

USER MANUAL

SGFAR 25...50KTLX-G3



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1. About this manual

This manual contains important safety information that must be observed during installation and maintenance of the device.

Carefully read this manual before use and retain it for future reference!

This manual must be treated as an integral component of the device. The manual must be kept in close proximity to the device, including when it is handed over to another user or moved to a different location.

1.1 Copyright declaration

- The copyright of this manual is owned by SOFARSOLAR. It may not be copied – neither partially nor completely – by companies or individuals (including software, etc.) and must not be reproduced or distributed in any form, or with the appropriate means.
- SOFARSOLAR reserves the right to final interpretation. This manual may be amended following feedback from users or customers. Please consult our website at <http://www.sofarsolar.eu> for the latest version.
- The current version was updated on 12/14/23.

1.2 Structure of the manual

This manual contains important safety and installation instructions that must be observed during installation and maintenance of the device.

1.3 Scope

This product manual describes the installation, electrical connection, commissioning, maintenance and fault elimination procedures of the SOFAR 25 ... 50KTLX-G3 inverters.

1.4 Target group

This manual is intended for specialist electrical engineers who are responsible for the installation and commissioning of the inverter in the PV system, as well as the PV system operators.

1.5 Symbols used

This manual contains information on safe operation and uses symbols to ensure the safety of persons and property as well as the efficient operation of the inverter. Please read through the following symbol explanations carefully in order to prevent injury or property damage.

DANGER

Non-observance will result in death or serious injury.

- Follow the warnings in order to prevent death or serious injury!

WARNING

Non-observance may result in death or serious injury.

- Follow the warnings in order to prevent serious injury!

CAUTION

Non-observance may result in minor injury.

- Follow the warnings in order to prevent injury!

ATTENTION

Non-observance may result in property damage!

- Follow the warnings in order to prevent damage to or destruction of the product.

NOTE

- Provides tips essential to the optimal operation of the product.

2. Basic Safety Information

NOTE

- If you have any questions or problems after reading the following information, please contact SOFARSOLAR

This chapter details the safety information pertaining to the installation and operation of the device.

2.1 Safety information

Read and understand the instructions within this manual and familiarise yourself with the relevant safety symbols in this chapter before beginning with the installation of the device and eliminating any faults.

Before connecting to the power grid, you must obtain official authorisation from the local power grid operator in accordance with the corresponding national and state requirements. Furthermore, operation may only be carried out by qualified electricians.

Please contact the nearest authorised service centre if any maintenance or repairs are required. Please contact your dealer to obtain information about your nearest authorised service centre. Do NOT carry out repairs on the device yourself; this may lead to injury or property damage.

Before installing the device or carrying out maintenance on it, you must open the DC switch in order to interrupt the DC voltage of the PV generator. You can also switch off the DC voltage by opening the DC switch in the Array junction box. Not doing this may result in serious injury.

2.1.1 Qualified personnel

Personnel tasked with the operation and maintenance of the device must have the qualifications, competence and experience required to perform the described tasks, while also being capable of fully understanding all instructions contained within the manual. For safety reasons, this inverter may only be installed by a qualified electrician who:

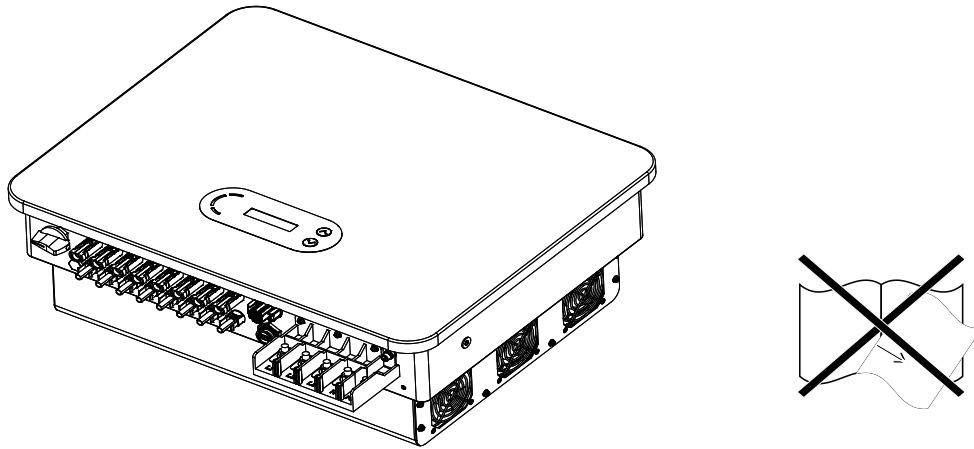
- has received training on occupational safety, as well as the installation and commissioning of electrical systems.
- Is familiar with the local laws, standards and regulations of the grid operator.

SOFARSOLAR assumes no responsibility for the destruction of property or any injuries to personnel caused by improper usage.

2.1.2 Installation requirements

Please install the inverter according to the information contained in the following section.

Mount the inverter to a suitable object with a sufficient load-bearing capacity (e.g. walls, PV frames etc.) and ensure that the inverter is upright. Choose a suitable place for the installation of electrical devices. Ensure that there is sufficient space for an emergency exit which is suitable for maintenance. Ensure sufficient ventilation in order to guarantee an air circulation for the cooling of the inverter.



2.1.3 Transport requirements

The factory packaging is specifically designed to prevent transport damage, i.e. violent shocks, moisture and vibrations. However, the device must not be installed if it is visibly damaged. In this case, notify the responsible transport company immediately.

2.1.4 Labeling on the device

The labels must NOT be concealed by items and foreign objects (rags, boxes, devices, etc.); they must be regularly cleaned and kept clearly visible at all times.

2.1.5 Electrical connection

Observe all applicable electrical regulations when working with the Solar inverter.

DANGER

Dangerous DC voltage

- Before establishing the electrical connection, cover the PV modules using opaque material or disconnect the PV generator from the inverter. Solar radiation will cause dangerous voltage to be generated by the PV generator!

DANGER

Danger through electric shock!

- All installations and electrical connections may only be carried out by trained electricians!

IMPORTANT

Authorisation for grid feed-in

- Obtain authorisation from the local power grid operator before connecting the inverter to the public power grid.

NOTE

Voiding of guarantee

- Do not open the inverter or remove any of the labels. Otherwise, SOFARSOLAR shall assume no guarantee.

2.1.6 Operation



DANGER

Electric shock

- Contact with the electrical grid or the device's terminals may result in an electric shock or fire!
- Do not touch the terminal or the conductor which is connected to the electrical grid.
- Follow all instructions and observe all safety documents that refer to the grid connection.



CAUTION

Burning due to hot housing

- While the inverter is being operated, several internal components will become very hot.
- Please wear protective gloves!
- Keep children away from the device!

2.1.7 Repair and maintenance



DANGER

Dangerous voltage!

- Before carrying out any repair work, first switch off the AC circuit breaker between the inverter and power grid, and then the DC switch.
- After switching off the AC circuit breaker and the DC switch, wait a minimum of 5 minutes before starting any maintenance or repair work.

IMPORTANT

Unauthorised repairs!

- Following the elimination of any faults, the inverter should be fully functional once more. Should any repairs be required, please contact a local authorised service centre.
- The internal components of the inverter must NOT be opened without the relevant authorisation. Shenzhen SOFARSOLAR Co., Ltd. assumes no responsibility for any resulting losses or defects.

2.2 Symbols and signs



CAUTION

Beware of burning hazards due to the hot housing!

- While the inverter is in operation, only touch the display and the buttons, as the housing can become hot.

ATTENTION

Implement earthing!

- The PV generator must be earthed in accordance with the requirements of the local power grid operator!
- For reasons of personal safety, we recommend that all PV module frames and inverters of the PV system are reliably earthed.



WARNING

Damage due to overvoltage

- Ensure that the input voltage does not exceed the maximum permissible voltage. Overvoltage may cause long-term damage to the inverter, as well as other damage that is not covered by the warranty!

2.2.1 Symbols on the inverter

Several symbols pertaining to safety can be found on the inverter. Please read and understand the content of these symbols before starting the installation.

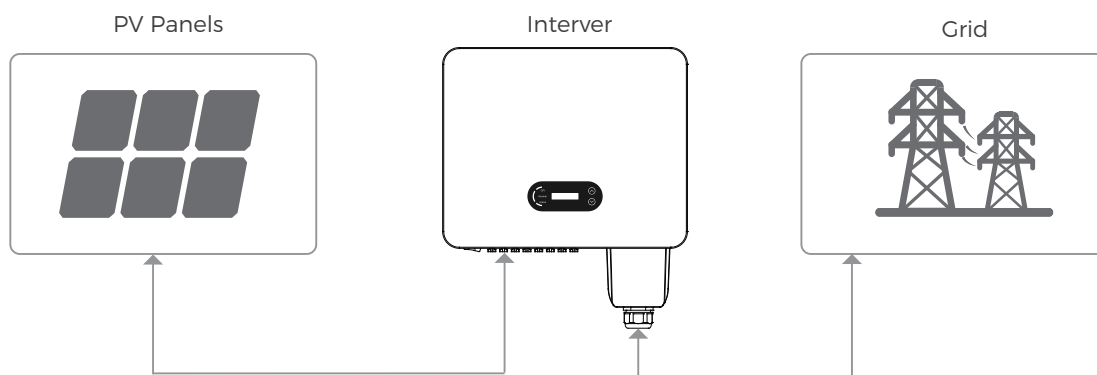
Symbols	Description
	Residual voltage is present in the inverter! Before opening the inverter, you should wait five minutes to ensure that the capacitor has been fully discharged.
	Caution! Danger through electric shock
	Caution! Hot surface
	The product is compliant with EU guidelines
	Earthing point
	Please read the manual before installing the inverter
	Device degree of protection according to EN 60529
	Positive and negative poles of the DC input voltage
	The inverter must always be transported and stored with the arrows pointing upward
	The temperature range in which the inverter can operate
	RCM (Regulatory Compliance Mark) The product meets the requirements of the applicable Australian standards.

3. Product features

This chapter describes the product features, dimensions and efficiency levels.

3.1 Product dimensions

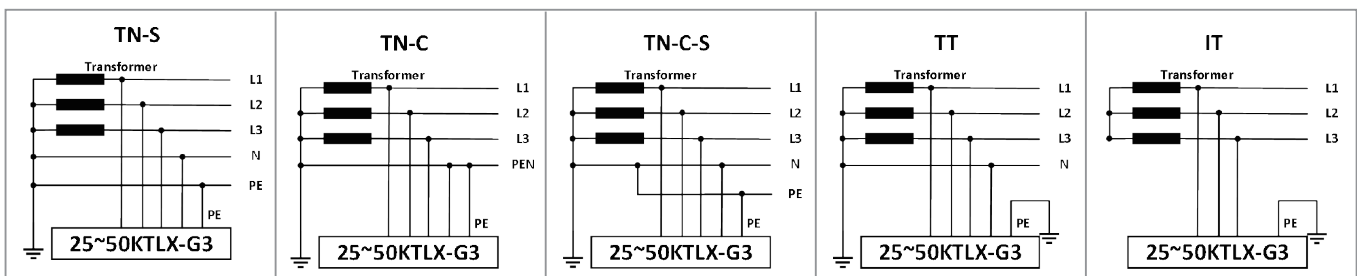
The SOFAR 25 ... 50KTLX-G3 is a grid-coupled PV inverter with up to two MPPTs which converts the direct current generated by PV systems into a three-phase alternating current and feeds it into the public power grid. The AC circuit breaker and DC switch are used as a disconnecting device and must be easily accessible.



SOFAR 25 ... 50KTLX-G3 inverters may only be used with photovoltaic modules which do not require one of the poles to be earthed. In normal operation, the operating current must not exceed the limits specified within the technical data. Only photovoltaic modules may be connected at the input of the inverter (no batteries or other power sources must be connected).

3.2 Power grid types

The SOFAR 25 ... 50KTLX-G3 are compatible with the following grid types:



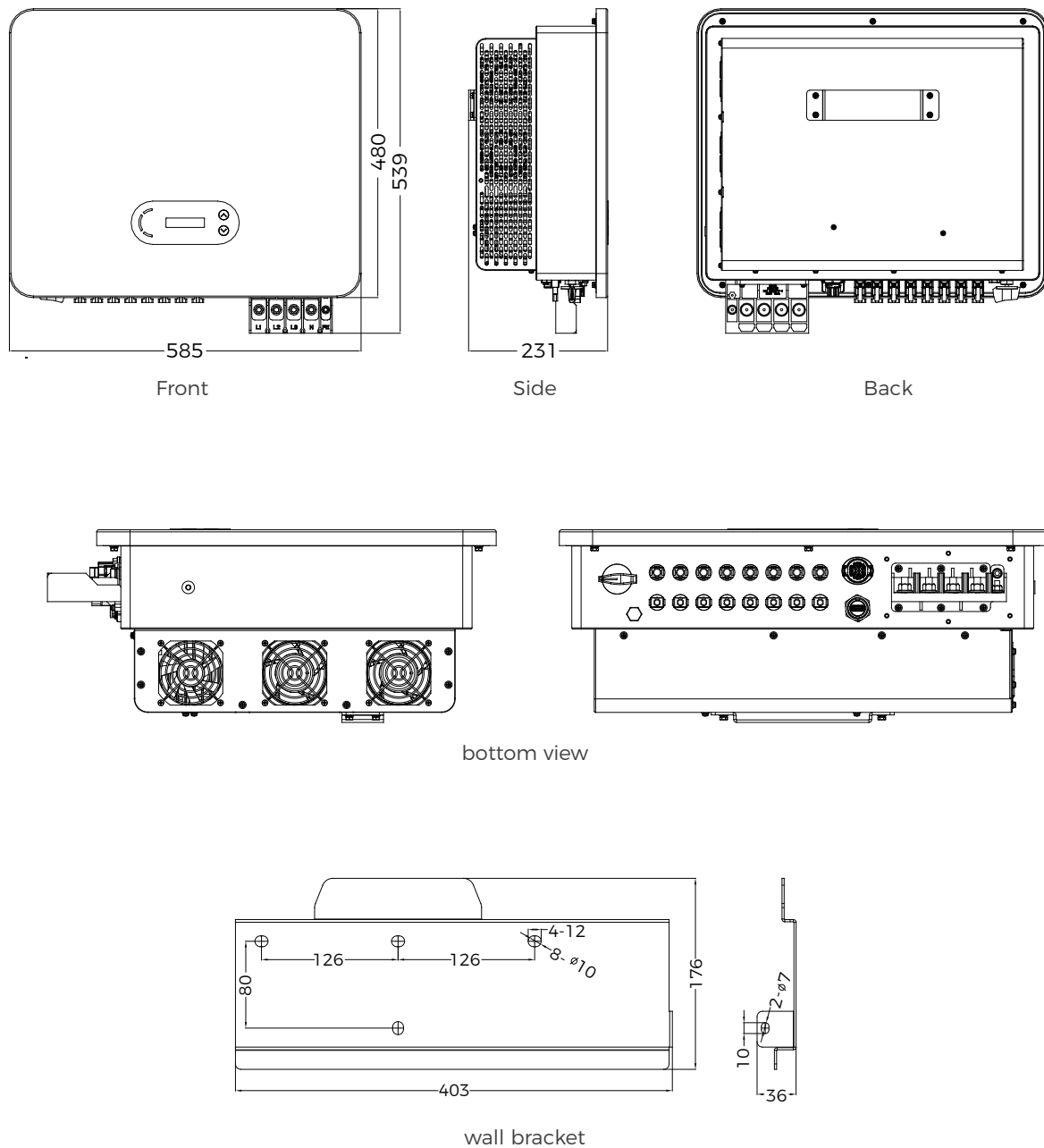
NOTE

- For the TT grid, voltage between N and PE should be less than 30 V.

3.3 Product dimensions

All SOFAR 25 ... 50KTLX-G3 have the following dimensions:

$L \times W \times H = 585 \text{ mm} \times 480 \text{ mm} \times 220 \text{ mm}$

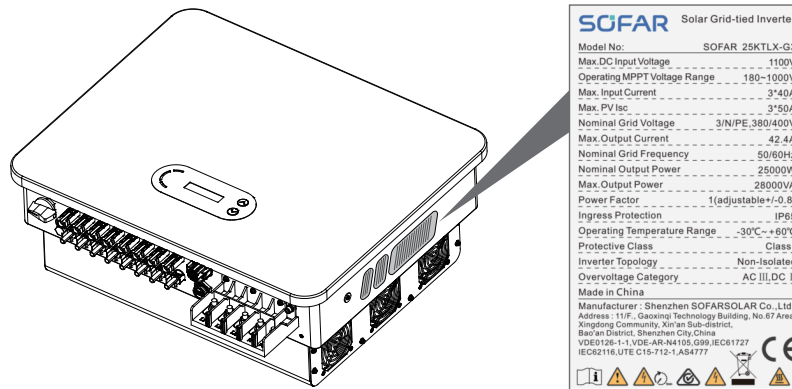


NOTE

- SOFAR 25...36KTLX-G3 inverters support 6-channel PV string input.
- SOFAR 40...50KTLX-G3 and the HV models support 8-channel PV string input.

3.4 Labeling on the device

Labeling must not be covered or removed!



3.5 Functional features

The DC output generated by the PV generator is filtered by the input board before it reaches the power board. The input board also provides functions such as the detection of insulation impedance and the measurement of the DC current and voltage. The DC current is converted into AC current by the power board. The AC current is filtered by the output board and fed into the power grid. The output board also provides functions such as grid voltage and current measurement, earth fault protection and a disconnecting relay. The control board supplies the auxiliary energy, controls the operating state of the inverter and displays the operating status on the display board. An error code will appear on the display if the inverter is in an abnormal operating state. At the same time, the control board may trigger the relay in order to protect the internal components.

