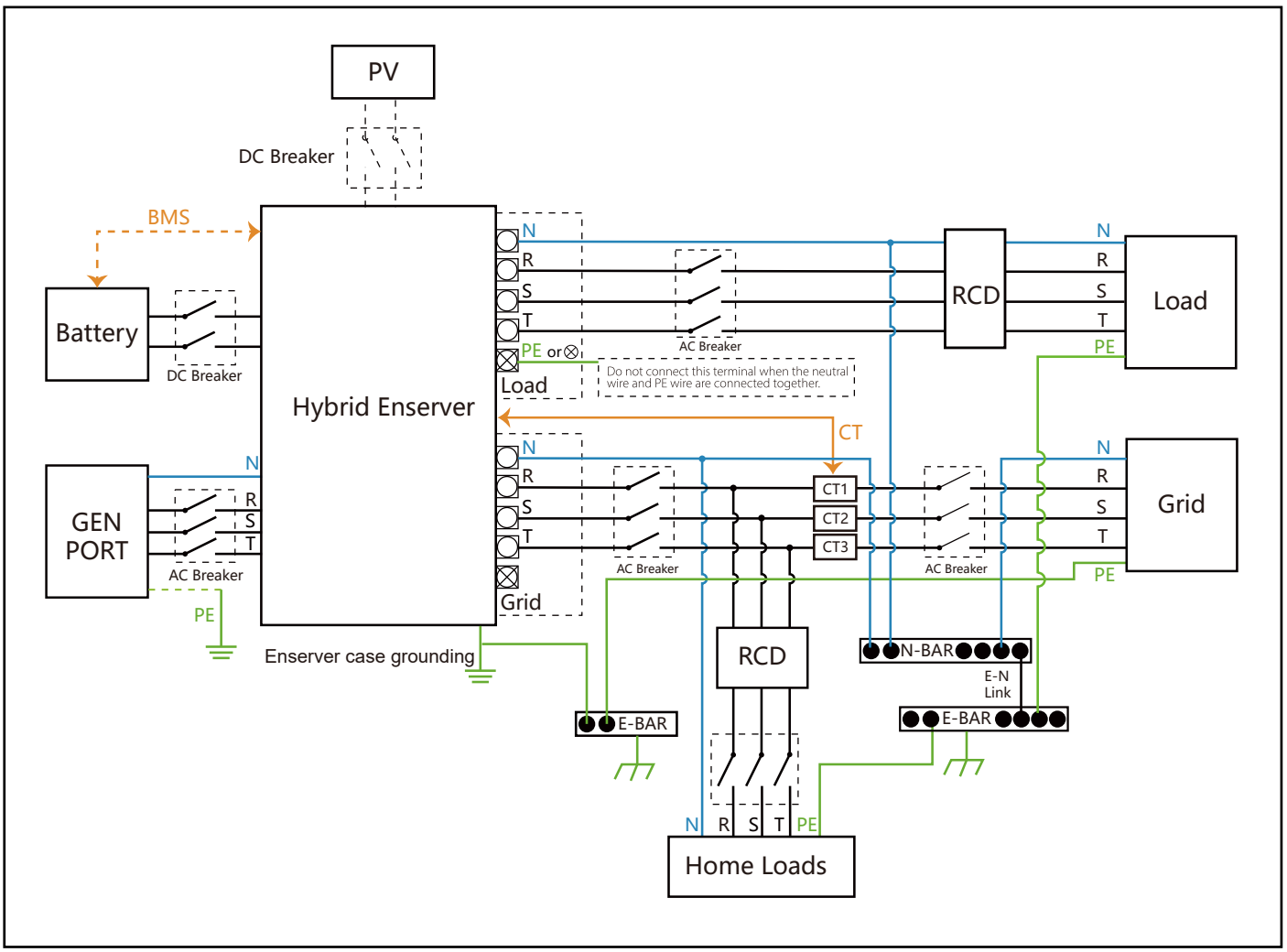
Model	Wire Size	Cable(mm^2)	Torque Value (max)
10kW	6AWG	10	1.2Nm

The enserver has a built-in leakage current detection circuit. A Type A RCD can be connected per local regulations. External leakage protection must be ≥300 mA to ensure proper inverter operation.

7. WIRING SYSTEM FOR ENSERVER

This diagram is an example for grid systems without special requirements on electrical wiring connection.

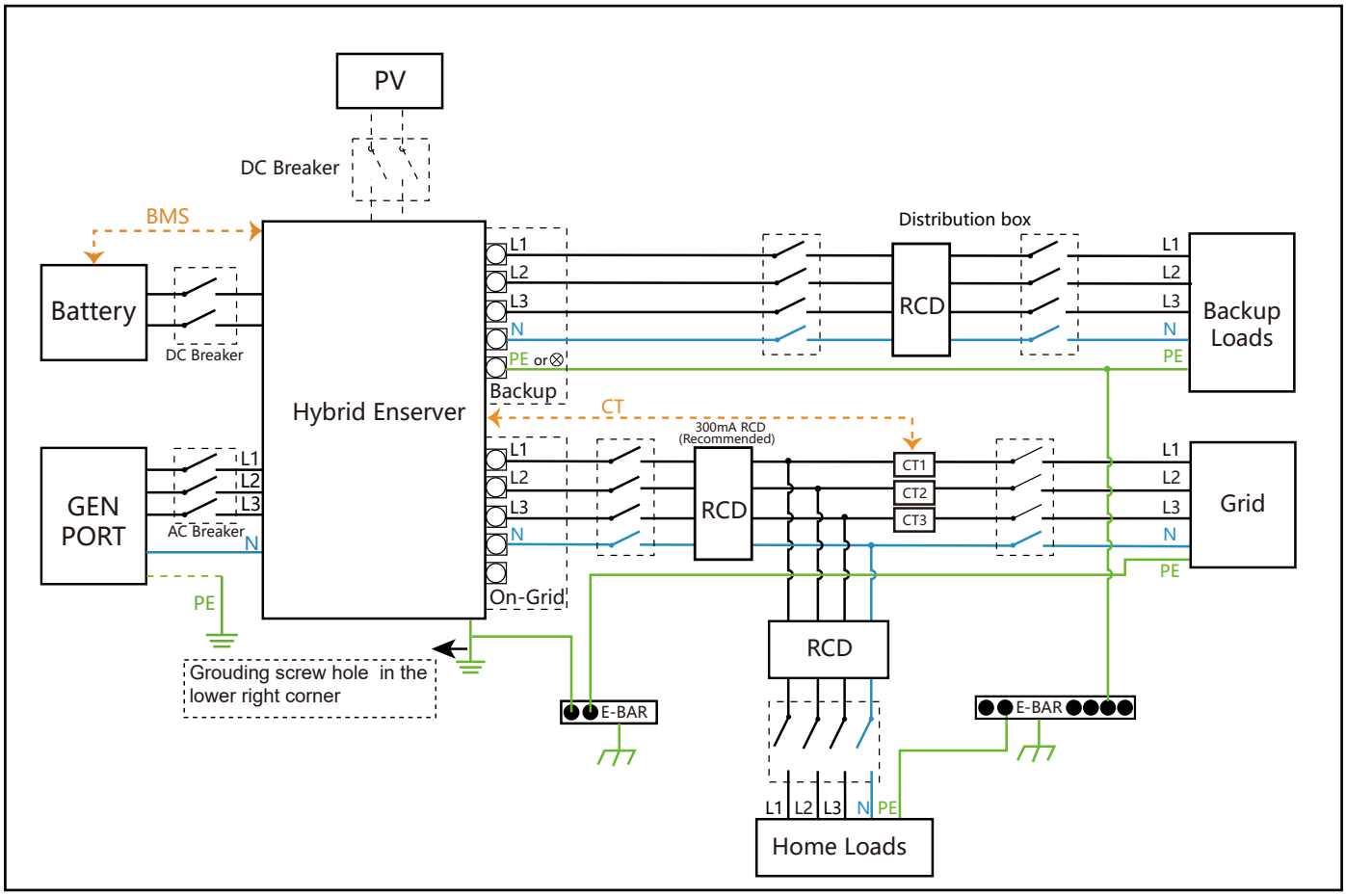
The back-up PE line and earthing bar must be grounded properly and effectively.
Otherwise the back-up function may be abnormal when the grid fails.



This diagram is an example for an application in which neutral is separated from the PE in the distribution box.

For countries such as China, Germany, the Czech Republic, Italy, etc., please follow local wiring regulations!

Note: Backup function is optional in German market. Please leave backup side empty if backup function is not available in the enserver.



OPERATION

POWER ON

Once the ENWALL Module has been properly installed, do the following steps:

1. Press the On (located on the left side of the enserver) to turn on the ENWALL.
2. Turn On the breaker connected between the enserver and the ESS.

POWER OFF

1. Turn Off the breaker connected between the enserver and the ESS.
2. Press the Off (located on the left side of the enserver) to turn off the unit.

OPERATION AND DISPLAY PANEL

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

LED Indicator		Messages
DC	Green led solid light	PV Connection normal
AC	Green led solid light	Grid Connection normal
Normal	Green led solid light	Enserver operating normal
Alarm	Red led solid light	Malfunction or warning

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

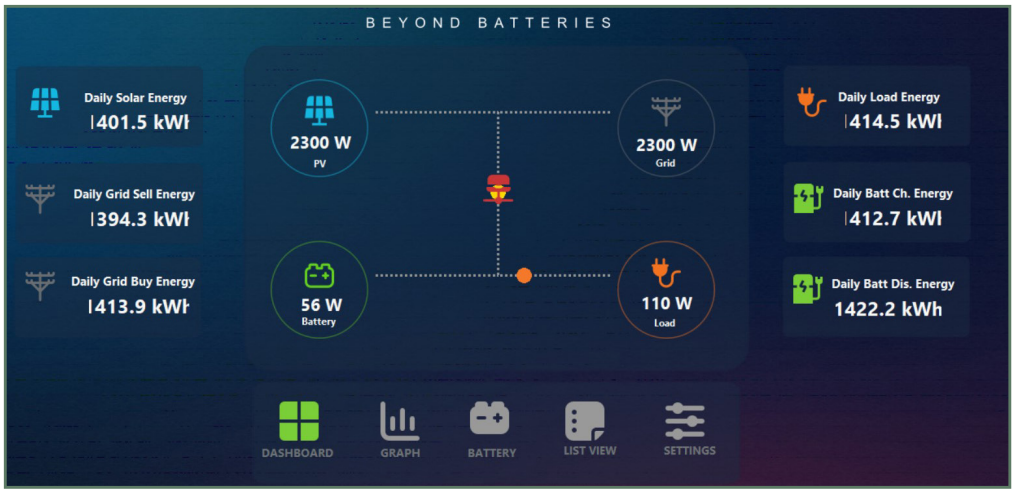
ENWALL DISPLAY LCD

The Monitoring LCD allows user to monitor and configure the ENWALL Module.

