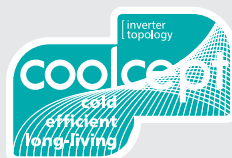




coolcept³



coolcept³-x



Installation and operating instructions

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1 Preface

Thank you for choosing inverters from the *coolcept*³ range of products manufactured by Steca Elektronik GmbH. By using solar energy you make a significant contribution to environmental protection by reducing the total amount of atmospheric pollution caused by carbon dioxide (CO₂) and other damaging gases.

Highest efficiency with longer service life

The innovative inverter topology is based on a single-stage transformerless circuit concept and is integrated into all devices in the *coolcept*³ series. This unique technology allows peak efficiencies of up to 98,6 % to be achieved. Depending on the type, the European efficiency of the devices is also significantly greater than 98 % and sets new standards in photovoltaic grid-feed systems.

A new and unique cooling concept inside the inverter ensures an even distribution of heat and a long service life.

Designer casing and easy installation

For the first time, the very high efficiency allows the use of a designer casing made of plastic for the *coolcept*³ inverters. This offers many advantages. The overall surface temperature of the devices remains very low. This also offers great installation advantages. The *coolcept*³-x inverters have a sturdy metal casing that allows them to be also used outdoors.

The lightweight devices weigh only approx. 12 kg and can be easily and safely mounted on a wall. The supplied wall bracket and practical recessed grips for right and left handed installers make mounting of the device simple and convenient. All connections and the DC circuit breaker are externally accessible.

Visualisation tools and accessories

The devices have a graphical display for visualising the energy yield values, current performance and operating parameters of the photovoltaic system. Its innovative menu allows individual selection of the various measurements.

See www.stecasolar.com for further information on accessories. Your installer can, of course, also give you more information about the options and accessories that are available.

2 General information

2.1 General safety instructions

- This document is part of the product.
- Install and use the device only after reading and understanding this document.
- Always perform the measures described in this document in the sequence specified.
- Keep this document in a safe place for the entire service life of the device. Pass the document on to subsequent owners and operators of the device.
- The yield of the system can be reduced through improper operation
- If the housing is damaged, do not connect the device to the DC or AC lines
- If one of the following components is damaged, immediately take the device out of operation and disconnect it from the mains grid and PV generators.:
 - Device (not functioning, visible damage, smoke, penetration of liquid etc.)
 - Lines
 - PV generators

Do not switch the system on again before

- the device has been repaired by a dealer or the manufacturer,
 - Damaged cables or PV generators have been repaired by a technical specialist.
- Never cover the device
 - Do not open the casing: Risk of death. Invalidation of the guarantee.
 - Factory labels and markings must never be altered, removed or rendered unreadable.
 - Comply with the instructions of the respective manufacturer when you connect an external component that is not described in this document (e.g. external data loggers). Components that are incorrectly connected can damage the device.

Safety instructions on the device



- ① Serial number as a bar code and in plain text
- ② Warning of hot surface, only coolcept³-x
- ③ Dangerous voltages can remain present on the components up to 10 minutes after switching off the DC circuit breaker and the line circuit breaker
- ④ Read and follow the manual!
- ⑤ Dispose of the device at a collection point for electronic equipment

2.2 Identification

Feature	Description
Types	coolcept³ (plastic housing): StecaGrid 3203, StecaGrid 4003, StecaGrid 5003, StecaGrid 6003 coolcept³-x (stainless steel housing): StecaGrid 3203x, StecaGrid 4003x, StecaGrid 4803x, StecaGrid 5503x
Version status of the manual	Z03
Manufacturer's address	Contact, see ↗ <i>Chapter 10 „Contact“ on page 71</i>
Certificates	For Declaration of Conformity, see www.stecasolar.com ⇒ coolcept ³ – coolcept ³ -x
Optional accessories	■ External data loggers: – WEB'log from Meteocontrol – Solar-Log from Solare Datensysteme ■ StecaGrid SEM: 747.231 ■ RS485 bus cable 1.5 m for coolcept³-x: 737.605 ■ RS485 bus cable 5 m for coolcept³-x: 737.603 ■ RS485 bus cable 20 m for coolcept³-x: 737.604 ■ RS485-USB adapter cable for coolcept³-x: 737.707 ■ PushPull RJ45 connecting plug for coolcept³-x: 737.607 ■ Termination plug for RS485 bus – IP21: 752.856 – IP65: 740.864

Rating plate



- ① Bar code for internal use
- ② Technical data of DC-Bat connection (for coolcept³ devices only) and protection class
- ③ Technical data - DC-PV input
- ④ Article number and product designation
- ⑤ Manufacturer and address
- ⑥ Cover the *Protection class II* and CE mark
- ⑦ Country of manufacture
- ⑧ Technical data of the AC output
- ⑨ Standard for grid monitoring



Notice

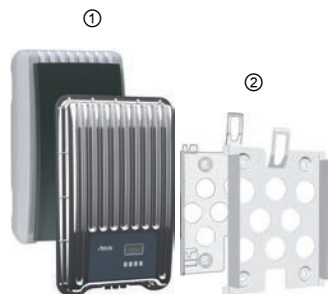
- For the serial number, see ☞ „Safety instructions on the device“ on page 6.
- For the position of the type plate, see ☞ Chapter 3.1 „Housing“ on page 11 pos. 3.

EU Declaration of Conformity

The products described in this document comply with the applicable European directives. Certificates for the products are provided at www.stecasolar.com ⇒ PV GRID CONNECTED ⇒ Grid inverters

2.3 Scope of delivery

- Inverter ①, type coolcept (plastic housing) or coolcept-x (stainless steel housing, IP65)
- Mounting plate ② for type coolcept or coolcept-x
- AC plug ③
- 1 pair SUNCLIX plug-in connectors ④
- 3 sealing caps (for RJ45 socket; only coolcept-x) ⑤
- Brief installation and operating instructions ⑥



2.4 Intended use

- The inverter must only be used in grid-coupled photovoltaic systems. The inverter is suitable for all PV generator with connections that do not need to be grounded.
- PV generator must be used that have an IEC 61730 class A rating because the inverter does not have electrical isolation.

- If the maximum AC operating voltage is higher than the maximum system voltage of the photovoltaic generator, then PV generators must be used that have a maximum system voltage that is higher than the AC grid voltage.
- The battery connection contacts are intended for an optional energy storage system. This consists of an additional control component and an external energy storage unit. The battery connection must not be directly connected to a battery **under any circumstances**.



Notice

An overview of suitable PV generators is available at www.stecasolar.com ⇒ PV GRID CONNECTED ⇒ Service and support.

2.5 About this manual

2.5.1 Contents

This manual describes the inverters of the types coolcept³ and coolcept³-x. The points at which the types differ are marked in the text.

This manual contains all information that a specialist needs to set up and operate the inverters. Follow the instructions of the respective manufacturers when installing other components (e.g. PV generators, cables or external energy storage units).

2.5.2 Target group

Unless otherwise indicated, the target audiences of this manual are technical professionals and system operators. Technical professionals are, for example:

- Persons who have the knowledge of terminology and the skills necessary for setting up and operating photovoltaic systems.
- Persons who have the necessary training, knowledge and experience, and knowledge of the applicable regulations in order to evaluate and recognise the dangers inherent in the following work:
 - Installation of electrical equipment
 - Production and connection of data communication cables
 - Production and connection of mains grid power supply cables

2.5.3 Designations

Symbols

The following table contains the symbols used in this manual

Warning signs	Type of danger
	Warning – high-voltage.
	Warning – danger zone.

Symbols used on the device

Tab. 1: The following table contains the symbols used on the device.

Cover the	Description
	Danger from electricity.
	Read the manual before using the product.

Signal words

Keywords used in conjunction with the symbols described:

Signal word	Meaning
DANGER!	This combination of symbol and signal word indicates an immediate dangerous situation that will result in death or serious injury if it is not avoided.
WARNING!	This combination of symbol and signal word indicates a possible dangerous situation that can result in death or serious injury if it is not avoided.
NOTICE!	This combination of symbol and signal word indicates a possible dangerous situation that can result in material and environmental damage if it is not avoided.

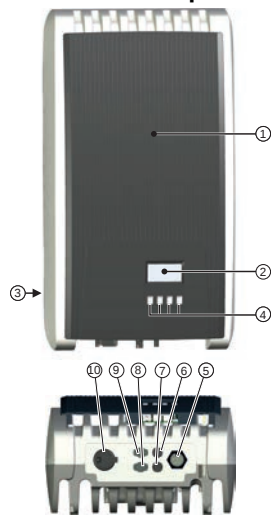
Abbreviations

Abbreviation	Description
Derating	Power reduction
DHCP	DHCP automatically integrates the device in an existing network (acronym: D ynamic H ost C onfiguration P rotocol)
MSD	Internal grid monitoring of the inverter (English: M ains monitoring with allocated S witching D evelopes).
MPP	Working point producing the most power (English: m aximum p ower p oint)
MPP tracker	Controls the power of the connected module strings to match the MPP
SELV, TBTS, MBTS	Schutkleinspannung (EN: S afety E xtra L ow V oltage; FR: T rès B asse T ension de S écurité; ES: M uy B aja T ensión de S eguridad)
V _{PV}	The PV generator voltage present at the DC connection (photovoltaic voltage)

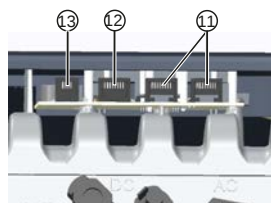
3 Structure and function

3.1 Housing

3.1.1 coolcept³



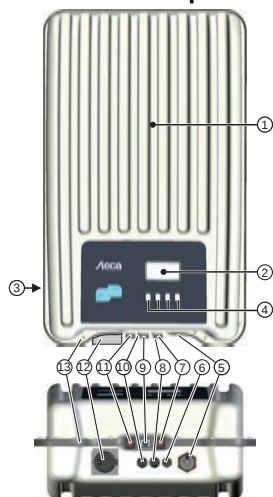
- ① Hood
- ② Display (monochrome, 128 x 64 pixels)
- ③ Rating plate, serial number, warnings
- ④ Operating buttons: ESC, △, ▽, SET (from left to right)
- ⑤ 1x AC connection
- ⑥ 1x DC connection Minus (–) for optional energy storage system (Phoenix Contact SUNCLIX, safe to touch)
- ⑦ 1x DC connection Minus (–) for solar modules (Phoenix Contact SUNCLIX, safe to touch)
- ⑧ 1x DC connection Plus (+) for solar modules (Phoenix Contact SUNCLIX, safe to touch)
- ⑨ 1x DC connection Plus (+) for optional energy storage system (Phoenix Contact SUNCLIX, safe to touch)
- ⑩ DC load-break switch (disconnects plus and minus input simultaneously)



- ⑪ 2 x RJ45 sockets (RS485 bus)
- ⑫ 1x RJ45 socket (Ethernet)
- ⑬ 1x RJ10 socket (Modbus RTU)

The housing components are described in detail below.

3.1.2 coolcept³-x



- ① Hood
- ② Display (monochrome, 128 x 64 pixels)
- ③ Rating plate, serial number, warnings
- ④ Operating buttons: ESC, Δ, ∇, SET (from left to right)
- ⑤ 1x AC connection
- ⑥ Pressure equalization membrane
- ⑦ 1x RJ45 socket (RS485 bus)
- ⑧ 1x DC connection Minus (–) for PV generator (Phoenix Contact SUNCLIX, safe-touch)
- ⑨ 1x RJ45 socket (RS485 bus)
- ⑩ 1x DC connection Plus (+) for PV generator (Phoenix Contact SUNCLIX, safe to touch)
- ⑪ 1x RJ45 socket (Ethernet)
- ⑫ DC load-break switch (disconnects plus and minus input simultaneously, can be safeguarded with a padlock)
- ⑬ Bore for optional attachment of a grounding element or mechanical fastening element (securing chain)

The housing components are described in detail below.

3.2 Operating buttons

The operating buttons ④ in [Chapter 3.1.1 „coolcept³“ on page 11](#) and in [Chapter 3.1.2 „coolcept³-x“ on page 12](#) have the following functions:

Button	Action	Function	
		General	guided operation
ESC	Press briefly	Goes to the next higher menu level	Navigates 1 step back
		Discards any changes	
	Press longer (≥ 1 second)	Goes to the status display	Jumps to the start of the guided configuration process
△	Press briefly	■ Moves the marking bar or the display content upward ■ In a numeric setting, moves the marking 1 position to the left ■ Increases an adjustment value by 1 increment	
▽	Press briefly	■ Moves the marking bar or the display content downward ■ In a numeric setting, moves the marking 1 position to the left ■ Increases an adjustment value by 1 increment	
SET	Press briefly	Goes to the next lower menu level	—
		■ a selected numerical value starts flashing and can be changed ■ adopts a change ■ changes the state of a control element (check box/radio button)	
	Press longer (≥ 1 second)	Answers a query dialog with Yes	Goes 1 step back

3.3 Display

3.3.1 General information

For the presentation on the display (② in [Chapter 3.1.1 „coolcept³“ on page 11](#) and [Chapter 3.1.2 „coolcept³-x“ on page 12](#))

- Symbol : While the inverter is processing large volumes of data, it cannot process any user inputs. The resulting waiting time is indicated by the animated sun symbol.
- Errors are indicated by a red flashing backlighting. An event message is also displayed at the same time.

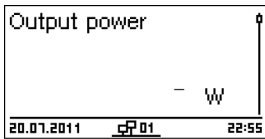
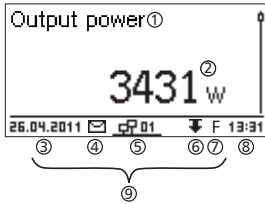


Notice

The display reacts slower at very low temperatures. In particular, this can apply for coolcept³-x devices if they are used outdoors.

