



StecaGrid 8 000+ 3ph  
StecaGrid 10 000+ 3ph

**Installations- und Bedienungsanleitung**  
**Installation and operating instructions**  
**Notice d'installation et d'utilisation**

**DE EN FR**

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# 1 Preface

## Always symmetrical

The advantage of three-phase feeding is that the produced solar capacity is always symmetrically distributed on all three power conductors to the public power grid. This is the case across the whole output range offered by these inverters. When designing a system, the laborious work involved in avoiding asymmetry of more than 4.6 kW through the correct selection of separate inverters is thus dispensed with. Symmetrical feeding is greatly in the interests of energy supply companies. Lengthy discussions with such companies are therefore a thing of the past.

## Long service life

While the voltage passes through zero on the grid-feeding phase, single-phase inverters must temporarily accommodate all energy supplied by the solar modules within the device. This is usually realised by electrolytic capacitors. These components influence the service life of an electronic device, due to the possibility of drying out. With three-phase inverters, energy is fed into the grid on at least two phases at all times. Thus, the necessity of intermediate storage of energy in the device is greatly reduced, which is of benefit to the system operator with regard to a longer service life (see Fig. 1 and Fig. 2).

## Flexible connection

Due to the wide input voltage range and a high input current, all commonly available crystalline solar modules can be connected to the inverters in various configurations. Beyond this, the system is also approved for use with CdTe and CIS / CIGS thin-film modules (see [www.stecasolar.com/matrix](http://www.stecasolar.com/matrix)). Four plug/socket pairs are available for flexible, mechanical DC connection.

## Easy handling

The graphical LCD display is able to visualise the energy yield values, current performance and operating parameters of the system. Its innovative menu allows individual selection of the various measurements. The guided, pre-programmed menu allows easy initial commissioning of the device. Despite their high output, the inverters can be mounted to the wall. Thanks to the high degree of protection, the inverters can be installed indoors or outdoors. Due to the integrated DC circuit breaker, installation work is made easier, and the installation time is reduced. It is not necessary to open the inverter during installation.

## Flexible system design

Combined, the StecaGrid 8000+ 3ph and StecaGrid 10000+ 3ph inverters allow for an optimal dimensioning for almost all power classes. A diverse range of combinations are possible, but all with a common target: the effective use of solar irradiation.

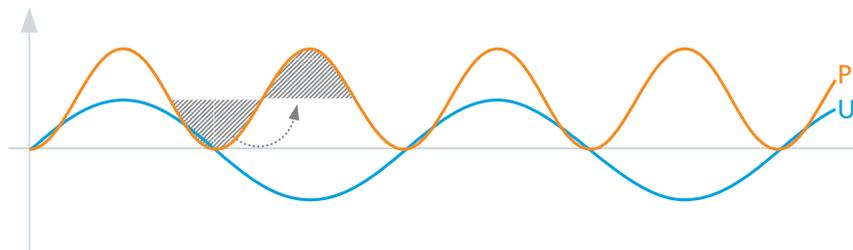


Fig. 1: Output P with single-phase grid feeding

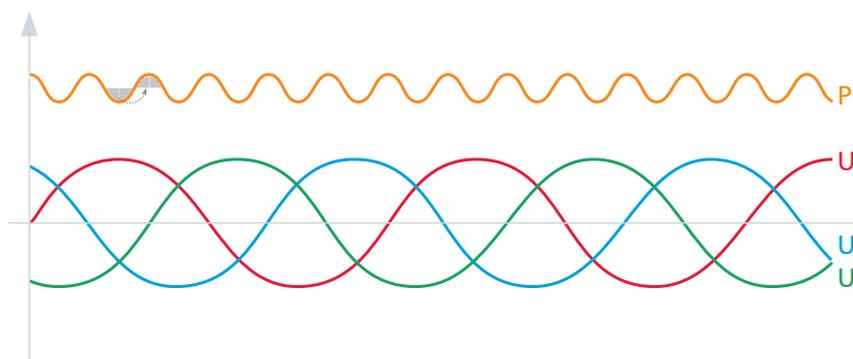


Fig. 2: Output P with three-phase grid feeding

## 2 Identification

### General information

Feature	Description
Type	StecaGrid 8000+ 3ph / StecaGrid 10000+ 3ph
Issue version of the manual	Z02
Manufacturer's address	See Section 17, p. 80.
Certificates	See p. 121 onwards and <a href="http://www.stecasolar.com">www.stecasolar.com</a> ⇒ StecaGrid 8000+ 3ph / 10000+ 3ph
Optional accessories	<ul style="list-style-type: none"> <li>• StecaGrid Vision remote display, Steca order no. 737.421</li> <li>• External data loggers: <ul style="list-style-type: none"> <li>– StecaGrid Monitor, Steca order no. 738.424</li> <li>– <i>WEB'log</i> from Meteocontrol</li> <li>– <i>Solar-Log</i> from Solare Datensysteme</li> </ul> </li> <li>• Grounding terminal, Steca order no. 743.012</li> <li>• Termination plug, Steca order no. 740.864</li> <li>• Opposing contacts for <i>Multi-Contact MC4</i> DC connections: <ul style="list-style-type: none"> <li>– Plug: Steca order no. 719.621</li> <li>– Socket: Steca order no. 719.622</li> </ul> </li> <li>• Safety sleeve for <i>Multi-Contact MC4</i>, Steca order no. 742.215</li> <li>• AC plug for cable diameter of 15 ... 18 mm<sup>2</sup>, Steca order no. 741.038</li> </ul>

Tab. 1: Identifying characteristics of the inverter

### Type plate

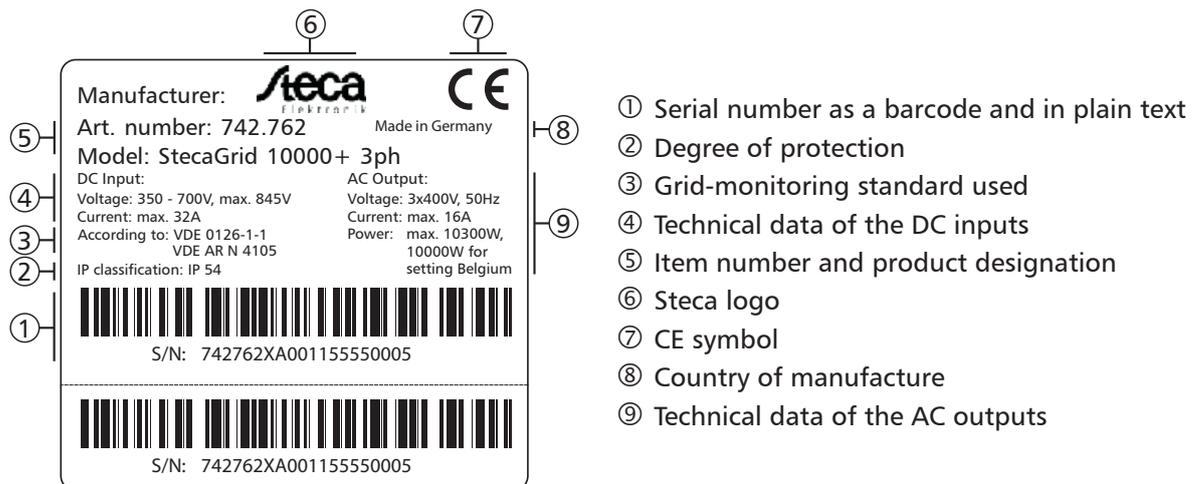


Fig. 3: Type plate (example)

For the position of the type plate, see Fig. 5, p. 47.

### Display

The correct version of the manual matching the software is shown under the *Information/System info* menu item in the display. The optionally available *StecaGrid Vision* remote display also shows this version information; more information on this is provided in the *StecaGrid Vision* operating instructions.

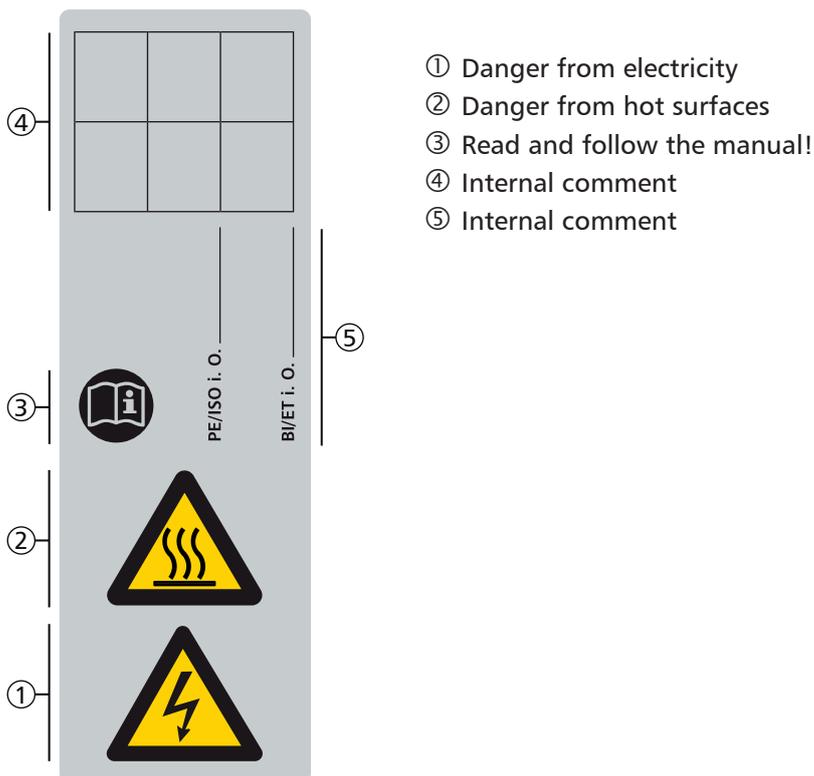
### 3 General safety instructions

- 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.
- Improper operation can reduce the yields of the photovoltaic system.
- The device must not be connected to the DC or AC cables if it has a damaged casing.
- If one of the following components is damaged, immediately take the device out of operation and disconnect it from the mains grid and solar modules.
  - Device: not functioning, visible damage (including at the front operating panel), smoke, etc.
  - Cables
  - Solar modules

The photovoltaic system must not be switched on again until:

  - The device has been repaired by a dealer or the manufacturer.
  - Damaged cables or solar modules have been repaired by a technical specialist.
- Never cover the casing.
- Do not open the casing. Risk of death. Invalidation of the guarantee.
- Factory labels and markings must never be altered, removed or rendered unreadable.
- The surface temperature of the casing can exceed +70 °C.
- Observe the respective manufacturer's manual when connecting an external device that is not described in this document (e.g. external data logger). Incorrectly connected devices can damage the inverter.

#### Safety instructions on the device



## 4 Scope of delivery

- StecaGrid 8000+ 3ph/10 000+ 3ph ①
- Mounting rail ②
- AC plug ③
- Installation and operating instructions ④
- Data cable ⑤

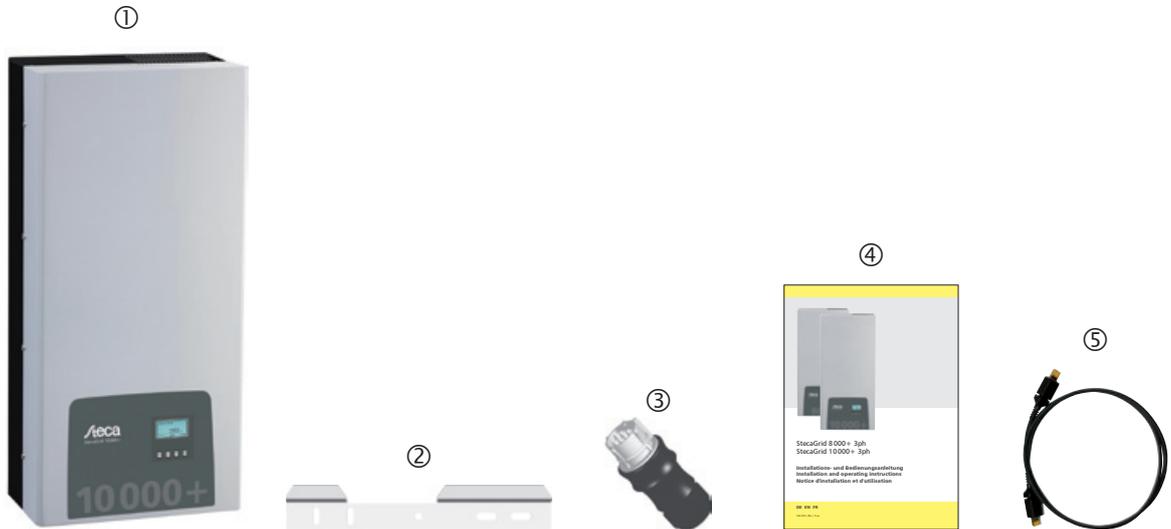


Fig. 4: Scope of delivery

## 5 Proper usage

The inverter may only be used in grid-connected photovoltaic systems. Up to 4 module strings can be connected. All solar modules are suitable whose connections do not need to be grounded.

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### Note

An overview of suitable solar modules is available at [www.stecasolar.com/matrix](http://www.stecasolar.com/matrix).

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## 6 About this manual

### 6.1 Contents

This manual contains all information required by a technical professional for setting up and operating the inverter. Follow the instructions of the respective manufacturers when installing other components (e.g. solar modules, cables).

### 6.2 Target audience

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

### 6.3 Markings

#### 6.3.1 Symbols

Tab. 2 describes the symbols used in this manual and on the device.

Symbol	Description	Location	Symbol	Description	Location
	General danger warning	Manual		Danger from hot surfaces	Manual Device
	Danger from electricity	Manual Device		Read the manual before using the product.	Device

Tab. 2: Symbols used in this manual and on the device

#### 6.3.2 Keywords

The keywords described in Tab. 3 are always used in conjunction with a symbol from Tab. 2.