The first page on LCD is dashboard by default.

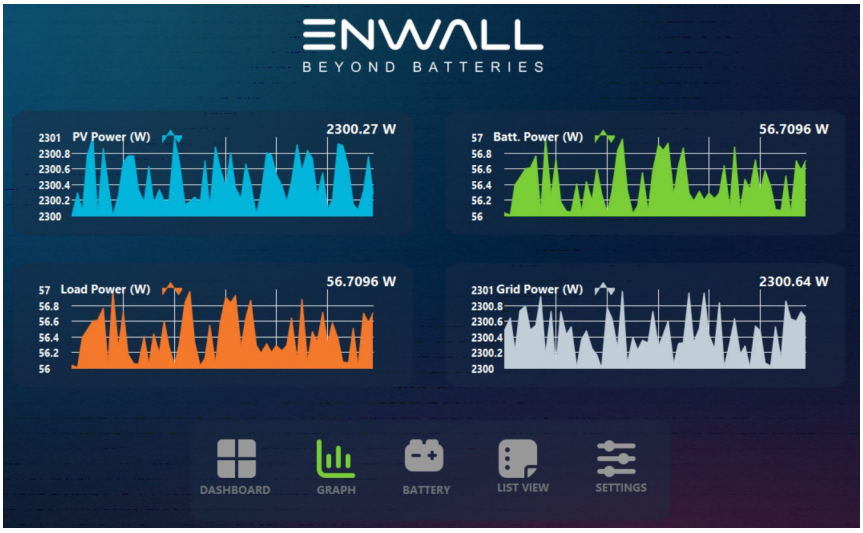
DASHBOARD:

The dashboard displays information on Solar, Grid, Load, and ESS. Users can read parametric values such as daily solar energy, grid sell and buy energy, load energy, and ESS charge/discharge energy. The screen also shows energy flow direction using arrows.



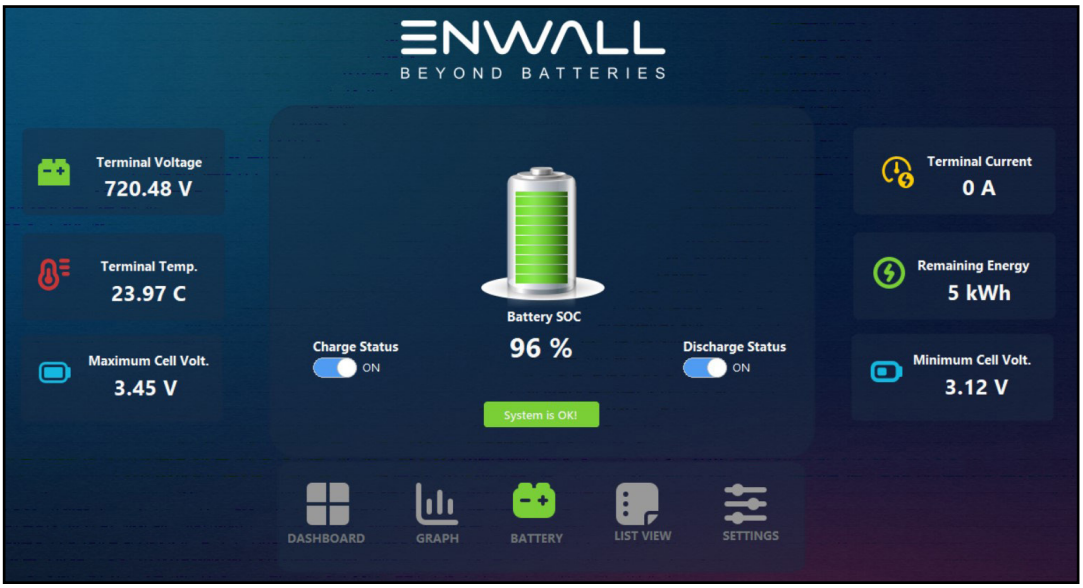
GRAPH:

The graph screen displays graph charts for PV power, ESS power, grid power, and load power.



ESS:

The ESS screen displays the ESS dashboard, showing terminal voltage, current, temperature, remaining energy, and max/min cell voltage. The middle section indicates SOC, charge, and discharge status.



LIST VIEW:

The list screen displays all the parameter values of Grid, ESS, Load and PV in the form of list.

SETTINGS

The setting page helps user to setup work mode for ENWALL Module.

Solar Sell: "Solar sell" is for Zero export to load or Zero export to CT: when this item is active, the surplus energy can be sold back to grid. When it is active, PV Power source priority usage is as follows: load consumption and charge ESS and feed into grid.

Max Solar Power: allows the maximum DC input power.

Selling First: This Mode allows hybrid enserver to sell back any excess power produced by the solar panels to the grid. If time of use is active, the ESS energy also can be sold into grid.

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

Power source priority for the load is as follows:

1. Solar Panels.

2. Grid.

3. Batteries (until programmable % discharge is reached).

Grid Peak-shaving: when it is active, grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and ESS as supplement. If still can't meet the load requirement, grid power will increase to meet the load needs.

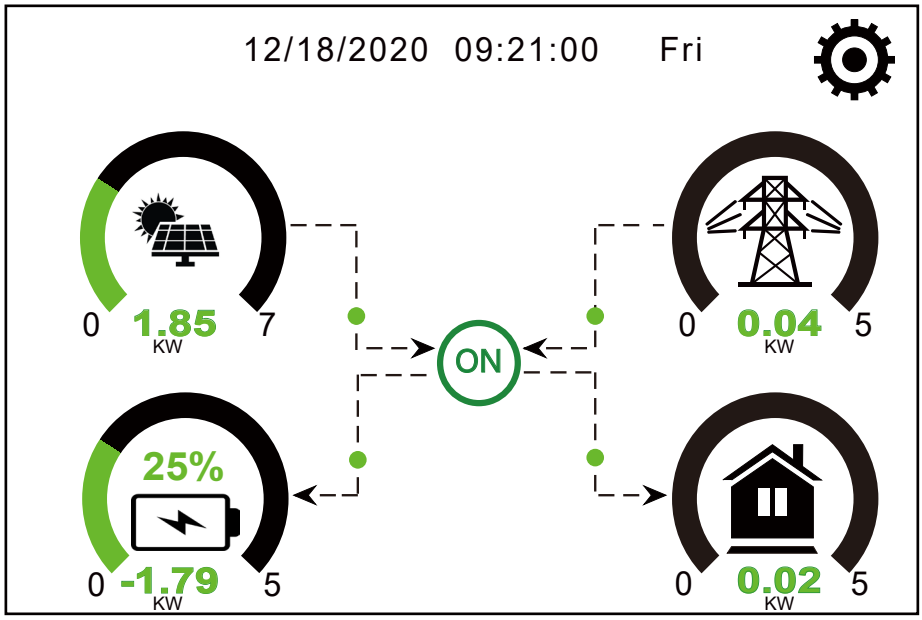
Max. sell power: Allows the maximum output power to flow to grid.

Zero-export Power: for zero-export mode, it tells the grid output power. Recommend to set it as 20-100W to ensure the hybrid enserver will not feed power to grid.