3.3.2 Information

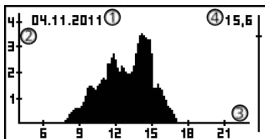
Status display



Numeric yield (day, month, year)

Daily yield ①	
20.07.2011	15,2 kWh ②
19.07.2011	21,0 kWh
18.07.2011	21,5 kWh

Graphical yield (day, month, year)



The information shown on the display is described below using illustrative examples.

The status display shows the following values:

- ① Measurement name
- ② Measurement with units
- ③ Date is displayed alternately with IP address
- ④ Cover the *Non-confirmed event messages*; more information on this is provided in Section 5.1 „Event messages“ on page 51
- ⑤ Animated symbol *Connect* symbol with 2-digit inverter address; indicates data traffic on the RS485 bus.
- ⑥ Cover the *Power reduction (Derating)*
- ⑦ Cover the *Fixed voltage mode activated*
- ⑧ Time
- ⑨ IP address of the device when a network connection has been established, display alternates with ③ – ⑦

The following applies to the status display:

- The measurements shown in the status display are defined under *Settings* ▶ *Meas. values*. Some measurements are always displayed (default setting).
- Current values are not displayed at night (solar irradiation too low; example in Fig. left).
- The CO₂ saving shown in the status display are calculated using the savings factor 508 g/kWh.

Daily, monthly and annual yields can be displayed numerically in a list.

- ① Yield period (day/month/year)
- ② Individual yields with period and value (1 per row)

The yield periods contain the following numbers of individual entries:

- Day yield: last 31 days¹⁾
- Monthly yield: last 13 months¹⁾
- Annual yield: last 30 years¹⁾

¹⁾ A yield value of 0 is shown when the inverter was not yet installed at that time.

Daily, monthly and annual yields can be displayed graphically in a chart.

- ① Period on an individual yield (here: day yield)
- ② Y axis ^{1) 2) 3)}
- ③ X axis: Time in hours/days/months/years
- ④ Total of all individual yields shown in the diagram, in kWh

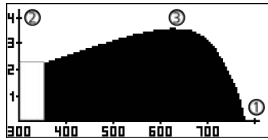
The graphical representation can show annual yields for the last 20 years.

- ¹⁾ Yield in kWh
- ²⁾ With addition of „M“: : yield in MWh
- ³⁾ The scaling changes depending on the maximum value.

Event messages

🔗 Chapter 6 „Fault rectification“ on page 50

PV generator characteristic curve

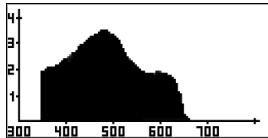


- ① X axis: input voltage in V
- ② Y axis: power in kW
- ③ Peak = MPP

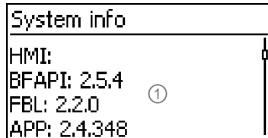
If the „Ch. Curve“ menu item is called, the inverter records the PV generator characteristic curve and then displays it (Fig. upper left).

The following applies:

- The inverter traverses the input voltage range and records the power generated over this range. Duration: a few seconds; ☒ is displayed.
- The MPP is at the peak of the PV generator characteristic curve.
- This peak and the PV generator characteristic curve change with the level of solar irradiation.
- Multiple peaks are a sign of partial shadowing (Fig. left).
- If the top of the curve is flat, the inverter can possibly no longer feed power into the grid.



Information



The menu item **Information** contains the following sub-menu items.

- **Contact info**
- **System info** (see Fig. left):
 - Product designation
 - Serial number of the inverter
 - Information concerning the software and hardware version of the inverter (see sample ① in Fig. left)
 - Inverter address
 - Power limit set at the inverter or predefined by the country selection.
- **Country setting**: country that is currently set and country-specific grid parameters; see also 🔗 Chapter 8.3 „Country table“ on page 69.
- **Reactive power characteristic curve**: Diagram of the reactive power characteristic curve (only if prescribed for the set country)

- **Network:** Network parameters, partially configurable under Settings ► Network
 - Host name: Unique name in the network
 - DHCP status: DHCP on/off
 - Link status: Status of the network connection
 - IP address: IP address of the inverter
 - Subnet mask: Subnet mask of the inverter
 - Gateway: IP address of the network gateway
 - DNS address: IP address of the DNS server
 - MAC address: Hardware address of the inverter
- Results of the last self-test (only if in the country setting *Italy* is set)

3.3.3 Settings

Numerical settings

Remun. factor
€ 0,1220

Date setting ①
② ② ② 20 07 2011

Remuneration

- Possible currencies: £ (Pounds), € (Euros), kr (Krones), *none*.
- The maximum value that can be set for remuneration is limited for technical reasons. The remuneration must be set using different units as required. Example: Dollars instead of Cents (set currency to *none*).

① Designation of the numerical setting

② Value to be set; the selected value to be set is highlighted in black.

Date

When setting the month/year, a check is performed to ensure that the selected day is valid. If not, then the day is automatically corrected.

Example: 31.02.2011 is corrected to 28.02.2011.

Selection of the measurements

Select meas.
☒ Output power ☒ Current day yield ☒ PV voltage

Selection of the measurements to be shown in the status display. The following measurements can be selected:

- Output power: Inverter output power¹⁾
- Current day yield: Day yield since 0:00
- PV voltage: The voltage supplied by the PV generators
- PV current: The current supplied by the PV generators
- Grid voltage: Voltage at the inverter connection¹⁾
- Grid current: The current fed into the mains grid
- Grid frequency: The frequency of the public grid
- Internal temperature: Internal temperature of the inverter
- Derating Reason for derating²⁾
- Max. daily power: The maximum power supplied in the current day³⁾
- Abs. max. power: The maximum power ever fed into the grid³⁾

- Max. daily yield: The maximum daily yield achieved³⁾
- Operating hours: The operating hours during which the device has been connected to the grid (including night-time hours).
- Total yield: Yield since commissioning
- CO₂ savings: CO₂ savings achieved since commissioning

¹⁾ Measurement is always displayed (cannot be switched off)

²⁾ Possible causes:

- Internal temperature too high
- User default *Power limiter*
- Frequency too high
- Controlled by grid operator (feed-in management)
- Delayed increase in power after starting

³⁾ Can be reset to 0 via Settings ► Reset max. vals.

Acoustic alarm

Acoustic alarm
☒ On
☐ Off

An acoustic alarm sounds (approx. 4.5 kHz) when an event message is displayed.

- 2 Sounds: Warning
- 3 Sounds: Error

The acoustic alarm is switched off with the factory default settings.

Backlight

Backlight
☐ off
☒ automatic
☐ Grid feed

- off
- automatic: Switches on for 30 seconds when a button is pushed
- Grid feed: (factory setting)
 - *Not feeding*: Switches on for 30 seconds when a button is pushed; then switches off
 - *Feeding*: Switches on for 30 seconds when a button is pushed; then dims

TCP/IP network



Notice

- A prerequisite for this is that you know the parameters required for setting up the TCP/IP network connection. Consult (further) technical professionals if required.
- DHCP is activated in the device ex-works. This allows automatic integration of the device in most networks.

Network
DHCP
IP address
Subnet mask

Network settings, required for network communication, e. g. with an Internet portal:

- DHCP: Switch DHCP on/off
- IP address: IP address of the inverter
- Subnet mask: Subnet mask of the inverter
- Gateway: IP address of the network gateway

- DNS address: IP address of the DNS server
- web-portal: Settings at the web portal
 - Web portal setting: Disabling of data transmission and selection of a web portal
 - Re-transmission: Data in the inverter is transmitted a second time
 - Connection check: Checks the internet connection and indicates the result

3.3.4 Service menu

The service menu items are described below. Some items are password protected; see [Chapter 5.1 „Overview of operating functions“ on page 46](#) (menu structure).

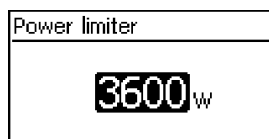
You can obtain the password from technical support; see [Chapter 10 „Contact“ on page 71](#).



NOTICE!

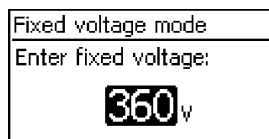
Risk of reduced yields. In the service menu, inverter and grid parameters can be changed. The service menu must only be operated by a specialist, who ensures that the change does not violate applicable regulations and standards!

Power limiter



The inverter output power can be manually limited to a minimum of 500 W. When the power is manually limited, the *Power reduction* symbol is shown in the status display and the „Derating“/„Cause: User default“ measurement is displayed.

Fixed voltage



The device can regulate the input voltage to a manually adjustable value. This switches off the automatic setting of the MPP (MPP tracking). The input voltage can be adjusted over a range between the maximum and minimum input voltage and the minimum input voltage in 1V steps.

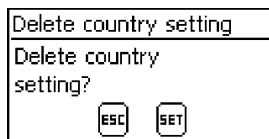
Exemplary application: Hydroelectric installation



NOTICE!

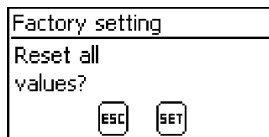
Before setting a fixed input voltage, make sure that the generator is suitable for this. Otherwise, this may result in yield losses or damage to the system.

Delete country setting



After the country setting has been deleted the device restarts anew and displays the guided 1st commissioning menu.

Factory setting

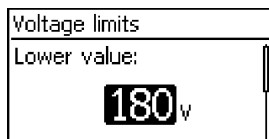


Resetting the device to the factory setting deletes the following data:

- Yield data
- Event messages
- Date and time
- Country setting
- Display language
- Network settings

After the factory setting has been deleted, the device restarts anew and displays the guided 1st commissioning menu.

Voltage limits (peak value)

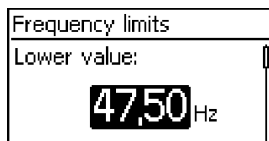


The following voltage limits can be changed:

- Upper disconnection value¹⁾
- Lower disconnection value¹⁾ (Fig. left)

¹⁾ The disconnection value relates to the peak value of the voltage.

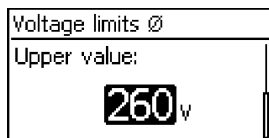
Frequency limits



The following frequency limits can be changed:

- Upper disconnection value
- Lower disconnection value (Fig. left)
- Derating switch-on threshold (because frequency is too high)
- Frequency threshold when switching on again

Voltage limits Ø (average value)



The following voltage limits can be changed:

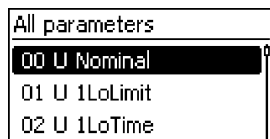
- Upper disconnection value¹⁾ (Fig. left)
- Lower disconnection value¹⁾

¹⁾ The disconnection value relates to the average value of the voltage.

Reactive power

The possible reactive power settings are identical to the settings during the initial commissioning. See  „Reactive power“ on page 39.

All parameters



Service technicians can use this menu item for changing additional MSD parameters.

3.4 Cooling

The internal temperature control system prevents excessive operating temperatures. When the internal temperature is too high, the inverter adjusts the power consumption from the PV generators to reduce the heat dissipation and operating temperature.

The inverter is convection cooled via fins on the front and rear side. A maintenance-free fan circulates the heat within the closed housing evenly over the entire surface of the housing.

3.5 Grid monitoring

The inverter constantly monitors the mains grid parameters while feeding the grid. If the grid deviates from the legally prescribed specifications then the inverter automatically switches off. When the grid conforms to the legally prescribed specifications then the inverter automatically switches on again.

3.6 Data communication

The device has the following communication interfaces:

- 1x RJ45 socket (Ethernet for TCP/IP network) for communication, e. g. with a central data server
- 2x RJ45 sockets (RS485 bus) for communication with external devices, e. g. a data logger
- 1x RJ10 socket (Modbus RTU) for communication e. g. with an external energy counter

3.6.1 Data

The inverter can transmit a wide range of data to other devices. Some of this data is shown on the display and certain data is stored in the internal memory (EEPROM) as described below.

Displayed data

- Voltage and current of the PV generator
- Power and current fed into the grid
- Voltage and frequency of the power grid
- Energy yields on a daily, monthly and annual basis
- Error conditions, notes
- Version information

Logged data (EEPROM)

- Event messages with date
- Energy yields on a daily, monthly and annual basis

The storage resolution of the energy yield data is as follows:

Energy yield data	Storage resolution/period
10-minute values	31 days
Daily values	13 months
Monthly values	30 years
Annual values	30 years
Total yield	permanent

3.6.2 Network (TCP/IP)

The device can transfer yield data and event messages via the TCP/IP interface to the Internet portal <http://www.solare-energiewende.de> server. The yield data can be displayed graphically in the Internet portal as illustrated below. This service is free of charge for a period of 2 years from the time of registration. The following applies:

- Before the Internet portal can be used, the user must go to www.steca.com/portal to register.
- The local network settings must be set at the inverter in order to establish a connection to the Internet portal server. This can be performed automatically or manually:
Automatically: If IP addresses are automatically assigned in your network (DHCP), then no settings need to be made at the inverter.
Manually: If IP addresses are not automatically assigned in your network, then you must manually set the inverter network settings via **Settings** ► **Network**; see  „TCP/IP network“ on page 17
- The address of the Internet portal server is permanently stored in the inverter and cannot be changed.
- Once the network connection is established, the inverter automatically starts non-encrypted transmission of data to the server.



Notice

The network cable must be disconnected in order to prevent transmission of the data, or data transmission must be disabled according to  „TCP/IP network“ on page 17.



Fig. 1: Graphical representation of the yield data in the Internet portal

Furthermore, you can use the TCP/IP interface to display yield data and other information as HTML pages. You need a PC connection to indicate the data. The HTML pages can be displays by means of a browser, such as Mozilla Firefox. To enable the connection, enter the IP address of the inverter (see inverter status indication) in the browser.

