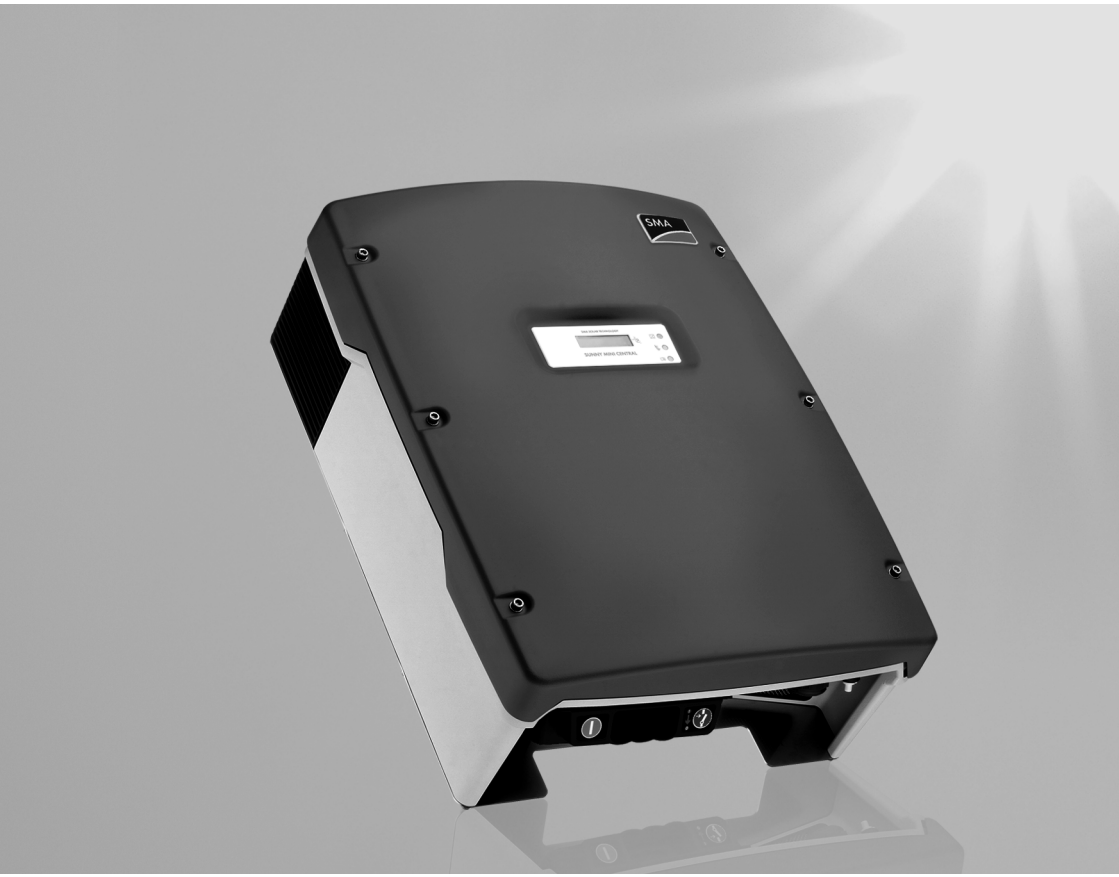
PV Inverter

# **SUNNY MINI CENTRAL** 6000TL / 7000TL / 8000TL

**Installation Guide**




SMC6-8TL-IEN083430 | IME-SMCTL_60_70_80 | Version 3.0

EN

# Table of Contents

# 1 Notes on this Manual

## 1.1 Validity

This installation guide describes the installation and commissioning of SMA inverters of the type Sunny Mini Central 6000TL, 7000TL, and 8000TL.

## 1.2 Target Group

Only qualified electricians may install and commission Sunny Mini Central units.

## 1.3 Storage of Manuals

All manuals for the Sunny Mini Central and the installed components must be stored with the system documentation and be accessible at all times.

## 1.4 Additional Information

You will find further information on special topics such as designing a line circuit breaker or the description of operation parameters in the download area at www.SMA.de.

## 1.5 Symbols Used

The following types of safety instructions and general information appear in this document:

**DANGER!**

DANGER indicates a hazardous situationwhich, if not avoided, will result in death or serious injury.

**WARNING!**

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**CAUTION!**

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTICE!**

NOTICE indicates a situation that can result in property damage if not avoided.

**Information**

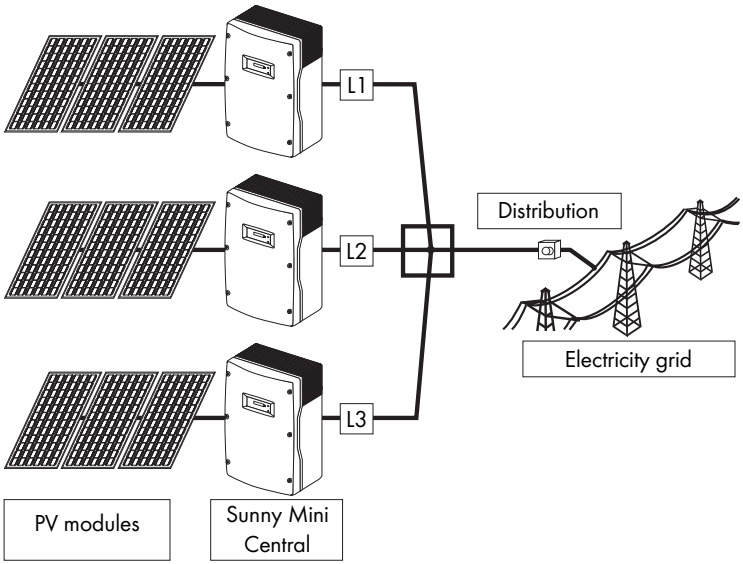
Information provides tips that are valuable for the optimal installation and operation of your product.

# 2 Security

## 2.1 Appropriate Usage

The Sunny Mini Central is a PV inverter that converts the DC current of solar cells to AC current and feeds it into the public grid.

### Principle of a PV System with the Sunny Mini Central




- The Sunny Mini Central may only be operated with solar generators (modules and cabling) of protection class II.
- PV modules with large capacities relative to ground, such as thin-film modules with cells on a metallic substrate, are therefore only to be implemented if their coupling capacity is below 50 nF/kWp.

  During grid feeding, a leakage current flows from the cells to the earth. The magnitude of this current depends on the manner in which the modules are installed and, to no small extent, on the weather (rain, snow). This operational leakage current is not to exceed 50 mA.

When planning the PV system, ensure that the values comply with the permitted operating range of all components at all times. The free design program "Sunny Design" (www.SMA.de/SunnyDesign) will assist you in this. The manufacturer of the PV modules must have approved the modules for use with this Sunny Mini Central unit. You must also ensure that all measures recommended by the module manufacturer for long-term maintenance of the module properties are taken (see also "Module Technology" technical information, in the download area of www.SMA.de).

Another use of the Sunny Mini Central as well as unauthorized installations or modifications can compromise the operating safety and void the warranty claims and the operation permission.

The following is not permitted:

- Using the Sunny Mini Central for purposes other than those indicated in this installation guide,
- Connecting other power supply units other than PV modules to the Sunny Mini Central,
- Modifying the Sunny Mini Central or installing components that have not been expressly recommended or sold by SMA Solar Technology!

## 2.2 Safety Instructions

**DANGER!**

**Danger to life due to high voltages in the Sunny Mini Central!**

All work on the Sunny Mini Central must be carried out by a qualified electrician.

**CAUTION!**

**Danger of burn injuries due to hot housing parts!**

- Do not touch the housing body during operation.
- Only touch the cover during operation.

**NOTICE!**

**Dust or water entering the Sunny Mini Central can damage the device!**

If the Electronic Solar Switch has been pulled out, the Sunny Mini Central only has a protection rating of IP21.

If the device has been temporarily decommissioned, proceed as follows to restore the IP65 protection rating:

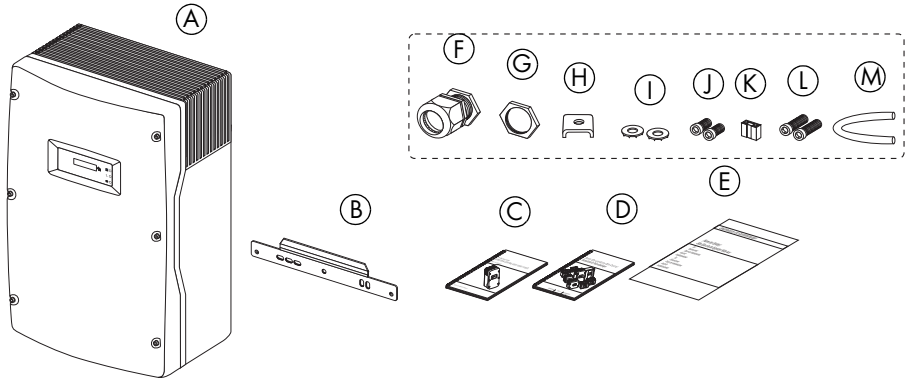
- Unplug all DC plug connectors and seal them with the protecting caps provided.
- Attach the Electronic Solar Switch.

**PV generator ground connection**

Comply with the local requirements for grounding the modules and the PV generator. SMA Solar Technology recommends connecting the generator frame and other electricity conducting surfaces such that there is continuous conduction and to connect them to the ground in order to reach maximum protection for property and persons.

# 3 Unpacking

## 3.1 Packing List



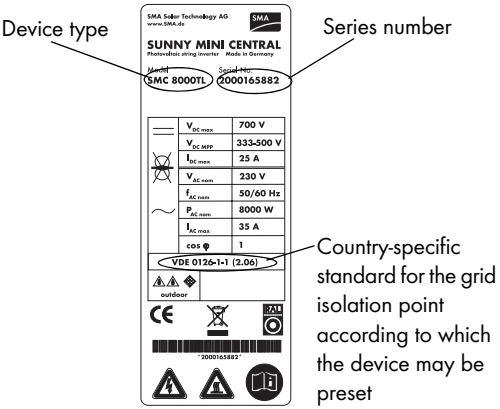

| Object | Quantity | Description |
|---|---|---|
| A | 1 | Sunny Mini Central |
| B | 1 | Wall mounting bracket |
| C | 1 | Installation guide |
| D | 1 | User manual |
| E | 1 | Set of documents with explanations and certificates |
| | 1 | Inverter accessories bag |
| | 1 | Communication accessories bag (optional),<br>packing list, see separate communication manual |
| | | |
| **Contents of inverter accessories bag:** | | |
| F | 1 | Cable screw connection for AC connection |
| G | 1 | Nut for AC connection cable screw connection |
| H | 1 | Clamping clip for additional connection to ground |
| I | 2 | Washers: 1 x for cover screws (replacement), 1 x for ground connection cable terminal |
| J | 2 | Cylinder head screws (M6 x 16): 1 x for cover (replacement), 1 x for ground connection cable terminal |
| K | 1 | Jumper for fan test |
| L | 2 | Cylinder head screws (M6 x 8) for securing the Sunny Mini Central on the wall mounting bracket |
| M | 1 | Silicone tube for insulation of the SMA Power Balancer connection cable |

## 3.2 Checking for Transport Damage

Check the Sunny Mini Central for visible external damage, such as cracks in the housing or display. Please contact your dealer if you find any damage.

## 3.3 Identifying the Sunny Mini Central

You can identify the Sunny Mini Central using the type label. The type label is on the right side of the housing.



# 4 Mounting

## 4.1 Selection of the Mounting Location

**DANGER!**
**Lethal danger caused by fire or explosion!**

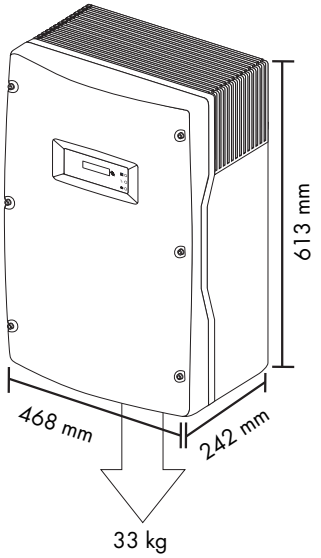
Despite careful construction, a fire can occur with electrical devices.