Keyword	Description
<b>Danger</b>	immediate danger of death or serious bodily injury
<b>Warning</b>	possible danger of death or serious bodily injury
<b>Caution</b>	possible danger of light or medium bodily injury
<b>Notice</b>	possible damage to property
<b>Note</b>	note on operation or use of the manual

Tab. 3: Keywords

#### 6.3.3 Markings used in the text

Marking	Description	Marking	Description
√	condition for action	<i>Italics</i>	emphasis, light
▶	single step	<b>Bold</b>	emphasis, heavy
1., 2., 3., ...	several steps in sequence	Courier	designation of product elements such as buttons, displays, operating states

Tab. 4: Markings used in the text

### 6.3.4 Abbreviations

Abbreviation	Description
MSD	internal grid monitoring of the inverter (MSD = Mains monitoring with allocated Switching Devices)
MPP	working point producing the most power (MPP = Maximum Power Point)
MPP tracker	controls the power of the connected module strings to match the MPP
SELV	safety low voltage (SELV = Safety Extra Low Voltage)
$V_{PV}$	the generator voltage present at the DC connection (photovoltaic voltage)

Tab. 5: Abbreviations

## 7 Structure and function

### 7.1 Casing

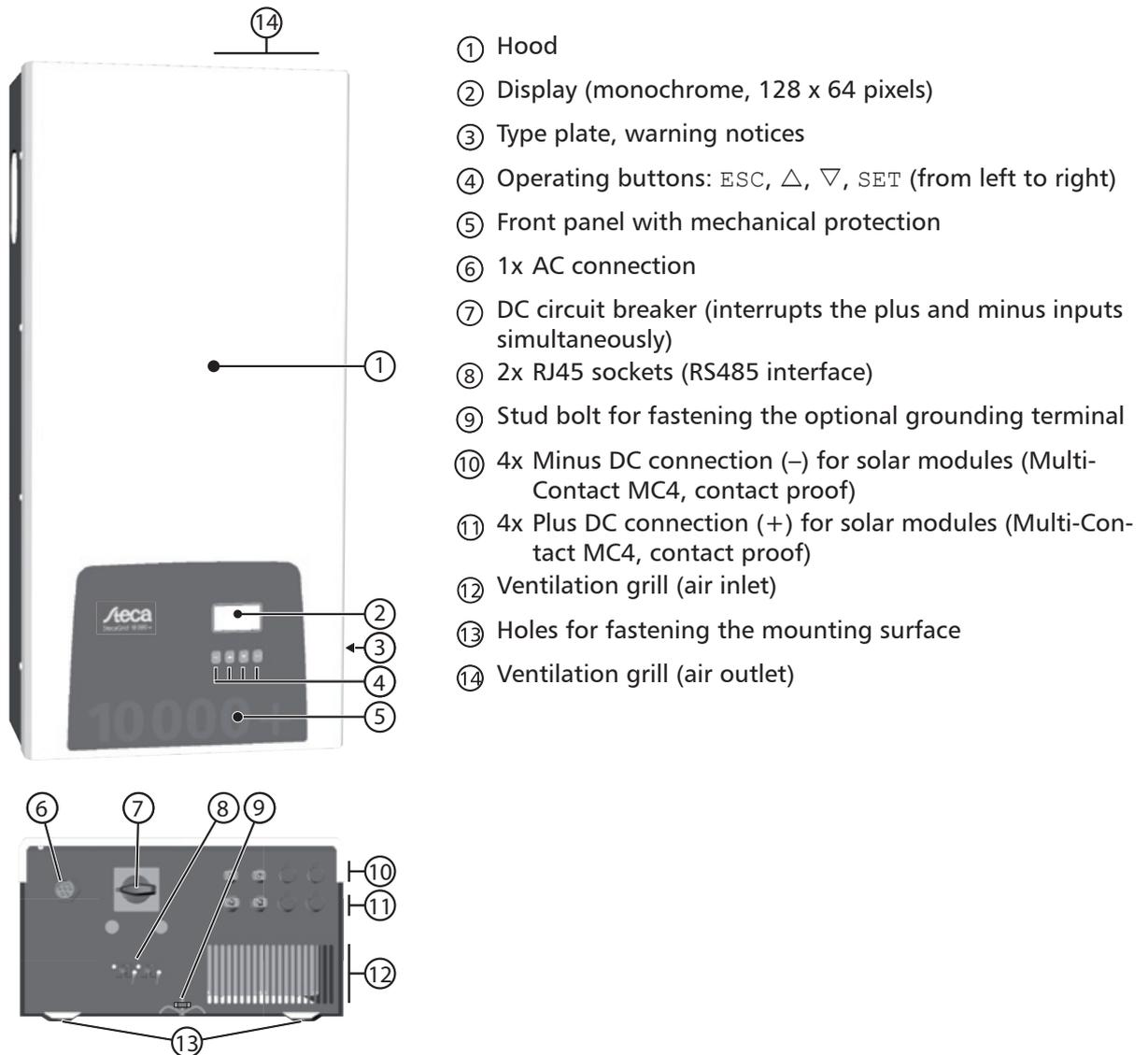


Fig. 5: Components on the front and lower sides of the casing  
The casing components are described in detail below.

## 7.2 Operating buttons

The operating buttons (④ in Fig. 5) have the following functions:

Button	Action	Function	
		General	Guided configuration process
ESC	Press briefly	<ul style="list-style-type: none"> <li>• jumps up by one menu level</li> <li>• discards any changes</li> </ul>	<ul style="list-style-type: none"> <li>• navigates 1 step back</li> </ul>
	Press longer (≥ 1 second)	<ul style="list-style-type: none"> <li>• jumps to the status display</li> </ul>	<ul style="list-style-type: none"> <li>• jumps to the start of the guided configuration process</li> </ul>
△	Press briefly	<ul style="list-style-type: none"> <li>• moves the selection bar or the display content upwards</li> <li>• when performing numerical settings, moves the selection 1 position to the left</li> <li>• increases the setting value by 1 step</li> </ul>	
▽	Press briefly	<ul style="list-style-type: none"> <li>• moves the selection bar or the display content downwards</li> <li>• when performing numerical settings, moves the selection 1 position to the right</li> <li>• decreases the setting value by 1 step</li> </ul>	
SET	Press briefly	<ul style="list-style-type: none"> <li>• jumps down by one menu level</li> </ul>	<ul style="list-style-type: none"> <li>• a selected numerical value starts flashing and can be changed</li> <li>• adopts a change</li> <li>• changes the state of a control element (check box/radio button)</li> </ul>
	Press longer (≥ 1 second)	<ul style="list-style-type: none"> <li>• answers a query dialog with Yes</li> </ul>	<ul style="list-style-type: none"> <li>• navigates 1 step forward</li> </ul>

Tab. 6: Functions of the operating buttons

## 7.3 Display

### 7.3.1 General information

For information shown in the display (② in Fig. 5) the following generally applies:

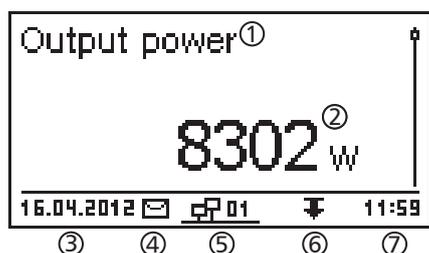
- Symbol : The inverter is processing large amounts of data and is not able to process any user input at this time. The resulting waiting time is indicated by the animated sun symbol.
- If hidden content is present, a column with a scroll bar appears at the right side of the display. The size of the scroll bar indicates the amount of hidden content.
- Selected entries are highlighted in black with white text.
- The backlighting switches off automatically 30 seconds after the last button was pressed.
- Errors are indicated by a red flashing backlighting. An event message is also displayed at the same time.

## 7.3.2 Information

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

### Status display

The status display shows measurements as listed below:



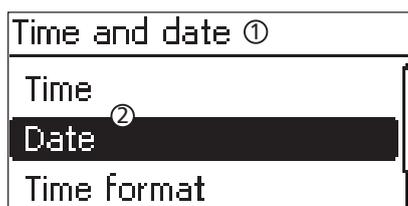
- ① Measurement name
- ② Measurement with units
- ③ Date
- ④ Symbol *non-confirmed status messages*; more information on this is provided in Section 11, p. 73.
- ⑤ Animated *Connect* symbol with 2-digit inverter address; indicates data traffic on the RS485 bus.
- ⑥ Symbol for *Derating*
- ⑦ Time



The following applies to the status display:

- The measurements shown in the status display are defined under *Settings/Measurements*. Some measurements are always displayed (default setting).
- Current values are not displayed at night (solar irradiation too low; example in fig left).
- The CO<sub>2</sub> savings shown in the status display are calculated using the savings factor 508 g/kWh.

### Menu



- ① Designation of the main/submenu
- ② Menu entries

### Numeric yield (day, month, year)

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

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

- 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 days<sup>1)</sup>

Monthly yield: last 12 months<sup>1)</sup>

Annual yield: last 30 years<sup>1)</sup>

- <sup>1)</sup> A yield value of 0 is shown when the inverter was not yet installed at this time.

### Numeric yield (total yield)

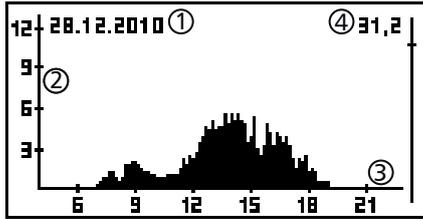
The total yield is displayed in its own window.



- ① Yield period for *Total yield* (all yields since initial commissioning)
- ② Starting point of recording
- ③ Total yield with units

## Graphical yield (day, month, year)

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



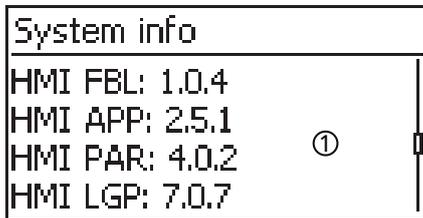
- ① Period for a single yield value (here: Day yield)
- ② y-axis:
  - Yield in kWh
  - With an extra *M*: yield in MWh
  - The scaling changes depending on the maximum value
- ③ x-axis: time in hours/days/months/years
- ④ Total of all individual yields shown in the diagram, in kWh

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

## Event messages

See Section 11, p. 73.

## Information



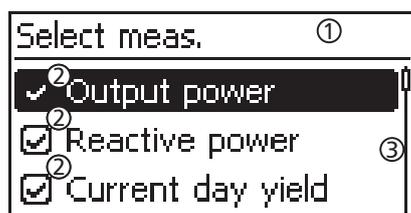
The **Information** menu item contains the following sub-menu items.

- **Contact info**
- **System info** (see fig. left):
  - Product designation
  - Serial number of the inverter
  - Information on the software and hardware versions of the inverter (see example ① in fig. left)
  - Country setting (country currently set)
  - Inverter address
  - Version of the operating instructions for the inverter
- **Country setting**: country that is currently set and country-specific grid parameters; see also p. 78
- **React. pwr. char. curve**: reactive power characteristic curve graph (only when prescribed for currently set country)
- **Self test**: result of the last successfully performed self test (only when the configured country is *Italy*)

### 7.3.3 Control elements

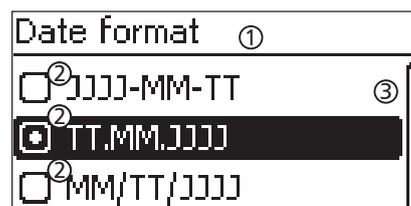
The control elements shown on the display, which are used for performing settings in the inverter, are described below using illustrative examples.

#### Selection list with check boxes



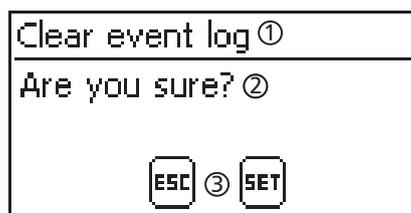
- ① Designation of the selection list
- ② Check boxes with names:
  - Check boxes allow multiple selection
  - The currently selected check box is highlighted in black
  - Preset check boxes have no frame and are always switched on (cannot be changed).
- ③ Scroll bar

#### Selection list with radio buttons



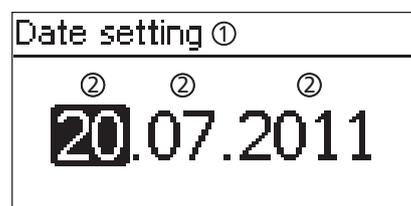
- ① Designation of the selection list
- ② Radio buttons with names:
  - Radio buttons are exclusive-OR (only one radio button can be switched on)
  - The currently selected radio button is highlighted in black
- ③ Scroll bar

#### Dialogs



- ① Dialog heading
- ② A question presented to the user
- ③ Response possibilities:
  - Back** (cancel): Press `ESC`
  - Confirm** (answer the question with Yes): press and hold `SET` for 1 second

#### Numerical settings



- ① Designation of the numerical setting
- ② Value to be set; the selected value to be set is highlighted in black.

When performing numerical settings of remuneration and dates, the following applies:

##### Remuneration

- Possible currencies: £ (Pound), € (Euro), kr (Krone), *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 a currency of *none*).

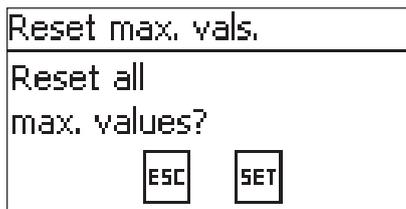
##### Date

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.

## 7.3.4 Other important display fields

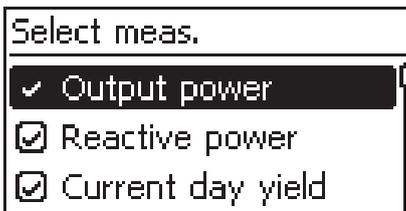
### Reset maximum values dialog



The *Reset maximum values* dialog allows the following stored maximum values to be reset to 0:

- Maximum daily power
- Maximum daily yield
- Absolute maximum power

### Select measurements



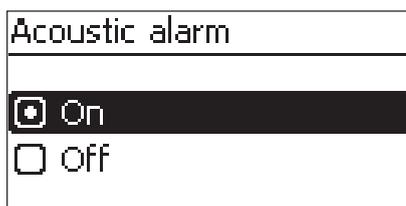
Selection of the measurements to be shown in the status display. The following measurements can be selected:

- Output power: output power of the inverter <sup>1)</sup>
- Reactive power: current reactive power in *var*
- Act. day yield: daily yield from 0:00 until now.
- PV voltage: the voltage supplied by the solar modules
- PV current: the current supplied by the solar modules
- Grid voltage L1<sup>1)</sup>, L2, L3
- Grid current L1, L2, L3: the current fed into the mains grid
- Grid frequency
- Internal temp.: the internal temperature of the inverter
- Power reduction (Derating): cause of the power reduction
- Day max. power: the maximum power supplied in the current day <sup>2)</sup>
- Abs. max. power: the maximum power ever fed into the grid <sup>2)</sup>
- Day max. yield: the maximum daily yield achieved <sup>2)</sup>
- Operating hours: the operating hours during which the device has been connected to the grid (including night-time hours)
- Total yield: yield since commissioning
- CO<sub>2</sub> saving: CO<sub>2</sub> savings achieved since commissioning

<sup>1)</sup> Measurement is always displayed (cannot be switched off)

<sup>2)</sup> Can be reset to 0 via *Settings/Reset max. values*.

