SOLAR ELECTRIC

KOSTAL

PIKO CI G2

30/50 kW solar inverter



Operating manual

Legal notice

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General note on gender equality

KOSTAL Solar Electric GmbH is aware of how language impacts on gender equality and always makes an effort to reflect this in documentation. Nevertheless, for the sake of readability we are unable to use non-gender-specific terms throughout and use the masculine form instead.

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1. About this documentation

This documentation contains important information on the functional principles of your product as well as its safety and usage.

Read this documentation carefully and in full before you work with the product. Follow the instructions and safety specifications in this documentation during all activities.

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1.2 Content, function and intended audience of the documentation 8
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1.1 Validity of the documentation

This documentation applies to inverters:

- PIKO CI 30 G2
- PIKO CI 50 G2

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1.2 Content, function and intended audience of the documentation

Content and function of the document

This documentation is an operating manual and is part of the product it describes.

This documentation provides you with important information on the following topics:

- Structure and function of the product
- Handling the product safely
- Explanations, specifications and instructions for handling the product, from transportation to disposal
- Technical data

Target groups

This documentation is aimed at the following categories of people:

- System planners
- Plant owners
- Qualified staff in transport, storage, mounting, installation, operation, maintenance and disposal

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1.3 Applicable documents and further information

To fully understand the content of this documentation and to perform the described work steps safely and in full, you require the following additional documents and information sources.

You can find all of the information about the product on our website in the ***Download*** area: **www.kostal-solar-electric.com/download/**

Applicable documentation

- Documentation for other components in the system
- The Quick Start Guide provided as part of the product's scope of delivery
- List of countries whose specifications the product meets
- Certificates and manufacturer declarations to forward to the energy supplier
- List of energy meters that are approved for use with the product
- List of inverter parameter values specific to each country
- List of events (error messages) that may occur in the inverter

Further information

- List of compatible partners: An overview of products from external partners that can be combined with products from KOSTAL Solar Electric GmbH to create optional upgrades.

Regulations

- Plant owner's operating regulations at the place of use
- Accident prevention regulations
- Regulations on work equipment safety
- Regulations on disposal and environmental protection
- Other applicable regulations at the place of use

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1.4 Notes in this manual

A distinction is made in this manual between warnings and information notes. All notes are identified in the text line with an icon.

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1.4.1 Warnings

DANGER

Indicates a direct hazard with a high level of risk, which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazard with a moderate level of risk, which, if not avoided, will result in death or serious injury.

CAUTION

Indicates a hazard with a low level of risk, which, if not avoided, will result in minor or slight injury or property damage.

INFO

Contains important instructions for installation and for trouble-free device operation in order to avoid damage to property and financial damages.

1.4.2 Meaning of symbols in warnings



Danger



Danger due to electrical shock and discharge

1.4.3 Meaning of symbols in information notes



The symbol indicates activities that may only be carried out by an electrician.



Information

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2. Safety

This chapter provides you with important information on handling your product safely.

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2.1 Proper use

Intended purpose

- This product is an inverter and is used to convert direct current from photovoltaic systems into alternating current.
- The alternating current generated may be used as follows:
  - Self-consumption
  - Feed-in to the public grid

Fields of use

- The product is intended for professional and private use.

Place of use

- The product is not intended for use in explosive or aggressive environmental conditions. Observe the specifications for the installation location.
- The product is intended for use indoors and outdoors.
- The product is only intended for stationary use.

Specifications for additional components, replacement parts and accessories

Additional components, replacement parts and accessories may only be used if they have been approved by KOSTAL Solar Electric GmbH for this product type.

You can find all of the information about the product on our website in the ***Download*** area:
www.kostal-solar-electric.com/download/

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2.2 Improper use

Any use of the product other than the use described in this documentation and in the applicable documentation is improper and is therefore not permitted.

Making any changes to the product that are not described in this documentation is not permitted. Prohibited changes to the product will result in loss of warranty.

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2.3 The operator's obligations

When using the product, the following obligations must be met:

Instruction

- Providing this documentation:
  - The operator must ensure that staff who carry out activities on and with the product have understood the content of the documentation for this product.
  - The operator must ensure that the documentation for this product is accessible to all users.
- Readability of the warning signs and labels on the product:
  - Warning signs and labels on the product must always remain legible after the product is installed.
  - The operator must replace any warning signs and labels that are no longer legible because they are old or damaged.

Occupational safety

- The operator must ensure that staff performing activities on and with the product are qualified to do so.
- The operator must ensure that the system is immediately shut down if there are discernible defects and must ensure that the defects are remedied.
- The operator must ensure that the product is only operated with the specified safety devices.

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2.4 Qualification of the staff

The activities described in this documentation must only be performed by people who are qualified for the task. Depending on the activity, they require specific specialist knowledge in the following areas and knowledge of the relevant specialist terms:

- Electrics

The following additional, specific qualifications are required:

- Knowledge of the applicable regulations for handling the product. See **Applicable documents and further information, Page 9**.

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2.5 Sources of danger

The product has been developed and tested in accordance with international safety requirements. Despite this, residual risks still exist and could cause personal injury and damage to property.

2.5.1 Danger of injury

Serious danger of injury or death from electric shock

- Do not touch exposed live parts or cables.
- Before working on the product: De-energise product and secure it against being switched back on.
- For all work on the product: Wear suitable protective equipment and use suitable tools.

2.5.2 Material damage

Risk of fire due to damaged supply cables

- Carry out regular visual checks on the supply cables and plugs.
- If you detect defects: Notify qualified staff and have the parts replaced.

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2.6 Safety devices

Safety devices required during installation

The following safety devices must be installed:

- Line circuit breaker
- Residual current device

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2.7 Personal protective equipment

For certain activities, staff are obligated to wear protective equipment. The required protective equipment is specified in the relevant chapters.

An overview of the required protective equipment

- Rubber gloves
- Protective glasses

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2.8 Emergency procedure

2.8.1 Fire procedure

1. Leave the danger zone immediately.
2. Notify the fire service.
3. Tell the emergency services that a PV system is in operation and state the location of modules, inverters, battery and separators.
4. Have any other measures carried out by qualified staff only.

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2.9 Observed standards and guidelines

The EU Declaration of Conformity lists standards and guidelines, the requirements of which are met by the product.

You can find all of the information about the product on our website in the ***Download*** area:
www.kostal-solar-electric.com/download/

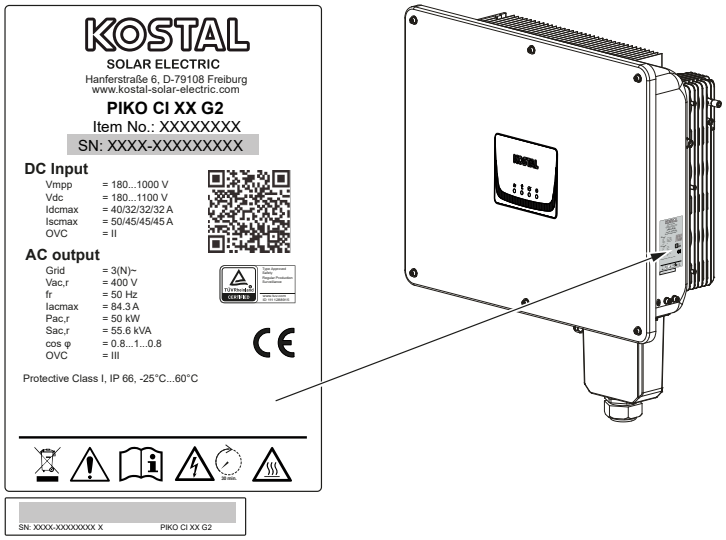
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3.1 Type plate and label on the device



The type plate and other labels are attached to the device housing. These signs and labels must not be altered or removed.

You will find the following information on the type plate:

- Manufacturer
- Model
- Serial number and article number
- Characteristics specific to the device
- QR code with the following information: Serial number and article number
- Barcode with serial number. The barcode can be used to configure inverters with the KOSTAL PIKO CI app.

Symbol	Explanation
	Danger notice
	Danger due to electrical shock and discharge
	Observe and read operating manual

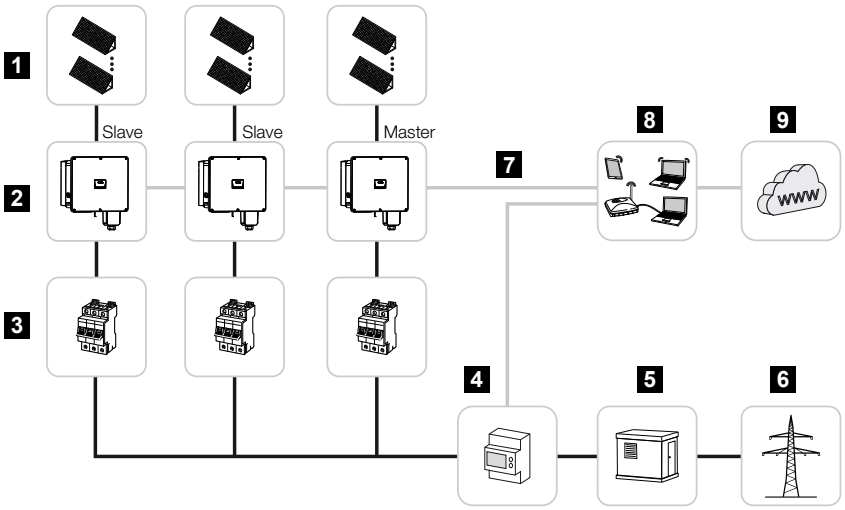
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Symbol	Explanation
	Danger due to electrical shock and discharge. Wait five minutes (discharge time of the capacitors) after shutdown
	Device must not be disposed of with household waste. Observe the local application of disposal requirements.
	CE marking The product satisfies the applicable EU requirements.
	Additional earth connection

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3.2 System overview

The inverter generates a three-phase AC and has been optimised for use in medium and large-scale PV systems thanks to its high output power. This makes it suitable for solar power plants, electricity farms and similar applications. The inverter can be operated in TT, TN-C, TN-S and TN-C-S grids.

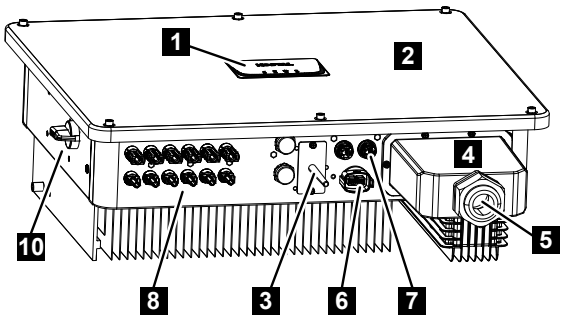


1 PV strings
2 Inverter
3 AC line circuit breaker
4 Energy meter
5 Distributor
6 Public grid
7 Communication connection
8 Router, PC connection
9 Internet

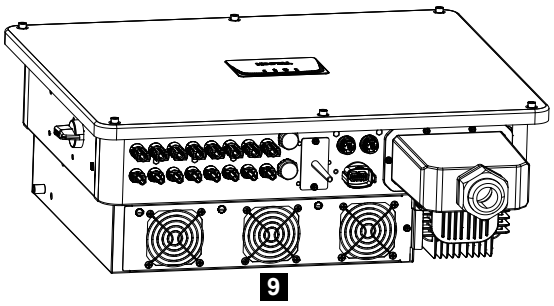
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3.3 PIKO CI 30/50 G2 inverter

PIKO CI 30 G2



PIKO CI 50 G2



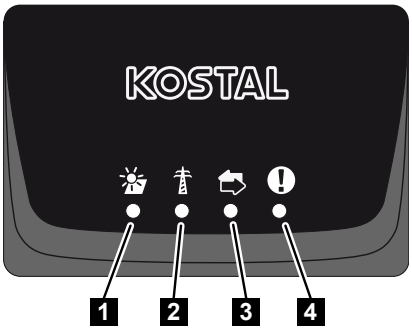
1 Status LED
2 Cover
3 WiFi antenna
4 AC terminal compartment
5 Cable opening for mains cable
6 Connection panel (RS485, RSE, NAS)
7 Connection (LAN)
8 Connections for PV modules
9 Fan
10 DC switch

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3.4 Status LED

The status LED provides information about the operational status of the inverter.

For more information: **Event codes, Page 124**.



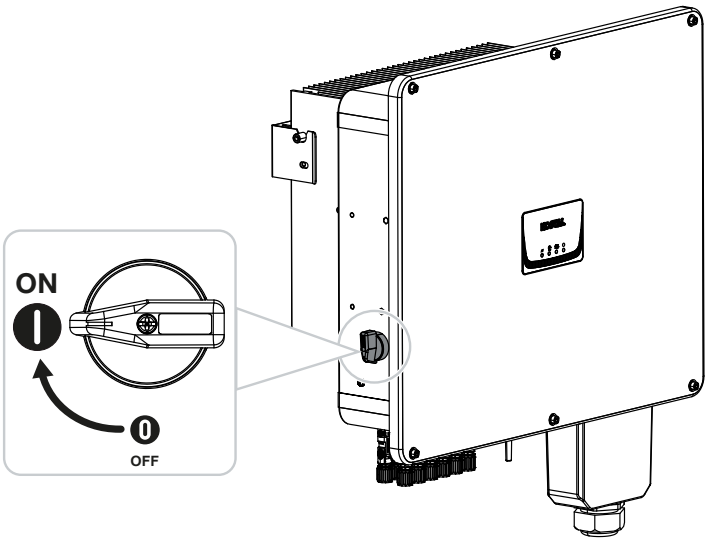
1 Status of PV modules
2 Status of grid
3 Status of communication
4 Warning message

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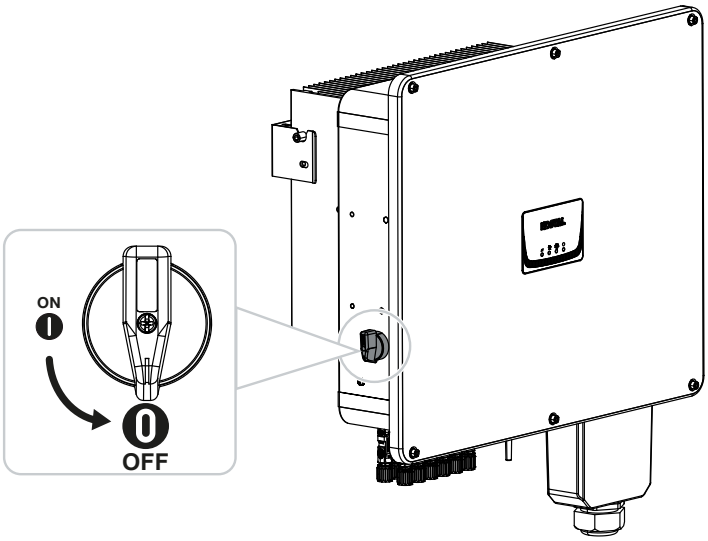
3.5 DC circuit switch on inverter

The inverter can be switched on and off via the DC circuit switch.

Switch on the inverter

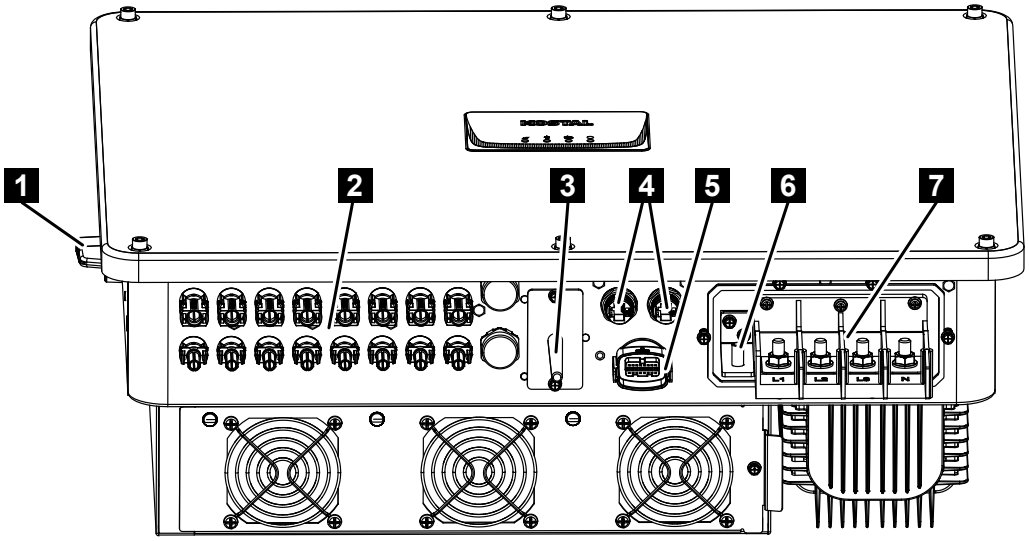


Switch off the inverter



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3.6 The connection area



1 DC circuit switch
2 DC connections for PV generators (6 for PIKO CI 30 G2/8 for PIKO CI 50 G2)
3 WLAN antenna
4 LAN connection
5 Communication connection (RS485, ripple control receiver, grid and system protection connection)
6 PE connection
7 AC terminals

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3.7 Functional overview

The inverter converts energy from the connected PV modules into alternating current and feeds this into the public grid.

3.7.1 Three-phase alternating current

The inverter generates a three-phase AC and has been optimised for use in medium and large-scale PV systems thanks to its high output power. This makes it suitable for solar power plants, electricity farms and similar applications. The inverter can be operated in TT, TN-C, TN-S and TN-C-S grids.

3.7.2 Arc detection (AFCI - Arc-Fault Circuit-Interrupter)

Arcs in PV systems can develop as a result of various factors, such as poor wiring, weather conditions and faulty components. These arcs may cause short circuits and fires, which may put the system and its surrounding area at risk.

The frequency spectrum of the DC current changes as soon as there is an arc. The inverter detects this change, immediately switches off and displays an error. In parallel, this message is also sent to the **KOSTAL Solar Portal**. The operator is then notified of the system error by e-mail if this has been configured in the **KOSTAL Solar Portal**.

As per IEC 63027, the inverter switches back on after a short break because some arc events disappear automatically if the inverters is briefly switched off.

If the arc develops again, the inverter immediately switches off again. If this error occurs five times within a 24-hour period, the inverter permanently switches off because a critical error can be assumed.

In this case, a qualified installer must check the system and eliminate the error.

Using the **PIKO CI Conf App**, the installer can reset the error and consequently release the inverter after having checked and repaired the PV system in the ***Settings > Inverter settings > Other settings > Reset arc errors*** menu item.

The ***AFCI function*** can be simply activated in the **PIKO CI Conf App** under ***Settings > Inverter settings > Other settings > AFCI function***.

3.7.3 Recording power generation

By connecting an external energy meter, the inverter can monitor the energy flow and optimally control the output power according to grid requirements.

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3.7.4 Communication

The inverter has various interfaces for communication purposes. These establish a connection to other inverters, sensors, energy meters or a link to the Internet. All data is transmitted encrypted.

- RS485/Modbus (RTU)

  Data loggers or energy meters are connected to the Modbus interface to record the energy flow.

- LAN or WiFi can be used to connect the inverter to the local network via which it can then access the Internet and solar portal.

For local access to the inverter:

- Bluetooth connection

Examples of what can be achieved via the KOSTAL PIKO CI Conf Tool and Bluetooth connection include initial commissioning or configuring the inverter.

3.7.5 Central grid and system protection

Central grid and system protection is required in some countries. This monitors the voltage and frequency in the grid and in the event of a fault, shuts down the photovoltaic systems by means of a circuit breaker.

The inverter allows an external monitoring unit to be connected for grid and system protection. An additional circuit breaker is not required as internal switches within the inverter ensure compliance with the grid operator's technical specifications.

3.7.6 Ripple control receiver

For systems in which the grid operator controls the feed-in capacity using ripple control receivers, the inverter has the required digital inputs.

3.7.7 Park controller

The inverter can be controlled centrally using a PGS park controller. In this setup, the park controller is the master and can control all inverters. The associated settings are configured using the **KOSTAL PIKO CI App** (version 6.15.1 or more recent) or the **KOSTAL PIKO CI Conf Tool** (version 1.1.7 or more recent).

3.7.8 Event codes

Events or faults during operation are stored in the inverter's event memory and transmitted to the KOSTAL Solar Portal or can be viewed in the KOSTAL PIKO CI Conf App or the KOSTAL PIKO CI Conf Tool.

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For more information: **Event codes, Page 124**.