ENSERVER LCD

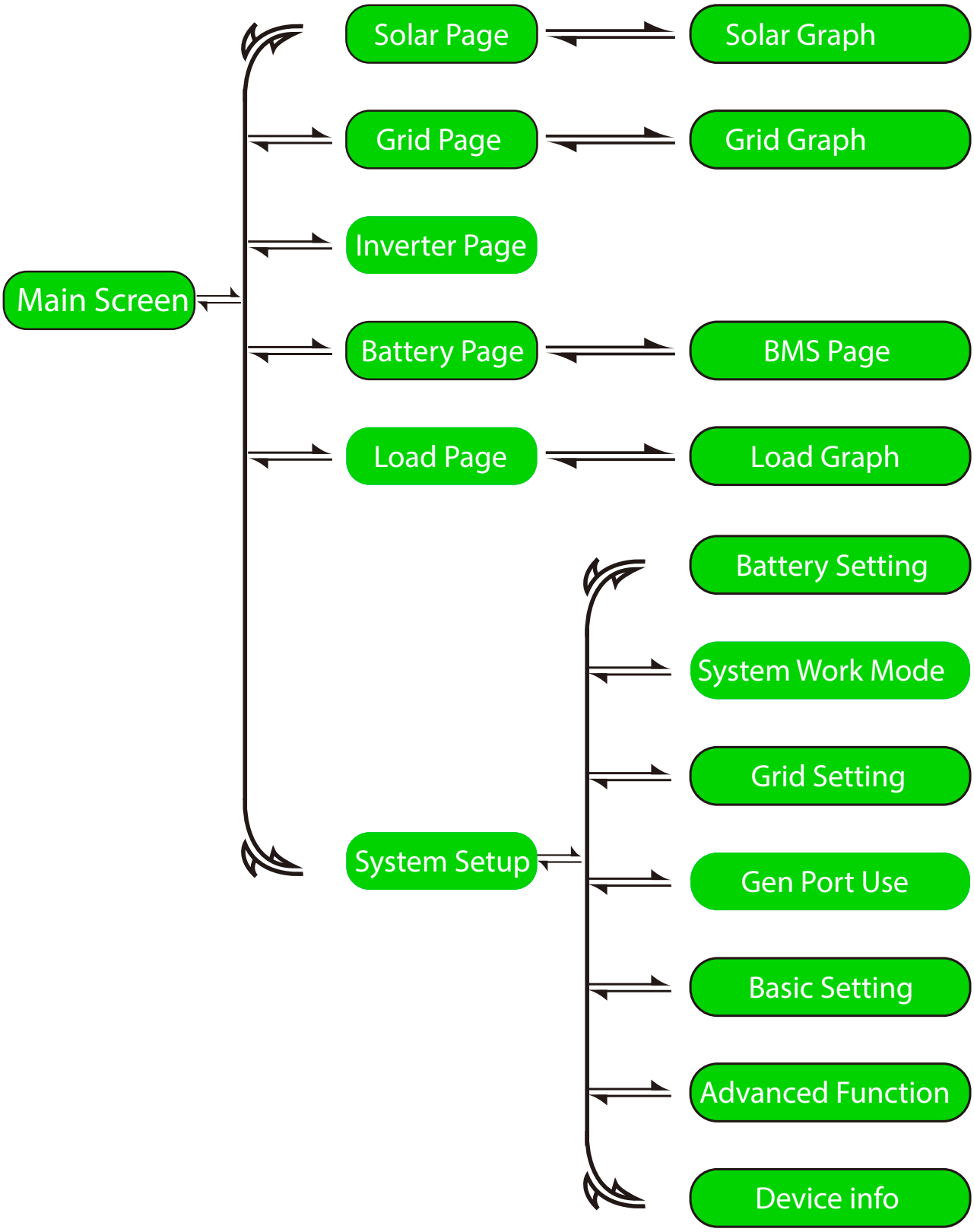
MAIN SCREEN

The LCD is touchscreen, below screen shows the overall information of the enserver.

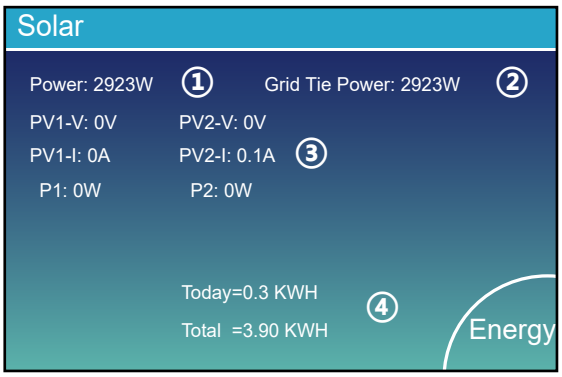


1. The icon in the center of the home screen indicates that the system is in Normal operation. If it turns into "comm./FXX" , it means the enserver has communication errors or other errors, the error message will display under this icon(FXX errors, detail error info can be viewed in the System Alarms menu).
2. At the top of the screen is the time.
3. System Setup Icon, Press this set button to enter into the system setup screen which includes Basic Setup, ESS Setup, Grid Setup, System Work Mode, Generator port use, Advanced function and ESS info.
4. The main screen shows the info including Solar, Grid, Load and ESS. It is also displaying the energy flow direction by arrow. When the power is approximate to high level, the color on the panels will change from green to red.
   - PV power and Load power always keep positive.
   - Grid power negative means sell to grid, positive means get from grid.
   - ESS power negative means charge, positive means discharge.

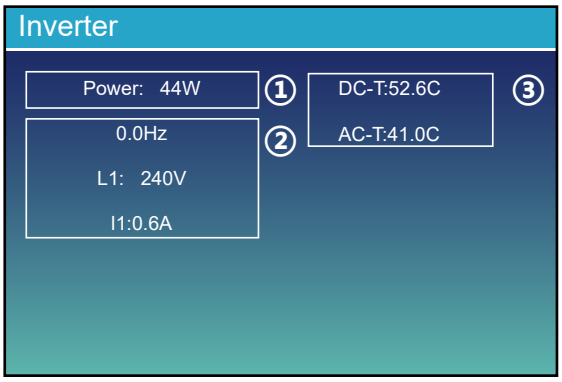
LCD operation flow chart



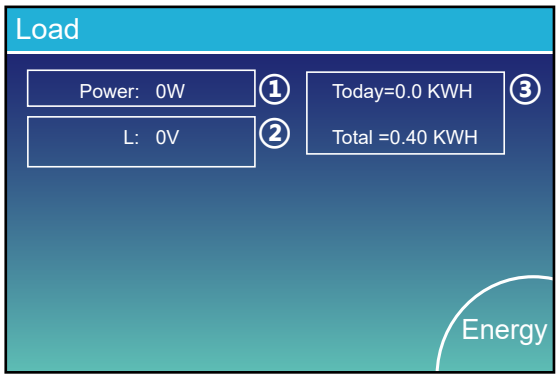
SOLAR POWER CURVE



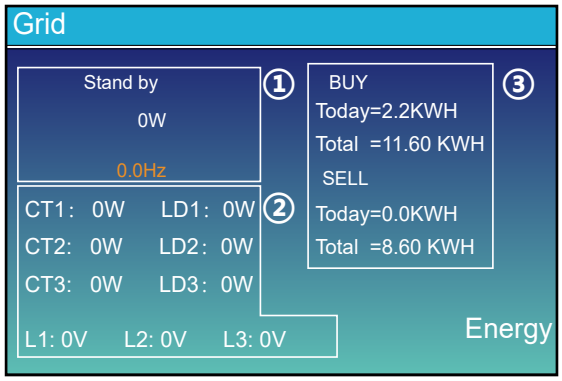
This is Solar Panel detail page.
1. Solar Panel Generation.
2. Grid Tie Power: when there's a string enserver AC couple at the grid or load side of hybrid enserver and there's a meter installed for the string enserver, then the hybrid enserver LCD will show the string enserver output power on its PV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



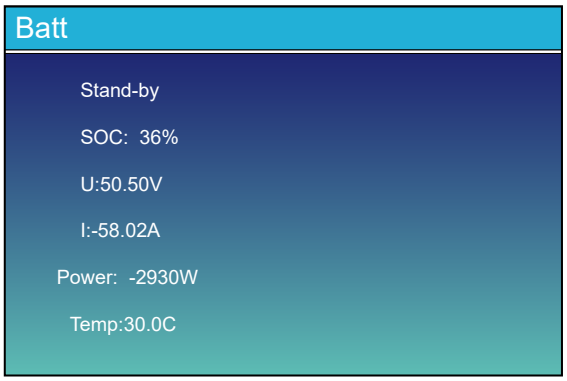
This is Enserver detail page.
1. Enserver Generation.
2. 0.0Hz: frequency DC/AC.
Voltage, Current, Power for each Phase.
3. *DC-T: mean DC-DC temperature,
AC-T: mean Heat-sink temperature.
*Note: this part info is not available for some LCD FW.



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

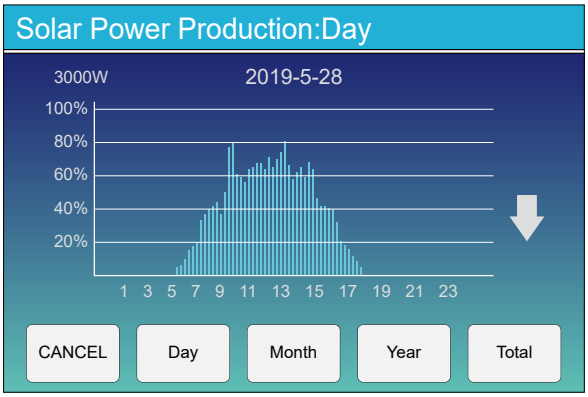


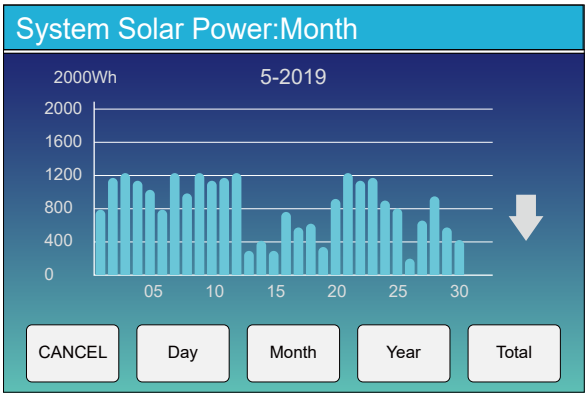
This is Grid detail page.
1. Status, Power, Frequency.
2. L: Voltage for each Phase
CT: Power detected by the external current sensors
LD: Power detected using internal sensors on AC grid in/out breaker
3. BUY: Energy from Grid to Enserver,
SELL: Energy from Enserver to grid.
Press the "Energy " button will enter into the power curve page.

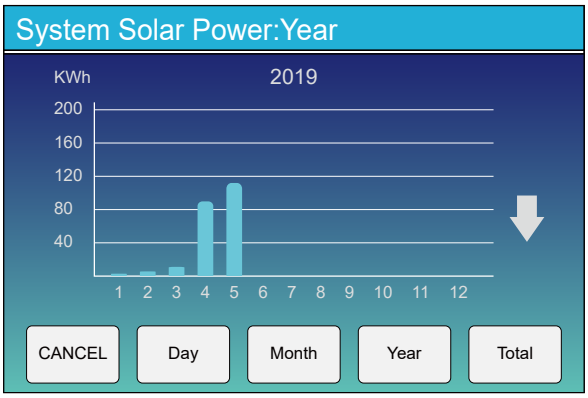


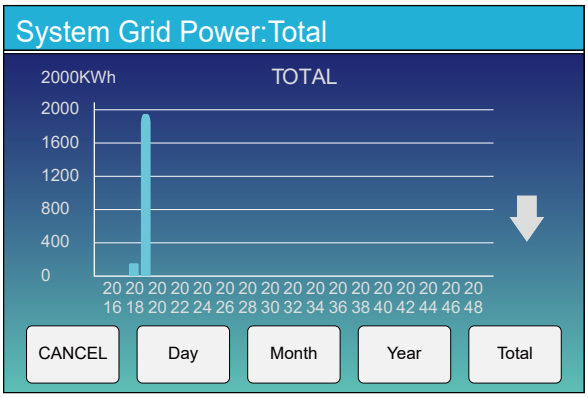
This is ESS detail page.