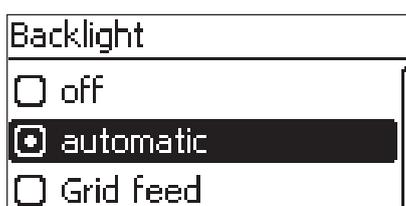
### Acoustic alarm



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

- 2 tones: warning
- 3 tones: error

### Backlighting



- off
- automatic: switches on for 30 seconds when a button is pushed
- grid feed:
  - *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

## 7.3.5 Service menu

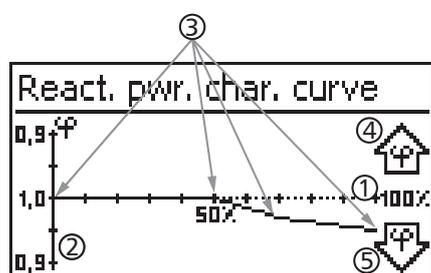
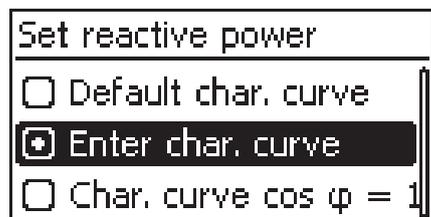
The following section describes the service menu items.

### Notice

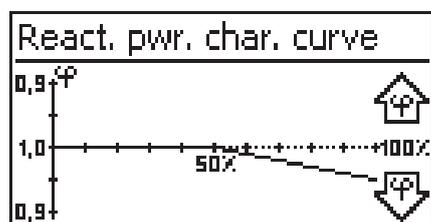
Risk of reduced yields. Inverter and grid parameters can be changed in the service menu. The service menu may only be used by professional personnel who can ensure that the changes do not contravene the applicable regulations and standards.

## Reactive power characteristic curve

### Overview



### Technical details



The reactive power characteristic curve must be set during initial commissioning if this is prescribed for the previously selected country. The following applies:

country. The following applies:

- 3 characteristic curves are available for selection (fig. left):
  - Default char. curve (pre-defined)
  - Char. curve  $\cos \varphi = 1$  (pre-defined)
  - Enter char. curve (manually adjustable)
- After configuration, the characteristic curve is displayed as a graph (example in fig. left).
  - ① x-axis, output power P in %
  - ② y-axis, phase shift  $\cos \varphi$
  - ③ Nodes (in example: 4 nodes)
  - ④ Arrow symbol *Overexcitation*
  - ⑤ Arrow symbol *Underexcitation*

- Each characteristic curve is defined by 2 to 8 nodes.
  - A node is defined by the output power P of the inverter (x-axis) and the associated phase shift (y-axis).
  - The phase shift can be set over a range of 0.90 (overexcitation) through 1.00 (no phase shift) to 0.90 (underexcitation).
  - The type of phase shift is shown in the graph using arrow symbols defined as follows (defined from the point of view of the inverter):
    - ↑φ: overexcitation, inductive
    - ↓φ: underexcitation, capacitive
  - The 3 characteristic curves available for selection have the following properties:
    - Default char. curve: pre-defined according to the selected country (example in fig. left).
    - Char. curve  $\cos \varphi = 1$ : pre-defined with  $\cos \varphi =$  constantly 1.00. This characteristic curve must be selected if no reactive power control is to be performed on the device.
    - Enter char. curve: the number of nodes and their x/y values can be configured.
- Exceptions: the first node is always located at  $x (P\%) = 0\%$  and the last node is always located at  $x (P\%) = 100\%$ .

## 7.4 Additional grounding connection

If prescribed, the inverter can be grounded via an additional stud bolt. A grounding terminal for the stud bolt is optionally available; see Fig. 5, p. 47.

## 7.5 Cooling

The internal temperature control system prevents excessive operating temperatures. If the internal temperature of the inverter exceeds the (derating) limit then the amount of power taken from the solar modules is automatically adjusted. This reduces the heat emission from the inverter and prevents the operating temperature from becoming too high.

The inverter is cooled at the rear by cooling fins and 2 maintenance-free fans.

## 7.6 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.

The legally prescribed specifications for the grid parameters are described in the *Table of countries*, p. 78.

## 7.7 Data communication

### 7.7.1 Displayed data

The inverter displays the following data:

- Voltage and current of the solar 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

Some of this data can be sent to the devices listed under 7.7.3.

### 7.7.2 Logged data

The inverter stores the following data permanently in internal memory (EEPROM):

- Error conditions, notes
- Energy yields on a daily, monthly and annual basis (Tab. 7).

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

Energy yield data	Storage resolution/ period
10-minute values	31 days
Daily values	12 months
Monthly values	30 years
Annual values	30 years
Total yield	permanent

Tab. 7: Storage resolution of the energy yield data

### 7.7.3 Interfaces and connected devices

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

- The inverter has two RS485 interfaces on the lower side of the casing (HARTING RJ45 sockets with PushPull locking mechanism).
- The beginning and end of the RS485 bus must be terminated; see also 7.7.5.
- A data cable is supplied with each inverter (1.5 m long, HARTING RJ45 plug with PushPull locking mechanism). Use an *alternative data connection cable* for longer connections; see 7.7.4.
- The inverters connected to the RS485 bus operate as bus slave units.

#### Note

The following inverters have compatible data interfaces and can also be connected to the RS485 bus as slaves: StecaGrid 3000, 3600, 8000, 10 000. Observe the manuals of these devices concerning the definition of addresses, termination and permissible data cables.

- If an *optional device* is connected to the bus, then this device operates as a bus master.
- Only 1 master may be connected to the RS485 bus at any given time.

The following *optional devices* support the transfer protocol used by the inverter:

- StecaGrid Vision remote display: display of the data from inverters connected to the RS485 bus
- PC or notebook (with suitable software, for technical professionals only):
  - Load firmware updates
  - Read inverter information using Steca service software
  - An optional RS485/USB adapter for connecting to the inverter is also available. The adapter is available from Steca.
- External data loggers (optional), recommended by Steca for professional system monitoring:
  - StecaGrid Monitor
  - WEB'log (Meteocontrol)
  - Solar-Log (Solare Datensysteme)

---

#### Note

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. 6: Wiring diagram, using the StecaGrid Vision remote display as an illustrative example

- ① Optional: StecaGrid Vision or external data logger (here: StecaGrid Vision)
- ② First inverter
- ③ Inverter
- ④ Last inverter, terminated
- ⑤ Data cable (supplied with the device)
- ⑥ Data cable (supplied with the device) or alternative data cable

### 7.7.4 Alternative data connection cable

#### Notice

Material damage caused by electrical voltage!

- The alternative data connection cable may only be manufactured by professional personnel.
- To connect it to the RJ45 socket of the first inverter, a *HARTING PushPull 10G No. 09 45 145 1560* RJ45 plug must be used to ensure that the inverter meets the specified degree of protection.

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 a 1:1 pin assignment if the alternative data connection cable is connected to the RJ45 sockets of the inverters and the StecaGrid Vision.
- Use the pin assignment according to Tab. 8, p. 56 if the alternative data connection cable is connected to the RJ45 socket of the first inverter and to the COMBICON connector of the StecaGrid Vision or to the connector of an external data logger.

			External data loggers				
Device	Inverter	StecaGrid Vision <sup>1)</sup>		StecaGrid Monitor	Solar-Log	Web'log  <sup>2)</sup>	
Plug	RJ45	RJ45	COMBICON <sup>1)</sup>	Terminal strip	Terminal strip	RJ12	Signal ↓
Pin	1	1	1	19 / 11 / 15	1	2	Data A
	2	2	2	21 / 13 / 17	4	4	Data B
	3	3	–	–	–	–	–
	4	4	–	–	–	–	–
	5	5	–	–	–	–	–
	6	6	–	–	–	–	–
	7	7	–	–	–	–	–
	8	8	3	1	3	6	Ground

Tab. 8: Pin assignments of the alternative data cable

<sup>1)</sup> Plugs for the alternative data cable are included in the scope of delivery for the StecaGrid Vision. More information is provided in the StecaGrid Vision manual.

<sup>2)</sup>

#### Notice

Danger of destroying the RS485 input of the inverter.

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!

### 7.7.5 Termination

To prevent data transmission errors, the start and end of the RS485 bus must be terminated.

- The StecaGrid Vision (at the start of the data connection) is permanently terminated internally.
- 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 using the optionally available termination plug (RJ45 plug).

### 7.7.6 Addressing

Every inverter must be assigned its own unique address for the communication between the bus master and slaves to function correctly; see also 7.7.3.

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.

### 7.7.7 Feed-in management

Depending on the country, the active power fed into the grid by a photovoltaic system must be able to be reduced by the grid operator. The following optionally available products are recommended for implementing this legally prescribed specification:

- WEB'log from Meteocontrol
- Solar-Log from Solare Datensysteme

## 8 Installation

### 8.1 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*.
- **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 Multi-Contact MC4 connections of the DC cables according to the manufacturer's instructions. A special tool is required for this.
    - ⚠ **Warning:** DC cables carry voltage when the solar modules are subjected to sunlight.
  4. Pull out the AC plug from the inverter as described in Section 8.10, p. 66.
  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).
- Do not connect cables to the inverter until explicitly asked to do so in the instructions.
- Do not open the casing. Risk of death. Invalidation of the guarantee.
- Connect only suitable circuits to the RJ45 sockets (RS485 interface).
- 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.

#### Notice

Danger of damage to the inverter or power reduction (derating)!

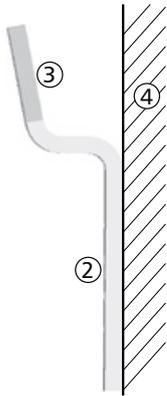
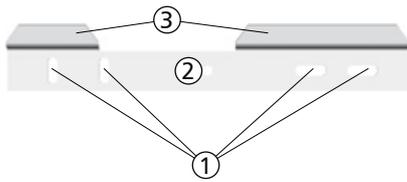
- The mounting location must satisfy the following conditions:
  - The mounting location and immediate environment are permanently fixed, vertical, flat, non-inflammable and not subject to constant vibration.
  - The permissible ambient conditions are conformed to; see *Technical data Inverter*, p. 76.
  - The following free spaces must be present around the inverter:
    - At the sides 150 mm
    - Above/below 250 mm
- Do not install the inverter in areas where animals are kept.
- Install the inverter in an environment that is as free as possible from dust to avoid impairment of the cooling function.
- Observe the connection ratings specified on the inverter type plate.
- The DC cables must not be connected to an earth potential (DC inputs and AC output are not galvanically isolated).
- Do not install inverters directly above each other, but rather offset so that the upper inverter is not heated by the radiated heat of the lower inverter.

#### Note

- Avoid exposing the inverter to direct sunlight.
- The display must be readable on the installed device.
- Choose an installation location where the noise emission of the device will not be a disturbance.

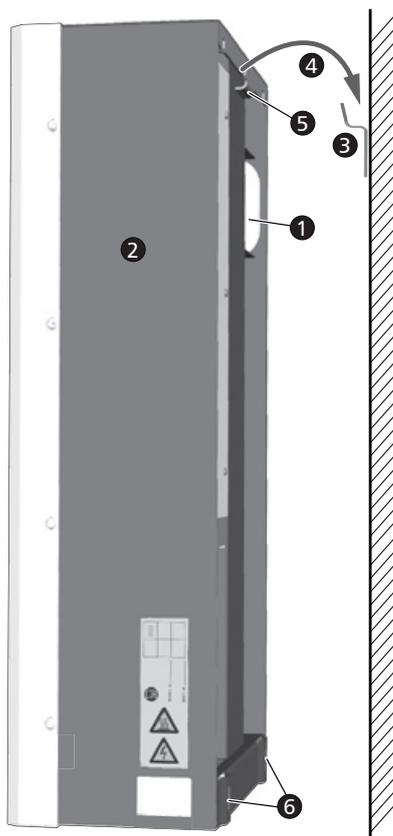
## 8.2 Mounting the inverter

### Fastening the mounting rail



1. Cover the upper ventilation holes of the inverter that lie below the mounting position (protection from drilling dust).
2. Fasten the mounting rail *level* on the mounting surface using at least 2 stainless steel screws, as shown in the illustrations at the left. Observe the following:
  - At least 2, or a maximum of 4, stainless steel screws are required, depending on the load-bearing capacity of the mounting surface.
  - Use screws and dowels etc. of a size appropriate for the weight of the inverter.
  - The main part ② of the mounting rail must lie flat on the mounting surface ④ with the attachment area ③ for the inverter casing facing upwards.

### Hanging the inverter on the mounting rail



#### Caution

Danger of personal injury. The inverter weighs 42 kg.

- Always carry the inverter using at least two people.
- Use the handle ① to carry the device.



#### Caution

Danger from hot surfaces. Allow hot inverters to cool down before touching.

1. Hang the inverter ② on the mounting rail ③ ④. Position the inverter so that the sheet metal tongue ⑤ slides into the corresponding recess on the mounting rail (between the mounting areas for the casing).
2. Fasten the inverter to the mounting surface through the fastening holes ⑥, using 2 suitable stainless steel screws and dowels etc.

#### Note

The procedure for removing the inverter from the mounting rail is described in 8.10, p. 66.

## 8.3 Preparing the AC connection

### 8.3.1 AC and DC connection diagram

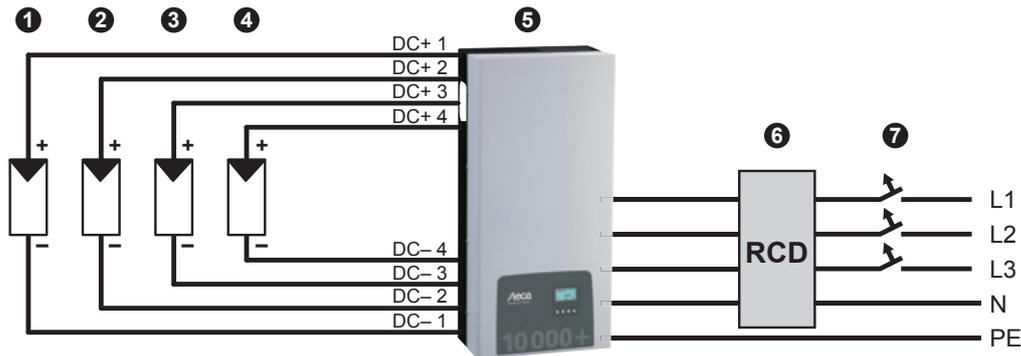


Fig. 7: Connection diagram of the inverter

- |                                       |  |
|---------------------------------------|--|
| ❶ Photovoltaic generator 1            | ❺ Inverter   |
| ❷ Photovoltaic generator 2 (optional) | ❻ Residual current circuit breaker (RCD = Residual Current Device) |
| ❸ Photovoltaic generator 3 (optional) | ❼ Line circuit breaker   |
| ❹ Photovoltaic generator 4 (optional) |  |

### 8.3.2 Line 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 Section 14.2, p. 78. See also Fig. 7, p. 59.

### 8.3.3 Residual current circuit breaker

Unless otherwise specified by the local installation regulations, installation of an external Type A residual current circuit breaker is sufficient.

