User Manual

1.Preface

This document describes the product information, installation and wiring, configuration and commissioning, troubleshooting and maintenance of the inverter. Please read through this manual to understand the product safety information and get familiar with the functions and features before installing and operating the product. The documentation will be updated occasionally.

1.1 Applicable Model

This document applies to the inverter models: GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2.

1.2 Target Audience

This document is intended for professionally trained technicians who are familiar with local standards and electrical systems, and the knowledge relevant to inverters. Installation, maintenance, repair and dismantling must be performed by qualified personnel.

1.3 Symbols

DANGER!	DANGER!"Danger"indicates a hazardous situation which, if not avoided, will result in serious injury or death. Danger! « danger » désigne une situation dangereuse qui, si elle n'est pas évitée, entraînera des blessures graves ou la mort.
WARNING!	WARNING! These servicing instructions are for the use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that specified in the operating instructions unless you are qualified to do so. Avertissement! Ces instructions de réparation sont destinées uniquement au personnel qualifié. Pour réduire le risque d'électrocution, ne faites pas de réparations autres que celles indiquées dans les instructions d'utilisation, à moins que vous ne soyez éligible.
CAUTION!	"Caution"indicates a hazardous situation which, if not avoided, could result in minor to moderate injury "Attention" indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner des blessures légères à modérées
NOTICE!	"Note"provides tips for the optimal operation of our product. « attention » donne des conseils pour optimiser le fonctionnement de nos produits.

1.4 Symbols

The latest version contains all the contents of all previous versions.

2.Safety Precaution

This manual contains important instructions for GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 series inverter that should be followed during installation and maintenance for the inverter. 2.1 General Safety Instructions GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 series inverter is designed and tested to meet all applicable North American and International safety standards. However, like all electrical and electronic equipment, safety precautions must be observed and followed during installation and operation of the GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 series inverter to reduce the risk of personal injury and to ensure a safe installation. Installation, commissioning, service, and maintenance of GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 series inverter must only be performed by authorized personnel that are licensed and/or satisfy state and local jurisdiction regulations. Before starting installation or commissioning, read the entire manual carefully to ensure correct and safe installation or commissioning. All US electrical installations must comply and be in accordance with all the state, local, utility regulations, and National Electrical Code ANSI/NFPA 70.

WARNING!	WARNING! This document does not replace and is not intended to replace any local, state, provincial, including without limitation applicable in the jurisdiction of installation. SolaX assumes no responsibility for the compliance or non-compliance with such laws or codes in connection with the installation of the product. Avertissement! Ce document ne remplace pas et n'est pas destiné à remplacer tout lieu, état, Province, y compris, mais sans s'y limiter,les documents applicables à la juridiction d'installation. Solax décline toute responsabilité en cas de respect ou de non - respect de ces lois ou normes lors de l'installation du produit.
DANGER!	Danger to life due to high voltages in the inverter! Before connecting the product to the electrical utility grid, contact the local utility company. Children should be supervised to ensure that they do not play with the appliance. Une tension élevée dans un onduleur peut mettre la vie en danger! Avant de connecter le produit au réseau électrique public, contactez Entreprises de services publics locaux. Les enfants devraient être surveillés pour s'assurer qu'ils ne jouent pasÉquipement.
WARNING!	Do not operate the inverter when the device is running. Ne pas faire fonctionner l'onduleur pendant que l'appareil est en marche.
WARNING!	Risk of electric shock! Risque d'électrocution!
WARNING!	When handling battery, adhere to all manufacturer safety instructions! Suivez toutes les instructions de sécurité du fabricant lors de la manipulation de la batterie!

WARNING!	Only accessories shipped with the inverter are recommended for use. Using other accessories may result in a fire or injury to the user Il est recommandé d'utiliser uniquement les accessoires fournis avec l'onduleur.L'utilisation d'autres accessoires peut provoquer un incendie ou blesser l'utilisateur
WARNING!	Do not disassemble any parts of the inverter which are not mentioned in the installation guide. It contains no user-serviceable parts. See warranty for instructions on obtaining service. Attempting to service the inverter yourself may result in a risk of electric shock or fire and will void your warranty. Ne démontez aucune pièce de l'onduleur qui n'est pas mentionnée dans le Guide d'installation. Il ne contient pas de pièces pouvant être réparées par l'utilisateur. Consultez la garantie pour obtenir des instructions sur l'obtention du service. Essayer de réparer l'onduleur vous - même peut entraîner un risque d'électrocution ou d'incendie et annuler votre garantie.
WARNING!	The inverter input and output circuits are isolated from the enclosure. This system does not include an isolation transformer and should be installed with an ungrounded PV array in accordance with the requirements of ANSI/NFPA 70, NEC 690.41.Equipment grounding is the responsibility of the installer and must be performed in accordance with all applicable Local and National Codes. Ne démontez aucune pièce de l'onduleur qui n'est pas mentionnée dans le Guide d'installation. Il ne contient pas de pièces pouvant être réparées par l'utilisateur. Consultez la garantie pour obtenir des instructions sur l'obtention du service. Essayer de réparer l'onduleur vous - même peut entraîner un risque d'électrocution ou d'incendie et annuler votre garantie.

WARNING!	Before operating the inverter, ensure that the inverter is grounded properly. This product must be connected to a grounded, metal, permanent wiring system, or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the product. Assurez - vous que l'onduleur est correctement mis à la terre avant de l'utiliser. Ce produit doit être connecté à un système de câblage permanent métallique mis à la terre ou le conducteur de mise à la terre de l'équipement doit fonctionner avec le conducteur du circuit et être connecté à la borne de mise à la terre de l'équipement ou au fil sur le produit.
WARNING!	When a ground fault is indicated, normally grounded conductors may be ungrounded and energized or normally ungrounded conductors may be grounded. Lorsqu'un défaut de mise à la terre est indiqué, un fil normalement mis à la terre peut ne pas être mis à la terre et alimenté, ou un conducteur normalement non mis à la terre peut être mis à la terre.
WARNING!	Keep away from flammable and explosive materials to avoid fire.Do not install or store the system in a corrosive environment where it may be exposed to ammonia, corrosive gases, acids, or salts (e.g.: chemical plant, fertilizer storage areas, tanneries, near volcanic ash eruption). Tenir à l'écart des objets inflammables et explosifs et éviter les incendies. Ne pas installer ou entreposer le système dans un environnement corrosif susceptible d'être exposé à l'ammoniac, aux gaz corrosifs, aux acides ou aux sels (p. ex., près d'une usine chimique, d'une zone de stockage d'engrais, d'une tannerie, d'une éruption de cendres volcaniques).

WARNING!	Neither touch the positive nor the negative pole of the PV connecting device. Never touch both poles at the same time. Ne touchez pas les pôles positif et négatif du dispositif de connexion photovoltaïque. Ne touchez jamais les deux pôles en même temps.
CAUTION!	GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 series inverter only supports a certain type of lithium-ion battery!(Manufacturer certified battery) GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 Les onduleurs série ne prennent en charge que certains types de batteries lithium - ion! (batterie certifiée par le fabricant)
CAUTION!	Possible damage to health as a result of the effects of radiation!Do not stay closer than 7.87 in/20 cm to inverter for a long time. Les effets des radiations peuvent nuire à la santé! Ne restez pas près de l'onduleur 7,87 pouces / 20 cm pendant une longue période.
CAUTION!	Danger of burn injuries due to hot enclosure parts! During operation, the enclosure may become hot. Surchauffe des parties du boîtier risque de brûlures!Pendant le fonctionnement, le boîtier peut devenir chaud.
CAUTION!	Risk of electric shock from energy stored in the capacitor. Never operate on the inverter couplers, the Mains cables, battery cables and PV cables when power is applied. After switching o ff the PV, battery and Mains, always wait for 5 minutes to fully discharge the intermediate circuit capacitors before unplugging DC, battery and Mains couplers. L'énergie stockée dans le condensateur présente un risque d'électrocution. N'utilisez jamais les coupleurs d'onduleur, les câbles d'alimentation, les câbles de batterie et les câbles photo

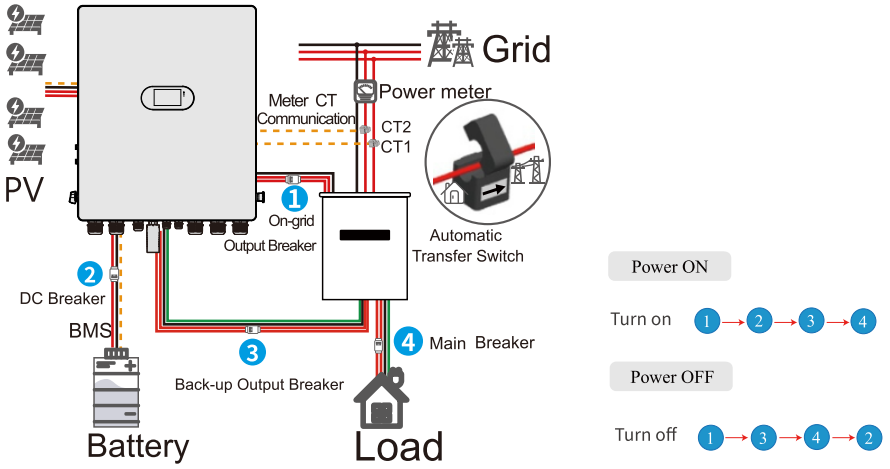
CAUTION!	-voltaïques lorsqu'ils sont sous tension. Après avoir éteint le PV, la batterie et l'alimentation, attendez toujours 5 minutes pour que le condensateur du circuit intermédiaire se décharge complètement, puis débranchez le DC, la batterie et le coupleur d'alimentation principal.
CAUTION!	The unit contains capacitors that remain charged to a potentially lethal voltage after the MAINS , battery and PV supply have been disconnected. Hazardous voltage will be present for up to 5 minutes after disconnection from the power supply. L'appareil contient des condensateurs qui restent chargés à une tension potentiellement mortelle après que l'alimentation principale, la batterie et l'alimentation photovoltaïque aient été déconnectées. La tension dangereuse dure 5 minutes après la déconnexion de l'alimentation.
CAUTION!	When accessing the internal circuit of the inverter, it is very important to wait 5 minutes before operating the power circuit or demounting the electrolyte capacitors inside the device. Do not open the device beforehand since the capacitors require time to sufficiently discharge! Lors de l'accès au circuit interne de l'onduleur, il est important d'attendre 5 minutes avant de faire fonctionner le circuit d'alimentation ou de retirer le condensateur d'électrolyte à l'intérieur de l'appareil. N'allumez pas l'appareil à l'avance, car il faut du temps pour que le condensateur se décharge suffisamment!
CAUTION!	Use insulated tools when installing the device. Individual protective tools must be worn during installation, electrical connection and maintenance. Utilisez des outils d'isolation lors de l'installation de l'appareil. Le port d'outils de protection individuelle est obligatoire lors de l'installation, des connexions électriques et de l'entretien.

NOTICE!	The inverter is heavy. Use of lift equipment is recommended. L'onduleur est lourd. Un équipement de levage est recommandé
NOTICE!	Make sure that existing wiring is in good condition and that wire is not undersized. Assurez - vous que le câblage existant est en bon état et que le câblage n'est pas surdimensionné.
NOTICE!	Measure the voltage between terminals UDC+ and UDC- with a multi-meter (impedance at least 1Mohm) to ensure that the device is discharged before working (35VDC) inside the device. La tension entre les bornes UDC + et UDC - est mesurée avec un multimètre (impédance d'au moins 1 mohm) pour s'assurer que l'appareil se décharge avant de fonctionner à l'intérieur de l'appareil (35 VDC).

3.Product Introduction

3.1 Application Scenarios

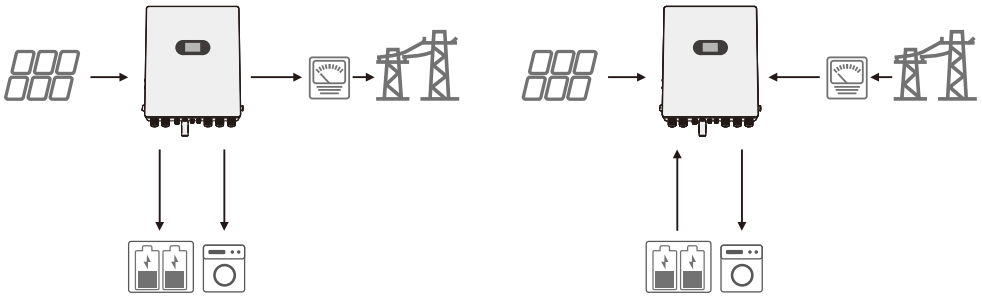
GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 is split-phase PV battery-storage inverter that converts the DC power generated by the PV string into AC power and sends the electricity into the grid. It can store the PV power in the battery and supply it to the load.



