GROWATT

MOD 3-15KTL3-X2 (Pro)

&

User Manual

Download Manual

Growatt New Energy

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Unless otherwise specified, this document is intended as an operation guide only. All statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Information on this document

This document applies to the following inverter models:
MOD (3000/4000/5000/6000/7000/8000/9000/10K/11K/12K/13K/15K)TL3-X2 (Pro)
（hereinafter referred to as MOD TL3-X2 (Pro)).
This document mainly describes the MOD TL3-X2(Pro) inverter mentioned above concerning its functions, installation, electrical connection, commissioning and maintenance. Prior to operating the inverter, read through this manual and familiarize yourself with all safety precautions and the features of the product.

The content of this document is continually reviewed and amended, where necessary. However, discrepancies cannot be excluded. Growatt reserves the right to make changes to the material at any time and without notice in order to keep the document accurate and up-to-date. For the latest documents, you can visit our official website, scan the QR code on the manual or reach out to your distributor. The parameters and images in this document are for reference only, and the actual product prevails.

This document is intended for photovoltaic (PV) plant operating personnel and qualified electricians.

Change history

Version 00

First release

Symbol convention

Symbols in this manual

The following safety symbols are used throughout this document to denote important safety information. Familiarize yourself with the symbols and their meaning before installing or operating this instrument.

Symbol	Meaning
 DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
 NOTICE	NOTICE is used to address practices which are not safety relevant.
 Information	Information that you must read and know to ensure optimal system operation.

Labels on this product

Symbol	Explanation
	Risk of high voltages which might lead to electric shocks
	Risk of fire
	Risk of burns due to hot surface
	Delayed discharge: High voltage exists after the battery is powered off. It takes 5 minutes to discharge to the safe voltage.
	Grounding: indicates the position for connecting the PE cable
	Direct Current (DC)
	Alternating Current (AC)
	Refer to the manual
	CE marking The inverter complies with the requirements of the applicable EU directives
	Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site

Definition and interpretation

AC
Abbreviation for "Alternating Current"
DC
Abbreviation for "Direct Current"
PV
Abbreviation for photovoltaic
AFCI
AFCI stands for Arc Fault Circuit Interrupter. It is a protective device designed to protect against fire hazards caused by arc faults. The Arc Fault Circuit Interrupter can detect arcs in the circuit and break the supply of electrical power to the circuit.
GFCI
GFCI stands for Ground Fault Circuit Interrupter. It is a safety device for protection against line-to-ground faults. A GFCI offers protection to users of electrical equipment against possible fatal electric shock from faulty equipment or accidental grounding.
Energy
Energy is measured in units of Wh (watt-hour), kWh (kilowatt-hour) or MWh (megawatt-hour). It is a measure of power output over time (energy = power x time). For example, if the inverter operates at a constant power of 4600 W for 30 minutes and then at a constant power of 2300 W for another 30 minutes, it would have generated a total energy output of 3450 Wh in that hour.
Power
Power is measured in W (watts), kW (kilowatts) or MW (megawatts), describing the rate at which the electricity is being used at a specific moment.
Power rate
Power rate is the ratio of current power fed into the power distribution grid and the maximum power of the inverter that can be fed into the power distribution grid.
Power factor
Power factor is the ratio between real power (measured in watts) and apparent power (measured in Volt-Amps). When the current and voltage are in phase, the power factor is 1.0. In an AC circuit, the power is not always equal to the direct product of volts and amperes due to reactive components. In order to find the true power of a single-phase AC circuit, the product of volts and amperes must be multiplied by the power factor.

Table of contents

1 Safety

Information	• Read this entire document before installing, operating and maintaining the product. Follow the instructions in this manual, note the safety symbols and observe all safety precautions.

Growatt shall not be held liable for any damage caused by the following circumstances:

- Use the product beyond the conditions specified in this manual or failure to meet the installation/environment requirements in accordance with applicable local and international standards.
- Device damage owing to force majeure, such as earthquakes, floods, volcanic eruptions, debris flows and lightning strikes.
- Failure to follow the operational instructions and safety warnings provided in the documentation.
- Unauthorized modifications to the product or the software code or disassembly of the product.
- Tools and materials prepared by the customer do not comply with local legislation and relevant standards.
- Damage caused by negligence of the customer or a third party, intentional breach, gross negligence and improper operations or damage not caused by Growatt.

1.1 Safety precautions

1.1.1 For operation personnel

- Only qualified technicians who have received professional training are permitted to install and operate the inverter. Installation personnel should read through this manual prior to installing the instrument.
- Non-professionals are not allowed to operate the equipment. Do not attempt to repair, modify or disassemble the inverter by yourself.

DANGER	• Do not work with power on; otherwise, it might lead to personal injury. • Do not wear conductive objects such as watches, bracelets, bangles, or rings during operation to avoid an electric shock. • Do not connect or disconnect power cables when the system is in operation as it may generate electric arcs and cause damage to the device. • Before performing routine maintenance, power off the system and wait 5 minutes for the capacitor to discharge to a safe level and to avoid body burns caused by the remaining heat.
WARNING	• Insulated tools must be used for all work on the system to avoid electric shocks. The dielectric withstanding voltage level must comply with local laws, regulations, standards and specifications. • Wear helmets, goggles, insulated gloves, reflective clothes and safety shoes during operation. • If a fault persists after restarting the system, please contact Growatt support. Tampering with or opening the inverter without authorization will void the warranty.

1.1.2 For electrical equipment

Information	• Check the equipment for damage before starting installation.
DANGER	• During installation, do not open the inverter without permission to prevent foreign objects from entering the device, which might cause short circuits. • The inverter must be properly grounded. • The air inlet and outlet of the fan must not be obstructed.

1.1.3 For equipment installation

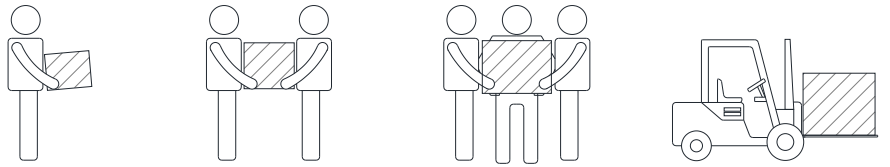
1.1.3.1 Moving heavy objects

WARNING	• Be careful when moving the inverter with consideration of its weight. Carry the equipment with your palms, rather than your fingers. Be aware of personal injury caused by a falling inverter. • If multiple persons are required to move the heavy equipment, consider factors like height when determining the manpower and work division. Ensure that the weight is evenly distributed to maintain balance. • When moving the equipment manually, wear protective gears such as gloves, safety shoes and helmets to prevent injuries.
NOTICE	• When moving the inverter, avoid applying forces to DC switches, PV terminals, BAT terminals, or AC terminals. The consequential damage to terminals or switches will not be covered by any warranty. • When moving the inverter with a forklift, it is important to ensure that the inverter is centered on the forks and is secured with appropriate straps to prevent tip-overs.

1.1.3.2 Moving the inverter

WARNING	• The inverter weighs about 16 kg and one person is required for moving it to the installation site.

Figure 1-1 Moving the inverter



1.1.3.3 Using a ladder

 WARNING	• Any work which is performed 2 meters or more is known as work at heights. Use a ladder when working at heights. If on-site conditions permit, use a double-hook safety belt when climbing the ladder to prevent falls. Do not attach the hooks to the ladder rung; instead, attach them to a solid structure that the ladder leans against. If the safety belt is not available, you are supposed to use a safety rope for fall protection. • The ladder base should be in good condition. Place the ladder on a level and solid working surface to prevent slipping and tilting.
 NOTICE	• When you need to perform live working at heights, use a wooden or insulated ladder. Check whether the ladder is as per the standards before using it. Do not use a ladder with potential safety hazards. • When working at heights, use a platform ladder with guard rails rather than a straight ladder.

1.1.3.4 Hoisting the equipment

 WARNING	• When hoisting the equipment, observe local hoisting standards closely.

1.1.3.5 Drilling holes

 NOTICE	• When drilling holes, wear protective gears, such as goggles, masks, and protective gloves. • Avoid drilling holes into the water pipes and power cables to prevent short circuits or other hazards. • When drilling holes, protect the equipment from shavings. Remove shavings from holes in time. • After drilling, clean up any dust inside the hole.

1.1.3.6 Connecting cables

 DANGER	• When exposed to light, the PV modules generate high DC voltage which is present in the DC cables. Ensure that the DC SWITCH on the inverter is set to OFF before connecting cables. • You are recommended to prepare firefighting equipment on site, such as fire sand and fire extinguishers. • Wear insulated gloves and use insulated tools to prevent electric shock injuries.

 WARNING	• Follow the wiring instructions specified in the user manual; otherwise, any device damage caused by improper wiring will not be covered under any warranty. • Unqualified persons shall not perform any electrical connections. • Wear insulated gloves to prevent static electricity from damaging the components of the inverter. • Do not use single-strand wire as the output wire for the inverter. • Do not use aluminum wire as the output cable. • Avoid overstress on the cable, which could lead to poor contact.
 Note	• When assembling cables, please keep a distance from the inverter to prevent cable debris from falling into the inverter, which might cause short circuits. • Damage caused by dust or moisture penetration due to improper installation of waterproof connectors is beyond the scope of warranty.

2 Product overview

2.1 Introduction

Features

The MOD TL3-X2(Pro) is a high-quality grid-tied inverter that converts the solar power generated by the PV panels into three-phase AC power and feeds it to the utility grid.

Model description

MOD 10K TL3 - X2 (Pro)
① ② ③④ ⑤

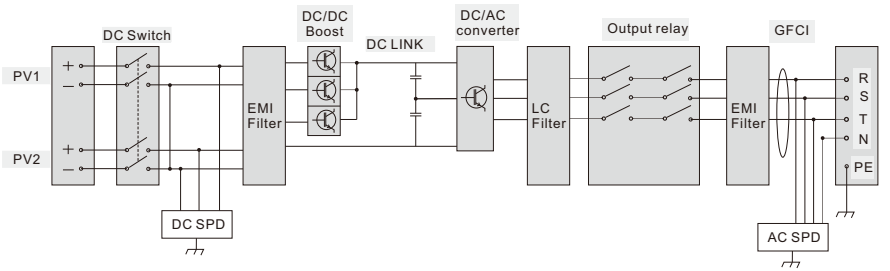
Table 2-1 Model description

Designation	Meaning	Description
①	Product series	MOD: Product series name
②	Power class	• 15K: the rated power is 15kW • 13K: the rated power is 13kW • 12K: the rated power is 12kW • 11K: the rated power is 11kW • 10K: the rated power is 10kW • 9000: the rated power is 9000W • 8000: the rated power is 8000W • 7000: the rated power is 7000W • 6000: the rated power is 6000W • 5000: the rated power is 5000W • 4000: the rated power is 4000W • 3000: the rated power is 3000W
③	Electronic architecture	TL: transformerless inverter
④	AC output	• /: single-phase • 3: three-phase
⑤	Feature	• X2 (Pro): PV Inverter

2.2 Working principle

The MOD 3-15KTL3-X2 (Pro) inverter features 2 independent MPPT (maximum power point tracking) channels. The inverter performs maximum power point tracking on the string inputs through the PV circuits and then converts the direct current (DC) to three-phase alternating current (AC) through the inverter circuit. It supports surge protection on the DC side and surge protection as well as ground fault protection on the AC side.

Figure 2-1 Schematic diagram



2.3 Operating status

There are four operating statuses of the MOD TL3-X2 (Pro) inverter: Standby, Normal, Fault and Update.

Figure 2-2 Operating mode

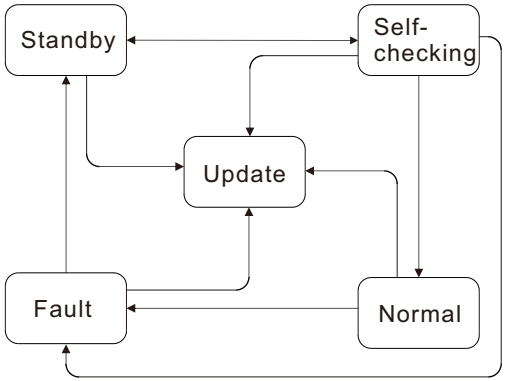


Table 2-2 Operating mode description

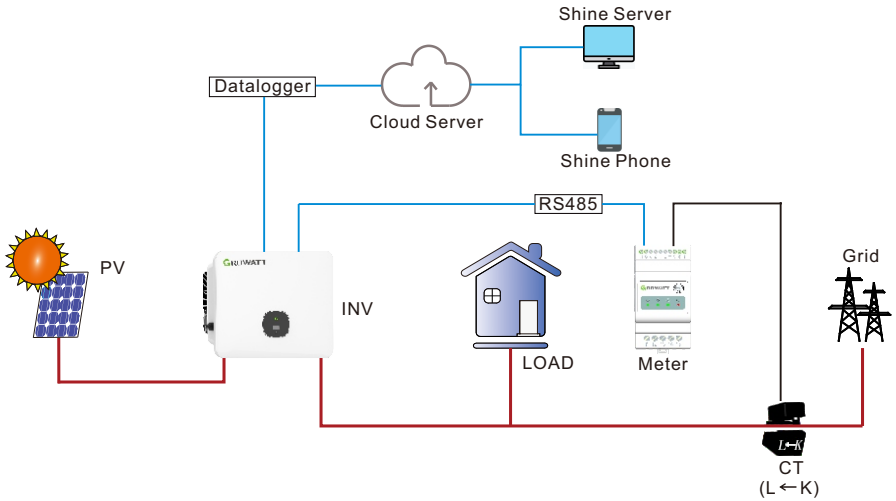
Operating status	Description
Standby	Receive a shutdown command or the PV voltage does not meet the requirement for grid connection
Self-checking	Conduct self-check to check if the grid connection requirements are met
Normal	Successfully connected to the grid or the inverter is working in the off-grid mode normally
Fault	A fault has occurred. The inverter exits the on-grid or off-grid output status
Update	Updating the firmware

2.4 Application scenarios

2.4.1 Grid-tied PV

NOTICE	• The use of an external electrical meter depends on the application scenario. For the export limitation function, a meter is required, which should be installed between the grid and loads.

Figure 2-3 PV System



2.5 Functions

2.5.1 Touch button

The MOD TL3-X2 (Pro) inverter features a touch button for user interaction. Tapping the button allows you to view different contents displayed on the OLED screen. Configuring parameters on the OLED display is also supported. For details, please refer to Section 6 Human-machine interaction.