### 8.3.4 Isolation transformer

► If an isolation transformer is required then it must be connected as shown in Fig. 8.



#### Danger

Risk of death by electrocution!

- In the connection diagram illustrated in Fig. 8, the primary and secondary sides of the isolation transformer are not galvanically isolated!
- If connection ❶ is missing, the isolation monitoring of the inverter is not functioning correctly.

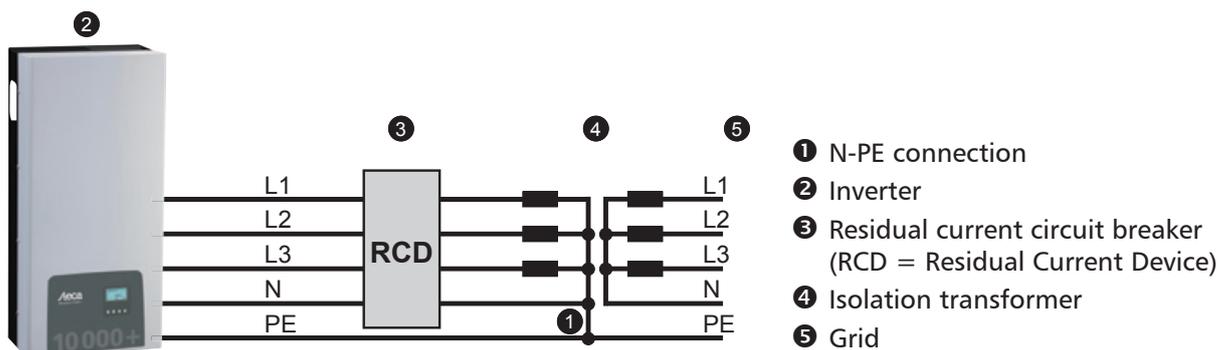


Fig. 8: Connection diagram of the isolation transformer

- |  |
|--|
| ❶ N-PE connection  |
| ❷ Inverter   |
| ❸ Residual current circuit breaker (RCD = Residual Current Device) |
| ❹ Isolation transformer  |
| ❺ Grid   |

### 8.3.5 Wiring the AC plug



#### Danger

Risk of death by electrocution! Observe the warning notes in Section 8.1, p. 57!

- ▶ Wire the AC plug provided as described in Fig. 9 and in p. 123 onwards.

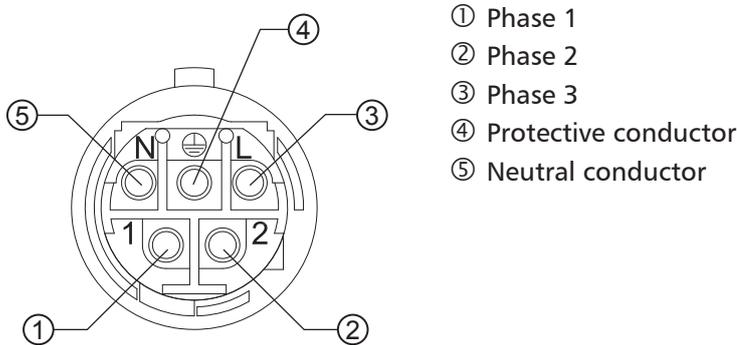


Fig. 9: Terminal pin assignments of the AC plug

### 8.4 Preparing the DC connections



#### Danger

Risk of death by electrocution!

- Observe the warning notes in Section 8.1, p. 57.
- Opposing Multi-Contact connectors must be attached to the DC cable to suit the *Multi-Contact MC4* DC connections (opposing contacts optionally available).
- All DC connections that are not connected to a cable must be closed off using the covers supplied. This ensures that the inverter complies with the specified protection degree.

#### Notice

Danger of damage to the inverter and the modules.

- Connect the opposing contacts for the DC connections to the DC cable, observing the correct polarity.
- The DC connections are internally interlinked to one MPP tracker. This means that external string fuses (in their own casing) must be installed if the maximum possible reverse current of all strings together is greater than the maximum permissible reverse current of the individual modules. The string fuses and casings are not included in the delivery.

1. Attach the Multi-Contact MC4 opposing contacts to the DC cable according to the manufacturer's instructions.
2. If legally prescribed (e.g. France), plug in the optionally available safety sleeves, according to the manufacturer's instructions (Fig. 10).



Fig. 10: Safety sleeve unmounted (left) and mounted (right)

### 8.5 Preparing an additional ground connection

- ▶ If an additional ground connection is locally prescribed then prepare the end of the ground cable according to the cable type.

#### Note

In France, the minimum cross-section of the ground cable conductor is legally prescribed to be 6 mm<sup>2</sup>.

## 8.6 Preparing the data connection cable

- ▶ If a data connection is required, use a standard RJ45 cable (patch cable) or construct an alternative data connection cable (Section 7.7, p. 54).

## 8.7 Connecting the inverter and switching on the AC power



### Danger

Risk of death by electrocution! Observe the warning notes in Section 8.1, p. 57.

1. If necessary, establish a data connection:
  - Connect the inverter and bus master using the data connection cable.
  - Plug the optionally available termination plug into the open RJ45 socket in the last inverter.
2. Push the Multi-Contact MC4 opposing contacts of the DC cable firmly into the DC connections of the inverter until they audibly click into place.
3. Insert the AC plug into the socket on the inverter until it audibly clicks into place.
4. Seal the AC connection as required. To do this, feed the tamper seal wire ① through the counter-nut ③ of the AC socket on the inverter (the counter-nut has a hole ②) and through the opening ④ in the opposing plug ⑤ according to Fig. 11.
5. If locally prescribed, attach the ground cable to the stud bolt using the optionally available grounding terminal ⑥; see ⑨ in Fig. 5, p. 47. Do not exceed a torque of 6 Nm.
6. Switch on the AC line circuit breaker. The start page for initial commissioning is shown on the display.
7. Perform initial commissioning and switch on the DC supply, as described in Sections 8.8 and 8.9.

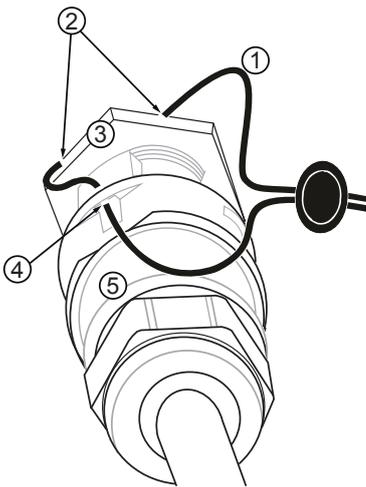


Fig. 11: Sealing of the AC connection using tamper seal wire

## 8.8 Initial commissioning of the inverter

### 8.8.1 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 causes the inverter to load the prescribed permissible deviations for grid voltage and frequency applicable to the selected country; more information on this is provided in the *Table of countries*, p. 78.
- **The country can only be set once!**  
Contact your installer if you have set the wrong country.
- Contact your installer if you cannot select the country where your inverter is installed.
- The country setting does not affect the language used on the display. The display language is set separately.

## 8.8.2 Operation

### Starting Initial commissioning

1st commissioning
SET short = select
SET long = continue
ESC = back

✓ The start page for initial commissioning is shown on the display.

► Press SET for a longer time. The next page is displayed.

### Selecting a language

Language
<input checked="" type="checkbox"/> english
<input type="checkbox"/> deutsch
<input type="checkbox"/> français

1. Press  $\triangle$ / $\nabla$  to select a language.
2. Press SET briefly. The language is adopted.
3. Press SET for a longer time.

### Setting the date

Date format
<input type="checkbox"/> JJJJ-MM-TT
<input checked="" type="checkbox"/> TT.MM.JJJJ
<input type="checkbox"/> MM/TT/JJJJ

1. Press  $\triangle$ / $\nabla$  to select a date format.
2. Press SET briefly. The date format is adopted.
3. Press SET for a longer time.

Date setting
20.07.2011

4. Press SET briefly. The day flashes.
5. Press  $\triangle$ / $\nabla$  to change the day.
6. Press SET briefly. The change is adopted.
7. Press  $\nabla$ . The month is selected.
8. Repeat steps 4 to 6 for the month.
9. Press  $\nabla$ . The year is selected.
10. Repeat steps 4 to 6 for the year.
11. Press SET for a longer time.

### Setting the time

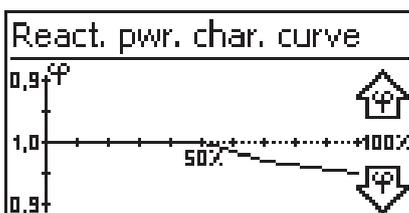
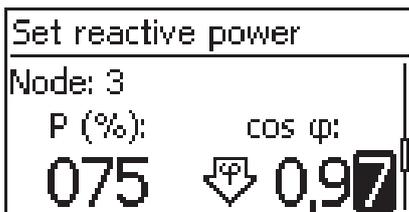
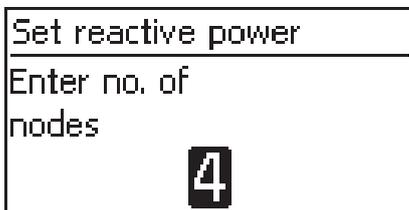
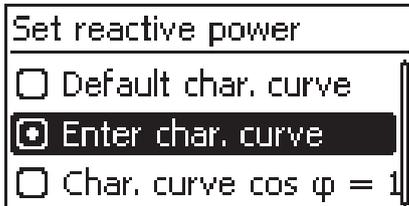
Time format
<input type="checkbox"/> 12h
<input checked="" type="checkbox"/> 24h

1. Press  $\triangle$ / $\nabla$  to select a time format.
2. Press SET briefly. The time format is adopted.
3. Press SET for a longer time.

Time setting
15:20

4. Press SET briefly. The hours display flashes.
5. Press  $\triangle$ / $\nabla$  to change the hour.
6. Press SET briefly. The change is adopted.
7. Press  $\nabla$ . The minutes are selected.
8. Repeat steps 4 to 6 for the minutes.
9. Press SET for a longer time.

## Setting the country and reactive power characteristic curve

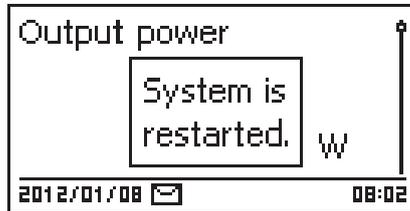


### Note

The country can only be set once!

1. Press  $\Delta \nabla$  to select a country.
2. Press SET briefly.
3. Press SET for a longer time.  
If a reactive power characteristic curve is not prescribed for the selected country then finish initial commissioning (see *Finishing initial commissioning*).
4. Press  $\Delta \nabla$  to select the reactive power characteristic curve according to the local regulations.
5. Press SET briefly. The characteristic curve is adopted.
6. Press SET for a longer time.
  - If Default char. curve was selected in step 4 then continue with step 18.
  - If Char. curve  $\cos \varphi = 1$  was selected in step 4 then continue with step 19.
7. Press SET briefly. The setting value flashes.
8. Press  $\Delta \nabla$  to change the number of nodes.
9. Press SET briefly. The value is adopted.
10. Press SET for a longer time.
11. Press  $\Delta \nabla$  to select a setting value for the first node.  $P\%$  has predefined fixed values for the first and last node (000%, 100%).
12. Press SET briefly. The setting value flashes.
13. Press  $\Delta \nabla$  to change the value.
14. Press SET briefly. The change is adopted.
15. Repeat steps 11 to 14 for the other setting value as required.
16. Press SET for a longer time.
17. Repeat steps 11 to 16 for the setting values of the remaining nodes.
18. Press  $\Delta \nabla$  to select the maximum overall apparent output power<sup>1)</sup> of the system (!).
  - 1) Total of the maximum apparent output power values of all inverters of the system.
19. The characteristic curve is displayed graphically (example in fig. left).
20. Press SET for a longer time.

## Finishing initial commissioning



1. Press **ESC** to jump stepwise backwards and correct settings *or* Press and hold **SET** for a longer period of time to finish initial commissioning.
2. If **SET** was pressed for a longer time then the inverter restarts anew and synchronises itself with the grid.

## 8.9 Switching on the DC supply

- ▶ Set the DC circuit breaker on the inverter to position **I** (Fig. 12). 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).

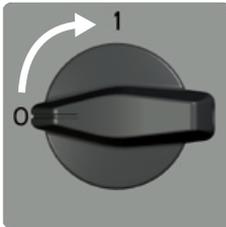


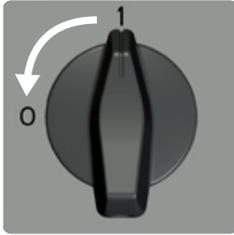
Fig. 12: Set the DC circuit breaker to position **I**.

## 8.10 Deinstalling the inverter



### Danger

Risk of death by electrocution! Only technical professionals may perform the work described in Section *Deinstalling the inverter*. Observe the warning notes in Section 8.1, p. 57.



### Switching off the AC and DC supplies

1. Turn the AC circuit breaker to off.
2. Set the DC circuit breaker on the inverter to position 0 (fig. left).

### Disconnecting the DC cables from the inverter

- ▶ Disconnect the Multi-Contact MC4 connections of the DC cables according to the manufacturer's instructions. A special tool is required for this.

 **Warning:** DC cables carry voltage when the solar modules are subjected to sunlight.

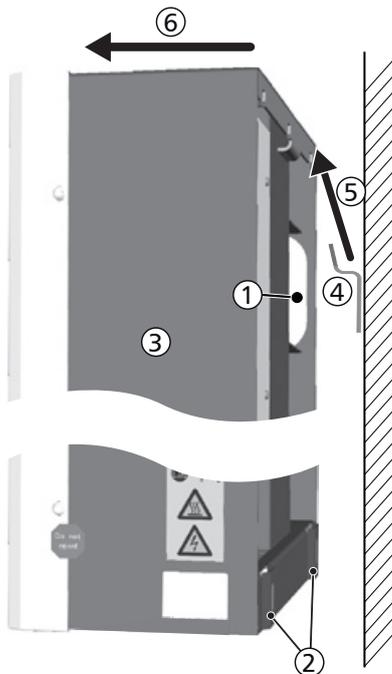
### Disconnecting the AC plug from the inverter

1. Remove the AC plug from the socket on the inverter as described on p. 123 onwards.
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)

- ▶ Open the AC plug as described on p. 123 onwards.

### Removing the inverter from the mounting surface



#### Caution

Danger of personal injury. The inverter weighs 42 kg.

- Always carry the inverter using at least two people.
- Use the handle ① to carry the device.



#### Caution

Danger from hot surfaces. Allow hot inverters to cool down before touching.

1. Remove the screws from the fastening holes ②.
2. Lift the inverter ③ from the mounting rail ④ ⑤ and remove it from the mounting surface ⑥.

