

Central Inverter

SUNNY CENTRAL 500HE-20/630HE-20/720HE-20/ 760HE-20/800HE-20

Maintenance Manual

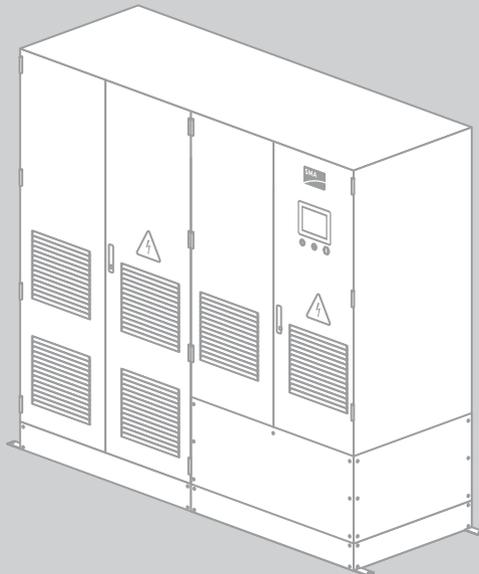


Table of Contents

1	Information on this Document	7
2	Safety	9
2.1	Safety Precautions	9
2.2	Skills of Skilled Persons	11
2.3	Personal Protective Equipment	11
3	Maintenance Intervals	12
4	Sunny Central HE-20	13
4.1	Design of the Inverter	13
4.2	Type Label	13
5	Maintenance when Voltage is Present	14
5.1	Reading off Error Messages and Warnings	14
5.2	Checking the DC Switch-Disconnecter	14
5.3	Checking the External Fast-Stop	16
5.4	AC Circuit Breaker (Optional)	17
6	Maintenance Under Voltage-Free Conditions	18
6.1	Disconnecting the Inverter	18
6.2	Disassembling the Panels	19
6.3	Replacing Ventilation Grid Mats	20
6.4	Maintaining the Interior of the Switch Cabinet	21
6.4.1	Disassembling the Protective Covers	21
6.4.2	Checking the Interior of the Switch Cabinet	21
6.4.3	Checking the Fuses/Disconnecting Blades	21
6.4.4	Checking the Surge Arrester	22
6.4.5	Replacing the GFDI/Soft Grounding Relay	23
6.4.6	Checking the Screw Connections of the Power Cabling	24
6.4.7	Checking Labels	26

6.5	Checking the Switch Cabinet from the Outside	27
6.5.1	Checking the Door Seals	27
6.5.2	Checking the Locking Devices and Hinges	28
6.5.3	Checking the Surface of the Switch Cabinet	28
6.5.4	Checking the Switch Cabinet for Corrosion.	29
6.6	Mounting the Protective Covers	29
6.7	Mounting the Panels	30
6.8	Maintenance after Connecting the Control Voltage	31
6.8.1	Connecting the Voltage	31
6.8.2	Checking the Fans	32
6.8.3	Checking the Heating Element and Hygrostat.	32
7	Maintaining the Accessories	34
7.1	Maintaining the Sunny String-Monitor	34
7.1.1	Disconnecting the Sunny String-Monitor	34
7.1.2	Maintenance Interval	34
7.1.3	Overview of the Main Components.	35
7.1.4	Checking the Mounting Location and Installation	38
7.1.5	Checking the Enclosure	38
7.1.6	Checking the Enclosure Interior	39
7.1.7	Checking the Base Plate.	39
7.1.8	Checking the Covers and Labels	40
7.1.9	Checking the Fuses and Fuse Holders	42
7.1.10	Checking the Screw Connections and Clamp Connections.	43
7.1.11	Checking the Surge Arrester	43
7.1.12	Checking the Supply Voltage.	43
7.1.13	Checking Shunt Release (Optional).	44
7.1.14	Checking the Undervoltage Release (Optional)	44
7.1.15	Checking the Earth Connection	44
7.1.16	Checking the LEDs on the Measurement PCB	45

7.2	Maintaining the Sunny Main Box	45
7.2.1	Disconnecting the Sunny Main Box	45
7.2.2	Maintenance Interval	45
7.2.3	Overview of the Main Components	46
7.2.4	Checking the Mounting Location and Installation	46
7.2.5	Checking the Enclosure	47
7.2.6	Checking the Enclosure Interior	47
7.2.7	Checking the Base Plate	47
7.2.8	Checking the Covers and Labels	48
7.2.9	Checking the Fuses and Fuse Holders	50
7.2.10	Checking the Screw Connections and Clamp Connections	50
7.3	Maintaining the SMA String-Combiner	51
7.3.1	Disconnecting the SMA String-Combiner	51
7.3.2	Maintenance Interval	51
7.3.3	Checking the Mounting Location and Installation	52
7.3.4	Checking the Base Plate	52
7.3.5	Checking the Enclosure and Enclosure Interior	52
7.3.6	Checking the String Cables	53
7.3.7	Checking the Covers and Labels	53
7.3.8	Checking the Fuses and Fuse Holders	54
7.3.9	Checking the Screw Connections and Clamp Connections	54
7.3.10	Checking the Surge Arrester	55
8	Contact	56