2.5.2 LED indicator

The MOD TL3-X2 (Pro) inverter is equipped with a leaf-shaped LED indicator, which demonstrates the operating status of the inverter. The meaning of the LED indication is illustrated in the table below:

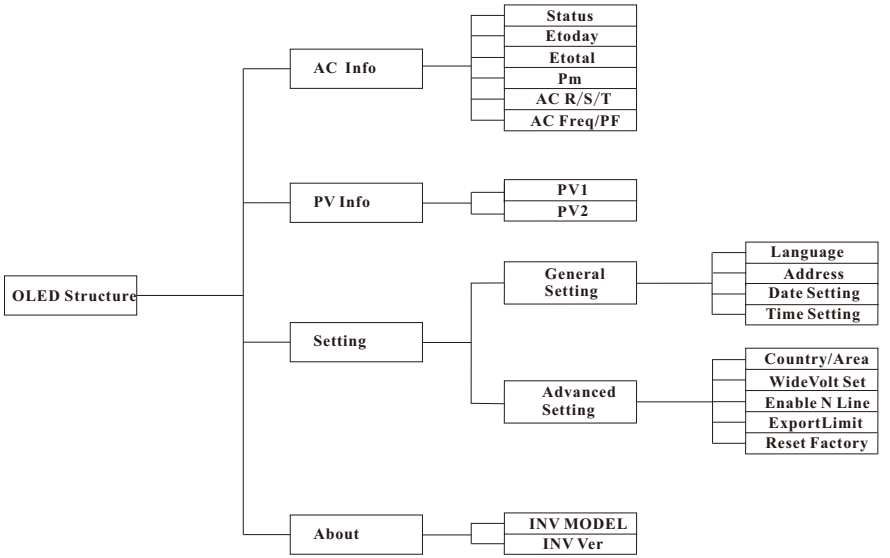
Table 2-4 LED indicator description

Symbol	Description	Inverter status	LED color	LED status
	Inverter status indicator	Standby	Green	0.5s on and 2s off
		Normal	Green	Solid
		Fault	Red	Solid
		Inverter warning	Green	0.5s on, 0.5s off
		Programming	Yellow	1s on and 1s off

2.5.3 OLED display

The MOD TL3-X2 (Pro) inverter comes with an OLED screen to display critical information, as shown in the figure below:

Figure 2-8 OLED display



2.5.4 Export limitation

When the MOD TL3-X2 (Pro) inverter is connected to an energy meter and the communication between the inverter and the meter is established, the export limitation function can be activated. The detailed configuring steps are shown in Section 8.1 Export limitation.

Standard export limitation

- When the "Phase levels" is disabled and the export limitation value is set to a positive value, it indicates the power allowed to be exported to the grid as a percentage. For example, if the inverter's rated power is 10 kW, and the export limitation is set to 30%, the power allowed to be fed to the grid is 10 kW * 30% = 3 kW. If Phase L1 carries a 1 kW load, Phase L2 and Phase L3 do not carry a load, the output of the inverter would be: L1: 1.33 kW, L2: 1.33 kW, L3: 1.33 kW and the power fed to the grid would be: L1: 0.33 kW, L2: 1.33 kW, L3: 1.33 kW.
- When the export limitation value is set to a negative value, it indicates the power allowed to be drawn from the grid as a percentage. For example, if the inverter's rated power is 10 kW, and the export limitation is set to -30%, the power allowed to be drawn from the grid is 10 kW * 30% = 3 kW. If the load power is greater than 3 kW (e.g. load power is 4 kW), the power grid provides 3 kW, and other energy needed will be supplied by the inverter output. When the PV energy is insufficient (e.g. PV power is 0.5kW), the inverter will output at its maximum power while drawing energy from the grid to power the loads.

2.5.5 Demand Response Modes (DRMs) & Radio Ripple Control Receiver (RRCR)

The MOD TL3-X2 (Pro) inverter is DRM compliant and can connect to a Radio Ripple Control Receiver (RRCR). A connector is used as the input port for DRMs and RRCR. For the port definitions, you can refer to Section 5.7.1 COM port definition.

- In accordance with Australian standards, the inverter has been designed to comply with Demand Response Modes (DRMs), with DRM 0 being a mandatory requirement. The DRMs is set to disabled by default. To enable it, please contact Growatt customer support. For details, please refer to Section 8.2 DRMs & Remote logic control.
- According to European standards, the inverter can be connected to a RRCR , which is enabled by default. For details, please refer to Section 8.2 DRMs & Remote logic control.

2.5.6 Dry contact

The MOD TL3-X2 (Pro) inverter features the dry contact function. Once it is enabled, Pin 1 and Pin 2 of the COM port on the inverter will output a 12V signal when the inverter's output power reaches the preset activation power level. This signal can be used as an activation or deactivation signal for other devices. Conversely, when the inverter's output power reaches the specified deactivation power level, the voltage output from Pin 1 and Pin 2 of the inverter's COM port changes from 12V to 0V, providing another signal that can be used as an activation or deactivation signal for other devices.

2.5.7 AFCI (Arc Fault Circuit Interrupter)

When the PV modules or the cables are in poor contact or damaged, an electrical arc may occur on the DC side, which might lead to a fire hazard. Growatt inverters are integrated with an arc-fault detection function in compliance with UL1699B-2018 standards. This feature is designed to ensure the safety of users' lives and property.
The AFCI function is disabled by default. You can enable this function on a couple of platforms, including the OSS, ShineServer, ShinePhone and ShineTools. Alternatively, you can contact Growatt support for assistance.

2.5.8 GFCI (Ground Fault Circuit Interrupter)

The MOD TL3-X2 (Pro) inverter is integrated with a leakage protection function. When the leakage current exceeds 300mA and continues for more than 300ms, the inverter will disconnect from the grid while reporting "Fault 201" and displaying "Residual I High". This feature is designed to ensure the safety of users' lives and property. The GFCI function is enabled by default.

2.5.9 Monitoring

The MOD TL3-X2 (Pro) inverter has a reserved port for connecting to the datalogger. After installing and registering the Growatt datalogger, you can monitor the system's operation status and configure its functions on ShinePhone (APP), ShineServer (https://server.growatt.com), and the OSS (https://oss.growatt.com).

3 Inspection upon delivery

3.1 Checking the packing list

Before unpacking the inverter, check the outer packing materials for any externally visible damage. After unpacking the inverter, check the scope of delivery for completeness. If the scope of delivery is incomplete or damaged, contact your dealer.

Figure 3-1 Scope of delivery

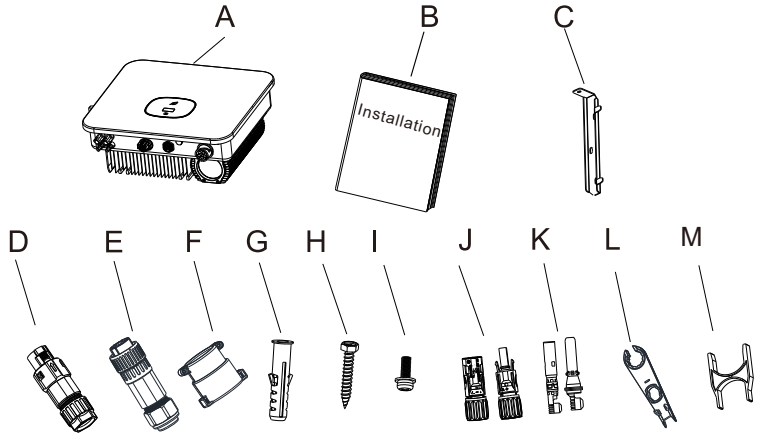


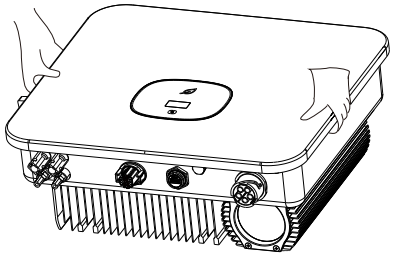
Table 3-1 Packing list of the MOD TL3-X2 (Pro) inverter

No.	Description	Quantity
A	Inverter	1
B	Quick Installation Guide	1
C	Wall-mounting bracket	1
D	COM port connector	1
E	AC connector	1
F	Porective cover	1
G	Plastic expansion tube	3
H	Expansion screw	3
I	Hexagon head screw	1
J	PV connector	2/2
K	PV metal contact	2/2
L	PV terminal removal tool	1
M	COM port removal tool	1

3.2 Moving the inverter

WARNING	• When moving the inverter, do not place your hands on the terminals, which are not designed to support the weight of the inverter. • When placing the inverter on the ground, it is essential to put foam or cardboard underneath it to prevent damage to the heat sink.

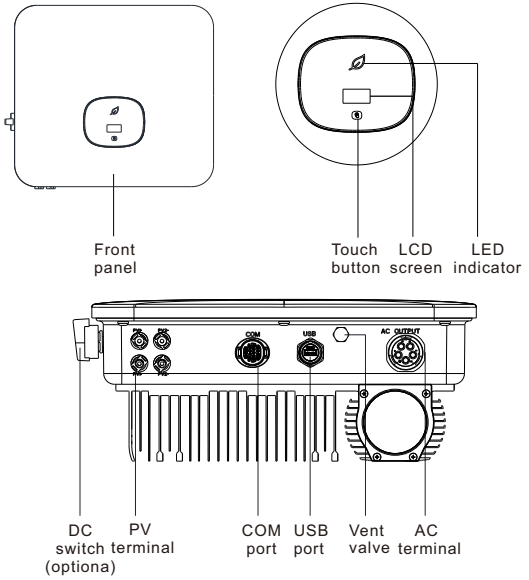
Figure 3-2 Lifting the inverter



3.3 Appearance

NOTICE	• The MOD 3-15KTL3-X2 (Pro) has two PV inputs.

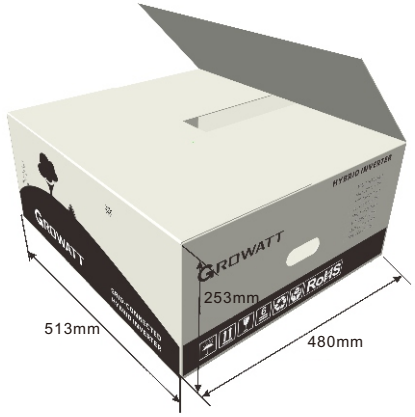
Figure 3-3 Appearance



3.4 Dimensions and weight

3.4.1 Dimensions of the package

Figure 3-4 Dimensions of the packing carton



3.4.2 Dimensions and weight of the inverter

Figure 3-5 Dimensions of the inverter

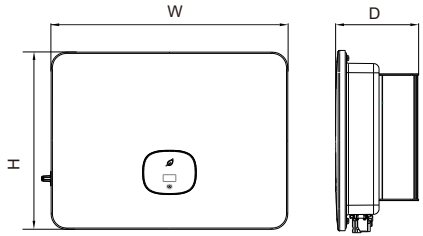


Table 3-2 Dimensions and weight

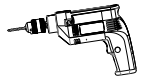
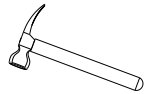
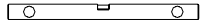
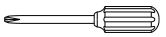
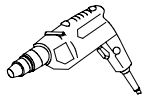
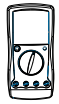
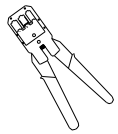
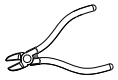
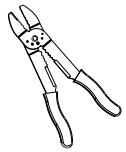
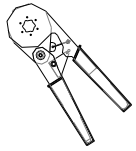
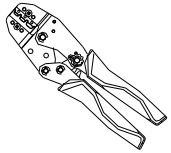
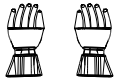
Model	Height (H)	Width (W)	Depth (D)	Weight
MOD 3-10KTL3-X2 (Pro)	387 mm	425 mm	178 mm	14.6 kg
MOD 11-15KTL3-X2 (Pro)	387 mm	425 mm	178 mm	15.6 kg

3.5 Storing the inverter

- Do not remove the exterior package of the inverter.
- Keep the storing temperature between -25℃ and 60℃, and the relative humidity between 5% RH and 95% RH.
- A maximum of 4 inverters can be stacked with package. Please use extreme caution when stacking the inverter to prevent device damage and personal injury resulting from a falling inverter.
- In case that the inverter has been stored for over two years, it must be inspected and tested by professional personnel before being put into operation.

4.1 Required tools

Table 4-1 Installation tools

Tools				
 Hammer drill	 Drilling bit (Φ8mm)	 Hammer	 Level	 Cross-head screwdriver
 Vacuum	 Marker	 Measuring tape	 Heat gun	 Multimeter
 Wire stripper	 Slanted mouth plier	  Crimping plier		
 Safety gloves	 Goggles	 Mask	 Safety shoes	 Helmet

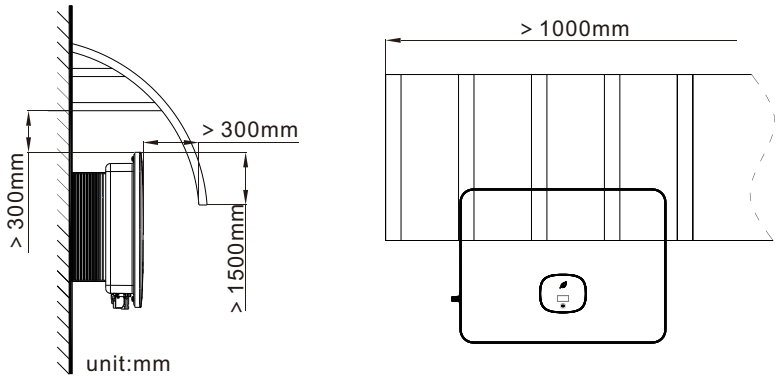
4.2 Installation requirements

4.2.1 Environment requirements

- The inverter is protected to IP66, supporting both indoor and outdoor installation.
- Do not install the inverter in areas where flammable or explosive materials are stored.
- When determining the installation location, avoid water pipes and wires buried in the wall to prevent accidents during drilling.
- The inverter generates high temperature on the enclosure during operation, so please install it in a location that is inaccessible to children.
- If the inverter is installed in an area with dense vegetation, in addition to regular weeding, the ground beneath the inverter (recommended area: 3m × 2.5m) should be hardened, such as by laying concrete or gravel.
- The inverter should be installed in a dry and well-ventilated environment to ensure proper heat dissipation.
- Do not expose the inverter to direct sunlight, rain, snow, etc. It is recommended to install an awning over the inverter.

Figure 4-1 Environment requirements

Figure 4-2 Installing an awning and clearance requirements

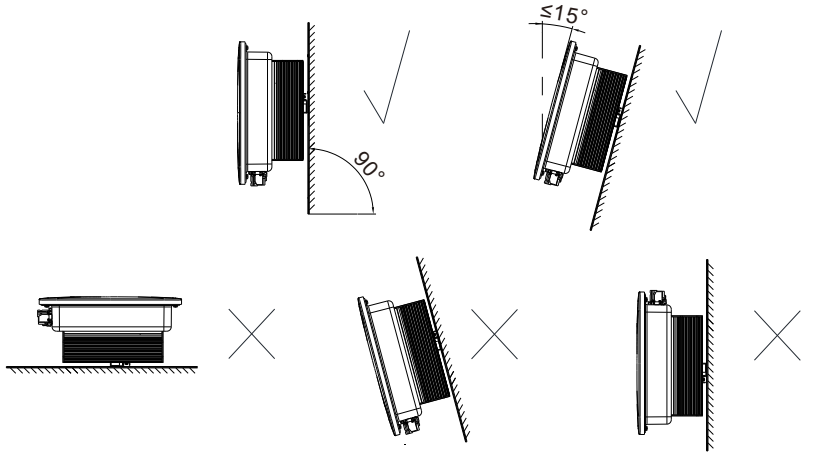


4.2.2 Carrier requirements

- Ensure that the installation surface meets the load-bearing requirement for supporting the weight of the inverter.
- The carrier where the inverter is installed must be fire-proof and high-temperature resistant.
- In residential areas, avoid mounting the inverter on gypsum boards or walls made of similar materials that has poor sound insulation performance to prevent the noise generated during its operation from disturbing residents in the living area.