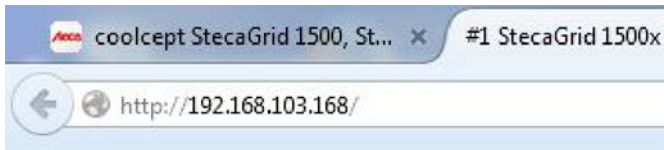


Fig. 2: Example for an IP address

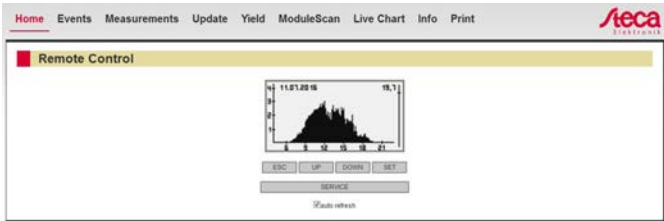


Fig. 3: Example 1 of an HTML page

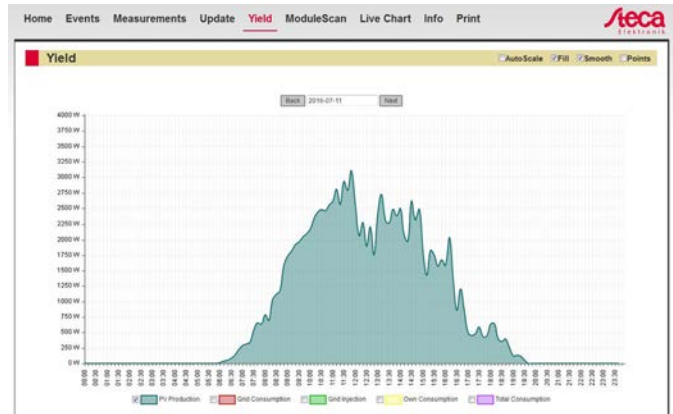


Fig. 4: Example 2 of an HTML page



To display the HTML pages, the *chart.js* licence-free software is used, www.chartjs.org. Copyright (c) 2013-2015 Nick Downie."

The HTML pages are the simplest way to update the firmware of the inverter. The corresponding page is shown below.



Fig. 5: View of the firmware update

3.6.3 RS485 bus

The inverter communicates with other devices via an RS485 bus. The following applies: The following applies:

- The inverter has two RS485 interfaces (RJ45 sockets) on the lower side of the casing.
- The beginning and end of the RS485 bus must be terminated; see 3.6.5, p.25.
- Standard RJ45 cables can be used as bus cables (Cat-5 patch cables, not supplied). Use an alternative data connection cable for longer connections; see 3.6.4, p.24 .
- The inverters connected to the RS485 bus operate as *slaves*.

**Notice**

The following inverters have compatible data interfaces and can be connected to the RS485 bus as slaves:

- *StecaGrid 2020*
- *StecaGrid 1500, 1800, 2000, 2300, 2500, 3000, 3010, 3600, 4200 and StecaGrid 1500x, 1800x, 2000x, 2300x, 2500x, 3010x, 3600x, 4200x*
- *StecaGrid 3203, 4003, 4803, 5003, 5503, 6003 and StecaGrid 3203x, 4003x, 4803x, 5503x*
- *StecaGrid 8000 3ph, StecaGrid 10000 3ph*
- *StecaGrid 8000+ 3ph, StecaGrid 10000+ 3ph*

Comply with the instructions in the manuals of these devices relative to addressing, termination, and approved data cables.



Notice

If in the country setting Italy is set, then the RS485 bus must be connected as follows to enable control through an external device in accordance with CEI 0-21.

- External fast switch-off (ital.: Teledistacco): If the lines 3¹⁾ and 8¹⁾ of the RS485 bus²⁾ are connected, e. g. via an external relay, the following applies:

Relay closes: The inverters on the bus disconnect themselves from the network.

Relay opens: The inverters connected on the network connect themselves to the network (regular operation).

- Switch-over of the grid frequency disconnection thresholds (Ital.: Modalità definitiva di funzionamento del sistema di protezione di interfaccia (impiego del SPI sulla base di letture locali e di informazioni/comandi esterni)): If the lines 5¹⁾ and 8¹⁾ of the RS485 bus²⁾ are connected, e. g. via an external relay, the following applies:

Relay closes: The inverters connected on the bus set the switch-off thresholds in accordance with CEI 0-21 to 47.5 Hz and 51.5 Hz.

Relay opens: The inverters connected on the bus set the switch-off thresholds in accordance with the country setting Italy ;
 ↪ Chapter 8 „Technical data“ on page 57.

We recommend that you integrate the wiring of lines 3, 5, and 8 in the bus termination.

¹⁾ Contact assignment of the RJ45 plug for the RS485 bus: See Fig. 6.

²⁾ In this regard, see Ⓔ under ↪ Chapter 3.1.1 „coolcept³“ on page 11 and Ⓔ and Ⓔ under ↪ Chapter 3.1.2 „coolcept³-x“ on page 12.

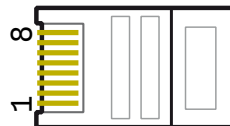


Fig. 6: Contact assignment (= line number) of the RJ45 plug

Optionally one (!) of the following masterdevices can be connected to the RS485 bus. The devices support the transfer protocol used by the inverter. The devices support the transfer protocol used by the inverter.

- Energy management unit StecaGrid SEM: Interface to a ripple control receiver for EEC-compliant feed-in management
- PC or notebook (with suitable software):
 - Read inverter information using the "StecaGrid User" read out software. This is available on our homepage see http://www.steca.com/index.php?StecaGrid_User_de
 - Connection to the inverter via optional adapter RS485↔USB is possible; the adapter is available from Steca under Article Number 746.610 (IP21) or 737.707 (IP65).
 - Load firmware updates (for technical professionals only)
- External data loggers, recommended by Steca for professional system monitoring:
 - WEB'log (Meteocontrol)
 - Solar-Log (Solare Datensysteme)
 - Energy-Manager (Kiwigrid GmbH)



Notice

The correct settings must be made in external data loggers, according to the manufacturer's instructions, before connecting them to the bus.

The wiring diagram of the RS485 bus is shown below.

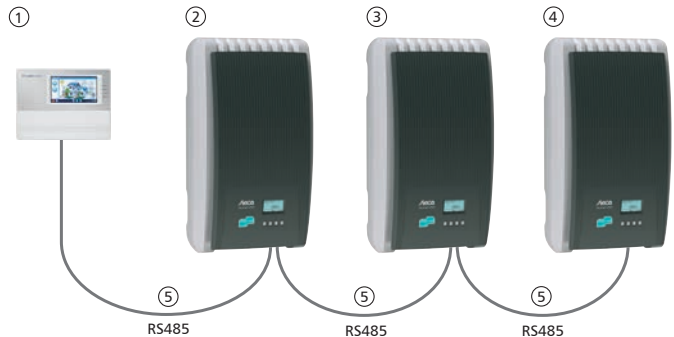


Fig. 7: Wiring diagram

- ① External data logger
- ② First inverter
- ③ Inverter
- ④ Last inverter, terminated
- ⑤ RJ45 standard cable (patch cable)

3.6.4 Alternative data connection cable



NOTICE!

Material damage caused by electrical voltage!
The alternative data connection cable may only be manufactured by professional personnel.

The alternative data connection cable is a Cat-5 cable for long data connections. The following applies to the alternative data connection cable:

- The total length of the RS485 bus must not exceed 1,000 m (Master/first inverter to last inverter).
- Use the pin assignment according to the table below if the alternative data connection cable is connected to the RJ45 socket of the first inverter or to the connector of an external data logger.

Tab. 2: Pin assignment of the alternative RS485 data cable

Device	Inverter	Solar-Log	WEB'log ¹⁾	Kiwigrid	Signal
Connection	RJ45	Terminal strip	RJ12	Terminal strip	↓
Contact	1	1	2	A	Data A
	2	4	4	B	Data B
	3	—	—	—	—
	4	—	—	—	—
	5	—	—	—	—
	6	—	—	—	—
	7	—	—	—	—
	8	3	6	GND	Ground



NOTICE!

¹ Danger of destroying the inverter's RS485 input. Pin 1 of the RJ12 socket of the Web'log data logger carries 24 V DC. Never connect the alternative data connection cable to pin 1!

3.6.5 RS485 termination

To prevent data transmission errors, the start and end of the RS485 bus should be terminated:

- The external data logger (at the start of the data connection) must be terminated according to the manufacturer's specifications.
- The last inverter (at the end of the data connection) is terminated by plugging the optionally available termination plug into the free RJ45 socket (for RS485 bus) (see table in [Chapter 2.2 „Identification“](#) on page 6 under 'Optional accessories').

3.6.6 RS485 addressing

Every inverter must be assigned its own unique address for communication between the bus master and the slaves.

Every inverter is set with an address of 1 at the factory. This means that the addresses must be adjusted in systems having more than 1 inverter. The following applies:

- The address is changed at the inverter via the menu items „Settings“ ▶ „Address“.
- Only addresses ranging from 1 – 99 may be set.
- The bus master devices usually support less than 99 addresses. Consult the respective operating instructions for these devices before setting the addresses of the inverters.
- We recommend starting with address 1 for the first inverter on the bus and then incrementing the address by 1 for each subsequent inverter on the bus, in the same order as they are physically installed. This makes it easier to identify the relevant inverters when their address is displayed in messages shown on the remote display.

3.6.7 Modbus RTU

The inverter communicates via Modbus RTU with energy meters. The following applies:

- Only energy meter pre-programmed in the inverter can be used.
- The energy meter must measure the supply from the grid in positive direction. Follow the manufacturer's instructions.

3.6.8 Modbus RTU data connection cable



NOTICE!

Material damage from electrical current! The alternative data connection cable may only be manufactured by technical professionals.

On the inverter side, a 4-pole telephone cable with RJ10 connector may be used as data connection cable.

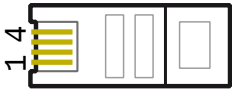


Fig. 8: Contact assignment (= line number) of the RJ10 plug

Device Connection	Inverter RJ10	Signal
Contact	1	Data A
	2	Data B
	3	Ground
	4	—

**NOTICE!**

Danger of destroying the Modbus RTU input of the inverter. Contact 4 of the RJ10 socket of the inverter carries voltage <20V. Do not use this contact.

4 Installation

4.1 Safety measures during installation

Observe the following safety notes when performing the work described in Section *Installation* .



DANGER!

Risk of death by electrocution!

- Only technical professionals may perform the work described in Section *Installation* .
- Do not connect cables to the inverter until explicitly asked to do so in the manual.
- Do not open the housing of the inverter.
- Connect only SELV circuits to the RJ45 sockets.
- Lay the cables such that the connection cannot come loose accidentally.
- When laying cables, ensure that no damage occurs to any of the constructional fire safety measures in the building.
- Make sure that no inflammable gases are present.
- Observe all applicable installation regulations and standards, national laws and connection values specified by the regional power supply company.



DANGER!

Danger from electrical current

ELECTRICAL SHOCK AND DISCHARGE!

The PV generators/lines may be energised as soon as the PV generators are exposed to light.

Always disconnect all DC and AC cables as follows before starting work on the inverter:

1. ➤ Turn the AC circuit breaker to off. Take measures to prevent the system from being unintentionally switched on again.
2. ➤ Set the DC circuit breaker on the inverter to position 0. Take measures to prevent the system from being unintentionally switched on again.
3. ➤ Disconnect the DC cable plug connectors according to the manufacturer's instructions.
4. ➤ Disconnecting the AC plug from the inverter ⇒ Release safety clip at the front of the AC plug by depressing it with a suitable object, then pull the plug out.

5. ➔ Check that all pins of the AC plug are free of voltage. Use a suitable voltmeter for this (do not use a simple neon phase checker).



NOTICE!

Risk of damage to the inverter or derating!

- The mounting location must satisfy the following conditions:
 - The mounting location and immediate environment are permanently fixed, vertical, flat, non-inflammable and not subject to constant vibration.
 - The permissible ambient conditions are conformed to; see Technical data ➔ *Chapter 8 „Technical data“ on page 57*.
 - The following free spaces must be present around the inverter:
 - Above/below: at least 200 mm
 - At the sides/in front: at least 60 mm
- Do not install the inverter in areas where animals are kept.
- Observe the connection ratings specified on the type plate.
- The DC cables must not be connected to an earth potential (DC inputs and AC output are not galvanically isolated).



NOTICE!

When transmitting data over a public network:

- Transmitting data over a public network may result in additional costs.
- Data transmitted over a public network is not protected from unauthorised access by third-parties.

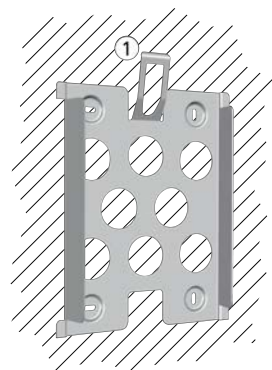


Notice

- *Avoid exposing the inverter to direct sunlight.*
- *The display must be readable on the installed device.*
- *The inverter operates not completely noiselessly. Consider this when choosing an installation location.*

4.2 Mounting the inverter

Fastening the mounting plate



► Screw the mounting plate to the mounting surface using 4 screws:

- Use screws (and dowels etc.) appropriate for the weight of the inverter.
- The mounting plate must lie flat on the mounting surface and the metal strips at the sides must point forwards (Fig. left).
- Install the mounting plate vertically with the retaining plate ① at the top (example in Fig. left).



NOTICE!

With coolcept³-x, you can secure the inverter with a padlock against theft or unauthorized removal. The padlock is inserted in a shackle which will lock into the retaining plate during mounting. Now, it is no longer possible to unlock the retaining plate.



NOTICE!

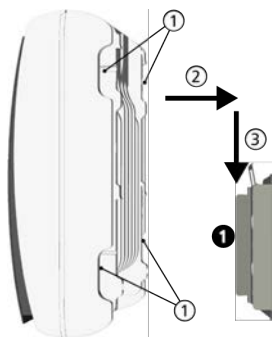
For more information on determining the optimum position for the mounting plate, refer to the Brief Installation Instructions comprised in the delivery, and to the Appendix under Mounting.

Attaching the inverter on the mounting plate



NOTICE!