- Do not mount the Sunny Mini Central on flammable construction materials.
- Do not mount the Sunny Mini Central in areas where highly flammable materials are stored.
- Do not mount the Sunny Mini Central in areas where there is a risk of explosion.

**CAUTION!**
**Danger of burn injuries due to hot housing parts!**

- Mount the Sunny Mini Central such that it cannot be touched inadvertently.

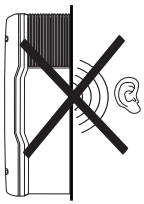
### 4.1.1 Dimensions and Weight



## 4.1.2 Ambient Conditions

- The mounting location and mounting method must be suitable for the weight and dimensions of the Sunny Mini Central.
- Mounting on a solid surface.
- The mounting location must be accessible at all times.
- The ambient temperature should be below 40 °C at all times to guarantee optimal operation.
- Do not expose the Sunny Mini Central to direct sunlight to avoid a power reduction due to excessive heating.
- In a living area, do not mount the unit on plasterboard etc. walls as otherwise audible vibrations are likely to result.

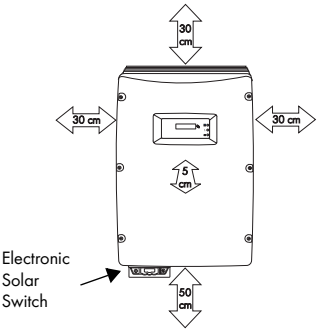
  The Sunny Mini Central can make noises when in use which can be seen as a nuisance when installed in a living area.



## 4.1.3 Safety Clearances

Observe the following minimum clearances to walls, other devices or objects to guarantee sufficient heat dissipation and enough space for pulling the Electronic Solar Switch handle.

| Direction | Minimum clearance |
|---|---|
| Sides | 30 cm |
| Above | 30 cm |
| Below | 50 cm |
| Front | 5 cm |

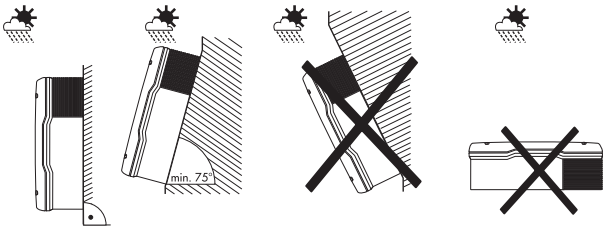



**Multiple Sunny Mini Centrals installed in areas with high ambient temperatures**

The individual Sunny Mini Central units must be far enough apart to ensure that the individual Sunny Mini Central units do not take in the cooling air of the neighboring unit.

If necessary, increase the clearance and ensure that the supply of cool air is sufficient to cool the Sunny Mini Centrals.

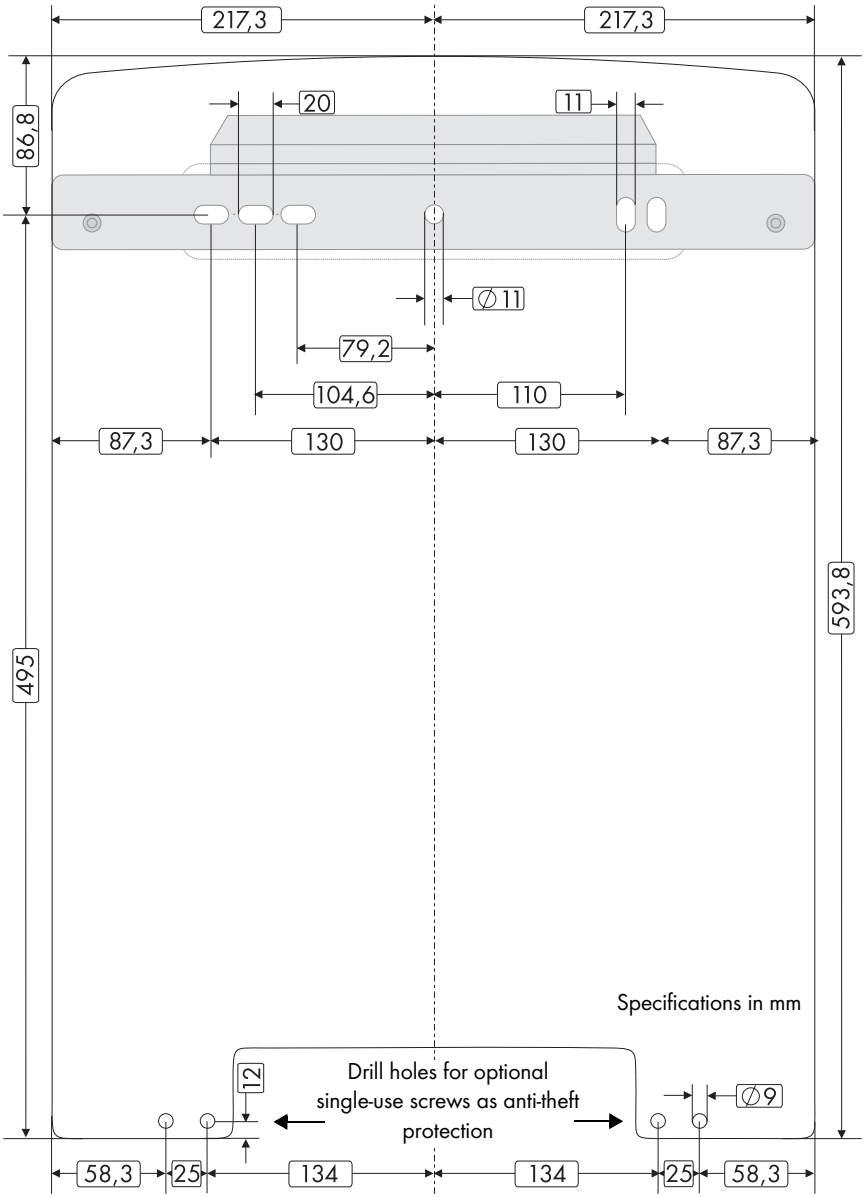
## 4.1.4 Position




- Vertical installation or tilted backwards by max. 15°.
- Never install the device with a forward tilt.
- Do not install horizontally.
- Install at eye level to allow operating modes to be read at all times.

## 4.2 Mounting Instructions

1. Position the drill holes with the aid of the wall mounting bracket and drill the holes. In doing so, use two to four of the six holes in the middle.

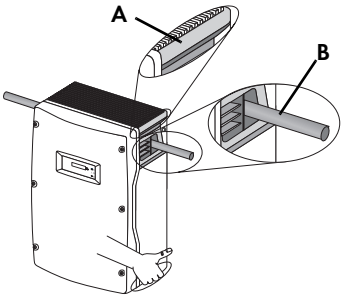


**CAUTION!**

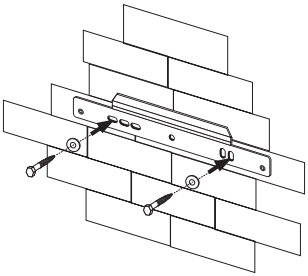
**Risk of injury due to the heavy weight of the Sunny Mini Central!**

The Sunny Mini Central weighs 33 kg

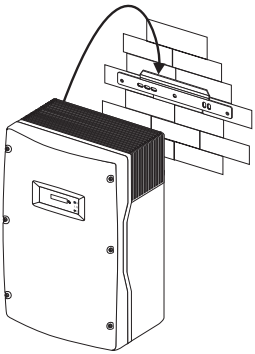
- Mount the wall mounting bracket with the appropriate mounting material (depending on subsurface).
- Use upper and lower edgewise handles (A) or steel bar in the housing opening (B - diameter of max. 30 mm) for transport and mounting.




2. Secure the wall mounting bracket using suitable screws and washers.



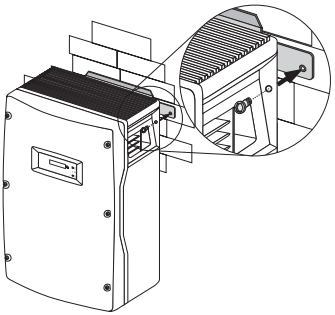
3. Attach the Sunny Mini Central to the wall bracket using the mounting opening in the rear wall of the housing.



4. Screw the Sunny Mini Central onto the wall mounting bracket on both sides using the M6 x 8 mm screws provided.

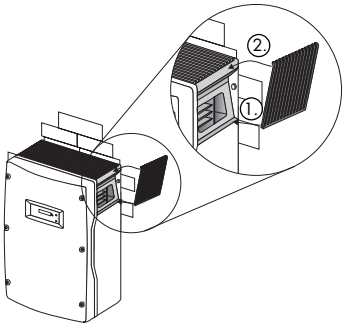
   Only fasten the screws using your hand!

5. Check that the unit is securely in place.



6. Close the recessed grips with the handle covers provided in the accessories kit.

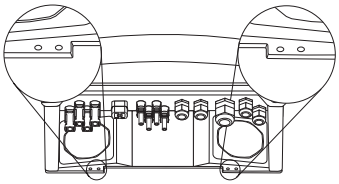
   The handle covers prevent the penetration of dirt and insects and can be reordered upon request from SMA Solar Technology (SMA order number: 45-7202, see Page 62 for contact).




**Optional anti-theft protection**

To protect the Sunny Mini Central against theft, the rear face can be secured to the wall at the bottom using 2 single-use bolts.

The other two holes are spares.



# 5 Electrical Connection

**NOTICE!**

**Electrostatic discharges can damage the Sunny Mini Central!**

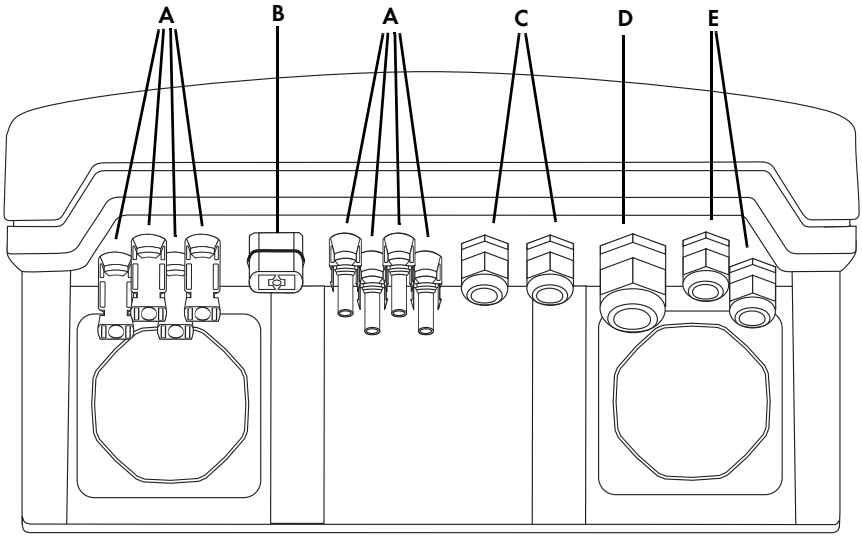
Internal components of the Sunny Mini Central can be irreparably damaged by static discharge.

- Ground yourself before you touch a component.

## 5.1 Connection Area Overview

### 5.1.1 View from Below

The following figure shows the assignment of the individual housing openings on the base of the Sunny Mini Central.