3.7.9 Service concept

For service purposes the event codes can be read out using the KOSTAL PIKO CI Conf App, the KOSTAL PIKO CI Conf Tool or the KOSTAL Solar Portal. Your installer or service partner can then decide what action to take before on-site deployment. In this way, multiple on-site deployment can be avoided.

3.7.10 Wireless commissioning

Commissioning is undertaken wirelessly using tablets or smartphones. The KOSTAL PIKO CI Conf App is available for this purpose. You can download it free of charge from the App Store.

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3.7.11 KOSTAL Solar Terminal

The KOSTAL Solar Terminal is the central gateway for you as a user. You can find the KOSTAL Solar Terminal on our website or at this link:
https://terminal.kostal-solar-electric.com.

KOSTAL Solar Terminal

The KOSTAL Solar Terminal is a central hub for various applications. To use them, you have to register once. You will then be given a user account for all the applications offered in the KOSTAL Solar Terminal. You can find more information on our website **https://www.kostal-solar-electric.com**.

If you have already registered for the KOSTAL Solar Terminal, you can sign in using your user details.

You have the following applications available to you, depending on your user role:

- KOSTAL Solar Portal
- Online KOSTAL Solar shop
- KOSTAL Solar Plan
- Smart Warranty activation
- Solar repower check

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3.7.12 KOSTAL PIKO CI Conf App

The **KOSTAL PIKO CI Conf App**, which is available free of charge, provides a graphical user interface. The app is used to commission and configure the inverter and to display its status:

- Log in on inverter
- Log in as system operator or installer
- Status request
- Current feed-in values at grid connection
- Display log data / events
- Inverter version display
- Inverter configuration (e.g. LAN connection, setting up the energy meter, etc.)



3.7.13 KOSTAL PIKO CI Conf Tool

The KOSTAL PIKO CI Conf Tool is a configuration tool used to configure the PIKO CI inverter using a direct LAN connection.

This means that you no longer need to stand in front of the inverter with a smartphone in order to configure the inverter.

The configuration tool can be used to address and configure all PIKO CI inverters in the local LAN network.

The user interface offers the same settings as the KOSTAL PIKO CI Conf App provides on smartphones.

KOSTAL
PIKO CI Conf Tool

The tool provides the following functions:

- Log in to the inverter as a ***system operator*** or an ***installer***
- Power flow diagram view
- Present values view
  Using various statistics, the user can display the current values for daily, monthly, annual and total yield. Detailed information can be displayed by expanding the statistics.
- Information about the inverter's yield data for daily, monthly, annual or total time periods.
- Download overall inverter log data or covering a limited time period.
- Configure the inverter
- Update inverter firmware
- Query inverter versions

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3.7.14 KOSTAL Solar Portal

The KOSTAL Solar Portal is a free online platform for monitoring the PV system.

The Solar Portal enables the operation of the inverter to be monitored via the Internet. For this purpose, the inverter sends the PV system's yield data and event messages to the solar portal via the Internet.

The information is then stored in the solar portal. You can view and call up this information via the Internet.

This means that the KOSTAL Solar Portal protects your investment in a PV system from yield losses, e.g. by actively warning you by e-mail when an event occurs.

Register for the KOSTAL Solar Portal free of charge using the KOSTAL Solar Terminal at **https://terminal.kostal-solar-electric.com**.



The Solar Portal has the following functions:

- Worldwide portal access via the Internet
- Graphic representation of the power and yield data
- Visualisation of data and thus being made aware of how to optimise self-consumption
- Notification of events by e-mail
- Data export
- Sensor evaluation
- Display and proof of a potential active power reduction by the grid operator
- Storage of log data for long-term and reliable monitoring of your PV system
- Providing system data for the KOSTAL Solar App

Prerequisites for using the Solar Portal:

- The inverter must have a connection to the Internet.
- Data transfer to KOSTAL Solar Portal must be activated in the inverter.
- The inverter must not be assigned to any other PV system in the KOSTAL Solar Portal.
- The inverter must be assigned to your PV system in the KOSTAL Solar Portal.

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You can find more information about this on our website **www.kostal-solar-electric.com**.

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3.7.15 The KOSTAL Solar Plan layout software

Our free KOSTAL Solar Plan tool makes the inverter layout easier for you.

Register for KOSTAL Solar Plan free of charge using the KOSTAL Solar Terminal at **https://terminal.kostal-solar-electric.com**.

Just enter the system details and individual customer details and receive a recommendation for a suitable KOSTAL solar inverter for the planned solar system. All KOSTAL solar inverters are considered for this. In addition, the customer's electricity consumption is considered and the potential self-consumption and self-sufficiency quotas are displayed using standard load profiles.

The KOSTAL Solar Plan covers the following areas of the inverter layout:

- ***Rapid layout***
  Manual inverter layout taking account of the inverter specifications.
- ***Standard layout***
  Automatic inverter layout with possible consideration of power consumption.

As well as providing an improved inverter layout, the KOSTAL Solar Plan also supports in preparing quotations. Customer, project and installer details can be added to the technical data entered by the user and included with the quotation as a PDF overview.

You can find additional information on our website **www.kostal-solar-electric.com** in the ***Installer portal*** area.

KOSTAL Solar Terminal

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3.8 The inverter's internal protective functions

The following protective functions are implemented in the inverter.

- Insulation monitoring
- Residual current monitoring
- arc detection

WARNING

Issues with the inverter's protective function

Some protective functions, such as insulation monitoring and residual current monitoring, may be affected by high capacities of the PV generator to earth.

These protective functions have been proven for a total capacity of the PV generator and battery to earth of 10µF. If the PV generator has a higher capacity to earth, there are no assurances that these protective measures will work properly.

WARNING

Electric shock or risk of fire originating from connected device!

If the protective functions output an error, there is a potential risk of fire or electric shock originating from the connected devices. The error must therefore be rectified immediately and this may only be done by qualified maintenance staff.

The protective functions are not affected by external blocking diodes.

Please check the setup specifications and standards valid locally to establish whether additional protective measures are required on site.

Insulation monitoring

Before connecting to the grid, the inverter checks the insulation of the entire PV generator and battery to earth.

If this resistance falls below the limit of 100 kΩ, this is displayed as an insulation fault.

- ***The inverter reports an "insulation resistance" event.***

For as long as the error persists and the insulation resistance is too low, the inverter does not connect to the grid.

This protective function cannot be configured or deactivated.

Residual current monitoring

The inverter monitors the leakage current of the PV generator, including the battery, as soon as it is connected to the grid.

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The internal residual current monitoring is AC/DC sensitive and corresponds to a type B RCD.

Residual current monitoring fulfils the following protective functions.

Fire prevention

If the residual current exceeds a value of 300mA, the inverter shuts down within 300ms.

- ***The inverter reports an "insulation monitoring" or "residual current too high" event.***

Before switching on again, the inverter checks the insulation to earth. If the insulation monitoring also detects an error or the insulation monitoring event occurs on a frequent basis, this may indicate that the insulation is damaged. The damage must be repaired immediately by qualified maintenance staff.

This protective function cannot be configured or deactivated.

Protection from electric shock

An electric shock usually leads to an erratic increase in residual current. The inverter detects erratic residual currents and, depending on the size of the increase, shuts down within the following times:

Sudden change in residual or earth fault current [mA]	Maximum response time [s]
30	0.3
60	0.15
90	0.04

- ***The inverter reports an "insulation monitoring" or "residual current too high" event.***

Before switching on again, the inverter checks the insulation to earth. If the insulation monitoring also detects an error or a **residual current too high** event occurs on a frequent basis, this may indicate that the insulation is damaged. The damage must be repaired immediately by qualified maintenance staff.

This protective function cannot be adjusted or deactivated.

arc detection

The inverter monitors the DC cables for dangerous arcs. An internal arc detection feature called AFCI is built into the inverter for this purpose. AFCI stands for Arc Fault Circuit Interrupter. AFCI is protective equipment that detects electrical arcs in electrical circuits and interrupts the circuit if a dangerous arc fault is detected.

These arcs may be caused by defective or damaged cables, loose contacts, crushed cables or old insulation. Arcs are a common cause of electrical fires.

How AFCI works

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- AFCI analyses electrical signals in real time.
- AFCI detects the characteristic patterns of arc faults (irregular high-frequency fluctuations).
- In the event of a fault, AFCI interrupts the electrical circuit before the arc can cause a fire.

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3.9 Making product data accessible

As per ***Data Act - Regulation (EU) 2023/2854 - Article 3 - Obligation to make product data and related service data accessible to the user***, information about stored data must be made accessible to users.

For PIKO CI, the data is created and saved as follows.

The product generates the following data

The type, format and estimated scope of product data the networked product can generate;

- Log data via the inverter's KOSTAL PIKO CI App:
  - Event notifications/CSV format/max. 4 kB/regularly
  - Generation data per hour for one day/CSV format/max. 5 kB/regularly
  - Generation data per day for one month/CSV format/max. 3 kB/regularly
  - Generation data per month for 25 years/CSV format/max. 2 kB/regularly
  - Configuration data/CSV format/max. 11 kB
- Access to log data using KOSTAL Solar Portal:
  XML format, size 2.5 kB, every 10 minutes

Information about generating data

Data is generated as follows.

- Data is continuously generated and visualised
- Data will be continuously provided by Modbus protocol with an update cycle of one second.

Storing data on other devices

Specification as to whether the networked product is able to store data on a device or a remote server, including the intended archiving period where applicable;

- Log data is averaged locally over a period of five minutes and stored for 1.5 years
- If portal transfers are enabled, the data is transferred to external servers.

Data access

This section specifies how to access data or delete it if required, including the associated technological means as well as the applicable Terms and Conditions of Use and the applicable service quality.

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- The log data can be downloaded via the inverter's integrated Webserver or via the appropriate inverter app.
- The log data can be deleted using the ***Reset User Settings*** function.
- It is also possible to download log data using the **KOSTAL Solar Portal**, providing portal data transfer has been enabled.

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4. Transport and scope of delivery

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4.2 Scope of delivery 46

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4.1 Transport and storage

The function of the inverter has been tested and it has been carefully packaged prior to delivery. Upon receipt, check the delivery for completeness and any transport damage.

POSSIBLE DAMAGE

Damage to the device

Potential risk of damage when setting the inverter down. Whenever possible, place the inverter on its back after unpacking.

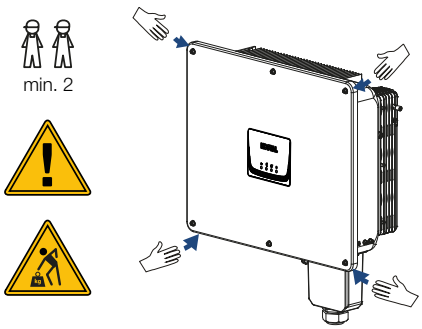
- Store all components of the inverter in the original packaging in a dry and dust-free place if the inverter is to be stored for a longer period of time before installation.
- Replace the packing material if it has been damaged.
- To transport the inverter, only handle it at the points indicated. Do not touch the AC connection area because this may become damaged.

CAUTION

Danger of injury!

The inverter is very heavy.

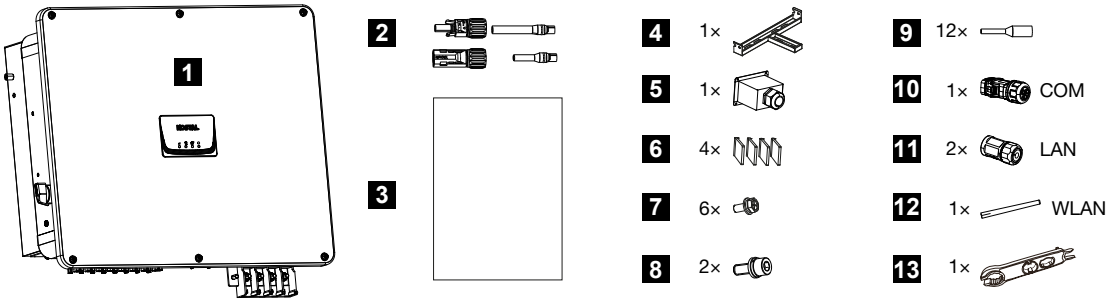
- Do not lift or transport the inverter alone. To prevent injury, get another person to help you.



- Do not tip the inverter onto its side. Avoid tilted positions.
- Only place the inverter down on its back.
- Do not place the inverter down on its side or on the top.

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4.2 Scope of delivery



1 Inverter
2 DC plug connector (each DC input: 1× plug, 1× socket)
3 Short manual
4 Wall mount
5 AC cap
6 AC separators
7 6 x M4 screws for AC cap
8 2 x M8 lock screw
9 12 x core end sleeves for communication plug
10 1 x communication plug
11 2 x caps for LAN
12 WiFi antenna
13 Installation tool for DC plug connectors

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5. Installation

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5.3 Installation dimensions 52
5.4 Installing the inverter 53

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5.1 Selecting the installation site

Observe these instructions when selecting the installation site so that you select the correct one.



Install the inverter indoors.



Install the inverter in a protected outdoor area.



Protect the inverter from direct precipitation.



Protect the inverter from coarse soiling, e.g. leaves.



Protect the inverter against dust, contamination and ammonia gases. Rooms and areas containing livestock are not permitted as installation sites.



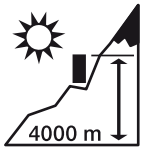
Do not install the inverter in potentially explosive areas.



The ambient temperature must be between -25 °C and +60 °C.



The air humidity may be between 0% and 100% (condensing).



Inverter may only be installed up to an altitude of 4000 m.

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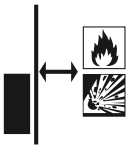
Outdoors in salty areas, do not install device any closer than 500 m from the coast. The device may be corroded in such areas. Areas close to the coast with a sea breeze or regions exposed to onshore winds are considered to be areas affected by salt. The region may vary depending on weather conditions (e.g. typhoons and monsoon rains) or topography (e.g. near dams and mountains).



A sufficient safety distance from flammable materials and potentially explosive areas in the vicinity must be ensured.

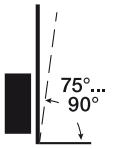


Mount inverter on a stable installation surface that can safely bear the weight. Plasterboard walls and wood planking are not permitted.

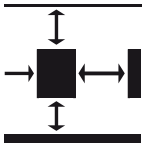


Do not install the inverter on a flammable installation surface.

WARNING! Risk of burns from hot parts on the inverter! Some of the inverter components can reach temperatures of over 80 °C during operation. Select the installation site in accordance with the information provided in these instructions. Always keep the ventilation openings clear.



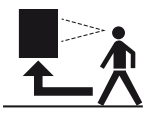
Install the inverter vertically. Tilted position up to 15° is permitted.



Maintain minimum distances and the necessary clearance.



The inverter makes noise during operation. Install inverter in such a way that people are not disturbed by operation noises.



The inverter must be easily accessible and the status LED must be easy to read.



Install the inverter out of reach of children or other unauthorised persons.

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Lay cables with UV protection or use UV-resistant cables.

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5.2 Installation site for WLAN connection

The inverter can be connected to the Internet by WLAN. Make sure that there is also a good connection to the Wifi router at the installation site. Changing the installation location at a later date involves a lot of effort. The range is approx. 20-30 m. Walls reduce the range considerably.

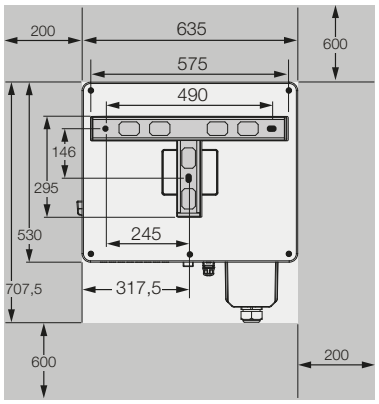
The following points should be noted:

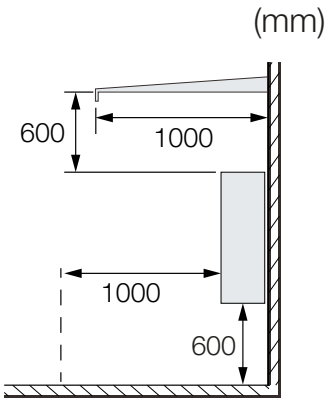
- Check in advance, e.g. with your mobile device, whether there is sufficient Wifi reception at the installation site.
- Measure the field strength. This should be as high as possible.
- If necessary, use repeaters to improve Wifi reception at the installation site.

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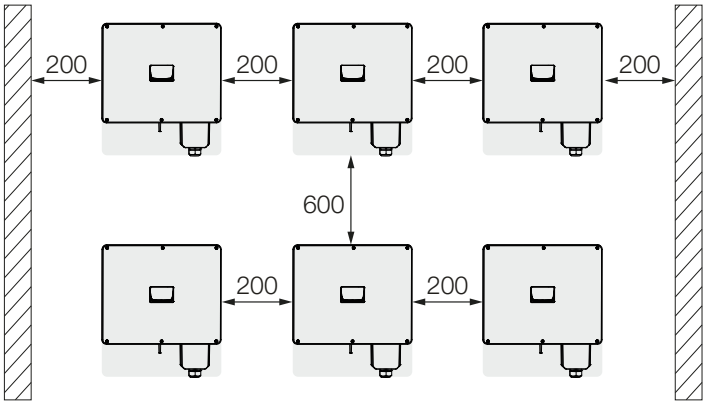
5.3 Installation dimensions

1. Be absolutely sure to maintain the clearance around the inverter so that it remains cool.
2. For installation, use retaining bolts that are suitable for the base, the weight of the inverter and the ambient conditions.
3. Use fastening screws that are suitable for the base in question to install the inverter wall mount.





4. Observe the specified distances if several inverters are installed side by side. The values given are minimum distances. Increase the distances if the thermal conditions in the installation environment require it, e.g. in case of unfavourable ventilation or strong sunlight.



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5.4 Installing the inverter

CAUTION

Danger of injury!

The inverter is very heavy.

- Do not lift or transport the inverter alone. To prevent injury, get another person to help you.

POSSIBLE DAMAGE

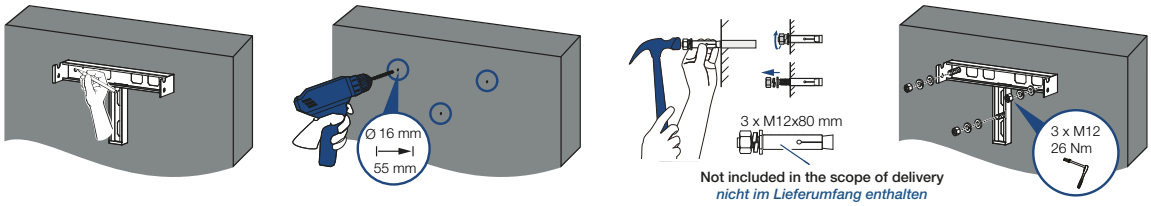
Damage to the inverter

If the wrong fastening material is used, the inverter may fall down.

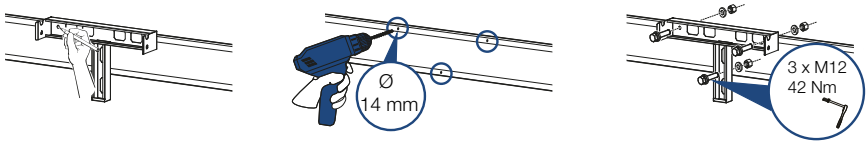
- Install the inverter using suitable fastening material, which is suitable for the substrate.

1. Install the inverter on a solid wall or on a stand. Observe the prescribed distances and other specifications.

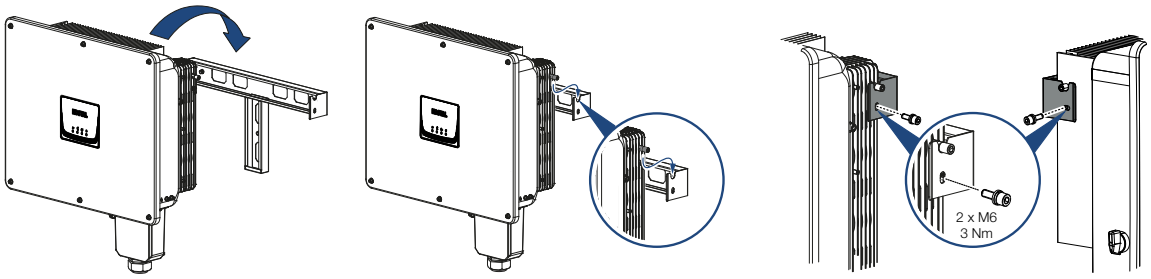
Wall mounting / *Wandmontage*



Optional - Frame mounting / *Optional - Gestellmontage*



2. Install the bracket on the base.
3. Lift the inverter onto the bracket.



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4. Make sure that the inverter is correctly seated and cannot slip off the bracket.
5. Install the lock screws.