1 Information on this Document

Validity

This document applies to the following inverters and accessories:

- SC 500HE-20
- SC 630HE-20
- SC 720HE-20
- SC 760HE-20
- SC 800HE-20
- SSM
- SSM16-11
- SSM24-11
- SMB
- SMB-C
- SMA String-Combiner

Target group

This manual is intended for skilled persons. Only qualified personnel with the appropriate skills are allowed to perform the tasks described in this manual (see Section 2.2 "Skills of Skilled Persons", page 11).

Additional information

For more information on third-party components, contact the relevant manufacturers.

A maintenance report is enclosed with every inverter. The maintenance report describes the pending maintenance work and the maintenance interval recommended by SMA Solar Technology AG.

Symbols

Symbol	Explanation
	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury
	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury
	Indicates a situation which, if not avoided, can result in property damage
	Information that is important for a specific topic or objective, but is not safety-relevant
	Indicates a requirement for meeting a specific goal
	Desired result
	A problem that might occur

Nomenclature

The following nomenclature is used in this document:

Full designation	Designation in this document
Sunny Central	Inverter
Sunny Central Communication Controller	SC-COM

Abbreviations

Abbreviation	Designation	Explanation
AC	Alternating Current	-
DC	Direct Current	-
ESD	Electrostatic Discharge	-
GFDI	Ground-Fault Detection Interruption	-
MSL	Mean Sea Level	-
PE	Protective Earth	Protective conductor
PV	Photovoltaics	-

2 Safety

2.1 Safety Precautions

Electric shock

High voltages that can cause fatal electric shocks are present in the live components of the inverter.

- All work must be carried out as described in this manual. Observe all safety precautions. Observe all safety precautions in this document and the inverter installation manual.
- Do not touch any live components in the inverter or the medium-voltage grid. Comply with all applicable safety regulations for handling medium-voltage grids.

In the event of an earth fault, remember that plant components which are presumed earthed may still be live.

- Ensure that no voltage is present before touching any part of the plant.

Hazardous voltages may still be present in the inverter even if the AC and DC main switches are switched off.

- Wait at least 12 minutes after switching off the inverter. This allows the capacitors to perform an electric discharge.

The insulation monitoring device with GFDI or remote GFDI does not provide protection from injury when GFDI is activated. PV modules that are earthed by GFDI discharge voltage to earth. Entering the PV field can lead to lethal electric shocks.

- Before entering the PV field, switch the PV modules to insulated operation.
- Ensure that the insulation resistance of the PV field is greater than $1 \text{ k } \Omega$.

Operating a damaged inverter can lead to serious injuries from electric shock.

- Only use the inverter when it is working safely and properly and check for visible damage on a regular basis.
- Ensure that all external safety equipment is freely accessible at all times and that regular checks are carried out to ensure that it is fully functional.

Escape routes

Opening the doors of 2 inverters located opposite each other blocks the escape route.

- Only open 1 inverter door at any given time. Maintain the minimum passage width between the open door of the inverter and the next fixed obstacle. The minimum passage width must comply with national standards. In Germany, the minimum passage width is 500 mm.

Electrostatic discharge

By touching electronic components, you can damage or even destroy the inverter through electrostatic discharge (ESD).

- When working on the inverter or handling assemblies, observe the electrostatic discharge safety regulations and wear protective gloves.
- Discharge the electrostatic charge by touching uncoated, earthed enclosure parts (e.g. at the protective conductor connection on the doors). This makes it safe to touch electronic components.

Environmental influences

Moisture and dust penetration will damage the inverter.

- Do not open the inverter when it is raining or if humidity is over 95%.
- Only perform maintenance in a dry and dust-free environment.

Observing torque

Adhere to the torque specifications listed in the circuit diagram and installation manual.

- Contact the SMA Service Line if torque specifications are not given.

Storing documentation

This documentation must be accessible to all service and maintenance personnel at all times.

- Safely store this documentation within the immediate area of the inverter.

Warning signs

Warning signs must be clearly legible at all times.

- Replace warning signs if damaged.