3.5.1 Functions

A. Digital inputs (DRMs)

The inverter can be switched on/off or the grid power can be controlled via the external control.

B. Feeding of reactive power into the grid

The inverter is capable of generating reactive power and can also feed it into the grid. The setting of the power factor (Cos Phi) can be controlled via the serial RS485 interface.

C. Limitation of the active power fed into the grid

The inverter can limit the active power fed into the grid to a specific value (as a percentage of the rated output).

D. Output reduction at overfrequency within the grid

If the grid frequency is higher than the limit value, the inverter will reduce the output power; this is required to ensure stability of the grid.

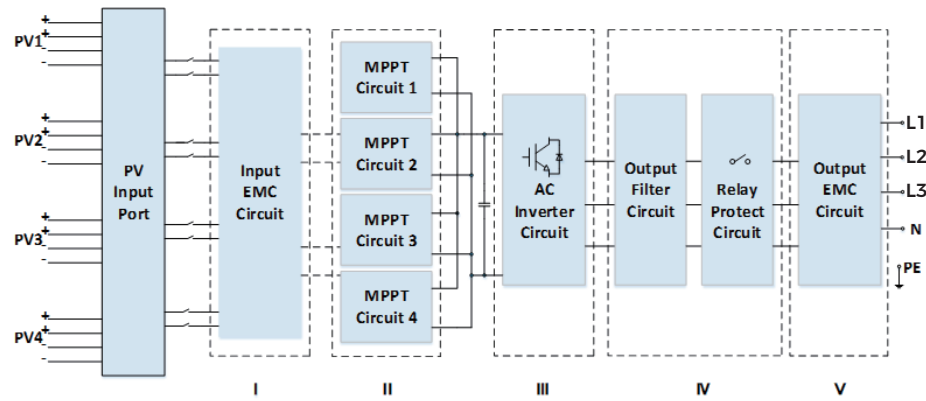
E. Data transfer

The inverter (or a group of inverters) can be monitored remotely via the RS485 communication bus or via WiFi/GPRS.

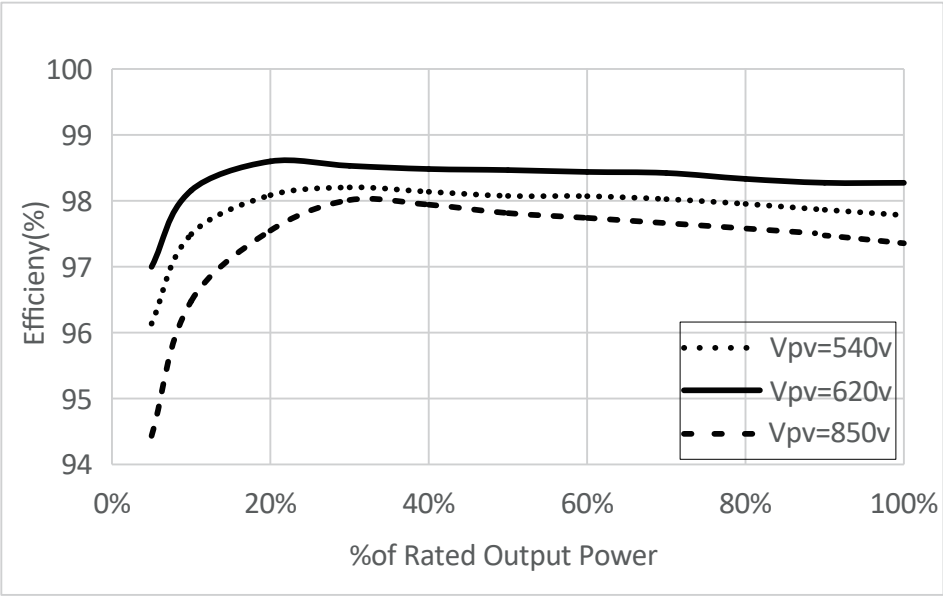
F. Software update

The device supports local updates via USB stick and remote updates via WiFi/GPRS.

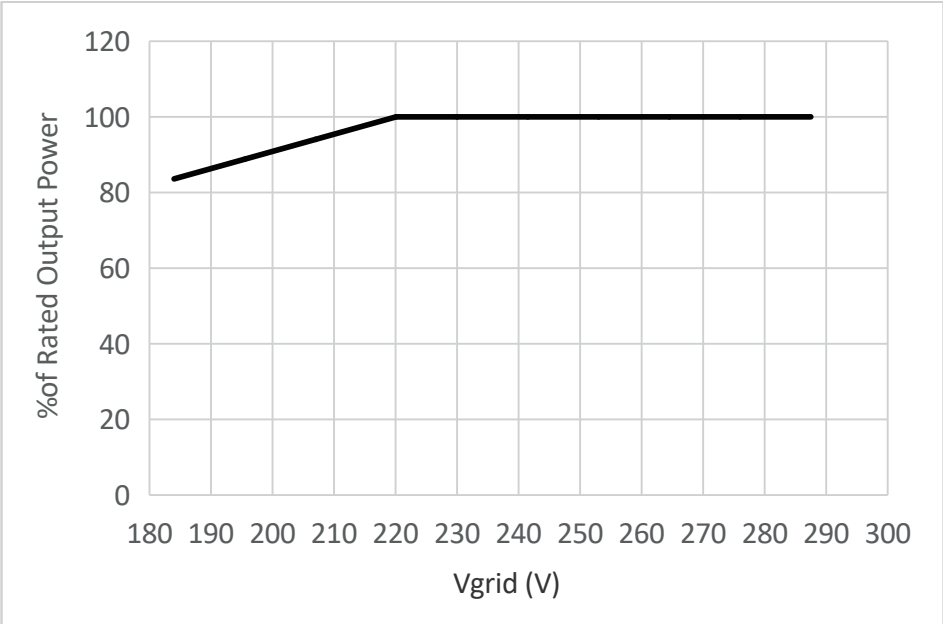
3.5.2 Electrical block diagram



3.6 Efficiency curve



Power efficiency curve (SOFAR 50KTLX-G3)



Rated power ratio vs. Grid voltage

4. Inverter Storage

If the inverter is not installed immediately, storage conditions need to meet the below requirements:

Place the inverter in the original packing case with the desiccant inside.

Keep the storage temperature around -30°C to $+70^{\circ}\text{C}$, Relative humidity 5 to 95%, non-condensing.

In case of stacking storage, the number of stacking layers should never exceed the limit marked on the outer side of the packing case.

The packing case should be upright.

If the inverter needs to be transported again, pack it strictly before loading and transporting it.

Do not store the inverter in places susceptible to direct sunlight, rain, and strong electric field.

The inverter needs to be stored in a clean and dry place and protected from dust and moisture.

Inverters stored for half a year and above need to be inspected and tested by a professional before being put into use.

NOTE

- Please store the product in accordance with the storage requirements. Damage to the product caused by storage conditions that do not meet the requirements will not be covered by the warranty.

5.Installation

5.1 Installation information

DANGER

Fire hazard

- Do NOT install the inverter on flammable material.
- Do NOT install the inverter in an area in which flammable or explosive material is stored.

CAUTION

Burning hazard

- Do NOT install the inverter in places where it can be accidentally touched. The housing and heat sink may become very hot while the inverter is being operated.

IMPORTANT

Weight of the device

- Take into account the weight of the inverter when transporting and moving it.
- Choose a suitable installation location and surface.
- Commission a minimum of two persons with the installation of the inverter.
- Do not set down the inverter upside-down.

5.2 Installation procedure

Mechanical installation is performed as follows:

- Examine the inverter before installation
- Prepare the installation
- Select an installation location
- Transport the inverter
- Mount the rear panel
- Install the inverter

5.3 Examination before installation

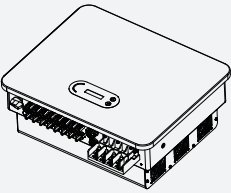
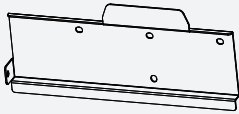
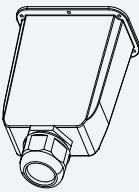
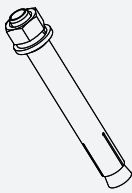
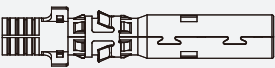
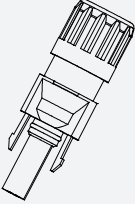
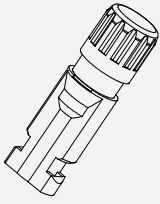
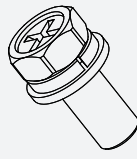
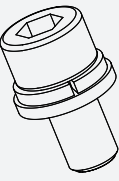
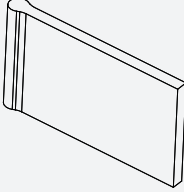
5.3.1 Checking the external packaging materials

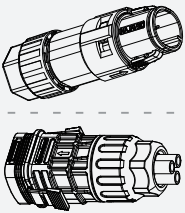
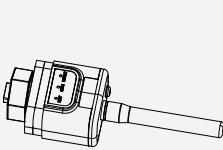
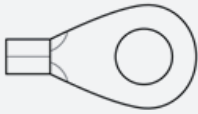
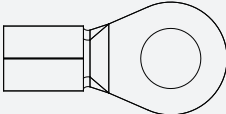
Packaging materials and components may become damaged during transportation.

Therefore, the external packaging materials must be examined before the inverter is installed. Check the external packaging material for damage, e.g. holes and cracks. If you discover any cases of damage, do not unpack the inverter and contact the transport company and/or dealer immediately. It is recommended that the packaging material should be removed within 24 hours before installing the inverter.

5.3.2 Checking the delivery scope

After unpacking the inverter, check that the delivery items are both intact and complete. In the event of any damage or missing components, contact the wholesaler.

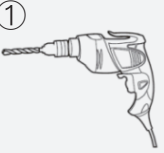
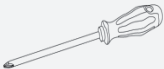
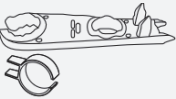
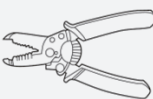
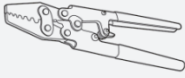
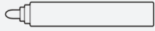
①		Inverter SOFAR 25 ... 50KTLX-G3 ×1	②		Wall bracket ×1
③		AC waterproof cover ×1	④		Hexagon screws ×4
⑤		PV+ metal pin ×6 / 8*	⑥		PV- metal pin ×6 / 8*
⑦		PV+ input terminal ×6 / 8*	⑧		PV- input terminal ×6 / 8*
⑨		M4 cross screw ×6	⑩		M5 cross screw ×1
⑪		M6 hexagon screw ×1	⑫		AC terminal insulation partition ×4

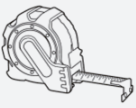
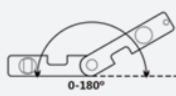
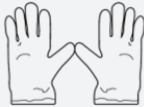
	COM terminal ×1		WiFi stick logger ×1 (Optional)
	R-type terminal (PE) ×1		R-type terminal (L1/L2/L3/N) ×4
	Document ×1		

*) second Pcs. for SOFAR 40...50KTLX-G3 + SOFAR 50KTLX-G3-HV

5.4 Tools

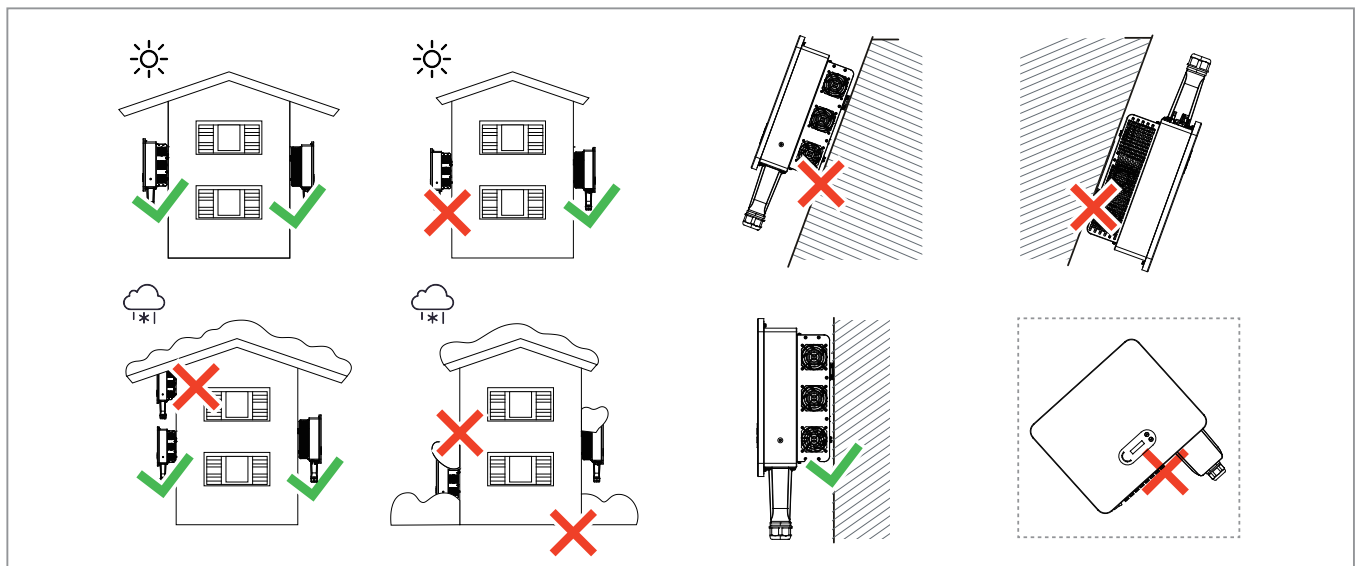
Prepare the tools required for the installation and the electrical connection.

	Model: Hammer Drill Recommend drill @ 60 mm Function: Used to drill holes on the wall		Model: Screwdriver Function: Used to tighten and loosen screws when installing the AC power cable; to remove and install the screws of the AC terminal
	Model: Removal Tool Function: Used to remove the PV terminal		Model: Wire stripper Function: Used to strip the wire
	Model: M6 Allen key Function: Used to turn the screw to connect the rear panel to the inverter		Model: Crimping tool Function: Used to crimp power cables
	Model: Multimeter Function: Used to check the earthing		Model: Marker Function: Used for Marking

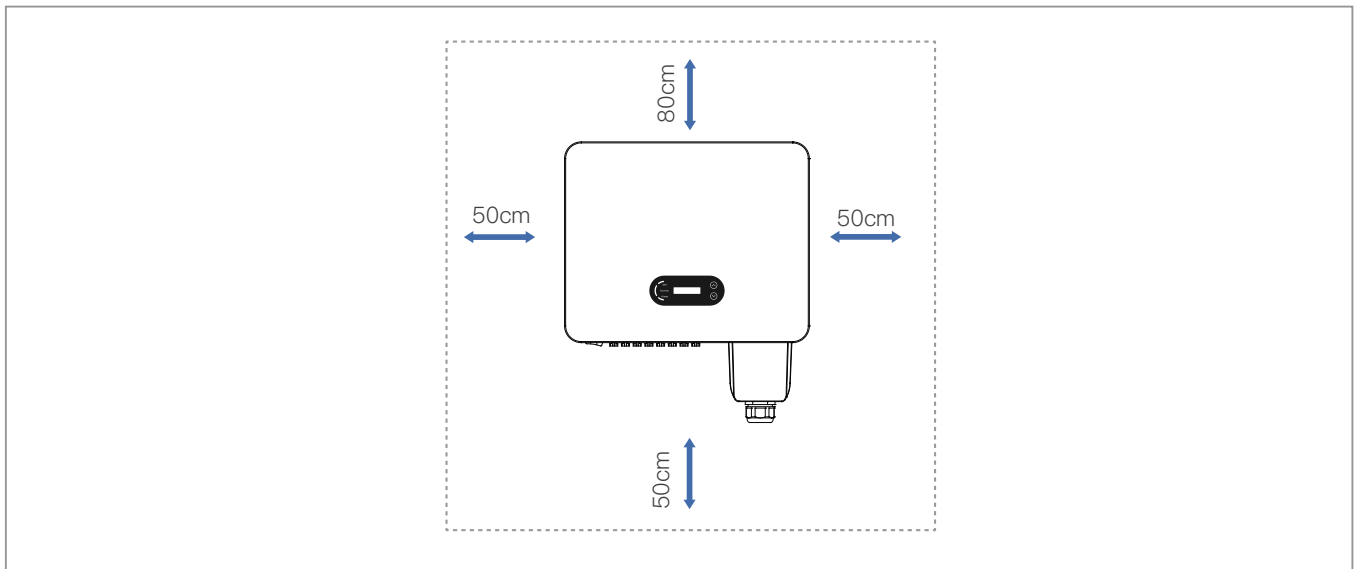
⑨ 	Model: Measuring Tape Function: Used to measure distances	⑩ 	Model: Spirit level Function: Used to align the wall bracket
⑪ 	Model: ESD gloves Function: for the installer	⑫ 	Model: Safety goggles Function: for the installer
⑬ 	Model: Anti-dust respiratory mask Function: for the installer	⑭ 	Model: Socket wrench Function: Used to install the expansion bolts
⑮ 	Model: Hammer Function: Used to install the expansion bolts		