✓ The inverter is installed.

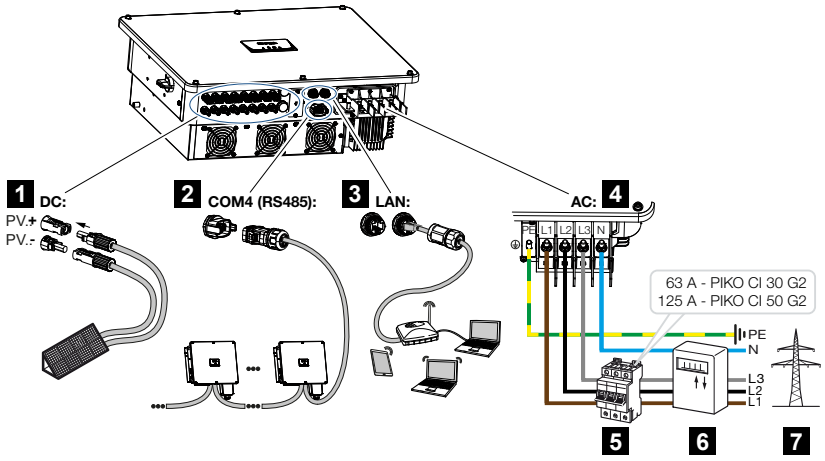
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6.1 Overview



1 Connections for PV modules
2 RS485 communication connections
3 LAN communication connections
4 AC connection
5 Line circuit breaker
6 Energy meters (e.g. KOSTAL Smart Energy Meter)
7 Public grid

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6.2 Cable specification

AC grid connection

Select the conductor cross-section according to the rated output current and the type of routing.

INFO

For outdoor installation, use UV-resistant cable. Alternatively, lay the cable protected from solar radiation.

The 4-wire AC connection (3L/PE without N) is only possible in symmetrical networks.

Take into account necessary reduction factors for ambient temperature and accumulation (when laying several cables without spacing).

Example: Ambient temperature 40 °C: Reduction factor 0.87 (according to DIN VDE 0100-520 / HD 60364-5-52).

AC cable specifications (grid connection)	
Connection method	4-wire (3L/PE without N) or 5-wire (3L/N/PE)
Cable length	max. 200 m
Material	Copper
Cable diameter	PIKO CI 30 G2: 25-31 mm PIKO CI 50 G2: 32-38 mm
Cable cross-section	PIKO CI 30 G2: 16-35 mm^2 PIKO CI 50 G2: 35-50 mm^2

DC grid connection

DC cable specifications (PV connection)	
Cable type	Solar cable e.g. PV1-F
Wire cross-section	4 – 6 mm^2
Cable diameter	6 – 8 mm

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6.3 Connecting mains cable

DANGER

Risk of death due to electrical shock and discharge!

De-energise device and secure against being switched on again.

CAUTION

Risk of fire due to overcurrent and heating of the mains cable

If mains cables are too small, they can heat up and cause a fire.

- Use a suitable cross-section.
- Install line circuit breaker to secure against overcurrent.

IMPORTANT INFORMATION

Make sure that the phases of the AC terminal and in the mains supply match.

This product may generate a direct current in the outer protective earthing conductor. If protective residual current devices (RCD) or residual current monitoring devices (RCM) are used, only type B ≥ 300 mA RCDs or RCMs are permitted on the AC side.

If type A RCD compatibility is activated in the device, a type A RCD can also be used.

INFO

Whenever working on the inverter, only ever use insulated tools to prevent short-circuits.

INFO

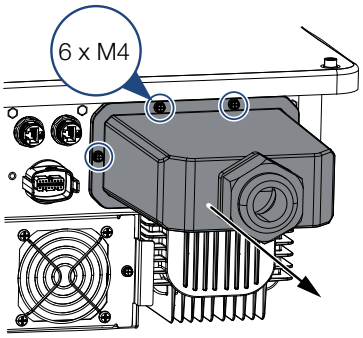
Make sure that the phases of the AC terminal and in the mains supply match.

The 4-wire AC connection (3L/PE without N) is only possible in symmetrical networks.

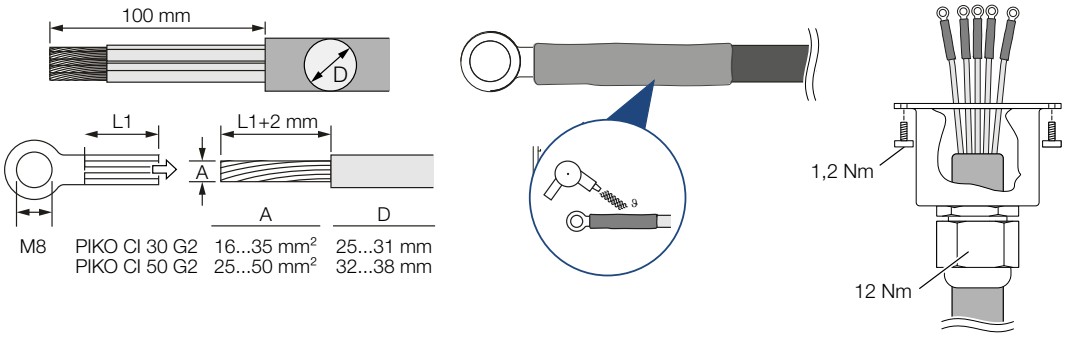
1. Disconnect the power supply from the mains.
2. Secure AC connection against being switched on again.
3. Switch the DC switch on the inverter to ***OFF***.
4. Correctly lay the mains cable from the power distributor to the inverter.

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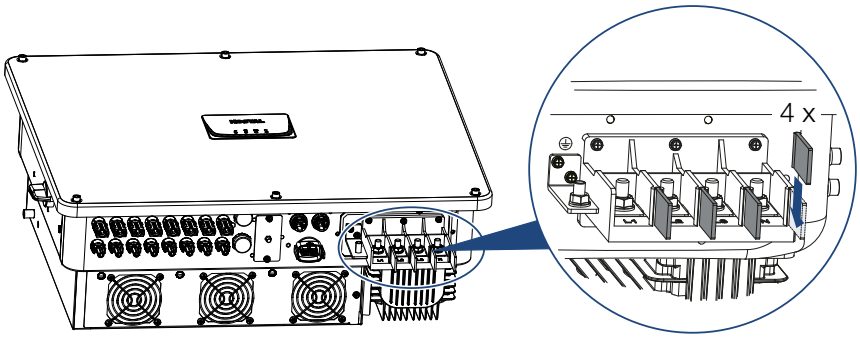
5. Install the necessary safety devices – line circuit breakers, residual current circuit breakers – in the mains cable.
6. Unscrew AC cap.



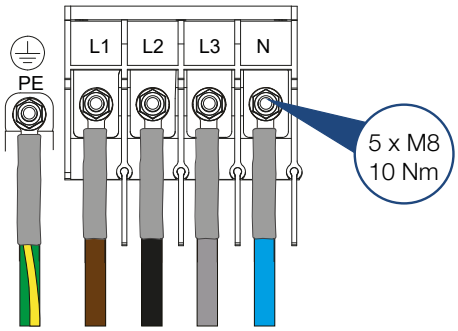
1. Strip insulation off mains cable.
2. Fit suitable heat-shrinkable sleeves onto the wires. Strip insulation off ends of conductors and crimp the cable ring lug onto the ends of conductors.



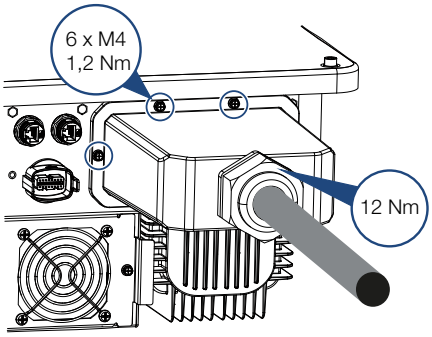
3. Pull the mains cable through the AC cap.
4. Install AC separators.



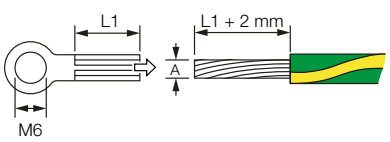
5. Connect the mains cable to the AC terminal according to the labelling.



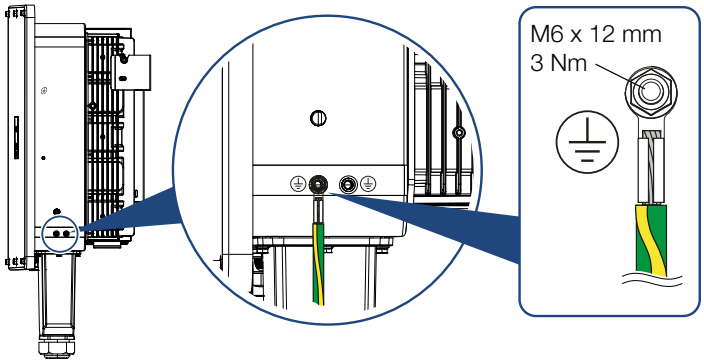
6. Screw the AC cap onto the inverter housing and the cable onto the AC cap. Tightening torque: AC cap 1.2 Nm, cable 12 Nm.



7. In countries in which a second PE connection is required, connect this at the marked place on the housing (outside).



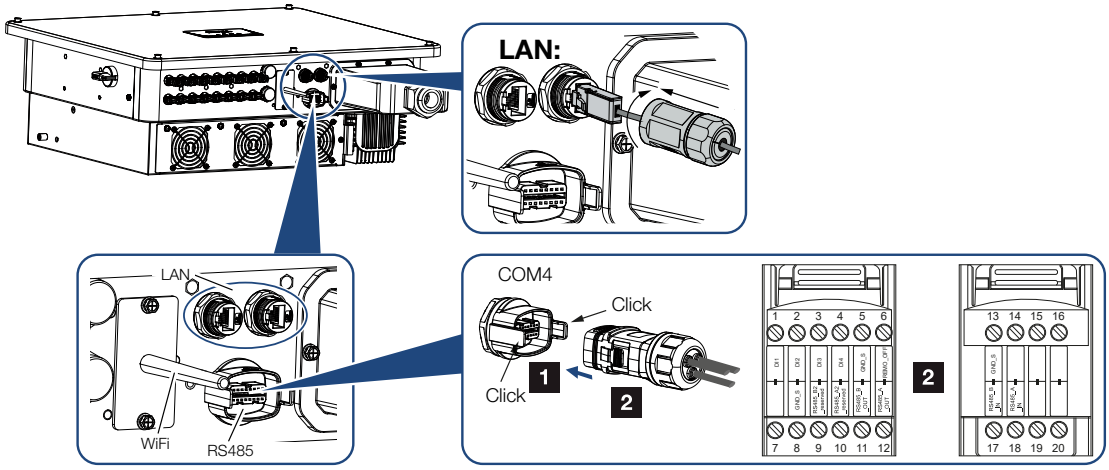
	A
PIKO CI 30 G2	≥ 16 mm²
PIKO CI 50 G2	≥ 35 mm²



✓ Mains cable connected

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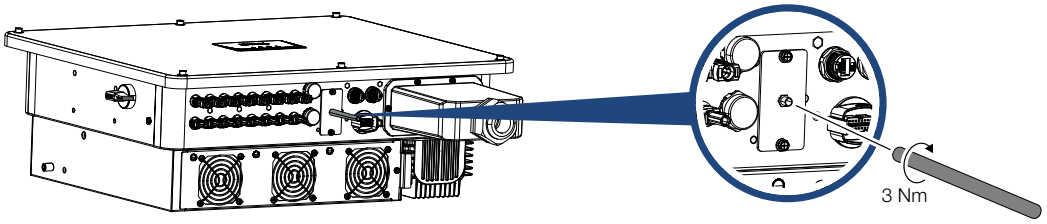
6.4 Overview of communication connections



Designation	Pin	Explanation
RJ45 LAN terminal	--	LAN connection 1
	--	LAN connection 2
COM4 communication interface	1	D|1 (ripple control receiver)
	2	D|2 (ripple control receiver)
	3	D|3 (ripple control receiver)
	4	D|4 (ripple control receiver)
	5	GND_S (ripple control receiver)
	6	Remote: Central system protection
	8	GND_S (central system protection)
	9	RS485_B2 (reserved)
	10	RS485_B2 (reserved)
	11	RS485_B_OUT
	12	RS485_A_OUT
	13	GND_S (RS485)
	14	---
	15	---
	16	---
	17	RS485_B_IN
	18	RS485_A_IN
	19	---
	20	---

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6.5 Mounting WiFi antenna

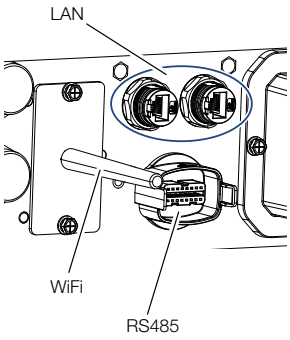


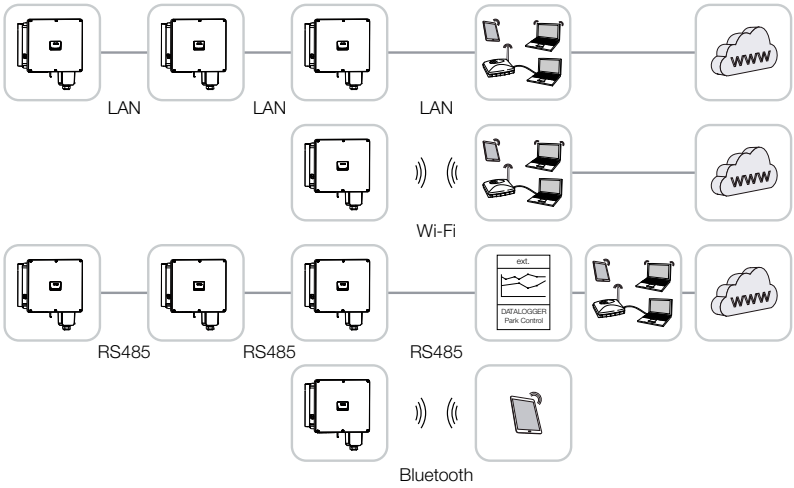
1. Remove protective cap from connection thread on inverter.
2. Screw the supplied WiFi antenna onto the stud bolt.
   Tightening torque: 3 Nm

✓ WiFi antenna mounted.

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6.6 Types of communication





The inverter features interfaces for LAN, RS485 Modbus and WiFi. There are therefore various possibilities for networking one or more inverters with each other and controlling them.

You can also combine different types of connections with each other. In a solar power plant, for example, it may be useful to network several inverters in the field in a wired manner (LAN/Ethernet or RS485), and to produce the connection to the local communication hub wirelessly via a radio link.

The inverter can be accessed directly via the local Bluetooth interface. The interface is used for initial commissioning or for direct configuration on site.

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6.6.1 LAN / Ethernet

INFO

Connecting the Ethernet cable to a router integrates the inverter into your own network and the inverter can then be contacted by all computers incorporated in the same network.

When networking via Ethernet, the inverter can be connected to the local network or the Internet. To do this, use one of the RJ45 connections in the connection panel.

Computers, routers, switches and/or hubs or other devices can be connected to the network.

Communication via LAN, Page 65

6.6.2 RS485 Modbus

Modbus is an industry standard for networking industrial measurement and control systems. A data logger or energy meter, for example, can be connected via this connection to control the connected inverters.

Communication via RS485, Page 66

6.6.3 WLAN / WiFi

INFO

At a later date, there are also plans for a connection from inverter to inverter.

Via WiFi, one or more inverters can be integrated into the local WLAN network, e.g. via a router or hub.

Communication via WiFi, Page 68

6.6.4 Bluetooth

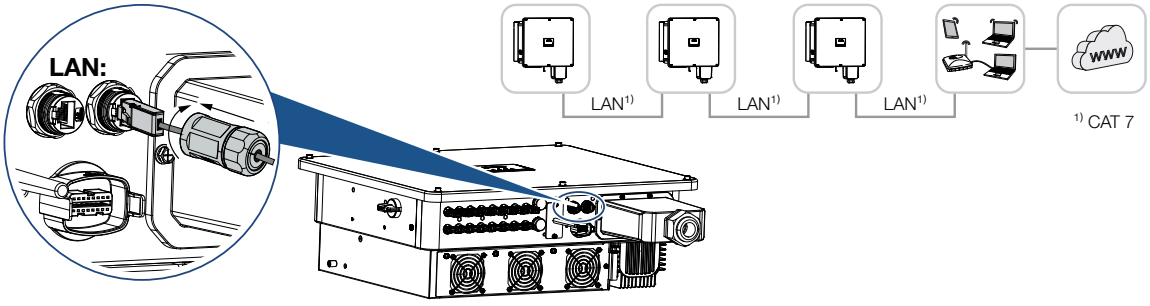
The Bluetooth interface is used primarily to configure the inverter on site or for initial commissioning.

For this purpose, use the KOSTAL PIKO CI Conf App and connect the inverter by Bluetooth.

Communication via Bluetooth, Page 69

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6.7 Communication via LAN



Connecting inverter to LAN/Ethernet cable

INFO

Use an Ethernet cable of category 7 (Cat 7, FTP) with a maximum length of 100 m as a network cable (Ethernet 10BaseT, 10/100 MBit/s).

1. Guide the Ethernet cable through the LAN cover provided.
2. Connect Ethernet cable to one of the LAN sockets.
   The second LAN socket is used to continue the network connection to further inverters.
3. Tighten LAN cover to the specified tightening torque.
   Tightening torque: 3 Nm.
4. Connect LAN/Ethernet cable to the computer or router.

INFO

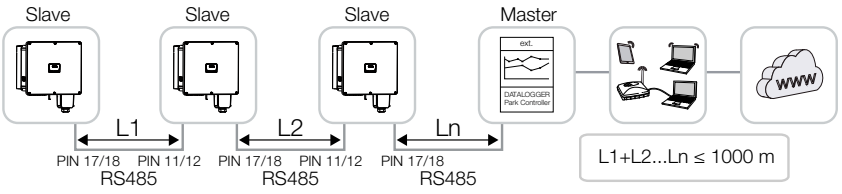
After commissioning, the settings for the Ethernet connection can still be configured in the KOSTAL PIKO CI Conf App.

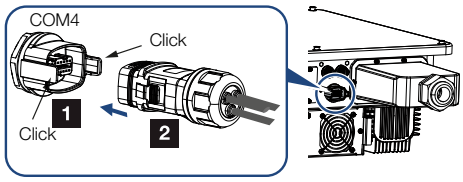
This includes, for example, the setting for IP mode, in which acquisition of an automatic IP address can be set.

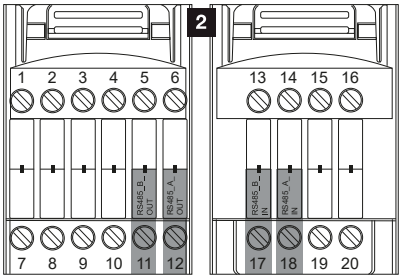
✓ LAN cable connected

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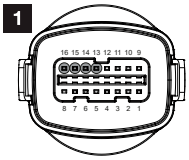
6.8 Communication via RS485







1	2	Functions / Funktion
13	11	RS485_B_OUT
14	12	RS485_A_OUT
15	17	RS485_B_IN
16	18	RS485_A_IN



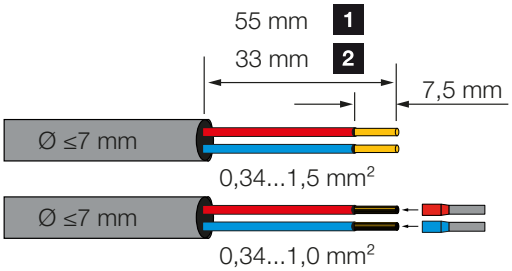
Connecting the RS485 connection

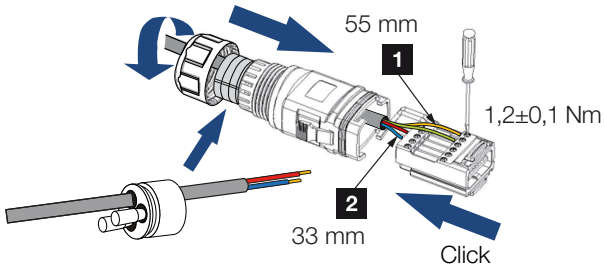
INFO

Requirements of communication cable:

- wire cross-section from 0.34 to 1.5 mm² (rigid) or 0.34 to 1.0 mm² (flexible)
- length of stripped insulation approx. 7.5 mm
- Potential bus length max. 1000 m. Follow the manufacturer's specifications on maximum cable length.