4.2.2.1 Angle requirements

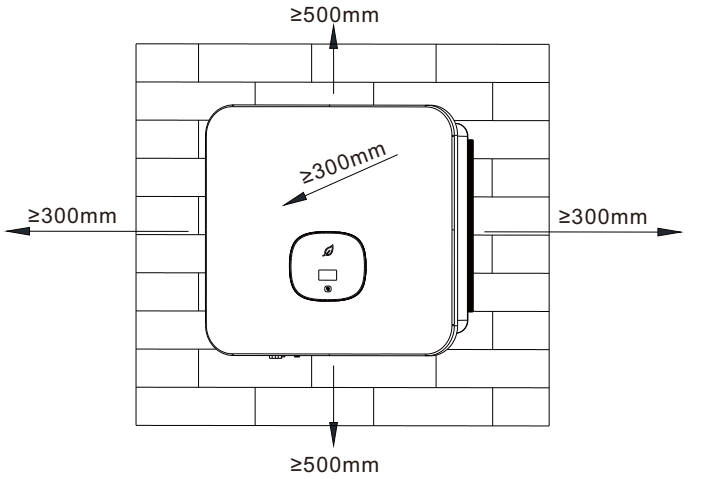
Figure 4-3 Angle requirements



4.2.2.2 Space requirements

- To ensure optimal operation of the inverter and facilitate ease of operation, please reserve enough space around the inverter.
- The temperature at the ventilation air outlet is relatively high. Therefore, the clearance requirements must be strictly adhered to in order to prevent it from affecting the performance of other devices. Please refer to the figure below:

Figure 4-4 Space requirements



When multiple inverters are installed, please refer to the following figures to maintain proper clearances:

Figure 4-5 Horizontal installation

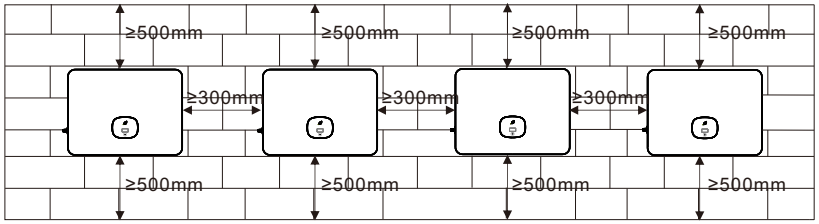
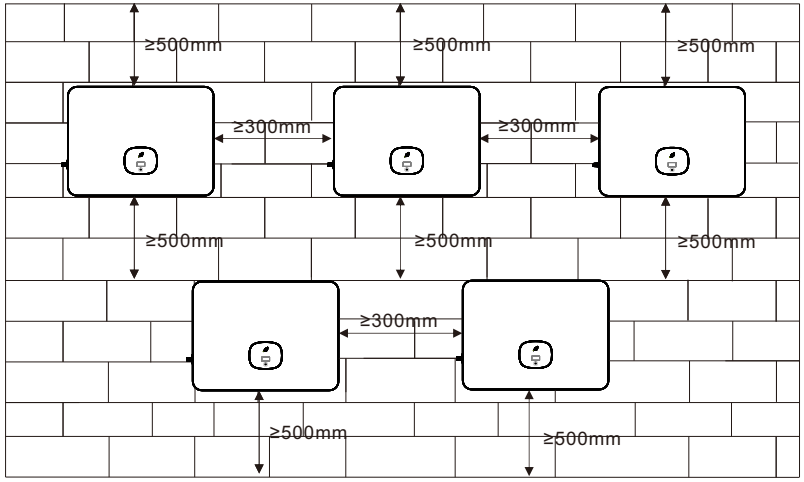


Figure 4-6 Two-row staggered installation



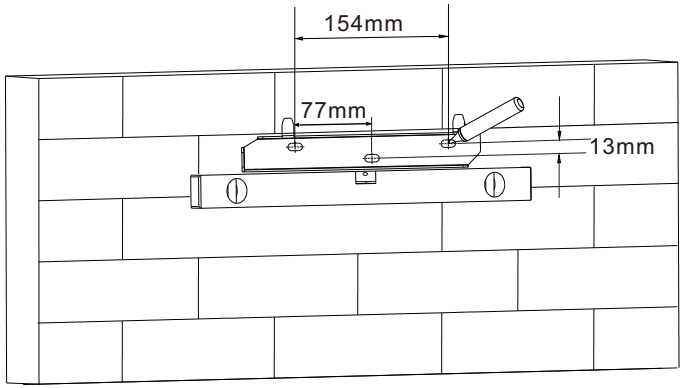
4.3 Wall-mounted installation

4.3.1 Installing the mounting bracket

DANGER	• Operation personnel should wear goggles and dust masks when drilling holes to prevent dust inhalation or contact with eyes.
WARNING	• After drilling holes, remove all the dust and debris inside and around the holes using a vacuum. Then, measure the hole spacing. For holes with inaccurate positons, drill holes again. • Ensure that the mounting bracket is level with the cement wall. Otherwise, the inverter cannot be mounted on the wall securely.

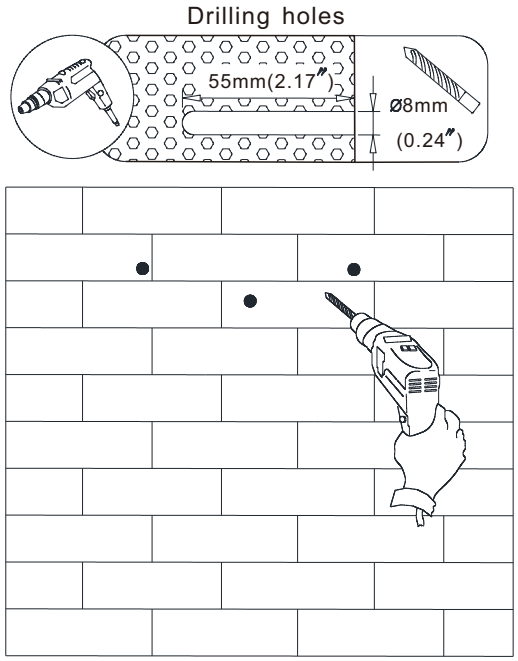
Step 1. Determining the hole position
Place the level at the predetermined installation position, then place the bracket above the level and mark the hole positions using the marker.

Figure 4-7 Dimensions of the mounting bracket



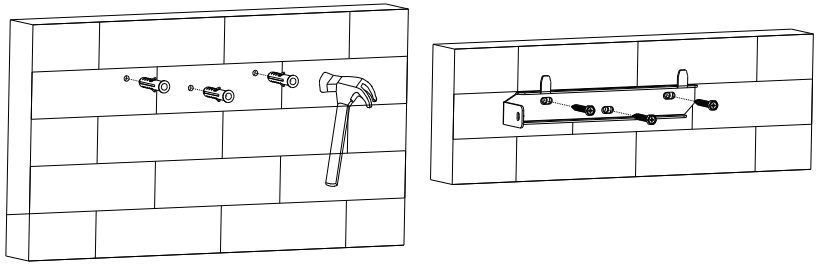
Step 2. Drilling holes
Drill holes on the marked positions with a Φ10 mm drill bit to a depth of 55 mm.

Figure 4-8 Drill bit size and drilling holes



Step 3: Securing the mounting bracket
Knock the plastic expansion tube, which can be found in the accessory bag, into the hole with a hammer. Then secure the bracket into the plastic expansion tube by tightening the screw.

Figure 4-9 Tightening the screws to secure the bracket



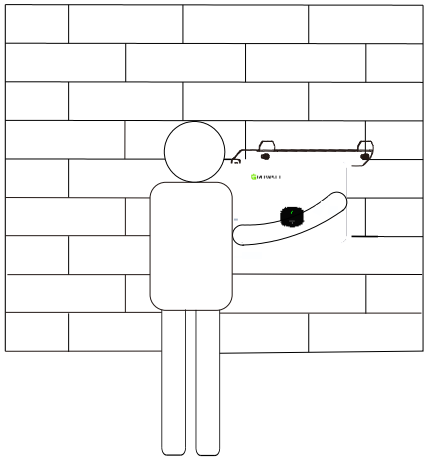
Step 4. Verifying that the bracket is securely installed
Shake the bracket with your hands to check if the bracket is securely installed.

4.3.2 Installing the inverter

Information	• Prior to installing the inverter, ensure that the mounting bracket is securely installed. • Electrical connections can only be performed after the securing screws are tightened.

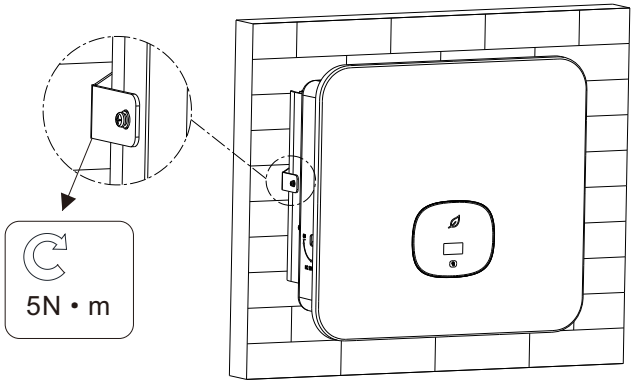
Step 1. Hang the inverter onto the bracket, carefully adjusting its position to ensure it is balanced on the wall bracket.

Figure 4-10 Moving the inverter by one person



Step 2. Secure the inverter to the bracket using M5 screws.

Figure 4-11 Securing the screw onto the inverter



5 Electrical connection

5.1 Safety precautions

 DANGER	• When exposed to light, the PV modules generate high DC voltage which is present in the DC cables. Ensure that the DC SWITCH on the inverter is set to OFF before connecting cables. • You are recommended to prepare firefighting equipment on site, such as fire sand and fire extinguishers. • Wear insulated gloves and use insulated tools to prevent electric shock injuries.
 WARNING	• Follow the wiring instructions specified in the user manual. otherwise, any device damage caused by improper wiring will not be covered under any warranty. • Unqualified persons shall not perform any electrical connections. • Wear insulated gloves to prevent static electricity from damaging the components of the inverter. • Do not use single-strand wire as the output wire for the inverter. • Do not use aluminum wire as the output cable. • Avoid overstress on the cable, which could lead to poor contact.
 Note	• When assembling cables, please keep a distance from the inverter to prevent cable debris from falling into the inverter, which might cause short circuits. • Damage caused by dust or moisture penetration due to improper installation of waterproof connectors is beyond the scope of warranty.

5.2 Preparing cables

Note: The cable specifications must comply with local regulations.

Table 5-1 Cable specifications

No.	Cable	Type	Recommended specifications	Source
1	DC input cable	Outdoor PV cable	• 4mm²~6mm²	Prepared by users
2	AC output cable	Outdoor copper core cable	• MOD 3-6KTL3-X2 (Pro): 6mm²~8mm² • MOD 7-10KTL3-X2 (Pro): 6mm²~10mm² • MOD 11-15KTL3-X2 (Pro): 10mm²~12mm²	Prepared by users
3	Signal cable	Outdoor shielded twisted pair cable	• 0.2mm²~1mm²	Prepared by users
4	Grounding cable	Outdoor copper core cable	• ≥5.5mm²	Prepared by users

5.3 Preparing the AC breaker

- An external AC circuit breaker should be installed on the AC side of the inverter to ensure a safe disconnection between the inverter and the grid.
- The AC breaker is not required to offer residual current protection as the inverter is equipped with a sensitive residual current detection device (RCD). If local regulations require the use of an AC breaker that incorporates residual current protection, it is advised to install a type A RCD between the inverter and the grid. The rated residual current must be greater than or equal to 300 mA.

 DANGER	• If an AC breaker with a rating greater than the recommended specification or the value outlined in local regulations is used, the inverter might fail to disconnect from the grid when an exception occurs, which might lead to severe damage. Growatt shall not be liable for the consequences.
 WARNING	• Each inverter must be equipped with an AC output breaker, and multiple inverters cannot share the same AC breaker.
 Note	• Users are responsible for preparing the terminals for connecting the AC breaker.

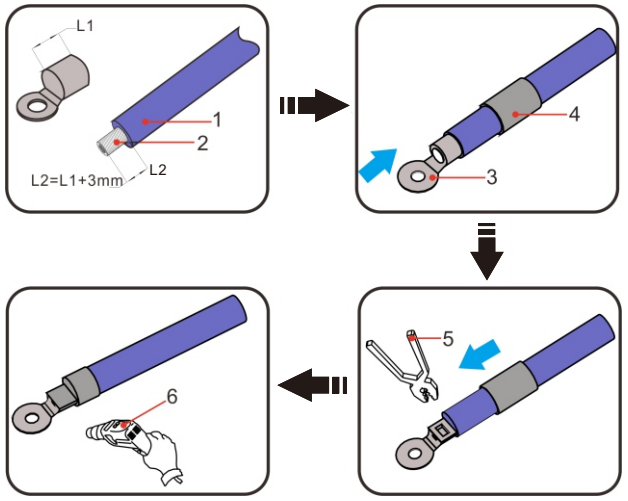
Table 5-2 AC breaker specifications

Inverter Model	Recommended AC breaker specification
MOD 3000TL3-X2 (Pro)	10A/230V
MOD 4000TL3-X2 (Pro)	10A/230V
MOD 5000TL3-X2 (Pro)	16A/230V
MOD 6000TL3-X2 (Pro)	16A/230V
MOD 7000TL3-X2 (Pro)	16A/230V
MOD 8000TL3-X2 (Pro)	20A/230V
MOD 9000TL3-X2 (Pro)	20A/230V
MOD 10KTL3-X2 (Pro)	25A/230V
MOD 11KTL3-X2 (Pro)	25A/230V
MOD 12KTL3-X2 (Pro)	25A/230V
MOD 13KTL3-X2 (Pro)	32A/230V
MOD 15KTL3-X2 (Pro)	32A/230V

5.4 Connecting the grounding cable

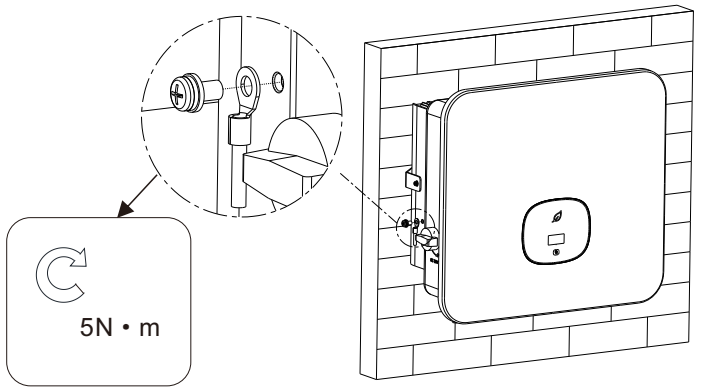
DANGER	• Please ensure that the grounding cable is securely connected; failure to do so may lead to an electric shock. • It is strictly prohibited to utilize the N-line as a grounding cable and connect it to the inverter's enclosure, as this can cause an electric shock.
WARNING	• The PE point at the AC output terminal serves only as an equipotential connection point and should not substitute for the protective grounding point on the enclosure. • It is recommended to apply silicone gel or paint around the grounding terminal as a protective coating after installation to prevent corrosion. • Lightning protection for the PV system should comply with international standards or IEC standards. Failure to do so may result in damage to PV components, accessories, inverters, and distribution facilities. In such cases, the company shall not be liable for the consequences.
Note	• Be careful not to damage the wire core while stripping wires. • The cavity formed after crimping the conductor in OT terminals should fully encapsulate the wire core, ensuring a tight and secure connection. • You can use heat shrink tubing or insulating tape to cover the crimped area. The use of heat shrink tubing is described as an example. • When using a heat gun, please take precautions to avoid equipment burns.