## 9 Operation

### 9.1 Overview of operating functions

The following overview describes the operating functions on the inverter display. For the sake of clarity, only the operating buttons  $\nabla$  and SET are illustrated.

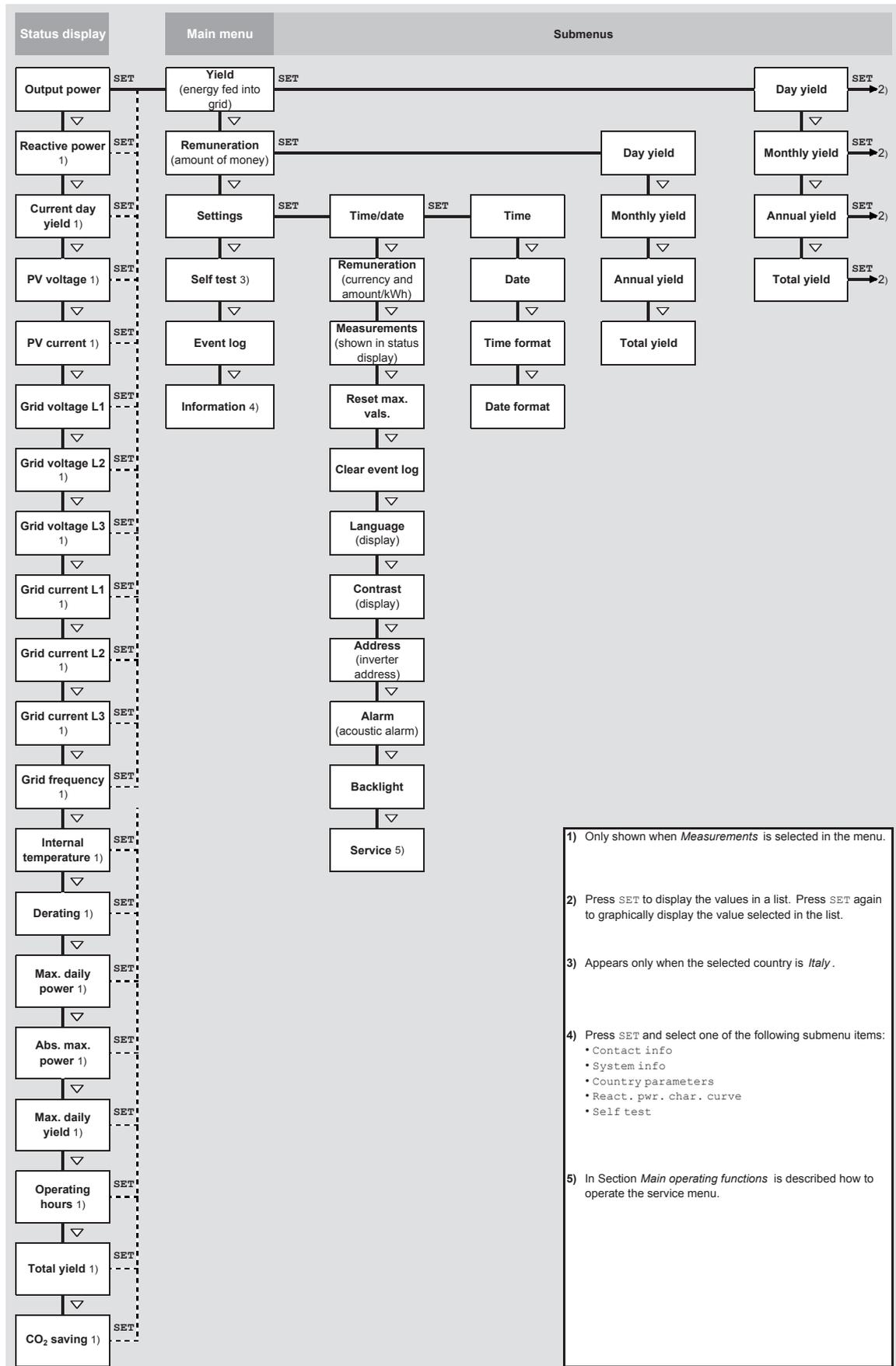


Fig. 13: Overview of operating functions on the display

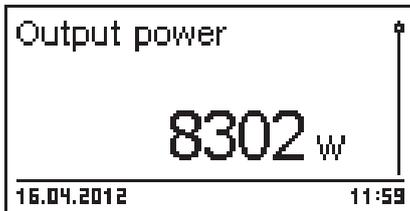
## 9.2 General operating functions

- Hidden content is shown using the  $\Delta$  and  $\nabla$  buttons.
- Repeated button presses: If  $\Delta$ / $\nabla$  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 backlight of the display if this has previously automatically switched off.

## 9.3 Main operating functions

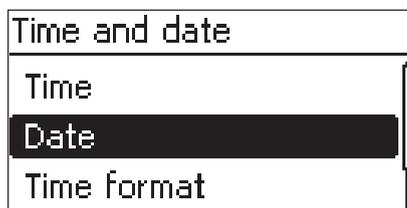
The figures in this section show examples.

### Status display



1. Press **ESC** for 1 second to call up the status display as required (fig. left).
2. Press  $\Delta$ / $\nabla$  to display a different status value.

### Menu navigation

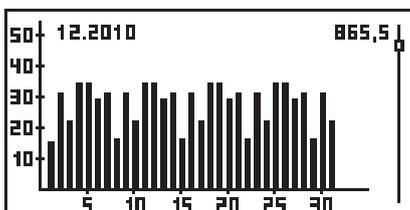
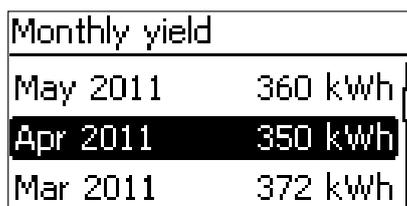


1. Press **ESC** for 1 second to call up the status display as required.
2. Press **SET**. The main menu is displayed with the top item selected.
3. Press  $\Delta$ / $\nabla$  to select a menu entry.
4. Press **SET** to call up the submenu (fig. left).
5. Repeat steps 3 and 4 for further submenus as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

### Event messages

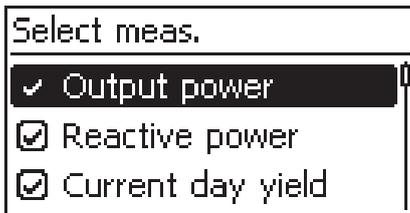
See Section 11 on p. 73 onwards.

### Displaying yields numerically (list) and graphically (chart)



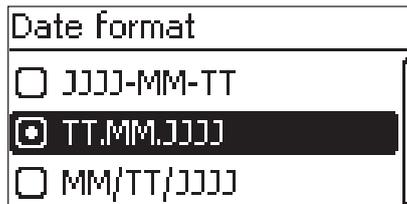
- ✓ The status display is shown.
1. Press **SET**. The main menu is displayed with **Yield** selected.
  2. Press **SET**. The list with yield time periods is shown.
  3. Press  $\Delta$ / $\nabla$  to select a yield time period.
  4. Press **SET**. The individual yields for the yield time period are shown in a list (fig. upper left).
  5. Press  $\Delta$ / $\nabla$  to select an individual yield value.
  6. Press **SET**. The selected individual yields are shown in a chart (fig. lower left).
  7. Press  $\Delta$ / $\nabla$  to page through the charts.
  8. Press **SET** to return to the list.

### Editing selection lists containing check boxes



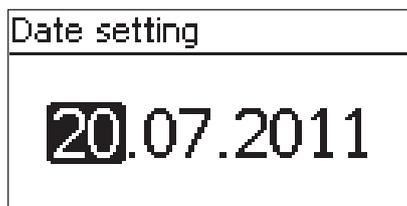
- ✓ A selection list with check boxes is displayed (fig. left).
1. Press  $\Delta$ / $\nabla$  to select a check box.
  2. Press **SET**. The state of the check box changes from *on* to *off* and vice-versa (preset check boxes cannot be changed).
  3. Repeat steps 1 and 2 for further check boxes as required.
  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 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  $\nabla$ . 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.

### Responding to dialogs



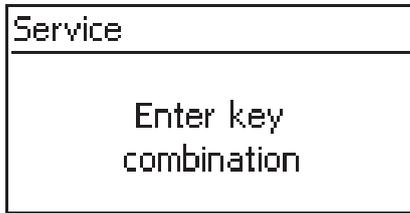
- ✓ A dialog is displayed (fig. left).
- ▶ Press **SET** or **ESC** as follows:
    - Press **SET** for 1 second to answer with *Yes*.
    - Press **ESC** to answer with *No*.

## Calling up the service menu and editing the values

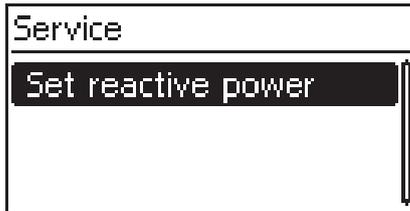
### Notice

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 professional personnel 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  $\Delta \nabla$  *simultaneously for 3 seconds*. The service menu is displayed (fig. left).
4. Press `SET` to edit the selected menu item.

## 10 Self test

The self test is mandatory for operation of inverters in Italy.

### Function

The prerequisites for performing the self test are as follows:

- The country *Italy* was selected during initial commissioning.
- The level of solar irradiation is high enough to ensure that the inverter can feed the grid.

During the self test, the inverter checks its switch-off behaviour with regard to too high / too low grid voltage and frequency (4 test phases, duration of approx. 2 minutes). The following applies:

- In each phase of the self test, the inverter changes its switch-off threshold, step-by-step upwards/downwards from the set lower/upper limit values.
- When the switch-off threshold reaches the actual grid voltage/frequency then the inverter stores this information.
- The data is shown on the display as follows:
  - The current values of the *first* test phase are displayed first; see Fig. 14.
  - The values of the *subsequent* test phases are added below (initially hidden).
  - If the self test succeeded then the status message `Self test passed` is added below. The status message must be displayed and confirmed.
- If the self test conditions are not satisfied, one of the status messages listed in Tab. 9 is displayed.
- If a measurement lies outside the required tolerance during the self test then the self test is cancelled and the inverter displays the status message `Self test failed`. The inverter remains disconnected from the grid (relay open, no feeding) until the self test is passed successfully.

### Note

The data stored in the inverter can be read using a PC and the *InverterSelftestProtocol* software. More information on this is provided in the *StecaGrid Service\_InverterSelftestProtocol* manual and at [www.stecasolar.com](http://www.stecasolar.com) ⇒ PV grid connected ⇒ Software.

Self-test	
L1 Uac max ①	230,0V
L1 Uac act ②	230,0V
L1 Uac off ③	230,0V
L1 Toff ④	100ms

- ① Upper / lower limit value according to the country setting
- ② Measured actual grid voltage / frequency
- ③ Switch-off threshold (changed in steps)
- ④ Switch-off time = time between the following events:
  - Switch-off threshold reaches the actual grid voltage/frequency
  - The inverter disconnects itself from the grid

Fig. 14: Self test – display of the test results

### Operation

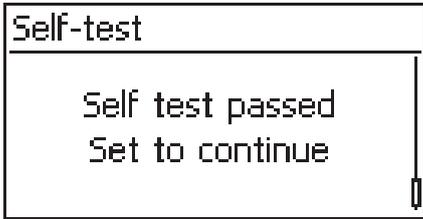
Self-test	
The self-test takes approx. 2 min.	
ESC	1s

Self-test	
L1 Uac max	230,0V
L1 Uac act	230,0V
L1 Uac off	230,0V
L1 Toff	100ms

- ✓ The country *Italy* is set in the inverter to be tested.
- 1. Check the country setting via `Information/System info` in the main menu as required.
- 2. Select `Self test` in the main menu. The dialog shown at the left is displayed.
- 3. Press and hold `SET` for 1 second. The self test starts.
- 4. The values for the first test phase are displayed (fig. left).
- 5. Press `▽` to display the values for the subsequent test phases (if available).
- 6. Only when `Self test failed` is displayed: Press `SET` to confirm the status message. The status display appears.

### Note

If `Self test failed` is displayed then repeat the self test as soon as possible so that the inverter can resume feeding.



When the self test has finished, proceed as follows:

7. Press  $\nabla$  several times until the status message `Self test passed` is displayed (fig. left).
8. Press `SET` to confirm the result of the self test. The status display appears.

Status message	Description	Remedy
An error was detected	An internal error prevented the self test from starting.	Contact your installer if this error occurs <i>frequently</i> .
Not enough sunlight	The self test was not started or was cancelled due to insufficient sunlight, especially in the evening / at night.	Repeat the self test during the day when the inverter is feeding the grid.
Invalid grid conditions	The self test was cancelled due to invalid grid conditions, e.g. due to insufficient AC voltage.	Repeat the self test later.
MSD not ready	The self test was not started because the inverter was not ready for operation.	Repeat the self test a few minutes later when the inverter is ready for operation and is feeding.

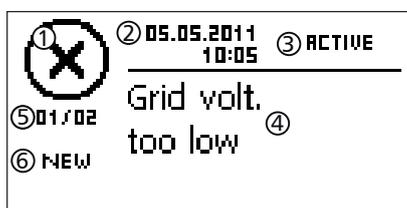
Tab. 9: Status messages of errors that prevent the self test from running

# 11 Troubleshooting

Faults are indicated by event messages as described below. The display flashes red. Tab. 10, p. 74 contains notes 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: The cause of the event message is still present *or* The date/time when 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 Total number of event messages = 30*
- ⑥ NEW is displayed until the event message has been manually confirmed via the ESC or  $\Delta/\nabla$  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 the grid while this error is present. Please contact your installer. More information on this is provided in Tab. 10.

### Display behaviour

New event messages are displayed immediately. The messages disappear after they have been confirmed or their cause(s) have been corrected.

---

### Note

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

---

If messages exist whose cause has been corrected but have *not* been confirmed then  is shown in the status display.

If an already confirmed error recurs then it is displayed again.

See also *Status display*, p. 49.

## Operation

### Confirming event messages

✓ An event message with the comment NEW is displayed.

- ▶ Press ESC/ $\Delta$ / $\nabla$ . The event message is confirmed and the display shows the information normally displayed when navigating via the ESC/ $\Delta$ / $\nabla$  buttons.