5.5 Installation location

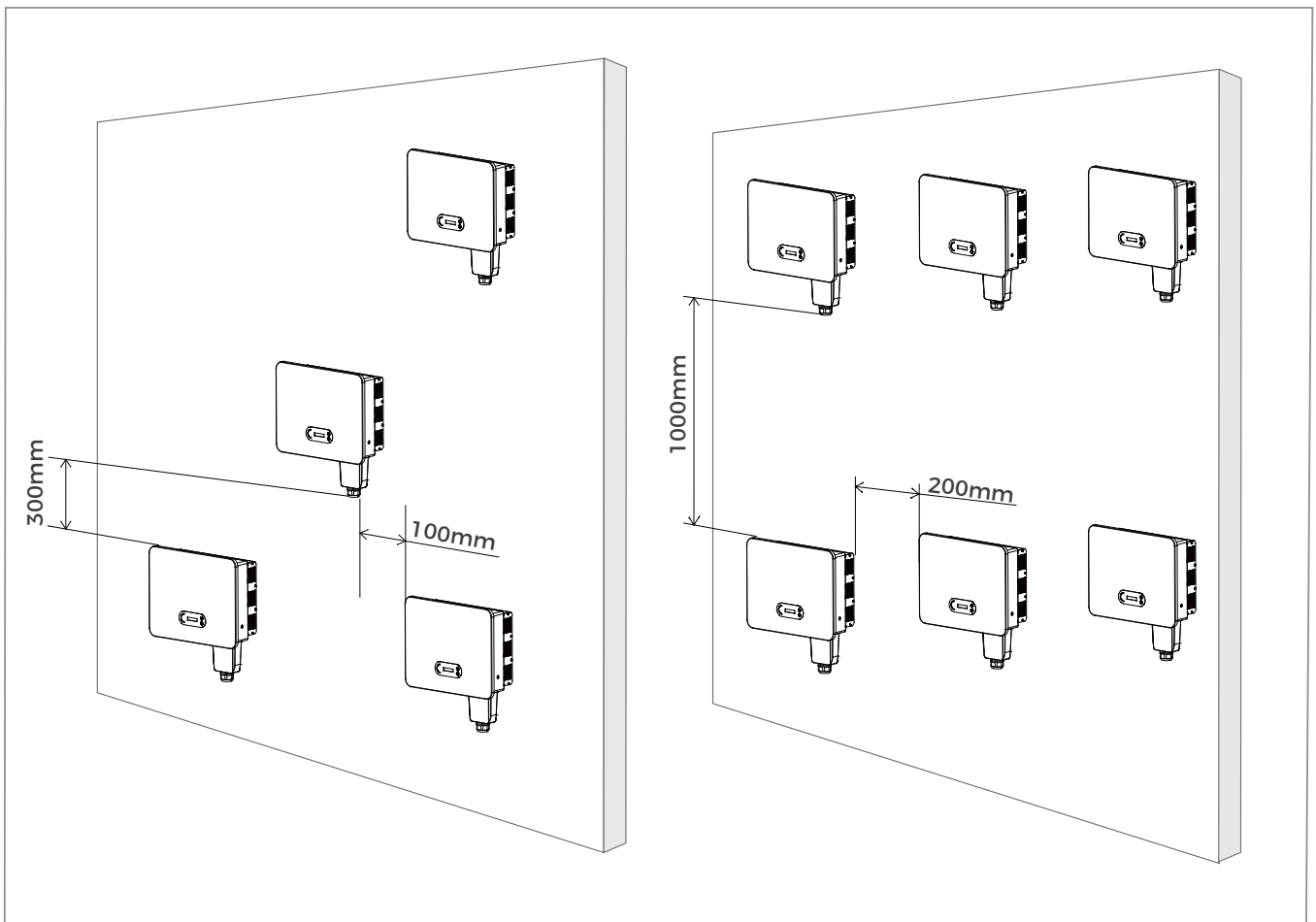
Choose a suitable position for the installation of the inverter. Ensure that the following requirements have been fulfilled:



Minimum distances for individual SOFAR 25 ... 50KTLX-G3 inverters:

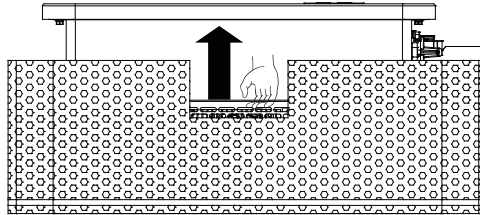


Minimum distances for several SOFAR 25 ... 50KTLX-G3 inverters:

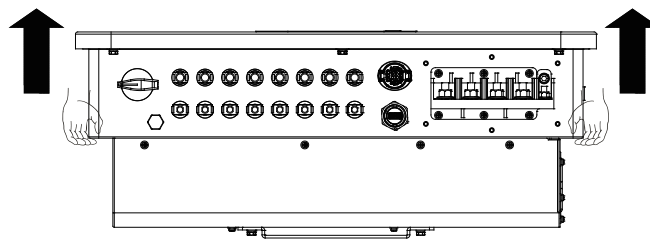


5.6 Unpacking the inverter

1. Open the packaging and have at least two people grip underneath the inverter at both sides.



2. Lift the inverter out of the packaging and move it to its installation position horizontally.



ATTENTION

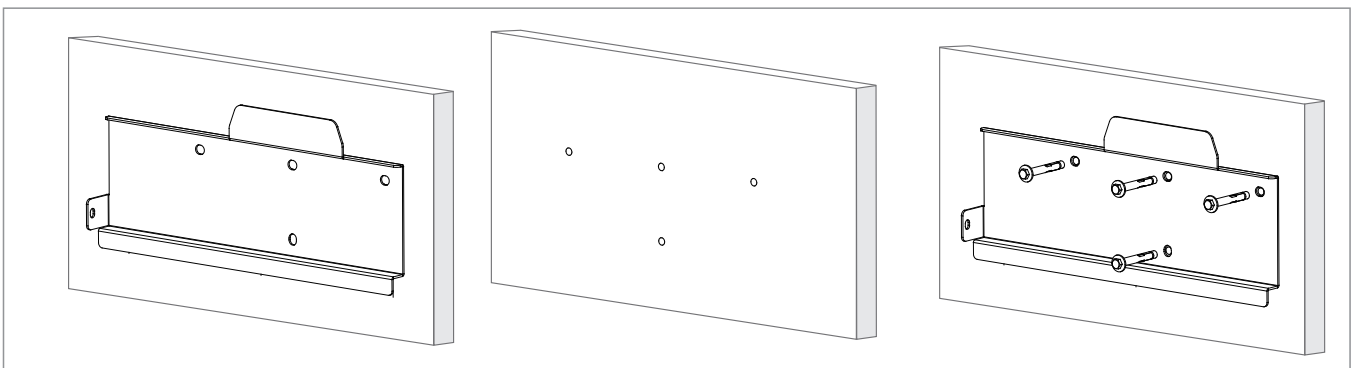
Mechanical damage

- In order to prevent injuries and damage to the device, ensure that the inverter is kept balanced while it is being moved - it is very heavy.
- Do not place the inverter on its connections, as these are not designed to bear its weight. Place the inverter horizontally on the ground.
- When you place the inverter on the ground, place foamed material or paper underneath it in order to protect its housing.

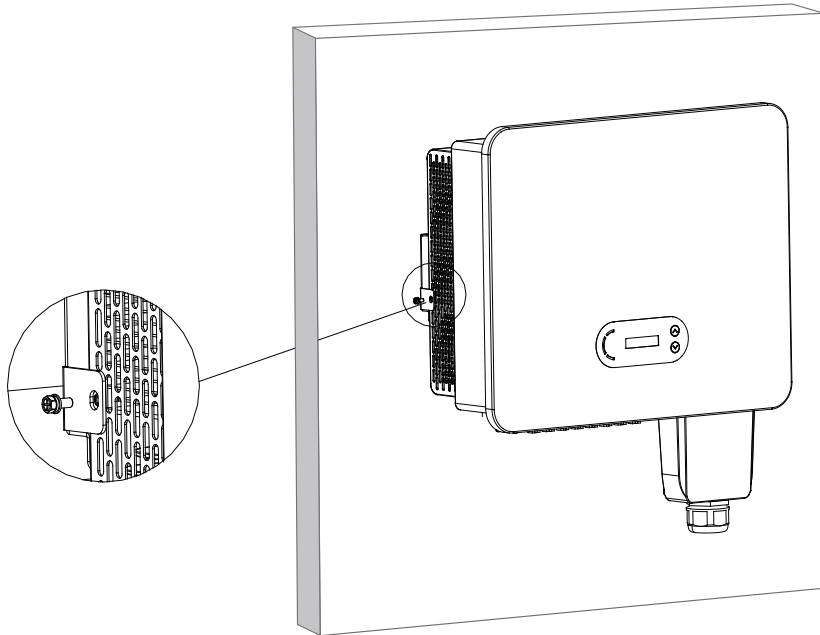
5.7 Installation of the inverter

1. Hold the wall bracket in the desired place and mark the three holes. Put the wall bracket aside and drill the holes.

2. Fasten the rear panel to the wall using the M8*80 screws.



3. Place the inverter in the wall bracket. Secure the inverter to the wall bracket using the M6 hexagon screw.



6. Electrical connections

6.1 Safety instructions

This topic describes the electrical connections of the inverter SOFAR 25 ... 50KTLX-G3. Read this section thoroughly and carefully before connecting the cables.

DANGER

Electrical voltage at the DC connections

- Ensure that the DC switch is OFF before establishing the electrical connection. The reason is that the electrical charge remains in the capacitor after the DC switch has been switched off. Therefore, at least 5 minutes must lapse before the capacitor has been electrically discharged.

DANGER

Electrical voltage

- PV modules generate electrical energy when exposed to sunlight, and this may present an electrical shock hazard. Therefore, cover the PV modules with an opaque sheet before connecting to the DC input power cable.

NOTE

- Open circuit voltage of the PV strings should not exceed 1100 V.

ATTENTION

Qualification

- The installation and maintenance of the inverter must be carried out by an electrician.

The connected PV modules must be compliant with IEC 61730 class A.

Model	Max. PV Panel ISC	Max. AC output current
SOFAR 25KTLX-G3	3*50 A	42.4 A
SOFAR 30KTLX-G3		51.5 A
SOFAR 30KTLX-G3-A		45.3 A
SOFAR 33KTLX-G3		56.0 A
SOFAR 36KTLX-G3		60.6 A
SOFAR 40KTLX-G3	4*50 A	66.7 A
SOFAR 45KTLX-G3		75.8 A
SOFAR 50KTLX-G3		83.3 A
SOFAR 40KTLX-G3-HV	3*50 A	53.0 A
SOFAR 50KTLX-G3-HV	4*50 A	66.2 A

6.2 Electrical connection

The electrical connection is established as follows:

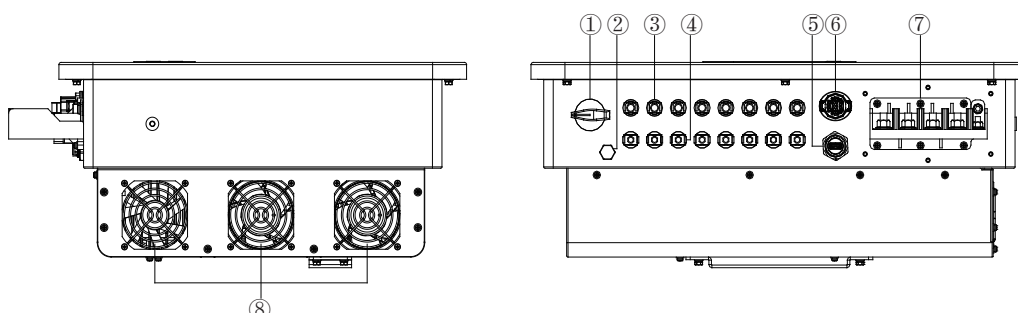
1. Connect PE cable
2. Connect DC input cable
3. Connect AC output power cable
4. Connect communication cable (optional)

6.3 Connections

CAUTION

Damage during transportation

- Please check the product packaging and connections carefully prior to installation.



- | | |
|-----------------------------|-----------------------------|
| ① DC switch | ② Venting valve |
| ③ PV input ports (positive) | ④ PV input ports (negative) |
| ⑤ WiFi/GPRS/Ethernet | ⑥ COM Port (RS485) |
| ⑦ AC output | ⑧ Fans |

6.4 Connecting the PE cables

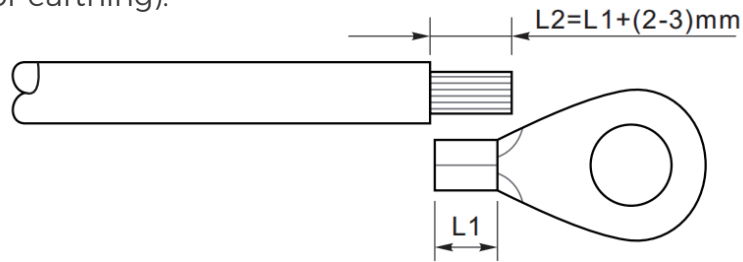
Connect the inverter to the equipotential bonding bar by using the protective earth cable (PE) for grounding.

ATTENTION

Pole earthing not permissible!

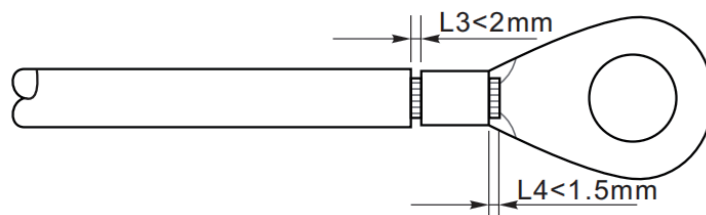
- As the inverter is transformerless, the plus and minus poles of the PV generator must NOT be earthed. Otherwise, the inverter will malfunction. In the PV system, not all live metal parts (e.g. PV module frames, PV frame, generator connection box housing, inverter housing) require earthing.

1. Remove the insulation of the cable. For outside use, cables of $> 16\text{mm}^2$ are recommended for earthing).

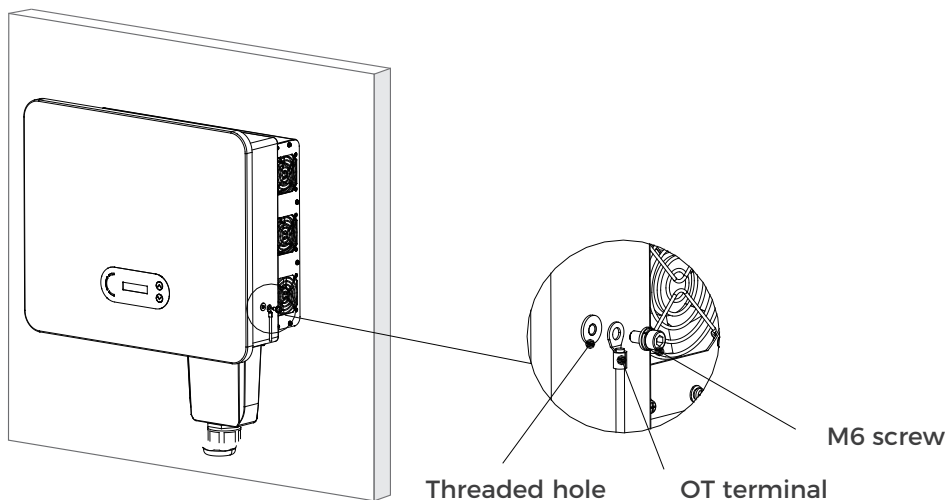


Note: $L2$ is 2 to 3 mm longer than $L1$

2. Crimp the cable to the ring terminal. Recommended OT terminal: OT-M6.



3. Tighten the crimped ring terminal with the M6 screw by using a torque wrench of 5 to 7 Nm:



6.5 Connecting the DC cables

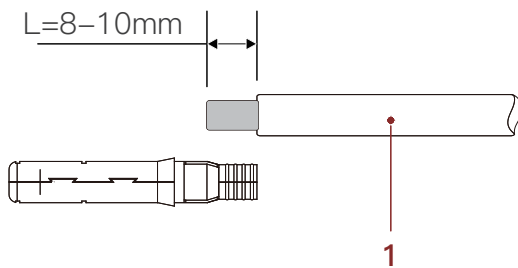
NOTE

- Maximum tolerance voltage $\geq 1100\text{ V}$

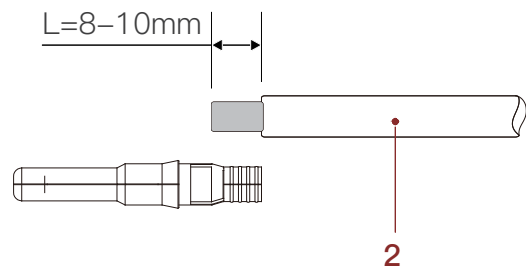
Please observe the recommended cable dimensions:

- Cu cable cross section: 2.5 ... 6 mm²
- Cable outside diameter: 6 ... 9 mm

1. Insert the positive and negative DC cables into the corresponding cable glands.

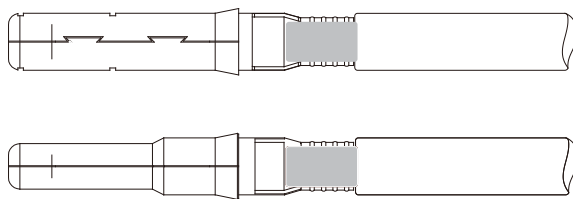


1. Positive DC cable



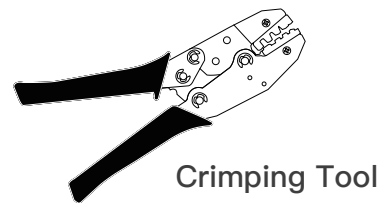
2. Negative DC cable

2. Use a crimping plier to crimp the DC cables.



Positive

Negative



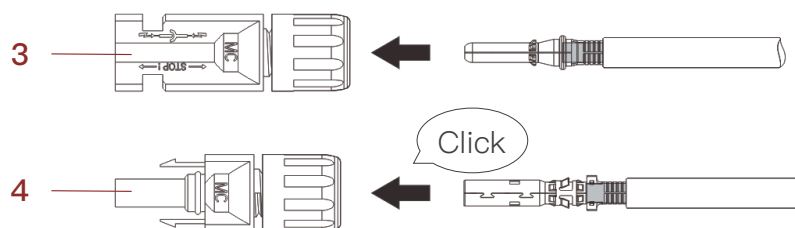
Crimping Tool

⚠ CAUTION

Danger of reverse polarity!