Figure 5-1 Preparing the cable



(1) Cable (2) Cable core (3) OT terminal (4) Heat shrink tubing (5) Crimping plier (6) Heat gun

Figure 5-2 Screw for grounding the enclosure

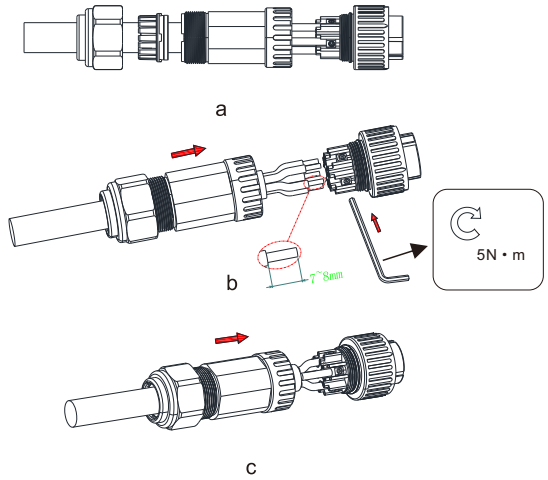


5.5 Connecting the AC output cable

DANGER	• An external AC circuit breaker is required on the AC side to ensure that the inverter can be safely disconnected from the grid. • If an AC breaker with a rating greater than the recommended specification or the value outlined in local regulations is used, the inverter might fail to disconnect from the grid when an exception occurs, which might lead to severe damage. Growatt shall not be liable for the consequences.
WARNING	• Each inverter must be equipped with an AC output breaker, and multiple inverters cannot share the same AC breaker.
Note	• Be careful not to damage the wire core while stripping wires. • The cavity formed after crimping the conductor in OT terminals should fully encapsulate the wire core, ensuring a tight and secure connection. • You can use heat shrink tubing or insulating tape to cover the crimped area. The use of heat shrink tubing is described as an example. • When using a heat gun, please take precautions to avoid equipment burns.

Step 1. Strip the five wires (A, B, C, N, PE) to a length of 7~8 mm. Route the wires through the cable gland, seal and housing of the AC connector, then connect them to the corresponding terminals. Secure the wires in place using the hex socket head screws.

Figure 5-3 Assembling the AC connector



Step 2. Connect the AC connector to the AC output terminal on the inverter. Ensure that the five wires are correctly assigned to the terminals according to the label on the AC output terminal. Then secure the protective cover onto the AC connector.

Figure 5-4 Connecting and Removing the AC connector

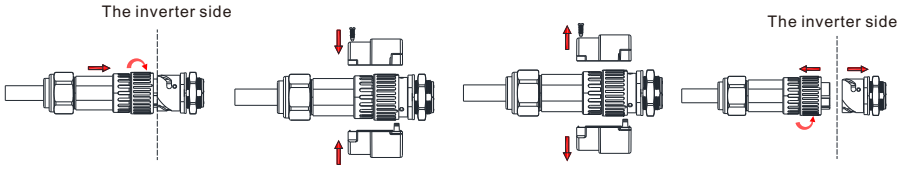
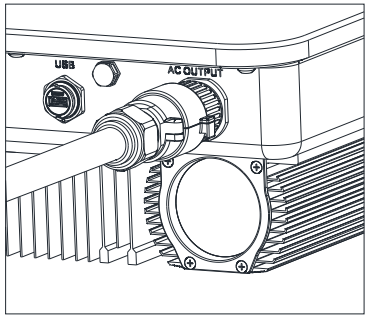


Figure 5-5 Finishing the AC connection

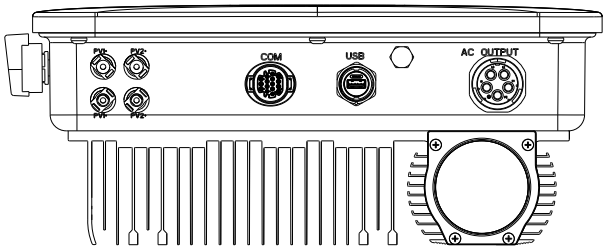


5.6 Connecting the DC input cable

DANGER	• Before connecting the DC input cables, verify that the DC voltage is within the permissible range (< 36V DC) and ensure that the DC SWITCH on the inverter is set to the OFF position. Otherwise, high voltages may lead to electric shocks. • Do not perform maintenance operations on the DC input cables when the inverter is in operation, such as connecting or removing a PV string or its component. Failure to do so may cause electric shocks. • If the DC input terminals of the inverter are not connected to the PV strings, do not remove the waterproof cover from the DC input terminals, as this could compromise the equipment's protection rating.
WARNING	Please ensure that the following conditions are met, as failure to do so may damage the inverter or pose a fire hazard. In such cases, the company shall not be liable for any consequences: • The maximum open-circuit voltage of each PV string must not exceed 1100Vdc under any conditions. • When the voltage of each PV string exceeds 1000V, the inverter will stop power output. • PV modules in each string should be of the same specification and type. • The maximum short-circuit current for each MPPT must not exceed 25A under any circumstances. • In cases where the inverter has no isolated transformer for its output, the negative pole of the PV panel is energized and grounding PV- is prohibited. • Pay attention to the correct polarity when connecting the DC cables. Connect the positive and negative terminals of the PV string to the positive and negative PV terminals on the inverter correspondingly. • In case that the DC cables are reversely connected, do not operate the DC switch and the positive and negative connectors immediately. Wait until the solar irradiance declines in the evening and the PV string current drops below 0.5A. Then turn the DC SWITCH to the OFF position and remove the positive and negative connectors to correct the polarity of the DC input cables.
Note	Device damage resulting from the following circumstances during the installation of PV strings and the inverter is beyond the scope of warranty: • Improper installation of distribution cables or incorrect wiring that leads to a short circuit between the positive or negative terminal of the PV string and ground, which may cause an AC/DC short circuit during inverter operation. • Moisture or dust penetration due to inappropriate sealing on the PV side.

Description
The MOD 3-15TL3-X2 (Pro) inverter has two PV inputs.

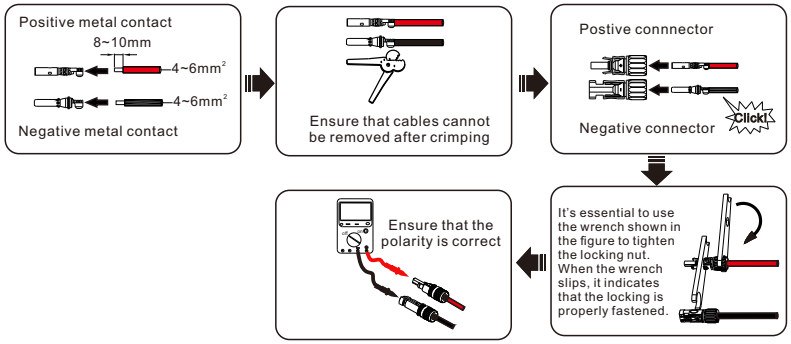
Figure 5-6 PV inputs



5.6.1 Connecting the PV terminal

WARNING	• Please use the positive and negative metal contacts and the DC connectors delivered with the inverter package. Using other incompatible models may result in severe consequences, which will void the warranty. • Crimp the PV metal contact with a dedicated crimper. Using an inappropriate crimping tool may lead to severe consequences, and any device damage caused by this is not covered by the warranty. • Cables with high rigidity are not recommended for the DC input as bending of cables may lead to poor contact of terminals. • When assembling the DC connectors, pay attention to the correct polarity and label the positive and negative cables. • After snapping the positive and negative connectors into place, pull the cables slightly to ensure that they are securely in place. • When wiring the DC input cables at the installation site, leave at least 50 mm of them slack. The axial tension on the PV connector should not exceed 80N and do not apply radial stress or torque on the PV connectors.

Figure 5-7 Preparing the PV input cables



5.7 Connecting the communication cable

WARNING	• When arranging the signal cables, separate them from power cables and keep them away from strong interference sources to avoid communication interruption. • If a signal cable is not required to be connected, please do not remove the COM terminal dustproof cover preinstalled on the inverter. • Crimp the tube terminal onto the end of the signal cable using a tube terminal crimper. Ensure the connection is secure and does not detach, as this could otherwise affect communication quality.

5.7.1 COM port definition

Figure 5-8 COM port

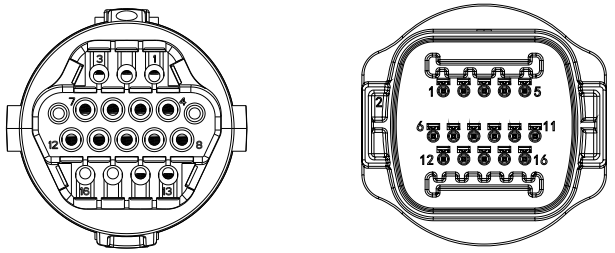


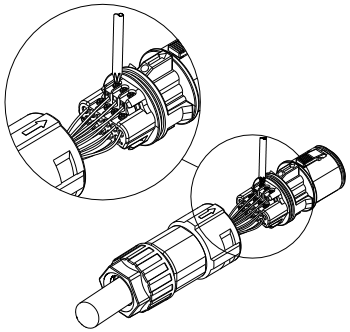
Table 5-3 Pin definition of the COM port

No.	Description	Remarks
1	+12V	Dry contact: the power supply should not be greater than 2W
2	COM	
3	RS485A1	RS485 communication port
4	RS485B1	
5	RS485A2	BAT communication port(reserved)
6	RS485B2	
7	RS485A3	Meter communication port
8	RS485B3	
9	Relay contact 1 /DRM 5	Relay contact 1 input/DRM5 command
10	Relay contact 2 /DRM 6	Relay contact 2 input/DRM6 command
11	Relay contact 3 /DRM 7	Relay contact 3 input/DRM7 command
12	Relay contact 4 /DRM 8	Relay contact 4 input/DRM8 command
13	REF/GEN	Relay&DRM signal reference
14	DRM0/COM	DRM0 common node

5.7.2 Connecting the COM connector

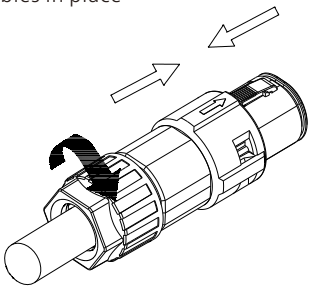
Strip the cable to a length of 10 mm then pass it through the waterproof connector cover and the threaded sleeve. Crimp the corresponding terminal provided in the accessory bag onto the communication cable, and plug in the communication connector.

Figure 5-9 Preparing the cable wiring to the COM port



Connect the connector to the COM port on the inverter and ensure that they are securely connected.

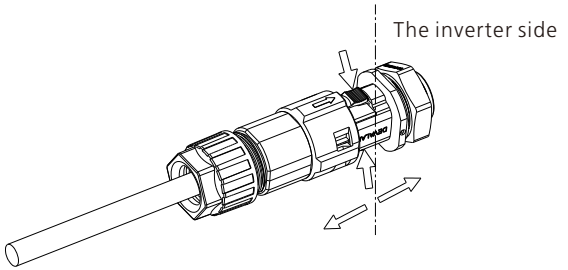
Figure 5-10 Securing the cables in place



5.7.3 Removing the COM connector

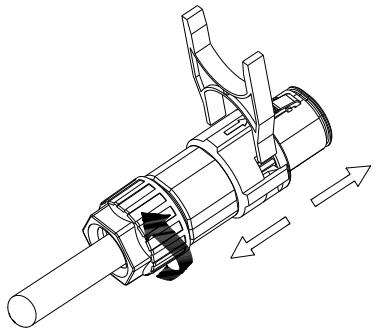
Press down the fastener, then remove the terminal from the inverter.

Figure 5-11 Removing the connector



Press the green area of the communication terminal using a flat-head screwdriver, then remove the communication cable.

Figure 5-12 Insert the H-shaped tool and pull it out of the socket Removing the cables



5.8 Connecting the meter (optional)

NOTICE	• The inverter supports export limitation, setting different operating modes, and monitoring self-consumption. To enable these functions, an external smart meter is required. Please purchase the meter from Growatt and the recommended model is the TPM-CT-G 100A smart meter. • After connecting the meter, you need to enable the meter communication on the inverter.

Recommended meter models:

Table 5-4 Meter specification

No.	Brand	Recommended model	Applicable system	Source
1	Growatt	• TPM-CT-G 100A	System with a single inverter /AC-Coupled system	Purchase from Growatt
2	Eastron	• SDM630-Modbus V3	System with a single inverter	Purchase from Growatt
3	Eastron	• SDM630MCT 40mA	System with a single inverter / multiple inverters connected in parallel	Purchase from Growatt
4	CHINT	• DTSU666/3*220/5(80)A	System with a single inverter	Purchase from Growatt
5	CHINT	• DTSU666/3*220/1.5(6)A	System with a single inverter	Purchase from Growatt

WARNING	• The phase sequence of the inverter must correspond with that of the meter; otherwise, it will not support export limitation and operating the inverter in different modes. • A smart meter is required for the energy storage system; otherwise, certain functions will be unavailable.

5.8.1 Connecting Growatt smart meter

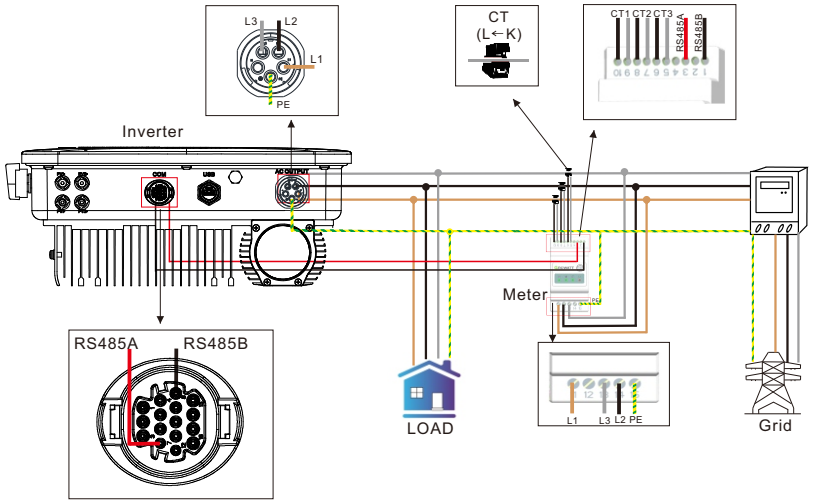
Table 5-5 Growatt smart meter specific parameters

Model		APM-CT-G
Dimensions		90*45*65mm (excluding the buckle)
IP rating		IP20 (indoor)
Supported measuring modes		Three-phase three-wire (3P3W), three-phase four-wire (3P4W)
Supported monitoring parameters		Voltage/current/active power/reactive power /power factor/frequency
3P4W (TPM-CT-G)	Rated voltage	230Vac/400Vac
	Phase voltage range	100Vac – 416Vac
3P3W (TPM-CT-G)	Rated voltage	230Vac/400Vac
	Phase voltage range	100Vac – 240Vac
	Line voltage range	173Vac – 416Vac
Measuring frequency		45-65Hz
CT		250A/40mA ,100A/40mA
Average power consumption		1W
Operating temperature		-30~65℃
Operating humidity		<85%RH
Communication method		RS485
Communication distance		200m
Communication protocol		MODBUS-RTU
Communication port		PIN A, RS485A/PIN B, RS485B

Information	• K→L is printed on the CT. K refers to the grid side and L refers to the load side.