CURVE PAGE-SOLAR & LOAD & GRID



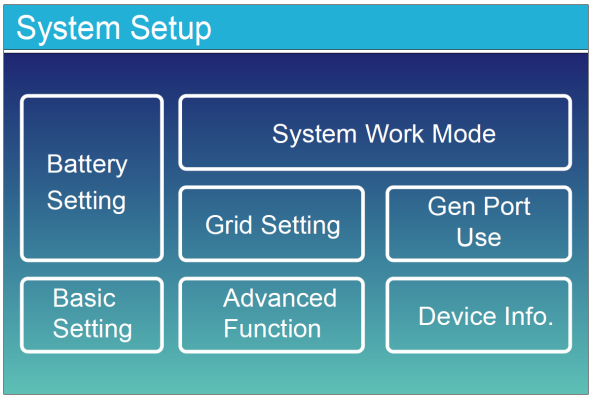






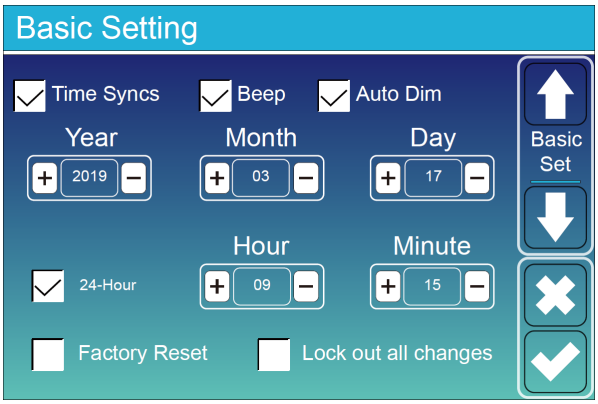
Solar power curve for daily, monthly, yearly and total can be roughly checked on the LCD, for more accuracy power generation, please check on the monitoring system. Click the up and down arrow to check power curve of different period.

SYSTEM SETUP MENU

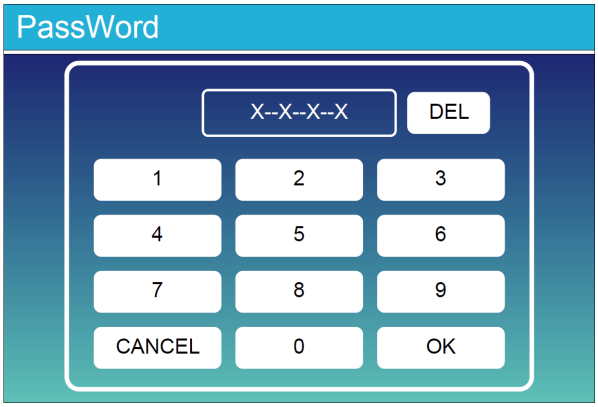


This is System Setup page.

BASIC SETUP MENU

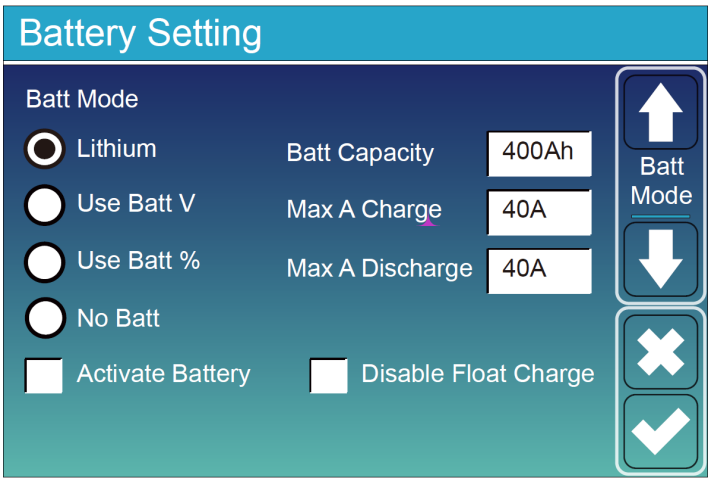


Factory Reset: Reset all parameters of the enserver.
Lock out all changes: Enable this menu for setting parameters that require locking and cannot be set up.
Before performing a successful factory reset and locking the systems, to keep all changes you need to type in a password to enable the setting.
The password for factory settings is 9999 and for lock out is 7777.



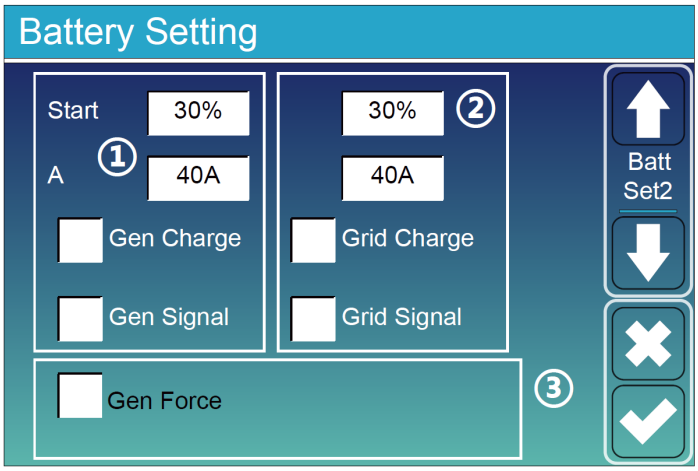
Factory Reset Password: 9999
Lock out all changes Password: 7777
System selfchek: After ticking this item, it needs input the password.
The default password is 1234

ESS SETUP MENU



ESS capacity: it tells hybrid enserver to know your ESS bank size.
Use Batt V: Use ESS Voltage for all the settings (V).
Use Batt %: Use ESS SOC for all the settings (%).
Max. A charge/discharge: Max ESS charge/ discharge current(0-120A for 5kW model).
No Batt: Tick this item if no ESS is connected to the system.

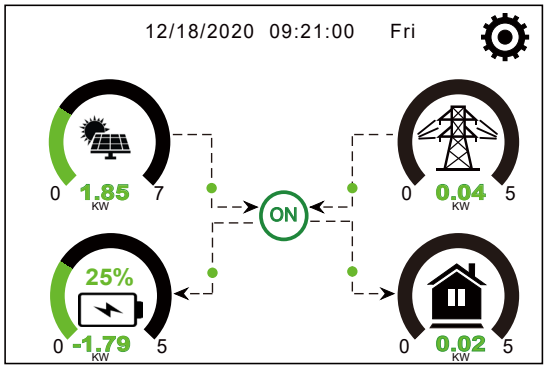
Active ESS: This feature will help recover a ESS that is over discharged by slowly charging from the solar array or grid.
Disable Float Charge: The enserver will keep the charging voltage at the current voltage when the BMS charging current requested is 0. It is used to help prevent ESS from being overcharged.



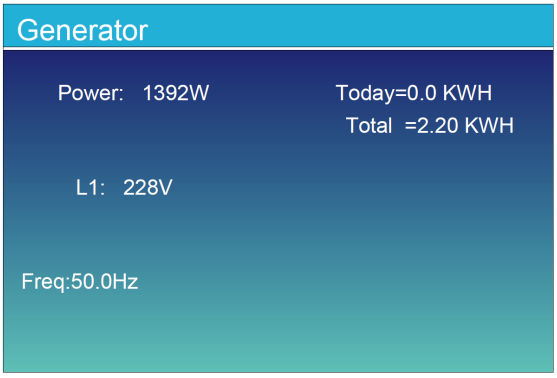
This is ESS Setup page.
1. Start = 30%: Percent S.O.C at 30% system will AutoStart a connected generator to charge the ESS bank.
A = 40A: Charge rate of 40A from the attached generator in Amps.
Gen Charge: uses the gen input of the system to charge ESS bank from an attached generator.
Gen Signal: Normally open relay that closes when the Gen Start signal state is active.

2. This is Grid Charge, you need select.
Start =30%: No use, Just for customization.
A = 40A: It indicates the Current that the Grid charges the ESS.
Grid Charge: It indicates that the grid charges the ESS.
Grid Signal: Disable.

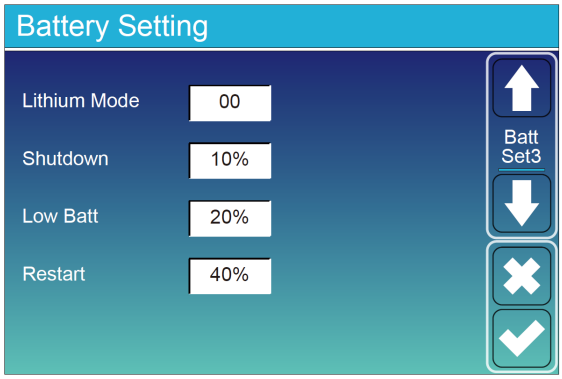
3. Gen Force: When the generator is connected, it is forced to start the generator without meeting other conditions.



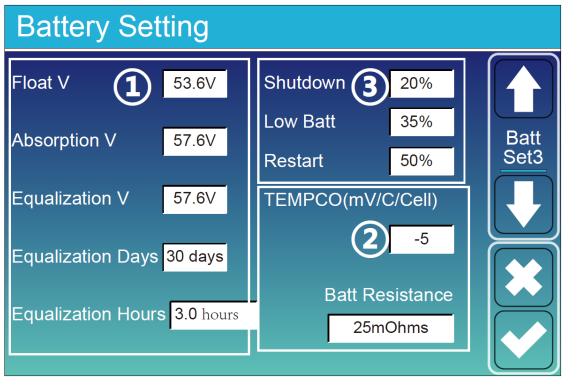
This page tells the PV and diesel generator power the load and ESS.