3.2 Operation Mode

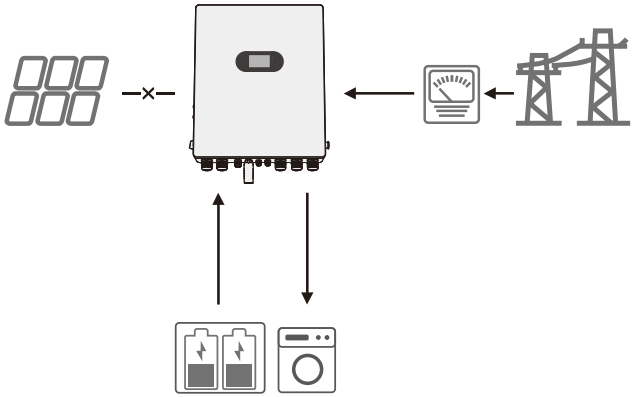
A. Self use Mode

• When the power generated in the PV system is sufficient, it will supply the loads firstly. And the excess power will charge the batteries first. The remaining power will be offered to the grid.



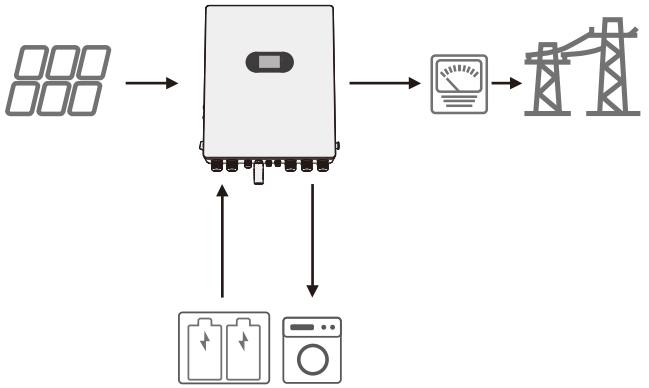
• When the power generated in the PV system is insufficient or no power is generated, the battery will supply the loads in priority. If the battery power is insufficient, then the load will be powered by the grid.

• When the power cannot be generated by the PV system, the battery will supply the loads in priority. If the battery power is insufficient, then the loads will be powered by the grid.

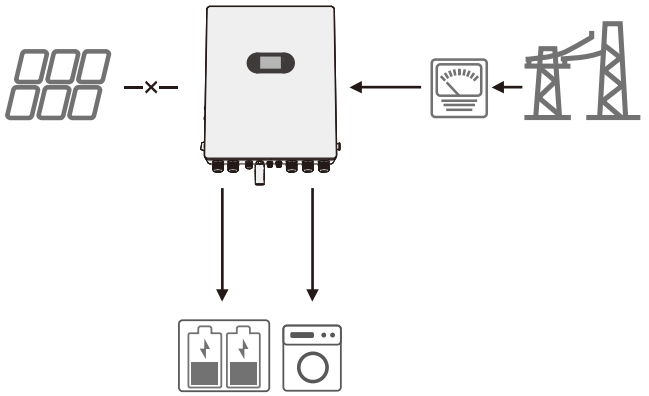


B. Economic Mode

• Daytime: when the electricity price is at its peak, the battery will power the load first, and the remaining power can be sold to the grid.

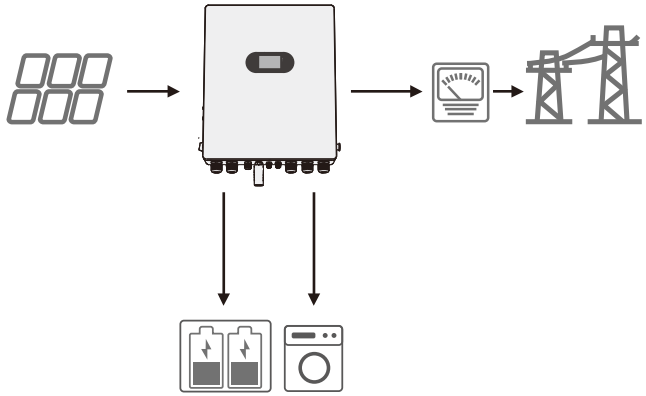


• Night: when the electricity price is at its valley, set the time for the grid to charge the battery.

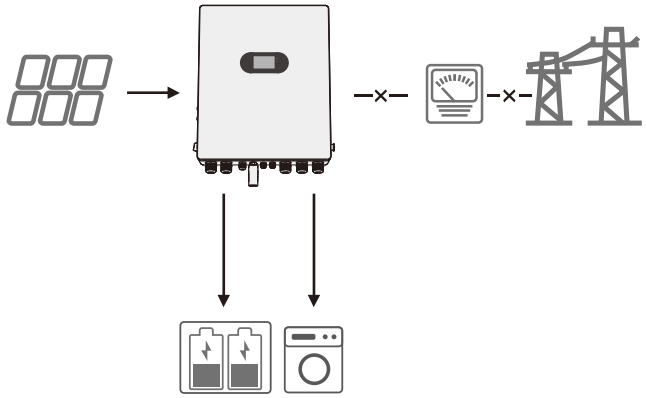


C. Back-up Mode

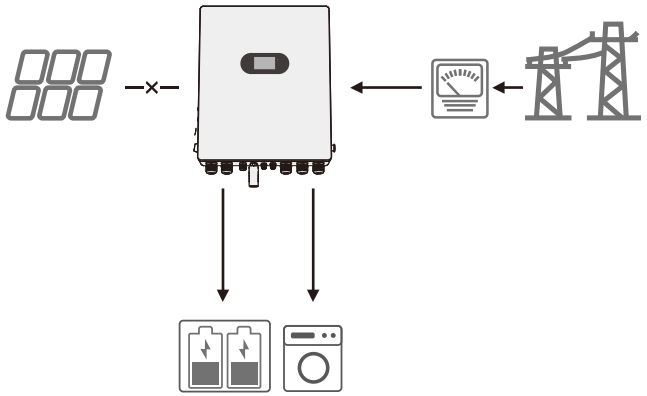
• When the PV energy is sufficient and the power grid is normal, the electricity generated in the PV system charge battery in priority. The excess electricity is offered to the load, and the remaining is sold to the power grid.



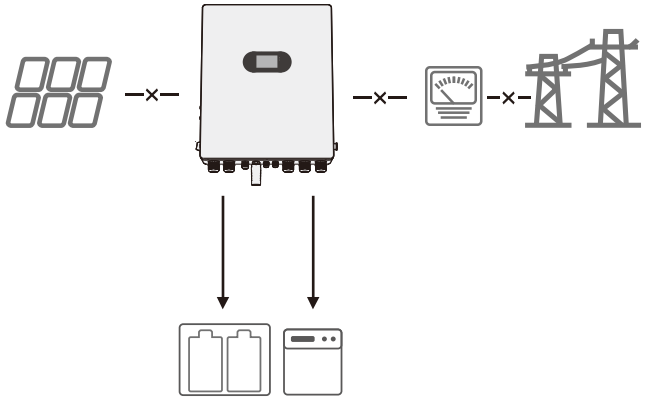
• When the PV energy is sufficient and the power grid is abnormal, the electricity generated in the PV system charges the battery in priority, the excess electricity is offered to the load, and the remaining is sold to the power grid. Insufficient load energy is replenished by the battery.



• When the PV energy is insufficient, the grid will charge the battery and supply the load when the power grid is normal. (Do not select this mode if the grid is not allowed to charge the battery according to the local laws and regulations.)

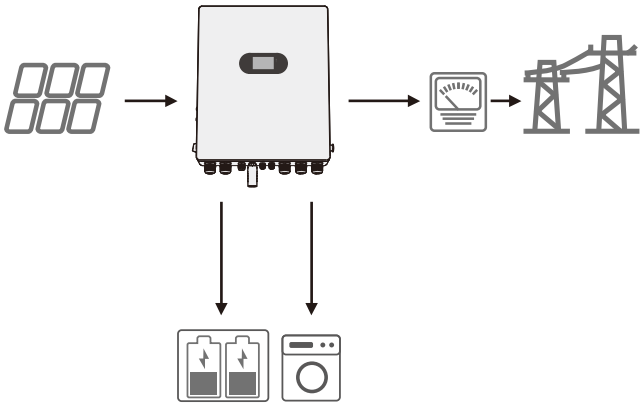


• When the PV energy is insufficient, the inverter will enter off-grid mode and the battery will supply power to the load when the grid is abnormal.

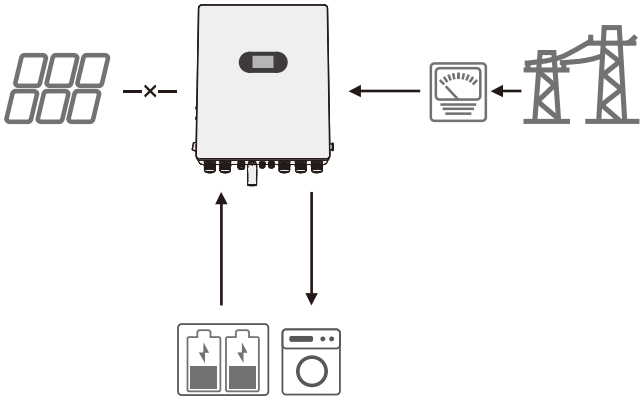


D. Feed-in priority Mode

• When PV energy is sufficient, under the condition that it satisfies the demand of the load, it can be sold it to the power grid in priority according to local regulations, and remaining energy is used to charge the battery.

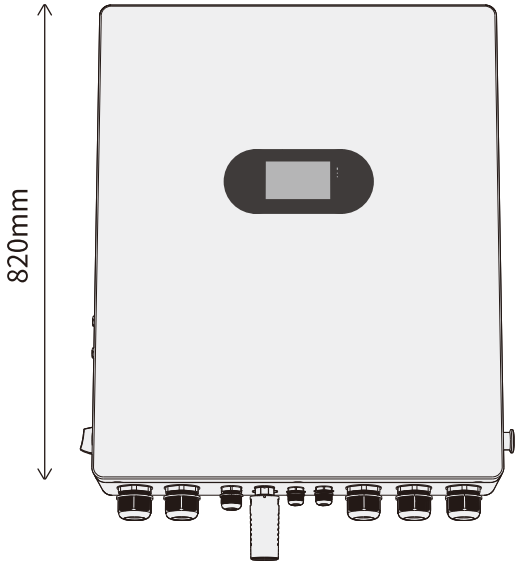


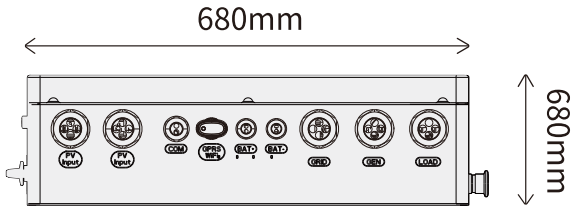
• When the PV energy is insufficient, under the condition that the battery meets the energy demand of the load, and the excess battery power is sold to the power grid in accordance with local regulations.



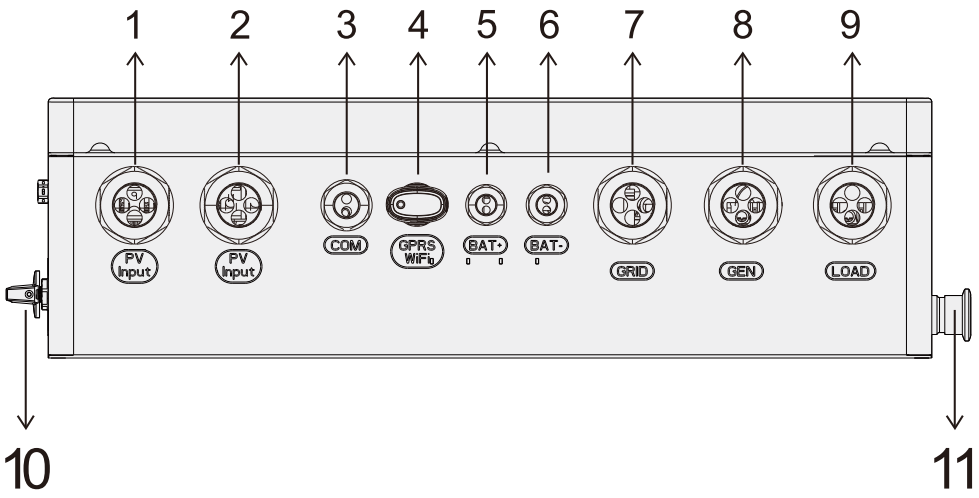
3.3 Appearance

3.3.1 Dimensions





3.3.2 Port Description



1.PV Cable Input Port	2.PV Cable Input Port	3.Communication Port	4.WIFI Port
5.Battery Port+	6.Battery Port-	7.Grid Port	8.Generator Port
9.Load Port	10.PV DC Input Switch	11.EPO/RSD Switch	

NOTICE!