- Ensure that the polarity is correct before plugging into the DC connections!

3. Insert the crimped DC cables into the corresponding connector housing until you hear a “clicking” sound.

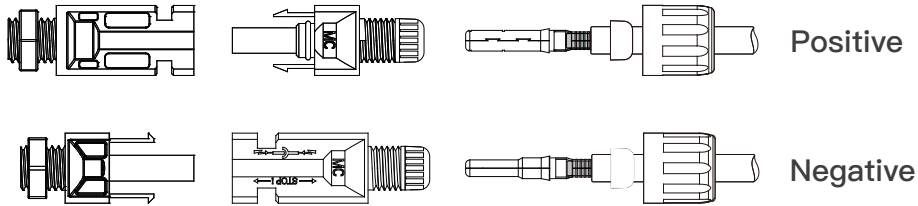


3. Positive

4. Negative

4. Verify the voltage level of the DC input with a multimeter and ensure that the polarity is correct.

5. Connect the DC connector to the inverter.



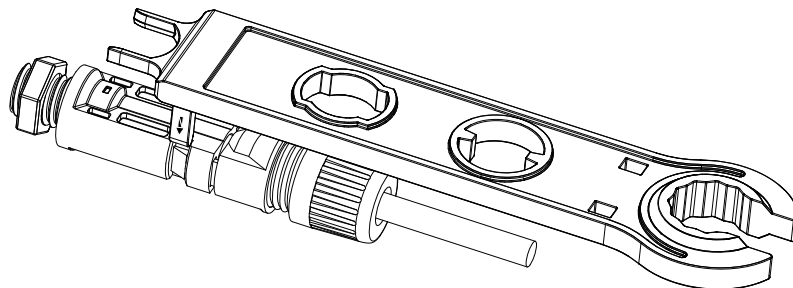
Removing the connectors

CAUTION

Danger of DC arcing

- Before removing the plus and minus connector, ensure that the DC switch has been set to OFF.

In order to remove the plus and minus connection from the inverter, insert a removal key into the locking and press on the key with the adequate force as shown in the following illustration:



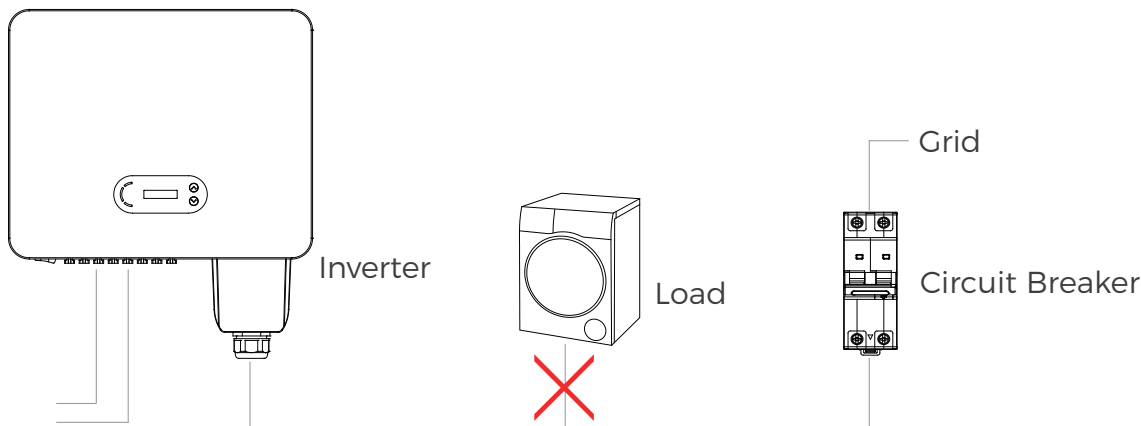
6.6 Connecting the AC power cables

Connect the inverter to the AC power distributor or the power grid using AC power cables.

CAUTION

AC connection

- Each inverter must have its own circuit breaker.
- Do not connect any consumers between the inverter and circuit breaker!
- The AC disconnecting device must be easily accessible.



NOTE

- The inverter SOFAR 25 ... 50KTLX-G3 has a built-in AFI (univ. sensitive residual current protection). If an external AFI is required, we recommend an AFI type A or B RCD featuring a residual current of 100 mA or higher.
- Please follow the national rules and regulations for the installation of external relais or circuit breakers!

Dimensioning

For correct installation, five-core outdoor cables should be used. To simplify the installation process, use flexible cables. The recommended cable specifications are listed in the following table.

Model SOFAR	L/N Cross section area (mm ²)		PE Cross section area (mm ²)		Cable insulation voltage (V)
	Cu	Al	Cu	Al	
SOFAR 25...33KTLX-G3	≥16	≥35	≥16	≥35	600
SOFAR 36...40KTLX-G3	≥25				
SOFAR 45...50KTLX-G3		≥50			

NOTE

- The AC circuit breaker must comply to I Δ N=0.1A
- The resistance at connection point must less than 2Ω

You need to use five core outdoor cables, the recommended AC cable and residual current device (RCD) can be used as below table:

If a RCD is required under local regulations, SOFAR recommends a type A or B RCD with sensitivity of 100 mA or higher.

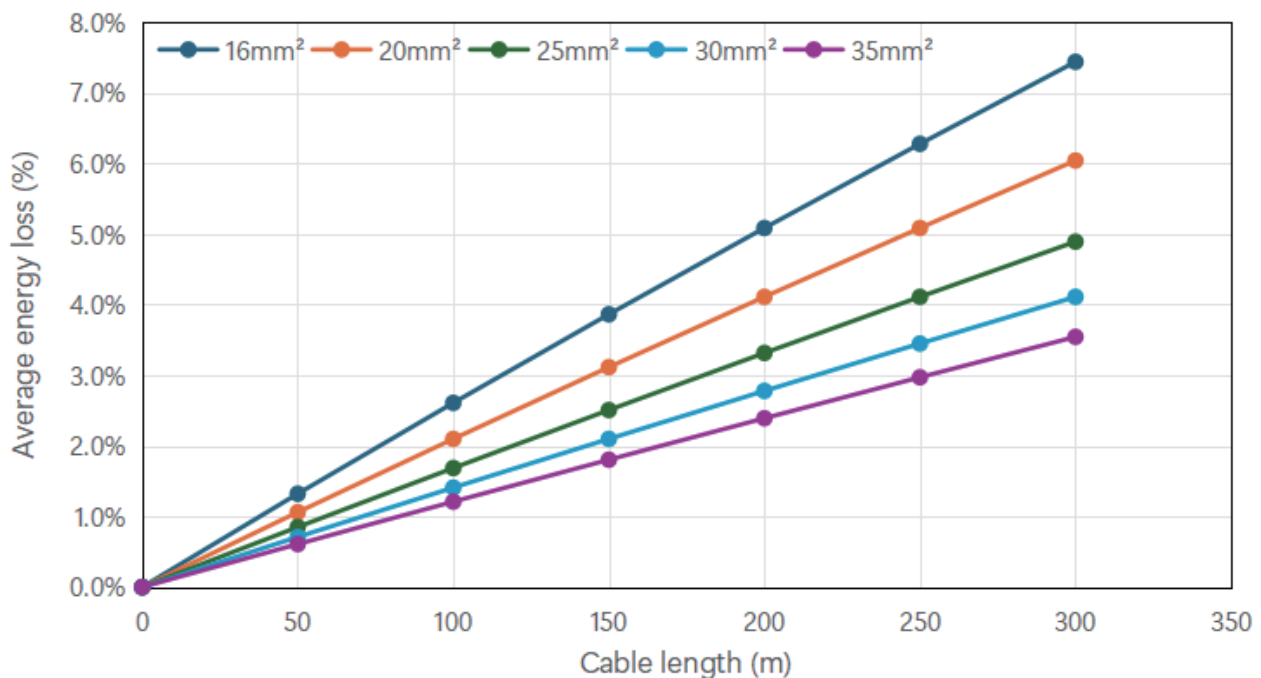
Where local electricity code requires an RCD with a lower leakage rating, the discharge current might result in nuisance tripping of the external RCD. SOFAR recommends the following measure in selecting an external RCD to avoid nuisance tripping:

1: Selecting appropriate RCD.

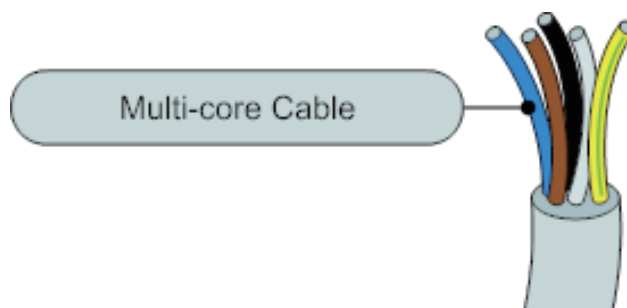
2: Configure the trip current of inverter internal RCD to a lower value that the trip current of the external RCD.

To ensure reliable anti-islanding protection, high-quality PV-specific cables with sufficient current-carrying capacity should be selected, ensuring that line losses are less than 1% of the normal power output. The distance from the inverter's AC side to the grid connection point should not exceed 300 meters, and AC cable losses should be kept below 3%. To avoid power generation losses, it is recommended that the losses not exceed 1%.

Taking copper cables as an example, the relationship between cable length, cross-sectional area, and average energy loss is illustrated below:



The AC output terminal is equipped with a high-current 5-core terminal block and a customized waterproof cover (IP65). Please follow below steps to connect the AC cable.



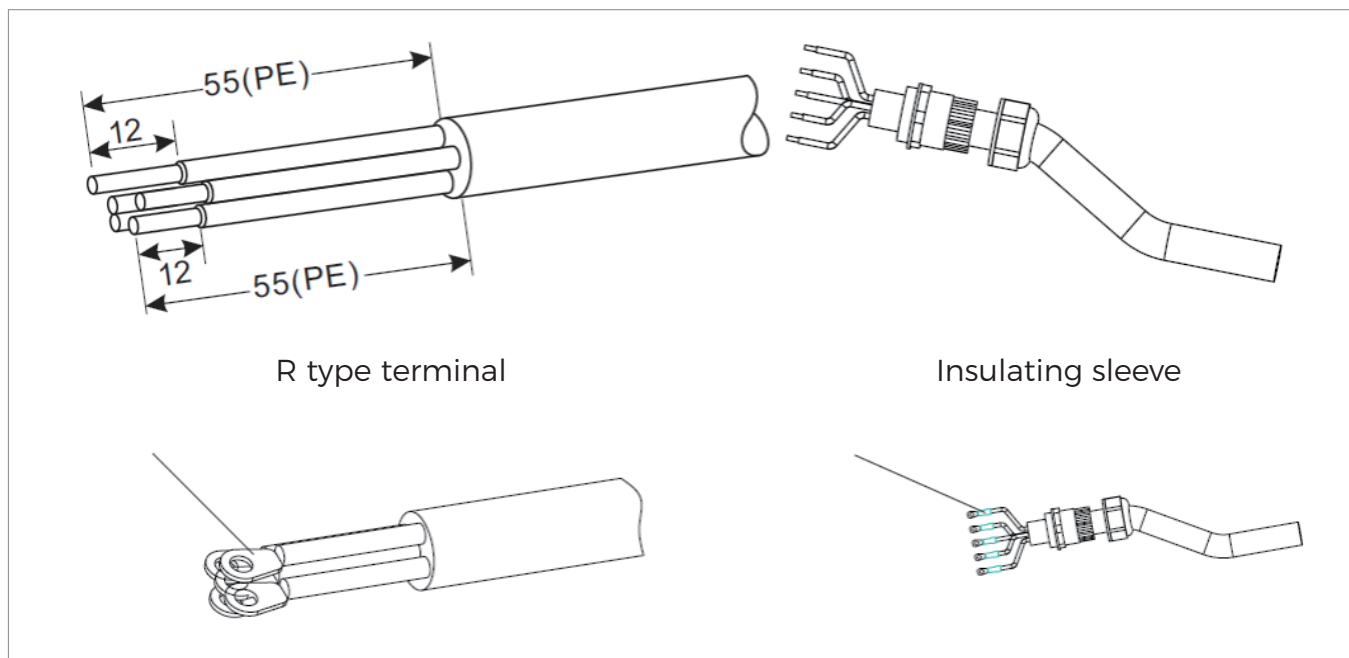
6.6.1 Installation instructions

⚠ CAUTION

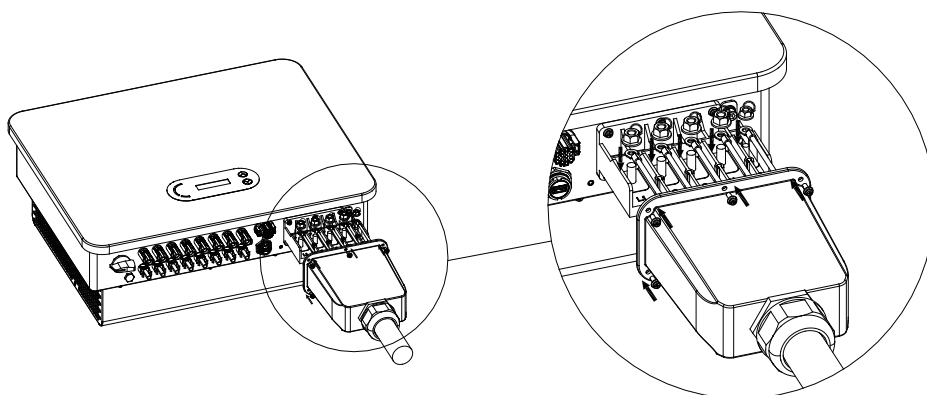
Electrical voltage

- Ensure that the grid has been switched off before removing the AC connector.

1. Select the suitable cable according to the table above. Remove the insulating layer of the AC output cable using a wire stripper and in accordance with the following illustration, and then guide the cables through the cable gland.



2. Connect the cables to the AC terminal block and tighten the M8 screws (6 ... 10 Nm) and M6 screws (5 ... 7 Nm). Then tighten the AC cover screws (2 ... 3 Nm);

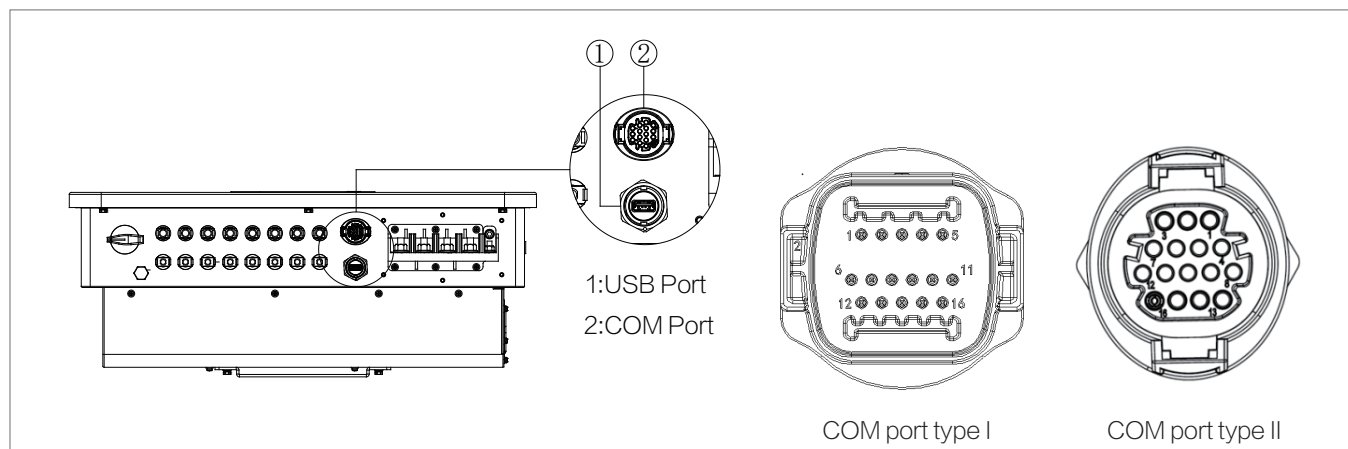


NOTE

- When an aluminum cable is used, a copper/aluminum conversion terminal is required. This is supplied together with the copper terminals.

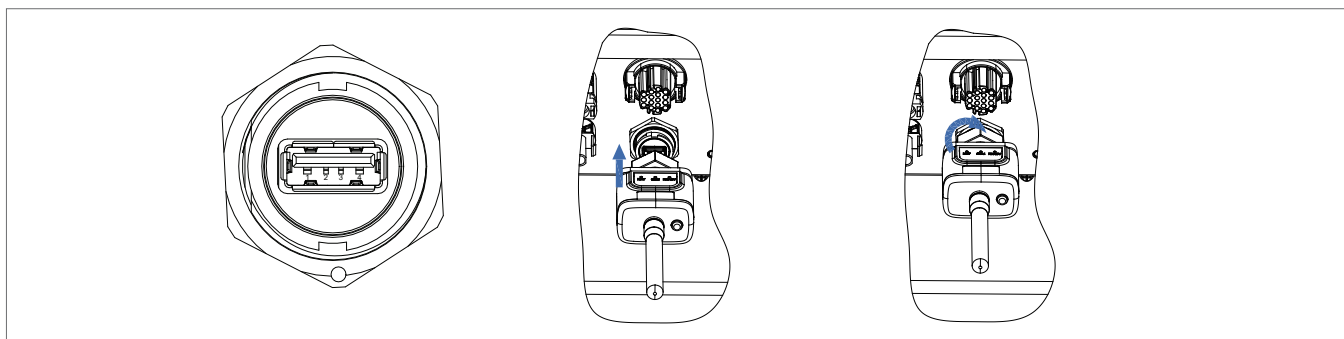
6.7 Communication ports

The SOFAR 25 ... 50KTLX-G3 inverters come with one of the following two COM ports and one USB port.