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

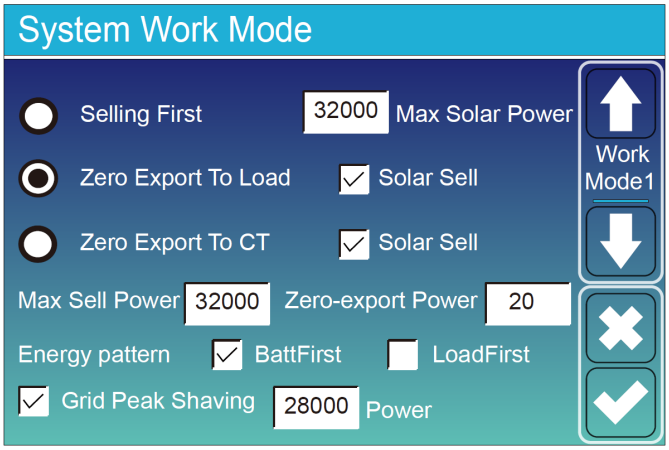


Lithium Mode: This is BMS protocol.
Shutdown 10%: It indicates the enserver will shutdown if the SOC below this value.
Low Batt 20%: It indicates the enserver will alarm if the SOC below this value.
Restart 40%: ESS voltage at 40% AC output will resume.



1. There are 3 stages of charging the Battery .
2. This is for professional installers, you can keep it if you do not know.
3. Shutdown 20%: The enserver will shutdown if the SOC below this value.
Low Batt 35%: The enserver will alarm if the SOC below this value.
Restart 50%: Battery SOC at 50% AC output will resume.

SYSTEM WORK MODE SETUP MENU



Work Mode

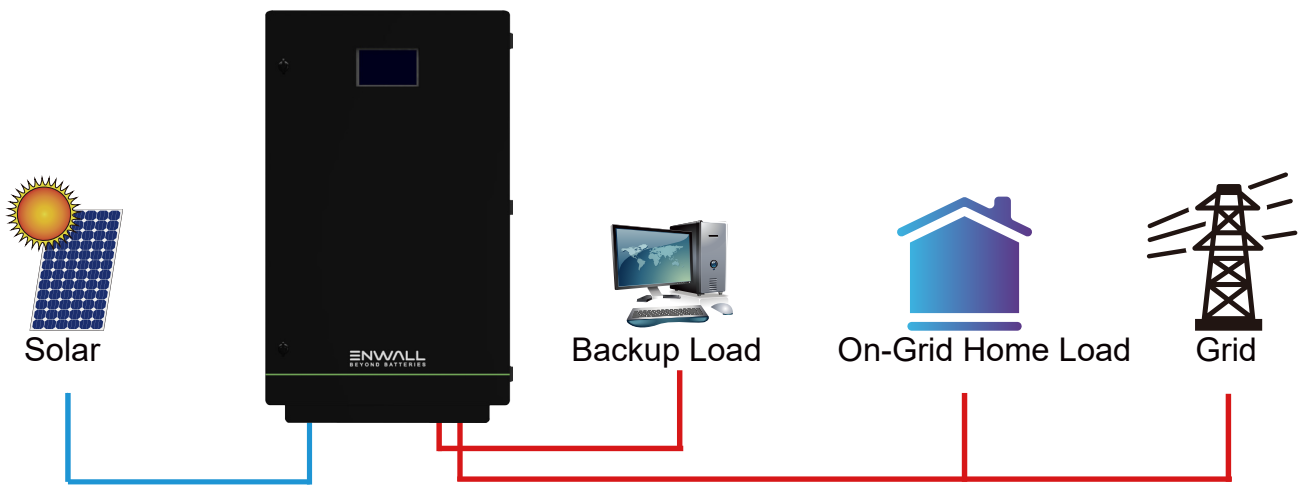
Selling First: This Mode allows hybrid Enserver to sell back any excess power produced by the solar panels to the grid. If time of use is active, the ESS energy also can be sold into grid.

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

Power source priority for the load is as follows:

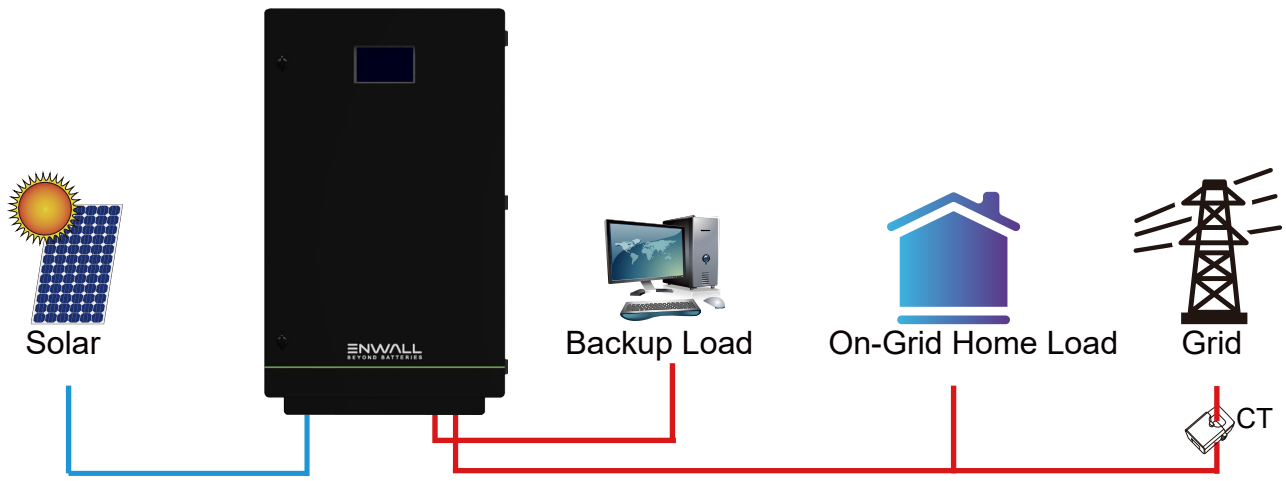
1. Solar Panels.
2. Grid.
3. Batteries (until programmable % discharge is reached).

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



Zero Export To CT: Hybrid Enserver will not only provide power to the backup load connected but also give power to the home load connected. If PV power and ESS power is insufficient, it will take grid energy as supplement. The hybrid Enserver will not sell power to grid. In this mode, a CT is needed.

The external CT will detect power flowing back to the grid and will reduce the power of the Enserver only to supply the local load, charge ESS and home load.



Solar Sell: "Solar sell" is for Zero export to load or Zero export to CT: when this item is active, the surplus energy can be sold back to grid. When it is active, PV Power source priority usage is as follows: load consumption and charge ESS and feed into grid.

Max. sell power: Allowed the maximum output power to flow to grid.

Zero-export Power: for zero-export mode, it tells the grid output power. Recommend to set it as 20-100W to ensure the hybrid Enserver won' t feed power to grid.

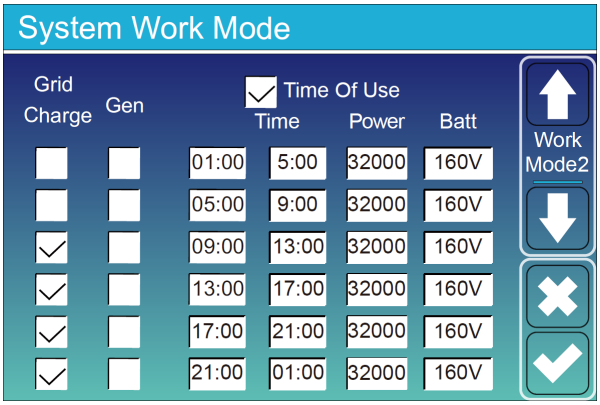
Energy Pattern: PV Power source priority.

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

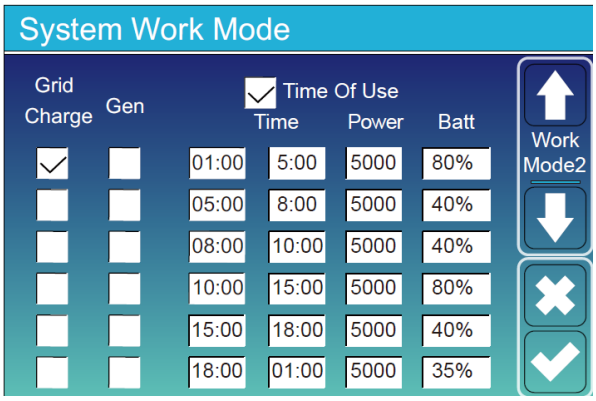
Load First: PV power is firstly used to power the load and then used to charge the ESS. If PV power is insufficient, Grid will provide power to load.

Max Solar Power: allowed the maximum DC input power.

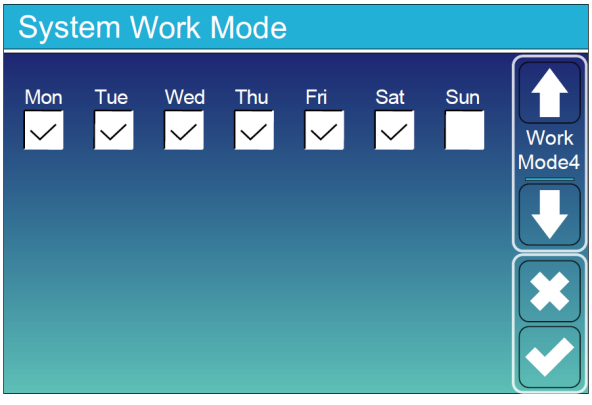
Grid Peak-shaving: when it is active, grid output power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and ESS as supplement. If still can't meet the load requirement, grid power will increase to meet the load needs.