The inverter power box (section L) is sealed at the factory and there are no user-serviceable parts inside.
La boîte d'alimentation de l'onduleur (section L) est scellée à l'usine et il n'y a pas de pièces utilisables à l'intérieur.

3.3.3 Nameplate

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER Model: GPEX-15KH2	
PV Input	
Max PV Input:	24kW
Mppt Input Volt:	120~550V
Max Input Current:	27A*4
Grid	
Rated Power(to grid):	15kVA
Max AC Current(to grid):	62.5A
Rated Power(from grid):	20kVA
Max AC Current(from grid):	83.3A
Grid Voltage:	120/240V
Grid Frequency:	60Hz
Power Factor Range:	-0.8~+0.8
Back-up Output	
Max AC Apparent Output Power:	19kVA
Max AC Apparent Output Current:	79.2A
Back-up Voltage:	120/240V
Back-up Frequency:	60Hz
Battery	
Nominal output Voltage:	204.8V
Battery Voltage Range:	75V-480V
Max charging Current:	75A
Max Discharging Current:	75A
GEN	
Nominal input voltage:	120/240Vac
Nominal frequency:	60Hz
Max.input current:	79.2Aac

System		
Enclosure Type:		Type 4X
Operating Temperature:		-22°F~+140°F no derating below 113°F
Dimensions(H*W*D):		840*680*200mm
Weight:		55Kg
UL1741,UL1699B, IEEE1547-2020, FCC part15 classB	Intergrated PV AFCI TYPE1	C US 304172 LISTED
Product Serial number: GUANGDONG GOSPOWER ELECTRIC TECHNOLOGY CO., LTD. Made in China		

The standard series number rules is as follows:

①Representative product model: For example: G1251, value: 1251

②Representative power: For example, 2000W, with a value of 202, $20 * 10^2$;550W, value: 551,$55 * 10^1$

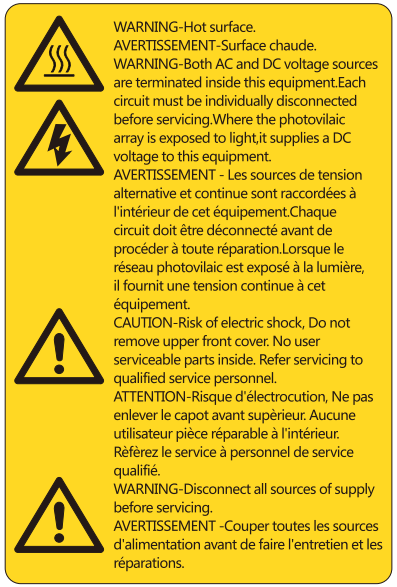
③Consistent with the second digit in the PN number, N: fan forward or no fan, R: fan reverse;

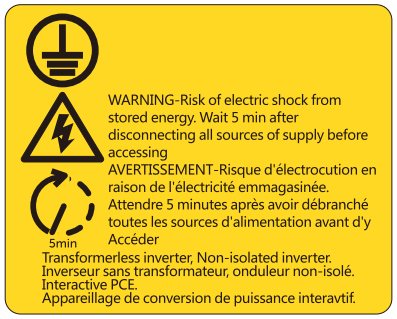
④The customer code should be consistent with the last two digits of the PN number; For example, PN0A, with a value of 0A;

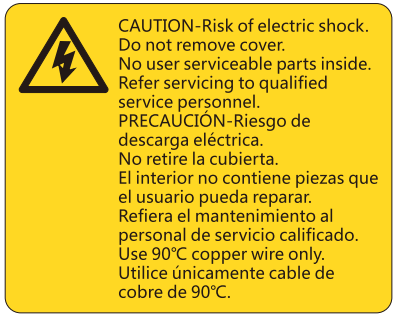
⑤YYMM: represents the month and year, for example, November 2022, with a value of 2211

⑥Serial number: starting from 00001, exceeding 99999, each digit is replaced by a letter, such as A0000 representing 100000

The warning label is as follows:







DANGER

High voltage!
Haute tension!

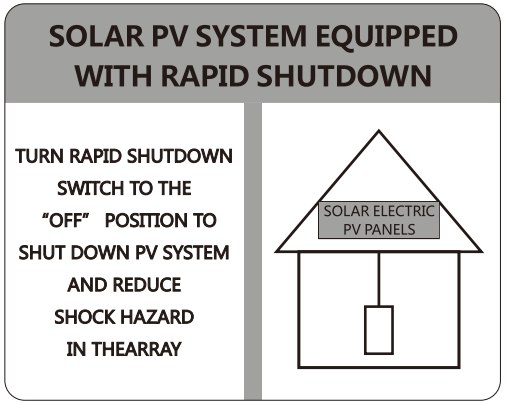
WARING

Reference to the instruction manual for the tightening torque to be applied to the wiring terminals.
Référence au manuel d'utilisation du couple de serrage à appliquer aux bornes de câblage
Use conductors with insulation rated for at least 90℃
Employer des conducteurs pour au moins 90℃

CAUTION!

Required Wire Size and Torques

Type	Specification	GPEX-15KH2	GPEX-12KH2	GPEX-10KH2	GPEX-8KH2	Torque(lbf.in)
PV	PV+	8-6AWG, 600V, ≥90℃, Copper conductors, Red wire				-
	PV-	8-6AWG, 600V, ≥90℃, Copper conductors, Black wire				-
	Grounded	8AWG, 600V, ≥90℃, Copper conductors, Yellow and green wire				Max. 10
Battery	BAT+	3-2AWG, 600V, ≥90℃, Copper conductors, Red wire				-
	BAT-	3-2AWG, 600V, ≥90℃, Copper conductors, Black wire				-
Grid	L1/L2/N	2-1AWG, 600V, ≥90℃, Copper conductors, Red/Black/White Wire for L1/L2/N				Max. 30
AC Load	L1/L2/N	3-2AWG, 600V, ≥90℃, Copper conductors, Red/Black/White Wire for L1/L2/N				Max. 25
GEN	L1/L2/N	3-2AWG, 600V, ≥90℃, Copper conductors, Red/Black Wire for L1/L2				Max. 25
AC Grounded	-	3AWG, 600V, ≥90℃, Copper conductors, Yellow and green wire				Max. 20
COMM	-	24-18AWG, 600V, ≥90℃, CAT5 or better, Copper conductors				-
		18-16AWG, ≥90℃, Copper conductors				



4.Check and Storage

4.1 Check before Receiving

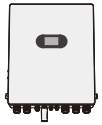
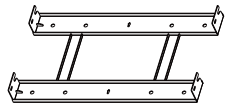
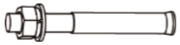
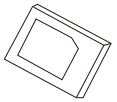
Check the following items before receiving the product.

A. Check the outer packing box for damage, such as holes, cracks, deformation, and other signs of equipment damage. Do not unpack the package and contact the supplier as soon as possible if any damage is found.

B. Check the inverter model. If the inverter model is not what you requested, do not unpack the product and contact the supplier.

C. Check the deliverables for correct model, complete contents, and intact appearance. Contact the supplier as soon as possible if any damage is found.

4.2 Deliverables

Number	Name	Photo	Quantity
1	Inverter		1
2	Mounting Plate		1
3	Expansion Bolt		8
4	User Manual		1
5	Current CT		2

6	Pin Terminal		20
7	O-shaped Terminal		8
8	WIFI Module		1
9	M6 Screw		4

4.3 Storage

If the equipment is not to be installed immediately, please store it in accordance to the following requirements:

A. Do not unpack the outer package or throw the desiccant away.

B. Store the equipment in a clean place. Make sure the temperature and humidity are appropriate and no condensation.

C. The height and direction of the stacking inverters should follow the instructions on the packing box.

D. The inverters must be stacked with caution to prevent them from falling.

E. If the inverter has been stored in the long term, it should be checked by professionals before being put into use.

5. Installation

WARNING!	Read all of these instructions, cautions, and warnings for the GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 series inverter. Lisez toutes ces instructions, mises en garde et avertissements pour l'onduleur de la série GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2.
WARNING!	nstallation and commissioning must be performed by a licensed electrician in accordance with local, state and National Electrical Code ANSI/NFPA 70 requirements. L'installation et la mise en service doivent être effectuées par un Électricien selon l'électricité locale, d'état et nationale Code ANSI/NFPA 70 exigences.
WARNING!	The installation and wiring connection methods of this inverter in the U.S. must comply with all US National Electric Code and local requirements. Les méthodes d'installation et de connexion de câblage de cet onduleur dans Les États-Unis doivent se conformer à tous les US National Electric Code et local Exigences.
WARNING!	Personal injury and machine damage may be caused by improper movement of the inverter. Please be strictly comply with the instructions of this manual when moving the install the inverter. Des dommages corporels et des dommages à la machine peuvent être causés par un mouvement inapproprié de l'onduleur. Veuillez être se conforment strictement aux instructions de ce manuel en déplaçant l'installation de l'onduleur.

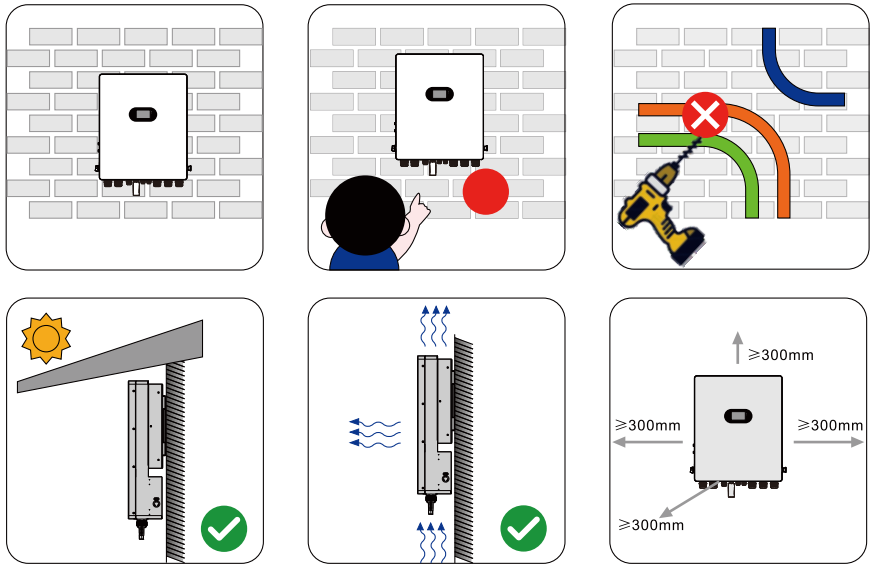
5.1 Installation Requirements

Installation Environment Requirements

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. Do not install the equipment in a place that is easy to reach for children.

High temperature occurs when the equipment is working. Do not touch the surface to avoid burning.

3. Avoid the water pipes and cables buried in the wall when drilling holes.
4. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a shade roof if it is needed.
5. The place to install the equipment shall be well-ventilated for heat radiation and large enough for operations.
6. The equipment with a high protection rating can be installed indoors or outdoors. The temperature and humidity at the installation site should be within the appropriate range.
7. Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
8. The altitude to install the inverter shall be lower than the maximum of 4000m.



Mounting Requirements

The wall shall be nonflammable and fireproof.

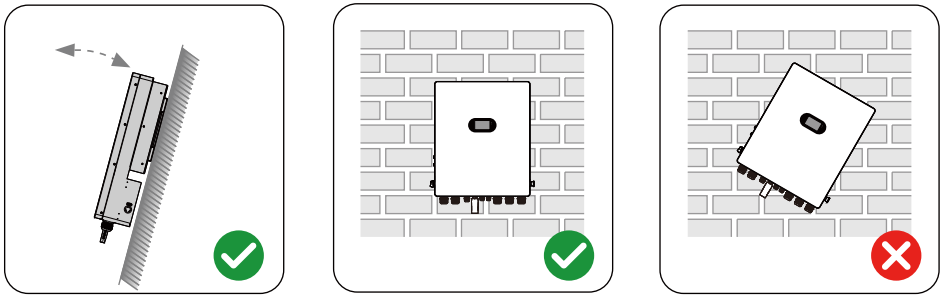
Install the equipment on a surface that is solid enough to bear the inverter weight.

Do not install the product on the wall with poor sound insulation to avoid the noise generated by the working product, which may annoy the residents nearby.

Installation Angle Requirements

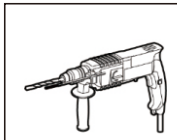
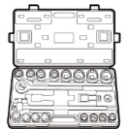
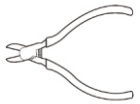
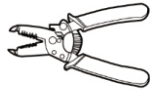
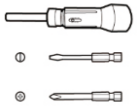
Install the inverter vertically or at a maximum back tilt of 15 degrees.