1. Guide the RS485 cable through the communication plug and seal provided.





2. Fit RS485 cable on plug.
   RS485 out is used to continue the network connection to further inverters.
3. Assemble plug and tighten union nut to the prescribed tightening torque. Tightening torque: 3 Nm.

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4. Connect the plug to the interface in the COM connection panel.
5. Connect RS485 cable to external device (e.g. data logger).

✓ RS485 cable connected.

After commissioning

INFO

After commissioning, the settings for the RS485 connection still have to be configured in the KOSTAL PIKO CI Conf App.

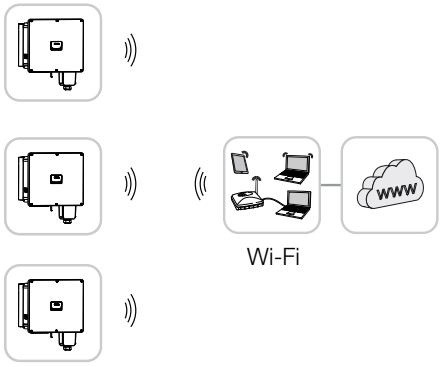
This includes, for example, setting the transmission speed.

1. The RS485 termination of the last inverter must be set to ***ON*** in the KOSTAL PIKO CI Conf App. This can be done under ***Settings > Communication settings > RS485 Settings > Terminal resistor***.
2. A different Modbus address must be assigned to each inverter using the KOSTAL PIKO CI Conf App.
   For this purpose, go to ***Settings > Communication settings > RS485 settings > Modbus address***.
3. As an option, it is also possible to configure a park controller using the KOSTAL PIKO CI Conf App.
   For this purpose, go to ***Settings > Inverter settings > Power adaptation/control > Park controller***.

✓ Settings configured

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6.9 Communication via WiFi



Connecting inverters via WiFi

INFO

Reset the WLAN password in the KOSTAL PIKO CI Conf App if you have forgotten it. The default password is:***12345678***.

1. The WiFi settings must be configured for each inverter in the KOSTAL PIKO CI Conf App.
2. To do this, go to the following menu item and configure the settings: ***Settings > Communication settings > WLAN settings > Select WLAN connection***

✓ Inverter connected via WiFi.

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6.10 Communication via Bluetooth



Connecting inverter via Bluetooth

1. Enable the Bluetooth function on your tablet or smartphone.
2. Switch on the inverter.
3. Launch the app.
4. If the prompt asking for permission to access location, camera and saving data appears on the smartphone, agree to this request.
5. Select Bluetooth as the connection in the app.



➔ The list of inverters appears.

6. If no inverter was found, you can
   - Refer to the type plate and ***Scan the inverter serial number barcode***,
   - Enter the inverter ***Serial number*** yourself,
   - Select ***Manual connection*** via Bluetooth.
7. Select a connection and connect to the inverter.

➔ The Bluetooth password entry window appears.

8. Enter the Bluetooth password and confirm with ***Enter***.
   You can also save the Bluetooth password for the next entry by pressing ***Save password***.

✓ When the app displays the message ***Connect***, the inverter is connected.

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6.11 Connecting the KOSTAL Smart Energy Meter

Connecting a KOSTAL Smart Energy Meter allows generation values and consumption values to be recorded or the output power of the inverter into the public grid to be controlled. In addition, the KOSTAL Smart Energy Meter can send data to the KOSTAL Solar Portal. To do this, the KOSTAL Smart Energy Meter must be set up in addition to the PIKO CI in the same system in the KOSTAL Solar Portal.

The energy meter is installed in the meter cabinet or in the main distribution board. Please also refer to the operating documentation of the KOSTAL Smart Energy Meter.

INFO

If a KOSTAL Smart Energy Meter is installed in the home network and a power limit is set, the active power is dynamically limited taking into account the home consumption. This means that in addition to the set power limitation (e.g. from a ripple control receiver), the home consumption is added up to the maximum power limit of the inverter.

INFO

Only energy meters that have been approved for this inverter may be used.

You will find an up-to-date list of the approved energy meters on our website in the download area for the product.

The following energy meters are currently approved:

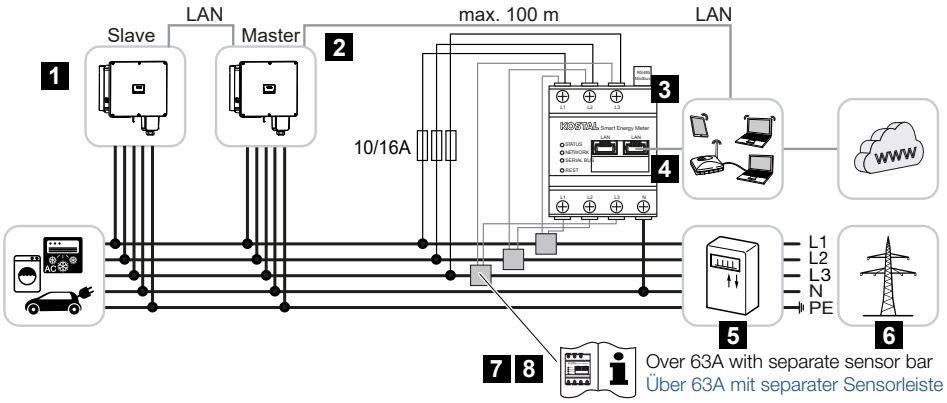
- KOSTAL Smart Energy Meter

The KOSTAL Smart Energy Meter can be connected to PIKO CI in two different ways. The connection method must then be set in the KOSTAL PIKO CI Conf App.

- **Communication connection for KOSTAL Smart Energy Meter via LAN, Page 71**
- **Communication connection for KOSTAL Smart Energy Meter via RS485, Page 74**

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6.11.1 Communication connection for KOSTAL Smart Energy Meter via LAN



1 Inverter
2 LAN interface to inverter
3 KOSTAL Smart Energy Meter
4 LAN interface for KOSTAL Smart Energy Meter
5 Feed meter
6 Public grid
7 Read the operating manual for the KOSTAL Smart Energy Meter.
8 Use a current transformer for currents above 63 A

Connecting the KOSTAL Smart Energy Meter

DANGER

Risk of death due to electrical shock and discharge!

De-energise all devices and secure them against being switched on again.

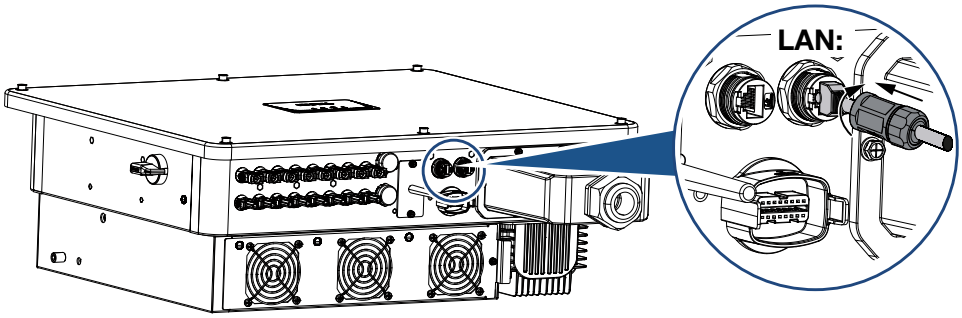
INFO

Use an Ethernet cable of category 7 (Cat 7, FTP) with a maximum length of 100 m as a network cable (Ethernet 10BaseT, 10/100 MBit/s).

1. De-energise the mains cable.
2. Install the KOSTAL Smart Energy Meter as shown in the illustrations at the grid connection point in the house grid.
3. Guide the Ethernet cable through the LAN cover provided.

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4. Connect Ethernet cable to one of the LAN sockets.
   The second LAN socket is used to continue the network connection to further inverters.



5. Tighten LAN cover to the specified tightening torque.
   Tightening torque: 3 Nm.
6. Connect the other end of the Ethernet cable to the router.
7. Establish a LAN connection from the KOSTAL Smart Energy Meter to the router.

✓ Inverter connected to KSEM.

After commissioning

After commissioning, the following settings still have to be configured in the KOSTAL PIKO CI Conf App.

Configuring settings using the KOSTAL Smart Energy Meter user interface

1. In the KOSTAL Smart Energy Meter, set ***Modbus settings > Modbus TCP > Slave (Enable TCP Slave)*** to ***ON***.
2. To make the home consumption visible in the KOSTAL Solar Portal, in the KOSTAL Smart Energy Meter set ***Inverter > Solar portal > Activate solar portal*** to ***ON***.

In this variant, the KOSTAL Smart Energy Meter works as a slave and sends data to the inverter.

Configuring settings using the KOSTAL PIKO CI App

1. Use of the KOSTAL Smart Energy Meter (KSEM) must be configured in the KOSTAL PIKO CI Conf App on the ***master*** inverter.
   For this purpose, go to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Activate/deactivate KSEM > Activate***.
2. The connection between KSEM and inverter is set by going to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Connection between KSEM and master inverter > LAN***.

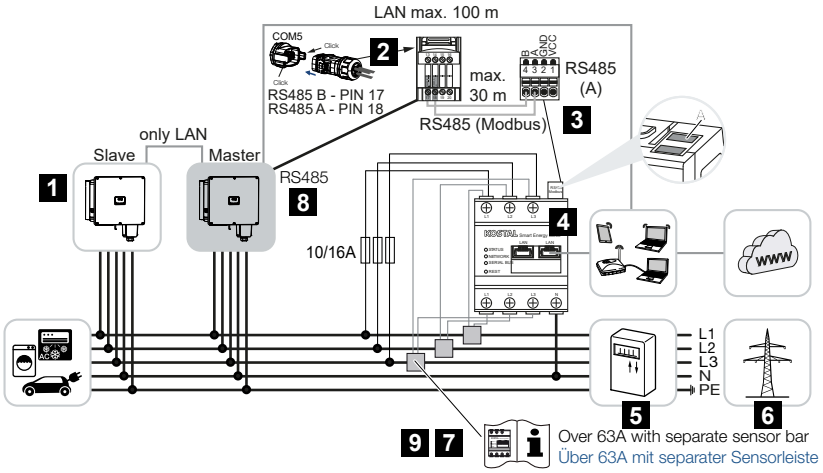
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3. The installation position is set by going to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Sensor position > Grid connection point***.
4. The KSEM modbus address is set by going to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Energy meter modbus address > 1*** (standard value in KSEM).
5. A power limitation of the grid feed-in (e.g. to 70%) must be entered in watts on the ***Master*** inverter.
   The active power limitation is entered by going to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Limitation of the active power to (W)***.
6. The KSEM IP address is entered at ***Settings > Inverter settings > Power adaptation/control > KSEM management > Energy meter IP address > KSEM IP address***.
7. All other inverters connected to the master inverter are configured as ***slaves***. Do not configure any further settings in slave inverters.

✓ Inverters configured.

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6.11.2 Communication connection for KOSTAL Smart Energy Meter via RS485



1 Inverter
2 RS485 interface for inverter
3 RS485 interface for KOSTAL Smart Energy Meter
4 KOSTAL Smart Energy Meter
5 Feed meter
6 Public grid
7 Read the operating manual for the KOSTAL Smart Energy Meter
8 Set RS485 termination in KOSTAL PIKO CI app to ON
9 Use a current transformer for currents above 63 A. Read the operating manual for the KOSTAL Smart Energy Meter

Connecting the KOSTAL Smart Energy Meter

DANGER

Risk of death due to electrical shock and discharge!

De-energise all devices and secure them against being switched on again.

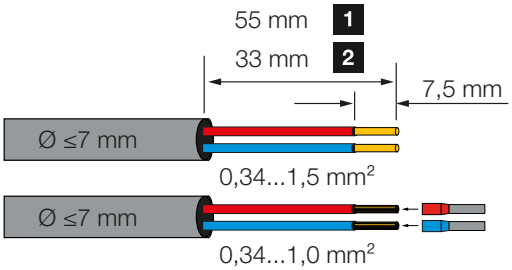
INFO

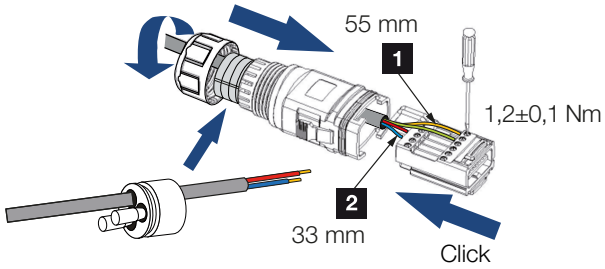
Requirements of communication cable:

- wire cross-section from 0.34 to 1.5 mm² (rigid) or 0.34 to 1.0 mm² (flexible)
- length of stripped insulation approx. 7.5 mm
- Potential bus length max. 1000 m. Follow the manufacturer's specifications on maximum cable length.

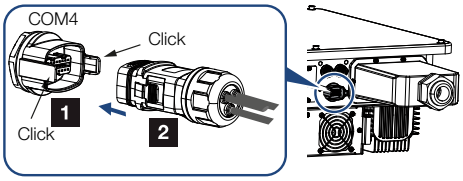
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1. De-energise the mains cable.
2. Install the KOSTAL Smart Energy Meter as shown in the illustrations at the grid connection point in the house grid.
3. Correctly route the communication cable from the inverter to the control cabinet and connect to the KOSTAL Smart Energy Meter following the manufacturer's wiring diagram.
4. De-energise the inverter. Switching off the inverter
5. Guide the RS485 cable through the communication plug and seal provided.

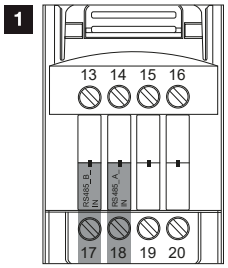


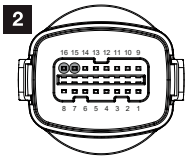


6. Fit RS485 cable on inverter plug.



2	1	Functions / Funktion
15	17	RS485_B_IN
16	18	RS485_A_IN





7. Assemble plug and tighten union nut to the prescribed tightening torque. Tightening torque: 3 Nm.
8. Connect the plug to the interface in the COM connection panel.
9. Establish a LAN connection from the KOSTAL Smart Energy Meter and the inverter to the Internet.

✓ Inverter connected to KSEM.

After commissioning

After commissioning, the following settings still have to be configured in the KOSTAL PIKO CI Conf App.

This includes elements, such as the RS485 connection setting.

Configuring settings using the KOSTAL Smart Energy Meter user interface

1. In the KOSTAL Smart Energy Meter, go to ***Modbus settings*** and select the PIKO CI to the RS485 A interface. Please refer to the operating manual of the KOSTAL Smart Energy Meter.

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In this variant, the KOSTAL Smart Energy Meter works as a slave and sends data to the inverter.

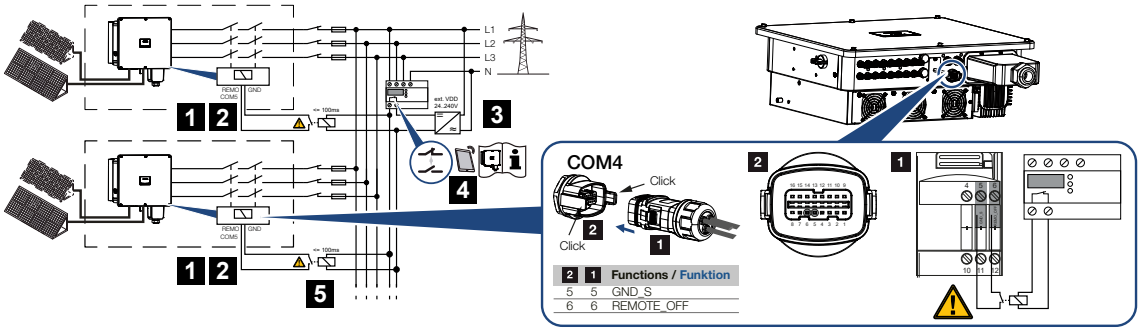
Configuring settings using the KOSTAL PIKO CI App

1. On the ***master*** inverter to which the RS485 communication cable is connected, set RS485 termination in the KOSTAL PIKO CI Conf App to ***ON***.
   This can be done under ***Settings > Communication settings > RS485 settings > Terminal resistor***.
2. Use of the KOSTAL Smart Energy Meter (KSEM) must be configured in the KOSTAL PIKO CI Conf App on the ***master*** inverter.
   For this purpose, go to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Activate/deactivate KSEM > Activate***.
3. The connection between KSEM and inverter is set by going to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Connection between KSEM and master inverter > RS485***.
4. The installation position is set by going to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Sensor position > Grid connection point***.
5. The KSEM modbus address is set by going to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Energy meter modbus address > 1*** (standard value in KSEM).
6. A power limitation of the grid feed-in (e.g. to 70%) must be entered in watts on the ***Master*** inverter.
   The active power limitation is entered by going to ***Settings > Inverter settings > Power adaptation/control > KSEM management > Limitation of the active power to (W)***.
7. All other inverters connected to the master inverter by LAN are configured as ***slave***.
   Do not configure any further settings in slave inverters.

✓ Inverters configured.

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6.12 Connecting central grid and system protection



1 COM plug
2 Inverter COM connection
3 Grid and system protection - Switch closed: Feed-in, Switch open: Feed-in prevented
4 Activation of grid and system protection via KOSTAL PIKO CI app
5 Relay in the event of great distances

Central grid and system protection is required in some countries. This monitors the voltage and frequency in the grid and in the event of a fault, shuts down the photovoltaic systems by means of a circuit breaker.

If your energy supplier requires central grid and system protection for your system, install an external monitoring device, which switches off the inverter via a normally open or normally closed contact. An additional circuit breaker is not required as this is replaced with the internal switches in the inverter.

Connection

DANGER

Risk of death due to electrical shock and discharge!

De-energise all devices and secure them against being switched on again.

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INFO

Requirements of communication cable:

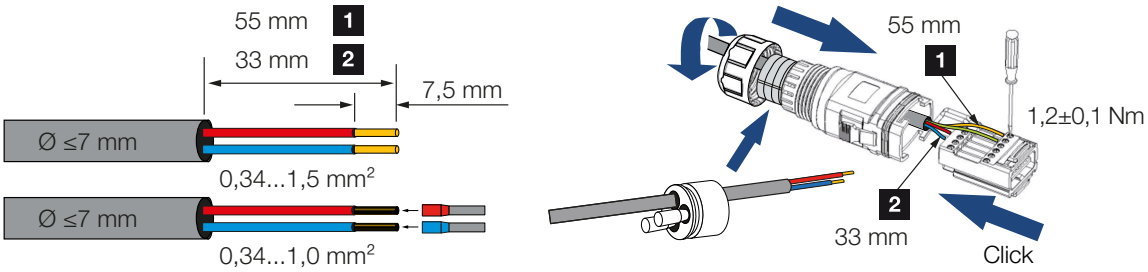
- wire cross-section from 0.34 to 1.5 mm² (rigid) or 0.34 to 1.0 mm² (flexible)
- length of stripped insulation approx. 7.5 mm
- Potential bus length max. 1000 m. Follow the manufacturer's specifications on maximum cable length.

POSSIBLE DAMAGE

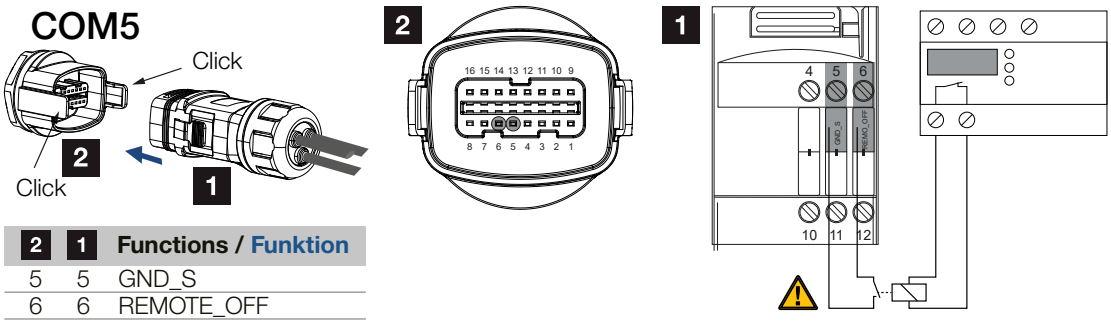
Remote connection in the inverter may be destroyed!