Time of use: it is used to program when to use grid or
generator to charge the ESS, and when to discharge the ESS to power the load. Only tick "Time Of Use" then the follow items (Grid, charge, time, power etc.) will take effect.
Note: when in selling first mode and click time of use, the ESS power can be sold into grid.
Gen charge: utilize diesel generator to charge the ESS in a time period.
Time: real time, range of 01:00-24:00.
Note: when the grid is present, only the "time of use" is ticked, then the ESS will discharge. Otherwise, the ESS won't discharge even the ESS SOC is full. But in the off-grid mode (when grid is not available, Enserver will work in the off-grid mode automatically).
Power: Max. discharge power of ESS allowed.
Batt(V or SOC %): ESS SOC % or voltage at when the action is to happen.
For example
During 01:00-05:00, if ESS SOC is lower than 80%, it will use grid to charge the ESS until ESS SOC reaches 80%.
During 05:00-08:00, if ESS SOC is higher than 40%, hybrid Enserver will discharge the ESS until the SOC reaches 40%. At the same time, if ESS SOC is lower than 40%, then grid will charge the ESS

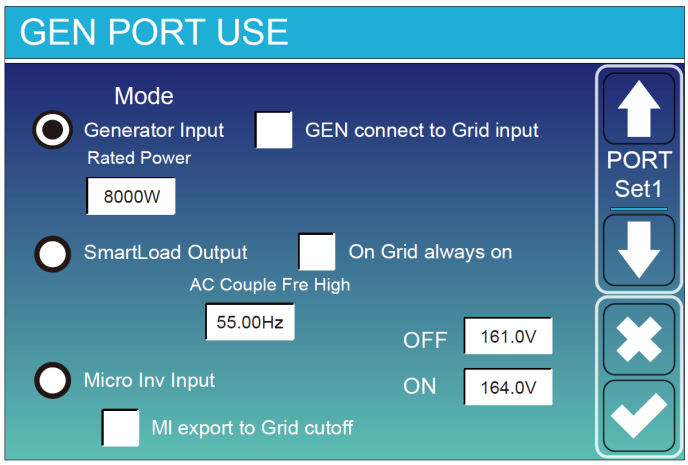


SOC to 40%.
During 08:00-10:00, if ESS SOC is higher than 40%, hybrid Enserver will discharge the ESS until the SOC reaches 40%.
During 10:00-15:00, when ESS SOC is higher than 80%, hybrid Enserver will discharge the ESS until the SOC reaches 80%.
During 15:00-18:00, when ESS SOC is higher than 40%, hybrid Enserver will discharge the ESS until the SOC reaches 40%.
During 18:00-01:00, when ESS SOC is higher than 35%, hybrid Enserver will discharge the ESS until the SOC reaches 35%.



It allows users to choose which day to execute the setting of "Time of Use".
For example, the enserver will execute the Time of use page on Mon/Tue/Wed/Thu/Fri/Sat only.

GENERATOR PORT USE SETUP MENU



Generator input rated power: allowed Max. power from diesel generator.

GEN connect to grid input: connect the diesel generator to the grid input port.

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

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

Smart Load OFF Batt: ESS SOC at which the Smart load will switch off.

Smart Load ON Batt: ESS SOC at which the Smart load will switch on. simultaneously and then the Smart load will switch on.

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

Micro Inv Input: To use the Generator input port as a micro-Enserver on grid Enserver input (AC coupled), this feature will also work with "Grid-Tied" Enservers.

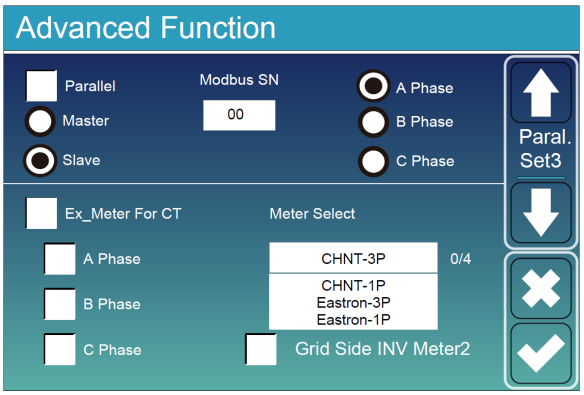
Micro Inv Input OFF: when the ESS SOC exceeds setting value, Microinveter or grid-tied Enserver will shut down.

Micro Inv Input ON: when the ESS SOC is lower than setting value, Microinveter or grid-tied Enserver will start to work.

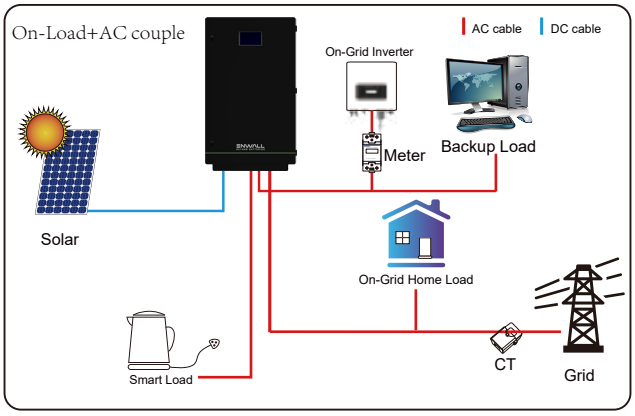
AC Couple Fre High: If choosing"Micro Inv input", as the ESS SOC reaches gradually setting value (OFF), during the process, the microEnserver output power will decrease linear. When the ESS SOC equals to the setting value (OFF), the system frequency will become the setting value (AC couple Fre high) and the MicroEnserver will stop working.

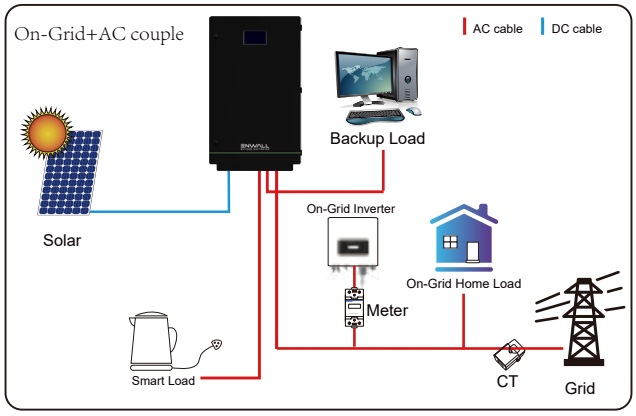
MI export to grid cutsoff: Stop exporting power produced by the microEnserver to the grid.

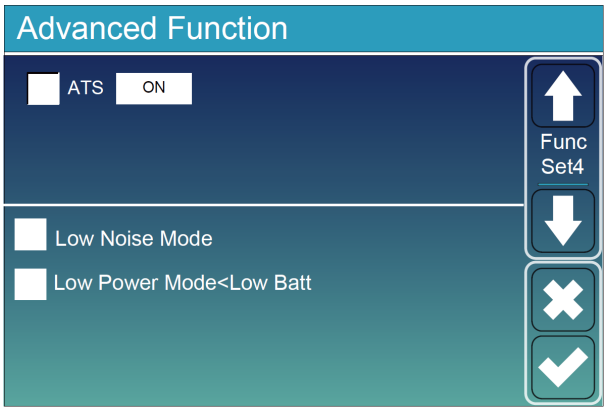
Note: Micro Inv Input OFF and On is valid for some certain FW version only.



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

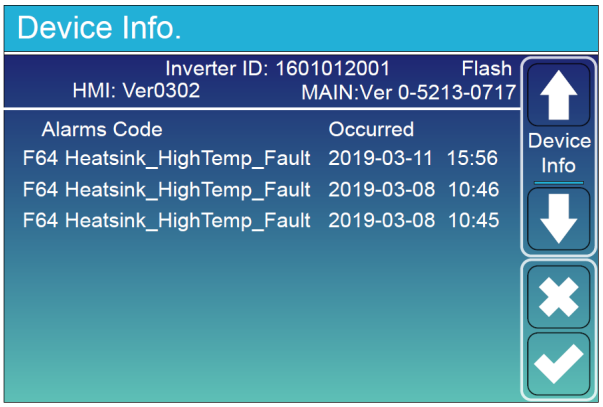






ATS: It is related with ATS port voltage. It is better in ATS ON "uncheck" position.
Low Noise Mode: In this mode, enserver will work in "low noise mode".
Low Power Mode<Low Batt: if selected and when ESS SOC is less then "Low Bat" value, the self-consumption power of enserver will be from grid and ESS simultaneously. If unselected, the self-consumption power of enserver will be mainly from grid.