Do not install the inverter upside down, forward tilt, back forward tilt, or horizontally.



Installation Tool Requirements

The following tools are recommended when installing the equipment. Use other auxiliary tools if necessary.

				
Hammer drill	Torque socket wrench	Torque wrench	Diagonal plier	Wire stripper
				
Torque screwdriver	Rubber mallet	Utility knife	Cable cutter	Heat shrink tubing

				
Heat gun	Cable tie	Vacuum cleaner	Multimeter (DC voltage measurement range ⩾ 600 VDC)	Marker
				
Measuring tape	Level	Stud finder	Hex key (M6)	Safety shoes
				
Safety gloves	Safety goggles	Anti-dust respirator		

5.2 Inverter Installation

5.2.1 Remove the Inverter

Operations such as transportation, turnover, installation and so on must meet the requirements of the laws and regulations of the country or region where it is located.

• Move the inverter to the site before installation. Follow the instructions below to avoid personal injury or equipment damage.

A. Consider the weight of the equipment before moving it. Assign enough personnel to move the equipment to avoid personal injury.

B. Wear safety gloves to avoid personal injury.

C. Keep balance to avoid falling down when moving the equipment

5.2.2 Install the Inverter

Avoid the water pipes and cables buried in the wall when drilling holes.

• Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.

• Make sure the inverter is firmly installed in case of falling down.

• The DC switch lock of appropriate size should be prepared by customers. The diameter of the lock hole is 5mm. The lock might not be able to install if the size is inappropriate.

1. Put the plate on the wall horizontally and mark positions for drilling holes.

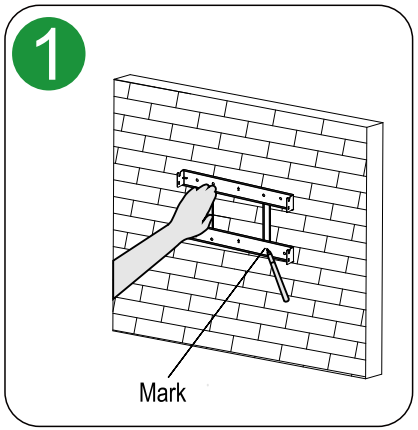
2. Drill holes to a depth of 80mm using the hammer drill. The diameter of the drill bit should be 10mm.

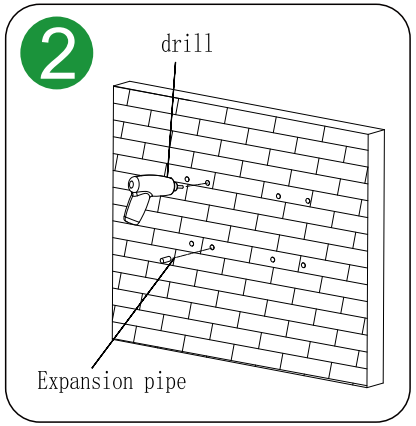
3. Use the expansion bolts to fix the plate on the wall.

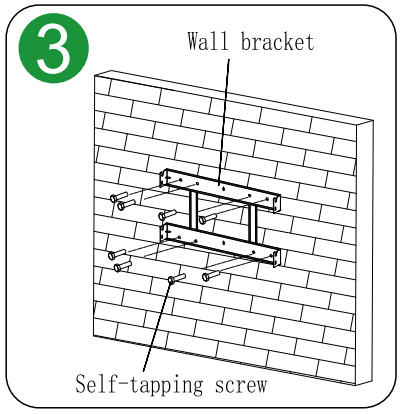
4. Install the inverter on the mounting plate. For models with handles, please lift the inverter by using the handles. For models without handles, please lift the inverter directly.

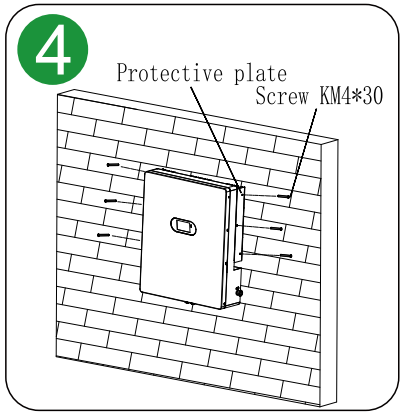
5: Tighten the screws to secure the mounting plate and the inverter.

NOTICE!	Before mounting the inverter, the mechanical installation of the whole battery must be completed. Avant de monter l'inverseur, l'installation mécanique de l'ensemble La batterie doit être complétée









6. Electrical Connection(10-15kW)

6.1 Safety Instructions

WARNING!	Read all of these instructions, cautions, and warnings for the GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 series inverter. Lisez toutes ces instructions, mises en garde et avertissements pour l'onduleur de la série GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 .
WARNING!	All electrical installations must be carried out in accordance with all applicable Local and National Codes. Before connecting the inverter to the grid, approval must be received by local utility as required by national and state interconnection regulations. Toutes les installations électriques doivent être effectuées conformément à tous les Codes locaux et nationaux applicables. Avant de connecter l'onduleur au réseau, l'approbation doit être Reçu par le service public local tel que requis par le national et l'état Règlements d'interconnexion.

DANGER!	When exposed to sunlight, the PV array generates dangerous DC voltage which is present in the DC conductors and the live components which can lead to lethal electric shocks. If you unplug the terminal plate with the connected DC conductors from the DCin slot under load, an electric arc may occur, which will cause an electric shock and burns. Do not touch non-insulated conductors. Do not touch the DC conductors. Do not touch any live components of the inverter. Lorsqu'il est exposé à la lumière du soleil, le panneau PV génère une tension continue dangereuse qui est présente dans les conducteurs et les composants sous tension qui peuvent conduire à des chocs électriques létaux. Si vous débranchez la plaque de borne avec les conducteurs cc connectés à partir de la fente de cc, en charge, un arc électrique peut se produire, ce qui provoquera une décharge électrique et des brûlures. Ne touchez pas les conducteurs non isolés. Ne touchez pas les conducteurs DC. Ne touchez aucun composant vivant de l'onduleur.
WARNING!	Damage to seals on the enclosure lids in subfreezing condition. If you open the enclosure lids of the wiring box when temperatures are below freezing, the enclosure lid seal could be damaged. As a result, moisture can get into the wiring box. Only open the enclosure lid of the wiring box if the ambient temperature is at least 32°F (0°C) and there is no frost. Dommages aux joints d'étanchéité des couvercles de l'enceinte en sous-congélation Condition. Si vous ouvrez les couvercles de la boîte de câblage Lorsque les températures sont inférieures au point de congélation, le joint du couvercle de l'enceinte Peut être endommagé. En conséquence, l'humidité peut entrer dans le câblage Boîte. Ouvrez seulement le couvercle de la boîte de câblage si La température ambiante est d'au moins 32°F (0°C) et il n'y a pas de gel.

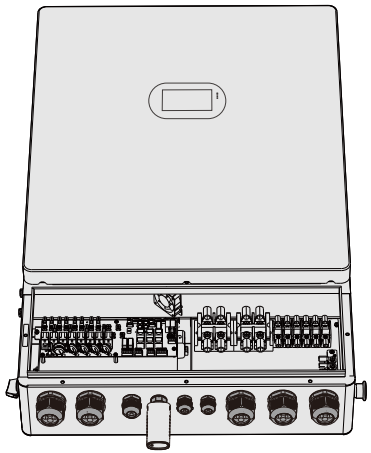
WARNING!	Damage to the inverter due to electrostatic discharge Touching electronic components will cause damage to or destroy the inverter through electrostatic discharge. Ground yourself before touching any component. Les dommages à l'onduleur dus à la décharge électrostatique touchant des composants électroniques causeront des dommages à l'onduleur ou détruiront l'onduleur par décharge électrostatique. Mettez-vous à la terre avant de toucher n'importe quel composant.
WARNING!	Damage to the inverter due to moisture ingress during installation! Never open the inverter when it is raining or snowing, or the humidity is over 95%. For attaching conduit to the enclosure, only use UL-listed rain-tight conduit fittings or UL-listed conduit fittings for wet locations complying with UL514B. Seal all unused openings tightly. Dommages à l'onduleur en raison de l'entrée d'humidité pendant Installation!N'ouvrez jamais l'inverseur quand il pleut ou neige,ou le L'humidité est supérieure à 95%.Pour fixer le conduit au boîtier, utilisez seulement ul-listé Raccords de conduit étanches à la pluie ou raccords de conduit ul-listés pour Emplacements humides conformes à UL514B.Sceller étroitement toutes les ouvertures non utilisées.

6.2 Electrical Connection

NOTICE!	N and PE wiring via ON-GRID and BACK-UP ports of the inverter are different based on the regulation requirements of different regions. Refer to the specific requirements of local regulations. Le câblage N et PE via les ports sur le réseau et de secours de l'onduleur sont différents en fonction des exigences réglementaires des différentes régions. Reportez-vous aux exigences spécifiques de la réglementation locale.

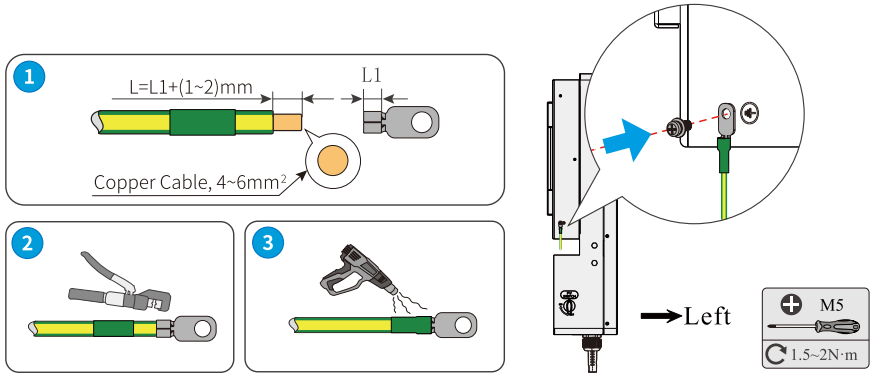
NOTICE!	There are built-in relays inside of the inverter's ON-GRID and BACK-UP AC ports. When the inverter is in the off-grid mode, the built-in ON-GRID relay is open; while when the inverter is in grid-tied mode, it is closed. Il y a des relais intégrés à l'intérieur du réseau de l'onduleur et des ports AC de secours. Lorsque l'onduleur est en mode hors réseau, le relais intégré sur le réseau est ouvert; Lorsque l'onduleur est en mode lié au réseau, il est fermé.
NOTICE!	When the inverter is powered on, the BACK-UP AC port is charged. Power o ffthe inverter first if maintenance is required for the loads connected with BACK-UP ports. Otherwise, it may cause electric shock. Lorsque l'onduleur est allumé, le port AC de secours est chargé. Éteignez d'abord l'onduleur si l'entretien des charges reliées aux ports de secours est nécessaire. Sinon, il peut causer une décharge électrique.

Firstly, remove the outer cover of the inverter with a screwdriver, and then open the cover of the junction box, as shown in the following figure:



6.2.1 Connecting the PE cable

CAUTION!	The PE cable connected to the enclosure of the inverter cannot replace the PE cable connected to the AC output port. Make sure that both of the two PE cables are securely connected. Le câble PE relié au boîtier de l'onduleur ne peut pas remplacer le câble PE relié au port de sortie ca. Assurez-vous que les deux câbles PE sont bien reliés.
CAUTION!	Make sure that all the grounding points on the enclosures are connected when there are multiple inverters. Assurez-vous que tous les points de mise à la terre sur les enceintes sont connectés lorsqu'il y a plusieurs onduleurs.
CAUTION!	To improve the corrosion resistance of the terminal, you are recommended to apply silica gel or paint on the ground terminal after installing the PE cable. Pour améliorer la résistance à la corrosion de la borne, il est recommandé d'appliquer du gel de silice ou de la peinture sur la borne au sol après avoir installé le câble PE.
CAUTION!	The PE cable should be prepared by the customer. Recommended specifications: Le câble PE doit être préparé par le client. Spécifications recommandées:
CAUTION!	Type: single-core outdoor copper cable Type: câble de cuivre extérieur à noyau unique
CAUTION!	Conductor cross-sectional area: 4-6mm². Section du conducteur: 4-6mm².



6.2.2 Connecting the DC Input Cable (PV)

DANGER!	Do not connect one PV string to more than one inverter at the same time. Otherwise, it may cause damage to the inverter. Ne connectez pas une chaîne PV à plus d'un onduleur en même temps. Autrement, il peut endommager l'onduleur.

Confirm the following information before connecting the PV string to the inverter. Otherwise, it may cause permanent damage to the inverter or even fire and personal and property losses.