Only a potential-free contact may be connected to the inverter connection for central mains and system protection; no voltage source may be connected.

1. De-energise the mains cable.
2. Install the monitoring device in the control cabinet or power distributor.
3. If there is a considerable distance between the monitoring unit and the inverter, a relay must be used.
4. Correctly route the communication cable from the inverter to the control cabinet and connect following wiring diagram provided by manufacturer.
5. Feed the communication cable through the supplied communication plug and seal.



6. Connect the communication cable to the inverter plug.



2	1	Functions / Funktion
5	5	GND_S
6	6	REMOTE_OFF

7. Assemble the plug and tighten the cap nut to the specified torque.
   Tightening torque: 3 Nm.
8. Plug the connector into the interface in the COM connection panel.

After commissioning

1. After commissioning, the function must be activated in each inverter using the KOSTAL PIKO CI Conf App.
   This can be activated under ***Settings > Basic settings > External shutdown > ON***.

✓ Inverter set up for grid and system protection function.

INFO

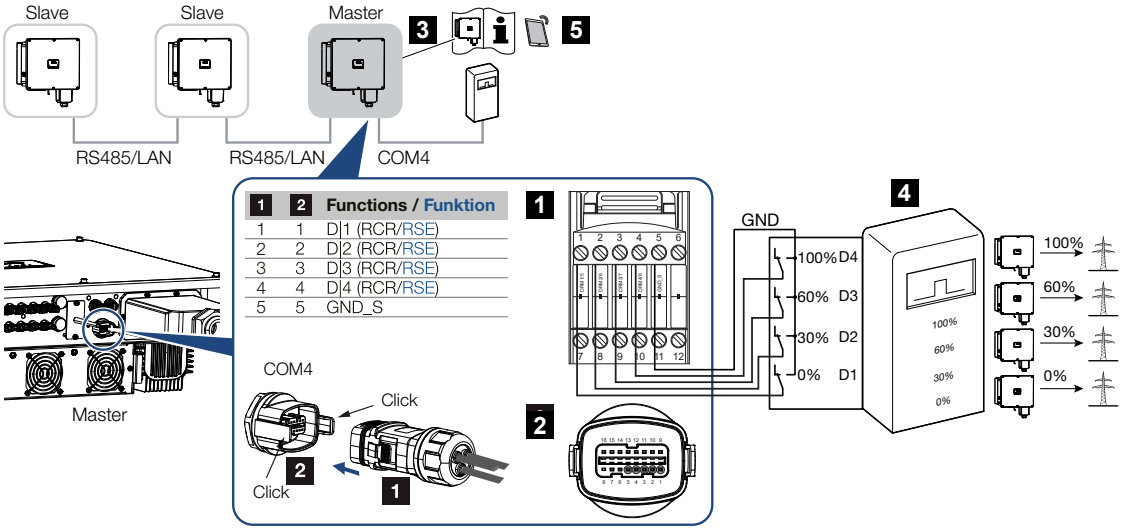
The external shutdown is not functioning reliably.

If the inverter switches off or does not function perfectly after the external shutdown is activated, the cable to the inverter may be too long.

The cable length can cause the cable resistance to be very high such that it does not fall to 0V. If this is the case, the cable to the inverter must be shortened.

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6.13 Connecting ripple control receiver



1 COM communication interface plug
2 COM communication interface socket
3 Inverter to which the ripple control receiver is connected
4 Ripple control receiver
5 Activate the ripple control receiver in the KOSTAL PIKO CI app

Several energy supply companies offer the owners of PV systems the option of regulating their system with variable active power control and thus increasing the feed-in into the public grid to up to 100%.

INFO

In some applications, the digital KOSTAL Smart Energy Meter may be regarded as a cost-effective alternative to the ripple control receiver. Here the feed-in may well be limited by the energy supply company, but the inverter controls the flow of energy (self-consumption in house grid and feed-in to the public grid) in such a way that the self-produced energy is not lost or loss is kept to an absolute minimum.

Ask your energy supply company or installer what application rule applies to you or whether there is an alternative (e.g. smart meter) better suited to you.

If a ripple control receiver is already connected to another KOSTAL inverter in your home network, you can use the control signals of this ripple control receiver.

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Connection

DANGER

Risk of death due to electrical shock and discharge!

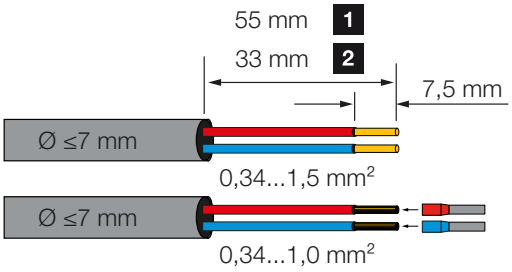
De-energise all devices and secure them against being switched on again.

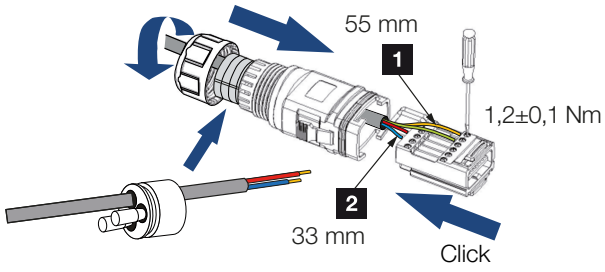
INFO

Requirements of communication cable:

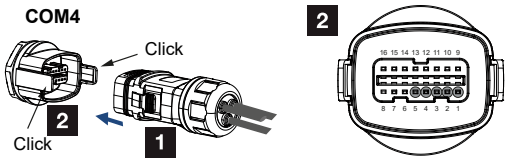
- wire cross-section from 0.34 to 1.5 mm² (rigid) or 0.34 to 1.0 mm² (flexible)
- length of stripped insulation approx. 7.5 mm
- Potential bus length max. 1000 m. Follow the manufacturer's specifications on maximum cable length.

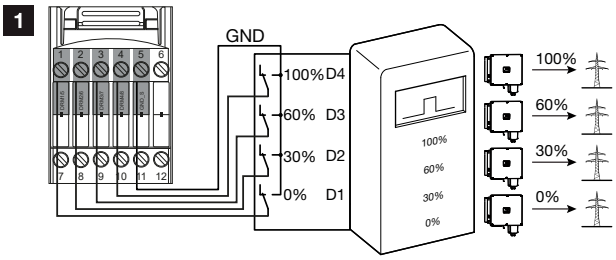
1. De-energise the mains cable.
2. Fit ripple control receiver in control cabinet or power distributor.
3. Correctly route the communication cable from the inverter to the control cabinet and connect following wiring diagram provided by manufacturer.
4. Guide the communication cable through the communication plug and seal provided.





5. Fit the communication cable on the inverter plug.





2	1	Functions / Funktion
1	1	D1 (RCR/RSE)
2	2	D2 (RCR/RSE)
3	3	D3 (RCR/RSE)
4	4	D4 (RCR/RSE)
5	5	GND_S

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6. Assemble plug and tighten union nut to the prescribed tightening torque. Tightening torque: 3 Nm.
7. Connect plug to interface in COM5 connection panel.

✓ The ripple control receiver is connected.

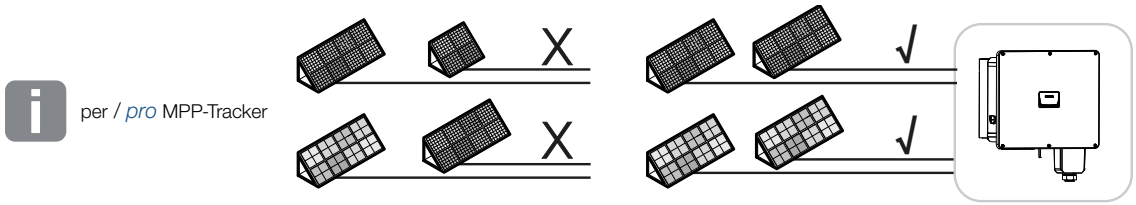
After commissioning

1. Open the KOSTAL PIKO CI Conf App and connect to the inverter to which the ripple control receiver is connected.
2. Activate the ripple control receiver in the KOSTAL PIKO CI Conf App by going to ***Settings > Inverter settings > Power adaptation/control > Ripple control receiver (RCR) > Activate ripple control receiver > ON***.
3. Configure the connection type between master and slave inverter (LAN or RS485) on the master inverter by going to ***Settings > Inverter settings > Power adaptation/control > Ripple control receiver (RCR) > Connection between master inverter and slave > LAN*** or ***RS485***
4. Set switching values for the ripple control receiver by going to ***Settings > Inverter settings > Power adaptation/control > Ripple control receiver (RCR) > RCR active power / RCR reactive power / RCR power factor***.

✓ The ripple control receiver has been configured.

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6.14 Connecting PV modules



Connectable solar modules

When selecting the PV modules to be connected to PIKO CI series inverters, note the following:

- Only connect PV modules according to IEC 61730 Class A.
- Do not ground the PV cables.
- Use suitable cables with the largest possible cross-section for connecting the PV modules!

INFO

Use flexible and tin-plated cables with double insulation according to EN50618.

We recommend a cross-section of 6mm^2. Please observe the specifications of the plug manufacturer and the technical data for the inverter.

- Per MPP tracker:
  - Only connect PV modules of the same type to an MPP tracker, i.e.:
  - same manufacturer,
  - same type,
  - same performance,
  - same size.

Different module types, sizes and connected loads and also a different number of PV modules can be connected to different MPP trackers.

Make sure that the maximum input current (I_{DCmax}) per MPPT and the maximum DC current per DC plug ($I_{Stringmax}$) are not exceeded in the process.

Technical data, Page 136

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6.14.1 Solar module connections

DANGER

Risk of death due to electrical shock and discharge!

The PV generators/cables may be live as soon as they are exposed to light.

WARNING

Serious burns due to arcs on the DC side!

During operation, dangerous arcs can occur when pulling or plugging the DC connections.

Before connecting the DC connectors, de-energise the DC side. DC switches must be in the OFF position.

WARNING

Risk of fire due to improper installation!

Incorrectly fitted plugs and sockets may heat up and cause a fire.

During installation, be sure to follow the manufacturer's requirements and manual. Properly mount plugs and sockets.

POSSIBLE DAMAGE

Risk of damage to the inverter due to PV modules connected with the wrong polarity

PV modules connected with the wrong polarity may cause thermal damage to the inverter.

- Measure the DC cables of the PV modules and connect to inverter with the correct polarity.
- Comply with the maximum input current per string for the inverter as stated in the technical data.
- The maximum input current must not be exceeded, even when using Y or T plugs.

Please note the following points before connecting the PV modules:

- Our planning tool KOSTAL Solar Plan should be used to optimally configure the solar modules and achieve the highest possible yields.
- Check the planning and the wiring of the modules for plausibility.

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- Measure and record the DC idling voltage and polarity of the PV modules. The idling voltage of the PV modules must be in the voltage range between $U_{DCstart}$ and U_{DCmax}.
- Make sure that the maximum short-circuit current of the PV modules is less than the permitted value.
- Make sure that the PV modules are not short-circuited.
- Make sure that the inverter is closed when the PV modules are connected.
- Make sure that when connecting several inverters there is no cross-connection of the PV modules.

Failure to observe these requirements will render any warranty, guarantee or other liability offered by the manufacturer null and void.

6.14.2 Preparing PV connector

The inverter uses DC plug connectors of the Helios H4 type from Amphenol.

During installation, use the DC plug connectors supplied with the inverter. Using incompatible positive and negative metal contacts and DC plug connectors may have serious consequences. Any resultant damage to the device is not covered by warranty.

- During installation, it is essential that the current specifications of the manufacturer are observed.
  Information about the Amphenol installation specification is available from:
  www.amphenol.com
- Only use installation tools from the manufacturer.
- When mounting the sockets and plugs, ensure that the solar modules have the correct polarity. PV modules connected with the wrong polarity may cause thermal damage to the inverter.

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6.14.3 Installing PV plug connectors

DANGER

Risk of death due to electrical shock and discharge!

Disconnect the DC cables by interrupting the connections to the PV modules.

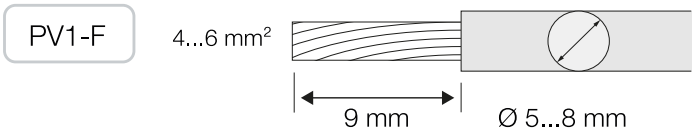
If it is not possible to disconnect the DC cables, observe the rules for working under voltage.

Use personal protective equipment, hard hat, visor or goggles, protective suit, insulating gloves.

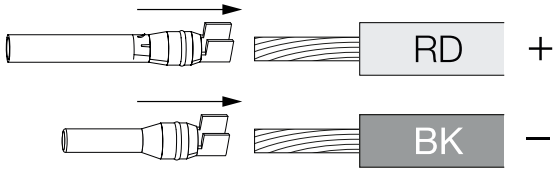
Use an insulating protective mat as an underlay.

Only use insulated tools.

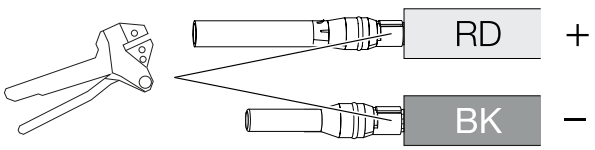
1. Strip approx. 9 mm of insulation off the solar cable.



2. Insert stripped wire end into crimped neck of contact.



3. Crimp the contact with a suitable crimping tool.

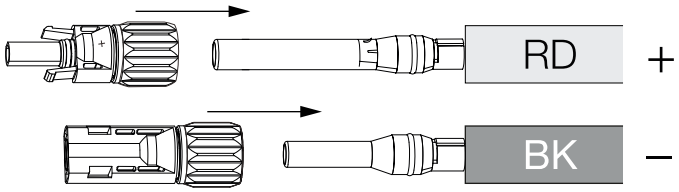


4. Insert contact into plug connector until the contact clicks into place tangibly and audibly.

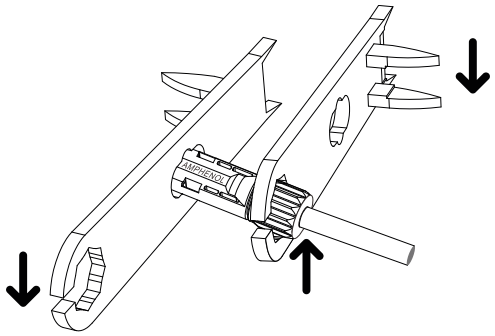
INFO

Once snapped into the housing, the contact cannot be removed from the plug connector.

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5. Tighten nut on plug connector (3 Nm).



✓ PV connector installed

6.14.4 Selecting PV inputs

If the inverter's DC inputs are not fully occupied, distribute the input assignment in accordance with the following tables: Make sure that the maximum input current (I_{DCmax}) per MPPT and the maximum DC current per DC input ($I_{Stringmax}$) are not exceeded in the process:

INFO

Only connect PV modules of the same type to an MPP tracker, i.e.:

- same manufacturer,
- same type,
- same performance,
- same size.

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Maximum input current

PIKO CI G2	$U_{DCstart}$	U_{DCmax}	I_{DCmax} per MPP tracker	$I_{Stringmax}$
30	≤200 V	≤1100 V	MPPT 1: 40 A MPPT 2: 32 A MPPT 3: 32 A	DC 1-2: ≤ 20 A DC 3-4: ≤ 20 A DC 5-6: ≤ 20 A
50	≤200 V	≤1100 V	MPPT 1: 40 A MPPT 2: 32 A MPPT 3: 32 A MPPT 4: 32 A	DC 1-2: ≤ 20 A DC 3-4: ≤ 20 A DC 5-6: ≤ 20 A DC 7-8: ≤ 20 A

DC connection assignment

PIKO CI G2	Connected PV strings	MPP trackers			
		1	2	3	4
		Used DC input			
30	1	1			--
	2	1	2		---
	3	1	2	3	--
	4	1, 2	3	4	--
	5	1, 2	3, 4	5	--
	6	1, 2	3, 4	5, 6	--
50	1	1			
	2	1	2		
	3	1	2	3	
	4	1	2	3	4
	5	1, 2	3	4	5
	6	1, 2	3, 4	5	6
	7	1, 2	3, 4	5, 6	7
	8	1, 2	3, 4	5, 6	7, 8

6.14.5 Connecting PV modules to the inverter

The DC cables of the solar modules must not be connected to the inverter under load.

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DANGER

Risk of death due to electrical shock and discharge!

Switch off the inverter on both the AC and DC sides.

INFO

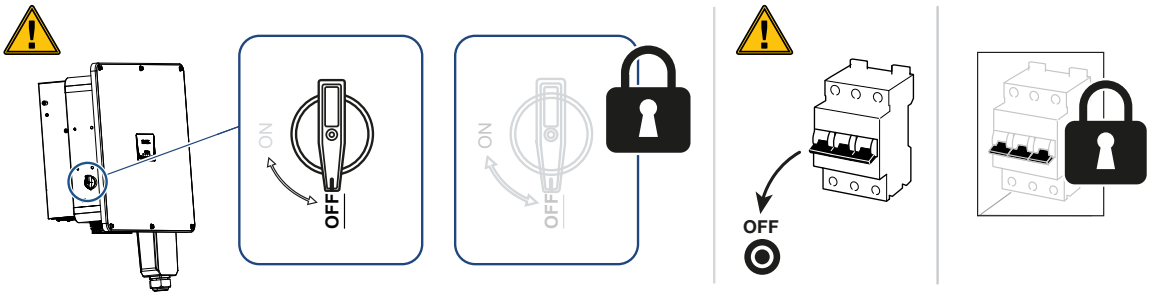
Observe national regulations! In France, in particular, the inverter and the supply lines must be labelled, for example.

The installer is responsible for obtaining and affixing the prescribed markings.

INFO

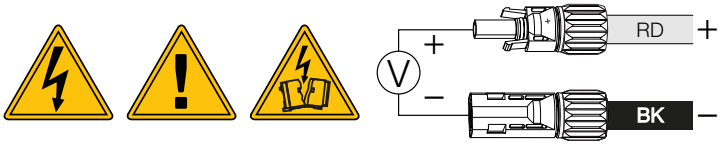
Keep the protective caps of the PV connections for future use.

1. Unlock the AC connection of the inverter by switching off the line circuit breaker.

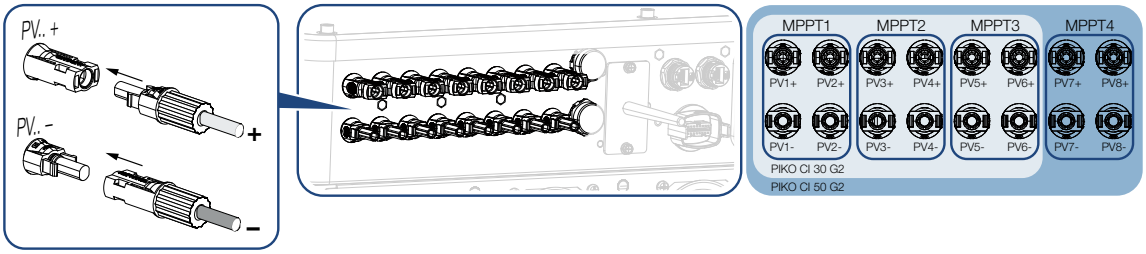


2. Turn the DC switch on the inverter to “OFF”.
3. Measure the DC cables of the PV modules before connecting them to the inverter with the correct polarity. PV modules connected with the wrong polarity may cause thermal damage to the inverter.
   Exceeding the maximum input current per string may result in damage to the inverter. Therefore, the maximum input current per string for the inverter as stated in the technical data must not be exceeded.

$U_{DCstart}$	U_{DCmax}
200	1100



1. Remove protective caps from input terminals.
2. Fit plug connectors of the individual PV strings into the DC inputs PV+ and PV- in pairs until they engage tangibly and audibly.



✓ The PV modules are connected.

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7. Initial commissioning

7.1 Installing KOSTAL PIKO CI app 92
7.2 Connecting inverter to app 93
7.3 Procedure for initial commissioning 94
7.4 Handover to the operator 95

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7.1 Installing KOSTAL PIKO CI app

1. Download the KOSTAL PIKO CI Conf App from the Apple App Store or Google Play Store onto your tablet or smartphone.



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7.2 Connecting inverter to app

For the inverter's initial commissioning, the inverter is connected to the smartphone via Bluetooth.