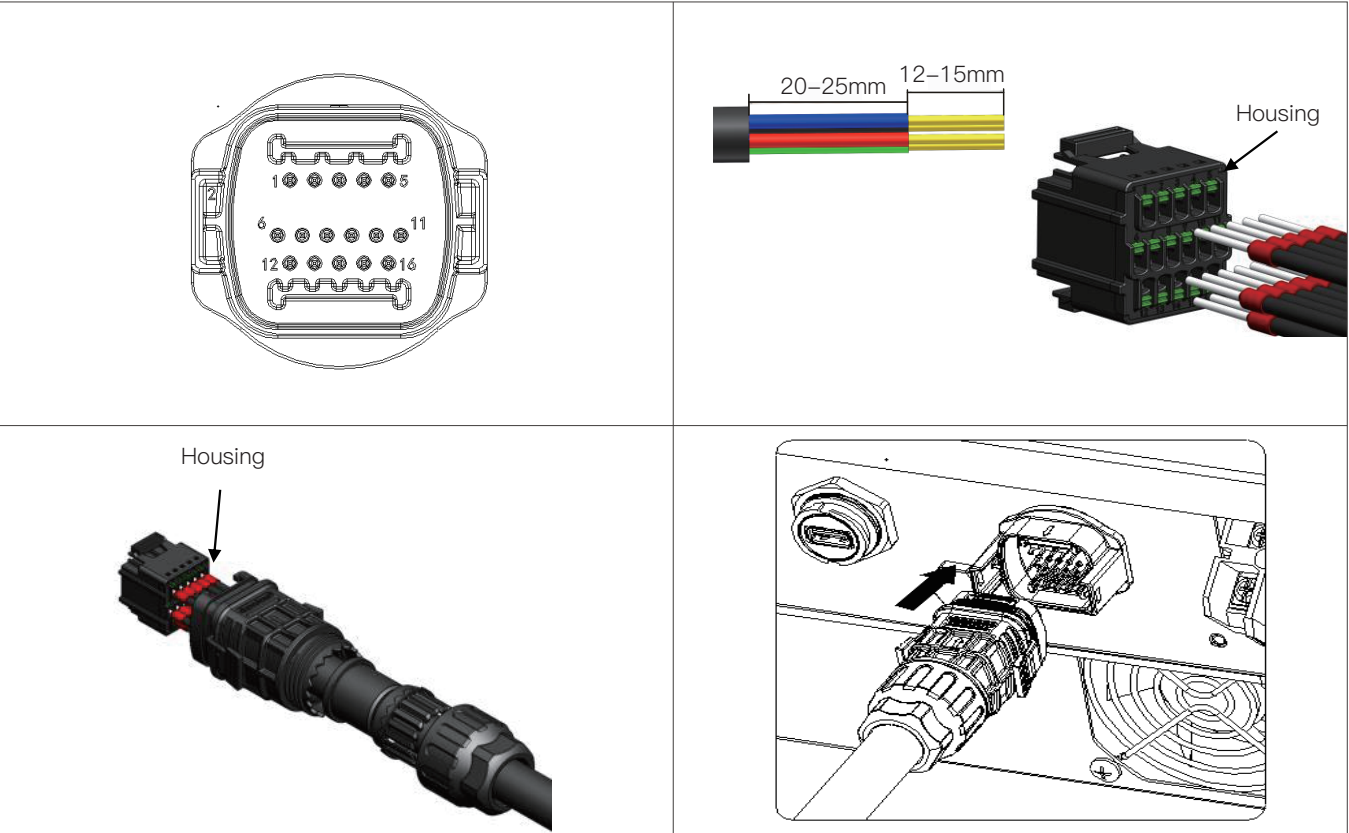
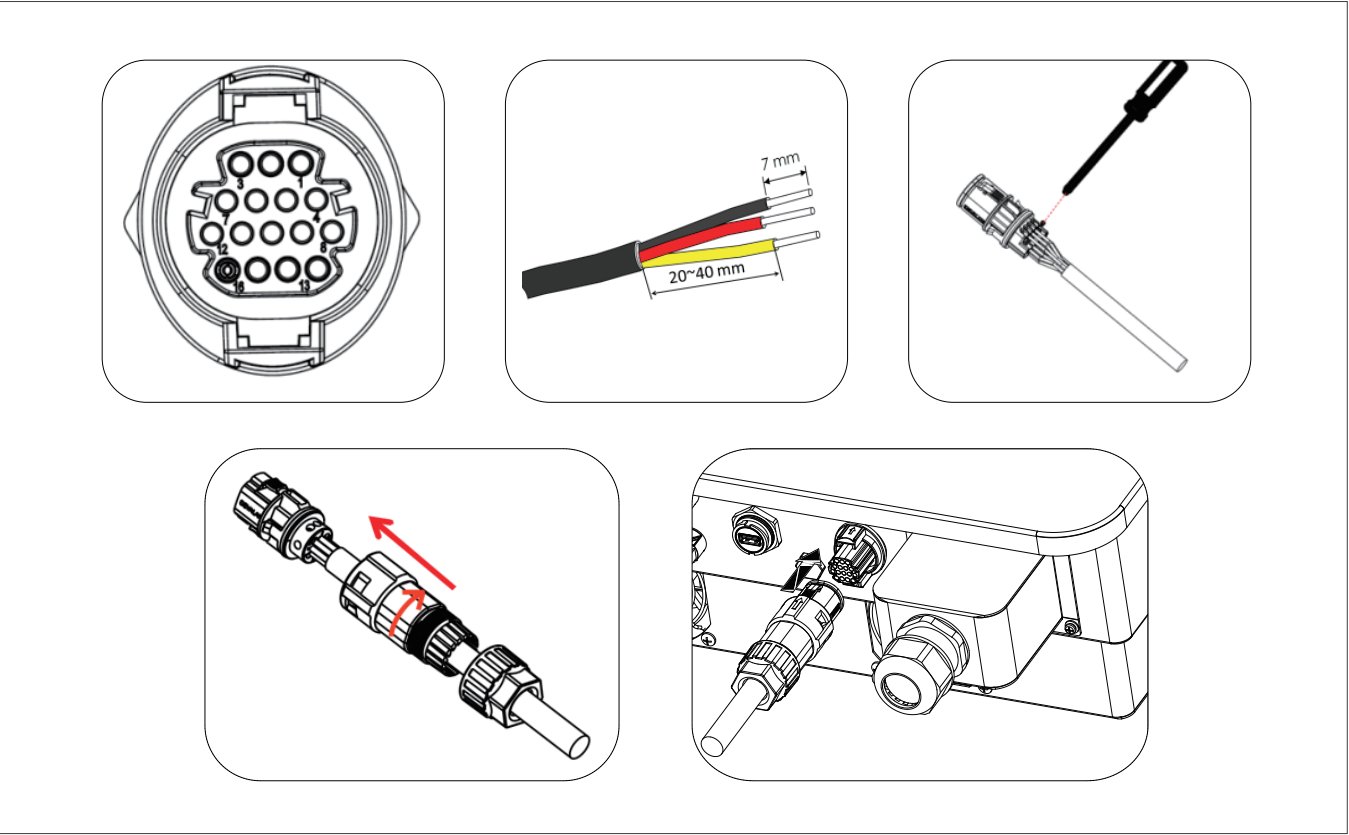
6.7.1 USB port

The USB port can be used to update the inverter's software version, or for connecting a WiFi-stick or Ethernet cable.



6.7.2 COM port

Please follow below steps to install the COM cable according to the correct COM port (check the corresponding type A or B):



Please refer to below table for the specific PIN assignments.

Function	Pin	Definition	Note
Inverter monitoring and system control	1	RS485 A1-1	RS485 Signal+
	2	RS485 A1-2	RS485 Signal +
	3	RS485 B1-1	RS485 Signal -
	4	RS485 B1-2	RS485 Signal -
Energy meter port	5	RS485 A2	RS485 Signal +
	6	RS485 B2	RS485 Signal -
Grounding	7	GND.S	Signal GND
Logic interface for power control and remote shutdown	8	DRM0	Remote shutdown
	9	DRM1/5	Digital input 1
	10	DRM2/6	Digital input 2
	11	DRM3/7	Digital input 3
	12	DRM4/8	Digital input 4

6.7.3 Logic Interface: DRMs, Power Control and remote shutdown

The DRM/Logic interface is used to control the inverter by external signals, usually provided from grid operators with ripple control receivers or other means. The logic interface inputs are defined according to different standard requirements.

The grid protection relays can trigger the internal grid relays to open within 150 ms.

NOTE

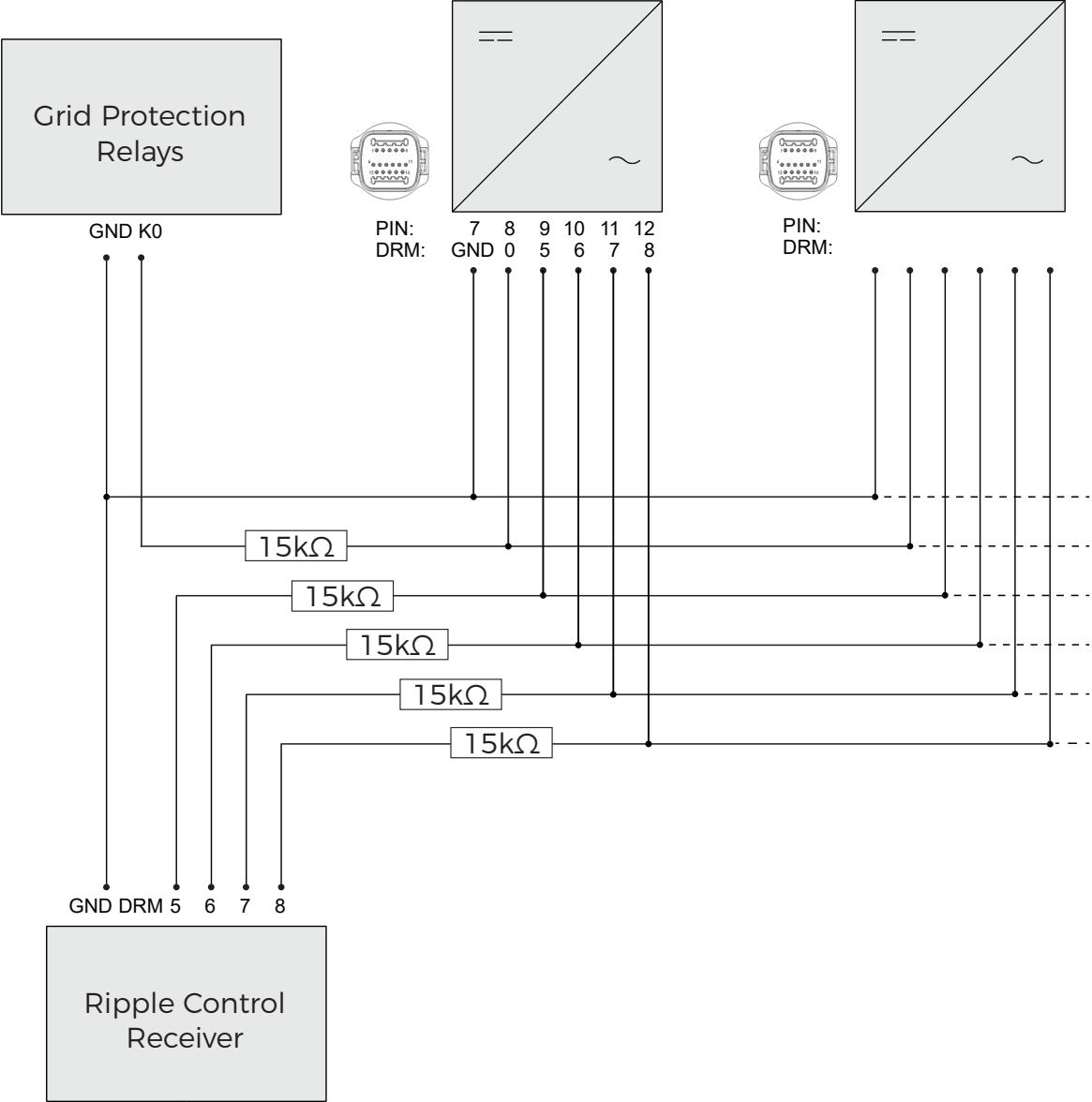
- The DRM0 inputs need a 15kΩ resistor in series to the input to feed-in power!

DRMs for AS/NZS 4777.2:2015 and AS/NZS 4777.2:2020

Also known as Inverter Demand Response Modes (DRMs).

The inverter recognises all supported Demand Response commands and initiates the reaction within two seconds. The inverter remains in the reduced power mode as long as the input is closed.

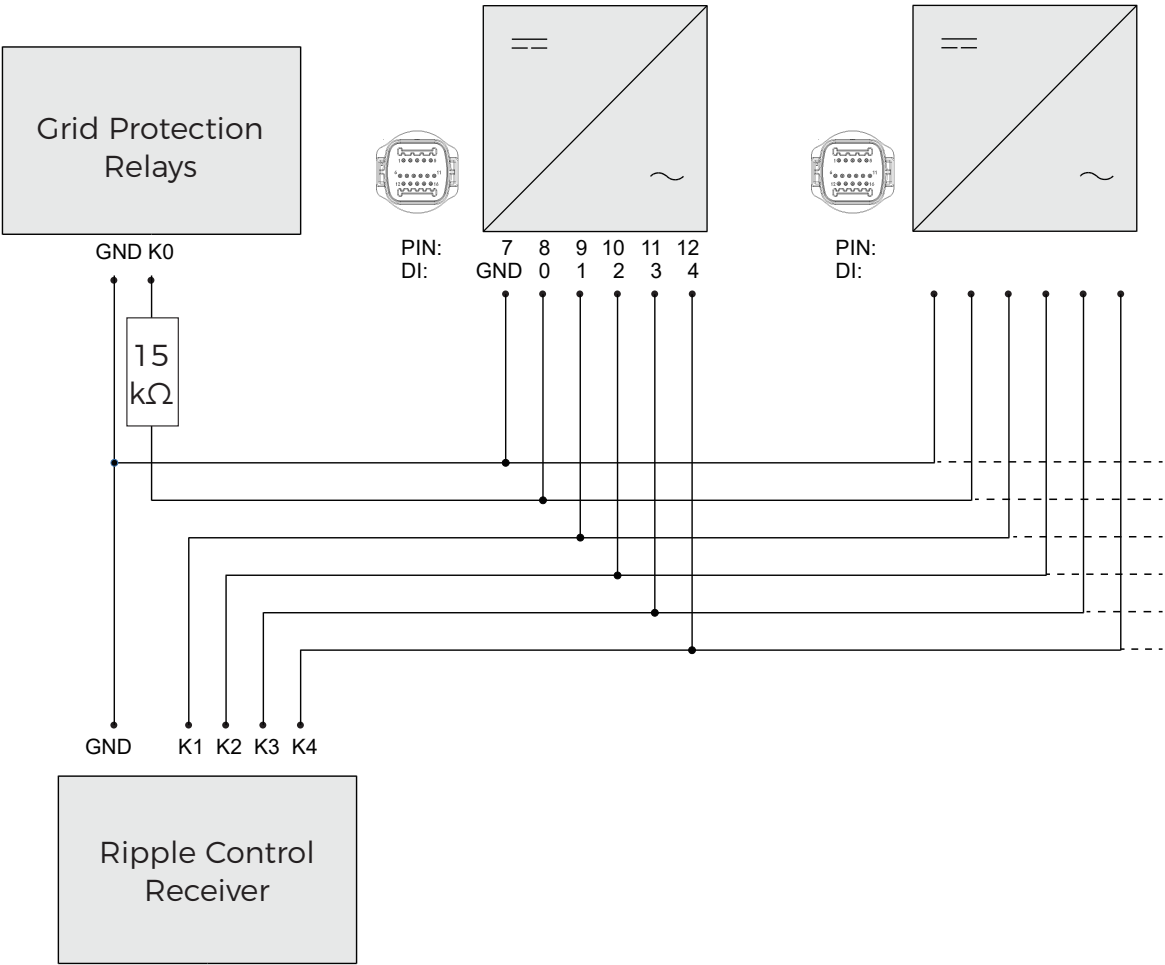
Supported DRM commands are pre-configured: DRM0, DRM5, DRM6, DRM7, DRM8:



Function	Pin	Definition	Note	Digital Input
Grounding	7	GND.S	Signal GND	
DRMs/Logic Interface	8	DRM0	Remote shutdown	
	9	DRM1/5	0% power feed-in	DI 5
	10	DRM2/6	50% power feed-in	DI 6
	11	DRM3/7	75% power feed-in	DI 7
	12	DRM4/8	100% power feed-in	DI 8

Logic interface for VDE-AR-N 4105:2018-11

This function serves to control and/or limit the output power of the inverter. The inverter can be connected to a radio ripple control receiver in order to dynamically limit the output power of all inverters within the system. The inverter remains in the reduced power mode as long as the input is closed.