**A** Plug connectors for connecting the PV strings

**B** Socket for the connection of the Electronic Solar Switch (ESS) DC load disconnection unit

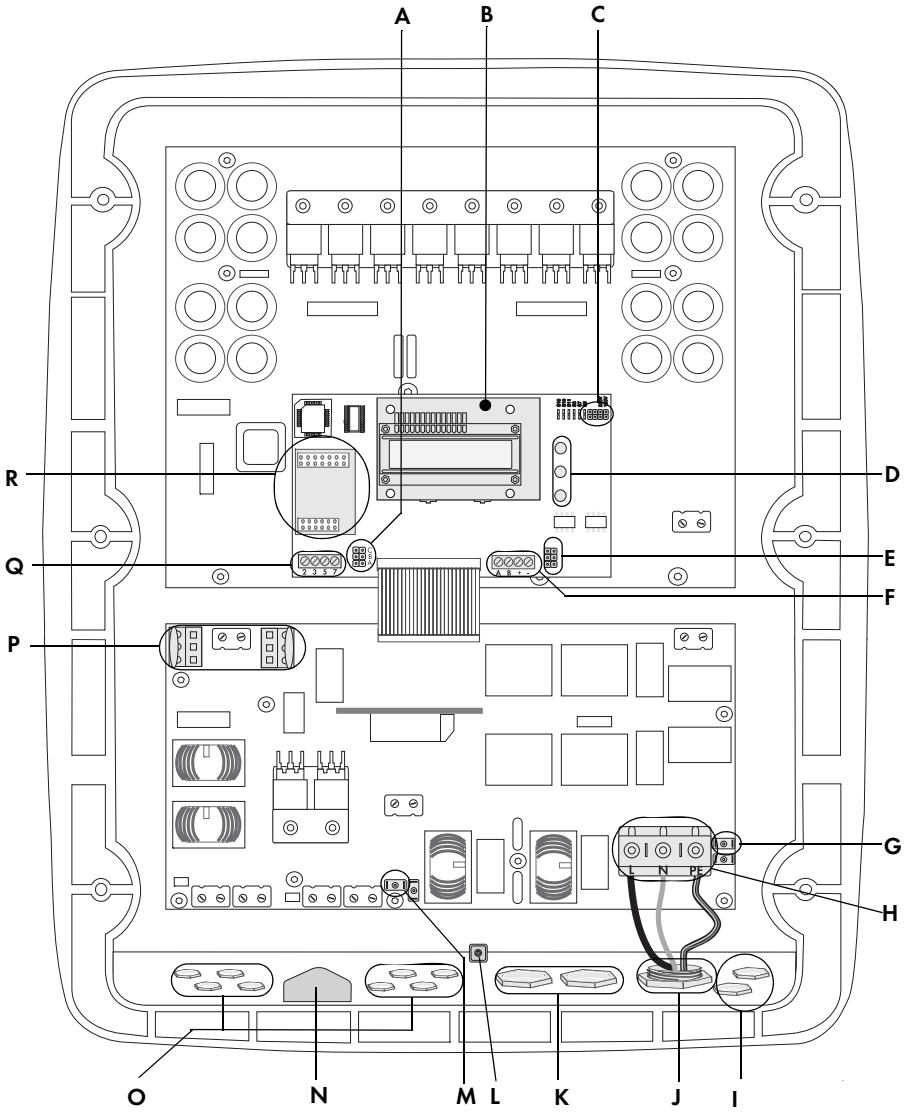
**C** Cable openings for optional communication via RS485 or radio (PG16)

**D** Cable opening for grid connection (AC) (11 mm - 25 mm)

**E** Cable openings for SMA Power Balancer

## 5.1.2 View from Inside

The following diagram gives a schematic overview of the various components and connection points inside the Sunny Mini Central with the cover removed.



**A** Jumper for communication (Page 38)
**B** Display (Page 40)
**C** Jumper for fan testing (Page 51)
**D** Operating status LEDs (Page 40)
**E** Jumper for SMA Power Balancer (Page 29)
**F** Connection terminals for SMA Power Balancer (Page 29)
**G** Tab for grounding the cable shield of the SMA Power Balancer connection cable (Page 29)
**H** Connection terminals for mains cable (AC) (Page 22)
**I** Cable openings for SMA Power Balancer (Page 29)
**J** Cable opening for mains cable (AC) (Page 22)
**K** Cable openings for communication (Page 38)
**L** Screwing device for shield clamp for communication cable Page 38)
**M** Tab for grounding the cable shield with communication (Page 38)
**N** Connection socket for "Electronic Solar Switch" (ESS) DC load disconnection unit (Page 26)
**O** PV input plug (DC) (Page 26)
**P** Varistors (Page 56)
**Q** Connection terminals for communication (Page 38)
**R** Slot for communication interface (Page 38)

## 5.2 Connection to the Public Grid (AC)

**Connection requirements of the utility operator**

Always observe the connection requirements of your utility operator!

### Wire Design

The cable cross section should be sized using the "Sunny Design" design program (www.SMA.de) so that output losses do not exceed 1 % at nominal power.

The maximum line length for each cable cross section is shown in the following table.

| Cable cross section | Max. cable length | | |
|---|---|---|---|
| | SMC 6000TL | SMC 7000TL | SMC 8000TL |
| 10.0 mm² | 25 m | 22 m | 19 m |
| 16.0 mm² | 41 m | 35 m | 31 m |
| 25.0 mm² | 64 m | 55 m | 48 m |

[a] Only use flexible cables.

Depending on the type of cable installation, observe the requirements of the following factors when selecting the cable type / cable cross section:

- the ambient temperature
- the type of cable installation and
- the UV resistance.

**Cut line losses in half**

If three Sunny Mini Centrals with symmetrical feeding are combined to form a three-phase system, the neutral conductor is not subjected to any load, and the line losses are halved. Thus, the maximum possible cable length is doubled.

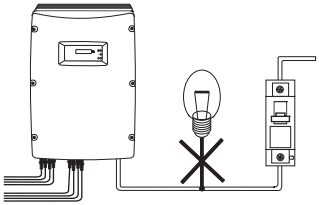
## Load Disconnection Unit

The maximal permissible rating is located in the technical data (Page 59).

**WARNING!**

**Risk of lethal burns!**

When a generator (Sunny Mini Central) and a consumer are connected to the same line circuit breaker, the protective function of the line circuit breaker is no longer guaranteed. The current from the Sunny Mini Central and the grid can add up to overcurrent which is not detected by the line circuit breaker.



- Never connect consumers between the Sunny Boy and the line circuit breaker without protection.
- Always install separate fuses for loads.

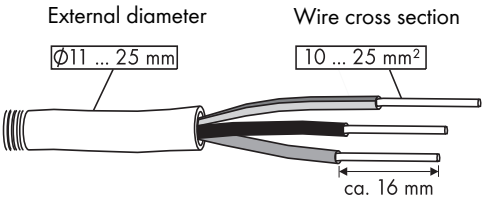
**Load disconnection unit**

Use only line circuit breakers as load disconnection units !

A screw type fuse element, e.g. D system (Diazed) or D0 system (Neozed) is not a load disconnection device, and thus may **not** be used as a load disconnection unit.

Upon disconnection under load, the screw type fuse element may be destroyed, or its functionality may be inhibited by contact burning. It only acts as cable protection.

## Cable Requirements




## Connection Procedure

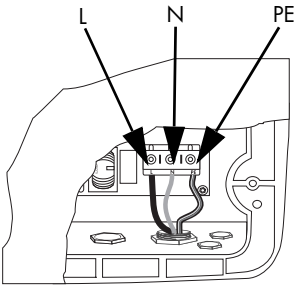
1. Check the grid voltage and compare it with "$V_{AC}$" on the type label.

   The exact operating range of the Sunny Mini Central is specified in the operating parameters. The operating parameters can be read using a communication component or requested from SMA Solar Technology.
2. Switch off the line circuit breaker and secure it to prevent it from being reactivated.
3. Loosen all six cover screws and remove the cover.
4. Remove the taping of the AC cable opening (see "E" on Page 19).

5. Insert the AC screw clamp into the cable opening from the outside and tighten it along with the nut from the inside.
6. Pull cable through.
7. Connect L, N and the protective earth (PE) to the terminal blocks in accordance with the labels.

   For this, the PE wire must be 5 mm longer than the L and N wires!

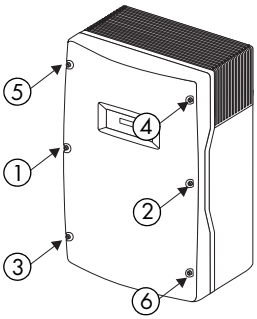
   L and N may not be swapped!
8. Securely close the screw clamp on the cable opening.




9. Secure the cover with six screws and the corresponding washers.

   Tighten the screws in the sequence shown on the right to a torque of 6 Nm. The toothing of the washers must face toward the cover.

   The Sunny Mini Central accessories kit contains a spare screw and spare washer.




**DANGER!**

**Danger to life due to live covers!**

The grounding of the housing cover is ensured by the toothed washers.

- Fasten the washers for all six screws with the toothing facing toward the cover.

**DANGER!**

**Danger to life due to high voltages in the Sunny Mini Central!**

- Do not switch on the line circuit breaker until the Sunny Mini Central is securely closed and the PV generator has been connected.

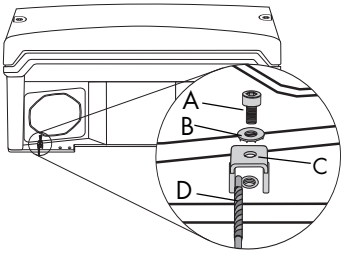
## Additional Grounding of the Housing

If a second protective earth connection is required in the installation country (e.g. Switzerland), you can also ground the Sunny Mini Central with an additional protective earth on the connection terminal of the housing.

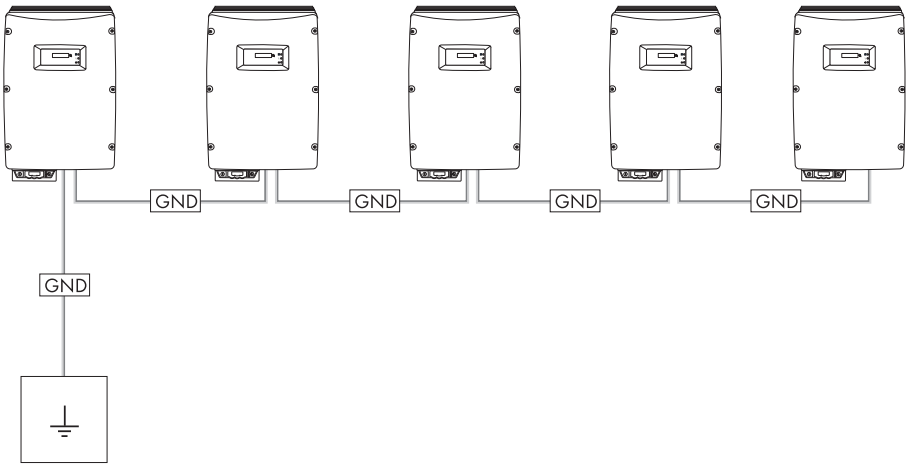
### Procedure

1. Insert the stripped grounding cable (D) under the terminal clamp (C) (max. cross section: 16 mm²).
2. Secure the terminal clamp with screw (A) and washer (B).

   The toothing of the washer must face toward the terminal clamp.




You can ground multiple Sunny Mini Centrals as shown below:



## 5.3 PV Generator (DC) Connection

- Requirements for the modules of the connected strings:
  - same type
  - same number
  - identical alignment
  - identical tilt
- The connecting wires of the solar modules must be equipped with plug connectors to allow the ten DC plug connectors of the Sunny Mini Central to be connected to it.

  A pre-assembled set for connecting the free cable ends from a string is available as an accessory from SMA Solar Technology:

| Connection set | Order code | Max. flow current |
|---|---|---|
| Multi-Contact 3 mm | SWR-MC | 21.0 A |
| Multi-Contact 4 mm | MC-SET | 30.0 A |
| Tyco | TYCO-SET | 30.0 A |

- The following limit values at the DC input of the Sunny Mini Central may not be exceeded:

| Device | Maximum input voltage | Maximum input current |
|---|---|---|
| SMC 6000TL | 700 V (DC) | 28.0 A (DC) |
| SMC 7000TL | 700 V (DC) | 31.0 A (DC) |
| SMC 8000TL | 700 V (DC) | 34.0 A (DC) |

**DANGER!**

**Risk of lethal electric shock or burns!**

The maximum possible input current per string is limited by the plug connector used. If the plug connector is overloaded, an electric arc may occur and there is a fire risk.

- Ensure that the input current for each string does not exceed the maximum flow current of the plug connectors used.

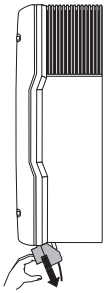
## Connection Procedure

**DANGER!**

**Danger to life due to high voltages in the Sunny Mini Central!**

- Before connecting the PV generator, ensure that the line circuit breaker is switched off.

1. Remove the Electronic Solar Switch by pulling it downwards and slightly towards the wall.



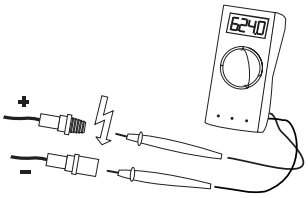
**NOTICE!**

**Excessive voltages can destroy the measuring device!**

- Only use measuring devices with a DC input voltage range up to at least 700 V.