DEVICE INFO SETUP MENU

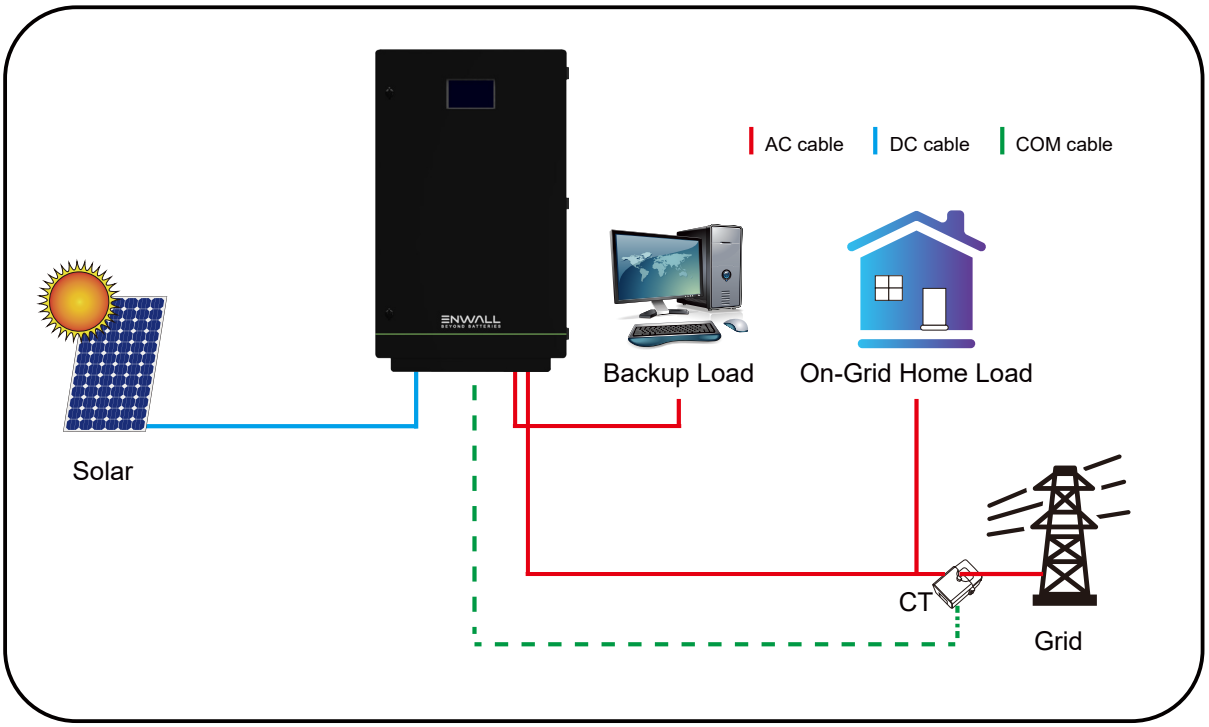


This page show Enserver ID, Enserver version and alarm codes.

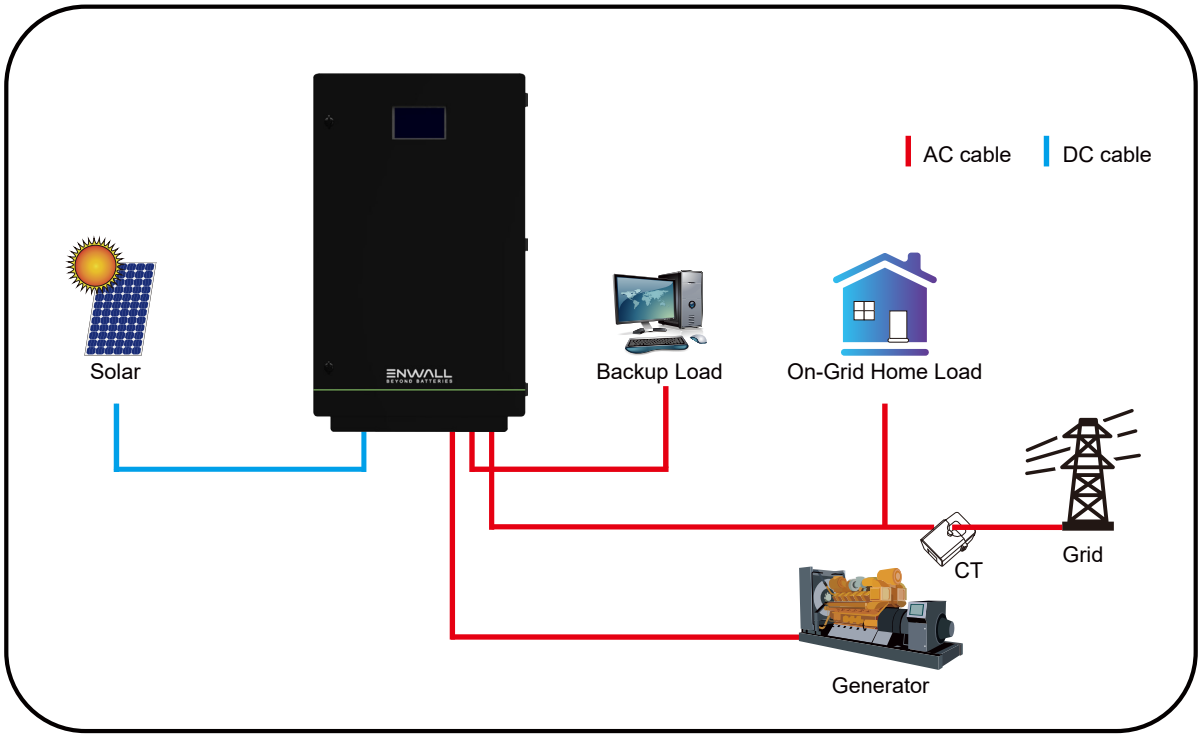
HMI: LCD version
MAIN: Control board FW version