Function	Pin	Definition	Note	Digital Input
Grounding	7	GND.S	Signal GND	
DRMs/Logic Interface	8	DRM0	Remote shutdown	
	9	DRM1/5	0% power feed-in	DI 5
	10	DRM2/6	30% power feed-in	DI 6
	11	DRM3/7	60% power feed-in	DI 7
	12	DRM4/8	100% power feed-in	DI 8

Remote Shutdown for EN50549-1:2019/VDE ARN 4105:2018-11

The inverter can be disconnected from the grid within 150 ms by an external signal. To use this function the DRM0 input is used. As long as the input is closed (the 15 k Ω is connected at the input), the inverter feeds-in. As soon as the input is shorted or opened, the inverter disconnects from the grid.

Functional description of the terminal

Function	Pin	Definition	Note
Grounding	7	GND.S	Signal GND
DRMs/Logic Interface	8	DRM0	Remote shutdown
	9	DRM1/5	0% power

NOTE

- The Logic interface has to be activated in the LCD screen of the inverter, or with SofarCloud App:
DRM0 active: Remote Shutdown
DRMn active: active power feed-in limitation function
- Also, the power levels in percentage can be adjusted if needed

6.8 Energy meter connection

To use the feed-in limitation function, a SmartMeter is required to measure the power flow at the point of common coupling (PCC). Please refer to below table for the Pin assignments for the RS485 connection between the inverter and the energy meter.

Inverter COM Port Pin	Function	Energy Meter Pin
5	RS485+ (A2)	24
6	RS485- (B2)	25

6.8.1 Feed-in limitation function

With this function, one single inverter can dynamically limit its output power to keep the feed-in power at the point of common coupling (PCC) below a defined setpoint.

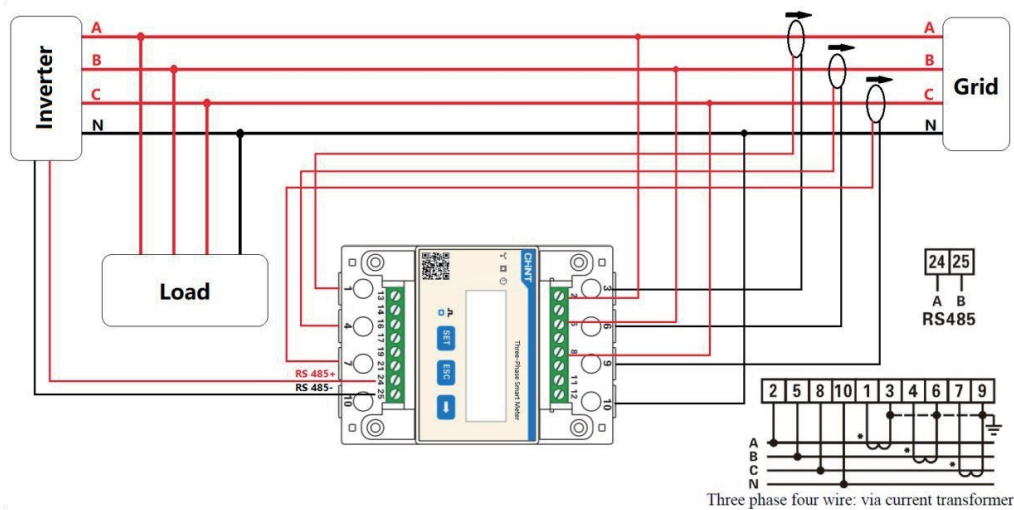
To use the feed-in limitation function, an external SmartMeter has to be connected to measure the power flow at the PCC.

To ensure this function works reliably, stable communication between the inverter and the SmartMeter is crucial. It is strongly recommended to use shielded twisted pair cables or Cat 5e Ethernet cables as communication wires, and the communication distance should not exceed 1000 meters.

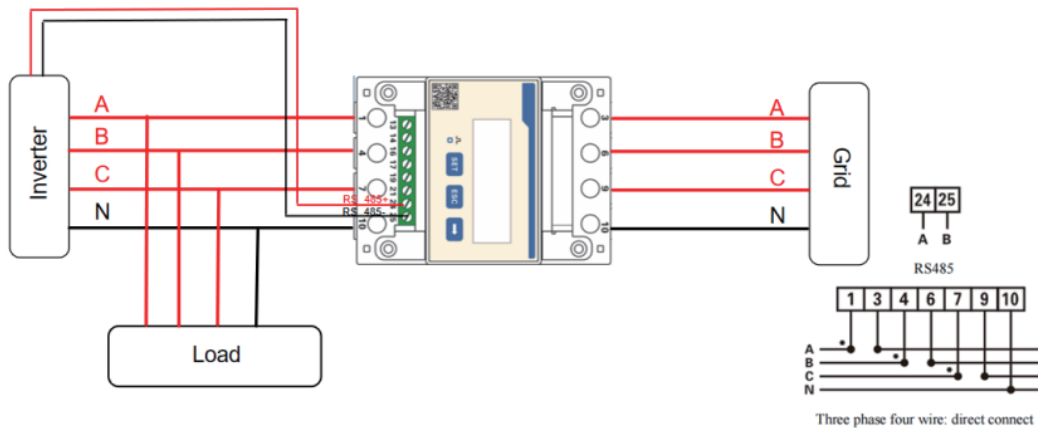
Cat 5e Ethernet cables are especially recommended. These cables contain four pairs of twisted wires—any one pair (such as orange–orange/white, blue–blue/white, green–green/white, or brown–brown/white) can be selected for RS485 communication, while the remaining three pairs are not required.

Wiring example:

Using the orange–orange/white pair: connect the orange wire to SmartMeter Pin 24 (485_A, inverter communication port Pin 5), and the orange/white wire to SmartMeter Pin 25 (485_B, inverter communication port Pin 6).



Three-phase four-wire meter wiring diagram (external CTs required)



Three-phase four-wire meter wiring diagram

NOTE

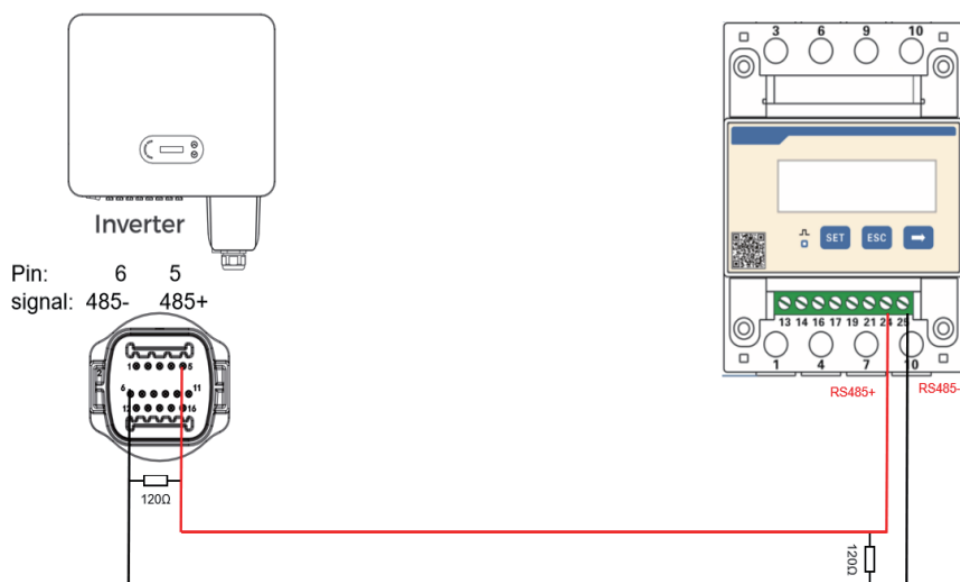
- Wiring may vary slightly depending on the SmartMeter model. Please refer to the wiring diagram on the side of the SmartMeter.
- The arrow on the CT must point to the grid.
- On the SmartMeter display: exported power to the grid is shown as a positive value, while imported power from the grid is shown as a negative value.

There is different feed-in limitation modes available, which can be set in the LCD screen menu:

"Feed-in Limit" menu

Hard Reflux	When this function is enabled, the inverter will disconnect from the grid if the export power exceeds the preset value.
Set Feed-in Limit	When the power exported to the grid needs to be limited, this function can be enabled, and the feed-in limit and control mode can be configured. Once the function is enabled, if communication between the inverter and the energy meter fails, the inverter will automatically limit its output power within the preset value.
Selling Power Mode	Limit the power exported to the grid within the preset range. Energy imported from the grid is ignored (default setting).
Total Power Mode	Limit the total power at the point of grid connection across all phases within the preset range.
Phase Power Mode	Limit the feed-in power of each phase to 1/3 of the setpoint.

For long-distance communication, it is recommended to use a termination resistor at the end of the RS485 line to improve communication quality. The diagram is shown below.



6.9 System monitoring

The SOFAR 25 ... 50KTLX-G3 inverters provide various communication methods for the system monitoring:

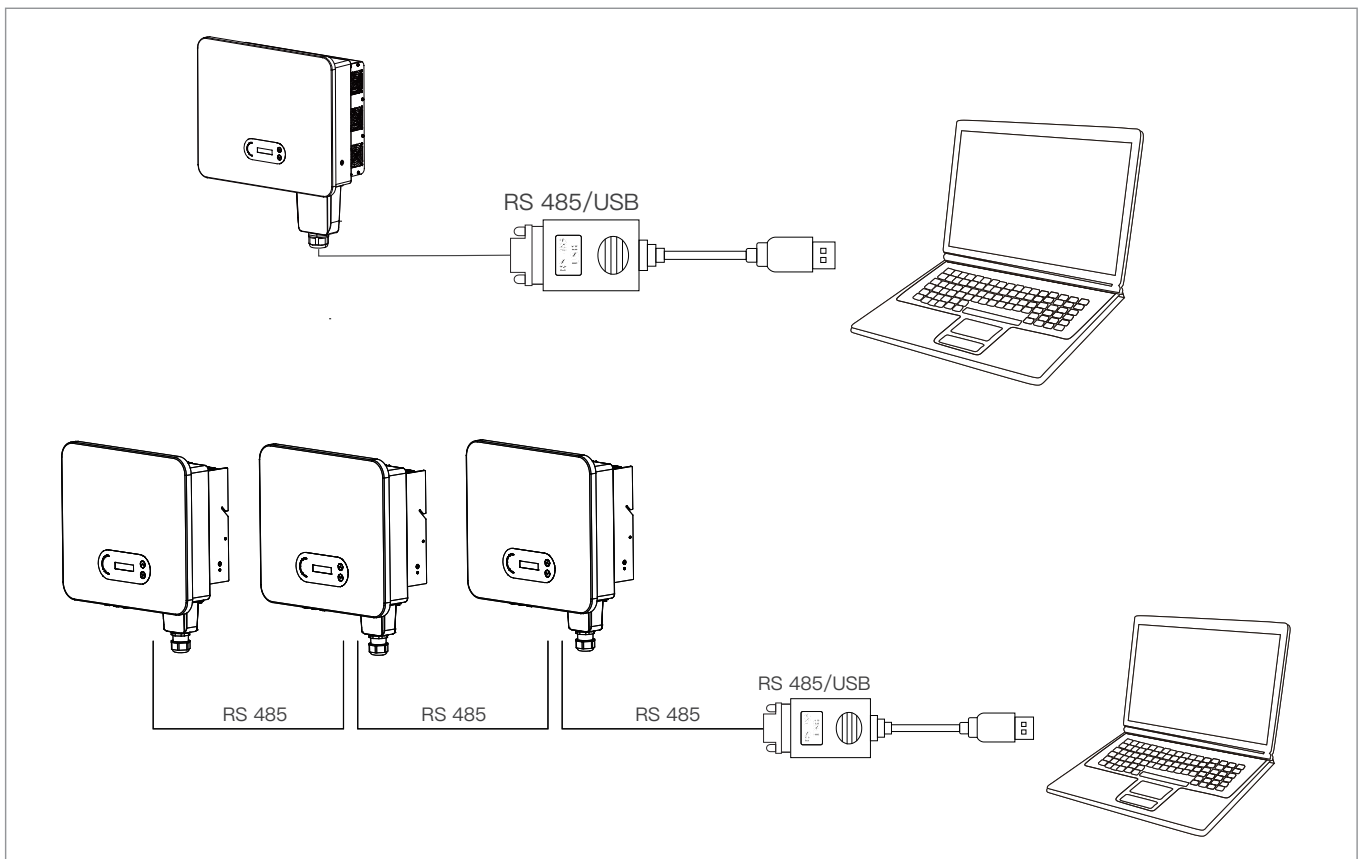
RS485 or WiFi stick (standard), GPRS or Ethernet stick (optional).

6.9.1 RS485 network

You can connect RS485-linked devices to your PC via an RS485 USB adapter or connect them to a data logger.

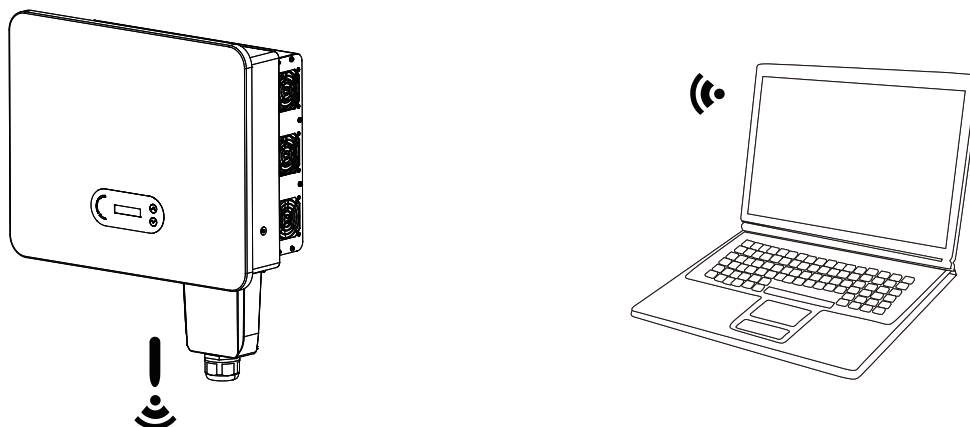
NOTE

- The RS485 line may not be any longer than 1000 m
- Assign each inverter its own modbus address (1 to 31) via the LCD display
- At the last inverter, put a termination resistor of 120 Ohm between RS485+ and RS485-



6.9.2 WiFi-, GPRS-, Ethernet stick

When you have installed the stick logger, the inverters can directly upload your operating, energy and alarm data in the SofarCloud monitoring portal.



NOTE

- The Stick Loggers are using the outgoing TCP port 10000, which could be blocked in some internet routers
- For stick logger configuration, please refer to the stick logger user manual

7. Commissioning the inverter

7.1 Safety test before commissioning

ATTENTION

Check the voltage range

- Ensure that the DC and AC voltages are within the permissible range of the inverter.

7.2 Starting the inverter

Configuration steps

1. Switch on the DC switch.
2. Switch on the AC circuit breaker.

When the DC output generated by the solar system is at a sufficient level, the inverter starts automatically. A correct operation is indicated by the screen displaying “normal”.

If the inverter displays an error message, consult chapter 8 for help.

NOTE

- Different distribution network operators in various countries have differing requirements for the grid connection of grid-coupled PV inverters.
- Ensure that you have selected the correct country code according to regional authority requirements, and consult a qualified electrician or employees of electrical safety authorities.
- SOFARSOLAR is not responsible for the consequences of selecting the incorrect country code.
- The selected country code influences the device grid monitoring. The inverter continuously checks the set limits and, if required, disconnects the device from the grid.

8.SofarCloud

SofarCloud is a platform for the full lifecycle management of renewable energy plants. It is designed for distributors/installers and end users of residential PV and storage systems as well as commercial and industrial PV and storage systems. Customers can monitor their systems both locally and remotely via the web interface or mobile app, effectively helping them to stay informed about the real-time operation of their plants, enabling refined management, efficient maintenance, transparent operation, and maximised benefits.

Web portal: <https://eu.sofarcloud.com>

8.1 Download and Install the App

1. Android device users can download the APP through major Android application markets such as Google Play.
2. IOS device users can search for “SofarCloud” in the App Store and download the app.
3. You can also download the “SofarCloud” by scanning the QR code below.



8.2 Register on APP

NOTE

- As the APP is updated periodically, the operation methods shown in this manual are for reference only. Please refer to the actual app interface for the most up-to-date instructions.
- If you have any questions, please consult the SofarCloud Web and App User Manual or contact SOFARSOLAR for assistance.

Before logging into the app, please ensure the following conditions are met:

- The inverter's AC and DC sides are powered on.
- The distance between your mobile phone and the inverter is within 5 meters with no obstacles in between.
- The Bluetooth function on your mobile phone is enabled.

Register

If you do not have a SofarCloud account, please click [Register] at the bottom of the login page.

On the registration page, select either [Installer] or [Owner], then follow the on-screen instructions to complete the account registration.

Once your account is successfully registered, you can log in to SofarCloud using your registered username and password.

The first screenshot shows the SofarCloud login page. At the top, it says 'English' with a dropdown arrow. Below that is the 'SOFAR' logo and 'Welcome to SofarCloud'. There are input fields for 'Email' and 'Password'. Below the password field is a 'Remember me' checkbox and a 'Forgot Password' link. A blue 'Log In' button is at the bottom. At the very bottom, there are links for 'Register' and 'Demo System'.

The second screenshot shows the 'Register' screen. It has two options: 'Installer' (with a worker icon) and 'Owner' (with a person icon). Each option has a brief description and a 'Click to create account' link.