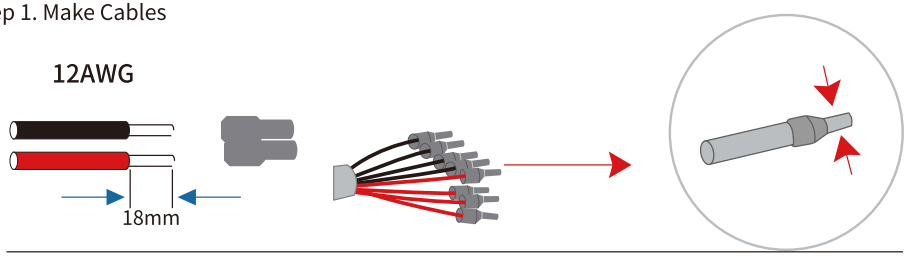
1. Make sure that the max short circuit current and the max input voltage per MPPT are within the permissible range.

2. Make sure that the positive pole of the PV string connects to the PV+ of the inverter. And the negative pole of the PV string connects to the PV- of the inverter.

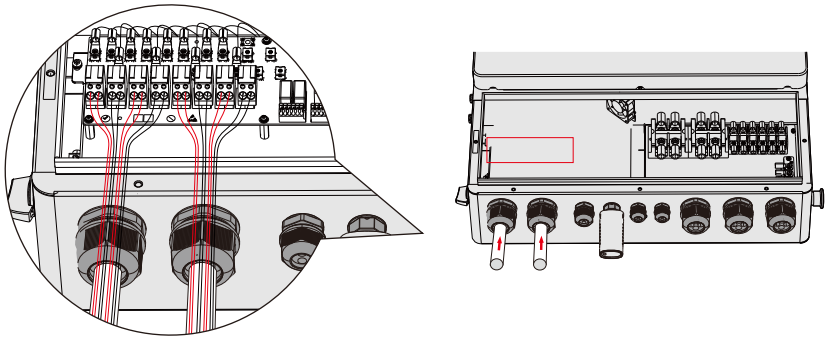
CAUTION!	The PV strings cannot be grounded. Ensure the minimum insulation resistance of the PV string to ground meets the minimum insulation resistance requirements before connecting the PV string to the inverter (R=maximum input voltage/ 30mA). Les chaînes PV ne peuvent pas être mises à la terre. Assurez-vous que la résistance d'isolation minimale de la corde PV à la terre répond aux exigences minimales de résistance d'isolation avant de connecter la corde PV à l'onduleur (R= tension d'entrée maximale / 30mA).

The PV strings cannot be grounded. Ensure the minimum insulation resistance of the PV string to ground meets the minimum insulation resistance requirements before connecting the PV string to the inverter (R=maximum input voltage/ 30mA).

Step 1. Make Cables



Step 2. Connect to the PV input terminal of the inverter, as shown in the following figure.



6.2.3 Connecting the AC Cable

CAUTION!	Do not connect loads between the inverter and the AC switch directly connected to the inverter. Ne connectez pas les charges entre l'onduleur et l'interrupteur secteur directement connecté à l'onduleur.
CAUTION!	The residual current monitoring unit (RCMU) is integrated into the inverter to prevent residual current from exceeding the limit. L'unité de surveillance du courant résiduel (RCMU) est intégrée dans l'onduleur pour empêcher le courant résiduel de dépasser la limite.

CAUTION!	The type A residual current device (RCD) can be connected to the inverter according to the local laws and regulations. Recommended specifications: ON-GRID RCD: 300mA; BACK-UP RCD: 30mA. L'appareil à courant résiduel de type A (RCD) peut être connecté à l'onduleur selon les lois et règlements locaux. Spécifications recommandées: ON-GRID RCD: 300mA; RCD de secours: 30mA.
NOTICE!	Install one AC output circuit breaker for each inverter. Multiple inverters cannot share one AC circuit breaker. installez un disjoncteur de sortie ca pour chaque onduleur. Plusieurs onduleurs ne peuvent pas partager un disjoncteur ca.
NOTICE!	An AC circuit breaker shall be installed on the AC side of the inverter to make sure that the inverter can safely disconnect the grid when an exception happens. Select the appropriate AC circuit breaker in accordance with local laws and regulations. Un disjoncteur ca doit être installé du côté ca de l'onduleur pour s'assurer que l'onduleur peut débrancher le réseau en toute sécurité lorsqu'une exception se produit. Sélectionnez le disjoncteur c.a. approprié conformément aux lois et règlements locaux.
CAUTION!	Connect the AC cables to the corresponding terminals"L1","L2", "N", and PE correctly. Otherwise, it will cause damage to the inverter. Connectez les câbles ca aux terminaux correspondants "L1", "L2", "N" et PE correctement. Sinon, il causera des dommages à l'onduleur.
CAUTION!	No part of the cable core can be exposed. Aucune partie du noyau du câble ne peut être exposée.

CAUTION!	Ensure that the insulation board is inserted into the AC terminal tightly. Veillez à ce que le panneau dìsolation soit bien inséré dans la borne AC.
CAUTION!	Assurez-vous que les câbles sont connectés en toute sécurité. Sinon, il causera des dommages à lònduleur en raison de la surchauffe pendant son fonctionnement. A partir de là, je vous ai dit: Sinon, il causera des dommages <BOS> the onduleur en raison de la surchauffe pendant son fonctionnement.
CAUTION!	Ensure that the waterproof cable passes through the waterproof connector or copper pipe and the connector is tight and durable. Assurez-vous que le câble étanche passe à travers le connecteur étanche ou le tuyau de cuivre et que le connecteur est serré et durable.

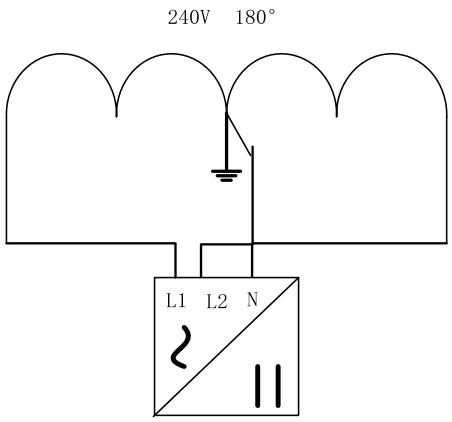
1) Grid Connection

CAUTION!	The installer is responsible for providing overcurrent protection. To reduce the risk of fire, only connect to a circuit provided with overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70. Lìnstallateur est responsable de la protection contre les surintensités. Pour réduire le risque dìncendie, branchez uniquement un circuit muni dùne protection contre les surtensions conformément au Code National de lélectricité, ANSI/NFPA 70.

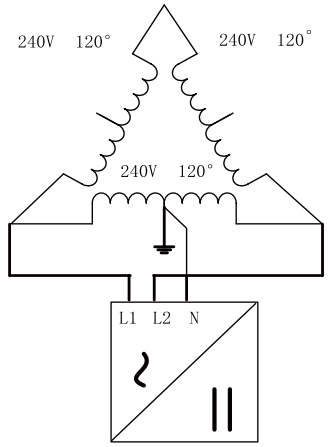
The connection procedure will vary depending on the grid configuration.

The following diagram provides an overview of the compatible grid configurations of which voltage limit, frequency limit and conductors have to be connected to the inverter to comply with the grid configuration.

• Public grid configuration allowed:



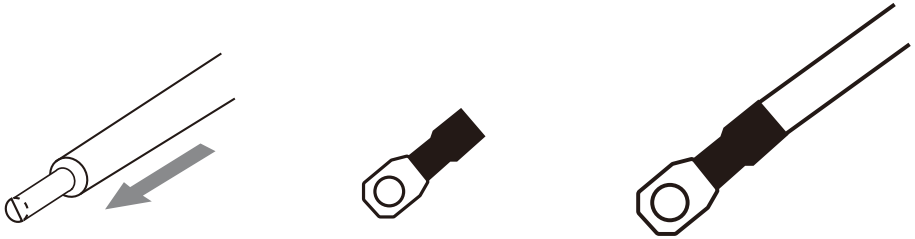
240V/120V Split Phase AC Grid



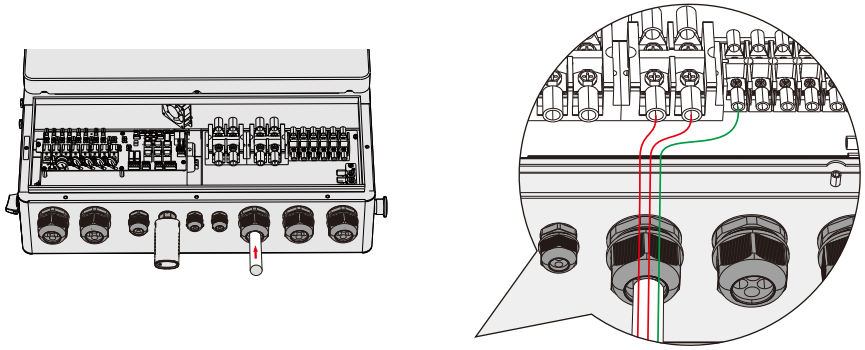
240V/120V S nger AC Grid

CAUTION!	DANGER — HIGH VOLTAGE! DANGER - haute tension!

Step 1: Cable production. L1 and L2 wires should be 2-1AWG, N wire should be 3 AWG, and use accessories to firmly crimp the wires.

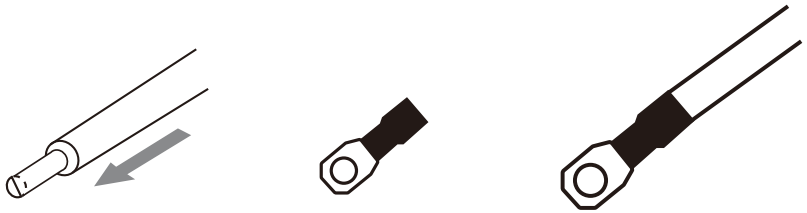


Step 2: Connect the grid cable to the terminals shown in the figure below, and use a screwdriver to fix and tighten the cable.

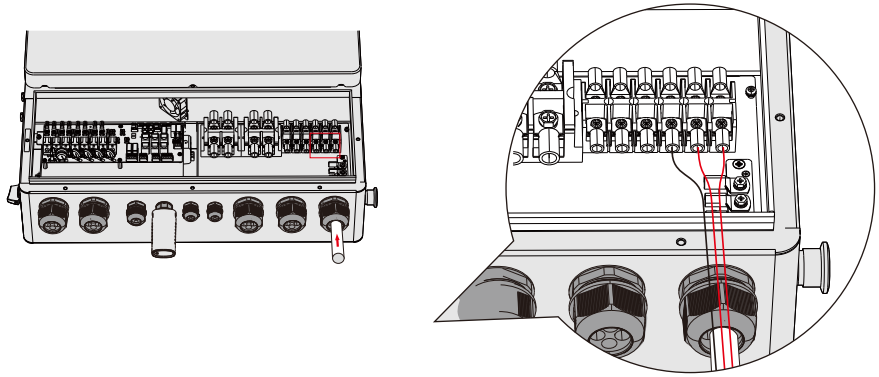


2) Load Connection

Step 1: The load cable should be 3-2 AWG. Use accessories to crimp the wires.

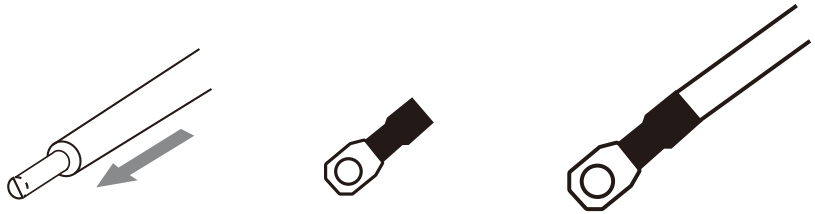


Step 2: Connect the load cable to the terminals shown below and use a screwdriver to fix and tighten the cable.