### 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  $\Delta/\nabla$  to page through the event messages.

## Event messages

Event message	Description	Type
Grid frequency too low	The grid frequency at the inverter is less than the minimum permissible value. Due to legal requirements, the inverter switches automatically off while the error state is present. ▶ Contact your installer if this error occurs frequently.	⊗
Grid frequency too high	The grid frequency at the inverter is greater than the maximum permissible value. Due to legal requirements, the inverter switches automatically off while the error state is present. ▶ Contact your installer if this error occurs frequently.	⊗
Grid freq. too high for reactivation	After switching off, the inverter cannot resume feeding because the grid frequency exceeds the legally prescribed switch-on value. ▶ Contact your installer if this error occurs frequently.	⊗
Grid voltage too low	The grid voltage at the inverter is less than the minimum permissible value. Due to legal requirements, the inverter switches automatically off while the error state is present. ▶ Contact your installer if this error occurs frequently.	⊗
Grid voltage too high	The grid voltage at the inverter is greater than the maximum permissible value. Due to legal requirements, the inverter switches automatically off while the error state is present. ▶ Contact your installer if this error occurs frequently.	⊗
Grid voltage $\emptyset$ too high	The output voltage averaged over the legally prescribed period of time lies outside the permissible tolerance range. The inverter switches automatically off while the error state is present. ▶ Contact your installer if this error occurs frequently.	⊗
Grid current DC Offset too high	The DC current portion fed into the grid by the inverter exceeds the maximum permissible value. The inverter switches off due to legally prescribed requirements and waits for a prescribed time before switching on again. If the fault remains present, the inverter switches off again. ▶ Contact your installer.	⊗
Resid. curr. too high	The residual current exceeds the permissible value. Due to legal requirements, the inverter switches automatically off while the error state is present. ▶ Contact your installer.	⊗
Isolation error	The isolation resistance between the positive or negative input and earth is less than the permissible value. For safety reasons the inverter must not feed into the grid. ▶ Contact your installer.	⊗
Fan faulty	At least one of the internal fans of the inverter is faulty. In certain situations the inverter will feed less power into the grid (derating). ▶ Contact your installer.	⚠
Device has overheated	Despite power reduction, the maximum permissible internal temperature has been exceeded. The inverter feeds no power into the grid until the maximum permissible temperature is no longer exceeded. 1. Check that the installation conditions are satisfied. 2. Check that the cooling fins and ventilation grill are free from soiling; see Section 12, p. 75. 3. Contact your installer if this message occurs frequently.	⊗
PV voltage too high	The input voltage at the inverter is greater than the maximum permissible value. ▶ Switch off the main DC switch at the inverter and contact your installer.	⊗
Grid islanding has been detected	There is no grid voltage present (inverter running independently). For safety reasons, the inverter must not feed into the grid. ▶ Contact your installer if this error occurs frequently.	⊗
Time/date lost	The inverter has lost the time settings because it was disconnected from the grid for too long. Yields cannot be stored and event messages will have the wrong date. ▶ Correct the time under <i>Settings / Time/Date</i> .	⚠

Event message	Description	Type
Intern. info	▶ Contact your installer if this information occurs frequently.	
Intern. warn- ing	▶ Contact your installer if this warning occurs frequently.	
Intern. error	▶ Contact your installer if this error occurs frequently.	
Self test failed	An error occurred during the self test and the self test was cancelled. ▶ Contact your installer when <ul style="list-style-type: none"> <li>– the self test is cancelled due to an error several times at different times of the the day and</li> <li>– it is certain that the grid voltage and frequency were within the limit values defined by the country setting; see Section 14.3, p. 78.</li> </ul>	

Tab. 10: Event messages

## 12 Maintenance

The inverter is basically maintenance-free. Despite this, it is a good idea to regularly check that the ventilation openings on the upper and lower sides of the device are free of dust. Clean the inverter when necessary as described below.

### Notice

Danger of damage to components. **Do not** use especially the following cleaning agents:

- Solvent-based cleaning agents
- Disinfection agents
- Coarse or sharp-edged cleaning agents

### 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.

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

## 13 Disposal

Do not dispose of the device in the normal household waste. At the end of its service life, return the device to Steca Customer Service with a note stating *Zur Entsorgung (For disposal)*. The device packaging consists of recyclable materials.

# 14 Technical data

## 14.1 Inverter

	StecaGrid 8000+ 3ph	StecaGrid 10000+ 3ph
<b>DC input side (PV generator connection)</b>		
Number of DC inputs	4	
Maximum start voltage	845 V	
Maximum input voltage	845 V	
Minimum input voltage	350 V	
Startup input voltage	350 V	
Rated input voltage	600 V	
Minimum input voltage for rated output	350 V	
MPP voltage	350 V ... 700 V	
Maximum input current	32 A	
Rated input current	14 A	17.3 A
Maximum input power at maximum active output power	9,250 W	10,800 W
Rated input power ( $\cos \varphi = 1$ )	8,400 W	10,400 W
Recommended maximum PV output	10,500 Wp	12,500 Wp
Derating / power limiting	Occurs automatically when: <ul style="list-style-type: none"> <li>• input power &gt; max. recommended PV power</li> <li>• cooling is inadequate</li> <li>• input current &gt; 32 A</li> <li>• grid current &gt; 16 A</li> <li>• internal or external power reduction (derating)</li> <li>• grid frequency too high (according to country setting)</li> <li>• limiting signal received via an external interface</li> </ul>	
<b>AC output side (mains grid connection)</b>		
Output voltage	320 V ... 480 V (depending on the country settings)	
Rated output voltage	400 V	
Maximum output current	16 A	
Rated output current	11.6 A	14.3 A
Maximum active power ( $\cos \varphi = 1$ )	8,800 W <sup>1) 3)</sup>	10,300 W <sup>2) 3)</sup>
Maximum active power ( $\cos \varphi = 0.95$ )	8,800 W <sup>3)</sup>	9,800 W <sup>3)</sup>
Maximum active power ( $\cos \varphi = 0.90$ )	8,800 W <sup>3)</sup>	9,300 W <sup>3)</sup>
Maximum apparent power ( $\cos \varphi = 0.95$ )	9,260 VA <sup>4)</sup>	10,300 VA <sup>4)</sup>
Maximum apparent power ( $\cos \varphi = 0.90$ )	9,780 VA <sup>4)</sup>	10,300 VA <sup>4)</sup>
Rated output	8,000 W <sup>3)</sup>	9,900 W <sup>3)</sup>
Rated frequency	50 Hz	
Grid type	L <sub>1</sub> / L <sub>2</sub> / L <sub>3</sub> / N / PE	
Grid frequency	47.5 Hz ... 52 Hz (depending on the country settings)	
Power losses in nighttime operation	< 2.5 W	
Feeding phases	three-phase	
Distortion factor ( $\cos \varphi = 1$ )	< 4% (max. output)	
Power factor $\cos \varphi$	0.90 capacitive ... 0.90 inductive	
<b>Characterisation of the operating behaviour</b>		
Maximum efficiency	96.3%	
European efficiency	95.2%	95.4%
MPP efficiency	> 99%	
Efficiency values (at 5%, 10%, 20%, 25%, 30%, 50%, 75%, 100% of the rated power) at rated voltage	83.6%, 92.4%, 95.1%, 95.6%, 95.8%, 96.3%, 95.7%, 95.1%	87.5%, 93.8%, 95.6%, 95.8%, 96%, 96.3%, 95.8%, 95.1%
Efficiency values (at 5%, 10%, 20%, 25%, 30%, 50%, 75%, 100% of the rated power) at minimum MPP voltage	84.4%, 91.8%, 94.5%, 95%, 95.1%, 95.6%, 94.7%, 94.3%	88.3%, 93.2%, 95%, 95.2%, 95.3%, 95.6%, 94.8%, 94.3%

	StecaGrid 8000+ 3ph	StecaGrid 10000+ 3ph
Efficiency values (at 5%, 10%, 20%, 25%, 30%, 50%, 75%, 100% of the rated power) at maximum MPP voltage	74.1%, 92.7%, 94.8%, 95.5%, 95.7%, 96.2%, 95.8%, 95.3%	77.2%, 94.1%, 95.3%, 95.7%, 95.9%, 96.2%, 95.9%, 95.3%
Efficiency reduction in the case of deviation from the DC rated voltage	-0.0025%/V	
Power derating at full power	from +50 °C ( $T_{amb}$ )	
Switch-on power	80 W	
Switch-off power	20 W	
Standby power	9 W	
<b>Safety</b>		
Protection class	I	
Isolation principle	no galvanic isolation, transformerless	
Grid monitoring	MSD, compliant with DIN VDE 0126-1-1 and VDE AR N 4105	
Isolation monitoring	yes, integrated	
Residual current monitoring	yes, integrated <sup>5)</sup>	
Overvoltage protection version	varistors	
<b>Application conditions</b>		
Area of application	indoor rooms with or without air conditioning, outdoors with protection	
Corrosion categories	C3	
Ambient temperature range $T_{amb}$	-20 °C ... +60 °C	
Storage temperature	-30 °C ... +80 °C	
Relative humidity	0% ... 95%, non-condensing	
Installation elevation	≤ 2000 m above sea level	
Degree of pollution	PD3	
Noise emission	< 60 dBA	
Impermissible ambient gases	ammonia, solvents	
<b>Equipment and design</b>		
Degree of protection	IP54	
Overvoltage category	III (AC), II (DC)	
DC connection	Multi-Contact MC4 (4 pairs), rated current of 22 A per input	
AC connection		
Type	Wieland RST25i5 plug	
Connection conductor cross-section	cable cross-sections ≤ 4 mm <sup>2</sup> , cable diameters 10 ... 14 mm <sup>2</sup> , cable diameters 15 ... 18 mm <sup>2</sup> with optionally available AC plug only	
Opposing socket	included in delivery	
Dimensions (X x Y x Z)	400 x 847 x 225 mm	
Weight	42 kg	
Display	graphical display, 128 x 64 pixels	
Communication interface	RS485; 2 x RJ45 sockets; connection to StecaGrid Vision, Meteocontrol WEB'log, Solar-Log or StecaGrid Monitor	
Feed-in management as per EEG 2012	EinsMan-ready, via RS485 interface	
Integrated DC circuit breaker	yes, compliant with VDE 0100-712	
Cooling principle	temperature-controlled fan, variable speed	
Test certificate	clearance certificate as per DIN VDE 0126-1-1, CE symbol, VDE AR N 4105, G59, G83, AS4777, UTE C 15-712-1. under preparation: CEI 0-21	

Tab. 11: Inverter technical data

- 1) Germany and Denmark\_unlimited: 8,000 W
- 2) Germany and Denmark\_unlimited: 9,900 W
- 3) Denmark: 6,000 W
- 4) Denmark: 6,670 VA at  $\cos \varphi = 0.90$ ; 6,320 VA at  $\cos \varphi = 0.95$
- 5) The design of the inverter prevents it from causing DC leakage current.

## 14.2 AC cables and line circuit breakers

Inverter	AC cable conductor cross-section	Line circuit breaker
StecaGrid 8000+ 3ph	5 x 1.5 mm <sup>2</sup>	3 x B16
	5 x 2.5 mm <sup>2</sup>	3 x B16 or 3 x B25
	5 x 4.0 mm <sup>2</sup>	3 x B16 or 3 x B25
StecaGrid 10000+ 3ph	5 x 2.5 mm <sup>2</sup>	3 x B20
	5 x 4.0 mm <sup>2</sup>	3 x B25

Tab. 12: Conductor cross-sections of the AC cables and suitable line circuit breakers

## 14.3 Table of countries

Details on setting the country are provided in Section 8.8, p. 62.

### Note

The requirements for the country-specific grid parameters may change at short notice. Contact the Steca Customer Service if the parameters specified below no longer correspond to the legally prescribed requirements in your country. See Section *Contact*, p. 80.

Country		Reconnection time	Voltage disconnection values (peak values) <sup>2)</sup>				Voltage disconnection values (average values) <sup>3)</sup>				Frequency disconnection values <sup>4)</sup>			
Name	Display <sup>1)</sup>		upper		lower		upper		lower		upper <sup>8)</sup>		lower	
		s	%	s	%	s	%	s	%	s	Hz	s	Hz	s
Germany <sup>5)</sup>	4900 Deutschland	60	15.0	0.2	-20.00	0.20	10	600.0	-	-	1.5	0.2	-2.5	0.2
Sweden	4600 Sverige	30	15.0	0.2	-15.00	0.20	6	60.0	-10	60.0	1.0	0.5	-3.0	0.5
France	3300 France	30	15.0	0.2	-15.00	0.20	10	600.0	-	-	0.2	0.2	-2.5	0.2
Portugal	35100 Portugal	20	15.0	0.2	-15.00	1.50	-	-	-	-	1.0	0.5	-3.0	0.5
Spain	3400 España	180	10.0	0.2	-15.00	0.20	-	-	-	-	1.0	0.2	-1.0	0.2
The Netherlands	3100 Nederland	30	10.0	2.0	-20.00	2.00	-	-	-	-	1.0	2.0	-2.0	2.0
Belgium_1 <sup>6)</sup>	3200 Belgique 1	30	10.0	0.1	-50.00	0.10	-	-	-15	1.5	0.5	0.1	-2.5	0.1
Belgium_1 unlimited	3201 Belgique 1 unl	30	10.0	0.1	-50.00	0.10	-	-	-15	1.5	0.5	0.1	-2.5	0.1
Belgium_2 <sup>6)</sup>	3202 Belgique 2	30	15.0	0.2	-20.00	0.20	10	600.0	-	-	0.5	0.2	-2.5	0.2
Belgium_2 unlimited	3203 Belgique 2 unl	30	15.0	0.2	-20.00	0.20	10	600.0	-	-	0.5	0.2	-2.5	0.2
Austria	4300 Österreich	30	15.0	0.2	-20.00	0.20	12	600.0	-	-	1.0	0.2	-3.0	0.2
Italy_1	3900 Italia 1	30	20.0	0.1	-20.00	0.20	-	-	-	-	0.3	0.1	-0.3	0.1
Italy_2	3901 Italia 2	30	20.0	0.1	-20.00	0.20	-	-	-	-	1.0	0.1	-1.0	0.1
Italy_3	3902 Italia 3	30	22.0	0.1	-25.00	0.20	-	-	-	-	5.0	0.2	-3.5	0.2
Slovenia	38600 Slovenija	30	15.0	0.2	-15.00	0.20	11	1.5	-	-	1.0	0.2	-3.0	0.2
Czech Republic	42000 Česko	30	15.0	0.2	-15.00	0.20	10	600.0	-	-	0.5	0.2	-0.5	0.2
Greek Islands	3001 Greece islands	180	15.0	0.5	-20.00	0.50	10	600.0	-	-	1.0	0.5	-2.5	0.5
Greek Mainland	3000 Greece continent	180	15.0	0.5	-20.00	0.50	10	600.0	-	-	0.5	0.5	-0.5	0.5
Australia <sup>6)</sup>	6100 Australia	60	17.0	2.0	-13.00	2.00	-	-	-	-	5.0	2.0	-3.5	2.0
Turkey	9000 Türkiye	30	15.0	0.2	-20.00	0.20	10	600.0	-	-	0.2	0.2	-2.5	0.2
Ireland	35300 Éire	30	10.0	0.5	-10.00	0.50	-	-	-	-	0.5	0.5	-2.0	0.5
United Kingdom G83	4400 United Kingdom G83	180	14.7	1.5	-10.00	1.50	-	-	-	-	0.5	0.5	-3.0	0.5
United Kingdom G59	4401 United Kingdom G59	180	15.0	0.5	-20.00	0.50	10	1.0	-13	2.5	0.1	0.5	-2.5	0.5
Switzerland	4100 Suisse	30	15.0	0.2	-20.00	0.20	10	600.0	-	-	0.2	0.2	-2.5	0.2
Hungary	3600 Magyarország	30	35.0	0.1	-50.00	0.10	10	2.0	-15	2.0	1.0	0.2	-1.0	0.2
Denmark_unlimited	4500 Danmark unlimited	60	15.0	0.2	-20.00	0.20	10	600.0	-	-	1.5	0.2	-2.5	0.2
Denmark <sup>7)</sup>	4500 Danmark	60	15.0	0.2	-20.00	0.20	10	600.0	-	-	1.5	0.2	-2.5	0.2
EN 50438	50438 EN 50438	20	15.0	0.2	-15.00	1.50	-	-	-	-	1.0	0.5	-3.0	0.5
Bulgaria	3590 Bălgarija	30	15.0	0.2	-20.00	0.20	10	600.0	-	-	0.2	0.2	-2.5	0.2
Mauritius	23000 Mauritius	180	10.0	0.2	-6.00	1.50	6	1.5	-	-	1.0	0.5	-3.0	0.5

Tab. 13: Table of countries

<sup>1)</sup> Country code and name as shown on the display.