The third screenshot shows the 'Installer Registration' form. It has several fields: '*Country' (with a dropdown showing 'China'), '*Company Name', '*Company Address', '*VAT Number', '*Email', and '*Password'. Each field has a 'Please enter' placeholder. There is a 'Get code' button next to the email field. The password field has a 'Re-enter Password' field next to it.

Currently, account registration supports either a mobile phone number or an email address.

Please follow the on-screen instructions to correctly enter your mobile phone number or email address, set a login password, and complete the verification process.

After successful verification, please tick the checkbox to indicate that you agree to the **Terms of Use** and **Privacy Policy**.

If you already have a SofarCloud account, you can log in directly.

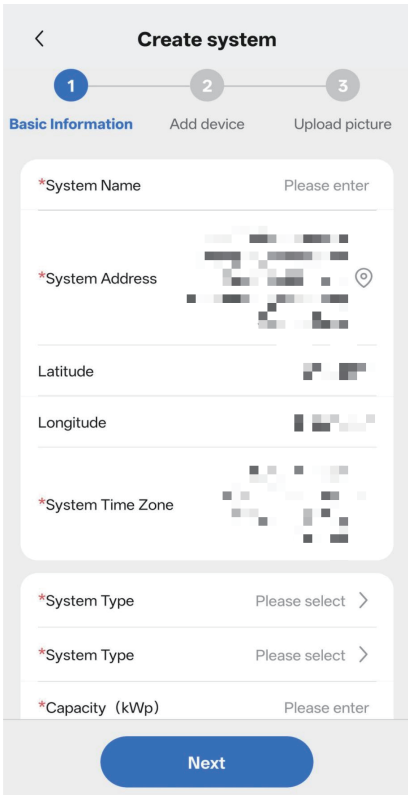
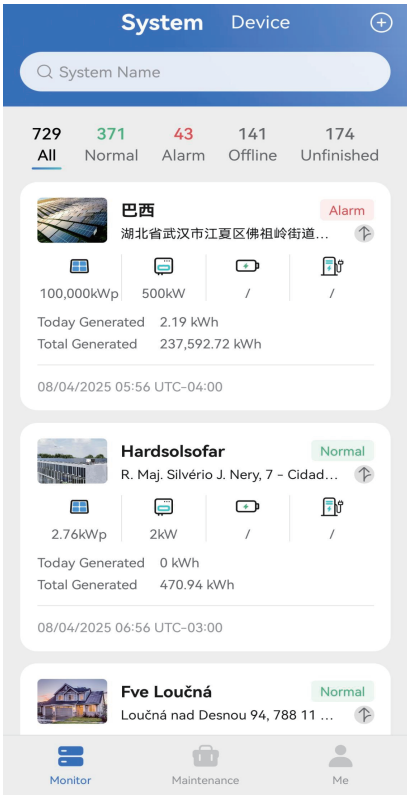
NOTE

- For account security purposes, the password must be a combination of numbers and letters, 6 to 32 characters in length, and must not contain spaces.
- After correctly entering all required information, click the [Register] button to automatically log in to your account.

8.3 Add a device

Method 1: Add a device via “Create system”

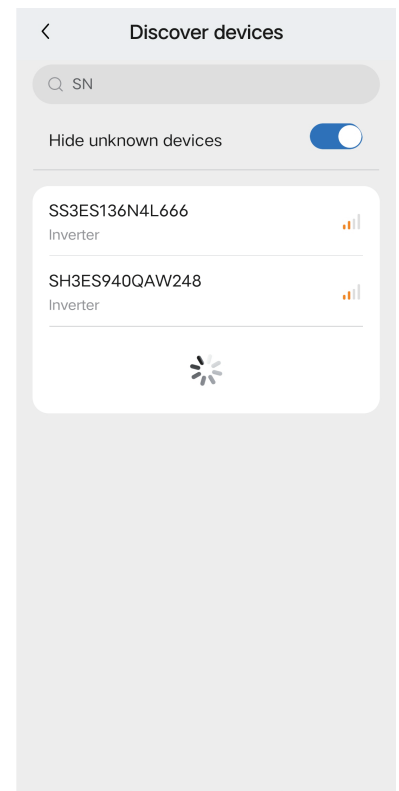
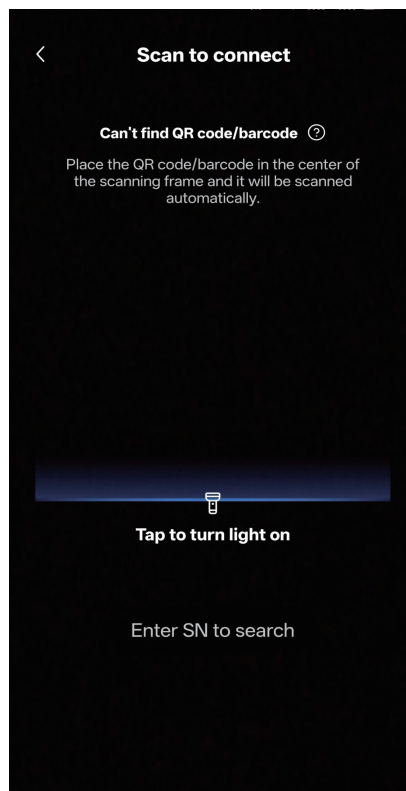
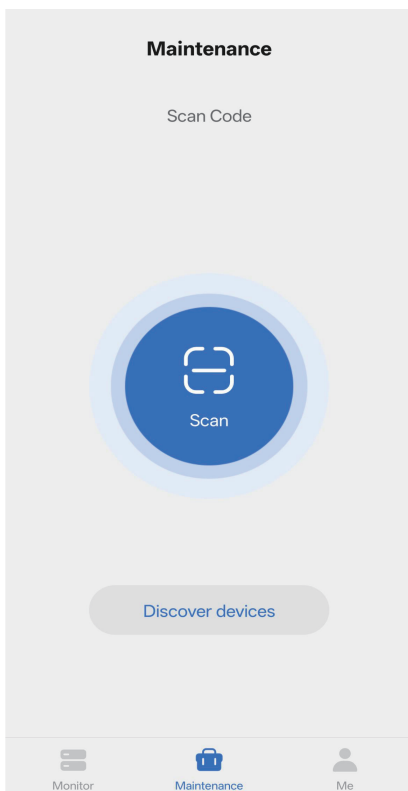
1. On the Home > Monitor tab, click the button at the top right corner to enter the "Create system" interface.
2. After completing the basic information as prompted, click the [Add] button under the "Add Device" section.
3. Scan the QR code or barcode of the device to obtain the SN number. Alternatively, you can manually enter the SN number and optionally enter a device name.
4. After clicking the [Confirm] button to complete the device addition, click [Next > Submit] to proceed.



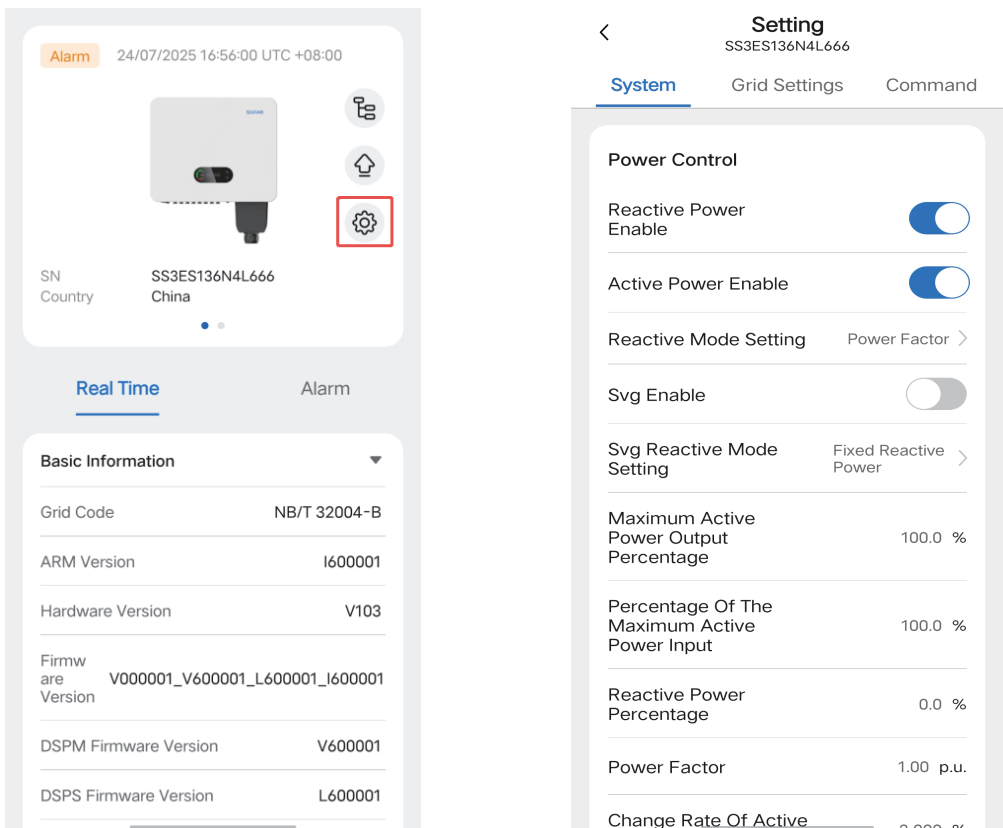
Method 2: Add a device directly

1. After logging into the app, go to the Home > Maintenance tab.
2. Tap [Scan] to quickly recognise and connect by scanning the device's barcode, or tap [Discover Devices] to select and connect to the target device from the list of Bluetooth-discovered devices.

- **Scan:** Tap [Scan] to prompt the phone's camera to open. Scan the barcode of the inverter's SN number to start searching for the device's Bluetooth. Once the Bluetooth is found, it will automatically connect and return to the home page.
- **Discover Devices:** After tapping [Discover devices], the app will navigate to the Bluetooth device list and start searching for nearby available Bluetooth devices. Select the device to connect to based on the inverter's serial number.



3. After successfully connecting the device, go to the device page. Through the [Setting] section, you can configure the language and safety code.

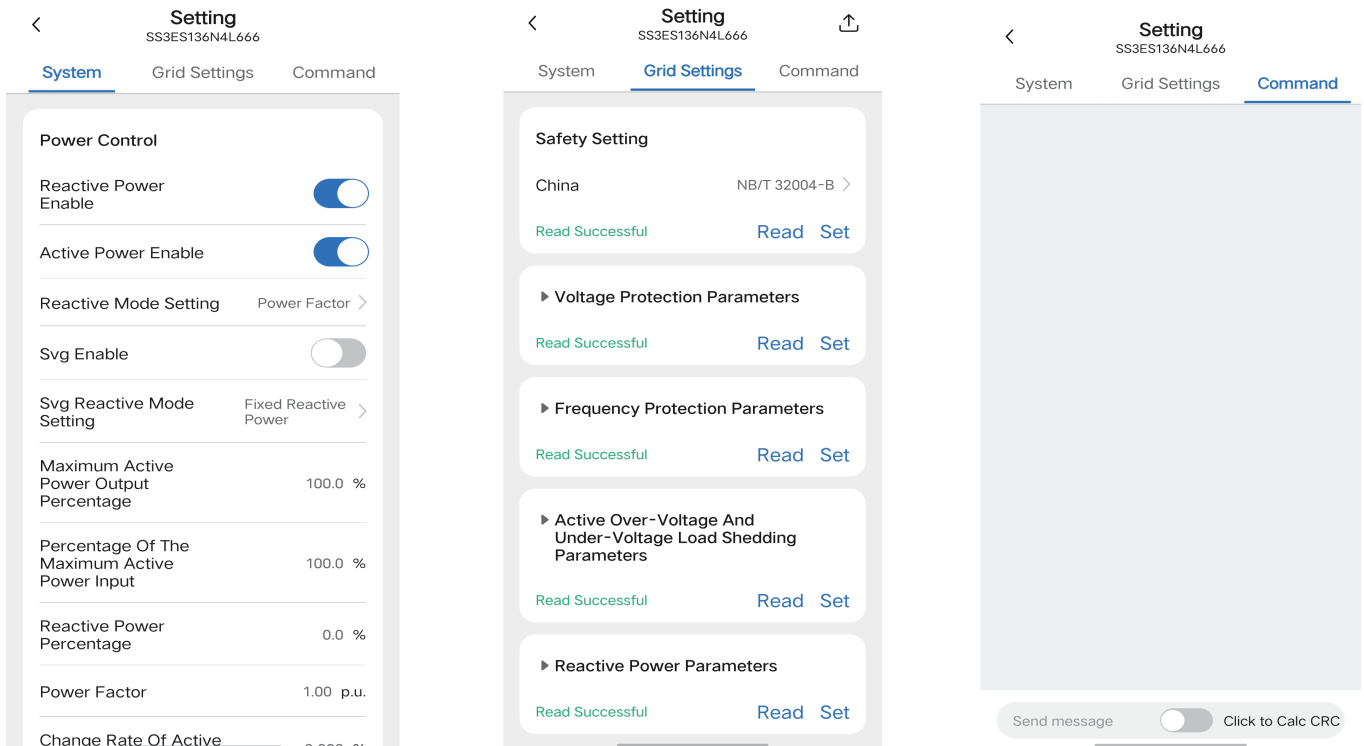


NOTE

- The available safety codes may vary depending on the device and software version. Please refer to the actual interface for details.

8.4 Device control

Parameters can be set for the inverter in three ways: system setting, grid setting and command.



1. System Setting: used to configure anti-reverse current, power control, RS485 communication parameters, input channel configuration, etc.

Menu content	Description
Power Control	Read/Set the inverter's real-time active and reactive power output.
Turn ON/Off	Read/Set the inverter startup/shutdown status.
Language Settings	Read/Set the language displayed on the inverter LCD.
485 Parameter Reading	Read/Set RS485 communication address, baud rate, stop bit, and parity.
PCC Power Harvesting Device	Read/Set the device for PCC power sampling: Energy Meter / CT / ARPC.
Feed-In Limit	Read/Set feed-in limitation status, feed-in power limit, and limitation mode (Feed-in Limitation / Three-Phase Sum Limitation / Phase Power Mode).
Input Channel	Read/Set input channel configuration as per customer requirements.

Menu content	Description
Resonance Detection Sensitivity	Read/Set resonance detection sensitivity; this setting controls sensitivity to grid voltage resonance — the higher the value, the more sensitive the detection.
USB stick upgrade	Place the firmware upgrade file in the USB drive folder named "firmware", and control the upgrade via the SofarCloud App.
USB Flash Drive Upgrade Safety Regulation	Place the safety regulation upgrade file in the USB drive folder named "firmware", and control the upgrade via the SofarCloud App.

2. Grid Setting: if certain safety parameters are not suitable, they can be adjusted appropriately based on the site conditions, with the consent of the local power utility.

Menu content	Description
Safety Setting	Configure overall grid safety settings to meet compliance.
Voltage Protection Parameters	Configure the grid voltage range as well as the overvoltage and undervoltage protection thresholds and response times at all levels to ensure safe operation and timely disconnection from the grid.
Frequency Protection Parameters	Configure grid frequency limits and multi-level over/under frequency protection settings to ensure stable response and compliance during frequency fluctuations.
Active Over-Voltage And Under-Voltage Load Shedding Parameters	Configure the inverter's active power derating strategy to ensure dynamic output adjustment based on customer requirements or grid voltage conditions. The settings are divided into three sections. The settings are divided into three sections: 1.Active power setting: Limits the inverter's active power output to meet load demands, grid stability, and equipment protection requirements. 2.Over/under voltage derating: Starts derating when the grid voltage reaches the derating start point; once the voltage reaches the derating end point, the inverter operates at the derated power limit. By dynamically reducing output power, the system maintains operation as much as possible while ensuring equipment safety, avoiding frequent start-stop cycles, load damage, or grid disturbances caused by voltage fluctuations. 3.DRM setting: Controls the inverter's output power via an external DRM control board. For details, please refer to section 6.7.3.

Menu content	Description
Reactive Power Parameters	Ensure compliance with grid voltage support and power factor requirements, with support for the following reactive power control modes: Mode 1: Output reactive power based on power factor Mode 2: Output reactive power as a percentage of rated reactive power Mode 3: Output reactive power corresponding to the power factor based on the device's active power output Mode 4: Output reactive power based on grid voltage
Start-Up Parameters	Configure inverter startup delay, voltage/frequency ranges, and power ramp rate to ensure smooth grid connection.
DCI Protection Parameters	Configure DC current injection limits to ensure compliance with grid standards on DC components.
Over-And Under-Frequency Load Shedding Parameters	Configure the power derating strategy under abnormal grid fluctuations to ensure stable operation during frequency variations
Voltage Ride Through Parameters	Configure the inverter to remain connected to the grid during sudden voltage rise or drop within a defined period, supporting grid voltage stabilization.
Islanding	Islanding protection is designed to prevent the inverter from continuing to operate when the grid is disconnected, which could cause injury to personnel or damage to electrical equipment
GFCI	Configure ground fault detection parameters to ensure the inverter promptly disconnects from the grid when leakage current exceeds the threshold, preventing electric shock risks
ISO	The inverter performs insulation monitoring to ground. When the insulation resistance falls below the threshold, the inverter disconnects from the grid to prevent electric shock hazards.
Import Safety	Configure standard import function to enable quick switching of grid compliance settings for different regions.