2.2 Skills of Skilled Persons

The work described in this document must be performed by skilled persons only. Skilled persons must have the following skills:

- Knowledge of how an inverter works and is operated
- Training in how to deal with dangers and risks associated with operating and maintaining electrical devices and plants
- Vocational training in the maintenance of electrical devices and plants
- Knowledge of all applicable standards and directives
- Knowledge of and adherence to this document and all safety precautions

2.3 Personal Protective Equipment

After the control voltage has been switched on, personal protective equipment is required for all work performed. The protective equipment must conform with Directive 89/686/EEC. Any protective equipment that is stipulated by law or otherwise required must also be used.

3 Maintenance Intervals

Observing maintenance intervals ensures trouble-free operation of the Sunny Central. Maintenance intervals depend on ambient and operating conditions. Under especially harsh ambient conditions, certain maintenance tasks must be performed more frequently. These maintenance tasks are listed in the maintenance report. SMA Solar Technology AG recommends an optical inspection every month to determine maintenance needs. Under normal ambient and operating conditions, the Sunny Central must be fully serviced at the following intervals:

Maintenance under normal ambient and operating conditions:

Description	Interval
Routine maintenance	Every 24 months

Preventative replacement intervals:

Description	Interval
Replacing the 24 V power supply units*	Every 10 years
Replacing the fans of the inverter bridge*	Every 13 years
Ventilation grid mats	Every 24 months
GFDI/soft grounding relay	100 trippings due to short circuit
Surge arrester	If tripped

* Contact the SMA Service Line.



Maintenance intervals

Plant size, location and ambient conditions influence the maintenance intervals.

- If the inverter is subject to adverse ambient conditions, SMA Solar Technology AG recommends shortening the maintenance intervals.

Spare parts

Spare parts can be identified by their reference designation (ref. des.) and the circuit diagram. The spare parts list includes the item number of each spare part. For information on a specific item number, please contact the SMA Service Line.

4 Sunny Central HE-20

4.1 Design of the Inverter

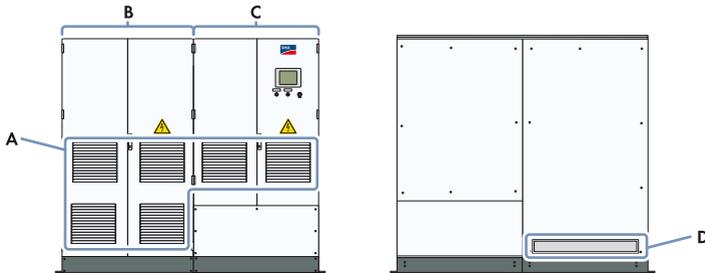


Figure 1: Design of the inverter

Item	Description
A	Ventilation grid
B	Inverter cabinet
C	Interface cabinet
D	Exhaust vent

4.2 Type Label

You can identify the inverter by its type label. The type label is located in the interface and inverter cabinet of the inverter. The serial number is also located at the front of the inverter.

5 Maintenance when Voltage is Present

5.1 Reading off Error Messages and Warnings

You can connect a PC via the service interface on the outside of the interface cabinet (see the Sunny Central installation manual).

- If an error occurs, view the error message on the display or SC-COM interface and respond accordingly (see the Sunny Central user manual).

5.2 Checking the DC Switch-Disconnecter

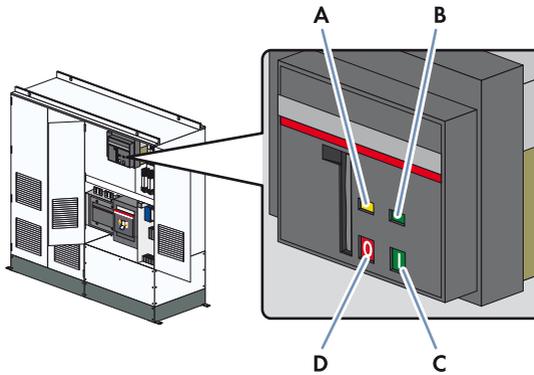


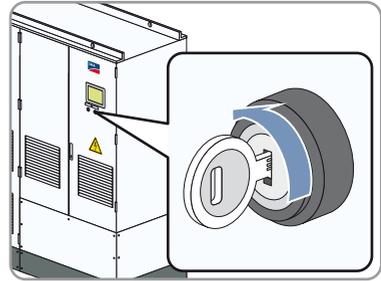
Figure 2: Design of the DC switch-disconnector

Item	Description
A	Spring status indicator
B	Position indicator
C	ON button
D	OFF button

Requirements:

- Control voltage is present.
- DC voltage is connected.