1. Switch on the inverter.

1. Enable the Bluetooth function on your tablet or smartphone.
2. Switch on the inverter.
3. Launch the app.
4. If the prompt asking for permission to access location, camera and saving data appears on the smartphone, agree to this request.
5. Select Bluetooth as the connection in the app.



➔ The list of inverters appears.

6. If no inverter was found, you can
   - Refer to the type plate and ***Scan the inverter serial number barcode***,
   - Enter the inverter ***Serial number*** yourself,
   - Select ***Manual connection*** via Bluetooth.
7. Select a connection and connect to the inverter.

➔ The Bluetooth password entry window appears.

8. Enter the Bluetooth password and confirm with ***Enter***.
   You can also save the Bluetooth password for the next entry by pressing ***Save password***.

✓ When the app displays the message ***Connect***, the inverter is connected.

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7.3 Procedure for initial commissioning

INFO

The installation process may vary depending upon the software version of the inverter.

Information about the menus: KOSTAL PIKO CI app - menu structure

INFO

The default password for the installer/administrator is ***superadmin***.

With this user, a variety of settings can be configured vis-à-vis the system operator, such as network settings, power limitations or grid guidelines.

This password should be changed after the initial commissioning. If you forget your password, it can be reset via the service.

INFO

Observe national regulations! In France, in particular, the inverter and the supply lines must be labelled, for example.

The installer is responsible for obtaining and affixing the prescribed markings.

1. In the app, select the ***Settings*** page.

➔ On the ***Settings*** page, the app shows you various menus where you can configure settings.

2. In order to have access to all relevant settings, go to the ***User Management*** menu item and then select ***Change user***.
3. Select ***Login*** as ***installer***.
4. Enter the password ***superadmin*** and select ***Login***.
5. Configure the settings for inverter operation and on the ***Settings*** page, select ***Inverter settings***.

✓ The inverter is in operation and can now be used. Initial commissioning is completed.

After commissioning

The following settings still need to be configured after initial commissioning:

- Inverter settings made by the installer
- Prescribed settings for grid feed-in by the energy supply company
- Change the password or update the inverter software.

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7.4 Handover to the operator

Following successful installation and commissioning, all documents are to be handed over to the operator.

Instruct the operator in how to use the PV system and the inverter.

The operator must be made aware of the following points:

- Position and function of the DC switch
- Position and function of the AC line circuit breaker
- Procedure for disconnecting the device
- Safety when handling the device
- Appropriate procedure when checking and servicing the device
- Meaning of the LEDs and the display messages
- Contact person in the event of a fault
- The provision of system and inspection documentation in accordance with DIN EN 62446 (VDE 0126-23) (optional).

As the **installer and commissioning engineer**, have the operator confirm the proper handover with their signature.

As the **operator**, have the installer and commissioning engineer confirm that the installation of the inverter and the PV system is safe and complies with standards with their signature.

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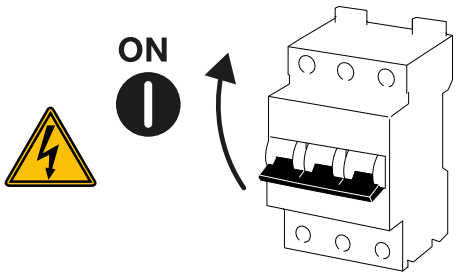
8. Operation and operating the device

8.1 Switching on the inverter 97
8.2 Switching off the inverter 98
8.3 De-energising the inverter 99
8.3.1 Disconnecting inverter on the AC side 99
8.3.2 Disconnecting DC cables 99
8.4 Operational statuses of inverter 101
8.5 Status LEDs 102
8.6 Status display via app 103

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8.1 Switching on the inverter

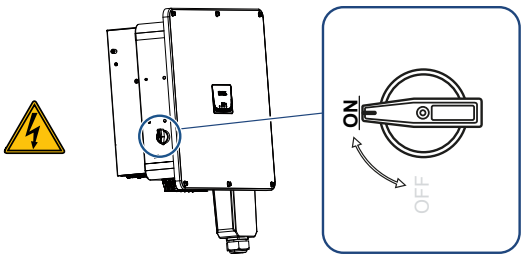
1. Activate supply voltage via the line circuit breaker.



2. Move the DC switch on the inverter to ***ON***.

INFO

As soon as one of the DC switches is set to ***ON***, the inverter starts up.



➔ The inverter starts up.

➔ The LEDs light up briefly during start-up.

➔ After startup, the LEDs indicate the operational status of the inverter.

INFO

When the inverter is commissioned for the first time, it goes into the ***Off*** (***Shutdown***) status.

When this happens, first carry out initial commissioning.

✓ The inverter is in operation.

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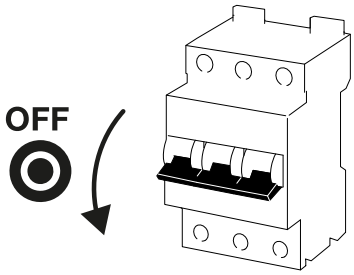
8.2 Switching off the inverter

INFO

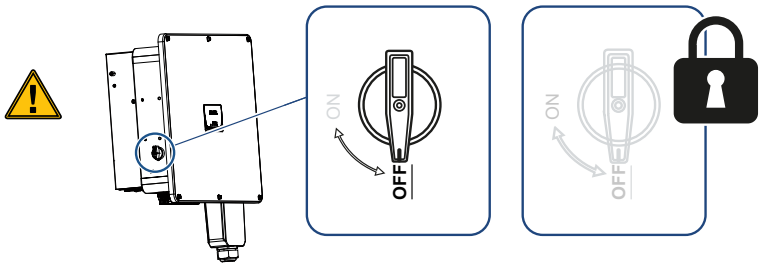
For maintenance work on the inverter, disconnect the device completely. **De-energising the inverter, Page 99**

To switch off the inverter, carry out the following steps:

1. Switch off line circuit breaker.



2. Switch the DC switch on the inverter to ***OFF***.



✓ The inverter is switched off.

The inverter remains energised and monitoring is still performed.

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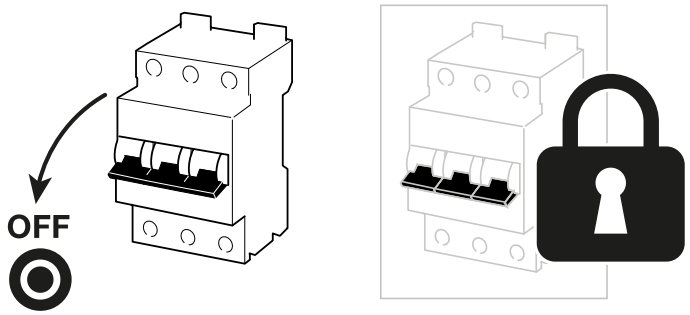
8.3 De-energising the inverter

For maintenance work on the inverter, especially on the connections, the inverter must be disconnected from the power supply.

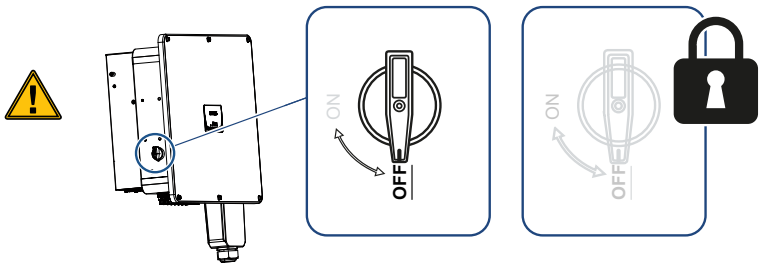
- For work on the AC side, e.g. on the energy meter, the earthing system or the communication connections, it is sufficient to disconnect the AC connection.
- For work on the PV modules or the DC feed lines, disconnect the DC connections.
- When working in the terminal compartment of the inverter, the inverter must be completely voltage-free on the AC and DC sides.

8.3.1 Disconnecting inverter on the AC side

1. Switch off AC line circuit breaker and secure it against being switched on again.



2. Switch DC switch on inverter to ***OFF*** and secure it against being switched on again.



✓ The inverter is voltage-free on the AC side.

8.3.2 Disconnecting DC cables

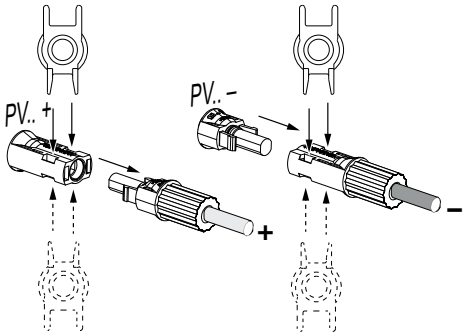
The inverter must first be de-energised on the AC side. Then all DC connections on the inverter can be disconnected. You will need the disassembly tool supplied with the device.

DANGER

Risk of death due to electrical shock and discharge!

When working in the terminal compartment, on the DC supply lines or on the PV modules, the DC cables must still be disconnected.

1. De-energise all devices and secure them against being switched on again.
2. Disconnect the DC cables by interrupting the connections to the PV modules.
   If it is not possible to disconnect the DC cables, observe the rules for working under voltage:
   - Use personal protective equipment, hard hat, visor or goggles, protective suit, insulating gloves.
   - Use an insulating protective mat as an underlay.
3. Insert the disassembly tool into the plug's side release openings so that the plug is unlocked and separated from the socket by approx. 1.5 mm.



4. Remove plug from the socket.
5. Ensure that the disconnected DC cables are protected against both weather (rain) and unauthorized access.
6. Check that all connections on the inverter are voltage-free.
7. Wait at least 10 minutes before carrying out any further work on the inverter so that the capacitors contained in it can discharge.

✓ The inverter is isolated on the DC side and voltage-free.

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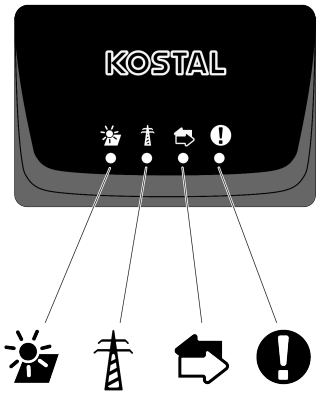
8.4 Operational statuses of inverter

After switching on, the inverter is always in one of the following operational statuses:

Operational status	Description
Standby	The connected PV modules are not supplying enough energy to feed it into the power grid. As soon as the required conditions are met, the inverter switches to the ***Feed in*** status.
Feed in	The inverter is generating electrical energy and feeding it into the connected power grid.
Off (Shutdown)	The inverter is switched off due to a switch-off command or an error that has occurred. As soon as the inverter receives a power-up command or the error is corrected, the inverter switches to the ***Standby*** status.

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8.5 Status LEDs



The LEDs on the front indicate the current operational status.

Further status information can be viewed using the KOSTAL PIKO CI Conf App or in the KOSTAL Solar Portal.

Measures to rectify events can be found in the chapter **Event codes, Page 124**.

Meaning		State	Description
	PV inputs	Lights up	The input voltage is within the operating range
		Flashes	Overvoltage/undervoltage
	Feed-in	Off	The inverter does not feed in
		Lights up	The inverter feeds energy into the grid. Every 30 seconds the inverter reports its current power: flashes once: < 20 % Flashes twice: < 40 % Flashes 3x: < 60 % Flashes 4x: < 80 % Flashes 5x: < 100 %
		Continuous flashing	The state of the power grid does not allow any feed-in.
	Communication	Off	No connection active or no communication
		Flashes	The inverter is communicating with another device.
	Fault	Off	No fault
		Lights up or flashes	A fault has occurred

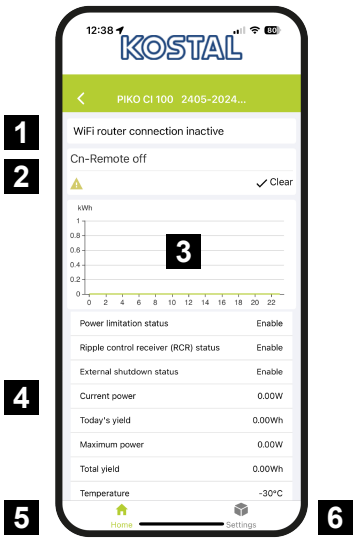
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8.6 Status display via app

The smartphone app KOSTAL PIKO CI Conf App displays the current operational status, the power output and the current measuring values from inverter operation.

INFO

The user interface in the KOSTAL PIKO CI Conf App depends on the installed firmware (FW) and version of the app used and may differ from the description here.



1 Connection status to the router
2 Event messages
3 Energy generated
4 Current measuring values
5 Selection of the Home page
6 Selection of the Settings page

More information about the KOSTAL PIKO CI Conf App: **KOSTAL PIKO CI App, Page 105**.

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9. KOSTAL PIKO CI app

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9.1 KOSTAL PIKO CI App

The free KOSTAL PIKO CI Conf App provides a graphical user interface.

The app is used to commission and configure the inverter and to display its status:

- Log in on inverter
- Update inverter firmware
- Log in as user or administrator
- Status request
- Current feed-in values at grid connection
- Display of the log data
- Inverter version display
- Inverter configuration
  (e.g. LAN connection, setting up the energy meter, etc.)

You can find more information in the separate documentation for the **KOSTAL PIKO CI app**, located in the **Download area**.

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9.2 Installation of the KOSTAL PIKO CI app



Download the KOSTAL PIKO CI Conf App from the Apple App Store or Google Play Store onto your tablet or smartphone and install it.

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9.3 Connecting the inverter to the KOSTAL PIKO CI app via Bluetooth

Only possible with PIKO CI 100 / PIKO CI 30/50 G2

The KOSTAL PIKO CI Conf App is opened or launched using a smartphone or tablet. To do this, the smartphone or tablet must be within range of the inverter.

1. Enable the Bluetooth function on your tablet or smartphone.
2. Switch on the inverter.
3. Launch the app.
4. If the prompt asking for permission to access location, camera and saving data appears on the smartphone, agree to this request.
5. Select Bluetooth as the connection in the app.



➔ The list of inverters appears.

6. If no inverter was found, you can
   - Refer to the type plate and ***Scan the inverter serial number barcode***,
   - Enter the inverter ***Serial number*** yourself,
   - Select ***Manual connection*** via Bluetooth.
7. Select a connection and connect to the inverter.

➔ The Bluetooth password entry window appears.

8. Enter the Bluetooth password and confirm with ***Enter***.
   You can also save the Bluetooth password for the next entry by pressing ***Save password***.

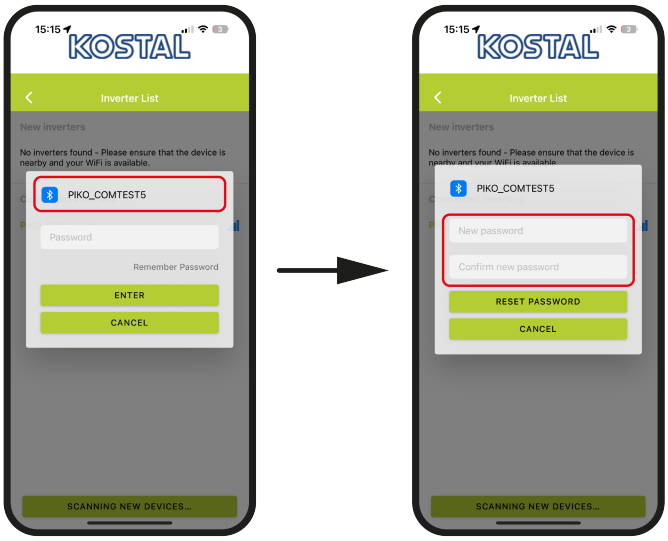
✓ When the app displays the message ***Connect***, the inverter is connected.

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Forgotten Bluetooth password/change Bluetooth password

If you have forgotten or want to change the Bluetooth password, proceed as follows:

1. Tap three times on the Bluetooth symbol, enter a new Bluetooth password and confirm the password by re-entering it.



2. Confirm the entry by pressing ***Reset password***.

➔ The Bluetooth password has been reset to the new Bluetooth password.

3. Enter the Bluetooth password and confirm with ***Enter***.
   You can also save the Bluetooth password for the next entry by pressing ***Save password***.

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9.4 Logging in as an installer

Once the KOSTAL PIKO CI Conf App is connected to an inverter, you can see all the values. However, some settings can only be changed by an installer/administrator. This requires a change of user.

To do this, proceed as follows:

1. In the app, select the ***Settings*** page.

➔ On the ***Settings*** page, the app shows you various menus where you can configure settings.

2. In order to have access to all relevant settings, go to ***User management*** and then touch the ***Change user*** button.
3. Select ***Installer***.
4. Enter the password and select ***Login*** .

INFO

The default password for the installer/administrator is ***superadmin***.

With this user, a variety of settings can be configured vis-à-vis the system operator, such as network settings, power limitations or grid guidelines.

This password should be changed after the initial commissioning. If you forget your password, it can be reset via the service.

✓ You are now logged in as an installer.

Configuring settings

Now configure the settings of the inverter as required.

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10. System monitoring

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10.1 The log data

The inverter is equipped with a data logger, which regularly records data from the system. The log data can be used for the following purposes:

- Check operating characteristics of the system
- Determine and analyse errors
- Download and graphically depict yield data

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10.2 Retrieving log data

There are several options for retrieving and permanently storing the log data:

- **Option 1:** Download and display log data via KOSTAL PIKO CI Conf App (only possible as an installer)
- **Option 2:** Transfer log data to a solar portal and display it

10.2.1 Option 1: Download and display log data via the KOSTAL PIKO CI app

It is only possible to download log data via the **KOSTAL PIKO CI App** if you are logged in as an installer.

A range of inverter data can be exported.

- Event messages
- Generation data
- Inverter configuration data

1. In the KOSTAL PIKO CI Conf App, go to ***Settings > Basic settings > Export event messages***. KOSTAL PIKO CI app - menu structure
2. Confirm the download.

✓ The log data can be saved to a computer and displayed and further processed with any common spreadsheet program (e.g. Excel).

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10.2.2 Option 2: Transfer log data to the KOSTAL Solar Portal and display it

With a solar portal it is possible to monitor the PV system and performance data via the Internet.

The KOSTAL Solar Portal has the following functions, which, however, may differ depending upon the portal:

- Graphic depiction of performance data
- Worldwide online access to the portal
- Email notification of errors
- Data export (e.g. Excel file)
- Long-term storage of log data

Data transfer to the KOSTAL Solar Portal:

INFO

A correctly set-up network connection/Internet connection is a prerequisite for data transfer.

It may take as long as 20 minutes following activation until the data export is visible on the KOSTAL Solar Portal.

The KOSTAL Solar Portal can be accessed using the following link: **www.kostal-solar-portal.com**.

- The inverter has an Internet connection.
- The inverter is registered on the KOSTAL Solar Portal .
- The activation of data transfer is activated in the inverter by default.

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10.3 The KOSTAL Solar Portal

The solar portal of KOSTAL Solar Electric GmbH is a free Internet platform for monitoring the PV system.

The inverter sends the PV system's yield data and event messages to the KOSTAL Solar Portal via the Internet.

The information is stored in the KOSTAL Solar Portal. You can view and call up this information via the Internet.

KOSTAL Solar Portal

Conditions for use

- The inverter must have a connection to the Internet.
- The inverter must not yet be registered on the KOSTAL Solar Portal .
- The inverter must not yet be assigned to a plant.

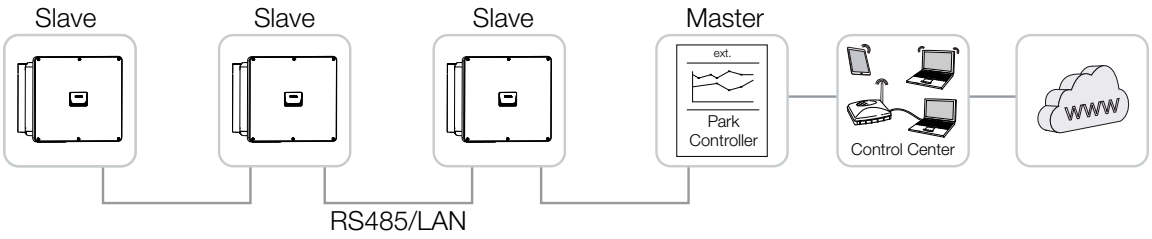
To use the KOSTAL Solar Portal, follow these three steps:

- Data transfer to KOSTAL Solar Portal must be activated in the inverter. With the KOSTAL PIKO CI Conf Tool, this activation is activated by default.
- You must register on the website of KOSTAL Solar Electric GmbH to use the KOSTAL Solar Portal. Registration is free.
- If the KOSTAL PIKO CI Conf Tool is connected to a KOSTAL Smart Energy Meter, the KOSTAL Smart Energy Meter must also be set up in the KOSTAL Solar Portal to display the self-consumption values.