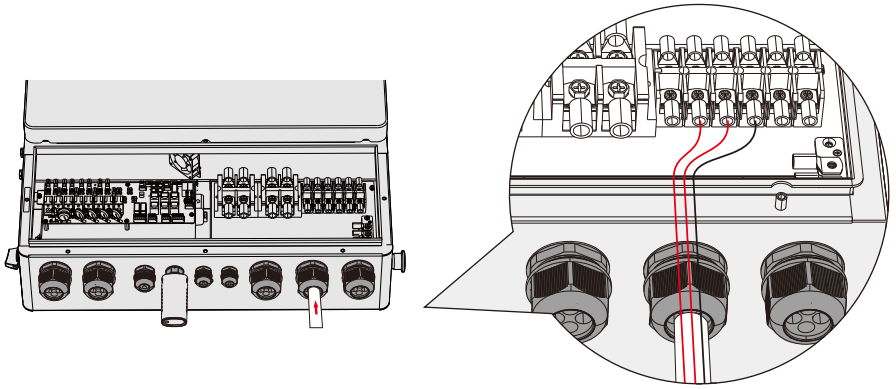


3) Generator Connection

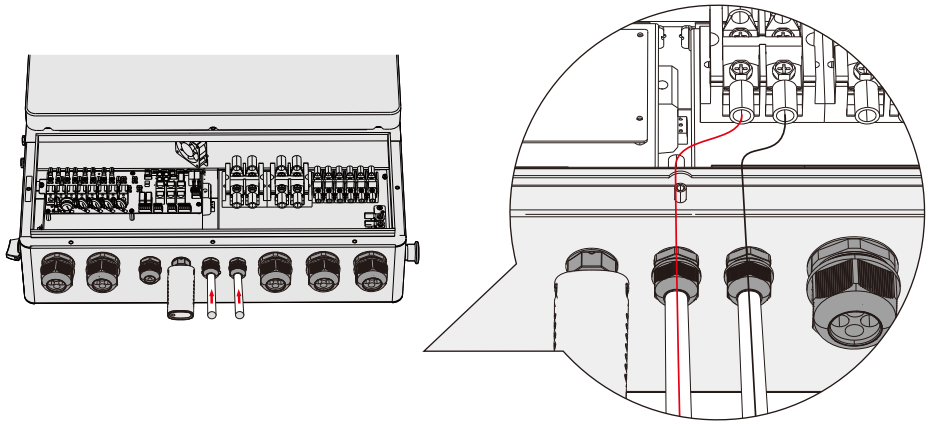
Step 1: Cable production. Generator cable should be 3-2 AWG, and use accessories to firmly crimp the cables.



Step 2: Connect the generator input cable to the terminals shown in the figure below, and use a screwdriver to fix and tighten the cable.



4) Inline terminal shall be used for battery connection. Pay attention to the polarity and directly connect to the terminals of the battery.



5) Circuit breaker requirements

The AC circuit breaker (not included in the GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 series inverter) is required to protect each AC line (L1/ L2/N) of the inverter. The circuit breaker should be able to handle the rated maximum output voltage and current of the inverter.
Refer to the table below to determine the specific circuit breaker in order to avoid potential fire hazards. The AC circuit breaker selection and installation must follow the National Electrical Code(NEC), ANSI/NFPA 70 or local electrical codes.

Max output overcurrent protection(amps) for GRID(L1/L2/N)

Inverter model	Description	Source
GPEX-8KH2	3-pole, 110 A, 240 Vac	Purchase by customer
GPEX-10KH2	3-pole, 110 A, 240 Vac	Purchase by customer
GPEX-12KH2	3-pole, 110 A, 240 Vac	Purchase by customer
GPEX-15KH2	3-pole, 110 A, 240 Vac	Purchase by customer

Max output overcurrent protection(amps) for Load(L1/L2/N)

Inverter model	Description	Source
GPEX-8KH2	3-pole, 100 A, 240 Vac	Purchase by customer
GPEX-10KH2	3-pole, 100 A, 240 Vac	Purchase by customer
GPEX-12KH2	3-pole, 100 A, 240 Vac	Purchase by customer
GPEX-15KH2	3-pole, 100 A, 240 Vac	Purchase by customer

Max output overcurrent protection(amps) for GEN(L1/L2/N)

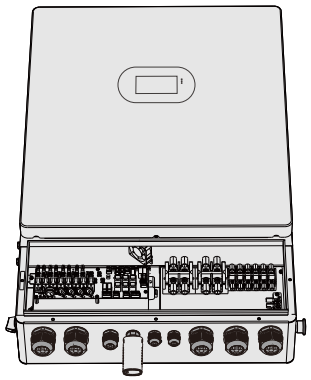
Inverter model	Description	Source
GPEX-8KH2	3-pole, 100 A, 240 Vac	Purchase by customer
GPEX-10KH2	3-pole, 100 A, 240 Vac	Purchase by customer
GPEX-12KH2	3-pole, 100 A, 240 Vac	Purchase by customer
GPEX-15KH2	3-pole, 100 A, 240 Vac	Purchase by customer

The DC circuit breaker (not included in the GPEX-8KH2,GPEX-10KH2,GPEX-12KH2,GPEX-15KH2 series inverter) is required to protect each BAT line (BAT+,BAT-) of the inverter. The circuit breaker should be able to handle the rated maximum output voltage and current of the inverter.

Inverter model	Description	Source
GPEX-8KH2	2-pole, 100 A, 500 Vdc	Purchase by customer
GPEX-10KH2	2-pole, 100 A, 500 Vdc	Purchase by customer
GPEX-12KH2	2-pole, 100 A, 500 Vdc	Purchase by customer
GPEX-15KH2	2-pole, 100 A, 500 Vdc	Purchase by customer

6.2.4 Communication Connection

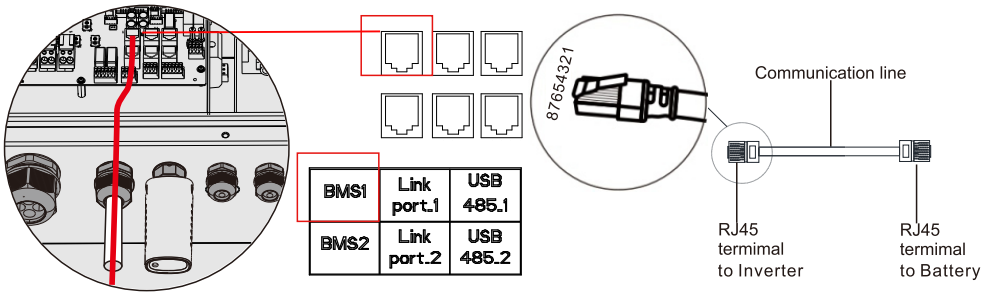
• Ensure that the communication device is connected to the right COM port. Route the communi cation cable far away from any interference source or power cable to prevent the signal from being impacted.



The pin starts from the left and the left one is No. 1.

N0.	Port Definition		Function	Description
1	J2	1COM1	Dry contact signal	Connects dry contact signal, and achieves functions such as load and generator control.
		2NC1		
		3NO1		
		4COM2		
		5NC2		
		6NO2		
2	J14	1DI-1	Dry contact signal	Connects dry contact signal, and achieves functions such as load and generator control.
		2EX-END		
		3DI-2		
		4EX-END		
3	J8	1CT2-GND1	Anti-reflux CT port	Monitors grid transmission power
		2CT2.V		
		3CT1-GND1		
		4CT1.V		
4	J11	1EX_485A	External 485 communication	Used for local computer monitoring
		2EX_485A		
		3METER-485A	Meter 485 communication	Used for external meter communication
		4METER-485B		
		5EX_12V	12Vpower	External 12V power
		6EX_GND		

6.2.5 Connecting BMS communication cable (RJ45 connector)



Support RJ45 connector. The definition is as followed.

Pin	1	2	3	4	5	6	7	8
Definition	485B	485A	GND	CANH	CANL	GND	485A	485B

7. Equipment Commissioning

7.1 Check before Power on

No.	Check Item
1	The product is firmly installed at a clean place that is well-ventilated and easy to maintenance.
2	The PE, DC input, AC output, and communication cables are connected correctly and securely.
3	Cable ties are routed properly and evenly, and intact.
4	Unused cable holes are fitted with the waterproof nuts.
5	The conduit holes are sealed.
6	The voltage and frequency at the connection point meet the inverter grid connection requirements.

7.2 Power on

Step 1: Turn on the high-voltage breaker between the inverter and battery.

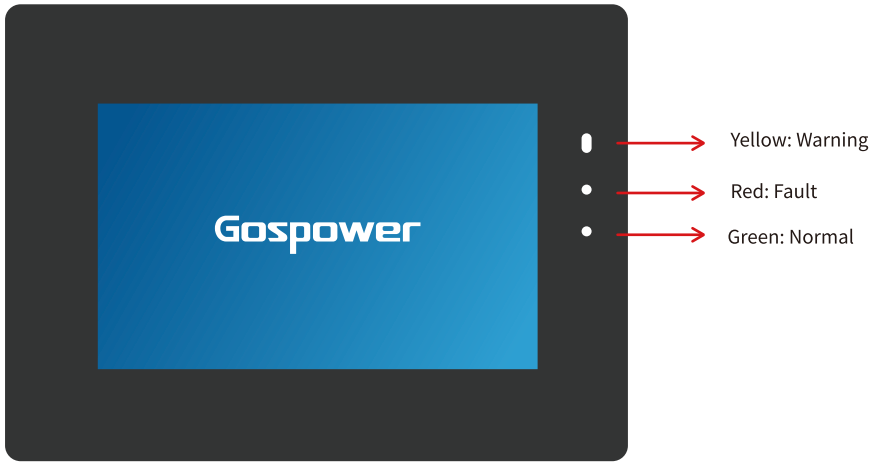
Step 2: Turn on the PV switch of the inverter.

Step 3: Turn on the AC breaker on the ON-GRID side of the inverter.

Step 4: Turn on the AC breaker on the BACK-UP side of the inverter.

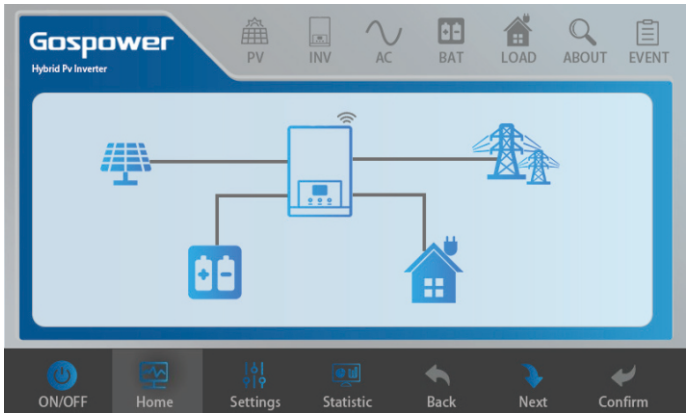
8.system Commissioning

8.1 Indicator

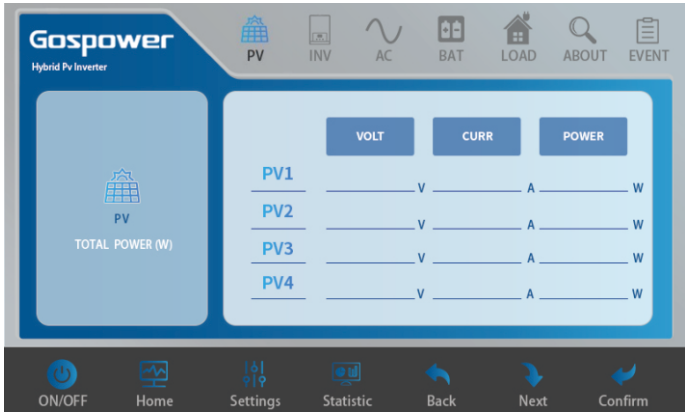


8.2.1 Setting Inverter Parameters through the Display Screen

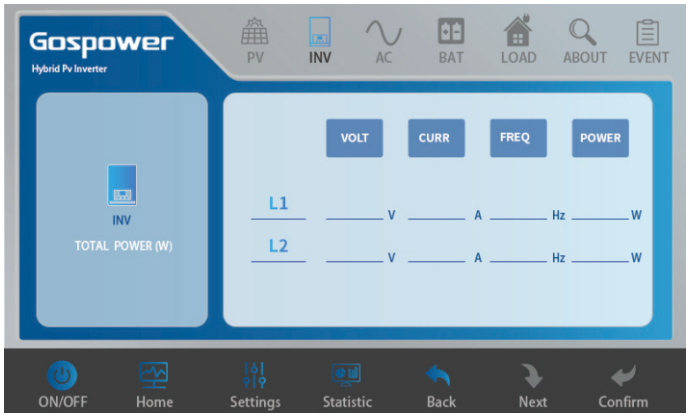
1. When the inverter is powered on, it shows the Gospower page and then turns to the Home page.



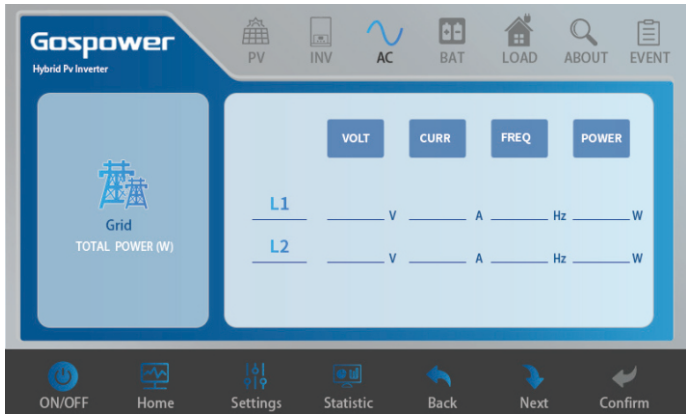
2. Tap the PV icon to enter the PV parameters page, click the Back and Next buttons at the bottom of the page to switch pages and view other parameters.