How to remove the inverter from the mounting plate is described under [Chapter 4.9 „Switch on DC“](#) on page 44.



1. ➤ Grasp inverter on the grip recesses ① (coolcept³) or by the perimeter edge (coolcept³-x), fit it onto the mounting plate ① so that it is centred ② and lightly press it on (see the example in the fig. on the left).
2. ➤ Lower the inverter ③ until the securing sheet metal element of the mounting plate audibly locks in place. In this process, the hooks on the rear of the inverter must be guided above the catches on the mounting plate.
3. ➤ The inverter must now be firmly seated on the mounting plate and it can no longer be lifted (upwards).

4.3 Prepare AC connection

4.3.1 Miniature circuit breaker

Information on the required line circuit breaker and the cables to be used between the inverter and the line circuit breaker is provided in [Further information on page 69](#)

4.3.2 Fault current circuit breaker

If the local installation regulations require the installation of an external residual current circuit breaker, then a Type A residual current circuit breaker as per IEC 62109-1, § 7.3.8. is sufficient.

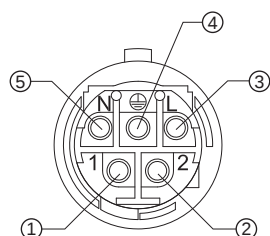
4.3.3 Assemble AC plug



DANGER!

Risk of death by electrocution! Observe the hazard warnings under !

- Wire the AC plug supplied as shown in the figure below.



- ① Phase 1
- ② Phase 2
- ③ Phase 3
- ④ Protective conductor PE has no function in the device; it does not have to be connected since the inverter meets the requirements of the protection class II.
- ⑤ Neutral conductor

4.4 Prepare DC connections



DANGER!

Risk of death by electrocution!

- Observe the hazard warnings under *Chapter 4.1 „Safety measures during installation“ on page 30.*
- Use the provided SUNCLIX plugs so that the specified protection class is maintained.



NOTICE!

The mating pieces that match the DC connections must be connected to the DC cables with correct polarity and in accordance with the manufacturer's guidelines.

Only an energy storage system approved by Steca may be connected to the battery connections.

If this instruction is not complied with, there is danger of damaging the inverter and the modules.

4.5 Preparing the data connection cable

- ➔ If a data connection is required, use a standard RJ45 cable (patch cable, Cat5) or construct an alternative data connection cable (see *Further information on page 26*).

4.6 Connecting the inverter inverter and switching the AC on



DANGER!

Risk of death by electrocution! Observe the hazard warnings under *Chapter 4.1 „Safety measures during installation“ on page 30.*

**NOTICE!**

- Between the data connection cables (RS485/Ethernet/Modbus RTU) and the DC/AC lines, maintain a distance of 200 mm, to avoid interference in the data transmission.
- The protection class IP65 for type coolcept³-x is only ensured if the AC and DC plugs are plugged in and the RJ45 sockets are sealed with sealing caps.

1. ➞ If necessary, establish the data connection:
 - Connect the inverters and the master with data connection cables.
 - Plug a suitable termination plug into the last inverter.
2. ➞ Seal open RJ45 sockets of coolcept³-x with sealing caps.
3. ➞ Forcefully press the plug connector mating piece (DC cable) into the DC connection on the inverter until it audibly locks in place.
4. ➞ Plug the AC connector onto the coupling on the inverter, until the plug audibly locks in place.
5. ➞ Switch on the AC miniature circuit breaker. The start page for 1st commissioning is shown on the display.
6. ➞ Perform 1st commissioning and switch on the DC supply, as described in

4.7 Initial commissioning of the inverter

4.7.1 Function

Conditions for starting initial commissioning

Initial commissioning starts automatically when at least the AC connector has been installed and switched on as described previously. If initial commissioning is not fully completed then it starts again anew the next time the device is switched on.

Guided initial commissioning

Initial commissioning is a guided procedure that sets the following information:

- Display language
- Date / Time
- Country
- Reactive power characteristic curve (if prescribed for the selected country)

Setting the country

The following applies when setting the country:

- The country set must always be the same as the country where the inverter is installed. This ensures that the inverter will load the specified net parameters of the respective country; for more information, refer to the Countries table on the Steca homepage, www.steca.com/Wechselrichter-Wohnsiedlung.
- **The country can only be set once!**
Contact the Steca Technical Support if you have set the wrong country.
- If the Countries table does not list your country, select a country with stricter specifications.
- The country setting does not affect the language used on the display. The display language is set separately.

4.7.2 Operation

Starting 1st commissioning

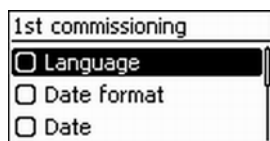
The check list for 1st commissioning is displayed:

- The default display language is English.
- The `Language` entry is selected.
- The check boxes are not selected.



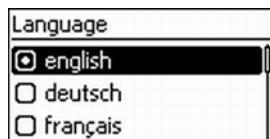
NOTICE!

- When a check list item is called up, the corresponding check box is automatically selected.
- Initial commissioning is completed by calling up the `Finish` item.
- `Finish` can only be performed when *all other* check boxes are selected.



1. ➞ Press $\Delta \nabla$ to select a check list item.
2. ➞ Press `SET` to call up the item.
The items are described in detail below.

Language



1. ➞ Press $\Delta \nabla$ to select a display language.
2. ➞ Press `SET`.
⇒ The language is adopted.
3. ➞ Press `ESC`.
✓ The check list is shown.

Date format

Date format
☐ JJJJ-MM-TT
☒ TT.MM.JJJJ
☐ MM/TT/JJJJ

1. ➞ Press $\triangle \nabla$ to select a date format.
2. ➞ Press SET.
⇒ The date format is adopted.
3. ➞ Press ESC.
✓ The check list is shown.

Date

Date setting
20.07.2011

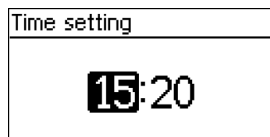
1. ➞ Press SET.
⇒ The day flashes.
2. ➞ Press $\triangle \nabla$ to change the day.
3. ➞ Press SET.
⇒ The change is adopted.
4. ➞ Press ∇ .
⇒ The month is selected.
5. ➞ Repeat steps 1 to 3 for the month.
6. ➞ Press ∇ .
⇒ The year is selected.
7. ➞ Repeat steps 1 to 3 for the year.
8. ➞ Press ESC.
✓ The check list is shown.

Time format

Time format
☐ 12h
☒ 24h

1. ➞ Press $\triangle \nabla$ to select a time format.
2. ➞ Press SET.
⇒ The time format is adopted.
3. ➞ Press ESC.
✓ The check list is shown.

Time



1. ➞ Press **SET**.
⇒ The hours display flashes.
2. ➞ Press $\triangle \nabla$ to change the hour.
3. ➞ Press **SET**.
⇒ The change is adopted.
4. ➞ Press ∇ .
⇒ The minutes are selected.
5. ➞ Repeat steps 1 to 3 for the minutes.
6. ➞ Press **ESC**.
✓ The check list is shown.

Country selection



NOTICE!

The country can only be set once!



1. ➞ Press $\triangle \nabla$ to select a country.
2. ➞ Press **SET**.



3. ➞ Press **ESC**.
⇒ the dialog shown at the left is displayed.
4. ➞ Press **ESC** to select a different country by performing step 1 and step 2, or
Press **SET** for a longer period of time (> 1 s) to confirm the currently selected country.
✓ The check list is shown.

Reactive power



NOTICE!

The following items are only displayed when the use of a reactive power characteristic curve is prescribed for the country currently selected in the Country item:

- Mode: Type of characteristic curve
Select one of the following types:
 - $\cos \phi = 1$
 - $Q(P)$
 - $Q(U)$ linear
 - $Q(U)$ hysteresis
- Loading defaults¹⁾: A default characteristic curve can be selected here.
- Node 1¹⁾
No. of nodes¹⁾ The nodes provide for free programming of a characteristic curve.
- Node 2¹⁾
- Node n^{1) 2)}
- Display char. curve

¹⁾: Not indicated with mode $\cos \phi = 1$.

²⁾: Is only displayed when no. of nodes has been set to a value > 2.

Reactive power
☐ Mode
☐ Display curve

Mode
☒ $\cos \phi = 1$
☐ $Q(P)$
☐ $Q(U)$ lin.

1. ➞ Press SET to call up the item.

2. ➞ Press $\Delta \nabla$ to select a type of reactive power characteristic curve.

3. ➞ Press SET.

⇒ The reactive power characteristic curve type is adopted.

4. ➞ Press ESC.

✓ The check list is shown.

Loading defaults



NOTICE!

If $\cos\Phi = 1$ was not selected, an additional menu item Load defaults is indicated.

Reactive power
☒ Mode
Load Defaults
☐ Number of nodes

Load Defaults
☐ Q(P) >3680W
☐ Q(P) >13800W

1. ➞ Press ∇ to select "Load defaults".
2. ➞ Press SET.
3. ➞ Press $\triangle\nabla$ to select a default characteristic line.
4. ➞ Press SET.
⇒ The default characteristic line is adopted.
5. ➞ Press ESC.
✓ The check list is shown.

Number of nodes

Set reactive power
Enter no. of nodes
4

1. ➞ Press SET.
⇒ The value flashes.
2. ➞ Press $\triangle\nabla$ to change the number of nodes.
3. ➞ Press SET.
⇒ The value is adopted.
4. ➞ Press ESC.
✓ The check list is shown.

Node n



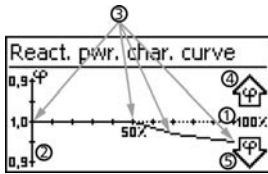
NOTICE!

P % cannot be changed at the first and last nodes (000 %, 100 %).



1. ➞ Press $\Delta \nabla$ to select a parameter for the node.
2. ➞ Press SET.
⇒ The parameter value flashes.
3. ➞ Press $\Delta \nabla$ to change the value.
4. ➞ Press SET.
⇒ The change is adopted.
5. ➞ Repeat steps 1 to 4 for the other parameters.
6. ➞ Press ESC.
✓ The check list is shown.

Display char. curve

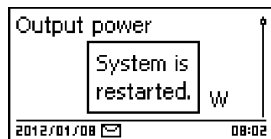


1. ➞ The previously set reactive power characteristic curve is displayed graphically (example in Fig. left).
 ① x-axis, output power P in %
 ② y-axis, phase shift cos ϕ
 ③ Nodes (in example: 4 nodes)
 ④ Arrow symbol *Overexcitation*
 ⑤ Arrow symbol *Underexcitation*
2. ➞ Press ESC
✓ The check list is shown.

Finish

✓ Finish has been selected in the check list and SET has been pressed. One of 2 possible dialogues is displayed.

1. ➞ Proceed as follows, depending on the respective dialogue:
 - Dialogue Settings are incomplete: Press SET and work through the open items in the check list.
 - Dialogue Are all settings correct?: Press ESC to correct settings or



2. ➞ Press and hold **SET** (> 1 s) to finish 1st commissioning.

✓ If **SET** was pressed for a longer time then the inverter starts anew and synchronises itself with the grid (Fig. left).

4.8 Feed-in management

Depending on the country, photovoltaic systems must have the possibility of being reduced in the fed-in effective power by the network operator. The following products are recommended for implementing this legally prescribed specification:

- StecaGrid SEM
- WEB'log from Meteocontrol
- Solar-Log from Solare Datensysteme
- Energy-Manager from Kiwigrid

Furthermore, an energy meter can be used for feed-in management. It must be connected to the Modbus RTU interface and meet the preconditions specified in [Chapter 3.6.7 „Modbus RTU“](#) on page 28 and [Chapter 3.6.8 „Modbus RTU data connection cable“](#) on page 28.

Energy management
Mode
Dyn. feed in control
Configuration



NOTICE!

The settings for feed-in management must be made in the sub-menu 'Energy management'.

Mode

Mode
☒ Off
☐ Energymeter

1. ➞ Press **SET** to call up the item.
2. ➞ Press **▽** to select "Energy meter".
3. ➞ Press **SET**.
4. ➞ Press **ESC** to go one level higher to Energy management.

Dynamic feed-in regulation

Dyn. feed in control
2260_W



NOTICE!

The power fed into the grid is adjusted in 10 W steps. It can be limited to a minimum of 0 W.

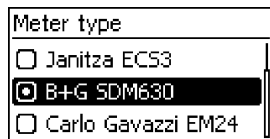
Configuration of the energy meter

Configuration
Meter type



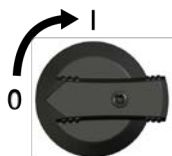
NOTICE!

The inverter can only work with energy meters that have been pre-programmed in the inverter. The pre-programmed energy meters are listed under **Meter type**.



1. ➞ Press **SET** to call up the item.
2. ➞ Press **Δ▽** to select a meter type.
3. ➞ Press **SET**.
4. ➞ Press **ESC** to quit the sub-menu.

4.9 Switch on DC



- ➞ Place DC load-break switch on the inverter on position **I** (Fig. left). After testing via the internal MSD (approx. 2 minutes), the power fed into the grid can be shown on the display (assuming that sunlight is present).



NOTICE!

At the coolcept³-x devices, the DC load-break switch can be safeguarded with a padlock (shackle thickness max. 7 mm) against accidental activation.

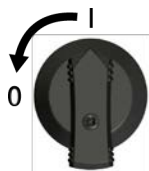
4.10 Deinstalling the inverter



DANGER!

Risk of death by electrocution! Only technical professionals may perform the work described in this section. Follow the safety instructions at the beginning of the Section "Installation".

Switching off the AC and DC supplies



1. ➞ Set the DC circuit breaker on the inverter to position **0** (Fig. left).
2. ➞ Turn the AC circuit breaker to off.
3. ➞ Wait for at least 10 minutes before disconnecting the plug-in connectors of the DC cable.

Disconnecting the DC connections from the inverter

- ➔ Disconnect the DC cable plug connectors according to the manufacturer's instructions; see appendix.