2. Check the connection cables of the solar modules for correct polarity and that the maximum input voltage of the Sunny Mini Central is not exceeded.

   Check the system design if the open circuit voltage of the solar modules is less than 10 % below the maximum input voltage of the Sunny Mini Central!




**NOTICE!**

**The Sunny Mini Central could be irreparably damaged by overvoltage!**

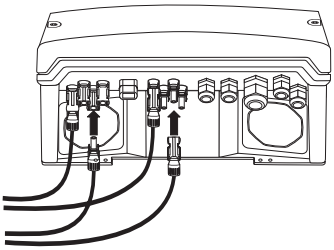
If the voltage of the solar modules exceeds the maximum input voltage of the Sunny Mini Central, it could be irreparably damaged by overvoltage.

All warranty claims become void.

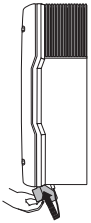
- Do not connect strings to the Sunny Mini Central with open circuit voltage greater than the maximum input voltage of the Sunny Mini Central.
- Check the system design.

3. Check the strings for ground faults, as described in section 9.1 „The Red LED is Continuously On“ (54).

4. Connect the DC plug connectors.
5. Close unused input sockets with the sealing caps included in the packing list.



6. Check the Electronic Solar Switch for wear as described in section 8.2 and insert it until it audibly clicks into place.



**NOTICE!**

**Manipulating the connector in the handle can damage the Electronic Solar Switch!**

The connector must remain moveable inside the handle to ensure proper contact. Tightening the screws voids all warranty claims and creates a fire risk.

- Do not tighten the connector screw in the Electronic Solar Switch handle.

**NOTICE!**

**Damage to the Electronic Solar Switch!**

If inserted incorrectly, the Electronic Solar Switch can be damaged by high voltages.

- Press the handle firmly into place on the socket of the Electronic Solar Switch until it audibly engages.
- Check that the unit is securely in place.

You can now commission the Sunny Mini Central as described in section 6 „Commissioning“ (40). The following connection options are optional.

**The residual current circuit breaker**

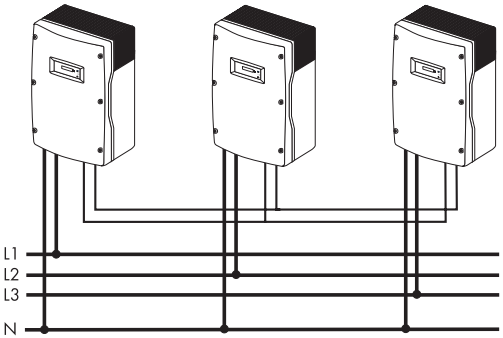
The Sunny Mini Central is equipped with an integrated all-pole sensitive failure current monitoring unit. This enables the Sunny Mini Central to automatically differentiate between real failure currents and "normal" capacitative discharge currents.

If an external RCD or residual current breaker is mandatory, you must use a circuit breaker which is triggered at a leakage current of 100 mA or more.

## 5.4 Connection of the SMA Power Balancer

The Sunny Mini Central is equipped with the SMA Power Balancer as standard. This enables a circuit connection of three Sunny Mini Centrals to a three-phase low-voltage grid.

Each of the three Sunny Mini Centrals in a group must be connected to a different grid phase conductor (L1, L2 and L3)!




By activating this circuit, you can stipulate how the other two Sunny Mini Centrals are to react if there is a device fault with the third Sunny Mini Central or there is a grid voltage fault in its phase.

The connections for the SMA Power Balancer are galvanically isolated from the rest of the Sunny Mini Central circuit.

## 5.4.1 Configuration

The SMA Power Balancer is deactivated at the factory using the "PowerBalancer" parameter (parameter setting = off) and can only be activated and configured using an SMA communication component. You will find options available for this in the Sunny Mini Central user manual or on the SMA website www.SMA.de.

Request a personal SMA grid guard password from SMA Solar Technology so that you can modify the "PowerBalancer" parameter (contact: see Page 62).

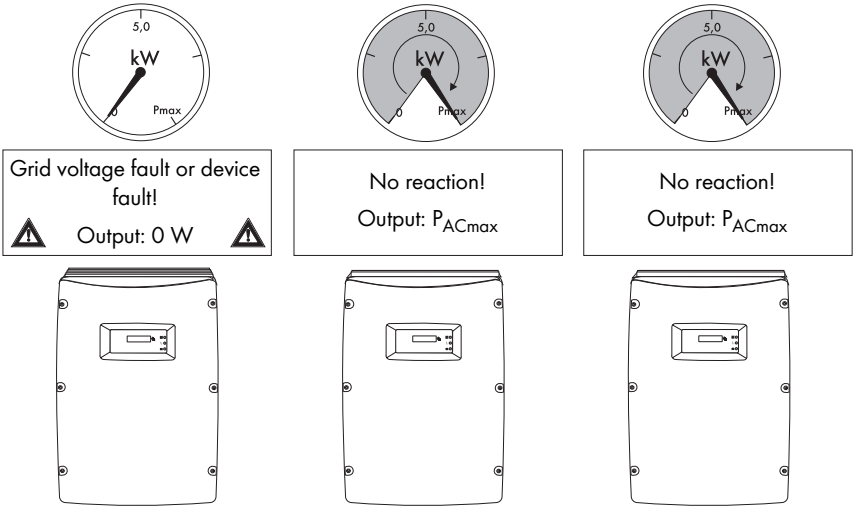
### Configuration Options

There are four different configuration options for the "PowerBalancer" parameter.

- **Off**

  The Power Balancer is deactivated (factory setting).

  In the event of a device fault or grid voltage fault at a Sunny Mini Central, only this Sunny Mini Central is disconnected from the grid and the other two devices continue to run at an undiminished power level.

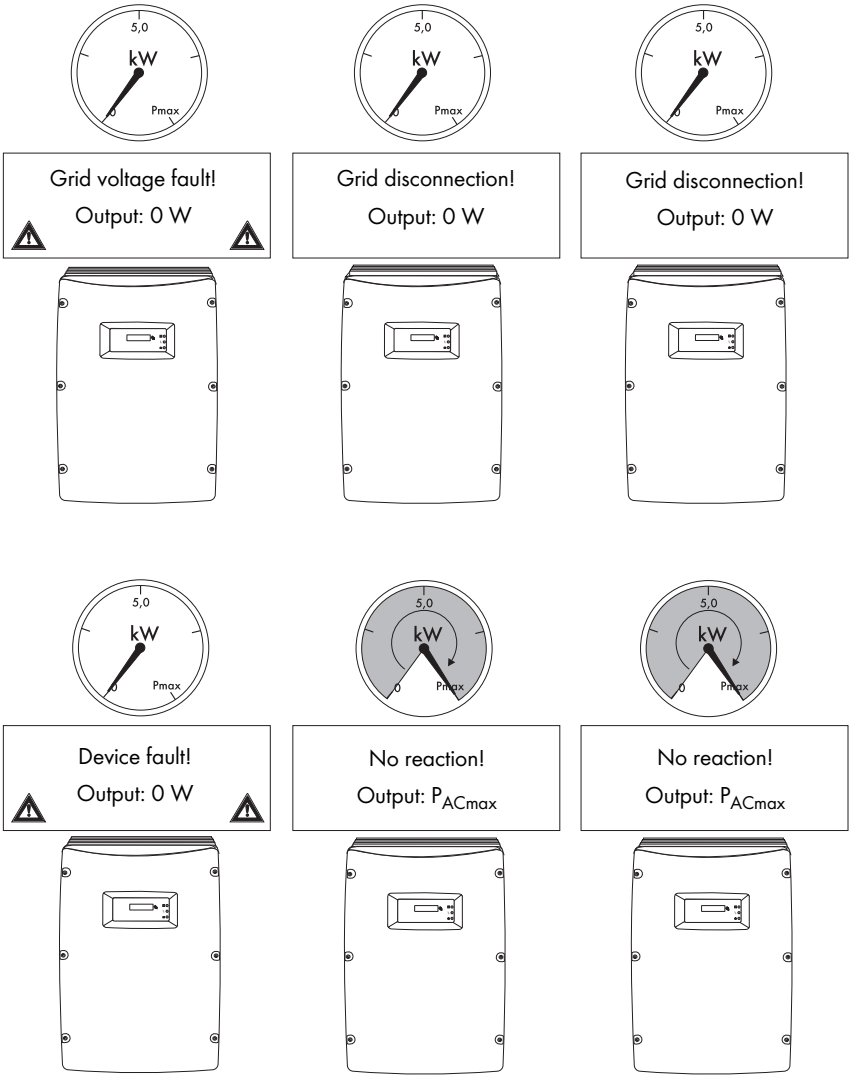


- **PhaseGuard**

  If one of the three Sunny Mini Centrals indicates a grid voltage fault and stops feeding in, the other two inverters also disconnect from the grid automatically.

  If one of the three Sunny Mini Centrals indicates a device fault and stops feeding in, the other two inverters are not affected and continue to feed in at full power.

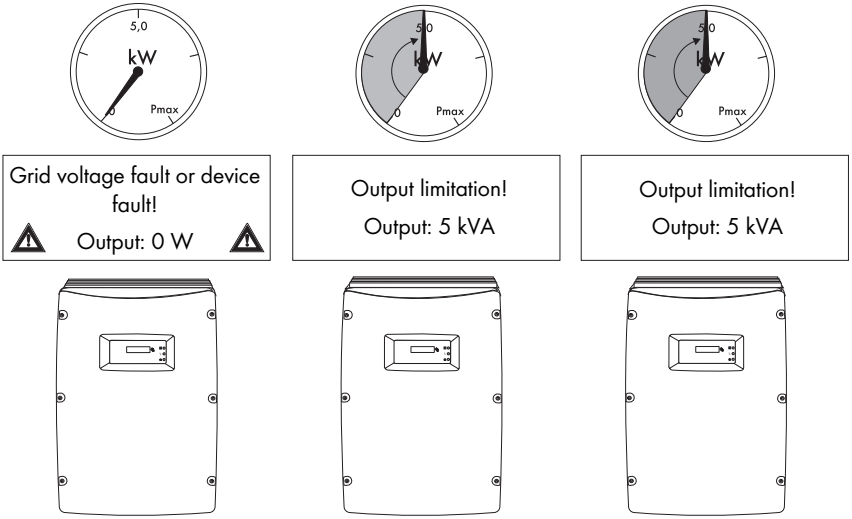
  For systems with a nominal power output > 30 kW, select this setting in order to realize the required three-phase voltage monitoring.



- **PowerGuard**

  If one of the three Sunny Mini Centrals indicates a grid voltage fault or device fault and stops feeding in, the other two inverters automatically limit their power to 5 kW over a 10 minute average.

  Select this setting in order to prevent an unbalanced load of over 5 kVA in a group of three Sunny Mini Centrals.