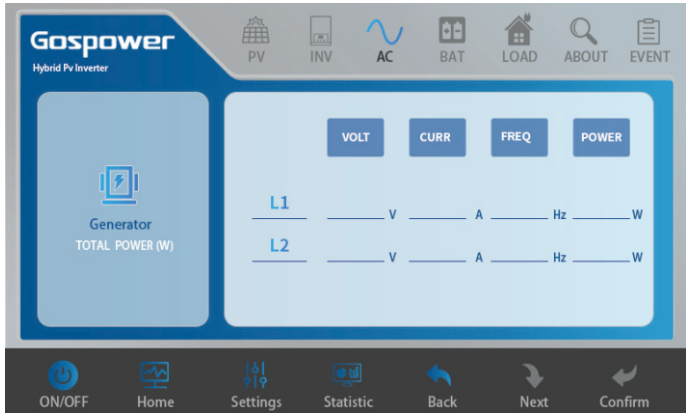


3. Tap the INV icon to enter the INV parameters page.

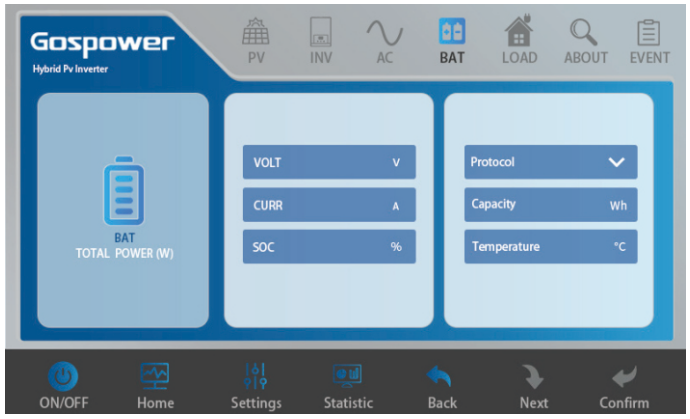


4. Tap the AC icon to enter the Grid and Generator parameters page, click the Back and Next buttons at the bottom of the page to switch pages and view other parameters.

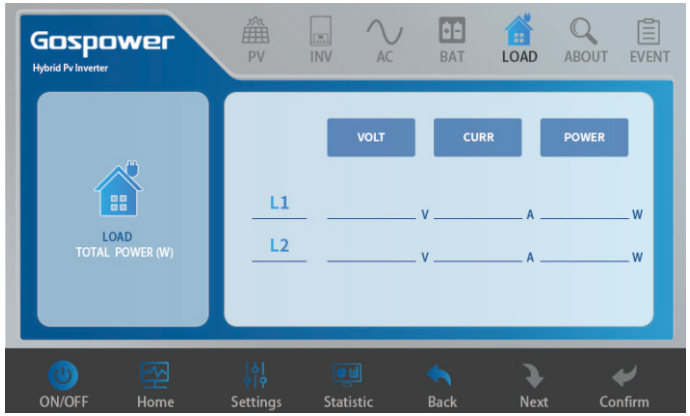




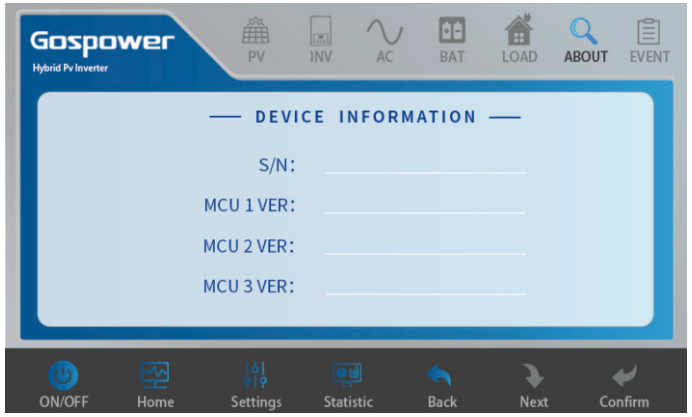
5. Tap the BAT icon to enter the Battery parameters page.



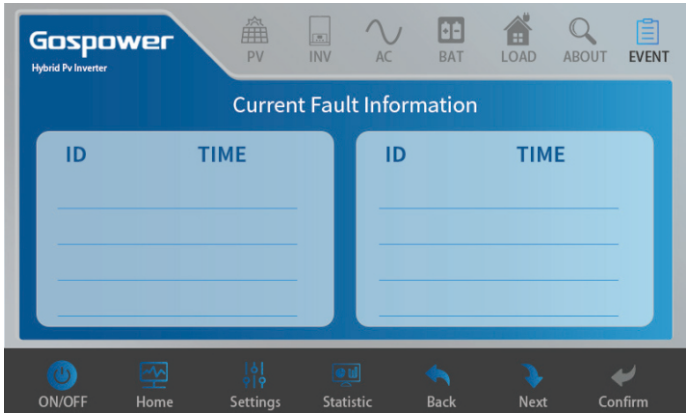
6. Tap the LOAD icon to enter the Load parameters page.



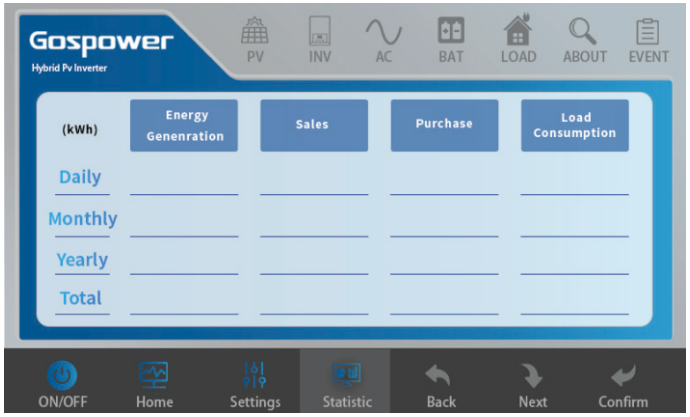
7. Tap the About icon to enter the Device information page.



8. Tap the EVENT icon to enter the Current Fault Information page, click the Back and Next buttons to switch pages, and view other information.



9. Click the Statistic button to enter the Statistic page.

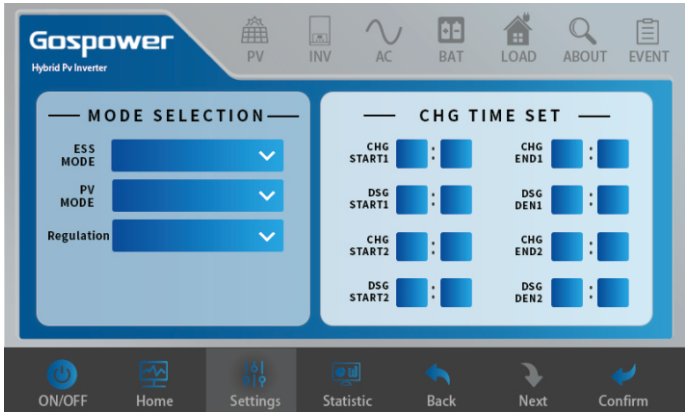


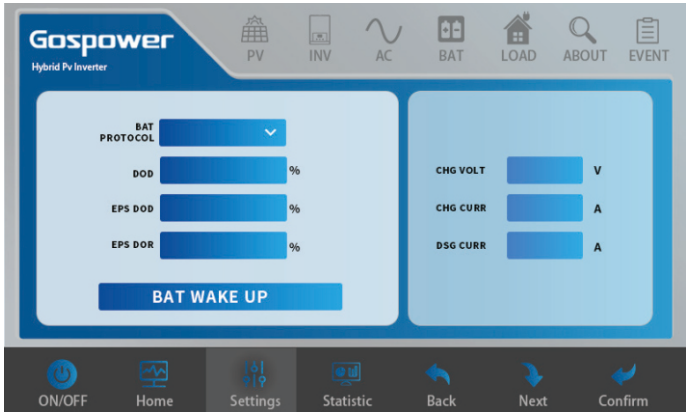
10. Setting

Tap the Setting button to enter the Setting page.

Tap the System Settings icon to enter the System Settings page, the ESS mode and PV mode can be set into this page.

Tap the BAT Settings icon to enter the BAT Settings page, the BAT PROTOCOL and DOD(the depth of discharge) can be set into this page.





NOTE:DOD=70% means that the inverter can discharge up to 70% of the battery's power, leaving the remaining 30% of the battery's power for emergency power outage backup.You can set the value of DOD according to your needs. If the value of SOC(State of charge) is lower than the value of (1-EPS DOD) , the battery will charge until the SOC value is greater than the value of (1-EPS DOR)and then discharge again.Therefore, the setting needs to follow the following logic: EPS DOD>EPS DOR>DOD.

8.2.2 Inverter Parameters

GPEX	GPEX-8KH2	GPEX-10KH2	GPEX-12KH2	GPEX-15KH2
(1)PV input				
Vmax PV (Vdc)	550V	550V	550V	550V
Isc PV	20A	20A	40A	40A
Maximum operating PV input current (each MPPT)	15.5A	15.5A	27A	27A
Maximum operating PV input current (each String)	15A	15A	15A	15A
Nominal input voltage (dc)	384V	384V	384V	384V
Range of PV input operating voltage (Vdc)	120-550V	120-550V	120-550V	120-550V
MPPT range	120-550V	120-550V	120-550V	120-550V
Range of PV voltage@ full output (Vdc)	235-550V	235-550V	225-550V	225-550V
Start input voltage (Vdc)	150V	150V	150V	150V
No. of MPPT/Strings per MPPT	4/1	4/1	4/2	4/2
Max input power per MPPT (W)	3.6KW	3.6KW	5KW	6KW
Max. PV input power	14.4KW	14.4KW	20KW	24KW
(2)Battery terminal parameters				
Nominal AC output voltage (Vac)	120/240 V (L1, L2, N)	120/240 V (L1, L2, N)	120/240 V (L1, L2, N)	120/240 V (L1, L2, N)
Nominal AC output frequency (Hz)	60Hz	60Hz	60Hz	60Hz
Nominal AC output current (Aac)(L-L)	33.3A	41.6A	50A	62.5A
Nominal AC output power (W)(240V)	8KW	10KW	12KW	15KW
Max. Continuous AC output current (Aac)	33.3A	41.6A	50A	62.5A

Max. Continuous AC output power (VA)	8KVA	10KVA	12KVA	15KVA
Output power factor rating	0.8leading☒0.8lagging			
Nominal AC input voltage (Vac)	120/240 V (L1, L2, N)	120/240 V (L1, L2, N)	120/240 V (L1, L2, N)	120/240 V (L1, L2, N)
Nominal AC input frequency (Hz)	60Hz	60Hz	60Hz	60Hz
Max. Continuous AC input current (Aac)	83.3	83.3	83.3	83.3
Nominal AC input power (W)	20KW	20KW	20KW	20KW
Max. Continuous AC input power (VA)	20KVA	20KVA	20KVA	20KVA
Nominal AC input current, Grid Charge to battery (Aac), (W)	33.3A	41.6A	50A	62.5A
Max. Continuous AC input current, Grid Charge to battery (Aac	33.3A	41.6A	50A	62.5A
Nominal AC input power, Grid Charge to battery (W)	8KW	10KW	12KW	15KW
Max. Continuous AC input power, Grid Charge to battery (VA)	8KVA	10KVA	12KVA	15KVA
Max output overcurrent protection (amps)	150A 2P	150A 2P	150A 2P	150A 2P
(3)Back-up terminal parameters				
Nominal AC output voltage (Vac)	120/240 V (L1, L2, N)	120/240 V (L1, L2, N)	120/240 V (L1, L2, N)	120/240 V (L1, L2, N)
Nominal AC output frequency (Hz)	60Hz	60Hz	60Hz	60Hz
Nominal AC output power (W)	19KW	19KW	19KW	19KW
Max. Continuous AC output current (Aac)	79.2A	79.2A	79.2A	79.2A
Max. Continuous AC output power (VA)	19KVA	19KVA	19KVA	19KVA
Max output overcurrent protection (amps)	100A 3P	100A 3P	100A 3P	100A 3P
(4)Generator terminal parameters				
Nominal AC input voltage (Vac)	240 V (L1, L2,N)	240 V (L1, L2,N)	240 V (L1, L2,N)	240 V (L1, L2,N)
Nominal AC input frequency (Hz)	60 Hz	60 Hz	60 Hz	60 Hz
Nominal AC input current (Aac)	79.2A	79.2A	79.2A	79.2A
Max. Continuous AC input current (Aac)	79.2A	79.2A	79.2A	79.2A
Max. Continuous AC input power (VA)	19KVA	19KVA	19KVA	19KVA
Max output overcurrent protection (amps)	100A 3P	100A 3P	100A 3P	100A 3P
(5)Battery terminal parameters				
Battery Type	LFP	LFP	LFP	LFP
Nominal voltage (Vdc)	153.6V	153.6V	153.6V	153.6V
Range of DC charging/output voltage (Vdc)	75-480V	75-480V	75-480V	75-480V
Max. charging/output current (Adc)	75A	75A	75A	75A
Max. charging/output power (W)	8KW	10KW	12KW	15KW
Max output overcurrent protection (amps)	100A 2P	100A 2P	100A 2P	100A 2P
Other				
Storage temperature	—30°~ +60°/0~95%	—30°~ +60°/0~95%	—30°~ +60°/0~95%	—30°~ +60°/0~95%
Normal operation temperature range	—30°~ +60°/0~95%	—30°~ +60°/0~95%	—30°~ +60°/0~95%	—30°~ +60°/0~95%
Output power temperature derating and maximum full power operating ambient	45°Cderating	45°Cderating	45°Cderating	45°Cderating
Enclosure Type	Type 4X	Type 4X	Type 4X	Type 4X
Certification	UL1741:3RD , CSA-C22.2 NO.107.1, UL1998, UL1699B ,IEEE1547-2018, IEEE1547.1-2020 , IEEE2030.5 (2018&IEEE1547.1-2020)CEC-300-2018-009-CMF,FCC PART 15B:2020 , ICES-003 ISSUE 7			

9. System Maintenance

DANGER!