WARNING!

DC cables carry voltage when the PV generators are subjected to sunlight.

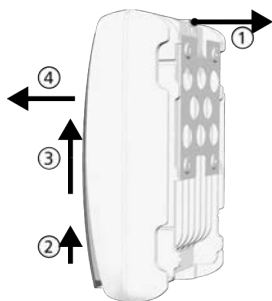
Disconnecting the AC plug from the inverter

1. ➔ Disconnecting the AC plug from the inverter
Release the safety clip at the front of the AC plug by depressing it with a suitable object, then pull the plug out.
2. ➔ Check that all pins of the AC plug are free of voltage:
Use a suitable voltmeter for this (do not use a simple neon phase checker).

Opening the AC plug (only if required)

- ➔ Opening the AC plug:
First, unscrew the rear cable connection. Next, release the safety clips at the left and right of the plug housing by depressing them simultaneously with a suitable object. Now, pull the top part of the housing off the contact element.

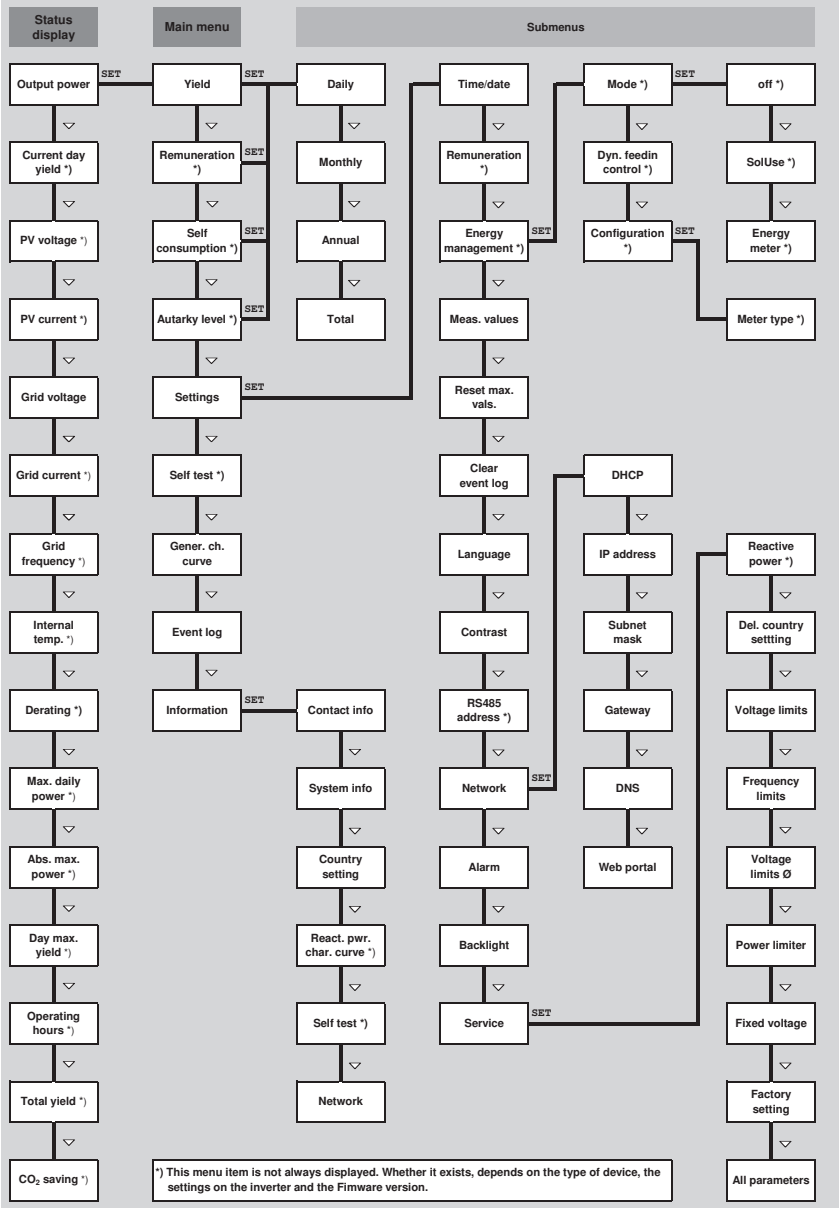
Removing the inverter from the mounting surface



1. ➔ Use one hand to press the retaining plate on the mounting plate approx. 5 mm towards the mounting surface ① (Fig. left).
2. ➔ Use the other hand to push the inverter upwards, far enough so that the retaining plate no longer latches ②. Release the retaining plate.
3. ➔ Lift the inverter with both hands until the hooks on the rear side of the inverter are free ③.
4. ➔ Remove the inverter from the mounting surface ④.

5 Operation

5.1 Overview of operating functions



Only the ∇ and SET operating buttons are illustrated (for the sake of clarity).

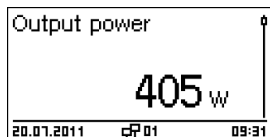
5.2 General operating functions

- Hidden content is shown using the $\triangle$ and ∇ buttons.
- Repeated button presses: If $\triangle/\nabla$ need to be pressed repeatedly, you can alternatively hold these buttons pressed for a *long* time. The rate of repetition increases the longer the button is held.
- Pressing any button switches on the display backlighting

5.3 Important operating functions

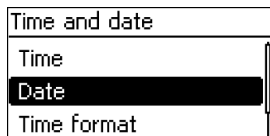
The figures in this section show examples.

Status display



1. ➞ If necessary, press **ESC** for 1 second to call up the status display (Fig. left).
2. ➞ Press $\triangle/\nabla$ to display a different parameter.

Menu navigation



1. ➞ Press **ESC** for 1 second to call up the status display as required.
2. ➞ Press **SET**.
⇒ The main menu is displayed with the top item selected.
3. ➞ Press $\triangle/\nabla$ to select a menu item.
4. ➞ Press **SET** to call up the submenu (Fig. left).
5. ➞ Repeat steps 3 and 4 for further submenus as required.

Event messages

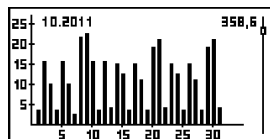
See „Event messages“ on page 51.

Displaying entries numerically (list) and graphically (diagram)

The status display is shown.

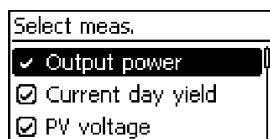
1. ➞ Press **SET**.
⇒ The main menu is displayed with **Yield** selected.
2. ➞ Press **SET**.
⇒ The list with yield time periods is shown.
3. ➞ Press $\triangle/\nabla$ to select a yield time period.
4. ➞ Press **SET**.
⇒ The individual yields for the yield time period are shown in a list (Fig. left).
5. ➞ Press $\triangle/\nabla$ to select an individual yield value.

Monthly yield	
May 2011	360 kWh
Apr 2011	350 kWh
Mar 2011	372 kWh



6. ➔ Press **SET**.
⇒ The selected individual yield is shown in a chart (Fig. left).
7. ➔ Press $\Delta \nabla$ to page through the charts.
8. ➔ Press **SET** to return to the list.

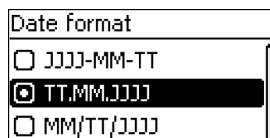
Editing selection lists containing check boxes



A selection list with check boxes is displayed (Fig. left).

1. ➔ Press $\Delta \nabla$ to select a check box.
2. ➔ Press **SET**.
⇒ The state of the check box changes from *onto* *off* and vice-versa (preset check boxes cannot be changed).
3. ➔ Repeat steps 1 and 2 for further check boxes as required.
4. ➔ Press **ESC**.
✓ The changes are adopted and the next higher menu level is displayed.

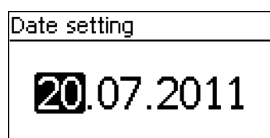
Editing selection lists containing radio buttons



A selection list with radio buttons is displayed (Fig. left).

1. ➔ Press $\Delta \nabla$ to select a radio button that is currently switched off.
2. ➔ Press **SET**.
⇒ The selected radio button is switched on and the previously switched on radio button is switched off.
3. ➔ Press **ESC**.
✓ The changes are adopted and the next higher menu level is displayed.

Changing numeric settings



A numeric setting is displayed (example *Date* in Fig. left).

1. ➔ Press **SET**.
⇒ The selected value flashes (*Day* in Fig. left).
2. ➔ Press $\Delta \nabla$ to change the value.

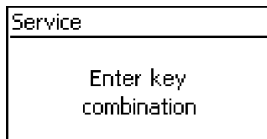
3. ➤ Press **SET**.
⇒ The change is adopted (value no longer flashes) or Press **ESC** to cancel the change (value no longer flashes).
4. ➤ Press **▽**.
⇒ The next value is selected.
5. ➤ Repeat steps 1 to 4 for the remaining values.
6. ➤ Press **ESC**.
✓ The next higher menu level is displayed.

Calling up the service menu and editing the values

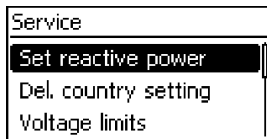


NOTICE!

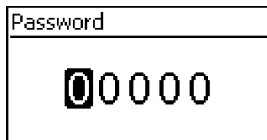
Risk of yield losses and contravention of regulations and standards. Inverter and grid parameters can be changed in the service menu. The service menu must therefore only be used by technical professionals who know the applicable regulations and standards.



1. ➤ Select the **Service** menu item.
2. ➤ Press **SET**.
⇒ The fig. shown at the left appears.



3. ➤ Press **△▽** simultaneously for 3 seconds.
⇒ The service menu is displayed (Fig. left).
4. ➤ Press **△▽** to select a menu item.



5. ➤ Press **SET** to edit the menu item. The following applies:
 - Enter the password if required (Fig. left); see [Chapter 3.3.4 „Service menu“ on page 18](#).
 - If necessary, press **△▽** within a menu item to display and edit other settings (e.g. **Voltage limits**).
 - The menu items are described in [Chapter 3.3.4 „Service menu“ on page 18](#).

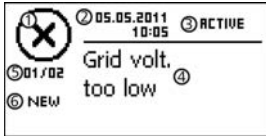
5.4 Internet portal

For a StecaGrid portal description and the registration page of your system, go to www.steca.com/portal.

6 Fault rectification

Faults are indicated by event messages as described below. The display flashes red. The *list of event messages* below contains information on troubleshooting and fault correction.

Structure



Event messages contain the following information:

- ① Symbol for the type of event message
- ② Date/time when the event occurred
- ③ ACTIVE = cause of the event message is still present or Date/time at which the cause of the event message was corrected.
- ④ Cause of the event message
- ⑤ Counter: No. of the displayed event messages / Total number of event messages; max number of all event messages = 60
- ⑥ NEW is displayed until the event message has been manually confirmed via the ESC or Δ/∇ button.

Function

Event message types

- **Type Information** (symbol ⓘ)
The inverter has detected an error that does not affect the feed-in process. The user does not need to intervene.
- **Type Warning** (symbol ⚠)
The inverter has detected an error that may result in reduced yields. It is highly recommended that you correct the cause of the error.
- **Type Error** (symbol ⊗)
The inverter has detected a serious error. The inverter will not feed into the grid while this error is present. Please contact your installer. More information is provided in the table below.

Display behaviour

New event messages are displayed immediately. The messages disappear after they have been confirmed or their causes have been corrected.



Note

When an event message is confirmed, the user thereby simply confirms that he/she has seen the message. This does not correct the error that caused the event message to be shown!

If messages exist whose cause has been corrected but have not been confirmed then $\boxtimes$ is shown in the status display. If an already confirmed error recurs then it is displayed again.

Operation

Confirming event messages

✓	An event message with the comment NEW is displayed.
▶	Press ESC/ Δ/∇ . The event message is confirmed.

Displaying event messages

1. ➤ Select **Event log** in the main menu.
2. ➤ Press **SET**.
 ⇒ The event messages are displayed in chronological order (latest message first).
3. ➤ Press **△▽** to page through the event messages.

Event messages

Event message	Description	Type
CountryCode failed	There is an inconsistency between the selected country setting and the country setting stored in memory. ► Notify your installer.	
Country parameters invalid	The inverter cannot inject into the grid because it has no valid parameters. ► Notify your installer.	
Device overheated	In spite of capacity reduction, the maximum permissible temperature is exceeded. The inverter does not inject into the grid until the permissible temperature range is reached. 1. Check whether the installation conditions are fulfilled. 2. Contact your installer if this alarm occurs frequently.	
Data transfer failed	A setting failed, for example during initial commissioning, because it has not been properly adopted. ► Repeat the setting. ► Contact your installer if this error occurs frequently.	
Fan faulty	The internal fan of the inverter is defective. It is possible that the inverter injects into the grid with reduced capacity. ► Notify your installer.	
Grid current DC offset too high	The DC current power share that is injected by the inverter into the grid, exceeds the permissible value. Pursuant to statutory regulations, the inverter switches off automatically as long as this fault is pending. ► Notify your installer.	
Grid frequency too high	The grid frequency applied on the inverter exceeds the permissible value. Pursuant to statutory regulations, the inverter switches off automatically as long as this fault is pending. ► Contact your installer if this error occurs frequently.	
Grid frequency too high for reactivation	After switch-off, the inverter cannot inject again because the grid voltage exceeds the legally prescribed switch-on value. ► Contact your installer if this error occurs frequently.	