NOTE

- Safety Setting and Import Safety are both used to import grid code standards, but through different methods. When importing a grid code, make sure to select the correct standard:
- Grid connection requirements for PV inverters vary across countries and grid operators.
- Ensure that the correct country code is selected according to local authority requirements, and consult a qualified electrician or electrical safety authority if needed.
- SOFAR is not responsible for any consequences arising from selecting the wrong country code.
- The selected country code affects grid monitoring. The inverter continuously checks the configured limits and will disconnect from the grid if necessary.
- For an up-to-date list of country codes based on firmware versions, please refer to the documentation at: https://sofarsolar.jianguoyun.com/p/DTGcTXoQ4c_MChi8mIYGIAA_

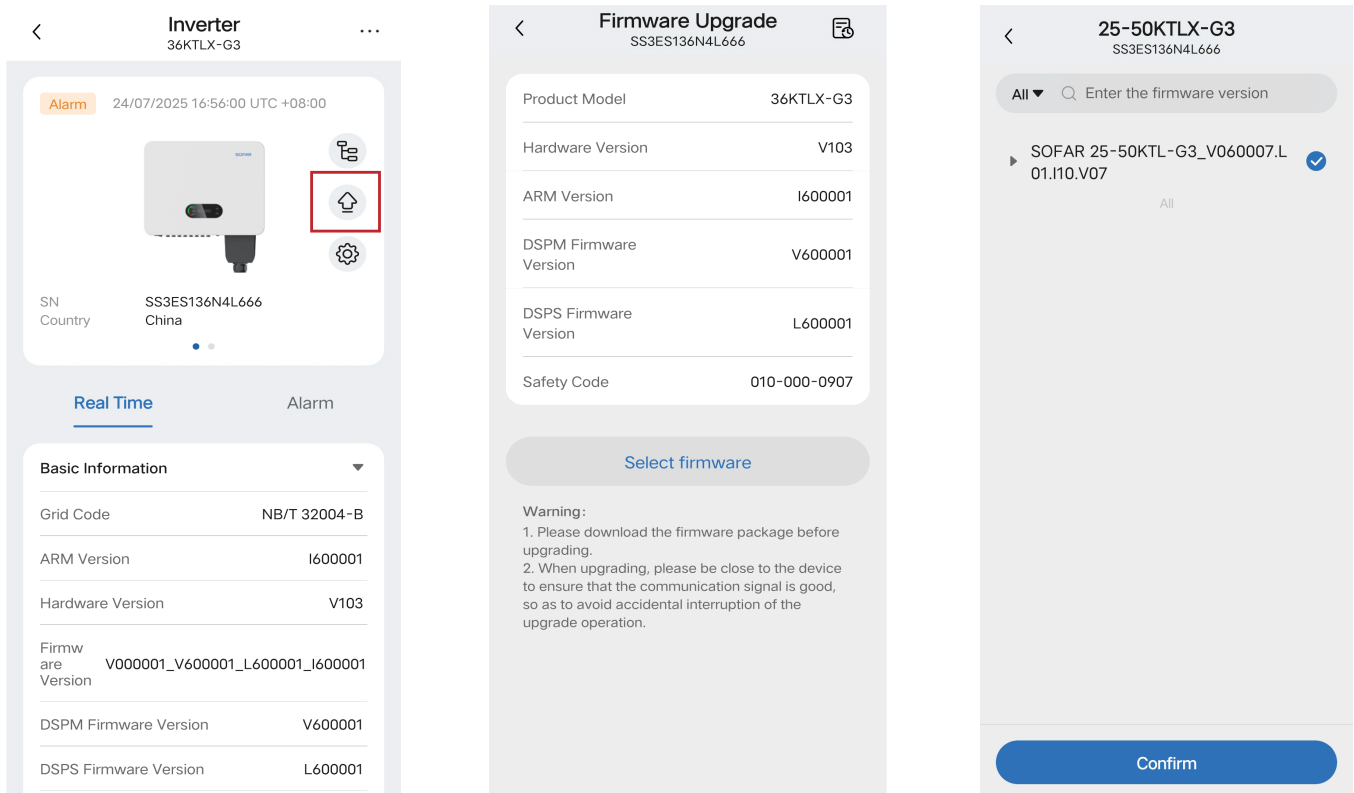
3. Command: Custom commands are control instructions based on the MODBUS protocol, enabling the reading and configuration of internal information and control parameters of the device.

NOTE

- Configuration permissions vary by user role; please refer to the actual interface for details.

8.5 Device upgrade

1. Tap the [Upgrade] button, and follow the on-screen instructions to download the firmware package in advance.
2. Tap [Select Firmware], choose the target firmware, and then tap [Confirm] at the bottom.



NOTE

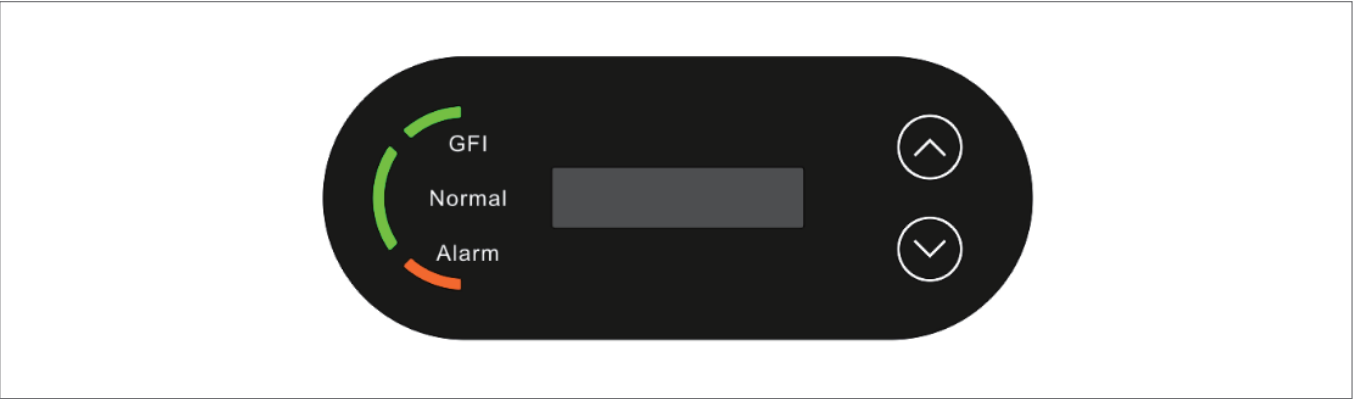
- During the upgrade process, the system will sequentially send commands, download the firmware, verify the firmware, and upgrade the device based on the selected firmware, until the upgrade reaches 100% completion.
- If the upgrade fails, the failure reason will be displayed at the point of failure. You can either tap [Cancel] in the lower-left corner to exit the upgrade, or tap [Retry] in the lower-right corner to attempt the upgrade again.

9.Operation of the device

This chapter describes the LCD and LED displays of the SOFAR 25 ... 50KTLX-G3 inverter.

9.1 Control panel and display field

9.1.1 Buttons and display lights



Buttons

Button	Name	Description
	Up	Short press: Select previous menu item Long press: Exit menu or current interface
	Down	Short Press: Select next menu item Long press: "Enter" button

LED's

- Normal (green) illuminates: "Normal" state
 flashes: "Wait" or "Check" state
- Alarm (red) illuminates: "Error"
- GFI (red) illuminates: GFCI faulty

9.2 Standard display

This shows a rolling display of the DC voltage/current (PV1), energy yields (today/total), grid voltage and current, as well as the status.



9.3 Status display

The following table displays the various statuses and their meanings:

Status	Description
Initialisation	The control software is started
Wait	Connecting criteria are checked. The voltage and frequency limits must be within the defined range for a specific duration in accordance with the selected country code.
Check	The inverter checks the insulation resistance, relays and other safety requirements. It will also carry out a self-test to ensure that its software and hardware are functioning faultlessly. If an error or a fault occurs, the inverter will go into the "Error" or "Continuous" state.
Normal	The inverter goes into the "Normal" state, and feeds current into the grid
Fault	The inverter goes into the "Fault" state if an error or a fault occurs. It is normally reset automatically by the inverter.
Permanent	Repeated errors can lead to a permanent error which needs investigation and problem solving on site.

9.4 Menu structure

Hold the down button to show the main menu.

Main menu

1. Enter Settings	"See "Settings
2. Event list	"See "Set country codes
3. System Info information	See System information menu
4. Display time	See Display time
5. Software update	See Firmware update

The full LCD menu can be accessed via the link below:

https://sofarsolar.jianguoyun.com/p/DX1YmtEQ4c_MChjBmIYGIAA

NOTE

- Ensure that the correct country code is selected according to local authority requirements, and consult a qualified electrician or electrical safety authority if needed.
- SOFAR is not responsible for any consequences arising from selecting the wrong country code.

Password

Several settings require a password to be entered (the standard password is 0001). When entering the password, press briefly to change the figure and press and hold to confirm the current figure.

Event list menu

The event list is used to display the real time event recordings, including the total number of events and each specific ID no. and event time. The most recent events are listed at the top.

2. Event list	
1. Current event	2. Event "History
Fault information	001 ID04 06150825 (display of the event sequence number, event ID number and time that the event takes place)

System information menu

1. Inverter Type	2. Serial Number	3. GeneralSoftVer
4. GeneralHardVer	5. ProtocolVer	6. Safety
7. SafetySwVerParameters	8. SafetyHardVer	9. Input mode
10. Remote State	11. Reflux Enable	12. Reflux Power
13. DRMs0	14. DRMn	15. MPPT Scan
16. ForceContro	17. PCC Select	18. PV-ISO
19. GFCI	20. PV Strings	21. Reactive Power
22. Power Ratio	23. Safety Paras	24. ComProtocol
25. Comm Blackout Config		

Display time

Displays the current system time.

Software update

The user can update the software via the USB flash drive. SOFARSOLAR will provide the firmware update when it is required.

9.5 Software update

1. Switch the DC and AC switches off and then remove the communication cover. If an RS485 line has been connected, ensure that the nut is loosened. Ensure that the communication line is not energised. Remove the cover to prevent the connected communications connector from becoming loose.
2. Insert the USB stick into the computer.
3. SOFARSOLAR will send the firmware update to the user.
4. Unzip the file and copy the original file to a USB stick. Attention: The firmware update file must be in the "firmware" subfolder!
5. Insert the USB flash drive into the USB interface of the inverter.
6. Switch on the DC switch and go to menu item "5. Software update" on the LCD display.
7. Enter the password (the standard password is 0715).
8. The system will then successively update the main DSP, auxiliary DSP and ARM processors. Pay attention to the displays.
9. If an error message appears, switch off the DC switch and wait until the LCD screen goes out. Then, switch the DC switch back on and proceed with the update from step 5.
10. After the update is complete, switch the DC switch off and wait until the LCD screen goes out
11. Re-establish a watertight communication connection
12. Switch the DC and AC circuit breaker back on
13. You can check the current software version in item "3. Software version" of the SystemInfo menu.

10. Troubleshooting handling

10.1 Troubleshooting

This section contains information and procedures pertaining to the remedying of potential problems with the inverter.

To carry out troubleshooting, proceed as follows:

- Check the warnings, error messages or error codes displayed on the screen of the inverter.

If no error information is displayed on the screen, check whether the following requirements have been fulfilled:

- Has the inverter been set up in a clean, dry, well-ventilated area?
- Is the DC switch set to ON?
- Are the cables sufficiently dimensioned and short enough?
- Are the input connections, output connections and the wiring all in good condition?
- Are the configuration settings for the relevant installation correct?
- Are the display field and the communication cables correctly connected and undamaged?

Please proceed as follows to display the recorded problems: Hold the button down to bring up the main menu of the standard interface. Select "2. Event list" and hold the button down to bring up the event list.

Earth fault alarm

This inverter is compliant with IEC 62109-2 Clause 13.9 for earth fault protection.

If an earth fault alarm occurs, the error is displayed on the LCD screen, the red light illuminates and the error can be found in the error history log.

The complete list of fault IDs and troubleshooting methods for this series can be found at the link below.

https://sofarsolar.jianguoyun.com/p/DTyZL48Q4c_MChjHoYcGIAA

10.2 Maintenance

Inverters do not generally require daily or routine maintenance. Before carrying out cleaning, ensure that the DC switch and AC circuit breaker between the inverter and power grid have been switched off. Wait at least 5 minutes before carrying out cleaning.

10.2.1 Cleaning the inverter

Clean the inverter using an air blower and a dry, soft cloth or a soft bristle brush. Do NOT clean the inverter with water, corrosive chemicals, cleaning agents etc.

10.2.2 Cleaning the heat sink

In order to help guarantee correct long-term operation of the inverter, make sure that there is sufficient space for ventilation around the heat sink. Check the heat sink for blockages (dust, snow etc.) and remove them if present. Please clean the heat sink using an air blower and a dry, soft cloth or a soft bristle brush. Do NOT clean the heat sink with water, corrosive chemicals, cleaning agents etc.

10.2.3 Fan maintenance

Fans must be cleaned and maintained regularly for both performance and safety concerns.

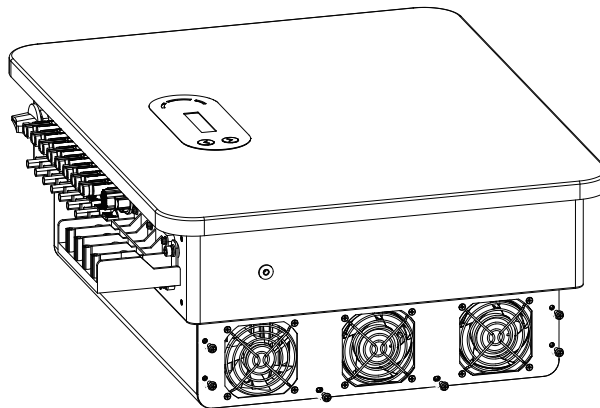
ATTENTION

Regularly clean or maintain

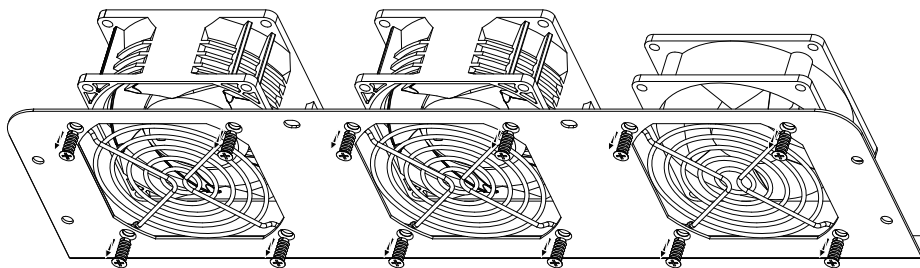
- Broken or faulty fans may cause cooling issues, which may lead to limited heat dissipation and a lower working efficiency of the inverter.

Please follow below steps for maintenance:

1. Check the connections to ensure all electric connections are turned off.
2. Unscrew the six screws at the four corners of the fan housing:



3. Unscrew the screws at the fan position, unplug the terminals at the interface between the fan and the inverter and then remove the fan:



4. Use a soft brush to clean the fan. In case of damage, ensure to replace it in time.
5. Reinstall the inverter according to the above steps.

11. Technical data

Datasheet	SOFAR 25KTLX- G3	SOFAR 30KTLX- G3	SOFAR 33KTLX- G3	SOFAR 36KTLX- G3	SOFAR 40KTLX- G3	SOFAR 45KTLX- G3	SOFAR 50KTLX- G3
Input (DC)							
Recommended max. PV input power (Wp)	37500	45000	49500	54000	60000	67500	75000
Max. DC power for single MPPT (W)	25000						
Number of MPP trackers	3				4		
Number of DC inputs	2 for each MPPT						
Max. input voltage (V)	1100						
Start-up voltage (V)	200						
Rated input voltage (V)	620						
MPPT operating voltage range (V)	180 – 1000						
Full power MPPT voltage range (V)	480 – 850	510 – 850	540 – 850	480 – 850	510 – 850	540 – 850	
Max. input MPPT current (A)	3*40				4*40		
Max. input short circuit current per MPPT (A)	3*50				4*50		
Output (AC)							
Rated power (W)	25000	30000	33000	36000	40000	45000	50000
Max. AC power (VA)	28000	34000	37000	40000	44000	50000	55000
Max. output current (A)	42.4	51.5	56.0	60.6	66.7	75.8	83.3
Rated grid voltage	3 / N / PE, 230 / 400						
Grid voltage range	310 – 480 Vac (according to local standard)						
Rated frequency	50 Hz / 60 Hz						
Grid frequency range	45 – 55 Hz / 55 – 65 Hz (according to local standard)						
Active power adjustable range	0 – 100%						
THDi	< 3%						
Power factor	1 default (adjustable +/-0.8)						
Performance							
Max. efficiency	98.60%				98.80%		
European weighted efficiency	98.20%						

Protection		
DC reverse polarity protection	Yes	
Anti-islanding protection	Yes	
Leakage current protection	Yes	
Ground fault monitoring	Yes	
PV-array string fault monitoring	Yes	
Feed-in limitation function	Yes	
DC switch	Yes	
Input / output SPD	PV: type II standard, AC: type II standard	
Communication		
Standard communication mode	RS485 / WiFi / Bluetooth, optional: Ethernet	
General Data		
Ambient temperature range	-30 °C – 60 °C	
Self-consumption at night (W)	<3	
Topology	Transformerless	
Degree of protection	IP65	
Allowable relative humidity range	0 – 100%	
Max. operating altitude	4000 m	
Noise	< 60 dB	
Weight (kg)	36	37
Cooling	Fan	
Dimension (mm)	585*480*220	
Display	LCD, App via Bluetooth	
Warranty	10 years, optional: up to 20 years	
Standard		
EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4	
Safety standards	IEC 62109-1/2, IEC 62116, IEC 61727, IEC 61683, IEC 60068(1,2,14,30), IEC 60255	
Grid standards	VDE V 0124-100, V 0126-1-1, VDE-AR-N 4105, CEI 0-21/CEI 0-16, UNE 206 007-1, EN 50549, G98/G99, EN 50530	

Version 2.0



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