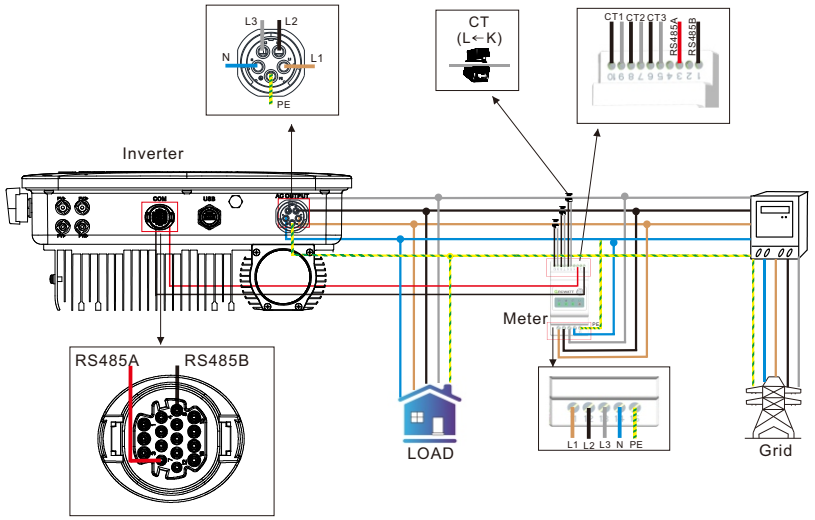
5.8.1.1 3P3W wiring

Figure 5-13 3P3W System (with a Growatt smart meter)



5.8.1.2 3P4W wiring

Figure 5-14 3P4W System (with a Growatt smart meter)



5.8.2 Connecting Eastron smart meter

Table 5-6 Eastron smart meter specific parameters

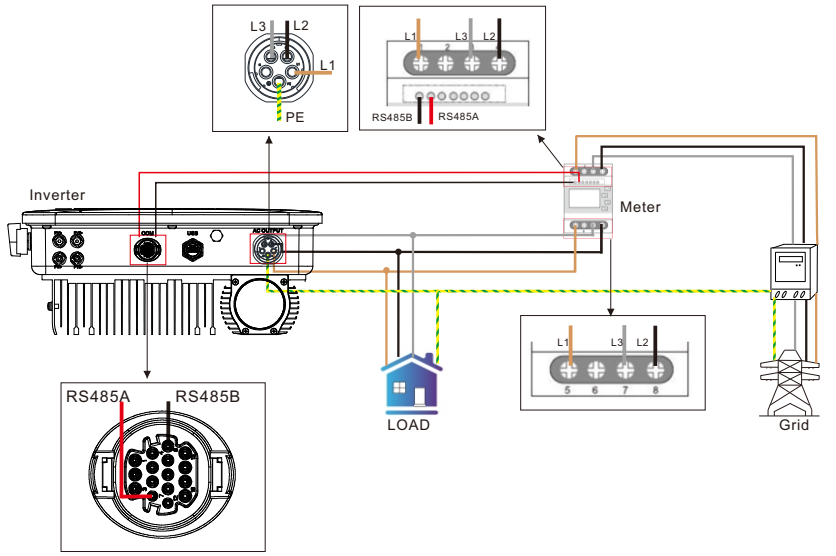
Manufacturer	Eastron
Type	SDM630CT-Modbus V3
General Specifications	
Voltage AC (Un)	3*230V
Voltage Range	184~299V AC
Base Current (Ib)	10A
Power consumption	≤2W
Frequency	50/ 60Hz(±10%)
AC voltage withstand	4kV for 1 minute
Impulse voltage withstand	6kV-1.2uS waveform
Over current withstand	20Imax for 0.5s
Pulse output 1	1000imp/kWh (default)
Pulse output 2	400imp/kWh
Display Max. Reading	LCD with white backlit 999999kWh
Environment	
Operating temperature	-25℃to +55℃
Storage and transportation temperature	-40℃to +70℃
Reference temperature	23℃±2℃
Relative humidity	0 to 95%, non-condensing
Altitude	up to 2000m
Warm up time	3s
Installation category	CAT II
Mechanical Environment	M1
Electromagnetic environment	E2
Degree of pollution	2
Mechanics	
Din rail dimensions	72x66x100 mm (WxHxD) DIN 43880

Manufacturer	Eastron
Mounting	DIN rail 35mm
Ingress protection	IP51 (indoor)
Material	Self-extinguishing UL94V-0
Communication port	PIN A, RS485A/PIN B, RS485B

Information	Pin 1/2/3/4 of the meter are connected to the grid and Pin 5/6/7/8 to the inverter.

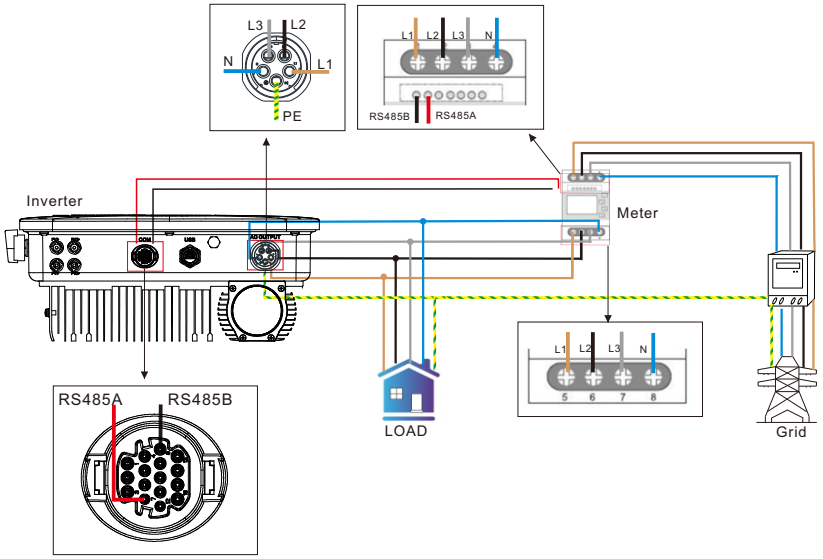
5.8.2.1 3P3W wiring

Figure 5-15 3P3W system (with an Eastron smart meter)



5.8.2.2 3P4W wiring

Figure 5-16 3P4W system (with an Eastron smart meter)



5.8.3 Connecting CHINT smart meter

Table 5-7 CHINT smart meter specific parameters

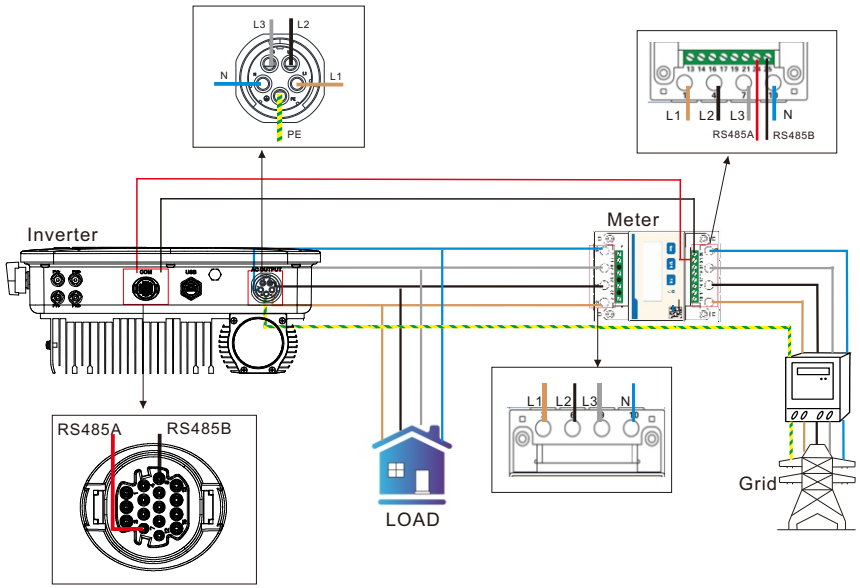
General specifications	
Rate voltage	3×230/400Vac
Reference frequency	50Hz/60Hz
Specified operating voltage range	0.9Un~1.1Un
Extended operating voltage range	0.8Un~-1.15Un
Voltage line power consumption	<1.5W/6VA
Input current	0.25-5(80)A
Starting current	0.004Ib
AC voltage withstand	2kV /5mA for 1 minute
Impulse voltage withstand	4kV-1.2/50uS waveform
Max. Reading	9999999kWh

General specifications	
Accuracy	
Active power	1% of range maximum
Reactive power	2% of range maximum
Environment	
Rated temperature	-10℃~+45℃
Limit temperature	-25℃~+70℃
Relative humidity (average annual)	<75%
Atmosphere	63.0kPa~106.0kPa
Installation category	CAT III
Degree of pollution	Conform to RoHS
Communication	
Communication	RS485 output for Modbus RTU
Baud rate	9600
Pulse	400imp/kWh
Communication port	PIN 24, RS485A/PIN 25, RS485B
Mechanics	
Din rail dimensions	100×72×65mm (LxW×H)
Mounting	DIN rail 35mm
Sealing	IP61 (indoor)

Information	Pin 1/4/7/10 of the meter are connected to the grid and Pin 3/6/9/10 to the inverter.

5.8.3.1 3P4W wiring

Figure 5-17 3P4W system (with a CHINT meter)



5.9 Connecting the monitoring module

Information	• The datalogger/SEM-X/ShineMaster-X is an optional accessory and should be purchased by the users separately.

5.9.1 The monitoring module model

With a monitoring module connected, the MOD TL3-X2 (Pro) inverter can be monitored via the cloud server and the APP.
Recommended datalogger model:

Table 5-8 Datalogger specifications

No.	Brand	Recommended model	Applicable system
1	GROWATT	• ShineWiFi-X	A single inverter
2	GROWATT	• ShineLan-X	A single inverter
3	GROWATT	• ShineLink-X	A single inverter
4	GROWATT	• ShineMaster-X	A single inverter

5.9.2 Configuration

Step 1. Setting the communication address of the inverter

Information	• The communication address ranges from 1 to 254.

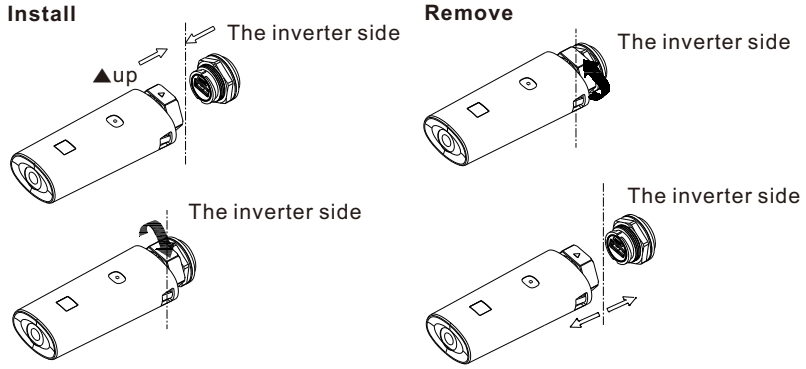
After the inverter is powered on, you can set the inverter communication address through the RS485 or the USB to WiFi module. Please refer to Section 8.3 for instructions on setting the inverter communication address.

Step 2. Configuring the ShineMaster-X/SEM-X
The SEM-X box comprises the ShineMaster-X and other components. Scan the QR code below to obtain the SEM-X User Manual for guidance on configuring the SEM-X and ShineMaster-X (in Chapter 3).

【SEM-X Configuration Guide】

5.9.3 Installing and removing the datalogger

Figure 5-18 Installing and removing the datalogger



5.9.4 Configuring the datalogger

You can access the configuration guide of the following datalogger models by scan the corresponding QR code.

Table 5-9 Datalogger configuration guide

Datalogger	
ShineWiFi-X Configuration Guide	
ShineLan-X Configuration Guide	
ShineLink-X Configuration Guide	

Human-machine interaction 6

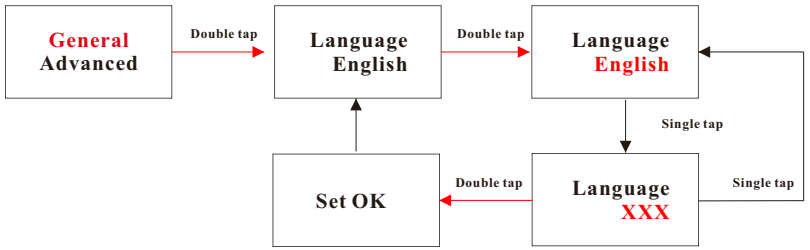
6.1 OLED control

Table 6-1 Touch button

Symbol	Description	Explanation	
	Touch button	Single tap	Switch pages or increase the number by 1
		Double tap	Access settings or confirm your setting
		Triple tap	Return to the previous interface
		Long press for 5s	Restore to the default value

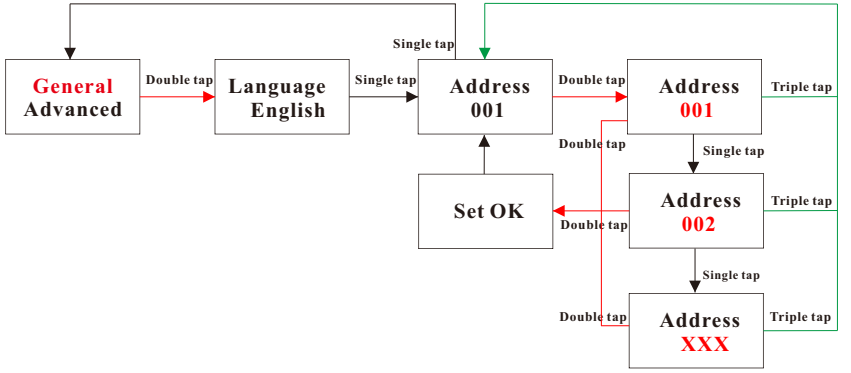
6.2 Setting the language

The inverter offers multiple language options. Single tap to view different options; double tap to confirm your setting. Select the language as shown below:



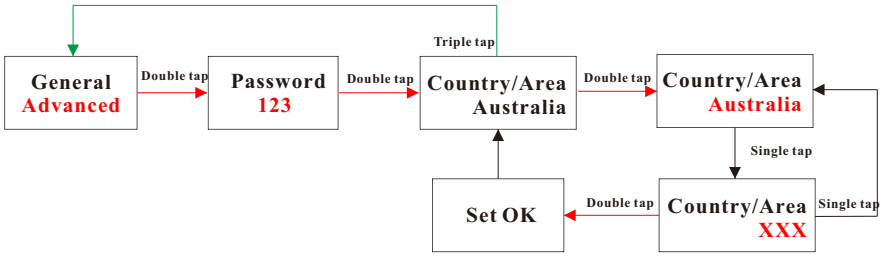
6.3 Setting the communication address

Single tap to increase the number by one; double tap to confirm your setting. Set the time as shown below:



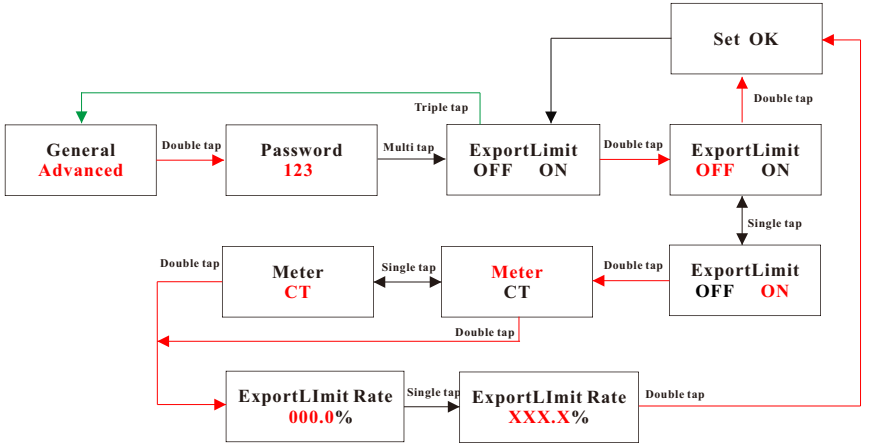
6.4 Setting the country/area

Single tap to view the options or increase the number by one; double tap to confirm your settings. The password for advanced settings is 123. After entering the password, you can modify the Country/Area setting.