Event message	Description	Type
Grid frequency too low	The grid frequency applied on the inverter is below the permissible value. Pursuant to statutory regulations, the inverter switches off automatically as long as this fault is pending. ► Contact your installer if this error occurs frequently.	
Grid frequency too low reactivation	After switch-off, the inverter cannot inject again because the grid voltage is below the legally prescribed switch-on value. ► Contact your installer if this error occurs frequently.	
Grid islanding detected	The grid is not carrying any voltage (self-run of the inverter). For safety reasons the inverter is not allowed to inject into the grid. It switches itself off as long as the error is present (display dark). ► Contact your installer if this error occurs frequently.	
Grid relay defective	The inverter has detected that a grid relay is defective; for this reason, it is not injecting into the grid. ► Notify your installer.	
Grid voltage too high	The grid voltage applied on the inverter exceeds the permissible value. Pursuant to statutory regulations, the inverter switches off automatically as long as this fault is pending. ► Contact your installer if this error occurs frequently.	
Grid voltage Ø too high	The output voltage averaged over the legally prescribed time period exceeds the permissible tolerance range. The inverter switches off automatically as long as this fault is pending. ► Contact your installer if this error occurs frequently.	
Grid voltage too low	The grid voltage applied on the inverter is below the permissible value. Pursuant to statutory regulations, the inverter switches off automatically as long as this fault is pending. ► Contact your installer if this error occurs frequently.	
Grid voltage Ø too low	The output voltage averaged over the legally prescribed time period is below the permissible tolerance range. The inverter switches off automatically as long as this fault is pending. ► Contact your installer if this error occurs frequently.	
Grid voltage too high for reactivation	After switching off, the inverter cannot resume feeding because the grid voltage exceeds the legally prescribed switch-on value. ► Contact your installer if this error occurs frequently.	
Grid voltage too low for reactivation	After switch-off, the inverter cannot inject again because the grid voltage is below the legally prescribed switch-on value. ► Contact your installer if this error occurs frequently.	
Intern.error	► Contact your installer if this alarm occurs frequently.	

Event message	Description	Type
Intern. info	► Contact your installer if this alarm occurs frequently.	
Intern. warning	► Contact your installer if this alarm occurs frequently.	
Isolation error	The insulating resistor between plus and minus input and ground underarranges the permissible value. For safety reasons the inverter is not allowed to inject into the grid. ► Notify your installer.	
L and N swapped	Outer conductor and neutral conductor are connected swapped out. For safety reasons the inverter is not allowed to inject into the grid. ► Notify your installer.	
No branding	The inverter has incorrect or faulty device data. For this reason, the inverter cannot inject into the grid. ► Notify your installer.	
No connection to the energy meter	The communication connection between the inverter and the energy meter is missing or not correct. ► Contact your installer to have the connection checked.	
Overtemperature HSS	The maximum permissible boost converter temperature has been exceeded. The inverter does not inject into the grid until the permissible temperature range is reached. 1. Check whether the installation conditions are fulfilled. 2. Contact your installer if this alarm occurs frequently.	
Power reduction due to temperature	The inverter reduces its output power because the maximum permissible temperature has been reached. 1. Check whether the installation conditions are fulfilled. 2. Contact your installer if this error occurs frequently.	
PV current too high	The input current at the inverter exceeds the permissible value. The inverter limits the current to the permissible value. ► Contact your installer if this alarm occurs frequently.	
PV voltage too high	The input voltage applied on the inverter exceeds the permissible value. ► Switch off the DC load-break switch of the inverter and notify your installer.	
Reading CountryCode failed	The inverter could not correctly read out the country setting from the memory. ► Notify your installer.	

Event message	Description	Type
Residual current too high	The fault current that flows from the plus or minus input via the PV generators exceeds the permissible value. Pursuant to statutory regulations, the inverter switches off automatically as long as this fault is pending. ► Notify your installer.	
RS485 Gateway activated	No communication with the inverter possible via the RS485 interface. ► Disconnect the inverter from the grid and reset it (AC reset). ► Have your installer carry out this operation.	
Software incompatible	"After a firmware update, the different software statuses in the inverter do not match any more. 1. Repeat the firmware update using a valid update file. 2. Contact your installer if this error occurs frequently.	
Time/date lost	The inverter lost the time because it remained unconnected from the grid for too long a time. Yield data cannot be stored, event messages only with incorrect date. ► Correct the time settings under Settings ► Time/date.	

7 Maintenance and disposal

7.1 Maintenance

The inverter is virtually maintenance-free. Nevertheless, we recommend that you inspect it regularly to ensure that the fins on the front and rear of the device are free of dust. Clean the device when necessary as described below.



NOTICE!

Danger of destroying components on devices of type coolcept³:

- **Do not** allow cleaning agents and devices to penetrate between the fins at the front of the inverter (under the grey hood).
- The following cleaning agents, in particular, **must not be used**:
 - Cleaning agents that contain solvent
 - Disinfectants
 - Gritty or sharp-edged cleaning materials

Removing dust



Dust should be removed using compressed air (max. 2 bar).

Removing heavy soiling



DANGER!

Risk of death by electrocution! Use cleaning agents only with a slightly damp cloth.

1.  Remove heavy soiling with a slightly damp cloth (use clear water). If necessary, use a 2 % hard soap solution instead of water.
2.  After cleaning, remove any soap residue using a slightly damp cloth.

7.2 Disposal

The crossed-out wheellie bin symbol on the device indicates that this product must not be disposed of with the normal household waste. It must be taken to a collection point for waste electrical and electronic equipment. Information on the collection points can be obtained from the local waste disposal company, the next collection point for household waste or from the dealer where you bought your device.

Electrical devices can contain hazardous components which, if they are disposed of improperly, may do harm to environment and human health. Separate collection ensures proper treatment, recovery and reuse of the raw materials contained in the waste equipment according to the provisions of current legislation.

The device packaging consists of recyclable materials.

8 Technical data

8.1 Inverter

8.1.1 StecaGrid 3203/3203x/4003/4003x

	StecaGrid 3203/x		StecaGrid 4003/x	
DC input side (PV generator connection)				
Number of DC inputs	1			
Maximum start voltage	1000 V			
Maximum input voltage	1000 V			
Minimum input voltage for feeding-in	250 V			
Start input voltage	250 V			
Rated input voltage	415 V		515 V	
Minimum input voltage for rated output	300 V		375 V	
Number of MPP trackers	1			
Operating input voltage range	250 ... 800 V			
Maximum input current	11 A			
Maximum short-circuit current	+20 A/- 13 A			
Rated input current	8 A			
Max. current refeed to PV generator	0 A			
Maximum input capacity at maximum output effective power	3,300 W		4,100 W	
Nominal input power (cos φ = 1)	3,300 W		4,100 W	
Derating / power limiting	occurs automatically when: ■ input power > max. recommended PV power ■ Cooling is inadequate ■ Input current too high ■ Output current too high ■ Grid frequency too high (in accordance with country setting) ■ Limiting signal on external interface ■ Output power limited (set on the inverter)			
DC side (storage connection) ¹⁾				
Voltage	580 V ... 1000 V			
Maximum current	10 A			

	StecaGrid 3203/x	StecaGrid 4003/x
AC output side (grid connection)		
Output voltage	320 V to 480 V (depending on the country settings)	
Rated output voltage	400 V	
Maximum output current	7 A	
Maximum inrush current (switch-on current)	16 A (for 10 ms)	
RMS short-circuit current	3.82 A _{RMS} (for 60 ms)	
Rated output current	4.6 A	5.8 A
Maximum effective power (cos φ = 1)	3,200 W	4,000 W
Maximum effective power (cos φ = 0.95)	3,040 W	3,800 W
Maximum effective power (cos φ = 0.90)	2,880 W	3,600 W
Maximum apparent power (cos φ = 0.95)	3,200 VA	4,000 VA
Maximum apparent power (cos φ = 0.90)	3,200 VA	4,000 VA
Rated output	3,200 W	4,000 W
Nominal frequency	50 Hz and 60 Hz	
Grid type	L ₁ /L ₂ /L ₃ /N/FE (protective earth)	
Grid frequency	45 Hz ... 65 Hz (depending on the country settings)	
Power losses in night-time operation	< 3 W	
Feeding phases	Three-phase	
Distortion factor (cos φ = 1)	< 1 %	
Power factor cos φ	0.8 capacitive ... 0.8 inductive	
Characterization of the operating behaviour		
Maximum efficiency	98.6 %	
European efficiency	97.9 %	98.1 %
California efficiency	98.3 %	98.4 %
MPP efficiency	> 99.7 % (static), > 99 % (dynamic)	

	StecaGrid 3203/x	StecaGrid 4003/x
Efficiency values (at 5 %, 10 %, 20 %, 25 %, 30 %, 50 %, 75 %, 100 % of the rated power) at rated voltage	82 %, 91.7 %, 95.6 %, 96.2 %, 96.8 %, 97.5 %, 97.7 %, 97.1 %	87.3 %, 93.7 %, 96.5 %, 97.1 %, 97.4 %, 97.9 %, 98 %, 97.7 %
Efficiency values (at 5 %, 10 %, 20 %, 25 %, 30 %, 50 %, 75 %, 100 % of the rated power) at minimum MPP voltage	81.6 %, 91.2 %, 95.1 %, 95.9 %, 96.3 %, 97 %, 97.1 %, 96.7 %	85.4 %, 92.8 %, 96.1 %, 96.7 %, 97 %, 97.5 %, 97.4 %, 97.1 %
Efficiency values (at 5 %, 10 %, 20 %, 25 %, 30 %, 50 %, 75 %, 100 % of the rated power) at maximum MPP voltage	86.4 %, 93.2 %, 96.2 %, 96.8 %, 97.3 %, 98 %, 98.2 %, 98.3 %	89.1 %, 94.5 %, 96.8 %, 97.3 %, 97.7 %, 98.2 %, 98.2 %, 98.1 %
Efficiency reduction in the case of a rise in ambient temperature (at temperatures > 40 °C)	0.005 %/°C	
Efficiency change in the case of deviation from the DC rated voltage	0.002 %/V	
Own consumption	< 8 W	
Power reduction at full power	from 50 °C (T _{amb})	
Switch-on power	10 W	
Switch-off power	8 W	
Safety		
Protection class	II	
Separation principle	No electrical isolation, transformer-less	
Grid monitoring	yes, integrated	
Insulation monitoring	yes, integrated	
Fault current monitoring	yes, integrated ²⁾	
Version overvoltage protection	Varistors	
Reverse polarity protection	yes	
Implementation conditions		
Implementation area	coolcept ³ : indoor rooms, with or without air conditioning coolcept ³ -x: indoor rooms, with or without air conditioning, out of doors with or without protection	
Climate classification pursuant to IEC 60721-3-3	coolcept ³ : 3K3 coolcept ³ -x: 4K4H	
Ambient temperature	-15 °C ... +60 °C	

	StecaGrid 3203/x	StecaGrid 4003/x
Storage temperature	−30 °C ... +70 °C	
Relative humidity	coolcept ³ : 0 % ... 95 %, non-condensing coolcept ³ -x: 0 % ... 100 %	
Installation altitude	≤ 2000 m above sea level	
Degree of pollution	PD3	
Noise emission (typical)	29 dBA	
Impermissible ambient gases	Ammonia, solvents	
Equipment and design		
Protection class	coolcept ³ : IP21 (housing: IP51; display: IP21) coolcept ³ -x: IP65	
Overvoltage category	III (AC), II (DC)	
DC connection		
Type	coolcept ³ : Phoenix Contact SUNCLIX (2 pairs: 1 x PV, 1 x battery) coolcept ³ -x: Phoenix Contact SUNCLIX (1 pair)	
Connection cross section	Conductor cross-section 2.5 ... 6 mm ²	
Opposing connector	Opposing connector (1 pair) included in delivery	
AC connection		
Type	Wieland RST25i5 plug	
Connection cross section	Cable diameter 10 ... 14 mm ² , conductor cross-section ≤ 4 mm ²	
Opposing connector	Opposing connector included in delivery	
Dimensions (X x Y x Z)	coolcept ³ : 340 x 608 x 222 mm coolcept ³ -x: 399 x 657 x 227 mm	
Weight	coolcept ³ : 10 kg coolcept ³ -x: 12 kg	
Display	Graphical display, 128 x 64 pixels	
Communication interfaces	RS485 (2 x RJ45 sockets: connection to Meteocontrol WEB'log or Solar-Log™), Ethernet interface (1 x RJ45), Modbus RTU (1 x RJ10 socket: connection to energy meter, only coolcept ³)	
Integrated DC circuit breaker	yes, compliant with VDE 0100-712	

	StecaGrid 3203/x	StecaGrid 4003/x
Cooling principle	Temperature-controlled fan, speed variable, internal (dust-protected)	
Test certificate	Certificates download see the product page on our homepage.	

Technical data at 25 °C / 77 °F

¹⁾ Only Steca storage-ready devices may be connected to the storage system connection. Batteries **cannot** be connected directly.

²⁾ Due to its design the inverter cannot cause any DC fault currents.