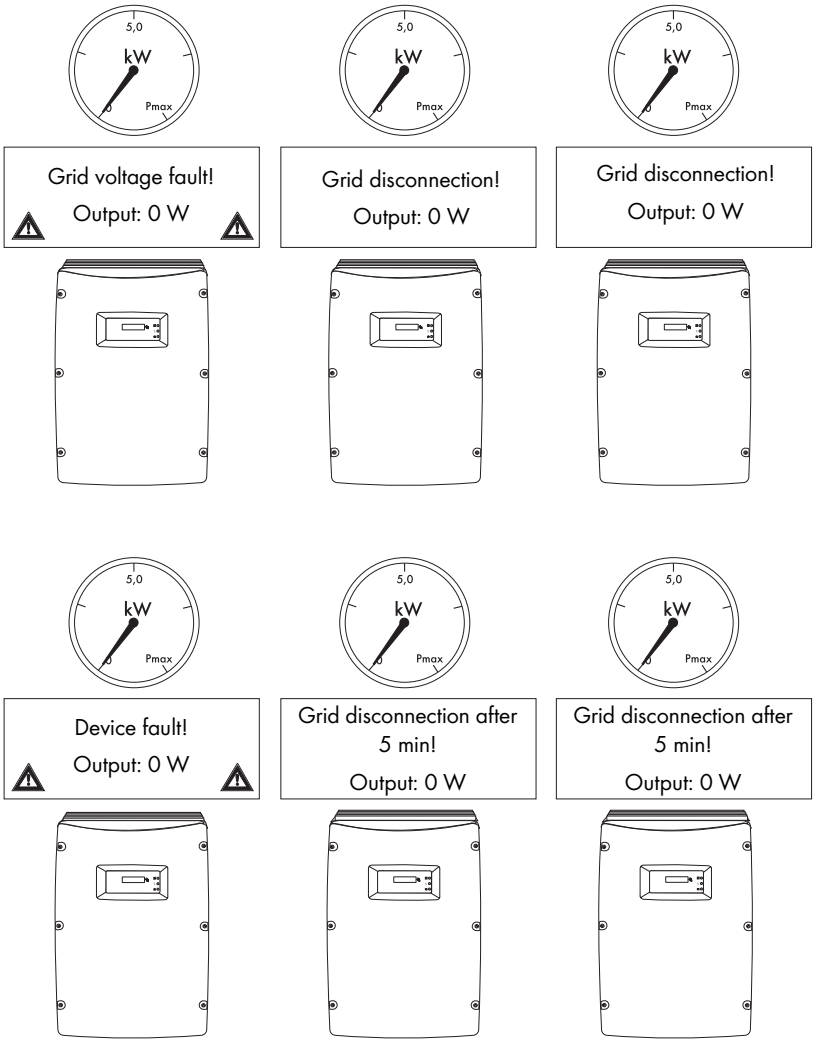


- **FaultGuard**

  If one of the three Sunny Mini Centrals indicates a grid voltage fault and stops feeding in, the other two inverters also disconnect from the grid immediately.

  If one of the three Sunny Mini Centrals indicates a device fault and stops feeding in, the other two inverters also disconnect from the grid 5 minutes later.

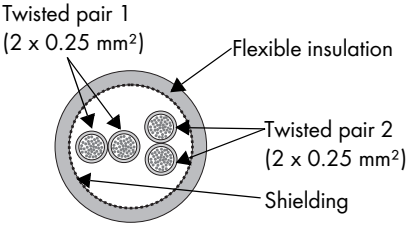
  Select this setting in order to realize the three-phase voltage monitoring required for systems with a nominal power output > 30 kW, and to prevent an unbalanced load of more than 5 kVA between two phases.



## 5.4.2 Cabling

For cabling up the SMA Power Balancer, use a "LiYCY" cable, structured as shown here:

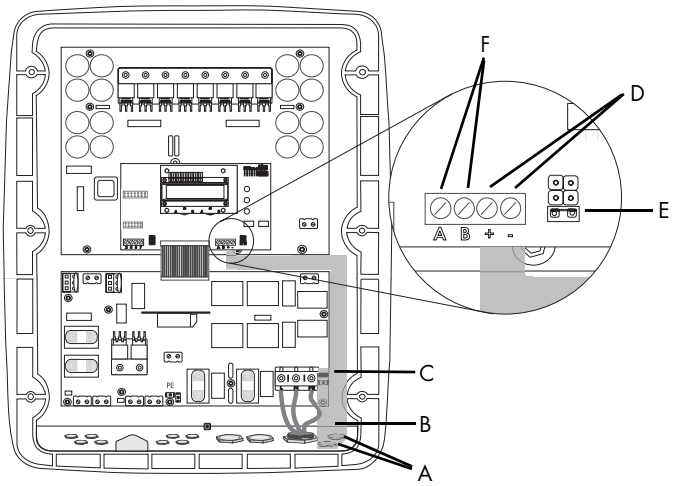
- Indoors: LiYCY 2 x 2 x 0.25
- Outdoors: Li-2YCYv 2 x 2 x 0.25




Proceed as follows for the cabling:

1. Open the Sunny Mini Central as described in section 7.1 „Opening the Sunny Mini Central“ (46).
2. Feed the cable in every Sunny Mini Central.

   In doing so, use one of the two right housing openings (A) on the bottom side and feed the cable up along the cable route (B) to the terminal block (D).




**A** Housing openings in the base of the Sunny Mini Central

**B** Cable route (gray surface)

**C** PE connector

**D** Screw terminals for connecting the wires

**E** Jumper slots

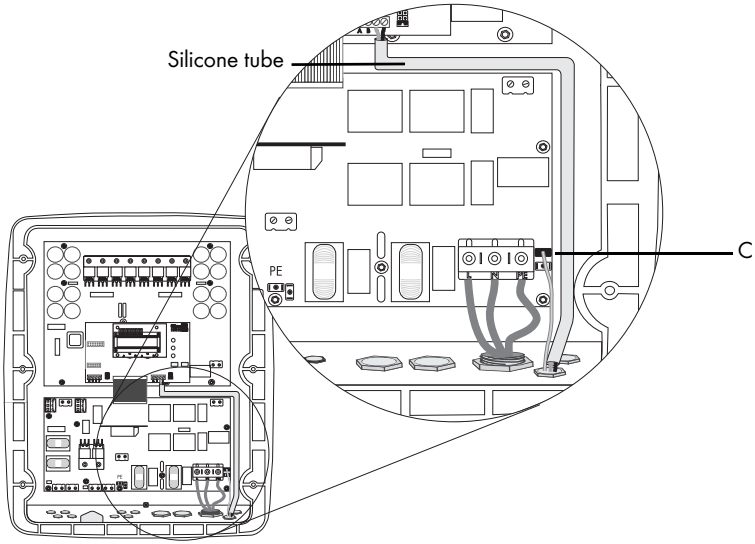
**F** Screw terminals for the wire jumper

**DANGER!**

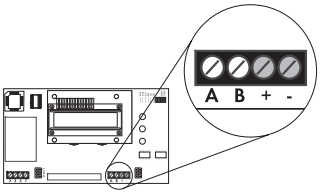
**Danger to life due to high voltages in a fault of the cable of the SMA Power Balancer!**

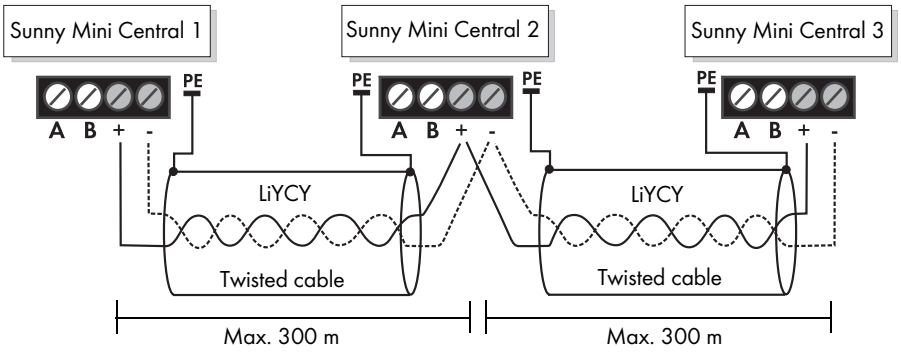
- Pull the silicone tube included in every Sunny Mini Central over the plus and minus line of the cable.
- Cut the silicone tube to the required length.

  The silicone tube must completely cover the cable inside the housing of the inverter.




3. Ground the cable shield in every Sunny Mini Central on the PE connector (C).
4. Fit the conductors of the plus and minus line in every Sunny Mini Central with wire sleeves and connect them to the plus and minus poles of the terminal block (D).
5. In order to connect the three Sunny Mini Centrals to each other, you must bring together the plus and minus lines of the two other Sunny Mini Centrals on the middle Sunny Mini Central terminal block.

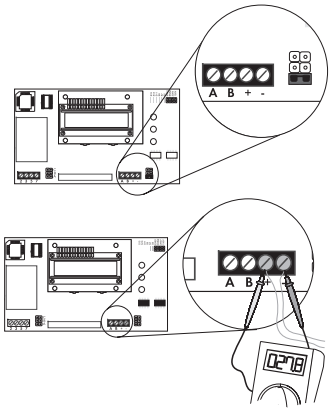





In doing so, the cable length between two Sunny Mini Centrals must not exceed 300 m.

6. In the middle Sunny Mini Central (the one with two wires per terminal), plug one of the provided jumpers into the lowest of the slots pictured on the right.

   Or bypass screw terminals A and B with a wire jumper.




7. Measure the resistance between the plus and minus pole of the terminal block in this Sunny Mini Central.

   If the resistance is approx. 27.8 kOhm (± 370 Ohm), the SMA Power Balancer is properly connected. Otherwise, check the cabling.

8. Close the Sunny Mini Centrals as described in section 7.2 „Closing the Sunny Mini Central" (48).

**Connection with a Sunny Mini Central 9000TL, 10000TL, or 11000TL**

In order to be able to connect the SMA Power Balancer with a Sunny Mini Central 9000TL, 10000TL, or 11000TL, the Sunny Mini Central 6000TL, 7000TL, or 8000TL must be equipped with a special connection plug (order number PBL-SMC-10-NR). The connection of three Sunny Mini Centrals is then carried out with a special connector cable (order number PBL-YCABLE-10).

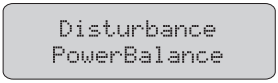
## 5.4.3 Functionality Test

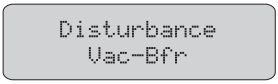
To test whether the SMA Power Balancer operates correctly, proceed as follows:

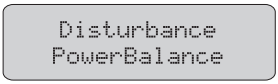
1. Select the "PhaseGuard" setting of the "PowerBalancer" parameter for all three Sunny Mini Centrals.
2. Check whether all Sunny Mini Centrals in the group are feeding the grid normally (green LED glows continually or display message shown to the right). If this is the case, proceed to step 3.

   If all Sunny Mini Centrals in this group show the display message pictured to the right: check the installation of the SMA Power Balancer and contact SMA Solar Technology if necessary.

   
   
3. Switch off the line circuit breaker for one of the three Sunny Mini Centrals.
4. The Sunny Mini Central with a deactivated line circuit breaker then indicates a grid voltage fault with the display message shown to the right ("Bfr" and "Srr" are irrelevant).

   
   
5. The other two Sunny Mini Centrals then also disconnect themselves from the grid with the display message shown to the right. Both devices subsequently switch to "Balanced" mode.

   
   
6. If the Sunny Mini Centrals react as described above, the functionality test has been completed successfully. Otherwise, check the configuration.
7. If necessary, reset the "PowerBalancer" parameter on all Sunny Mini Centrals back to the desired setting.
8. Switch on the line circuit breaker again.

## 5.5 Slot for Communication Interfaces

The communication interface is used for communication with special data acquisition devices or a PC with corresponding software.

See the communication interface documentation for a detailed wiring diagram. This section describes how to install the communication interface in the Sunny Mini Central.

### Installation Procedure

The letters in brackets refer to the figure on the next page.

1. Open the Sunny Mini Central as described in section 7.1 „Opening the Sunny Mini Central“ (46).

**NOTICE!**

**Electrostatic discharges can damage the communication interface!**

- Do not touch componentsconnectionsandplugcontacts.'
- Ground yourself before removing the communication interface from the packaging by touching the PE or a non-coated part of the housing.

2. Thread the cable through the cable opening (G) on the Sunny Mini Central. Use the right cable opening for radio communication.

**DANGER!**

**Danger to life through high voltage if there is a fault with the communication cable.**

- Pull the silicone tube over the cable.

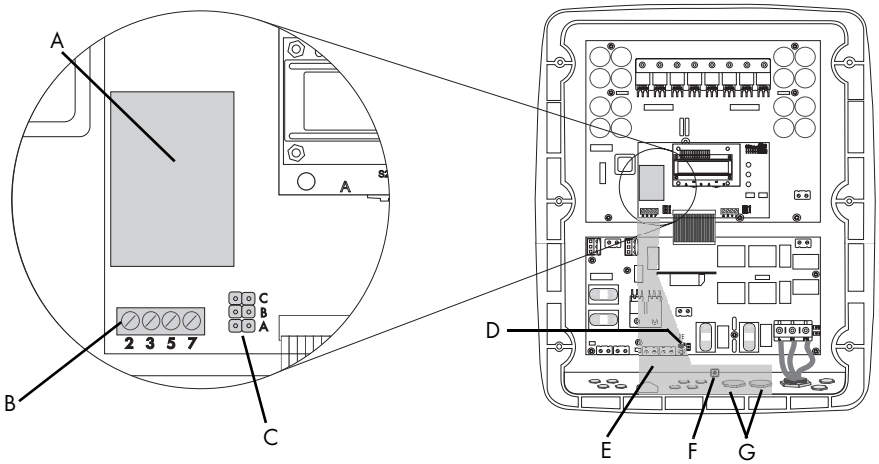
  The silicon tube must completely cover the communication cable inside the housing.