Mode

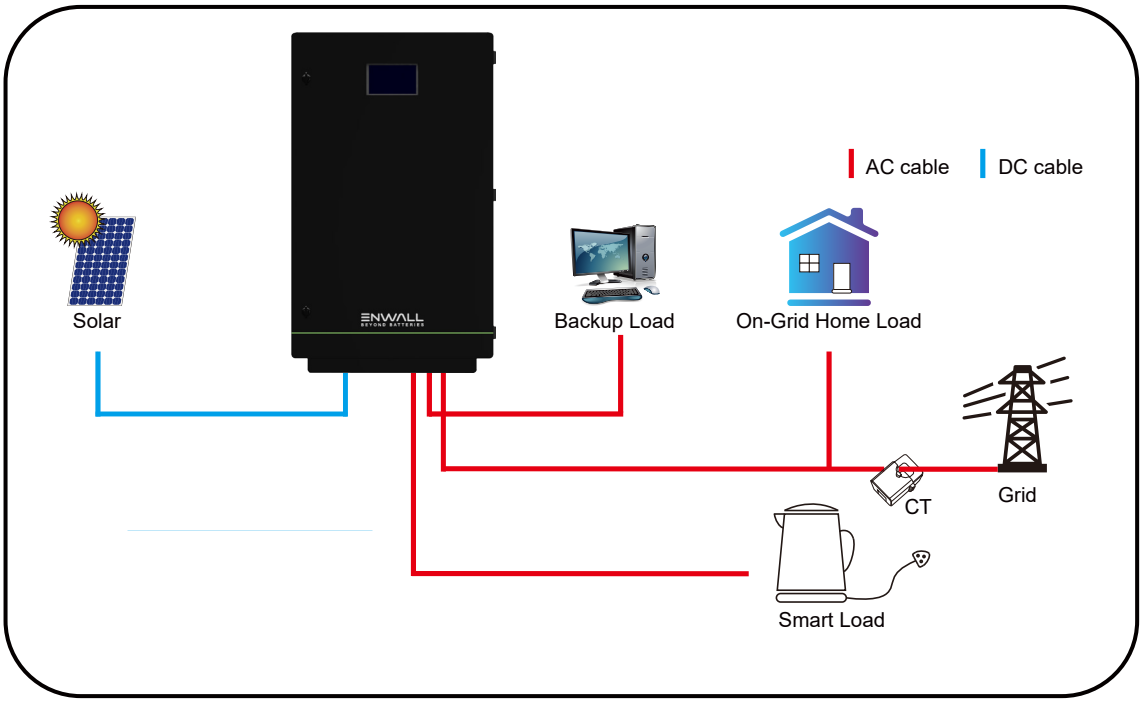
MODE I:BASIC



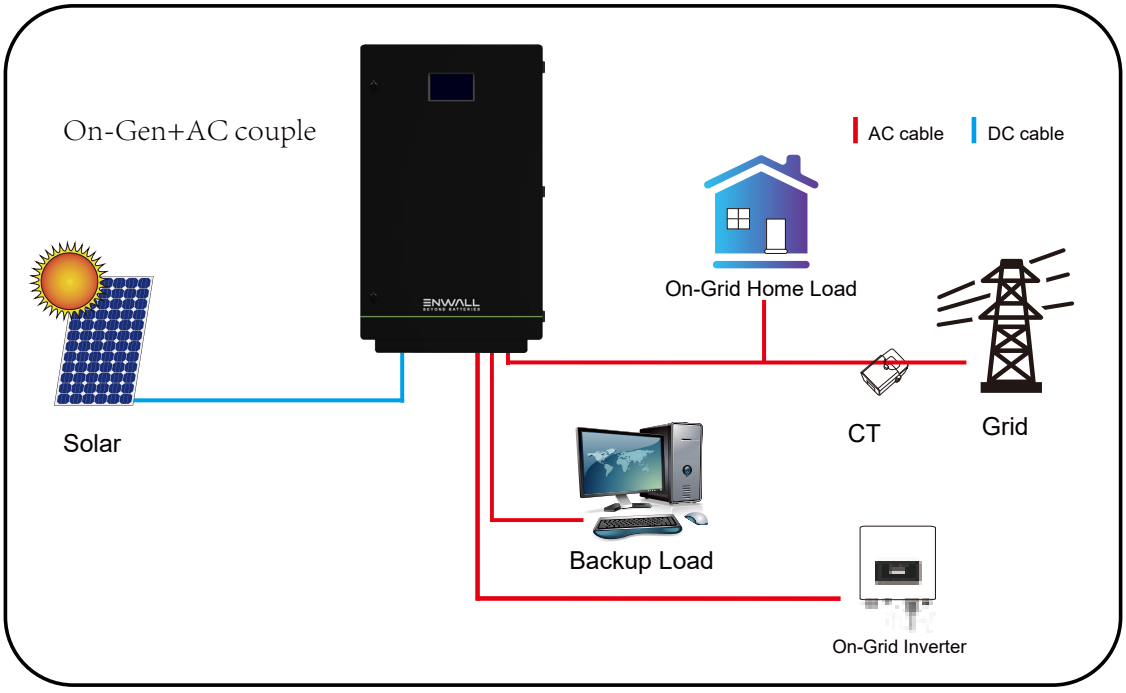
MODE II: WITH GENERATOR

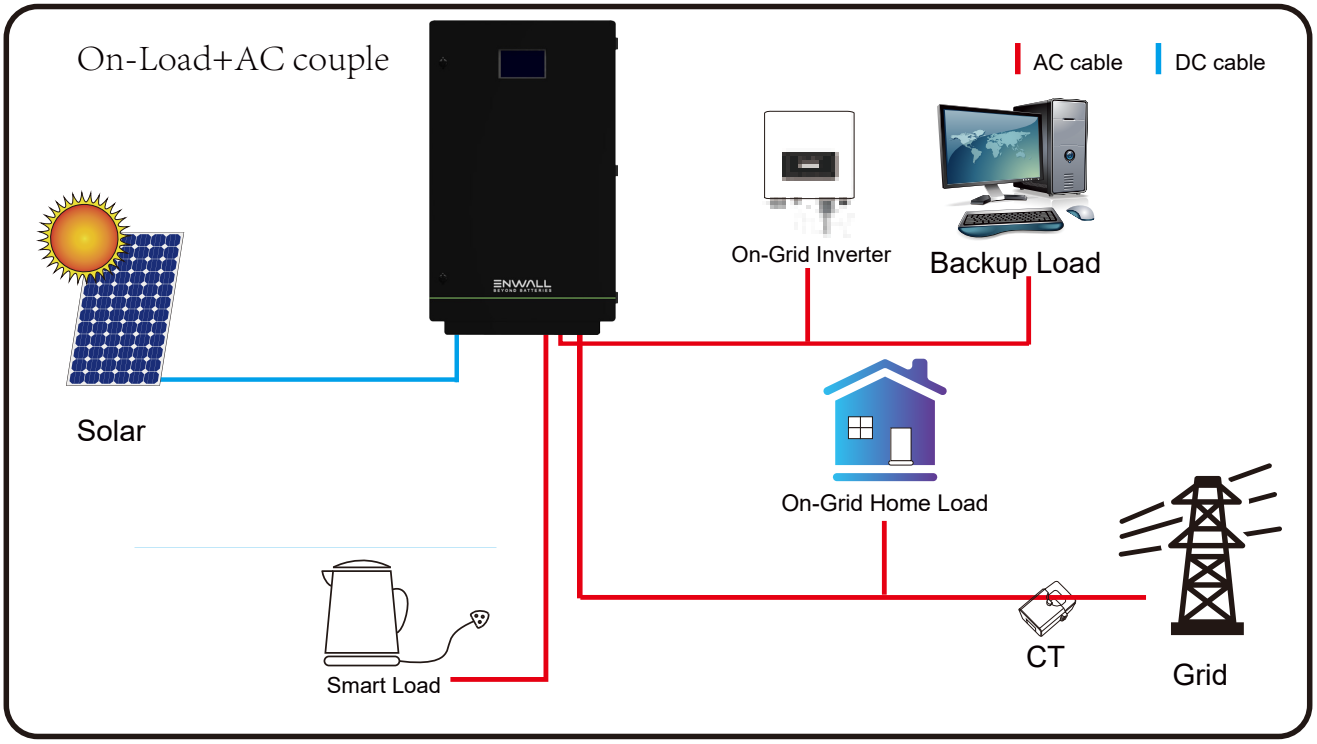


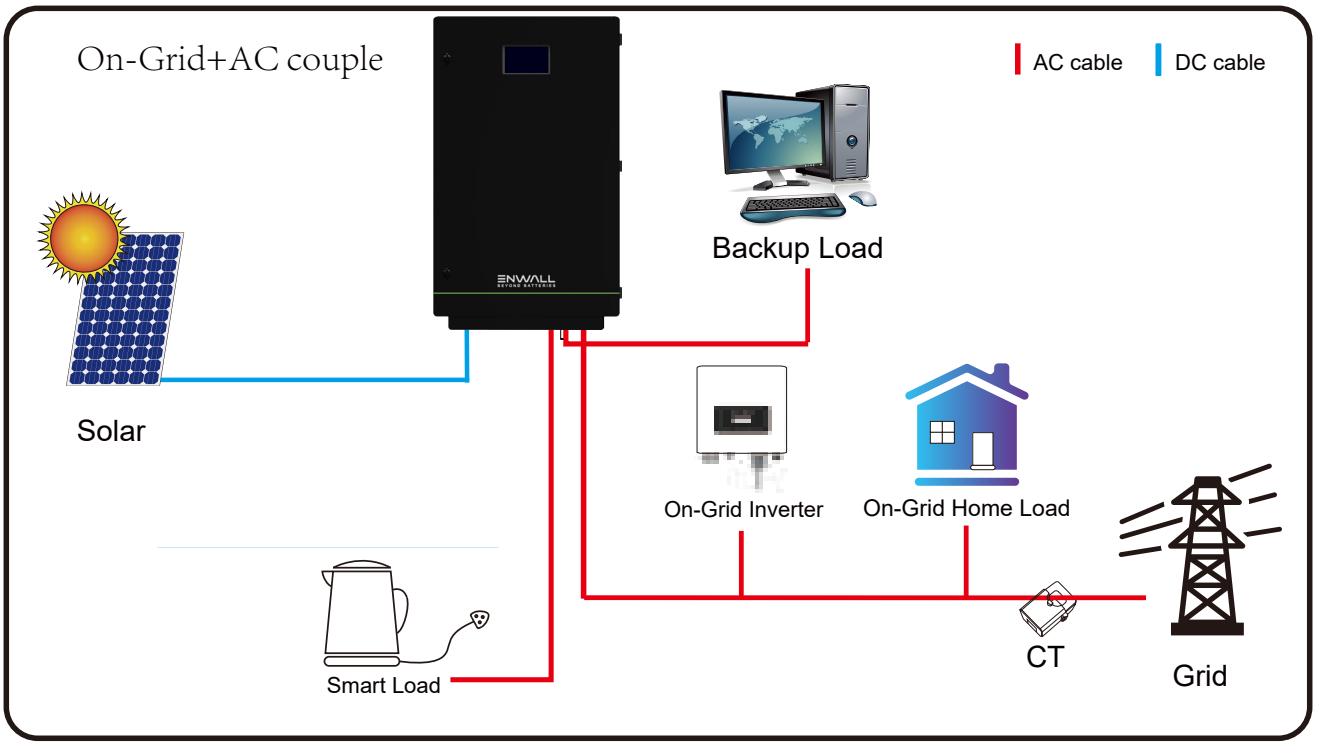
MODE III: WITH SMART-LOAD



MODE IV: AC COUPLE







The 1st priority power of the system is always the PV power, then 2nd and 3rd priority power will be the ESS bank or grid according to the settings.

The last power backup will be the Generator if it is available.

Fault information and processing

Error code	Description	Solutions
F08	GFDI _Relay_Failure	1. When enserver is in Split phase (120/240Vac) or three-phase system (120/208Vac) system, the backup load port N line must be to connected to ground; 2. If the fault still exists, please contact us for help.
F13	Working mode change	1. When the grid type and frequency changed it will report F13; 2. When the ESS mode was changed to "No ESS" mode, it will report F13; 3. For some old FW version, it will report F13 when the system work mode changed; 4. Generally, it will disappear automatically when shows F13; 5. If still same, turn off the DC switch and AC switch and wait for one minute and then turn on the DC/AC switch; 6. Contact customer care, if can not go back to normal state.
F18	AC over current fault of hardware	AC side over current fault 1. Please check whether the backup load power and common load power are within the range; 2. Restart and check whether it is in normal; 3. Contact customer care, if can not go back to normal state.

F20	DC over current fault of the hardware	DC side over current fault 1. Check PV module connection and ESS connection; 2. In off-grid mode, if the enserver starts with a high-power load, it may report fault F20. Please reduce the connected load power. 3. Turn off the DC switch and AC switch and then wait one minute, then turn on the DC/ AC switch again; 4. Contact customer care, if can not go back to normal state.
F22	Tz_EmergStop_Fault	Please contact your installer for help.
F23	AC leakage current is transient over current	Leakage current fault 1. Check PV side cable ground connection. 2. Restart the system 2~3 times. 3. If the fault still exists, please contact customer care for support.
F24	DC insulation impedance failure	PV isolation resistance is too low 1. Ensure the PV panels are connected to the enserver firmly and correctly. 2. Check whether the PE cable of enserver is connected to ground; 3. Contact customer care, if can not go back to normal state.

F26	The DC busbar is unbalanced	1. Please wait for a while and check whether it is normal; 2. In split-phase mode, if the load on L1 and L2 differs significantly, the system will report fault F26. 3. Restart the system 2~3 times. 4. Contact customer care, if can not go back to normal state.
F34	AC Overcurrent fault	1. Check the backup load connected, make sure it is in allowed power range; 2. If the fault still exists, please contact customer care for support.
F35	No AC grid	No Utility 1. Please confirm grid is lost or not; 2. Check the grid connection is good or not; 3. Check the switch between enserver and grid is on or not; 4. Contact customer care, if can not go back to normal state.
F42	AC line low voltage	Grid voltage fault 1. Check the AC voltage is in the range of standard voltage in specification; 2. Check whether grid AC cables are firmly and correctly connected; 3. Contact customer care, if can not go back to normal state.

F47	AC over frequency	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. Contact customer care, if can not go back to normal state.
F48	AC lower frequency	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. Contact customer care, if can not go back to normal state.
F56	DC busbar voltage is too low	ESS voltage low 1. Check whether ESS voltage is too low; 2. If the ESS voltage is too low, using PV or grid to charge the ESS; 3. Contact customer care, if can not go back to normal state.
F58	BMS communication fault	1. It tells the communication between hybrid enserver and ESS. BMS is disconnected when "BMS_Err-Stop" is active; 2. If you don't want to see this happen, you can disable "BMS_Err-Stop" item on the LCD; 3. If the fault still exists, please contact customer care for support.

F63	ARC fault	1. ARC fault detection is only for US market; 2. Check PV module cable connection and clear the fault; 3. Contact customer care, if can not go back to normal state.
F64	Heat sink high temperature failure	Heat sink temperature is too high 1. Check whether the work environment temperature is too high; 2. Turn off the enserver for 10mins and restart; 3. Contact customer care, if can not go back to normal state.