8.1.2 StecaGrid 4803x/5503x

	StecaGrid 4803x	StecaGrid 5503x
DC input side (PV generator connection)		
Number of DC inputs	1	
Maximum start voltage	1000 V	
Maximum input voltage	1000 V	
Minimum input voltage for feeding-in	250 V	
Start input voltage	250 V	
Rated input voltage	615 V	700 V
Minimum input voltage for rated output	490 V	560 V
Number of MPP trackers	1	
Operating input voltage range	250 ... 800 V	
Maximum input current	11 A	
Maximum short-circuit current	+20 A/- 13 A	
Rated input current	8 A	
Max. current refeed to PV generator	0 A	
Maximum input capacity at maximum output effective power	4,920 W	5,620 W
Nominal input power (cos φ = 1)	4,920 W	5,620 W

	StecaGrid 4803x	StecaGrid 5503x
Derating / power limiting	occurs automatically when: ■ input power > max. recommended PV power ■ Cooling is inadequate ■ Input current too high ■ Output current too high ■ Grid frequency too high (in accordance with country setting) ■ Limiting signal on external interface ■ Output power limited (set on the inverter)	
DC side (storage connection) ¹⁾		
Voltage	580 V ... 1000 V	
Maximum current	10 A	
AC output side (grid connection)		
Output voltage	320 V to 480 V (depending on the country settings)	
Rated output voltage	400 V	
Maximum output current	10 A	
Maximum inrush current (switch-on current)	16 A (for 10 ms)	
RMS short-circuit current	3.82 A _{RMS} (for 60 ms)	
Rated output current	7 A	8 A
Maximum effective power (cos φ = 1)	4,800 W	5,500 W
Maximum effective power (cos φ = 0.95)	4,560 W	5,225 W
Maximum effective power (cos φ = 0.90)	4,320 W	4,950 W
Maximum apparent power (cos φ = 0.95)	4,800 VA	5,500 VA
Maximum apparent power (cos φ = 0.90)	4,800 VA	5,500 VA
Rated output	4,800 W	5,500 W
Nominal frequency	50 Hz and 60 Hz	
Grid type	L ₁ /L ₂ /L ₃ /N/FE (protective earth)	
Grid frequency	45 Hz ... 65 Hz (depending on the country settings)	
Power losses in night-time operation	< 3 W	

	StecaGrid 4803x	StecaGrid 5503x
Feeding phases	Three-phase	
Distortion factor (cos φ = 1)	< 1 %	
Power factor cos φ	0.8 capacitive ... 0.8 inductive	
Characterization of the operating behaviour		
Maximum efficiency	98.7 %	
European efficiency	98.2 %	98.3 %
California efficiency	98.5 %	98.5 %
MPP efficiency	> 99.7 % (static), > 99 % (dynamic)	
Efficiency values (at 5 %, 10 %, 20 %, 25 %, 30 %, 50 %, 75 %, 100 % of the rated power) at rated voltage	92.8 %, 96.2 %, 97.9 %, 98.2 %, 98.4 %, 98.7 %, 98.6 %, 98.4 %	92.9 %, 95.8 %, 97.7 %, 98 %, 98.2 %, 98.5 %, 98.4 %, 98.2 %
Efficiency values (at 5 %, 10 %, 20 %, 25 %, 30 %, 50 %, 75 %, 100 % of the rated power) at minimum MPP voltage	87.8 %, 94.2 %, 96.8 %, 97.3 %, 97.6 %, 97.9 %, 97.8 %, 97.7 %	90.2 %, 95.1 %, 97.3 %, 97.6 %, 97.8 %, 98.2 %, 98.1 %, 97.7 %
Efficiency values (at 5 %, 10 %, 20 %, 25 %, 30 %, 50 %, 75 %, 100 % of the rated power) at maximum MPP voltage	89.6 %, 94.5 %, 97 %, 97.4 %, 97.7 %, 98.3 %, 98.4 %, 98.2 %	90.5 %, 95.1 %, 97.2 %, 97.6 %, 97.8 %, 98.2 %, 98.2 %, 98 %
Efficiency reduction in the case of a rise in ambient temperature (at temperatures > 40 °C)	0.005 %/°C	
Efficiency change in the case of deviation from the DC rated voltage	0.002 %/V	
Own consumption	< 8 W	
Power reduction at full power	from 50 °C (T _{amb})	
Switch-on power	10 W	
Switch-off power	8 W	
Safety		
Protection class	II	
Separation principle	No electrical isolation, transformer-less	
Grid monitoring	yes, integrated	
Insulation monitoring	yes, integrated	
Fault current monitoring	yes, integrated ²⁾	

	StecaGrid 4803x	StecaGrid 5503x
Version overvoltage protection	Varistors	
Reverse polarity protection	yes	
Implementation conditions		
Implementation area	indoor rooms, with or without air conditioning, out of doors with or without protection	
Climate classification pursuant to IEC 60721-3-3	4K4H	
Ambient temperature	−15 °C ... +60 °C	
Storage temperature	−30 °C ... +70 °C	
Relative humidity	0 % ... 100 %	
Installation altitude	≤ 2000 m above sea level	
Degree of pollution	PD3	
Noise emission (typical)	29 dBA	
Impermissible ambient gases	Ammonia, solvents	
Equipment and design		
Protection class	IP 65	
Overvoltage category	III (AC), II (DC)	
DC connection		
Type	Phoenix Contact SUNCLIX (1 pair)	
Connection cross section	Conductor cross-section 2.5 ... 6 mm²	
Opposing connector	Opposing connector (1 pair) included in delivery	
AC connection		
Type	Wieland RST25i5 plug	
Connection cross section	Cable diameter 10 ... 14 mm², conductor cross-section ≤ 4 mm²	
Opposing connector	Opposing connector included in delivery	
Dimensions (X x Y x Z)	399 x 657 x 227 mm	
Weight	12 kg	
Display	Graphical display, 128 x 64 pixels	
Communication interfaces	RS485 (2 x RJ45 sockets: connection to Meteocontrol WEB'log or Solar-Log™), Ethernet interface (1 x RJ45)	
Integrated DC circuit breaker	yes, compliant with VDE 0100-712	

	StecaGrid 4803x	StecaGrid 5503x
Cooling principle	Temperature-controlled fan, speed variable, internal (dust-protected)	
Test certificate	Certificates download see the product page on our home-page.	

Technical data at 25 °C / 77 °F

¹⁾ Only Steca storage-ready devices may be connected to the storage system connection. Batteries **cannot** be connected directly.

²⁾ Due to its design the inverter cannot cause any DC fault currents.

8.1.3 StecaGrid 5003/6003

	StecaGrid 5003	StecaGrid 6003
DC input side (PV generator connection)		
Number of DC inputs	1	
Maximum start voltage	1000 V	
Maximum input voltage	1000 V	
Minimum input voltage for feeding-in	250 V	
Start input voltage	250 V	
Rated input voltage	640 V	770 V
Minimum input voltage for rated output	470 V	560 V
Number of MPP trackers	1	
Operating input voltage range	250 ... 800 V	
Maximum input current	11 A	
Maximum short-circuit current	+20 A/- 13 A	
Rated input current	8 A	
Max. current refeed to PV generator	0 A	
Maximum input capacity at maximum output effective power	5,110 W	6,130 W
Nominal input power (cos φ = 1)	5,110 W	6,130 W

	StecaGrid 5003	StecaGrid 6003
Derating / power limiting	occurs automatically when: ■ input power > max. recommended PV power ■ Cooling is inadequate ■ Input current too high ■ Output current too high ■ Grid frequency too high (in accordance with country setting) ■ Limiting signal on external interface ■ Output power limited (set on the inverter)	
DC side (storage connection) ¹⁾		
Voltage	580 V ... 1000 V	
Maximum current	10 A	
AC output side (grid connection)		
Output voltage	320 V to 480 V (depending on the country settings)	
Rated output voltage	400 V	
Maximum output current	10 A	
Maximum inrush current (switch-on current)	16 A (for 10 ms)	
RMS short-circuit current	3.82 A _{RMS} (for 60 ms)	
Rated output current	7.2 A	8.7 A
Maximum effective power (cos φ = 1)	5,000 W	6,000 W
Maximum effective power (cos φ = 0.95)	4,750 W	5,700 W
Maximum effective power (cos φ = 0.90)	4,500 W	5,400 W
Maximum apparent power (cos φ = 0.95)	5,000 VA	6,000 VA
Maximum apparent power (cos φ = 0.90)	5,000 VA	6,000 VA
Rated output	5,000 W	6,000 W
Nominal frequency	50 Hz and 60 Hz	
Grid type	L ₁ /L ₂ /L ₃ /N/FE (protective earth)	
Grid frequency	45 Hz ... 65 Hz (depending on the country settings)	
Power losses in night-time operation	< 3 W	

	StecaGrid 5003	StecaGrid 6003
Feeding phases	Three-phase	
Distortion factor (cos φ = 1)	< 1 %	
Power factor cos φ	0.8 capacitive ... 0.8 inductive	
Characterization of the operating behaviour		
Maximum efficiency	98.7 %	
European efficiency	98.2 %	98.3 %
California efficiency	98.5 %	98.5 %
MPP efficiency	> 99.7 % (static), > 99 % (dynamic)	
Efficiency values (at 5 %, 10 %, 20 %, 25 %, 30 %, 50 %, 75 %, 100 % of the rated power) at rated voltage	92.8 %, 96.3 %, 97.9 %, 98.1 %, 98.3 %, 98.7 %, 98.5 %, 98.4 %	90.5 %, 95.3 %, 97.3 %, 97.7 %, 98.0 %, 98.2 %, 98.2 %, 97.9 %
Efficiency values (at 5 %, 10 %, 20 %, 25 %, 30 %, 50 %, 75 %, 100 % of the rated power) at minimum MPP voltage	87.9 %, 94.4 %, 96.9 %, 97.3 %, 97.6 %, 98.0 %, 97.8 %, 97.7 %	92.0 %, 96.2 %, 97.8 %, 98.1 %, 98.3 %, 98.4 %, 98.2 %, 97.8 %
Efficiency values (at 5 %, 10 %, 20 %, 25 %, 30 %, 50 %, 75 %, 100 % of the rated power) at maximum MPP voltage	89.8 %, 94.6 %, 97 %, 97.4 %, 97.7 %, 98.3 %, 98.3 %, 98.2 %	90.2 %, 95.1 %, 97.2 %, 97.6 %, 97.9 %, 98.0 %, 98.1 %, 97.7 %
Efficiency reduction in the case of a rise in ambient temperature (at temperatures > 40 °C)	0.005 %/°C	
Efficiency change in the case of deviation from the DC rated voltage	0.002 %/V	
Own consumption	< 8 W	
Power reduction at full power	from 50 °C (T _{amb})	from 45 °C (T _{amb})
Switch-on power	10 W	
Switch-off power	8 W	
Safety		
Protection class	II	
Separation principle	No electrical isolation, transformer-less	
Grid monitoring	yes, integrated	
Insulation monitoring	yes, integrated	
Fault current monitoring	yes, integrated ²⁾	

	StecaGrid 5003	StecaGrid 6003
Version overvoltage protection	Varistors	
Reverse polarity protection	yes	
Implementation conditions		
Implementation area	Indoor rooms, with or without air conditioning	
Climate classification pursuant to IEC 60721-3-3	3K3	
Ambient temperature	−15 °C ... +60 °C	
Storage temperature	−30 °C ... +70 °C	
Relative humidity	0 % ... 95 %, non-condensing	
Installation elevation	≤ 2000 m above sea level	
Degree of pollution	PD3	
Noise emission (typical)	29 dBA	
Impermissible ambient gases	Ammonia, solvents	
Equipment and design		
Protection class	IP 21 (housing: IP 51; display: IP 21)	
Overvoltage category	III (AC), II (DC)	
DC connection		
Type	Phoenix Contact SUNCLIX (2 pairs: 1 x PV, 1 x battery)	
Connection cross section	Conductor cross-section 2.5 ... 6 mm²	
Opposing connector	Opposing connector (1 pair) included in delivery	
AC connection		
Type	Wieland RST25i5 plug	
Connection cross section	Cable diameter 10 ... 14 mm², conductor cross-section ≤ 4 mm²	
Opposing connector	Opposing connector included in delivery	
Dimensions (X x Y x Z)	340 x 608 x 222 mm	
Weight	10 kg	
Display	Graphical display, 128 x 64 pixels	
Communication interfaces	RS485 (2 x RJ45 sockets: connection to Meteocontrol WEB'log or Solar-Log™), Ethernet interface (1 x RJ45), Modbus RTU (1 x RJ10 socket: connection to energy meter)	
Integrated DC circuit breaker	yes, compliant with VDE 0100-712	

	StecaGrid 5003	StecaGrid 6003
Cooling principle	Temperature-controlled fan, speed variable, internal (dust-protected)	
Test certificate	Certificates download see the product page on our home-page.	

Technical data at 25 °C / 77 °F

¹⁾ Only Steca storage-ready devices may be connected to the storage system connection. Batteries **cannot** be connected directly.

²⁾ Due to its design the inverter cannot cause any DC fault currents.

8.2 AC cables and line circuit breakers

Tab. 3: Conductor cross-sections of the AC cables and suitable line circuit breakers

Inverter	Cable cross section AC line	Power loss ¹⁾	Miniature circuit breaker
StecaGrid 3203/3203x	2.5 mm ²	4 W	B16
	4.0 mm ²	3 W	B16
StecaGrid 4003/4003x	2.5 mm ²	7 W	B16
	4.0 mm ²	4 W	B16
StecaGrid 4803x	2.5 mm ²	10 W	B16
	4.0 mm ²	7 W	B16
StecaGrid 5503x	2.5 mm ²	13 W	B16
	4.0 mm ²	8 W	B16
StecaGrid 5003	2.5 mm ²	11 W	B16
	4.0 mm ²	7 W	B16
StecaGrid 6003	2.5 mm ²	14 W	B16
	4.0 mm ²	8 W	B16

¹⁾ Power loss of the AC line at the inverter's nominal power and line length 10 m.

8.3 Country table

Due to legal requirements, the values in the table above may change at short notice. For a current overview, go to <http://www.steca.com/Wechselrichter-Wohnsiedlung>. You'll find the table for the respective product family under Downloads ⇒ Certificates.

9 Liability, commercial guarantee, legal guarantee

For the warranty terms for your device, go to
<http://www.steca.com/pv-grid/warranties>.

10 Contact

In the case of complaints or faults, please contact the local dealer from whom you purchased the product. They will help you with any issues you may have.