<sup>2)</sup> Disconnection values are upper and lower deviations from the peak values of the rated voltage

- (in %) and the associated switch-off time (in s).
- 3) Disconnection values are upper and lower deviations from the average values of the rated voltage (in %) and the associated switch-off time (in s).
  - 4) Disconnection values are upper and lower deviations from the rated frequency (in Hz) and the associated switch-off time (in s).
  - 5) Maximum output power: 8,000 W (StecaGrid 8000+ 3ph) and 9,900 W (StecaGrid 10000+ 3ph)
  - 6) Maximum output power of 10,000 W (StecaGrid 10000+ 3ph only)
  - 7) Maximum output power: 6,000 W (StecaGrid 8000+ 3ph and StecaGrid 10000+ 3ph)
  - 8) In Germany and Denmark, the inverter switches on again as soon as the frequency drops below the legally prescribed value of 50.05 Hz.

## 15 Exclusion of liability

The manufacturer can neither monitor compliance with this manual nor the conditions and methods during the installation, operation, usage and maintenance of the inverter. Improper installation of the system may result in damage to property and, as a consequence, to bodily injury.

Therefore, we assume no responsibility or liability for loss, damage or costs which result from, or are in any way related to, incorrect installation, improper operation, or incorrect use and maintenance. Similarly, we assume no responsibility for patent right or other right infringements of third parties caused by usage of this inverter.

The manufacturer reserves the right to make changes to the product, technical data or installation and operating instructions without prior notice.

As soon as it becomes evident that safe operation is no longer possible (e.g. visible damage), remove the device from the grid and the photovoltaic generator immediately.

## 16 Commercial and legal guarantee conditions

Guarantee conditions for products from Steca Elektronik GmbH

### 1. Defects in materials and workmanship

The guarantee only applies to defects in materials and workmanship, insofar as these can be attributed to inadequate professional ability on the part of Steca.

Steca reserves the right at its own discretion to repair, adapt or replace the faulty products.

### 2. General information

In accordance with statutory regulations, there is a 2-year legal guarantee on all products for the customer.

For this Steca product, we provide a voluntary 5-year commercial guarantee to the specialist dealer from the date of invoice or receipt. This voluntary guarantee applies only to products sold within an EU country.

The legal guarantee entitlements are not restricted by the voluntary guarantee.

To be able to make a claim under the guarantee the customer must provide proof of purchase (payment receipt).

If a problem arises, the customer must contact his or her installer or Steca Elektronik GmbH.

### 3. Guarantee exclusion clause

The guarantees on products from Steca Elektronik GmbH described under point 1 are not valid in the event that the fault is attributable to: (1) specifications, designs, accessories, or components added to the product by the customer or at the wish of the customer, or special instructions from the customer relating to the production of the product, the connection (of Steca products) with other products that are not explicitly approved by Steca Elektronik GmbH; (2) modifications or adjustments to the product by the customer, or other causes due to the customer; (3) incorrect arrangement or installation, incorrect or careless handling, accident, transport, overvoltage, storage or damage caused by the customer or other third party; (4) unavoidable accident, fire, explosion, construction or new construction of any kind in the environment where the product is located, due to natural phenomena such as earthquakes, flooding, or storms, or any other cause outside the control of Steca Elektronik GmbH; (5) any other cause that could not be foreseen or avoided with the technology used in manufacturing the product; (6) if the serial number and/or the type number has been manipulated or rendered unreadable; (7) the use of the solar products in a movable object, for example ships, mobile homes, or others; (8) failure to conform to the instructions on care and maintenance of the product, as recommended by Steca in the operating instructions; (9) damage, soiling or painting of the casing so that cleaning or repair is no longer possible.

The guarantee stated in this operating manual only applies to consumers who are customers of Steca Elektronik GmbH or of resellers authorised by Steca Elektronik GmbH. The guarantee mentioned here is not transferable to a third party. The customer shall not transfer his rights or responsibilities resulting from this in any way, without the prior written approval of Steca Elektronik GmbH. Fur-

thermore, Steca Elektronik GmbH shall in no case be liable for indirect damage or loss of profit. Unless otherwise specified by any applicable compulsory legislative regulations, Steca Elektronik GmbH shall also not be liable for any other damages other than those for which Steca Elektronik GmbH has hereby explicitly accepted liability.

## 17 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.

### Europe

Steca Elektronik GmbH  
Mammostrasse 1  
87700 Memmingen  
Germany

Phone +49 700 STECAGRID  
+49 (0) 700 783224743  
Monday to Friday from 08:00 a.m. to 4:00 p.m.  
Fax +49 (0) 8331 8558 132  
Email [service@stecasolar.com](mailto:service@stecasolar.com)  
Internet [www.stecasolar.com](http://www.stecasolar.com)

## 18 Notes

### Inverter

Type.....  
Serial number .....

### Installer

Company.....  
Contact person .....

Street and number .....

Postcode.....

Town.....

Telephone number.....

Email .....

# Appendix

## Zertifikate – Certificates – Certificats



EU – KONFORMITÄTSERKLÄRUNG  
EC – DECLARATION OF CONFIRMITY  
DECLARATION DE CONFORMITE DE LA CE

Zertifikat/ Certificat/ Certificat Nr.

001-0112

Die Firma  
The company  
La société

Steca Elektronik GmbH  
Mammostraße 1  
87700 Memmingen  
Germany  
www.steca.com

erklärt in alleiniger Verantwortung, dass folgendes Produkt  
hereby certifies on its responsibility that the following product  
se déclare seule responsable du fait que le produit suivant

**Netzwechselrichter**  
**StecaGrid 8000+ 3ph**  
**StecaGrid 10000+ 3ph**

auf das sich diese Erklärung bezieht, mit folgenden Richtlinien bzw. Normen übereinstimmt.  
which is explicitly referred to by this Declaration meet the following directives and standard(s).  
qui est l'objet de la présente déclaration correspondent aux directives et normes suivantes.

**Elektromagnetische Verträglichkeit – Richtlinie**  
**Electromagnetic Compability – Directive**  
**Compatibilité électromagnétique – Directive**

2004/108/EG

**Niederspannungsrichtlinie**  
**Low Voltage Directive**  
**Directive de basse tension**

2006/95/EG

**Europäische Normen** <sup>1) (2/2)</sup>  
**European Standard**  
**Norme européenne**

EN 55 014-1

EN 61 000-6-2

EN 61 000-6-3

EN 62 109-1

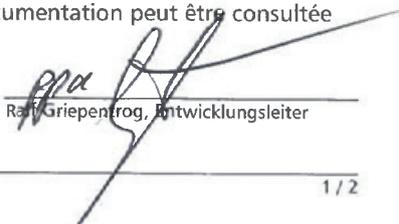
prEN 62 109-2

Die oben genannte Firma hält Dokumentationen als Nachweis der Erfüllung der Sicherheitsziele und die wesentlichen Schutzanforderungen zur Einsicht bereit.

Documentation evidencing conformity with the requirements of the Directives is kept available for inspection at the above company.

En tant que preuve de la satisfaction des demandes de sécurité la documentation peut être consultée chez la société sousmentionnée.

Memmingen, 12.01.2012

  
Ralf Griepentrog, Entwicklungsleiter

1 / 2



EU – KONFORMITÄTSEKTLÄRUNG  
EC – DECLARATION OF CONFIRMITY  
DECLARATION DE CONFORMITE DE LA CE

**Netzwechselrichter**

**StecaGrid 8000+ 3ph**

**StecaGrid 10000+ 3ph**

**BG**

**Декларация за съответствие на европейските норми**  
С настоящето декларираме, че посочените на страница 1 продукти, отговарят на следните норми и директиви:

Електромагнитна устойчивост 2004/108/EG,  
директива за ниско напрежение – 2006/95/EG.  
Приложими съгласувани стандарти и норми в частност:<sup>1)</sup>

**EE**

**EL vastavusavaldus**  
Käesolevaga avaldame, et nimetatud toode on kooskõlas järgmistele direktiivide ja standarditega:  
Elektromagnetilise ühilduvuse direktiiv 2004/108/EG,  
Madalpingedirektiiv 2006/95/EG

Kohaldatud Euroopa standardid, eelkõige: <sup>1)</sup>

**GR**

**Δήλωση προσαρμογής στις προδιαφές της Ε.Ε. (Ευρωπαϊκής Ένωσης)**  
Δηλώνουμε ότι το προϊόν αυτό σ' αυτή την κατάσταση παράδοσης καποιαεί τις ακόλουθες διατάξεις:

Ηλεκτρομαγνητική συμβατότητα 2004/108/EG,  
Οδηγία χαμηλής τάσης 2006/95/EG.  
Εναρμονισμένα χρησιμοποιούμενα πρότυπα, ιδιαίτερα:<sup>1)</sup>

**LT**

**Atitikties pareiškimas su Europos Sąjungoje galiojančiomis normomis**

Šiuo mes pareiškiamo, kad nurodytas gaminytis atitinka sekancias direktyvas bei normas:

Elektromagnetinio suderinamumo direktyva 2004/108/EG,

Žemosios įtampos direktyva 2006/95/EG.

Naudojamas Europoje normas, ypač: <sup>1)</sup>

**NO**

**EU-Overensstemmelseserklæring**

Vi erklærer hermed at denne enheden i utførelse som levert er i overensstemmelse med følgende relevante bestemmelser:

EG-EMV-Elektromagnetisk kompatibilitet 2004/108/EG,

EG-Lavspenningsdirektiv 2006/95/EG .

Anvendte harmoniserte standarder, særlig: <sup>1)</sup>

**RO**

**Declarație de conformitate UE**

Prin prezenta se declară că produsul mai sus menționat este în conformitate cu următoarele directive, respectiv norme:

Compatibilitate electromagnetică 2004/108/EG,

Directiva CE referitoare la tensiunile joase 2006/95/EG.

Norme europene utilizate, în special: <sup>1)</sup>

**SI**

**EU-izjava o skladnosti**

Izjavljamo, da je navedeni izdelek skladen z naslednjimi direktivami oz. standardi:

Direktiva o elektromagnetni združljivosti 2004/108/EG,

Direktiva o nizkonapetostni opremi 2006/95/EG.

Uporabljene evropski standardi, še posebej: <sup>1)</sup>

**CZ**

**Prohlášení o shodě EU**

Prohlašujeme tímto, že tento agregát v dodaném provedení odpovídá následujícím příslušným ustanovením:

Směrnice EU-EMV 2004/108/EG,

Směrnice EU-nízké napětí 2006/95/EG.

Použití harmonizační normy, zejména: <sup>1)</sup>

**ES**

**Declaración de conformidad CE**

Por la presente declaramos la conformidad del producto en su estado de suministra con las disposiciones pertinentes siguientes:

Compatibilidad electromagnética 2004/108/EG,

Directiva sobre equipos de baja tensión 2006/95/EG.

Normas armonizadas adoptadas, especialmente: <sup>1)</sup>

**HU**

**EK. Azonosságnyilatkozat**

Ezennel kijelentjük, hogy az berendezés az alábbiakkal megfelel:

Elektromágneses zavarás/tűrés: 2004/108/EG,

Kisfeszültségű berendezések irány-Elve: 2006/95/EG.

Felhasznált harmonizált szabványok, különösen: <sup>1)</sup>

**LV**

**ES Atbilstības deklarācija**

Paziņojam, ka minētais izstrādājums atbilst sekojošām direktīvām jeb normām:

2004/108/EG Par elektromagnētisko panesamību,

2006/95/EG Direktīvai par zemspriegumu.

Izmantojās Eiropas normas, īpaši: <sup>1)</sup>

**PL**

**Deklaracja Zgodności CE**

Niniejszym deklarujemy z pełną odpowiedzialnością że dostarczony wyrób jest zgodny z następującymi dokumentami:

Odpowiedniści elektromagnetyczna

2004/108/EG,

Normie niskich napięć 2006/95/EG.

Wyroby są zgodne ze szczegółowymi normami zharmonizowanymi: <sup>1)</sup>

**RU**

**Декларация о соответствии Европейским нормам**

Настоящим документом заявляем, что данный агрегат в его объеме поставки соответствует следующим нормативным документам:

Электромгнитная устойчивость 2004/108/EG,

Директивы по низковольтному напряжению 2006/95/EG.

Используемые согласованные стандарты и нормы в частности: <sup>1)</sup>

**SK**

**Prehlásenie o zhode ES**

Týmto prehlasujeme, že sa uvedený produkt zhoduje s nasledovnými smernicami príp. normami:

Elektromagnetická zlučiteľnosť 2004/108/EG,

Smernica o nízkom napätí 2006/95/EG.

Použitie európske normy, predovšetkým: <sup>1)</sup>

**DK**

**EF-overensstemmelseserklæring**

Vi erklærer hermed, at denne enhed ved levering

overholder følgende relevante bestemmelser:

Elektromagnetisk kompatibilitet: 2004/108/EG,

Lavvolts-direktiv 2006/95/EG.

Anvendte harmoniserede standarder, særligt: <sup>1)</sup>

**FI**

**CE-standardinmukaisuuseloste**

Ilmoitamme täten, että tämä laite vastaa seuraavia asiaankuuluvia määräyksiä:

Sähkömagneettinen soveltuvuus 2004/108/EG,

Matalajännite direktiivi: 2006/95/EG

Käytetyt yhteensovitetut standardit, erityisesti: <sup>1)</sup>

**IT**

**Dichiarazione di conformità CE**

Con la presente si dichiara che i presenti prodotti sono conformi alle seguenti disposizioni e direttive rilevanti:

Compatibilità elettromagnetica 2004/108/EG,

Direttiva bassa tensione 2006/95/EG.