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10.4 Park control

If inverters are centrally controlled using a PGS park controller, the park controller can be activated and configured using the KOSTAL PIKO CI App or KOSTAL PIKO CI Conf Tool.



The following settings must be configured:

The settings in the KOSTAL PIKO CI app must be configured on all inverters that are going to be controlled via the PGS park controller.

Settings can only be configured by installers.

1. In the KOSTAL Solar App, connect to the inverter to which the park controller is connected.
2. Change the user and log in as installer.
   Settings > User management > Change user > Log in as installer
3. Activate the PGS park controller by going to ***Settings > Inverter settings > Power adaptation/control > Park controller > Park controller configuration.***
   - Activate with high priority means that the PGS controller takes control.
   - ***Activate with low priority*** means that a control value is determined if there is a combination of connected controllers (e.g. RCR, KSEM, PGS park controller). Usually the lowest value.
4. Select ***Connection between park controller and inverter > LAN*** or ***RS485.***
5. Set the ***Communication timeout*** (interruption of connection to PGS park controller) or adopt the default value of 60 seconds.
6. Should the connection to the PGS park controller be lost, you can select the ***Behaviour with missing controller***. In this case, you can choose either the ***Last valid value*** or a ***Limitation [%]***.
   If you select ***Limitation [%]***, you will have to configure additional settings for active power and reactive power mode.

✓ PGS park controller configured in inverter.

Other settings, which are required in the external PGS park controller / park controller, are described in the manuals for the respective PGS park controller / park controller.

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11. Maintenance

11.1 During operation 117
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11.1 During operation

Once correctly installed, the inverter runs virtually maintenance-free.

For proper operation in a larger solar system, the normal measures of regular system monitoring are fully sufficient.

In particular, tracking the energy obtained via data loggers, the KOSTAL Solar Portal or energy meters will quickly indicate irregularities. Events during operation are also logged.

For plant safety, we would recommend the maintenance work stated in the following sections.

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11.2 Maintenance and cleaning

The following maintenance tasks are to be carried out for the inverter:

DANGER

Risk of death due to electrical shock and discharge!

Life-threatening voltages are present in the inverter.

- Only a qualified electrician may open and perform work on the device.
- Disconnect all poles of the device before starting work.
- Wait at least 10 minutes after disconnecting the device until the internal capacitors have discharged.

Maintenance list

Activity	Interval
Check operational status ■ Normal operating noise ■ Function of all communication connections ■ Damage or housing deformation	Once a month
Electrical connections ■ Check that cable connections and plugs have good contact and are secure ■ Check cable connections for damage or ageing ■ Check grounding	Once every six months
Clean the inverter ■ Remove soiling ■ Check ventilation ducts, clean if necessary ■ Remove and clean the fan if necessary	Once a year

Use maintenance lists in which the work undertaken is logged.

If no maintenance work is carried out, this will result in an exclusion of warranty (see 'Exclusion of warranty' in our service and warranty conditions).

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11.3 Housing cleaning

Only clean the housing with a damp cloth.

Do not use any harsh cleaning agents.

Do not use devices that produce a spray or water jet.

In particular, check the condition of the ventilation ducts and the function of the fans.

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11.4 Fan

Inverters generate heat during operation, which is dissipated via built-in heat sinks and fans. For this purpose, the ventilation ducts and fans must be kept free of contamination.

If problems occur, check whether the ambient temperature of the inverter exceeds the upper limit. If so, improve ventilation to lower the temperature. If the fan emits abnormal noise, replace the corresponding fans in good time. Please contact your support team for assistance with this.

Vacuuming ventilation ducts

To ensure many years of trouble-free operation, regularly vacuum the ventilation ducts.

POSSIBLE DAMAGE

Risk of damage when blowing out with compressed air.

When blowing out the ventilation ducts with compressed air, fine dust particles may find their way into the bearings of the installed fans and damage them.

- Do not use compressed air, vacuum the inverter's ventilation ducts instead.

- Remove detritus consisting of leaves, dust, insects, etc., especially in the vicinity of the ventilation ducts.
- For example, use an industrial vacuum cleaner and vacuum the ventilation ducts and immediate surroundings.

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11.5 Replacing AC / DC overvoltage protection modules

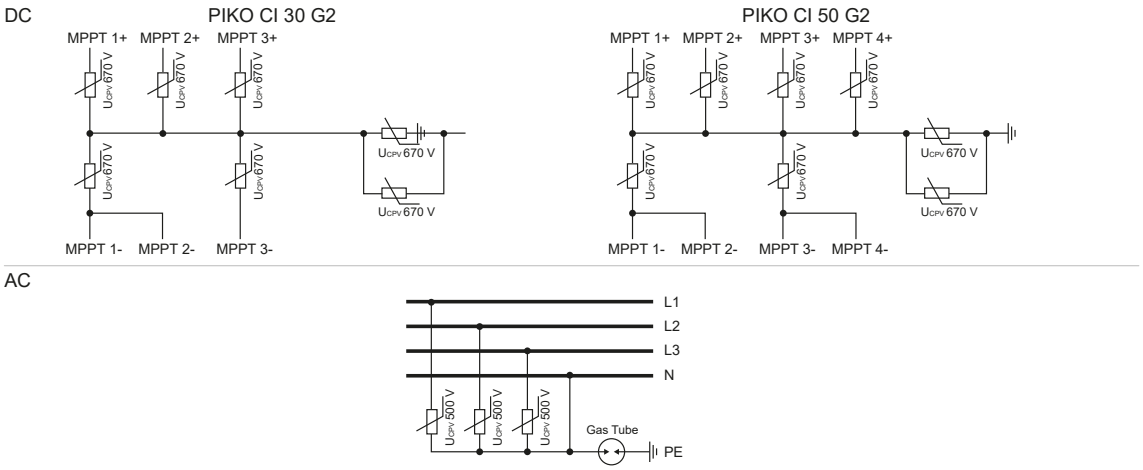
Type 2 DC and AC overvoltage protection modules are fitted in the inverter to protect against overvoltage. In the event of a fault, these can be replaced. An event message is output on the inverter for this purpose.

We recommend always replacing all overvoltage protection modules on the DC or AC side rather than just the faulty ones. Usually the modules that are not faulty are also damaged by the overvoltage damage.

The following module types are used:

Page	PIKO CI G2	Quantity	Type
DC	30	7	PV DC SPD - Type 2 / PV 670-25M2-10R (Ucpv 670 / (8/20 µs) In 10 kA / (8/20 µs) Imax 25 kA)
	50	8	
AC	30 50	3	PV DC SPD - Type 2 / PV 500-25M2-10R (Ucpv 500 V / (8/20 µs) In 10 kA / (8/20 µs) Imax 25 kA)

Block diagram for AC / DC overvoltage modules



Replacing overvoltage protection modules

DANGER

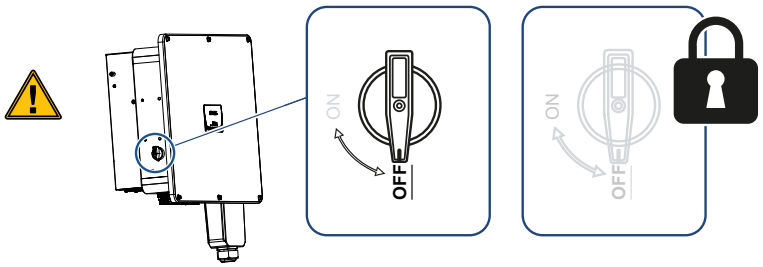
Risk of death due to electrical shock and discharge!

De-energise device and secure against being switched on again.

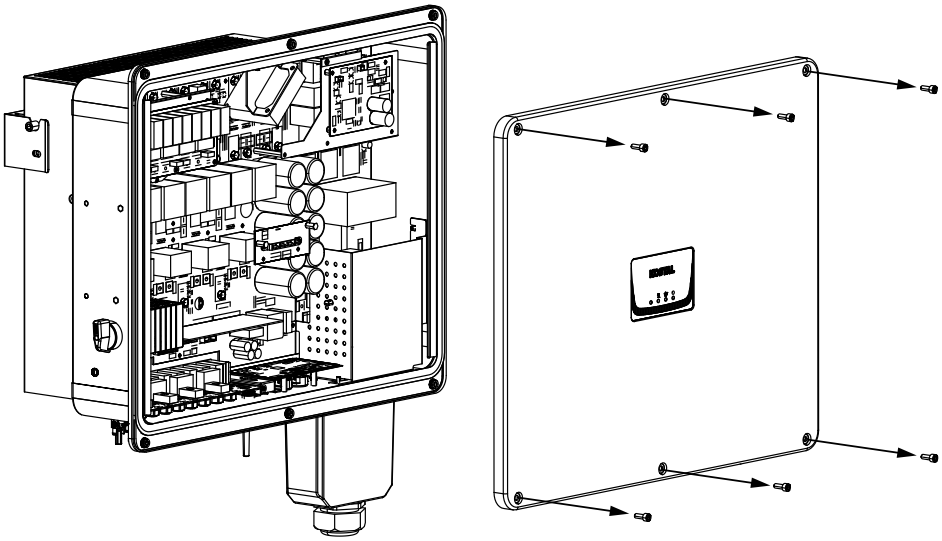
INFO

Whenever working on the inverter, only ever use insulated tools to prevent short-circuits.

1. Disconnect the power supply from the mains.
2. Secure AC connection against being switched on again.
3. Switch the DC switch on the inverter to ***OFF***.

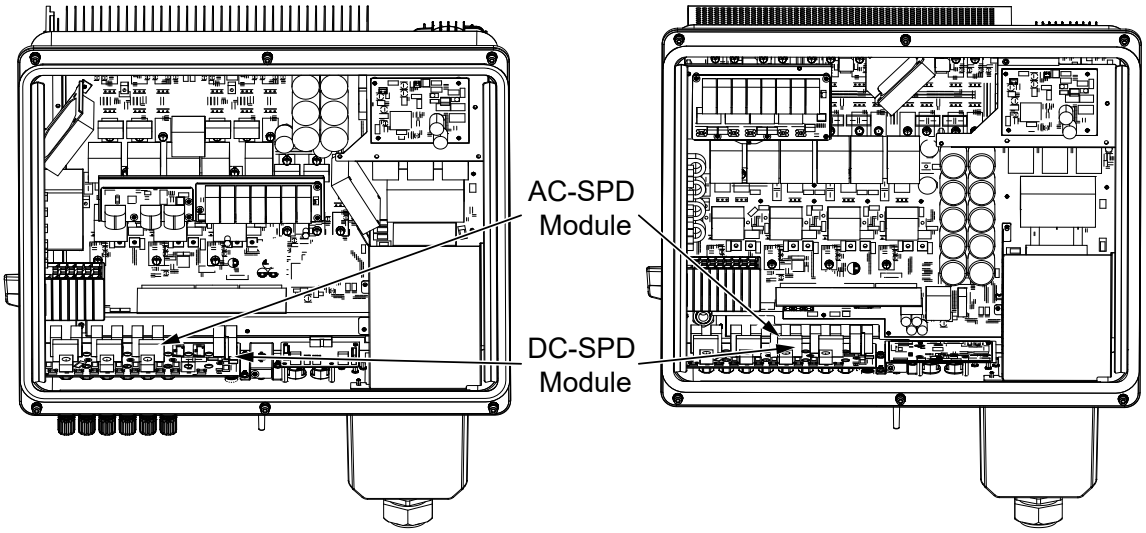


4. Wait at least 10 minutes after disconnecting the unit until the internal capacitors have discharged.
5. Remove the inverter's cover and open the inverter.



6. Remove defective overvoltage protection modules and replace with new ones. Defective modules can be recognised by a red mark in the module housing.

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7. Install cover and screw it tight (3 Nm).
8. Switch on the inverter again.

✓ The PV fuses have been replaced.

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11.6 Event codes

There is no need to take action when an event occurs occasionally or only briefly and the device resumes operation. When an event lasts for long periods or recurs frequently, the cause must be determined and rectified.

DANGER

Risk of death due to electrical shock and discharge!

Life-threatening voltages are present in the inverter.

- Only a qualified electrician may open and perform work on the device.

In case of a permanent event, the inverter interrupts the feed-in and switches off automatically.

- Check whether the DC switch or the external DC voltage separator has been switched off.
- Check whether the event is due to a mains power failure, or whether the fuse between the feed meter and the inverter has tripped.

In case of fuse failure, notify your installer. In the event of a power failure, wait until the grid operator has rectified the fault.

If the event lasts only a short time (grid fault, overheating, overload, etc.), then the inverter will automatically resume operation as soon as the event has been resolved.

If the event persists, notify your installer or the manufacturer's customer support team.

INFO

Contact details can be found in the section **Warranty and service, Page 147**.

Provide the following information:

- Device type and serial number. You will find this information on the type plate on the exterior of the housing.
- Error description
  (LED display and message in the KOSTAL PIKO CI Conf App).

Operational statuses and error causes are reported as a combination of LED display and event code. The event code is shown in the KOSTAL PIKO CI Conf App, in the KOSTAL PIKO CI Conf Tool or in the KOSTAL Solar Portal. Determine the type of event using the table below (**Event messages, Page 125**).

If an event occurs repeatedly or permanently, or for events that are not listed in the table, please contact Service.

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11.6.1 Event messages

Key for LEDs/display

	LED lights up		Status of PV modules
	LED flashing		Status of grid
	Original status		Status of communication
	LED off		Warning message/alarm

Event codes

LED				Event code		Causes	Recommended measures
				Portal	Device		
				-	-	Inverter update (LEDs run)	-
				-	-	Status normal	-
				-	-	Commissioning/start-up	-
				-	-	WLAN / WiFi / RS485 communication	-
				-	-	PV normal	-
				30001	A0 - Supply overvoltage	The grid voltage exceeds its permissible range or the grid is not available.	If the alarm occurs occasionally, there may be a fault in the power supply system. No additional measures are required. If the alarm occurs repeatedly, contact your local power company. If the fault is not caused by the grid, check the grid settings of the inverter using the KOSTAL PIKO CI Conf App. If the alarm continues for a long time, check whether: - the AC circuit breaker is disconnected, - the AC circuit breaker is damaged, - the AC terminals are detached, - the grid has a power failure.

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LED				Event code		Causes	Recommended measures
				Portal	Device		
○	☀	○	○	30002	A1 - Supply undervoltage	The grid voltage exceeds its permissible range or the grid is not available.	If the alarm occurs occasionally, there may be a fault in the power supply system. No additional measures are required. If the alarm occurs repeatedly, contact your local power company. If the fault is not caused by the grid, check the grid settings of the inverter using the KOSTAL PIKO CI Conf App. If the alarm continues for a long time, check whether: - the AC circuit breaker is disconnected, - the AC circuit breaker is damaged, - the AC terminals are detached, - the grid has a power failure.
○	☀	○	○	30003	A2 - Grid missing	The grid voltage exceeds its permissible range or the grid is not available.	If the alarm occurs occasionally, there may be a fault in the power supply system. No additional measures are required. If the alarm occurs repeatedly, contact your local power company. If the fault is not caused by the grid, check the grid settings of the inverter using the KOSTAL PIKO CI Conf App. If the alarm continues for a long time, check whether: - the AC circuit breaker is disconnected, - the AC circuit breaker is damaged, - the AC terminals are detached, - the grid has a power failure.
○	☀	○	○	30004	A3 - Grid overfrequency	The grid voltage exceeds its permissible range or the grid is not available.	If the alarm occurs occasionally, there may be a fault in the power supply system. No additional measures are required. If the alarm occurs repeatedly, contact your local power company. If the fault is not caused by the grid, check the grid settings of the inverter using the KOSTAL PIKO CI Conf App. If the alarm persists for a long time, check whether the AC line circuit breaker / AC terminals are disconnected or the grid power supply has failed.

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LED				Event code		Causes	Recommended measures
				Portal	Device		
○	☀	○	○	30005	A4 - Grid underfrequency	The grid voltage exceeds its permissible range or the grid is not available.	If the alarm occurs occasionally, there may be a fault in the power supply system. No additional measures are required. If the alarm occurs repeatedly, contact your local power company. If the fault is not caused by the grid, check the grid settings of the inverter using the KOSTAL PIKO CI Conf App. If the alarm persists for a long time, check whether the AC line circuit breaker / AC terminals are disconnected or the grid power supply has failed.
☀	○	○	○	30006	B0 - PV overvoltage	The input voltage of the PV modules exceeds the permissible range of the inverter.	Check the number of PV modules and adjust them if necessary.
●	○	○	●	30007	B1 - PV insulation fault	There is a short circuit between PV strings and protective earth. PV strings are installed in a persistently humid environment.	If the alarm occurs accidentally, the external circuits (PV strings) will supply irregular values. The inverter automatically returns to normal operation after the fault has been corrected. If the alarm occurs repeatedly or lasts for a long time, check whether the insulation resistance of the PV strings to earth is too low.
○	●	○	●	30008	B2 - Discharge current error	The insulation resistance to earth on the input side decreases during inverter operation, resulting in too high a residual current.	Check the insulation resistance to earth for the PV strings. If a short circuit has occurred, correct the error. If the insulation resistance to earth in a rainy environment is lower than the default value, adjust the insulation resistance in the KOSTAL PIKO CI Conf App.
☀	○	○	○	30012	B4 - PV undervoltage	The input voltage of PV modules is below the preset protection value of the inverter.	When the intensity of the sunlight is low, the voltage of the PV modules drops. No action is required. If the intensity of sunlight is high, check for short circuits, open circuits, etc. in the PV strings.
○	○	○	☀	30013	B5 - Overvoltage protection module defective	PV or AC overvoltage protection module faulty.	Please contact customer service.

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LED				Event code		Causes	Recommended measures
				Portal	Device		
				30014	A6 - Grid error	Fault in the power supply system or DC switch is OFF	If the alarm occurs occasionally, there may be a fault in the power supply system. No additional measures are required. If the alarm trips repeatedly, please proceed as follows: - Measure the three-phase voltages (L1-N, L2-N, L3-N) and check whether the unbalance is over 30%. If so, please contact your energy supplier. - Measure the three-phase voltages at the input and output side of the AC circuit breaker to check whether the circuit breaker is damaged. - Turn the DC switch to ON. If the DC switch trips frequently, contact your support team.
				30015	C1 - Arc faults	The PV cables may be damaged.	Check the PV string cabling for damage. If the alarm occurs repeatedly, the inverter cannot function properly. Please contact customer service.
				30016	A7 - High average grid voltage	The high average grid voltage exceeds the permissible range.	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. No further measures are required. If the alarm occurs repeatedly, the inverter cannot function properly. Please contact customer service.
				30017	C2 - Grid DC current share too high	The DC share in the grid exceeds the permissible range.	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. No further measures are required. If the alarm occurs repeatedly, the inverter cannot function properly. Please contact customer service.
				30018	C3 - Inverter relay fault	Internal relay faulty	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. No additional measures are required. If the alarm occurs repeatedly, for three-phase inverters, check the voltage of the live cable and of the neutral cable to earth. If the grid side is normal, please contact customer service to register a repair.
				30019	Cn - Remote deactivation	Communication failure	If an external data logger is used, restart the data logger or check the connection. If the error still occurs, contact your support team.

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LED				Event code		Causes	Recommended measures
				Portal	Device		
				30020	C5 - Excessive inverter temperature	The internal temperature exceeds the permissible range.	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. No additional measures are required. If the alarm occurs repeatedly, please check whether the installation location is exposed to direct sunlight, poor ventilation or high ambient temperatures. If the ambient temperature is under 45 °C and the heat dissipation and ventilation are good, please contact your support team.
				30021	C6 - Residual current monitoring fault	Residual current device test failed.	If the alarm occurs occasionally, there may be a temporary exception in the external cabling. The inverter can automatically return to normal operation after the fault has been corrected. No action is required. If the error still occurs, contact your support team.
				30022	B7 - Reverse polarity of strings	The cables of the PV strings were connected the wrong way round during inverter installation.	Check that the PV string cables are correctly connected. If they are connected the wrong way round, connect the cables correctly. If the cables for the PV strings are connected the wrong way round and the DC switch is set to ON, intervention on the switches or PV connections is not permitted. If interventions are made, the device may be damaged. Wait for a period when there is less solar irradiation, e.g. in the evening, and for the PV string current to fall below 0.5 A. Set the three DC switches to OFF and correct the PV connections.
				30023	C7 - System error	Internal system fault/warning	If the alarm occurs and the inverter is not working, please restart the inverter. If the error still occurs, contact your support team.
				30024	C8 - Fans blocked	Internal system fault/warning	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. If the alarm occurs repeatedly, contact your support team for technical assistance.