6.5 Setting the export limitation parameters

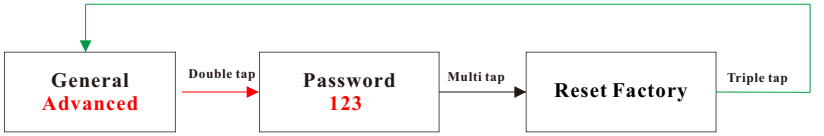
The MOD TL3-X2 (Pro) inverter supports the export limitation function when working with an external energy meter. Users can configure the parameter on the OLED screen. Single tap to view the options available or increase the number by one; double tap to confirm your setting. Set the export limitation parameters as shown below:



6.6 Restoring to factory settings

Information	• Be aware that with this operation, all parameters, except time and date, will be reset to default values.

Single tap to view the options available or increase the number by one; double tap to confirm your setting.



7 Commissioning

7.1 Checking before powering on the system

Table 7-1 Checking items

No.	Checking items	Criteria
1	Installation of the inverter	The inverter is securely installed
2	Cable layout	The communication cables and the power cables are separated
3	Grounding	The grounding cable is correctly and properly connected
4	Switch	The DC SWITCH and all other breakers connected to the inverter are OFF
5	Cable connection	The cables on the AC/PV/battery side are correctly and securely connected
6	Unused terminals & ports	All unused terminals and ports are sealed with waterproof caps
7	Installation environment	The installation environment meets all the requirements specified in this manual and ensure that the ventilation valve is not obstructed

7.2 Powering on the system

DANGER	• Wear insulated gloves and use insulated tools to avoid electric shocks or short-circuit accidents.
Note	• Before turning on the AC breaker, check if the AC voltage is within the permissible range using a multimeter.
Information	• After powering on the system, the OLED screen will display the error code/warning code when a fault/alarm occurs. For detailed troubleshooting suggestions, please see Section 12 Troubleshooting.

Step 1. Set the DC SWITCH on the left side of the inverter to ON (If you can not find this switch, skip this step).
Step 2. Turn on the AC breaker between the inverter and the grid.
Step 3. Check the running status of the inverter by observing the OLED screen.
Step 4. Tap the touch button to view information concerning the inverter on the OLED screen.

7.3 Setting the country/region

Note	• For certain models, you need to set the country/area after powering on the system manually. • If a wrong country/area has been selected, you can reconfigure it in advanced settings. For details, refer to Section 6.4 Setting the country/area.

Functions 8

Information	**Note:** Setting the following parameters on the ShinePhone APP or the Server webpage requires the password. To access the password, please contact Growatt service personnel.

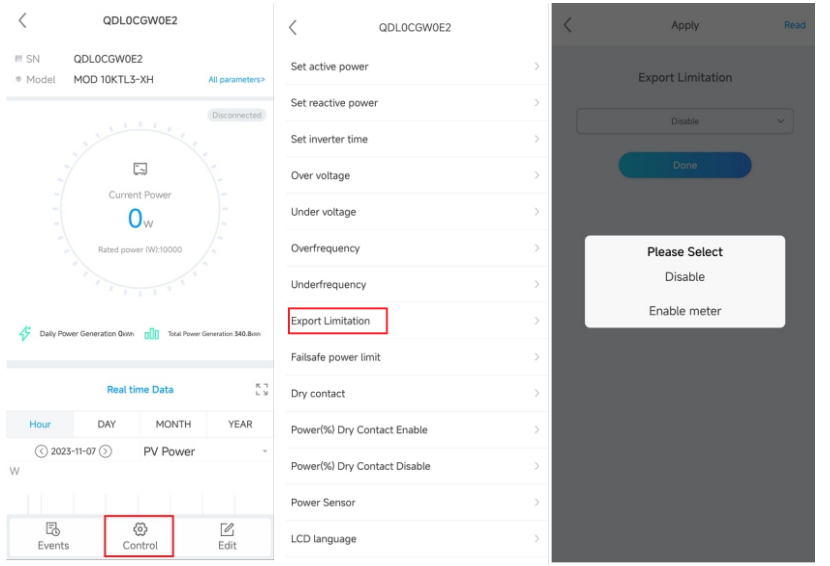
8.1 Setting the export limitation

WARNING	• To enable export limitation, a smart meter is required. Please select the meter recommended above; otherwise, the communication protocol may be mismatched. • Please ensure that all cables are correctly connected and the Export Limitation is enabled.

8.1.1 On the OLED screen

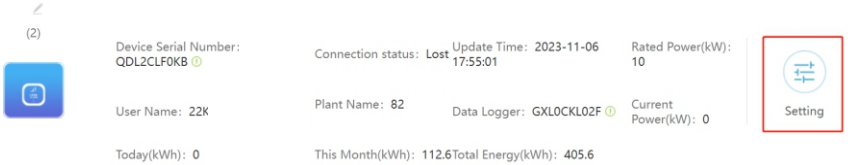
For details, please see Section 6.5 Setting the export limitation parameters.

8.1.2 On the ShinePhone APP

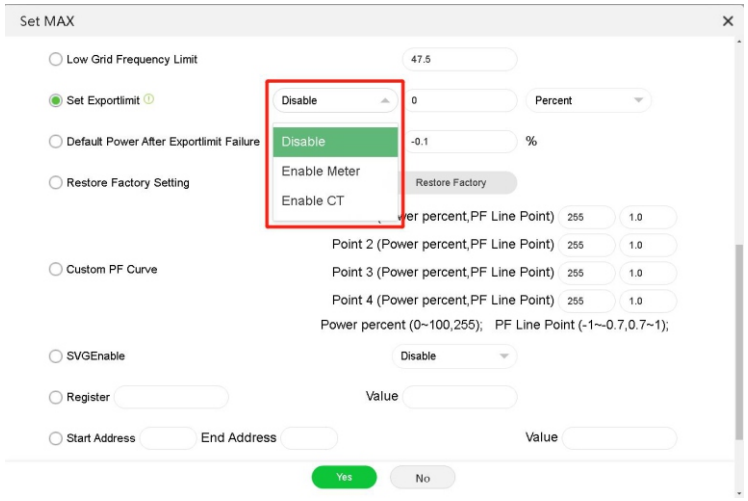


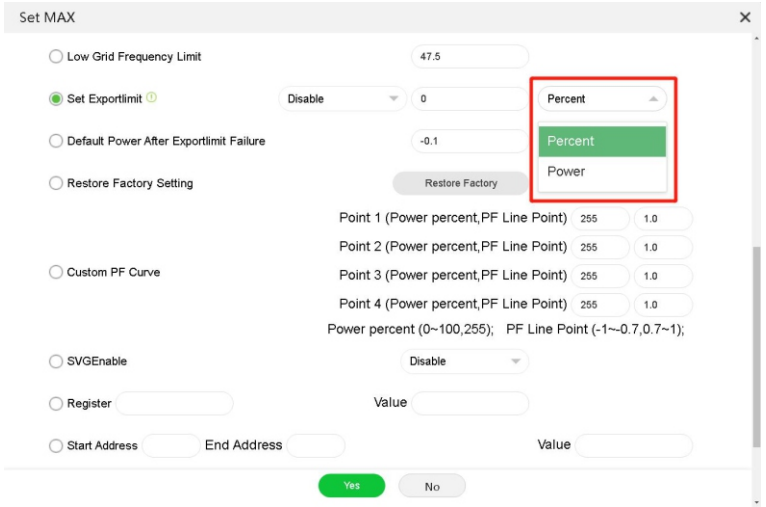
8.1.3 On the Server webpage

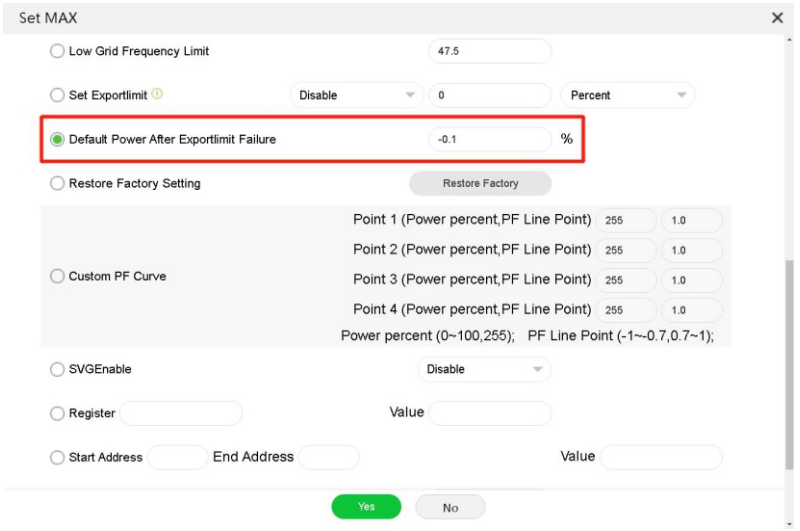
Step1. Log in with your Server account



Step2. Setting > Export limit setting > Enable > Set the Phase level







8.2 DRMs & Remote logic control

CAUTION	• Make sure the cable glands have been tightened firmly. • If the cable glands are not mounted properly, the inverter can be destroyed due to moisture and dust penetration. In this case, all the warranties shall be void.
WARNING	• Excessively high voltage can damage the inverter! • External voltage supplying to the DRM PORT should not exceed +5V.

8.2.1 Demand Response Modes (for AU & NZ only)

Information	• DRMs application description: • Applicable to AS/NZS4777.2.2020 • DRM0, DRM1, DRM2, DRM3, DRM4, DRM5, DRM6, DRM7, DRM8 are available. • The DRED (Demand Response Enabling Device) is a power grid dispatch device.

8.2.1.1 Method of asserting demand response modes

Figure 8-1 DRMs wiring diagram

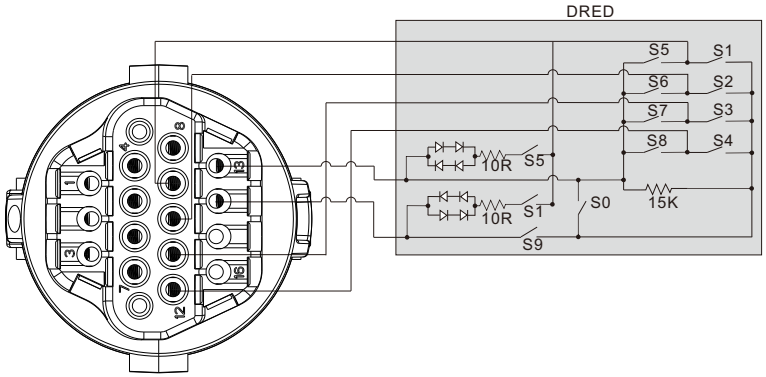
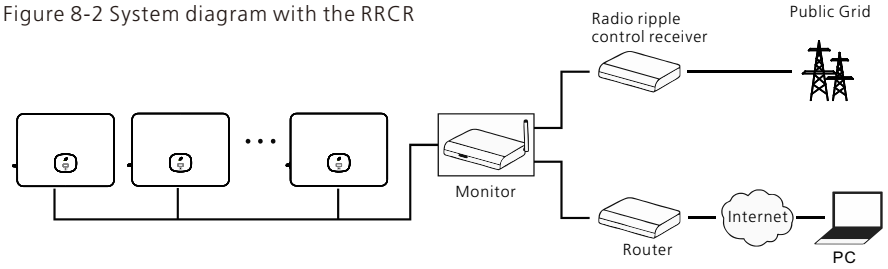


Table 8-1 DRMs function description

PIN	Mode	Switches on DRED		Function
14	DRM 0	S0	S9	When switches S0 and S9 are turned on, the inverter will shut down When switch S0 is turned off and S9 is turned on, the inverter will be grid-tied
9	DRM 5	S5	S9	Do not generate power
10	DRM 6	S6	S9	Do not generate at more than 50% of rated power
11	DRM 7	S7	S9	Do not generate at more than 75% of rated power and sink reactive power if capable
12	DRM 8	S8	S9	Increase power generation (subject to constraints from other active DRMs)

8.2.2 Active power control with a RRCR (for EU models)

Figure 8-2 System diagram with the RRCR



8.2.2.1 The following table illustrates the pin assignment and function:

Figure 8-3 RRCR wiring diagram

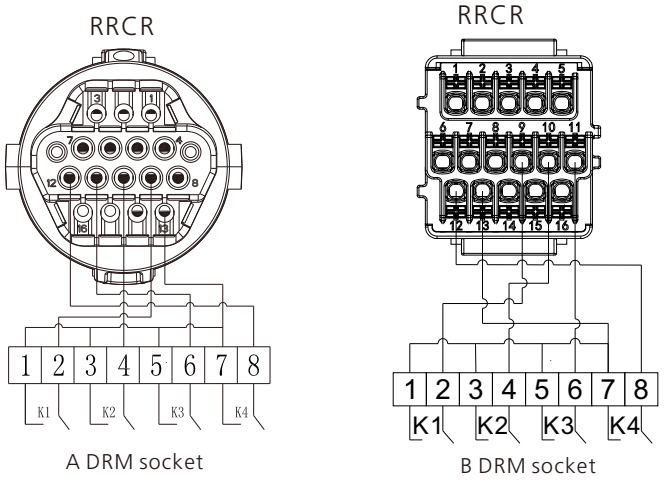


Table 8-2 RRCR wiring description

DRM Socket Pin NO.	Description	Connected to RRCR
9	Relay contact 1 input	K1 – Relay 1 output
10	Relay contact 2 input	K2 – Relay 2 output
11	Relay contact 3 input	K3 – Relay 3 output
12	Relay contact 4 input	K4 – Relay 4 output
13	GND	Relay's common node

8.2.2.2 The inverter is preconfigured to the following RRCR power levels:

Table 8-3 Power regulation description

DRM Socket Pin 9	DRM Socket Pin 10	DRM Socket Pin 11	DRM Socket Pin 12	Active power	Cos(φ)
Short circuit with Pin 13				0%	1
	Short circuit with Pin 13			30%	1
		Short circuit with Pin 13		60%	1
			Short circuit with Pin 13	100%	1

Active power control and reactive power control are enabled separately.