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Fax +49 (0) 8331 8558 132

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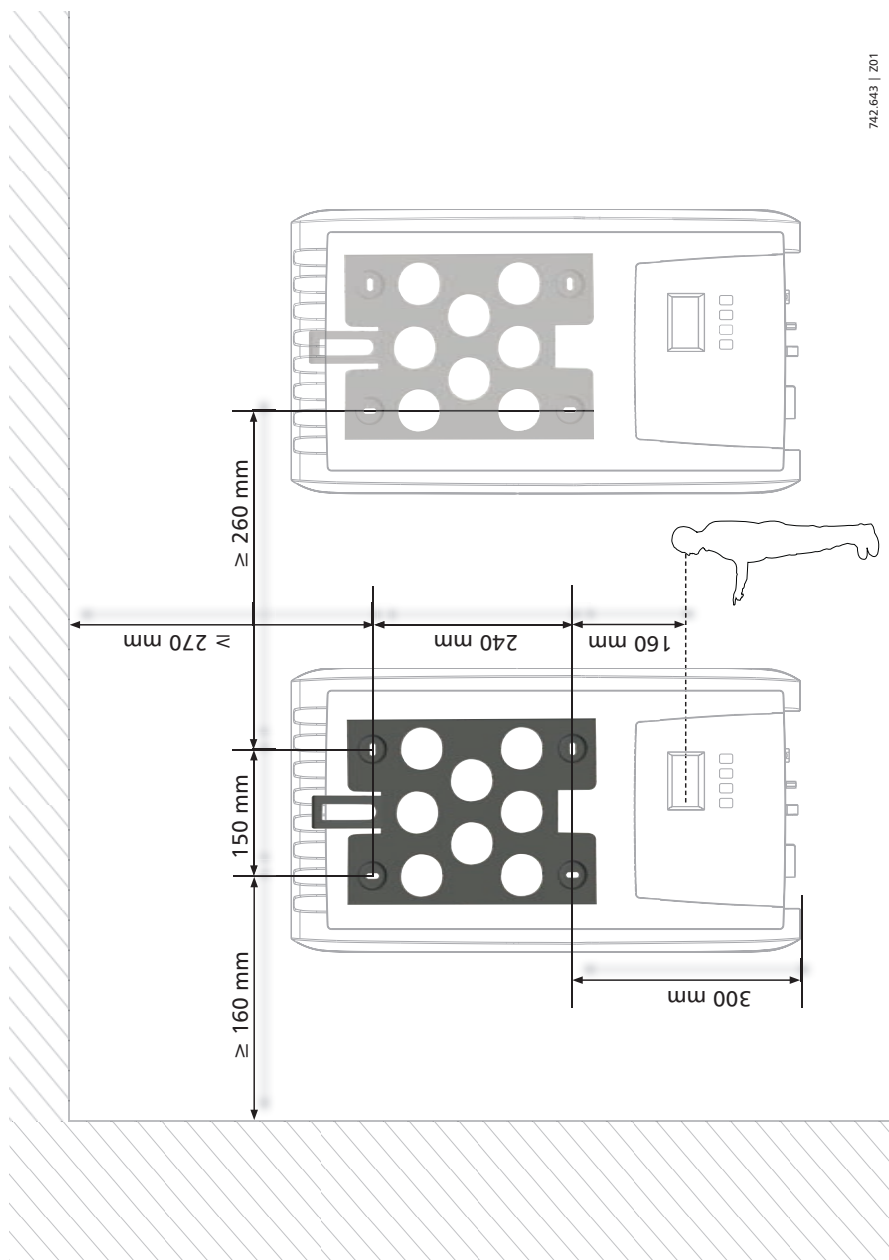
Internet www.stecasolar.com

Appendix

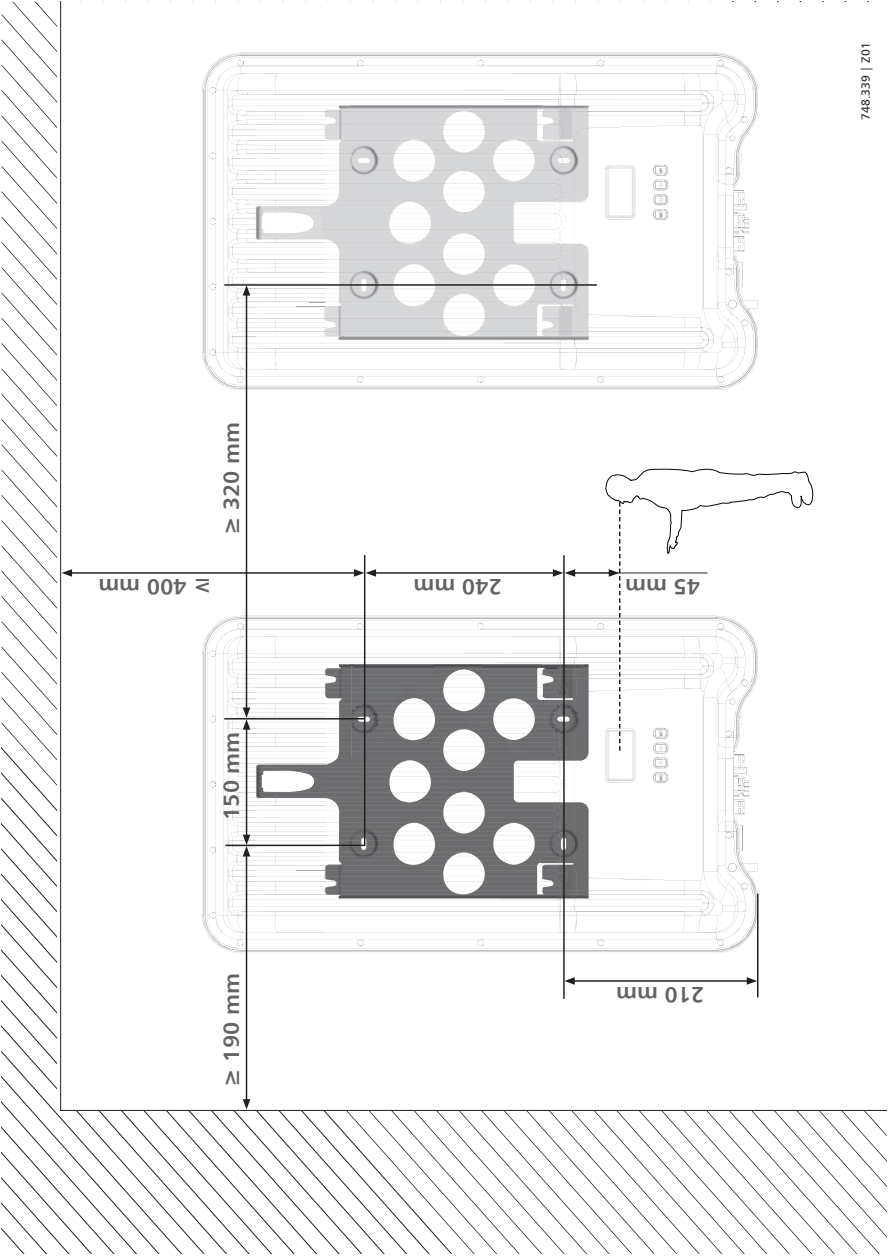
A Assembly

A.1 Bore dimension drawing for coolcept³ devices

742.643 | 201



A.2 Bore dimension drawing for coolcept³-x devices



A.3 AC plug

gesis RST 204/4/2015/2515

DEU **Montageanleitung für Steckverbinder 4...5-polig**
ENG **Mounting instructions for 4-/5-pole Connector**

gesis

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wieland

Montageanleitung (Mai 2006)
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Wichtige Information - bitte aufmerksam lesen

Dieses Beiblatt beschreibt die Montage der vier- und fünfpoligen gesis RST-Steckverbinder. Bitte beachten Sie, daß elektrische Anschlüsse und Installationen ausschließlich von hierfür ausgebildeten Fachkräften vorgenommen werden dürfen.

Important information - please read carefully

This leaflet is intended for use by trained electricians only. It describes the mounting of the four and five pole gesis RST connectors. Please observe the warnings and notes.

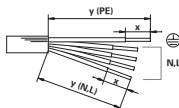
Kabeltypen

Cable types

- UL AWM Style 21098

Abmantellängen und Abisolierlängen (mm)

Dismantling and insulation strip lengths (mm)



Zugentlastung / strain relief	Ø 6...10 / 10...14	Ø 13...18
Leiter / conductor	PE N.L. PE N.L.	PE N.L. PE N.L.
Schraubanschluß / screw connection		
Abmantellänge y (mm) / Dismantling length y (mm)	30 25 55 50	
Abmantellänge y (Doppelschluß) / Dismantling length y (splitter connector)	45 40	
Abisolierlänge x (mm) / insulation strip length x (mm)	8	
	(Leiterquerschnitt/conductor cross section 1.5...4 mm²)	
Crimpschluß / crimp connection		
Abmantellänge y / Dismantling length y	42 37 49 44	
Abisolierlänge x / insulation strip length x	70+1	
	(Leiterquerschnitt/conductor cross section 0.75...4 mm²)	

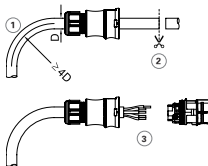
Biegeradius

Beachten Sie den minimalen Biegeradius der Leiter. Vermeiden Sie Zugkräfte auf die Kontaktstellen, indem Sie wie folgt vorgehen:

Bending radius

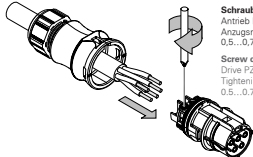
Note the minimum bending radius for conductors. Avoid pull forces on the contact points by proceeding as follows:

1. Leitung wie benötigt biegen
Bend the wire as required
2. Leitung ablängen
Cut the wire to length
3. Abmanteln, abisolieren.
Strip the cable and wires.



Leitermontage

Wire connection



Schraubanschluß:
Antidriv P21,
Anzugsmoment typ.
0.5...0.7 Nm

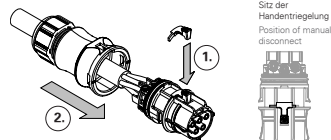
Screw connection:
Drive P21,
Tightening torque
0.5...0.7 Nm

Einsetzen der Handentriegelung (optional)

Die Handentriegelung ermöglicht das Trennen der Steckverbindung ohne Werkzeug.

Inserting the manual disconnect (optional)

The manual disconnect enables disconnecting without a tool.



Sitz der Handentriegelung
Position of manual disconnect

ACHTUNG / CAUTION

Bei Verwendung der Handentriegelung erlischt die Zulassung nach VDE 0606, da die Steckverbindung dann ohne Werkzeug zu öffnen ist.
Die Vorschrift VDE 0627 bleibt hiervon unberührt und wird im vollen Umfang eingehalten.

Connectors with manual disconnect are not approved according to VDE 0606 since the connection can be separated without tools.
Nevertheless, the direction VDE 0627 is obeyed to its full extent.

Verschließen

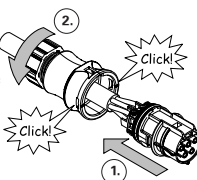
Closing

Verschraubung:

Anzugsmoment
typ. 4+1 Nm

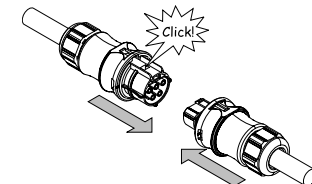
Screw connection:

Tightening torque
typ. 4+1 Nm



Stecken und verriegeln

Plugging and locking

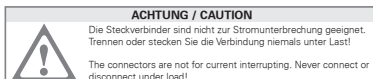
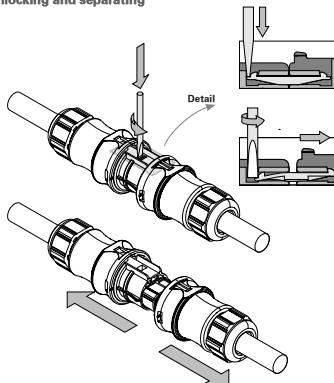


ACHTUNG / CAUTION

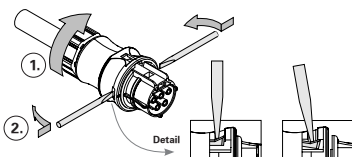
Die Steckverbinder sind nicht zur Stromunterbrechung geeignet.
Trennen oder stecken Sie die Verbindung niemals unter Last!

The connectors are not for current interrupting. Never connect or disconnect under load!

Entriegeln und Trennen Unlocking and separating



Öffnen des Steckverbinders Opening the connector

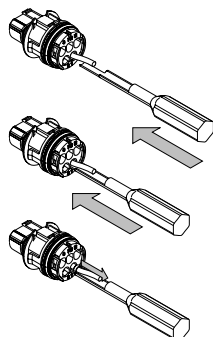


Leiterdemontage Crimpkontakte

Benutzen Sie zum Lösen der Crimpkontakte das Entriegelungswerkzeug (Art.-Nr. 05.502.3500.0). Zur Veranschaulichung der Handhabung ist nur ein Leiter gezeigt.

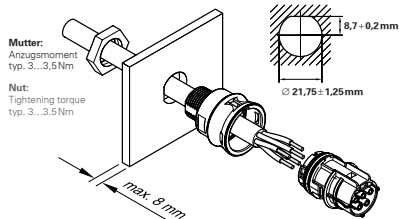
Unlocking crimp connections

For unlocking, use the tool (Ref.-No. 05.502.3500.0) as pictured. For clarity, only one conductor is shown.

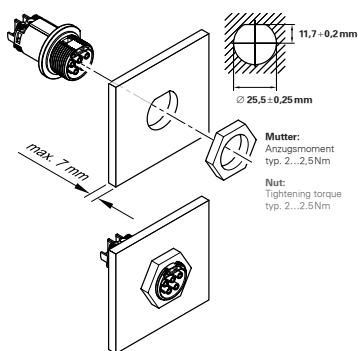


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Gehäuseeinbau mit M20-Durchführung Housing installation with M20 feedthrough



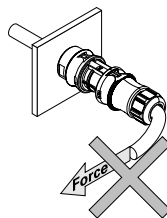
Gehäuseeinbau mit M25-Durchführung Housing installation with M25 feedthrough



ACHTUNG / CAUTION

Damit die Schutzart IP68 eingehalten wird, stellen Sie durch geeignete Maßnahmen sicher, daß die Steckverbinder vor Biegekräften geschützt sind (z.B. keine Lasten an Kabel hängen; Kabelaufwicklungen nicht freihängend etc.).

To ensure protection category IP68, do not expose the connection to bending forces (e.g. do not attach loads to the cable, no free-dangling cable windings etc.)



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[illegible]



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