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LED				Event code		Causes	Recommended measures
				Portal	Device		
●	○	●	●	30025	C9 - Intermediate circuit unbalance	Internal system fault/warning	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. If the alarm occurs repeatedly, contact your support team for technical assistance.
○	○	✳	●	30027	CB - Internal communication error	Internal warning	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. If the alarm occurs repeatedly, contact your support team for technical assistance.
✳	●	○	●	30028	CC - Software incompatible	Internal warning	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. If the alarm occurs repeatedly, contact your support team for technical assistance.
✳	○	●	●	30029	CD - EEPROM error	Internal warning	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. If the alarm occurs repeatedly, contact your support team for technical assistance.
✳	●	●	●	30030	CE - Persistent warning	Internal warning	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. If the alarm occurs repeatedly, contact your support team for technical assistance.
●	●	●	●	30031	CF - Inverter error	Internal warning	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. If the alarm occurs repeatedly, contact your support team for technical assistance.
✳	○	○	●	30032	CG - DC booster error	Internal warning	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. If the alarm occurs repeatedly, contact your support team for technical assistance.

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LED				Event code		Causes	Recommended measures
				Portal	Device		
○	○	○	○	30036	BA - PID device error	Internal system fault/warning	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. No further measures are required. If the alarm occurs repeatedly, the inverter cannot function properly. Please contact customer service.
○	○	○	○	30037	Bb - AFCI module faulty	The inverter has lost communication with the AFCI module.	Please contact customer service.
○	○	●	☀	30038	CH - Master connection lost	Connection between slave and master inverter is interrupted.	Check whether the communication line to the master inverter has been interrupted. If the error still occurs, contact your support team. Check the communication settings in the KOSTAL PIKO CI Conf app.
○	○	●	☀	30039	CJ - Meter connection lost	Communication connection to energy meter (KSEM) interrupted	Check whether the communication line between the master inverter and energy meter (KSEM) has been interrupted. If the error still occurs, contact your support team. Check the communication settings in the KOSTAL PIKO CI Conf app.
○	○	●	☀	30040	Co - Park controller	Communication failure	If an external park controller is used, restart the park controller or check the connection. If the error still occurs, contact your support team.
○	○	○	☀	30041	A8 - Neutral conductor grid error	Fault in the power supply system	If the alarm occurs occasionally, the inverter can automatically return to normal operation after the fault has been corrected. No further measures are required. If the alarm occurs repeatedly, the inverter cannot function properly. Please contact customer service.

If the inverter enters shutdown mode due to an event shown above, the Warning/Alarm LED will light up. The Troubleshooting table (Troubleshooting) describes actions to be taken for the most common events.

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12. Updating software

If the manufacturer has updated software for the inverter, this can be loaded into the inverter. The software is updated to the latest version. If an update is available, you will find this on the manufacturer's website, in the download area.

The following files must be updated, depending on the inverter:

- CSB (Communication Service Board Firmware)
- MCB (Master Control Board Firmware)
- SCB (Slave Control Board Firmware)
- AFCI (arc detection)
- WiFi/Bluetooth (communication module)

PIKO CI	MCB	SCB	CSB	AFCI	WiFi/Bluetooth
PIKO CI 30 G2	G9511-502300-xx_xxxxxx.bin	G9511-502301-xx_xxxxxx.bin	G9512-A10404-xx_xxxxxx.bin	G711-001250A-xx_xxxxxx.bin	G9512-A10406-xx_xxxxxx.bin
PIKO CI 50 G2	G9511-502300-xx_xxxxxx.bin	G9511-502301-xx_xxxxxx.bin	G9512-A10404-xx_xxxxxx.bin	G711-001250A-xx_xxxxxx.bin	G9512-A10406-xx_xxxxxx.bin

The PIKO CI update can be installed using one of the following methods:

- **Updating software using PIKO CI Tool, Page 133**
- **Updating software using PIKO CI App, Page 134**

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12.1 Updating software using PIKO CI Tool

Use the ***KOSTAL PIKO CI Conf Tool*** to conveniently install the software on a PIKO CI inverter or several inverters.

For this purpose, the inverter must be connected to the LAN network. The ***KOSTAL PIKO CI Conf Tool*** and the tool's documentation is available in the product's Download area.

Link to **KOSTAL PIKO CI Conf Tool** instructions.

1. Download update files to your PC from the KOSTAL Solar homepage by going to the product's Download area and Update.
2. Double-click on ***PIKO CI Conf*** to launch the application.
3. Search for the inverter you want to update.
4. Log in as installer.
5. Go to Update.
6. Select Single or Multiple mode.
7. Select the update files and start the update.
8. Follow the instructions.

✓ Update completed

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12.2 Updating software using PIKO CI App

If you want to update just one or two inverters, you can use the ***PIKO CI Conf App*** for this purpose. The following section describes how to proceed.

INFO

The default password for the installer/administrator is ***superadmin***.

With this user, a variety of settings can be configured vis-à-vis the system operator, such as network settings, power limitations or grid guidelines.

This password should be changed after the initial commissioning. If you forget your password, it can be reset via the service.

Procedure

Use a smartphone or tablet with the KOSTAL PIKO CI Conf Tool app installed. Proceed as follows:

1. Enable the Bluetooth function on your tablet or smartphone.
2. Launch the app.
3. Download the update files from the server by clicking on the ***DOWNLOAD UPDATE FILES*** button.
4. Select Bluetooth as the connection in the app.

➔ The list of inverters appears.

5. If the inverter isn't yet included in the list, go to ***Scan for new device***.
6. For the update to be imported, the user must be changed. Go to ***Settings > User management > Change User***.
7. Go to ***Login as installer*** and enter the relevant password.
8. Go to ***Settings > Basic settings > Update firmware***.

➔ The inverter identifies the update files, starts the upload and installs the files.

9. Check the version of the software in the app under ***Settings > Basic settings***.

✓ The update has been installed.

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13. Technical information

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13.1 Technical data

Subject to technical changes. Errors excepted.
You can find current information at **www.kostal-solar-electric.com**.

Input side (DC)

PIKO CI		PIKO CI 30 G2	PIKO CI 50 G2
Max. PV power	kWp	45	75
Nominal DC power	kW	30	50
Rated input voltage (Udc,r)	V	620	
Start input voltage (Udc,start)	V	200	
Max. system voltage (Udc,max)	V	1100	
MPP range at rated output (Umpp,min)	V	420	500
MPP range at rated output (Umpp,max)	V	850	
Operating voltage range (Udc,workmin)	V	180	
Operating voltage range (Udc,workmax)	V	1000	
Max. input current (Idc,max) per MPPT	A	104 (MPPT 1: 40 | MPPT 2-3: 32)	136 (MPPT 1: 40 | MPPT 2-4: 32)
Max. DC short-circuit current (Isc_pv)		140 (MPPT 1: 50 | MPPT 2-3: 45)	185 (MPPT 1: 50 | MPPT 2-4: 45)
Max. DC current per DC input (IStringmax)	A	20	
Internal DC string fuses	A	--	
Number of DC inputs		6	8
Number of independent MPP trackers		3	4

Output side (AC)

PIKO CI		PIKO CI 30 G2	PIKO CI 50 G2
Rated power, cos ϕ = 1 (Pac,r)	kW	30	50
Output apparent power (Sac,nom, Sac,max)	kVA	33.4 / 33.4	55.6 / 55.6
Min. output voltage (Uac,min)	V	322	
Max. output voltage (Uac,max)	V	520	
Rated alternating current (Iac,r)	A	43.5	72.5
Max. output current (Iac,max)	A	51	84.3
Short-circuit current (peak/RMS)	A	43.5	72.5
Grid connection		3N~, 230/400 V, 50 Hz	
Rated frequency (fr)	Hz	50	
Grid frequency (fmin - fmax)	Hz	45/55	
Setting range for the power factor (cos ϕAC,r)		0.8…1…0.8	
Power factor at rated power (cos ϕAC,r)		1	
THD	%	<3	
Standby	W	<1	

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Efficiency

PIKO CI		PIKO CI 30 G2	PIKO CI 50 G2
Max. efficiency	%	98.2	
European efficiency	%	97.8	
MPP adjustment efficiency	%	99.9	

System data

PIKO CI		PIKO CI 30 G2	PIKO CI 50 G2
Topology: Without galvanic isolation – transformerless		Yes	
Protection class in accordance with IEC 60529		IP66	
Protective class according to EN 62109-1		I	
Overvoltage category according to IEC 60664-1 on input side (PV generator)		II	
Overvoltage category according to IEC 60664-1 on output side (grid connection)		III	
DC/AC overvoltage protection		Type 2 (replaceable)	
Pollution degree		4	
Environmental category (outdoor installation)		Yes	
Environmental category (indoor installation)		Yes	
UV resistance		Yes	
AC cable diameter (min-max)	mm	25…31	32…38
AC cable cross-section (min-max)	mm^2	16…35	35…50
PV cable cross-section (min-max)	mm^2	4…6	
Max. fuse protection on output side (AC) IEC 60898-1	A	B63 / C63	B125 / C125
Internal operator protection in accordance with EN 62109-2		RCMU/RCCB type B	
Independent disconnection device according to VDE V 0126-1-1		Yes	
Height/width/depth	mm	530 (707)/635/224	
Weight	kg	33.1	44.3
Cooling principle – regulated fans		---	Yes
Max. air throughput	m^3/h	---	152
Noise emission (typical)	dB(A)	<35	<50
Ambient temperature	°C	-25…60	
Max. operating altitude above sea level	m	4000	
Relative humidity	%	0…100	
Connection technology, DC side		Amphenol plug H4	
Connection technology, AC side		M8	

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Interfaces

PIKO CI		PIKO CI 30 G2	PIKO CI 50 G2
Ethernet LAN TCP/IP (RJ45)		2	
Wi-Fi (2.4 GHz [IEEE 802.11 b/g/n])		Yes	
RS485		2	
Digital inputs		4	
Bluetooth		Yes	

Warranty

PIKO CI		PIKO CI 30 G2	PIKO CI 50 G2
Warranty (Smart Warranty)	Years	5	
Warranty extension	Years	5	

Warranty (Smart Warranty): Activate your free warranty (Smart Warranty) now in the KOSTAL Solar online shop (shop.kostal-solar-electric.com). This does not affect your statutory warranty. You will find more information about the service and warranty conditions in the download area for your product.

Warranty extension: Available subject to a charge from the KOSTAL Solar online shop (www.shop.kostal-solar-electric.com)

Directives / Certification

Directives / Certification	
PIKO CI 30 G2	IEC 62109-1, IEC 62109-2, VDE-AR-N 4105, VDE-AR-N 4110, size A TOR generator, size B TOR generator, NA/EEA-NE7–CH2020, NA/EEA-NE7–CH2020, CEI 0-16, CEI 0-21, NTS631, UNE 217001 IN, UNE 217002 IN, EN 50549-1, EN 50549-2, IEC 1727/IEC62116, VFR-2019, UTE C15-712-1, IRR-DCC-MV, C10/11, DANSK ENERGI
PIKO CI 50 G2	IEC 62109-1, IEC 62109-2, VDE-AR-N 4105, VDE-AR-N 4110, size A TOR generator, size B TOR generator, NA/EEA-NE7–CH2020, NA/EEA-NE7–CH2020, CEI 0-16, CEI 0-21, NTS631, UNE 217001 IN, UNE 217002 IN, EN 50549-1, EN 50549-2, IEC 1727/IEC62116, VFR-2019, UTE C15-712-1, IRR-DCC-MV, C10/11, DANSK ENERGI

Overvoltage category III (AC output): The device is suitable for permanent connection in the grid distribution behind the meter and the line protection fuse. If the connection cable travels outdoors over long distances, overvoltage protection devices may be necessary.

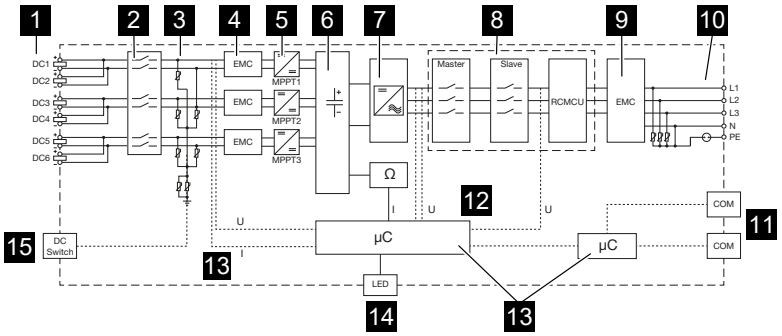
Overvoltage category II (DC input): The device is suitable for connection to PV strings. Long feed cables out of doors or a lightning protection system in the vicinity of the PV system may make lightning protection or surge protection equipment necessary.

Degree of contamination 4: Contamination results in continuous conductivity, e.g. due to conductive dust, rain or snow; indoors or outdoors.

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13.2 Block diagram

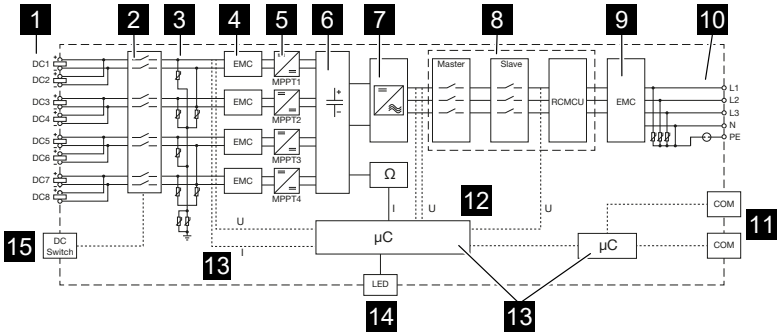
PIKO CI 30 G2



1 DC inputs for PV modules
2 Electronic DC disconnection device
3 Overvoltage protection (DC side)
4 EMC filter (DC side)
5 DC regulator
6 Intermediate circuit
7 Inverter bridge circuit
8 Grid monitoring and shutdown
9 EMC filter (AC side)
10 AC connection
11 Connection panels for communication interfaces
12 Voltage and current measurement
13 Control system and communication
14 Status LED
15 DC switch

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PIKO CI 50 G2



1 DC inputs for PV modules
2 Electronic DC disconnection device
3 Overvoltage protection (DC side)
4 EMC filter (DC side)
5 DC regulator
6 Intermediate circuit
7 Inverter bridge circuit
8 Grid monitoring and shutdown
9 EMC filter (AC side)
10 AC connection
11 Connection panels for communication interfaces
12 Voltage and current measurement
13 Control system and communication
14 Status LED
15 DC switch

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14. Accessories

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14.1 KOSTAL Solar App

The free KOSTAL Solar App offers you professional monitoring of your photovoltaic system. You can use the KOSTAL Solar App to access all the functions on your smartphone or tablet at any time.

To set up and use the app, you will need access to the KOSTAL Solar Terminal and the KOSTAL Solar Portal and to have an inverter set up there. To log in to the app, use the same login details as for the KOSTAL Solar Terminal.

You can use the KOSTAL Solar App to monitor your photovoltaic system and view relevant system data both at home and when you are out and about. It allows you to access the consumption and generation data over various time periods, such as day, week, month and year, and to view your photovoltaic system's historical data. This means that with the KOSTAL Solar App you are always up to date.

Download the free KOSTAL Solar App today and benefit from new and advanced functionalities.

Additional information about this product is available on our website **www.kostal-solar-electric.com** under ***Products > Tools and applications > KOSTAL Solar App***.

Download on the App Store

KOSTAL Solar App

GET IT ON Google Play

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14.2 PIKO CI app

In order to operate and configure the PIKO CI inverter, you will need the KOSTAL PIKO CI Conf App.



Download the KOSTAL PIKO CI Conf App from the Apple App Store or Google Play Store onto your tablet or smartphone and install it.

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14.3 PIKO CI Conf Tool

The KOSTAL PIKO CI Conf Tool is a configuration tool to configure the PIKO CI inverter via a direct LAN connection.

This means that you no longer need to stand in front of the inverter with a smartphone in order to configure the inverter.

All PIKO CI inverters within the local LAN network can be addressed and configured using the configuration tool.

The user interface offers the same settings as the KOSTAL PIKO CI Conf App on smartphones.

The PC used for installation must be running on an up-to-date Windows operating system.

Download the app from the download area.

For this purpose, go to **Download** > Applications – Tools > **KOSTAL PIKO CI Conf Tool**.

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14.4 KOSTAL Solar Portal

The KOSTAL Solar Portal is a free online platform for monitoring the PV system.

The Solar Portal enables the operation of the inverter to be monitored via the Internet. For this purpose, the inverter sends the PV system's yield data and event messages to the solar portal via the Internet.

The information is then stored in the solar portal. You can view and call up this information via the Internet.

This means that the KOSTAL Solar Portal protects your investment in a PV system from yield losses, e.g. by actively warning you by e-mail when an event occurs.

Register for the KOSTAL Solar Portal free of charge using the KOSTAL Solar Terminal at **https://terminal.kostal-solar-electric.com**.



The Solar Portal has the following functions:

- Worldwide portal access via the Internet
- Graphic representation of the power and yield data
- Visualisation of data and thus being made aware of how to optimise self-consumption
- Notification of events by e-mail
- Data export
- Sensor evaluation
- Display and proof of a potential active power reduction by the grid operator
- Storage of log data for long-term and reliable monitoring of your PV system
- Providing system data for the KOSTAL Solar App

Prerequisites for using the Solar Portal:

- The inverter must have a connection to the Internet.
- Data transfer to KOSTAL Solar Portal must be activated in the inverter.
- The inverter must not be assigned to any other PV system in the KOSTAL Solar Portal.
- The inverter must be assigned to your PV system in the KOSTAL Solar Portal.

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You can find more information about this on our website **www.kostal-solar-electric.com**.

KOSTAL Solar Electric

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15. Warranty and service

Information about the service and warranty conditions can be found in the download area for the product at **www.kostal-solar-electric.com**.

For service information and in the event of parts being needed, we require your device type and the serial number. You will find this information on the type plate on the exterior of the housing.

If you have any technical questions, please call our service hotline:

- Germany and other countries (language: German, English):
  +49 (0)761 477 44-222
- Switzerland:
  +41 32 5800 225
- France, Belgium, Luxembourg:
  +33 16138 4117
- Greece:
  +30 2310 477 555
- Italy:
  +39 011 97 82 420
- Poland:
  +48 22 153 14 98
- Spain, Portugal (language: Spanish, English):
  +34 961 824 927

Spare parts

If spare parts or accessories are required for troubleshooting, use only original spare parts and accessories manufactured and/or approved by the manufacturer.

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16. Appendix

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16.1 EU Declaration of Conformity

KOSTAL Solar Electric GmbH hereby declares that the PIKO CI described in this document complies with the basic requirements and other relevant conditions of the directives listed below.

- Directive 2011/65/EU
  (RoHS) to limit the use of certain hazardous substances in electrical and electronic equipment
- Directive 2014/53/EU
  (RED Radio Equipment and Telecommunications Terminal Equipment) Provision of radio equipment

You will find a detailed EU Declaration of Conformity for the product in the download area at:

www.kostal-solar-electric.com

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16.2 Open Source licence

This product contains Open Source software, developed by third parties and licensed using vehicles including GPL and/or LGPL.

For more details on this and a list of the Open Source software used and the associated licence texts, go to the Licences section on the website (Webserver) under ***Licences***.

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16.3 Decommissioning and disposal

To dismantle the inverter, proceed as follows:

DANGER

Risk of death due to electrical shock and discharge!

De-energise device and secure against being switched on again. **De-energising the inverter, Page 99**

1. De-energise inverter on AC and DC sides (**De-energising the inverter, Page 99**).
2. Remove all DC cables and communication cables.
3. Open the inverter's AC terminal compartment.
4. Loosen terminals and cable glands.
5. Remove all AC cables.
6. Close the inverter cover.
7. Loosen locking screw on inverter's bracket.
8. Lift inverter off the wall.

✓ Inverter decommissioned.

Proper disposal

Electronic equipment labelled with a dustbin with a line through it may not be disposed of with household waste. This equipment can be handed in to waste collection points free of charge.



Find out about the local requirements for the separate collection of electrical and electronic equipment in your country.

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www.kostal-solar-electric.com

07/2026 - EN - DOC03408307-0003 - Subject to technical changes. Errors excepted.
You can find current information at www.kostal-solar-electric.com.