8.3 Setting the COM address of the inverter

For details about setting COM address on the OLED display, please see Section 6.3 Setting the communication address.

8.4 Power de-rating for voltage variation (Volt-Watt mode)

The inverter regulates the output power based on the AC grid voltage. This feature is enabled by default and is considered an advanced function. If you need to modify this setting, please contact the after-sales O&M team for assistance.

8.5 Reactive power regulation for voltage variation (Volt-VAR mode)

The inverter adjusts the input/output power in response to changes of the AC grid voltage. This feature is disabled by default and is considered an advanced function. If you need to modify this setting, please contact the after-sales O&M team for assistance.

System maintenance 9

To ensure the long-term and reliable operation of the system, it is recommended to perform maintenance on a regular basis as instructed in this section.

 DANGER	• If the inverter is connected to a DC/DC high-voltage controller and the off-grid mode is enabled, disconnect the AC circuit breaker between the inverter and the grid, the inverter will output 230/240V voltage in the off-grid mode. Before maintaining the system, ensure that the DC SWITCH on the DC/DC high voltage controller is set to OFF.
	• After the system is powered off, there may still be residual electricity and heat in the inverter, which could lead to electric shock or burns. Wait 5 minutes after turning off the system and wear protective gloves before performing any operations on the inverter.

9.1 Powering off the system

Follow these steps to power off the system:
Step 1. Turn off the AC breaker between the inverter and the grid.
Step 2. Set the DC SWITCH on the inverter to OFF.
Step 3. If there is a DC breaker between the inverter and the PV string, disconnect the DC breaker.

9.2 Checking items and Maintenance frequency

Checking item	Checking content	Interval
Cleaning	• Check if the heat sink and the fan are obstructed or blocked by dust periodically.	Once a year
Operation status	• Check if the inverter's exterior is damaged or deformed. • Check for any abnormal sounds during operation.	Every six months
	• Check the operating status of the system on the APP.	Regularly
Cable connection	• Check if any cable is in poor contact or loose connection. • Examine cables for any damage. • Check for melting at terminal connections	Every six months
Grounding	• Verify if the grounding cable is securely connected.	Every six months
Sealing	• Inspect the sealing of all terminals and interfaces.	Every six months
Environment	• Inspect and clear any weeds around the inverter before they wither.	Once a year

10 Decommissioning

10.1 Removing the inverter

- Disconnect all electrical connections from the inverter, including the RS485 communication cable, DC input cables, AC output cables, and the grounding cable.
- Remove the inverter from the mounting bracket.
- Take away the mounting bracket.

10.2 Packing the inverter

- If the original package is available, please place the inverter in the original box and tie it with tapes.
- If the original package is not available, please put the inverter in a carton box that is suitable for its dimensions and weight.

10.3 Storing the inverter

Store the inverter in a dry place and keep the temperature between -25℃ and 60℃.

10.4 Disposing of the inverter

	Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.

Specification 11

11.1 MOD TL3-X2 (Pro)

Model / Specifications	MOD 3000TL3-X2 (Pro)	MOD 4000TL3-X2 (Pro)	MOD 5000TL3-X2 (Pro)	MOD 6000TL3-X2 (Pro)
Input data (DC)				
Max. recommended PV power(for module STC)	4500W	6000W	7500W	9000W
Max. DC voltage	1100V			
Start voltage	160V			
Full power voltage range	250V-850V			
Nominal voltage	600V			
MPP voltage range	140-1000V			
No. of MPP trackers	2			
No. of PV strings per MPP trackers	1/1			
Max. input current per MPP trackers	20A/20A			
Max. short-circuit current per MPP trackers	25A/25A			
Backfeed current to PV array	0A			
Output data (AC)				
Rated output power	3000W	4000W	5000W	6000W
Max. AC apparent	3300VA	4400VA	5500VA	6600VA
Nominal AC voltage /range	230V/400V			
AC grid frequency/range	50/60 Hz 45~55Hz/55-65 Hz			
Max. output current	5.0A	6.7A	8.3A	10.0A
Max output overload protection	50A			
Max. inrush current (Peak value/duration time)	10A/5mS			
AC inrush current	30A			
Max. output fault current (Peak value /duration time)	24.6A/10us			
Max. output fault current	24.6A			
Max. output overcurrent Protection	24.6A			

Specifications \ Model	MOD 3000TL3-X2 (Pro)	MOD 4000TL3-X2 (Pro)	MOD 5000TL3-X2 (Pro)	MOD 6000TL3-X2 (Pro)
Power factor (@nominal power)	>0.99			
Adjustable power factor	0.8Leading ...0.8Lagging			
THDi	<3%			
AC grid connection type	3W+PE /3W+N+PE			
Overvoltage category	PV:II AC:III Others:I			
Efficiency				
Max. efficiency	98.3%			
Euro-eta	97.5%			
Protection devices				
DC reverse-polarity protection	YES			
DC switch	OPT			
DC Surge protection	typeII OPT			
Insulation resistance monitoring	YES			
AC surge protection	typeII OPT			
AC short-circuit protection	YES			
Grid monitoring	YES			
Anti-islanding protection	Integrated (Active Frequency Drift)			
Residual-current monitoring unit	YES			
String Fuse protection	NO			
String monitoring	NO			
AFCI protection	OPT			
General data				
Dimensions (W / H / D) in mm	425*387*178mm			
Weight	14.6kg			
Operating temperature range	-25°C ... +60°C (>45°C Derating)			
Noise emission (typical)	≤29dB (A)			
Altitude	4000m			

Specifications \ Model	MOD 3000TL3-X2 (Pro)	MOD 4000TL3-X2 (Pro)	MOD 5000TL3-X2 (Pro)	MOD 6000TL3-X2 (Pro)
Internal consumption at night	1W			
Topology	Non-isolated			
Cooling	Natural heat dissipation			
Electronics protection degree	IP66			
Relative humidity	0~100%			
DC connection	H4/MC4 (OPT)			
AC connection	Quick Connect Terminal			
Interfaces				
Display	OLED+LED			
USB/RS485	YES			
WIFI/GPRS/4G/RF/LAN	OPT			

Model / Specifications	MOD 7000TL3-X2 (Pro)	MOD 8000TL3-X2 (Pro)	MOD 9000TL3-X2 (Pro)	MOD 10KTL3-X2 (Pro)
Input data (DC)				
Max. recommended PV power(for module STC)	10500W	12000W	13500W	15000W
Max. DC voltage	1100V			
Start voltage	160V			
Full power voltage range	300V-850V		350V-850V	
Nominal voltage	600V			
MPP voltage range	140-1000V			
No. of MPP trackers	2			
No. of PV strings per MPP trackers	1/1			
Max. input current per MPP trackers	20A/20A			
Max. short-circuit current per MPP trackers	25A/25A			
Backfeed current to PV array	0A			
Output data (AC)				
Rated output power	7000W	8000W	9000W	10000W
Max. AC apparent	7700VA	8800VA	9900VA	11000VA
Nominal AC voltage /range	230V/400V			
AC grid frequency/range	50/60 Hz 45~55Hz/55-65 Hz			
Max. output current	11.7A	13.3A	15.0A	16.0A
Max output overload protection	50A			
Max. inrush current (Peak value/duration time)	10A/5mS			
AC inrush current	30A			
Max. output fault current (Peak value /duration time)	44.5A/10us			
Max. output fault current	44.5A			
Max. output overcurrent Protection	44.5A			
Power factor (@nominal power)	>0.99			

Model / Specifications	MOD 7000TL3-X2 (Pro)	MOD 8000TL3-X2 (Pro)	MOD 9000TL3-X2 (Pro)	MOD 10KTL3-X2 (Pro)
Adjustable power factor	0.8Leading ...0.8Lagging			
THDi	<3%			
AC grid connection type	3W+PE /3W+N+PE			
Overvoltage category	PV:II AC:III Others:I			
Efficiency				
Max. efficiency	98.6%			
Euro-eta	98.1%			
Protection devices				
DC reverse-polarity protection	YES			
DC switch	OPT			
DC Surge protection	typeII OPT			
Insulation resistance monitoring	YES			
AC surge protection	typeII OPT			
AC short-circuit protection	YES			
Grid monitoring	YES			
Anti-islanding protection	Integrated (Active Frequency Drift)			
Residual-current monitoring unit	YES			
String Fuse protection	NO			
String monitoring	NO			
AFCI protection	OPT			
General data				
Dimensions (W / H / D) in mm	425*387*178mm			
Weight	14.6kg			
Operating temperature range	-25°C ... +60°C (>40°C Derating)			
Noise emission (typical)	≤29dB (A)			
Altitude	4000m			
Internal consumption at night	1W			

Specifications \ Model	MOD 7000TL3-X2 (Pro)	MOD 8000TL3-X2 (Pro)	MOD 9000TL3-X2 (Pro)	MOD 10KTL3-X2 (Pro)
Topology	Non-isolated			
Cooling	Natural heat dissipation			
Electronics protection degree	IP66			
Relative humidity	0~100%			
DC connection	H4/MC4 (OPT)			
AC connection	Quick Connect Terminal			
Interfaces				
Display	OLED+LED			
USB/RS485	YES			
WIFI/GPRS/4G/RF/LAN	OPT			

Specifications \ Model	MOD 11KTL3-X2 (Pro)	MOD 12KTL3-X2 (Pro)	MOD 13KTL3-X2 (Pro)	MOD 15KTL3-X2 (Pro)
Input data (DC)				
Max. recommended PV power(for module STC)	16.5kW	18kW	19.5kW	22.5kW
Max. DC voltage	1100V			
Start voltage	160V			
Full power voltage range	400V-850V		500V-850V	
Nominal voltage	600V			
MPP voltage range	140-1000V			
No. of MPP trackers	2			
No. of PV strings per MPP trackers	1/1			
Max. input current per MPP trackers	20A/20A			
Max. short-circuit current per MPP trackers	25A/25A			
Backfeed current to PV array	0A			
Output data (AC)				
Rated output power	11kW	12kW	13kW	15kW
Max. AC apparent	12.1kVA	13.2kVA	14.3kVA	16.5kVA
Nominal AC voltage /range	230V/400V			
AC grid frequency/range	50/60 Hz 45~55Hz/55-65 Hz			
Max. output current	18.3A	20.0A	21.7A	25A
Max output overload protection	63A			
Max. inrush current (Peak value/duration time)	15A/5mS			
AC inrush current	30A			
Max. output fault current (Peak value /duration time)	58.4A/10us			
Max. output fault current	58.4A			
Max. output overcurrent Protection	58.4A			
Power factor (@nominal power)	>0.99			

Model / Specifications	MOD 11KTL3-X2 (Pro)	MOD 12KTL3-X2 (Pro)	MOD 13KTL3-X2 (Pro)	MOD 15KTL3-X2 (Pro)
Adjustable power factor	0.8Leading ...0.8Lagging			
THDi	<3%			
AC grid connection type	3W+PE /3W+N+PE			
Overvoltage category	PV:II AC:III Others:I			
Efficiency				
Max. efficiency	98.6%			
Euro-eta	98.1%			
Protection devices				
DC reverse-polarity protection	YES			
DC switch	OPT			
DC Surge protection	typeII OPT			
Insulation resistance monitoring	YES			
AC surge protection	typeII OPT			
AC short-circuit protection	YES			
Grid monitoring	YES			
Anti-islanding protection	Integrated (Active Frequency Drift)			
Residual-current monitoring unit	YES			
String Fuse protection	NO			
String monitoring	NO			
AFCI protection	OPT			
General data				
Dimensions (W / H / D) in mm	425*387*178mm			
Weight	15.6kg			
Operating temperature range	-25°C ... +60°C (>40°C Derating)			
Noise emission (typical)	≤29dB (A)			
Altitude	4000m			
Internal consumption at night	1W			

Model / Specifications	MOD 11KTL3-X2 (Pro)	MOD 12KTL3-X2 (Pro)	MOD 13KTL3-X2 (Pro)	MOD 15KTL3-X2 (Pro)
Topology	Non-isolated			
Cooling	Natural heat dissipation			
Electronics protection degree	IP66			
Relative humidity	0~100%			
DC connection	H4/MC4 (OPT)			
AC connection	Quick Connect Terminal			
Interfaces				
Display	OLED+LED			
USB/RS485	YES			
WIFI/GPRS/4G/RF/LAN	OPT			

12 Troubleshooting

An error message will be displayed on the OLED screen and the LED indicator will turn red when a fault occurs, indicating that a system fault or an inverter fault has occurred. In some cases, you may need to contact Growatt for technical assistance.

12.1 System alarm

12.1.1 Inverter alarm

Warning message	Description	Troubleshooting
Warning 200	PV string fault	1. Check if the PV panels are normal after shutdown. 2. If the error message persists, contact Growatt support.
Warning 201	PV string/PID quick-connect terminals abnormal	1. Check the wiring of the string terminals after shutdown. 2. If the error message persists, contact Growatt support.
Warning 202	DC SPD function abnormal	1. After shutdown, check the DC SPD. 2. If the error message persists, please contact Growatt support.
Warning 203	Pv1 or PV2 short circuited	1. Check the DC SPD after shutdown. 2. If the error message persists, contact Growatt support.
Warning 204	Dry contact function abnormal	1. Check the wiring of the dry contact after shutdown. 2. If the error message persists, contact Growatt support.
Warning 205	PV boost driver abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 206	AC SPD function abnormal	1. Check the AC SPD after shutdown. 2. If the error message persists, contact Growatt support.
Warning 207	USB flash drive overcurrent protection	1. Unplug the USB flash drive. 2. Plug in the USB flash drive again after shutdown. 3. If the error message persists, contact Growatt support.
Warning 208	DC fuse blown	1. Check the fuse after shutdown. 2. If the error message persists, contact Growatt support.
Warning 209	DC input voltage exceeds the upper threshold	1. Turn off the DC switch immediately and check the DC voltage. 2. If the DC voltage is within the specified range and the error message persists, contact Growatt support.
Warning 210	PV string is reversely connected	1. Check the polarity of the PV terminals. 2. If the error message persists, contact Growatt support.