Norme armonizzate applicate, in particolare: <sup>1)</sup>

**NL**

**EU-verklaring van overeenstemming**

Hiermede verklaren wij dat dit aggregaat in die geleverde uitvoering voldoet aan de volgende bepalingen:

Elektromagnetische compatibiliteit 2004/108/EG,

EG-laagspanningsrichtlijn 2006/95/EG.

Gebruikte geharmoniseerde normen, in het bijzonder: <sup>1)</sup>

**PT**

**Declaração de Conformidade CE**

Pela presente, declaramos que esta unidade no seu estado original, está conforme os seguintes requisitos:

Compatibilidade electromagnética 2004/108/EG,

Directiva de baixa voltagem 2006/95/EG.

Normas harmonizadas aplicadas, especialmente: <sup>1)</sup>

**SE**

**CE-försäkran**

Härmed förklarar via tt denna maskin i levererat utförande motsvarar följande tillämpliga bestämmelser:

EG-Elektromagnetisk kompatibilitet 2004/108/EG,

EG-Lågspänningsdirektive 2006/95/EG.

Tillämpada harmoniserade normer, i synnerhet: <sup>1)</sup>

**TR**

**EC Uygunluk Teyid Belgesi**

Bu cihazın teslim edildiği şekilde aşağıdaki standartlara uygun olduğunu teyid ederiz:

Elektromanyetik Uyumluluk 2004/108/EG,

Alçak gerilim direktifi 2006/95/EG.

Kısmen kullanılan standartlar: <sup>1)</sup>

# Montage – Installation – Montage

## AC-Stecker – AC plug – connecteur AC

gesis RST 2014/2015/2515

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

gesis

**Hotline:**  
 Tel.: +49 (951) 9324-996  
 Fax: +49 (951) 9326-996  
 Email: BIT.TS@wieland-electric.com  
 Internet: www.gesis.com

Wieland Electric GmbH  
 Brennerstraße 10-14  
 96052 Bamberg  
 Tel. +49 (951) 9324-0  
 Fax +49 (951) 9324-198  
 Internet: www.wieland-electric.com  
 Email: info@wieland-electric.com



Montageanleitung (Mai 2006)  
 © 2006 Wieland Electric GmbH

### Wichtige Information - bitte aufmerksam lesen

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

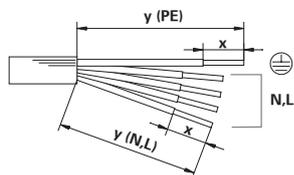
### Important information - please read carefully

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
<b>Schraubanschluss / screw connection</b>				
Abmantellänge y (mm) / Dismantling length y (mm)	30	25	55	50
Abmantellänge y (Doppelanschluß) / Dismantling length y (splitter connector)	45	40		
Abisolierlänge x (mm) / insulation strip length x (mm)	8 (Leiterquerschnitt/conductor cross section 1,5...4 mm²)			
<b>Crömpanschluss / crimp connection</b>				
Abmantellänge y / Dismantling length y	42	37	49	44
Abisolierlänge x / insulation strip length x	7,0+1 (Leiterquerschnitt/conductor cross section 0,75...4 mm²)			

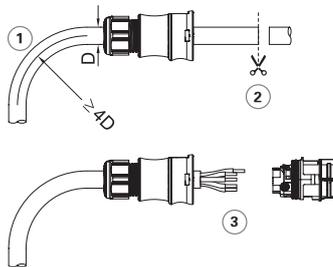
### Biegeradien

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

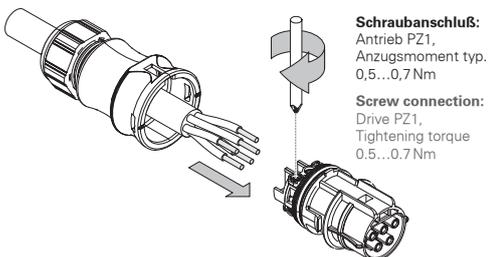
### Bending radius

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

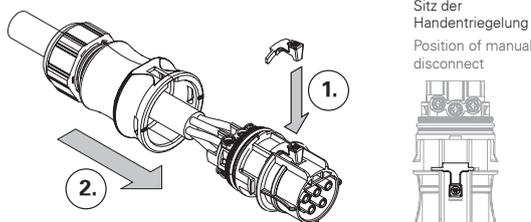


### Einsetzen der Handentriegelung (optional)

Die Handentriegelung ermöglicht das Trennen der Steckverbindung ohne Werkzeug.

### Inserting the manual disconnect (optional)

The manual disconnect enables disconnecting without a tool.



### ACHTUNG / CAUTION

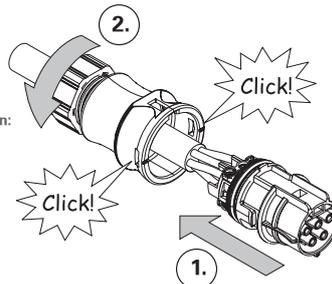
Bei Verwendung der Handentriegelung erlischt die Zulassung nach VDE 0606, da die Steckverbindung dann ohne Werkzeug zu öffnen ist. Die Vorschrift VDE 0627 bleibt hiervon unberührt und wird im vollen Umfang eingehalten.

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.

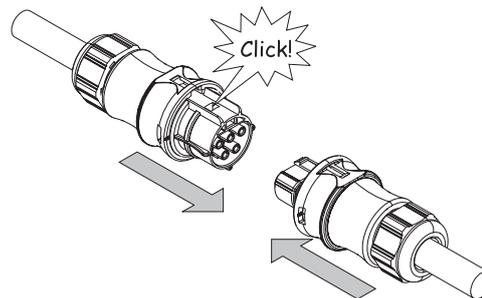
### Verschließen Closing

**Verschraubung:**  
Anzugsmoment typ. 4+1 Nm

**Screw connection:**  
Tightening torque typ. 4+1 Nm



### Stecken und verriegeln Plugging and locking

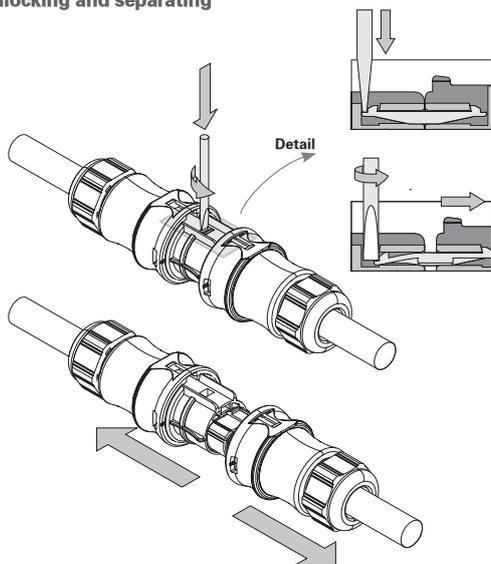


### ACHTUNG / CAUTION

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

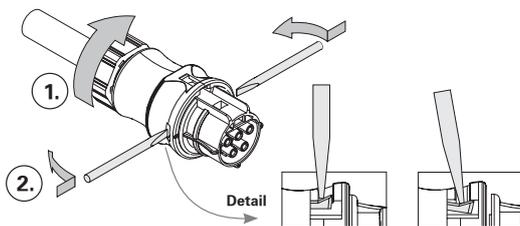
The connectors are not for current interrupting. Never connect or disconnect under load!

**Entriegeln und Trennen**  
Unlocking and separating



**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!

**Öffnen des Steckverbinders**  
Opening the connector

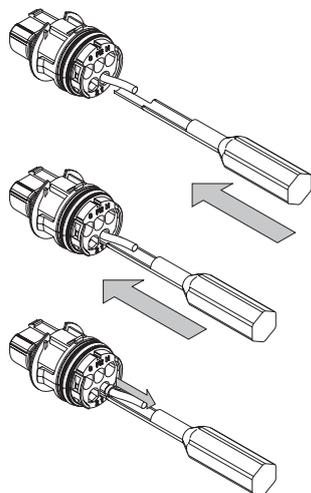


**Leiterdemontage Crimpkontakte**

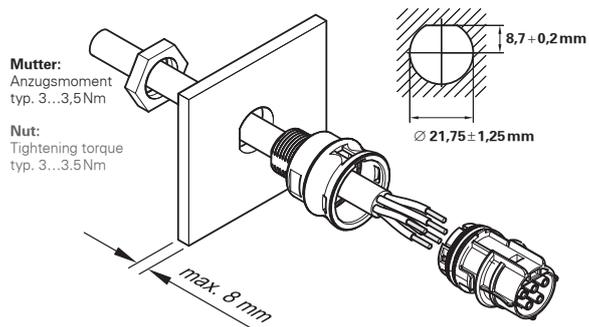
Benutzen Sie zum Lösen der Crimpkontakte das Entriegelungswerkzeug (Art.-Nr. 05.502.3500.0). Zur Veranschaulichung der Handhabung ist nur ein Leiter gezeigt.

**Unlocking crimp connections**

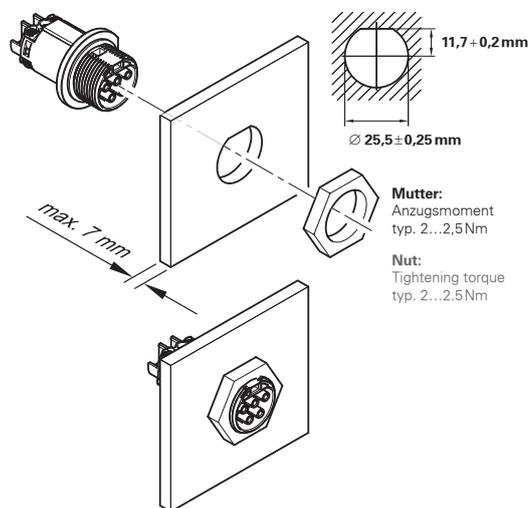
For unlocking, use the tool (Ref.-No. 05.502.3500.0) as pictured. For clarity, only one conductor is shown.



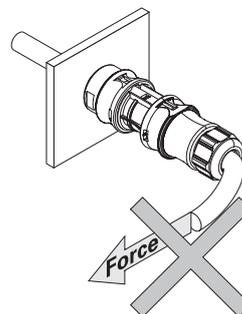
**Gehäuseeinbau mit M20-Durchführung**  
Housing installation with M20 feedthrough



**Gehäuseeinbau mit M25-Durchführung**  
Housing installation with M25 feedthrough



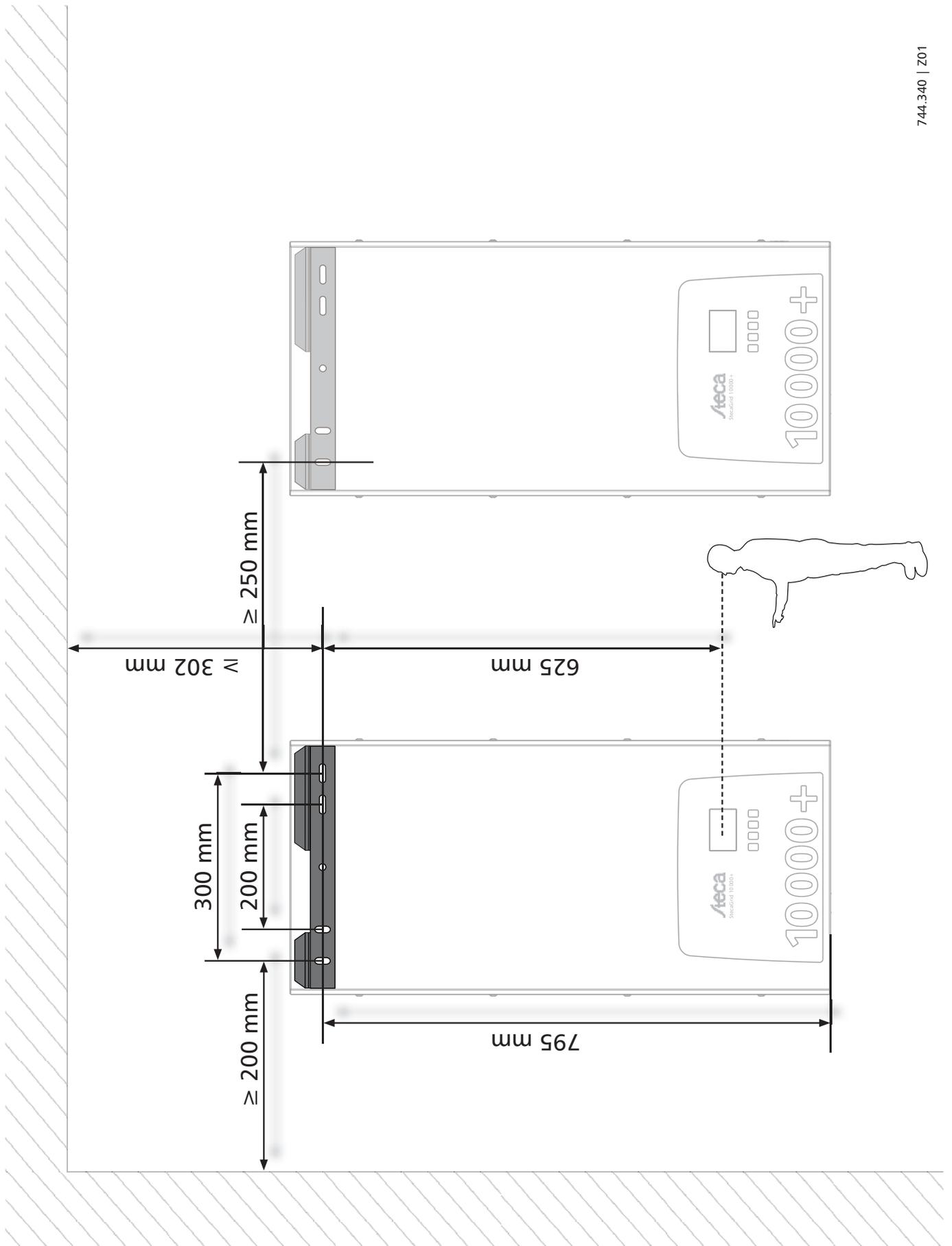
**ACHTUNG / CAUTION**  
Damit die Schutzart IP68 eingehalten wird, stellen Sie durch geeignete Maßnahmen sicher, daß die Steckverbinder vor Biegekräften geschützt sind (z.B. keine Lasten an Kabel hängen; Kabelaufwicklungen nicht freihängend etc.).  
To ensure protection category IP68, do not expose the connection to bending forces (e.g. do not attach loads to the cable, no free-dangling cable windings etc.)



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## Wechselrichter – Inverter – Onduleur



744.340 | Z01



744378