3. If the connection diagram of the communication device requires grounding the cable shield of the communication cable:
   - Use the provided shield clamp on its screwing device (F) for the communication interface. The installation and use of the cable shield is described in the communication interface documentation.
   - Or if no shield clamp was provided, ground the cable shield on the tab (D).
4. Install the communication cable (E) as described in the following figure.
5. Connect the communication cables to the screw terminal strip (B) as described in the connection plan of the communication device.

6. Connect the jumpers (C) if the connection plan of the communication device indicates this as necessary.

   A detailed description of the jumper functions can be found in the communication device manual.

7. Plug the communication interface to the left of the interface port (A).
8. Close the Sunny Mini Central as described in section 7.2 .




**A** Interface port

**B** Screw terminals for connection of the communication wires

**C** Jumper slot

**D** Tab for grounding the cable shield

**E** Cable route (gray surface)

**F** Screwing device for the shield clamp

**G** Cable openings in the base of the Sunny Mini Central

# 6 Commissioning

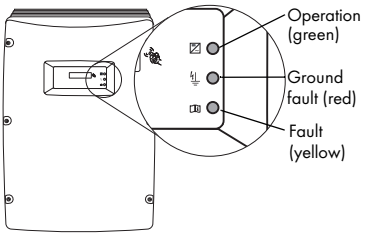
Check the following requirements before commissioning:

- Correct connection of the AC (grid) cable
- Full connection of the DC cables (PV strings)
- Unused DC plug connectors on the underside of the housing are sealed with protective caps
- The housing cover is securely screwed in place
- The Electronic Solar Switch is securely plugged
- The line circuit breaker is laid out correctly

## Commissioning Procedure

1. Switch on the line circuit breaker.
2. During the day, an illuminated or blinking green LED signals fault-free operation. If this is the case, commissioning was completed successfully.

   There is no display available for displaying due to a lack of radiation at night.
3. The meaning of the yellow and red LEDs as well as the error and status messages on the display are described in the user manual provided.



# 6.1 Display

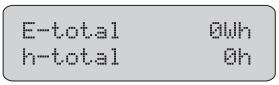
## Grid Feeding

After fault-free grid connection of the Sunny Mini Central, it takes approximately one minute until the following display messages are shown alternately. The display messages shown before that only have the purpose of indicating the initialization of the Sunny Mini Central and the process of controlling whether the power supply requirements are fulfilled.

1. The energy generated today and the current operating mode are displayed first.


2. The current feed-in power and the PV voltage are displayed after 5 seconds or when you tap the housing cover.

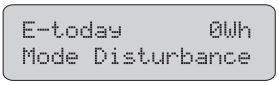

3. After a further 5 seconds, or when you tap again, the total energy produced and the time the Sunny Mini Central has been connected to the grid are displayed.




4. Then the cycle begins again.

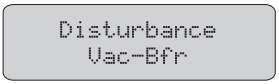
## Disturbance

1. In case of a fault, the message "Disturbance" is shown in the status bar.

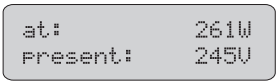



2. The exact failure message follows.

   For example, if the grid fault message shown here is displayed immediately after connection, it may be due to the fact that the AC wire is not correctly connected or the circuit breaker is not switched on yet.




3. If a measured value, which is not standard-compliant, is responsible for the failure, then the value measured at the time of the failure is displayed. If another measurement is possible, the current value is displayed in the second line.




Please refer to the provided operating manual of the Sunny Mini Central to read the exact explanations for the error and status messages!

### PV Overvoltage


**NOTICE!**

**Excessive DC voltage can destroy the Sunny Mini Central!**

Immediately disconnect the Sunny Mini Central!

1. Switch the line circuit breaker off.
2. Remove the Electronic Solar Switch.
3. Disconnect the DC plug connectors.

Check DC voltage!

- Higher than 700 V: Contact the planner / installer of the PV generator for assistance.
- Lower than 700 V: Connect the Sunny Mini Central to the PV generator again as described in section 5.3 „PV Generator (DC) Connection“ (26).
  If the message reappears, disconnect the Sunny Mini Central again and contact SMA (see section 12 „Contact“ (62)).

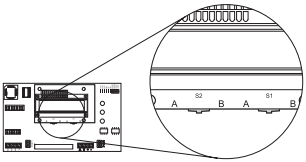
## 6.1.1 Setting the Display Language

You can set the language of the display using the switches on the underside of the display assemblies inside the Sunny Mini Central.

Proceed as follows:

1. Open the Sunny Mini Central as described in section 7.1 „Opening the Sunny Mini Central“ (46).
2. Set the switches for the required language, as shown below.

| Language | Switch S2 | Switch S1 |
|---|---|---|
| German | B | B |
| English | B | A |
| French | A | B |
| Spanish | A | A |




3. Close the Sunny Mini Central as described in section 7.2 „Closing the Sunny Mini Central“ (48).

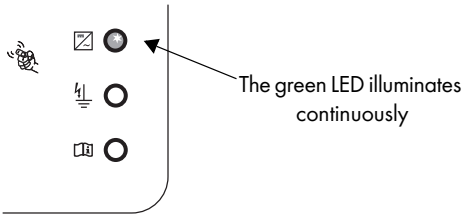
## 6.2 LED Display

### Overview

| Green | Red | Yellow | Status |
|---|---|---|---|
| glows continuously | is not glowing | is not glowing | OK (grid feeding) |
| | glows continuously | is not glowing | disturbance |
| | | glows continuously | OK (initialization) |
| flashes quickly (3 x per second) | is not glowing | is not glowing | OK (stop) |
| | glows continuously | is not glowing | disturbance |
| blinks slowly (1 x per second) | is not glowing | is not glowing | OK (waiting, grid monitoring) |
| briefly goes out (approx. 1 x per second) | glows continuously | is not glowing | disturbance |
| | is not glowing | is not glowing | OK (derating) |
| is not glowing | is not glowing | is not glowing | OK (overnight shutdown) |
| | | glowing/flashing | disturbance |
| | glows continuously | is not glowing | disturbance |
| | | glowing/flashing | disturbance |

### Grid Feeding

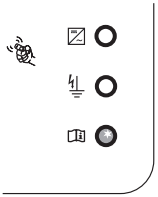
After a fault-free grid connection of the Sunny Mini Central, it takes approximately one minute until the green LED is continuously on. The blink codes shown before that only have the purpose of indicating the initialization of the Sunny Mini Central and the process of controlling whether the power supply requirements are fulfilled.



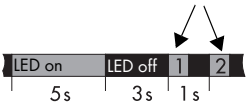
## Failure or Fault

If the Sunny Mini Central detects a failure or fault, this is indicated through a blink code of the yellow and, where applicable, the red LEDs.

For example, if the yellow LED glows for 5 seconds immediately after connection, then goes out for 3 seconds and then flashes briefly twice, there is a grid fault. In this case, it may be due to the fact that the AC cable has not yet been connected correctly or that the line circuit breaker has not yet been switched on.



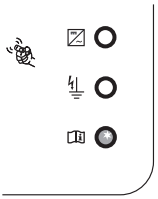
The yellow LED flashes twice in succession.

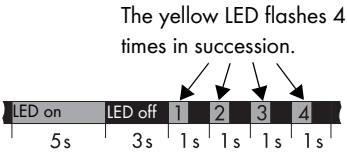



### Explanation of the blink codes

For a detailed description of the blink codes, see the provided operating manual of the Sunny Mini Central.

## PV Overvoltage






**NOTICE!**

**Excessive DC voltage can destroy the Sunny Mini Central!**

Immediately disconnect the Sunny Mini Central!

1. Switch the line circuit breaker off.
2. Remove the Electronic Solar Switch.
3. Disconnect the DC plug connectors.

Check DC voltage!

- Higher than 700 V:

  Contact the planner / installer of the PV generator for assistance.

- Lower than 700 V:

  Reconnect the Sunny Mini Central to the PV generator as described in section 5.3 „PV Generator (DC) Connection“ (26).

  If the message occurs again, disconnect the Sunny Mini Central again and contact SMA (see section 12 „Contact“ (62)).

# 7 Opening and Closing

**NOTICE!**

**Electrostatic discharges can damage the Sunny Mini Central!**

Internal components of the Sunny Mini Central can be irreparably damaged by electrostatic discharge.

- Ground yourself before you touch a component.

## 7.1 Opening the Sunny Mini Central

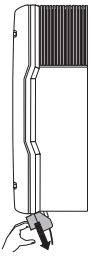
**DANGER!**

**Danger to life due to high voltages in the Sunny Mini Central!**

Before opening the Sunny Mini Central:

- Switch off the line circuit breaker and secure it to prevent it from being reactivated.

1. Remove the Electronic Solar Switch by pulling it downwards and slightly towards the wall.

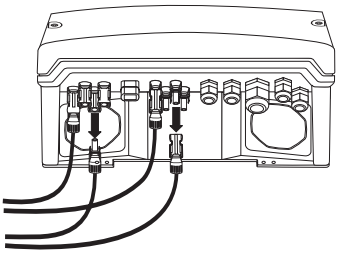


**DANGER!**

**Danger to life due to high voltages in the Sunny Mini Central!**

Safe disconnection from the PV generator is only guaranteed after removal of the Electronic Solar Switch and of all DC plug connectors.

- Remove the DC plug connector immediately to completely disconnect the PV generator from the Sunny Mini Central.



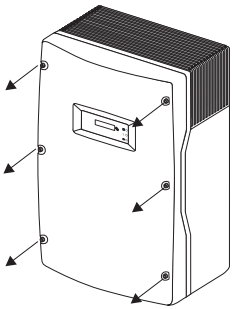
**DANGER!**

**Danger to life due to high voltages in the Sunny Mini Central!**

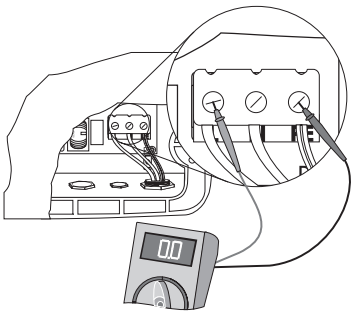
The capacitors in the Sunny Mini Central require 5 minutes to discharge.

- Wait 5 minutes before opening the Sunny Mini Central.

2. Loosen all six cover screws and pull the cover forward to remove it.



3. Use a suitable measuring device on the AC terminal to ensure that there is no voltage present at PE. If voltage is found, check the installation!

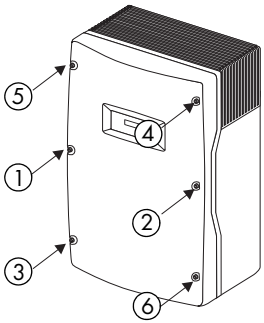


## 7.2 Closing the Sunny Mini Central

1. Secure the cover with six screws and the corresponding washers.

   Tighten the screws in the sequence shown on the right to a torque of 6 Nm. The toothing of the washers must face toward the cover.

   The Sunny Mini Central accessories kit contains a spare screw and spare washer.



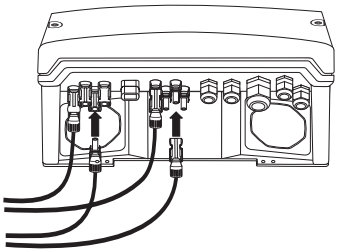

**DANGER!**

**Danger to life due to live covers!**

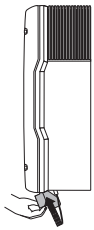
The grounding of the housing cover is ensured by the toothed washers.

- Fasten the washers for all six screws with the toothing facing toward the cover.

2. Check the DC plug connector for correct polarity and connect it.



3. Check the Electronic Solar Switch for wear as described in section 8.2 and insert it until it audibly clicks into place.



**NOTICE!**

**Manipulating the connector in the handle can damage the Electronic Solar Switch!**

The connector must remain moveable inside the handle to ensure proper contact. Tightening the screws voids all warranty claims and creates a fire risk.