Warning message	Description	Troubleshooting
Warning 217	BDC abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 218	BDC Bus disconnected	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 219	PID function abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 220	PV string disconnected	1. Check if the PV string is properly connected. 2. If the error message persists, contact Growatt support.
Warning 221	PV string current unbalanced	1. Check if the PV panels of the corresponding string are normal. 2. If the error message persists, contact Growatt support.
Warning 300	No utility grid connected or utility grid power failure	1. Check if the grid is down. 2. If the error message persists, contact Growatt support.
Warning 301	Grid voltage is beyond the permissible range	1. Check if the grid voltage is within the specified range. 2. If the error message persists, contact Growatt support.
Warning 302	Grid frequency is beyond the permissible range	1. Check if the grid frequency is within the specified range. 2. If the error message persists, contact Growatt support.
Warning 303	Off-grid mode, overload	1. Please reduce the load connected to the off-grid output terminal. 2. If the error message persists, contact Growatt support.
Warning 304	CT disconnected	1. Check if the CT is properly connected. 2. If the error message persists, contact Growatt support.
Warning 305	CT is reversely connected	1. Check if the CT is reversely connected. 2. If the error message persists, contact Growatt support.
Warning 306	The inverter failed to communicate with the CT	1. Check if the communication cable is properly connected. 2. If the error message persists, contact Growatt support.

Warning message	Description	Troubleshooting
Warning 307	CT pairing timed out	1. Check if the communication cable is properly connected. 2. If the error message persists, contact Growatt support.
Warning 308	Meter disconnected	1. Check if the meter is properly connected. 2. If the error message persists, contact Growatt support.
Warning 309	Meter is reversely connected	1. Check if the L line and the N line of the meter are reversely connected. 2. If the error message persists, contact Growatt support.
Warning 310	The voltage difference between the N line and the PE cable is abnormal	1. Check if the PE cable is reliably connected after shutdown. 2. If the error message persists, contact Growatt support.
Warning 400	Fan failure	1. Check if the fan is properly connected after shutdown. 2. If the error message persists, contact Growatt support.
Warning 401	Meter abnormal	1. Check if the meter is turned on. 2. If the meter is correctly connected to the inverter.
Warning 402	Communication between the optimizer and the inverter is abnormal	1. Check if the optimizer is turned on. 2. If the optimizer is correctly connected to the inverter.
Warning 403	PV string communication failure	1. Check if the wiring of the PV string after shutdown. 2. If the error message persists, contact Growatt support.
Warning 404	EEPROM abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 405	DSP and COM firmware version mismatch	1.Check the firmware version. 2. If the error message persists, contact Growatt support.
Warning 406	Boost circuit malfunction	1. Restart the inverter. 2. If the error message persists, contact Growatt support.

Warning message	Description	Troubleshooting
Warning 407	Over-temperature	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 408	NTC temperature sensor is broken	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 409	Reactive power scheduling communication failure	1. Check if ShineMaster is turned on. 2. If the error message persists, contact Growatt support.
Warning 410	Abnormal operation of the chip	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 411	Sync signal abnormal	1. Check if the sync cable is abnormal. 2. If the error message persists, contact Growatt support.
Warning 412	Startup requirements of grid connection are not met	1. Check if the grid voltage is within the specified range and check if the grid-connection startup voltage configuration is correct. 2. Check if the PV voltage is within the specified range. 3. Restart the inverter. If the error message persists, contact Growatt support.
Warning 500	The inverter failed to communicate with the battery	1. Check if the battery is turned on. 2. Check if the battery is correctly and securely connected to the inverter.
Warning 501	Battery disconnected	1. Check if the battery is properly connected. 2. If the error message persists, contact Growatt support.
Warning 502	Battery voltage too high	1. Check if the battery voltage is within the permissible range. 2. Check if the battery is correctly connected. 3. If the error message persists, contact Growatt support.
Warning 503	Battery voltage too low	1. Check if the battery voltage is within the permissible range. 2. Check if the battery is correctly connected. 3. If the error message persists, contact Growatt support.
Warning 504	Battery terminals are reversely connected	1. Check if the positive and negative terminals of the battery are reversely connected. 2. If the error message persists, contact Growatt support.

Warning message	Description	Troubleshooting
Warning 505	Temperature sensor of the lead-acid battery is disconnected	1. Check if the temperature sensor of the lead-acid battery is installed or not. 2. Check if the temperature sensor is well-connected. 3. If the error message persists, contact Growatt support.
Warning 506	Battery temperature is out of range	1. Check if the ambient temperature of the battery is within the specified range. 2. If the error message persists, contact Growatt support.
Warning 507	BMS reported a fault; either charging or discharging is prohibited	1. Figure out the cause according to the BMS error code. 2. If the error message persists, contact Growatt support.
Warning 508	Lithium battery overload protection	1. Check if the power of the load exceeds the BAT rated discharge power. 2. If the error message persists, contact Growatt support.
Warning 509	BMS communication abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 510	BAT SPD function abnormal	1. Check the BAT SPD after powering off the device. 2. If the error message persists, contact Growatt support.
Warning 600	DC component over high in output current	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 601	DC component over high in output voltage	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 602	Off-grid output voltage too low	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 603	Off-grid output voltage too high	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 604	Off-grid output over current	1. Check if the load power exceeds the upper limit. 2. Restart the inverter. If the error message persists, contact Growatt support.

Warning message	Description	Troubleshooting
Warning 605	Off-grid bus voltage too low	1. Check if the load power exceeds the upper limit. 2. Restart the inverter. If the error message persists, contact Growatt support.
Warning 606	Off-grid output overloaded	1. Check if the load power exceeds the upper limit. 2. Restart the inverter. If the error message persists, contact Growatt support.
Warning 607	Communication with the backup box is abnormal	1. Check the communication wiring of the backup box after powering off the device. 2. If the error message persists, contact Growatt support.
Warning 608	Backup box is abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Warning 700	Fan of the backup box is faulty	1. Check the wiring of the fan after powering off the device. 2. If the error message persists, contact Growatt support.
Warning 701	Generator failed to start	1. Check the generator and its wiring after powering off the device. 2. If the error message persists, contact Growatt support.

12.2 System fault

12.2.1 Inverter fault

Error code	Description	Troubleshooting
Error 200	DC Arc fault	1. After shutdown, check the connection of the PV string. 2. Restart the inverter. 3. If the error message persists, please contact Growatt support.
Error 201	Residual I High	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 202	PV Voltage High	1. Disconnect the DC switch immediately and check the voltage. 2. If the DC input voltage is within the permissible range and the error message persists, please contact Growatt support.
Error 203	PV Isolation Low	1. Check if the PV strings are properly grounded. 2. If the error message persists, please contact Growatt support.
Error 204	PV Reversed	1. After shutdown, check if the PV string is reversely connected to the inverter. 2. Restart the inverter. 3. If the error message persists, please contact Growatt support.
Error 300	AC V Outrange	1. Check the grid voltage. 2. If the grid voltage is within the permissible range and the error message persists, please contact Growatt support.
Error 301	AC terminals reversed	1. Check the connection of the AC output terminals. 2. If the grid voltage is within the permissible range and the error message persists, please contact Growatt support.
Error 302	No AC Connection	1. After shutdown, check the AC wiring. 2. If the error message persists, please contact Growatt support.
Error 303	N-PE Volt abnormal	1. After shutdown, check if the ground cable is reliably connected. 2. If the error message persists, please contact Growatt support.
Error 304	AC F Outrange	1. Check the grid frequency and restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 305	Overload	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 306	CT LN Reversed	1. Check if the CT is reversely connected. 2. If the error message persists, contact Growatt support.
Error 307	CT COM fault	1. Check if the communication cable is properly connected. 2. If the error message persists, contact Growatt support.
Error 308	Communication fault; CT and inverter pairing timed out	1. Re-pair the inverter and the CT. 2. If the error message persists, contact Growatt support.
Error 309	ROCOF Fault	1. Check the grid frequency and restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 310	N-PE Volt low	1. Check whether the N line on the inverter side with PV negative grounding is short-circuited with the ground cable and whether the output side is isolated with a transformer. 2. If the error message persists, please contact Growatt support.
Error 311	ExportLimitFail	1. After shutdown, check the connection of the CT and the meter. 2. If the error message persists, please contact Growatt support.
Error 400	DCI bias abnormal	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Error 401	High DC component in output voltage	1. Restart the inverter. 2. If the error message persists, contact Growatt support.

Error code	Description	Troubleshooting
Error 402	High DC component in output current	1. Restart the inverter. 2. If the error message persists, contact Growatt support.
Error 403	Output current unbalanced	1. Check if the output current is balanced after shutdown. 2. If the error message persists, contact Growatt support.
Error 404	Bus voltage sampling abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 405	Relay fault	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 406	Initialization mode abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 407	Auto-test failed	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 408	Over-temperature	1. After shutdown, check the temperature of the inverter and restart the inverter after the temperature is within the acceptable range. 2. If the error message persists, please contact Growatt support.
Error 409	Bus voltage abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 410	Abnormal voltage across terminals of the flying capacitor	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 411	Internal communication failure	1. Check the wiring of the communication board after shutdown. 2. If the error message persists, please contact Growatt support.
Error 412	Temperature sensor disconnected	1. Check if the temperature sensor module is properly connected. 2. If the error message persists, please contact Growatt support.

Error code	Description	Troubleshooting
Error 413	IGBT drive fault	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 414	EEPROM error	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 415	Auxiliary power supply abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 416	DC/AC overcurrent protection	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 417	Communication protocol mismatch	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 418	DSP and COM firmware version mismatch	1. Check the firmware version. 2. If the error message persists, please contact Growatt support.
Error 419	DSP software and hardware version mismatch	1. Check the firmware version. 2. If the error message persists, please contact Growatt support.
Error 420	GFCI module abnormal	1. Check the GFCI module after shutdown. 2. If the error message persists, please contact Growatt support.
Error 421	CPLD abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 422	Redundancy sampling inconsistent	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 423	PWM pass-through signal failure	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 424	INV current waveform abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 425	AFCI self-test failure	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.

Error code	Description	Troubleshooting
Error 426	PV current sampling abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 427	AC current sampling abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 428	BOOST short-circuited	Please contact Growatt support.
Error 429	BUS soft start failed	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 431	EPO fault	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 432	Monitoring chip BOOT verification failed	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 433	Incompatible battery model	1. Replace the battery model. 2. If the error message persists, please contact Growatt support.
Error 500	Incompatible battery software	1. Upgrade the battery software. 2. If the error message persists, please contact Growatt support.
Error 501	BMS failed to communicate with the inverter	1. Check the connection of the RS485 cable between the inverter and the battery. 2. Check if the battery is in the sleep mode. 3. If the error message persists, please contact Growatt support.
Error 502	Battery voltage is below the lower threshold	1. Figure out the fault based on the BMS error code. 2. If the error message persists, please contact Growatt support.
Error 503	Battery voltage exceeds the upper threshold	1. Check the battery voltage. 2. If the error message persists, please contact Growatt support.
Error 504	Battery temperature is beyond the range for charging/ discharging	1. Check the battery voltage. If it is within the permissible range, please restart the inverter. If not, please replace the battery. 2. If the error message persists, please contact Growatt support.

Error code	Description	Troubleshooting
Error 505	Battery terminals reversed	1. Check the temperature of the battery. 2. If the error message persists, please contact Growatt support.
Error 506	Battery disconnected	1. Check if the battery terminals are reversely connected. 2. If the error message persists, please contact Growatt support.
Error 507	Lithium battery overload protection	1. Check the wiring of the battery terminals. 2. If the error message persists, please contact Growatt support.
Error 508	BUS2 Volt Abnormal	1. Check if the power of the load exceeds the battery rated discharge power. 2. If the error message persists, please contact Growatt support.
Error 509	BAT Charge OCP (Overcurrent Protection)	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 510	BAT Discharge OCP (Overcurrent Protection)	1. Check if the PV voltage is oversized. 2. If the error message persists, please contact Growatt support.
Error 511	BAT soft start failed	1. Check if the battery discharge current configuration is proper. 2. If the error message persists, please contact Growatt support.
Error 600	Off-grid output short-circuited	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 601	Off-grid Bus Volt Low	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 602	Abnormal Volt at the off-grid terminal	1. Check if the battery is working properly or the battery experiences capacity loss. 2. If the error message persists, please contact Growatt support.
Error 603	Soft start failed	1. Restart the machine. 2. If the fault message still exists, contact the manufacturer.
Error 604	Off-grid output voltage abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.

Error code	Description	Troubleshooting
Error 605	Balanced circuit self-test failed	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 606	High DC component in output voltage	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 607	Off-grid output overload	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 608	Off-grid parallel signal abnormal	1. Restart the inverter. 2. If the error message persists, please contact Growatt support.
Error 609	Backup box is not detected	1. Check if the communication cables are properly connected. 2. If the error message persists, please contact Growatt support.
Error 610	Off-grid split-phase voltage abnormal	1. After shutdown, check the signal wiring for identifying the backup box. 2. If the error message persists, please contact Growatt support.
Error 700	Abnormal communication between the backup box and the inverter	1. Power off the system and check if the backup box split-phase transformer and the control relay are abnormal. 2. Restart the system. 3. If the error message persists, please contact Growatt support.
Error 701	Backup box grid-side relay failure	1. Check if the communication cable between the inverter and the backup box is properly connected. 2. If the error message persists, please contact Growatt support.
Error 702	Backup box generator relay connection failure	1. Restart the backup box. 2. If the error message persists, please contact Growatt support.
Error 703	Backup box on-grid overload	1. Restart the backup box. 2. If the error message persists, please contact Growatt support.
Error 704	Backup box off-grid split-phase overload	1. Restart the backup box. 2. If the error message persists, please contact Growatt support.
Error 705	Overheat inside the backup box	1. Reduce the load. 2. If the error message persists, please contact Growatt support.

EU Declaration of conformity 13

Within the scope of EU directives:
- 2014/35/EU Low Voltage Directive (LVD)
- 2014/30/EU Electromagnetic Compatibility Directive (EMC)
- 2011/65/EU RoHS Directive and its amendment (EU)2015/863

Shenzhen Growatt New Energy Co. Ltd confirms that the Growatt inverters and accessories described in this document are in compliance with the above-mentioned EU directives. The entire EU Declaration of Conformity can be found at www.ginverter.com.

Certificate of Compliance 14

Growatt confirms herewith that the products, when correctly configured, are in compliance with the requirements specified in the following standards and directives (Dec./2023):

Model	Certificates
MOD 3-15K-X2 (Pro)	CE, G98, G99, EN50549

15 Contact us

If you have technical problems concerning our products, please contact Growatt Service at +86 755 2747 1942. To provide you with the necessary support, please have the following information ready:

Serial Number	Format: LSLxxxxxx
Model	SxxBxxDxxTxxPxxUxxMxxxx
Error message	Error xxx
Grid voltage	xxx V
DC input voltage	xxx V
Can you reproduce the problem?	Yes or No
Has it occurred before?	Yes or No
What were the environmental conditions like when the problem occurred?	

Information about the PV panels

Manufacturer name and model number of the PV panel	xxx
Output power of the panel	xx kW
Voc of the panel	xxx V
Vmp of the panel	xxx V
Imp of the panel	xx A
The number of panels in each string	xx pcs.

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