Power o ffthe inverter before operations and maintenance. Otherwise, the inverter may be damaged or electric shocks may occur.

When the inverter is powered off, it takes time for the components to discharge. Wait until the components are discharged after power o ffin accordance with the labels.

Step 1: Turn o ffthe AC breaker on the ON-GRID side of the inverter.

Step 2: Turn o ffthe AC breaker on the BACK-UP side of the inverter.

Step 3: Turn o ffthe battery breaker between the inverter and the battery.

Step 4: Turn o ffthe DC switch of the inverter.

9.2 Removing the inverter

CAUTION!

• Make sure that the inverter is powered off.

• Wear proper PPE before any operations.

Step 1: Disconnect all the cables, including DC cables, AC cables, communication cables, the communication module, and PE cables.

Step 2: Remove the inverter from the mounting plate.

Step 3: Remove the mounting plate.

Step 4: Store the inverter properly. If the inverter needs to be used later, ensure that the storage conditions meet the requirements.

9.3 Disposal of the Inverter

If the inverter cannot work anymore, dispose of it according to the local disposal requirements for electrical equipment waste. Inverters cannot be disposed of as household waste.

9.4 Routine Maintenance

CAUTION!

• Make sure that the inverter is powered off.

• Wear proper PPE before any operations.

Maintaining Item	Maintaining Method	Maintaining Period
Systematic Clean	Check the heat sink, air intake, and air outlet for foreign matter or dust.	Once 4-6 months
DC Switch	Turn the DC switch on and o fften consecutive times to make sure that it is working properly.	Once a year
Electrical Connection	Check whether the cables are securely connected. Check whether the cables are broken or whether there is any exposed copper core.	Once 4-6 months
Sealing	Check whether all the cable hole are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year

10. Troubleshooting

Perform troubleshooting according to the following methods. Contact the after-sales service if these methods do not work. Collect the information below before contacting the after-sales service for the quick solutions of the problems.

1. Inverter information such as serial number, software version, installation date, fault time, fault frequency, etc.
2. Installation environment, including weather conditions, whether the PV modules are sheltered or shadowed, etc. It is recommended to provide some photos and videos to assist in analyzing the problem.
3. When fault occurs , the buzzer will work; When the fault disappears, the buzzer will stop working, or the system will restart after being powered off, and the buzzer will also stop working
4. Utility grid situation.

NO.	Name (orange is Alarm,red is Fault)	Reason	Soution
42	Relay Short	1. The relay is abnormal or short-circuited. 2. The control circuit is abnormal. 3. The AC cableconnection is abnormal, like a virtual connection or short circuit	1. Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
45	Relay Break		
52	High Grid Freq Class 1	Utility grid exception. The actual grid frequency exceeds the requirement of the local grid standard.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid frequency is within the permissible range. • Contact the local power company if the grid frequency exceeds the permissible range. • Modify the overfrequency protection threshold or disable the overfrequency protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range.
53	Low Grid Freq Class 1	Utility grid exception. The actual grid frequency is lower than the requirement of the local grid standard.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid frequency is within the permissible range. • Contact the local power company if the grid frequency exceeds thepermissible range. • Modify the overfrequency protection threshold or disable the overfrequency protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range.

54	L1 Grid Volt RMS OV Class 1	The grid voltage exceeds the permissible range, or the duration of high voltage exceeds the limit of HVRT.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid voltage is within the permissible range. • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the overvoltage protection threshold, HVRT or disable the overvoltage protection function after obtaining the approval of the local power company if the grid frequency is within the permissible range. 3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem cannot be solved.
55	L2 Grid Volt RMS OV Class 1		
57	L1 Grid Volt RMS UV Class 1	The grid voltage is lower than the permissible range, or the duration of low voltage exceeds the requirement of LVRT.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid voltage is within the permissible range. • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the grid overvoltage rapid protection threshold after obtaining the consent of the local power company if the grid voltage is within the permissible range. 3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists

58	L2 Grid Volt RMS UV Class 1		
63	On Grid Curr DCC OC		
64	Grid Offline	1. Utility grid power fails. 2. The AC cable is disconnected, or the AC breaker is off.	1. The alarm disappear automatically after the grid power supply is restored. 2. Check whether the AC cable is connected Reasonand the AC breaker is on.
65	Pos Bus Peak OV	1. The PV voltage is too high. 2. The sampling of the inverter BUS voltage is abnormal.	1. Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
66	Neg Bus Peak OV		
67	L1 Inv Curr Peak OC		
68	L2 Inv Curr Peak OC		
70	Bus Volt Peak Imbalance		
71	Inv Curr Peak Short		
72	L1 Inv Volt RMS OV		
73	L2 Inv Volt RMS OV		
78	L1 Load Curr RMS OC Class 1		
79	L2 Load Curr RMS OC Class 1		
81	L1 Load Curr RMS OC Class 2		
82	L2 Load Curr RMS OC Class 2		
84	L1 Load Curr RMS OC Class 3		
85	L2 Load Curr RMS OC Class 3		

87	L1 Gen. Volt RMS OV		
88	L2 Gen. Volt RMS OV		
90	Pos Bus Volt RMS OV		
91	Neg Bus Volt RMS OV		
92	Pos Bus Volt RMS UV		
93	Neg Bus Volt RMS UV		
96	Bus Volt RMS Imbalance		
97	O ffGrid Volt DCC OV		
98	Leak Curr Fault (On Grid)	The input insulation impedance to earth becomes low when the inverter is working.	1. If the problem occurs occasionally, it may be caused by a cable exception. The inverter will recover automatically after the problem is solved. 2. Check whether the impedance between the PV string and PE is too low if the problem occurs frequently or persists
99	Island Fault	The utility grid is disconnect ed. The utility grid is disconnected according to the safety regulations, but the grid voltage is maintained due to the loads.	1. Check whether the utility grid is disconnect ed. 2. Contact the dealer or the after-sales service.
101	HVRT Fault	Utility grid exception. The duration of utility grid exception exceeds the set time of HVRT.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid frequency is within the permissible range. If not, contact the local power company. If yes, contact the dealer or the after-sales service.

102	LVRT Fault	Utility grid exception. The duration of the utility grid exception exceeds the set time of LVRT.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid frequency is within the permissible range. If not, contact the local power company. If yes, contact the dealer or the after-sales service.
103	Heat-Sink 1 Over Temp.	1. Inverter installation location is not well-ventilat ed 2. Operation temperature exceeds Over 60°C 3. abnormal operation of the internal fan	1. Check whether the ventilation at the installation location of the inverter is good and whether the temperature exceeds the allowable temperature range. 2. If yes, please improve ventilation and cooling conditions. 3. If no, please contact your dealer or after-sales service center
104	Heat-Sink 2 Over Temp.		
107	AC Comm. Fault with PMU	1. Frame format error 2. Parity checking error 3. Can bus offline 4. Hardware CRC error 5. Send (receive) control bit is received (sent). 6. Transmit to the unit that is not allowed.	1. Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
108	AC Comm. Fault with DC		
109	Heat-Sink OT Derating		
110	Grid Freq Derating		
112	High Gen. Freq		
113	Grid Volt Derating		
118	Pos Bus HW OV		

119	Neg Bus HW OV		
120	Inv HW Short		
130	CT Fault		
132	AC MCU Fault		
134	Bus soft start timeout		
135	Inverter soft start timeout		
136	Grounding Fault	1. The PE cable of the inverter is not connected well. 2. The L cable and N cable are connected reversely when output of the PV string is grounded.	1. Check whether the PE cable of the inverter is connected properly. 2. Check whether the L cable and N cable are connected reversely if output of the PV string is grounded.
153	Load Volt OV		
154	Load Curr SC		
155	Meter Comm. Fault		
157	Inv Curr Peak OC		
173	Parallel Parameter Set Err		
174	Master Set Err		
175	Slaver Addr Set Err		
176	Slave address setting error		
177	High Grid Freq Class 2		
178	Low Grid Freq Class 2		

179	L1 Grid Volt RMS OV Class 2	The grid voltage is abnormal or ultra-high.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid voltage is within the permissible range. • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the grid overvoltage rapid protection threshold after obtaining the consent of the local power company if the grid voltage is within the permissible range.
180	L2 Grid Volt RMS OV Class 2		
182	L1 Grid Volt RMS UV Class 2		
183	L2 Grid Volt RMS UV Class 2		
185	L1 and L2 Phase Fault		
186	Parallel Master Lost		
187	Industrial Freq. Lost		
188	High Freq. Lost		
189	Parallel Comm. Err		
190	Neg Power OP Lv1		
191	Neg Power OP Lv2		
199	Pos Bus Volt Peak OV(Break)		
200	Neg Bus Volt Peak OV(Break)		

201	Pos Bus Volt RMS OV		
202	Neg Bus Volt RMS OV		
203	Pos Bus Volt RMS UV		
204	Neg Bus Volt RMS UV		
205	Pos Bus Volt HW OV		
206	Neg Bus Volt HW OV		
209	Buck-Boost 1 SW OC		
210	Buck-Boost 2 SW OC		
211	Buck-Boost 3 SW OC		
216	Bus OC Protect	1. The DC terminal is not firmly connected. 2. The DC cable is broken.	Check whether the cables are connected properly in accordance with the requirements.
217	DC Comm. Fault with PMU		
218	DC Comm. Fault with AC		
219	BMS Comm. Fault		
221	DC Heat-Sink 1 Over Temp.	1. Inverter installation location is not well-ventilat ed 2. Operation temperature exceeds Over 60°C 3. abnormal operation of the internal fan	1. Check whether the ventilation at the installation location of the inverter is good and whether the temperature exceeds the allowable temperature range. 2. If yes, please improve ventilation and cooling conditions. 3. If no, please contact your dealer or after-sales service center
222	DC Heat-Sink 2 Over Temp.		
261	DC MCU Fault		
262	EPO Break		

289	PV1 Insulation Fault	1. The PV string is short-cir cuited to PE. 2. The PV system is in a moist environment and the cable is not well insulated to the ground	1. Check whether the resistance of the PV string to PE exceeds 50kΩ. If no, check the short circuit point. 2. Check whether the PE cable is connected correctly. 3. If the resistance is lower on rainy days, please reset the insulation resistance protection threshold
290	PV2 Insulation Fault		
291	PV3 Insulation Fault		
292	PV4 Insulation Fault		
305	PV1 Volt OV	The PV array configuration is not correct. Too many PV panels are connected in series in the PV string.	Check the serial connection of the PV array. Make sure that the open circuit voltage of the PV string is not higher than the maximum operating voltage of the inverter.
306	PV2 Volt OV		
307	PV3 Volt OV		
308	PV4 Volt OV		
313	PV1 Curr OC	1. The PV configuration is not proper. 2. The hardware is damaged.	Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
314	PV2 Curr OC		
315	PV3 Curr OC		
316	PV4 Curr OC		
323	Arc Fault		
324	AFCI Self-Check Fault		
325	AFCI Comm. Fault		
355-362	Battery Fault		1. Disconnect the AC output switch and DC input switch, take o ffthe battery,then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
435			
456-460			
369-434	Battery Alarm		
436-354			
461-525			