- Do not tighten the connector screw in the Electronic Solar Switch handle.

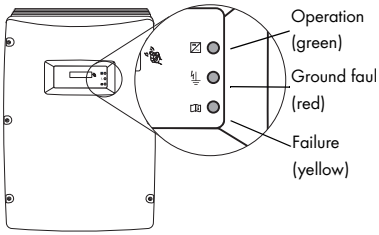
**NOTICE!**

**Damage to the Electronic Solar Switch!**

If inserted incorrectly, the Electronic Solar Switch can be damaged by high voltages.

- Press the handle firmly into place on the socket of the Electronic Solar Switch until it audibly engages.
- Check that the unit is securely in place.

4. Switch on the line circuit breaker.
5. Check whether the display and the LEDs indicate normal operating mode (see section 6 „Commissioning“ (40)).



# 8 Maintenance

## 8.1 Checking Heat Dissipation

### 8.1.1 Cleaning the Fans

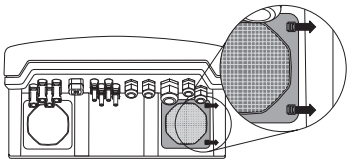
If the fan guards are only dirtiedwith loose dust, they can be cleaned with a vacuum cleaner. If you do not achieve satisfactory results with a vacuum cleaner, dismantle the fan for cleaning.

To do so, proceed as follows:

1. Disconnect the Sunny Mini Central from both the DC and AC connections, as described in section 7.1 „Opening the Sunny Mini Central“ (46).
2. Wait for the fans to stop rotating.

#### Cleaning the Fan Guards

3. Push the two latches at the right edge of the black plastic cover to one side and remove it carefully with the fan guards mounted behind it.
4. Clean the fan guard with a soft brush, a paint brush, a cloth, or compressed air.

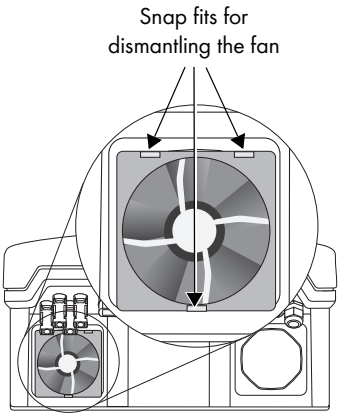


#### Cleaning the Fan

5. Press the front latches backwards and the rear latches forwards.
6. Remove the fan by pulling it slowly and carefully downwards.
7. Unlock and remove the plugs.

   The fan cables are long enough that you can lift the fans far enough out to disconnect the internal plugs in the Sunny Mini Central.
8. Remove the fan and clean it with a soft brush, a paint brush, or a cloth and water.

   Do not use compressed air as this can damage the fan.
9. After cleaning, assemble everything in reverse order.




10. Check that the fans are functional as described in the next section.

## 8.1.2 Checking the Fans

There are two ways to check that the fan is functional:

- Set the "Fan Test" parameter to "1" in the installer mode (using Sunny Data, Sunny Data Control, the Sunny Boy Control data logger, or Sunny WebBox), or
- place the jumper on the system control board (the jumper required to check the fans is included in the Sunny Mini Central accessories kit).

### Setting the Parameter

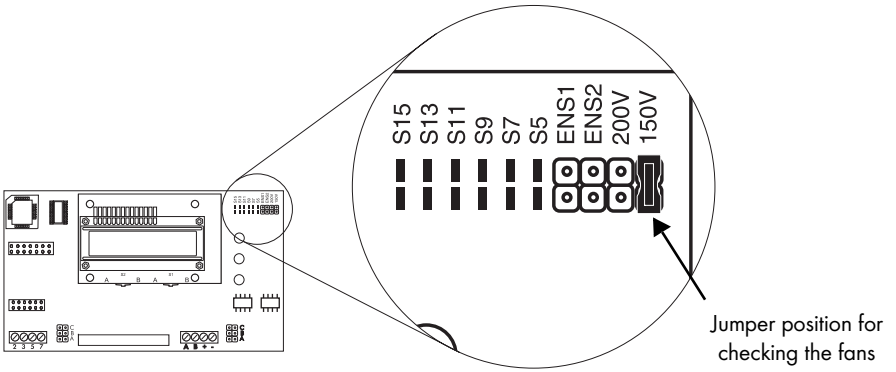
1. Request the installer password on the SMA Service Line (contact: see Page 62).
2. Set the "Fan Test" parameter to "1" in the installer mode.
3. Check the fansair-flow.'

   The Sunny Mini Central sucks air in from underneath and then blows it back out on the upper sides. Listen for any unusual noise, which could indicate incorrect installation or that the fans are faulty.
4. After checking the fans, set the "Fan Test" parameter back to "0".

### Setting the Jumper

The Sunny Mini Central recognizes the jumper only after the system has been restarted (i.e. all LEDs must have gone out before a restart).

1. Open the Sunny Mini Central as described in section 7.1 „Opening the Sunny Mini Central" (46).
2. Plug the provided jumper in the slot on the system control board as shown below.




3. Close the Sunny Mini Central as described in section 7.2 „Closing the Sunny Mini Central" (48).

4. Check the fansair-flow.'

   The Sunny Mini Central sucks air in from underneath and then blows it back out on the upper sides. Listen for any unusual noise, which could indicate incorrect installation or that the fans are faulty.

5. After checking the fans, remove the jumper. Open and close the Sunny Mini Central as described in section 7 „Opening and Closing“ (46).

## 8.1.3 Cleaning the Handle Covers

The Sunny Mini Central sucks air in from underneath via the fans and blows it out again at the top on both sides via the handle covers. Clean the handle covers, if they are dirty. Proceed as follows:

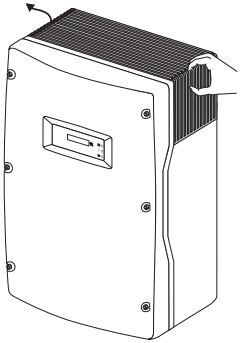
1. Remove the handle covers.

   Insert your finger above in the space between the handle cover and the housing and remove the handle covers to the side.

2. Clean the handle covers with a soft brush, a paint brush, or compressed air.

3. Fasten the handle covers back onto the Sunny Mini Central.

   The handle covers must be attached according to the inside inscription ("links/left" and "rechts/right").



**NOTICE!**

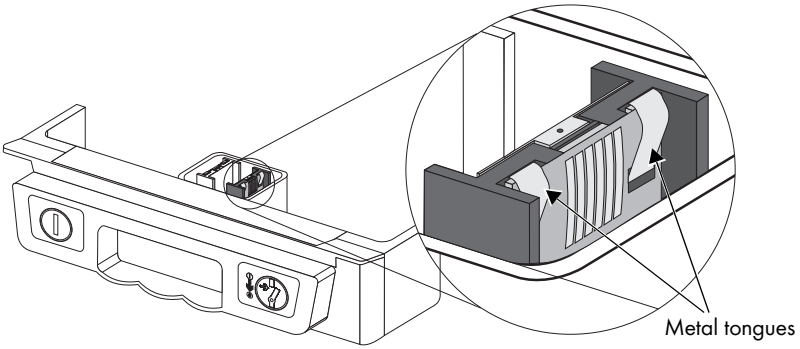
**Insects entering the Sunny Mini Central can damage the device!**

- The handle covers must not be removed permanently, because otherwise the device is not protected against the entrance of insects!

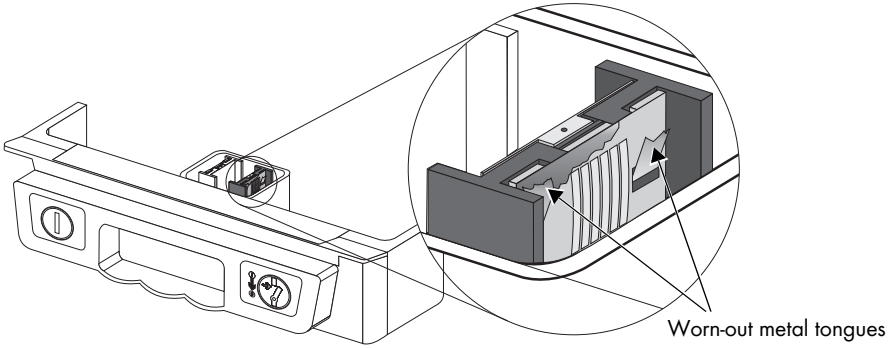
## 8.2 Inspection of the Electronic Solar Switch (ESS)

Check the Electronic Solar Switch for wear before you attach it.

To do this, check the metal tongues on the inside of the plug for brown discoloration.




If the metal tongues are brown or completely burned out (see figure below), then the Electronic Solar Switch can no longer reliably disconnect the DC side.




You must replace the handle of the Electronic Solar Switch before you can reactivate the Sunny Mini Central. Replacements for damaged Electronic Solar Switch handles are available from your dealer.

# 9 Troubleshooting

Should the Sunny Mini Central display other blink codes or display messages than those described in section 6 „Commissioning“ (40), please refer to the operating manual of the Sunny Mini Central to find the exact meaning of the display message or the blink code and, if necessary, the details on troubleshooting.

Please do not attempt any other repairs than those described here, but instead use the 24-hour replacement service (the Sunny Mini Central is made ready for shipping within 24 hours and then given to a shipping company) and the SMA Solar Technology AG repair service.

## 9.1 The Red LED is Continuously On

Either a ground fault exists in the PV generator or at least one of the varistors for the overvoltage protection is defective.

### 9.1.1 Check PV Generator for Ground Fault

1. Disconnect the Sunny Mini Central from both the DC and AC connections, as described in section 7.1 „Opening the Sunny Mini Central“ (46).

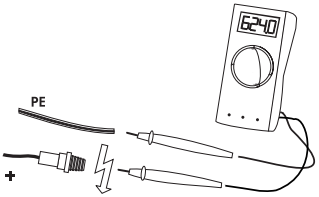
**NOTICE!**

**Excessive voltages can destroy the measuring device!**

- Only use measuring devices with a DC input voltage range up to at least 700 V.

2. Measure the voltages between the plus and minus pole of a string against the ground potential.

   If voltage is found, there is a ground fault in the corresponding string.




**DANGER!**

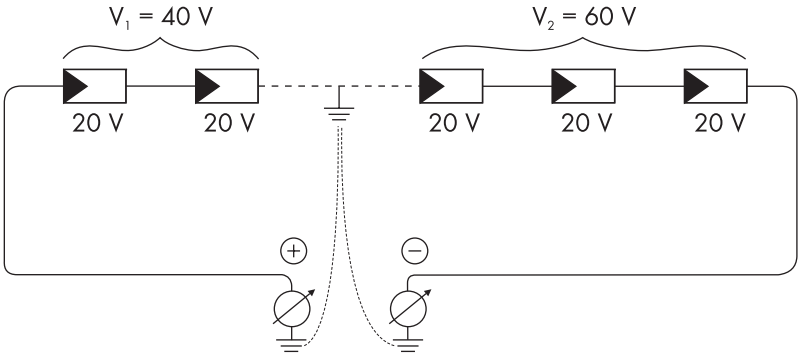
**Risk of lethal electric shock!**

In case of a ground fault, the PV generator may carry high voltages.

- Do not touch the frame of the PV generator.
- Do not touch PE.
- Wait until no voltage can be measured.
- Do not connect strings with ground faults to the Sunny Mini Central.

The approximate position of the ground fault can be determined from the ratio of the measured voltages between plus against ground potential and minus against ground potential.

Example:




The ground fault is between the second and third module in this case.

3. Repeat step 2 for each string.

| Event | Measure |
|---|---|
| You have found a ground fault. | • The installer of the PV generator must fix the ground fault in the affected string before the string may be reconnected to the Sunny Mini Central.<br>• Restart the Sunny Mini Central as described in section 7.2 „Closing the Sunny Mini Central“ (48), but **without** reconnecting the faulty string. |
| You have found no ground fault. | It is likely that one of the thermally monitored varistors is defective.<br>• Check the varistors as described in section 9.1.2 „Check the function of the varistors.“ (56). |

## 9.1.2 Check the function of the varistors.

Varistors are wearing parts. Their functioning diminishes with age or following repeated responses as a result of overvoltages. It is therefore possible that one of the thermally monitored varistors has lost its protective function.

You can check the varistors in the following way:

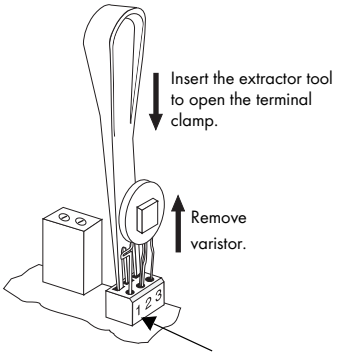
1. Open the Sunny Mini Central as described in section 7.1 „Opening the Sunny Mini Central“ (46).
2. Use a multimeter to check both varistors and see if there is a conducting connection between connectors 2 and 3 (position see section 5.1.2 „View from Inside“ (20)).

| Event | Measure |
|---|---|
| There is a **conducting** connection: | There is probably another fault in the Sunny Mini Central.<br>• Close the Sunny Mini Central as described in section 2.2, "Closing the Sunny Mini Central" (47).<br>• Discuss further steps with the SMA Technical Service Line. |
| There is **no conducting** connection: | The respective varistor is not working and must be replaced.<br>The varistors are specially manufactured for use in the Sunny Mini Central and are not commercially available. They must be ordered directly from SMA Solar Technology AG (SMA order code: "MSWR-TV7").<br>• To replace the part, proceed to step 3. |

3. Replace both varistors with new ones as shown in this drawing. Varistor failure is generally due to influences which affect all varistors similarly (temperature, age, induced overvoltage).

   If you do not receive a special tool for operating the terminal clamps together with your replacement varistors, please contact SMA. As an alternative, the terminal contacts can be operated using a 3.5 mm wide screwdriver.

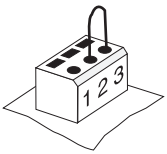
   Ensure the varistors are installed the right way round.



4. Possibly bridge terminals 2 and 3.

   If no replacement varistors are available on site, the Sunny Mini Central can be temporarily run without them.

   To do this, remove the varistors as described above and in their place, bridge the terminals 2 and 3 with a wire jumper.




**NOTICE!**

**The Sunny Mini Central could be irreparably damaged by overvoltage!**

If varistors are missing, the Sunny Mini Central is no longer protected against overvoltages.

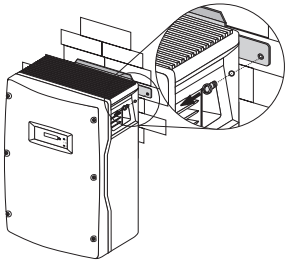
- Do **not** operate Sunny Mini Centrals without varistors in systems with a high risk of overvoltages.
- Replacement varistors should be obtained as soon as possible.

5. Close the Sunny Mini Central as described in section 7.2 „Closing the Sunny Mini Central" (48).

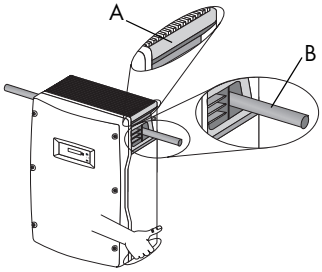
# 10 Decommissioning

## 10.1 Disassembly

1. Open the Sunny Mini Central as described in section 7.1 „Opening the Sunny Mini Central“ (46).
2. Remove all connector cables from the Sunny Mini Central.
3. Close the Sunny Mini Central with the six screws and the corresponding washers.
4. Remove both screws on the left and right side of the Sunny Mini Central that attach it to the wall mounting bracket.
5. Disconnect the anti-theft protection, if applicable.
6. Remove the Sunny Mini Central upwards in a vertical position from the wall mounting bracket.



7. When transporting the Sunny Mini Central, use the ergonomic handles at the top and bottom at the sides of the Sunny Mini Central (A) or the housing opening, for example, by sliding a steel bar through it (B) (diameter max. 30 mm).




## 10.2 Packaging

If possible, always pack the Sunny Mini Central in the original packaging. If this is no longer available, a similar box can be used which can withstand the weight of the Sunny Mini Central (35 kg), has a handle system, and can be closed fully.

## 10.3 Storage

Store the Sunny Mini Central in a dry place where ambient temperatures are always between -25 °C and +60 °C.

## 10.4 Disposal

Dispose of the Sunny Mini Central at the end of its service life in accordance with the disposal regulations for electronic scrap which apply at the installation site at that time. Alternatively, send it back to SMA with shipping paid by sender, and labeled "ZUR ENTSORGUNG" ("for disposal") (contact: see Page 62).

# 11 Technical Data

| | | SMC 6000TL | SMC 7000TL | SMC 8000TL |
|---|---|---|---|---|
| **PV generator connection data** | | | | |
| Max. input voltage | $U_{PV\,0}$ | 700 V [a] (based on -10 °C cell temperature) | | |
| Input voltage, MPP range | $U_{PV}$ | 333 V ... 500 V DC | | |
| Max. input current | $I_{PV\,max}$ | 19 A | 22 A | 25 A |
| Max. input power | $P_{DC}$ | 6200 W | 7200 W | 8250 W |
| Voltage ripple | $U_{pp}$ | < 10 % of the input voltage | | |
| Internal consumption during operation | | < 10 W | | |
| | | | | |

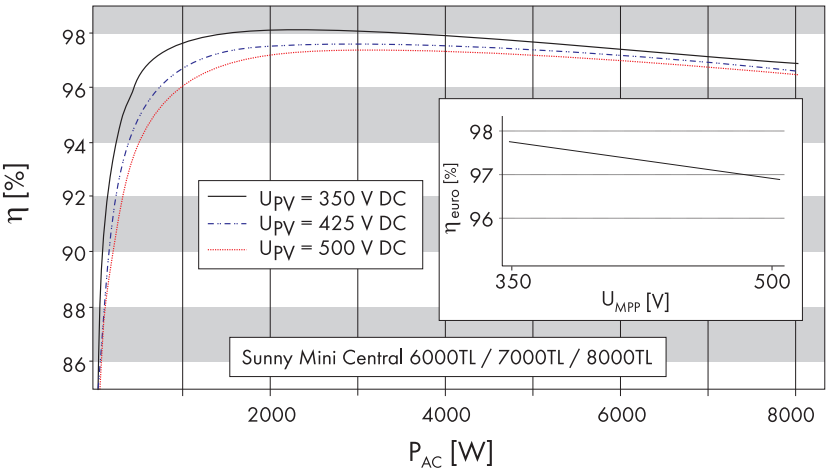
[a] The maximum open circuit voltage, which can occur at a cell temperature of -10 °C, may not exceed the maximum input voltage.

| **Grid connection data** | | | | |
|---|---|---|---|---|
| Nominal output power | PACnom | 6000 W | 7000 W | 8000 W |
| Peak output power | PACmax | 6000 W | 7000 W | 8000 W |
| Nominal output current | IACnom | 27 A | 31 A | 35 A |
| Max. output current | IACMax | 27 A | 31 A | 35 A |
| Max. fuse protection | | 50 A | | |
| Harmonic distortion of output current (at THD < 2 %, $P_{AC} > 0.5\ P_{ACnom}$) | $K_{IAC}$ | < 4 % | | |
| Nominal operational voltage | $U_{ACnom}$ | 220 V / 230 V / 240 V | | |
| Voltage range (extended operating range) | $U_{AC}$ | 180 V ... 260 V | | |
| Nominal operating frequency | $f_{ACnom}$ | 50 Hz / 60 Hz | | |
| Frequency range (extended operating range) | $f_{AC}$ | 50 Hz: 45.5 Hz ... 54.5 Hz<br>60 Hz: 55.5 Hz ... 64.5 Hz | | |
| Power factor (at nominal output power) | cos phi | 1 | | |
| Overvoltage category | | II (according to AUS/NZS 60950.1:2003)<br>III (according to EN 50178:1998) | | |
| Test voltage (50 Hz) | | 2.15 kV | | |
| Test surge voltage | | 4 kV (serial interface: 6 kV) | | |
| Internal consumption during night operation | | 0.25 W | | |

| | SMC 6000TL | SMC 7000TL | SMC 8000TL |
|---|---|---|---|
| **General data** | | | |
| EC Declaration of Conformity | enclosed set of documents, download area www.SMA.de | | |
| Dimensions (W x H x D) | approx. 468 mm x 613 mm x 242 mm | | |
| Weight | approx. 31 kg | approx. 32 kg | approx. 33 kg |
| Protection rating in accordance with DIN EN 60529 | IP65 | | |
| Climatic conditions (DIN EN 50178:1998-04): | | | |
| Location of type C: | class 4K4H extended temperature range: -25 °C to +60 °C extended air humidity range: 0 ... 100 %, extended air pressure range: 70 kPa to 106 kPa | | |
| Transport of type E: | class 2K3 temperature range: -25 °C ... +70 °C | | |
| Operation temperature range | -25 °C ... 60 °C | | |
| Max. operating altitude | 3,000 m above sea level | | |
| Topology | transformerless | | |
| Fan connections | designed for safe disconnection in accordance with DIN EN 50178:1998-04 | | |
| | | | |
| **Protective function DC side** | | | |
| All-pole disconnection unit on the DC input side | Electronic Solar Switch, DC plug connector | | |
| Overvoltage protection | thermally monitored varistors | | |
| Personal protection | insulation monitoring (Riso > 1 MOhm) | | |
| Reverse polarity protection | via short-circuit diode | | |

| | | SMC 6000TL | SMC 7000TL | SMC 8000TL |
|---|---|---|---|---|
| **Protective function AC side** | | | | |
| Short-circuit proofing | | current control | | |
| All-pole disconnection unit on grid side | | automatic disconnection device (SMA grid guard 2) | | |
| | | | | |
| **Efficiency** | | | | |
| Max. efficiency | $\eta_{max}$ | 98 % | | |
| CEC rebate efficiency | $\eta_{euro}$ | 97,7 % | | |
| | | | | |
| **Communication interfaces** | | | | |
| RS485 (galvanically isolated) | | optional | | |
| Radio | | optional | | |
| | | | | |
| **Electronic Solar Switch (ESS)** | | | | |
| Electrical service life (in case of a short circuit, with a nominal current of 30 A) | | min. 50 switching processes | | |
| Maximum switching current | | 30 A | | |
| Max. switching voltage | | 800 V | | |
| Max. PV power | | approx. 10 kW | | |
| Protection rating when plugged | | IP65 | | |
| Protection rating when unplugged | | IP21 | | |

## Efficiency curve



# 12 Contact

If you have technical problems concerning our products, contact the SMA Technical Service Line. We require the following information in order to provide you with the necessary assistance:

- Inverter type
- Series number of the Sunny Mini Central
- Type and number of modules connected
- Communication method
- Blink code or display of the Sunny Mini Central

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www.SMA.de

## Exclusion of liability

The general terms and conditions of delivery of SMA Solar Technology AG shall apply.

The content of these documents is continually checked and amended, where necessary. However, discrepancies cannot be excluded. No guarantee is made for the completeness of these documents. The latest version is available online at www.SMA.de or from the usual sales channels.

Guarantee or liability claims for damages of any kind are excluded if they are caused by one or more of the following:

- Damages during transportation
- Improper or inappropriate use of the product
- Operating the product in an unintended environment
- Operating the product whilst ignoring relevant, statutory safety regulations in the deployment location
- Ignoring safety warnings and instructions contained in all documents relevant to the product
- Operating the product under incorrect safety or protection conditions
- Altering the product or supplied software without authority
- The product malfunctions due to operating attached or neighboring devices beyond statutory limit values
- In case of unforeseen calamity or force majeure

The use of supplied software produced by SMA Solar Technology AG is subject to the following conditions:

- SMA Solar Technology AG rejects any liability for direct or indirect damages arising from the use of software developed by SMA Solar Technology AG. This also applies to the provision or non-provision of support activities.
- Supplied software not developed by SMA Solar Technology AG is subject to the respective licensing and liability agreements of the manufacturer.

## SMA Factory Warranty

The current guarantee conditions come enclosed with your device. These are also available online at www.SMA.de and can be downloaded or are available on paper from the usual sales channels if required.

## Trademarks

All trademarks are recognized even if these are not marked separately. Missing designations do not mean that a product or brand is not a registered trademark.

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