1. Move the key switch to "Stop".



2. Open the doors of the interface cabinet.
3. Check that the DC switch-disconnector is turned off and indicates the "Off" position.
If the DC switch-disconnector is not turned off and does not indicate the "Off" position, contact the SMA Service Line.
4. Close the doors of the interface cabinet.
5. Switch the inverter to "Start".
6. Open the doors of the interface cabinet.
7. Check that the DC switch-disconnector is turned on and indicates the "On" position.
If the DC switch-disconnector is not turned on and does not indicate the "On" position, contact the SMA Service Line.
8. Close the doors of the interface cabinet.
9. Move the key switch to "Stop".
10. Test the switching operation 3 times.

5.3 Checking the External Fast-Stop

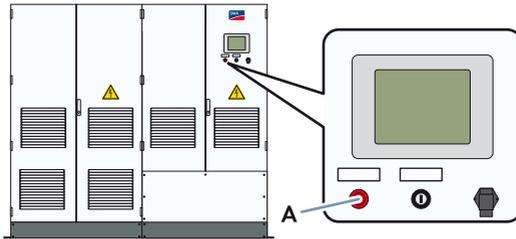


Figure 3: Position of the fast-stop

Item	Description
A	Fast-stop

Requirements:

- Control voltage is present.
- DC voltage is connected.

1. Check whether the DC switch-disconnector and the AC contactor audibly switch off when the fast-stop is actuated.
If no switching noises can be heard, contact the SMA Service Line.
2. For inverters with display: check whether the inverter display shows the error message 9009.
If the display does not show the error message 9009, contact the SMA Service Line.
3. For inverters with light repeaters: check whether the red light repeater is illuminated.
If the red light repeater is not illuminated, contact the SMA Service Line.
4. Open the doors of the interface cabinet.
5. Check whether the DC switch-disconnector turns off and indicates the "Off" position.
If the DC switch-disconnector does not turn off and does not indicate the "Off" position, contact the SMA Service Line.
6. Close the doors of the interface cabinet.
7. Unlock the fast-stop again.
8. Switch the inverter to "Start".
9. Test the switching operation 3 times.

5.4 AC Circuit Breaker (Optional)

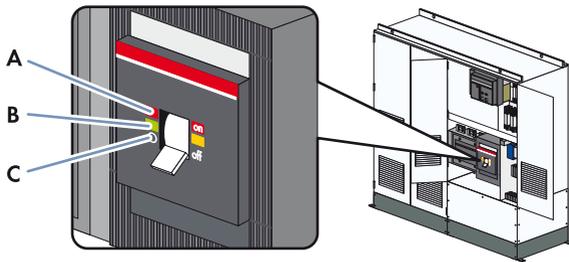


Figure 4: Design of the AC circuit breaker

Item	Description
A	"On" position
B	"Tripped" position
C	"Off" position

Additional maintenance material that is required but not included in the scope of delivery:

- A testing device approved by the manufacturer of the AC circuit breaker (e.g. TT1 from ABB).
 - Use the testing device to check whether the AC circuit breaker is ready for operation (instructions are included in the testing device documentation).
 - If an error is detected, contact the SMA Service Line.

6 Maintenance Under Voltage-Free Conditions

6.1 Disconnecting the Inverter

⚠ DANGER

Electric shock due to live voltage.

The components of the Sunny Central are energised. Touching components of the Sunny Central may result in death or severe injuries.

- Before performing any work on the Sunny Central, disconnect the inverter and ensure that it cannot be reconnected.
- After disconnecting the inverter, wait at least 15 minutes until the inverter capacitors have discharged completely.
- Ensure that no voltage is present.

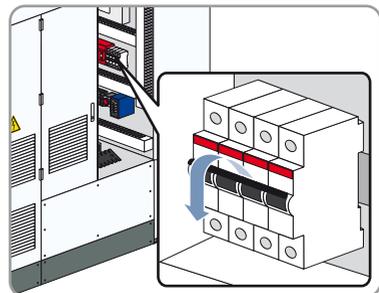
Before doing any maintenance work, disconnect the inverter from all voltage sources as described in this section.



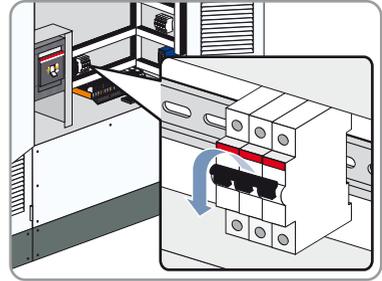
Person authorised to operate the medium-voltage transformer

Only a duly authorised person may connect or disconnect the AC voltage of the medium-voltage transformer.

1. Switch the inverter to "Stop".
2. Disconnect the AC voltage of the medium-voltage transformer externally.
3. Disconnect the DC voltage in the main distributor (e.g. Sunny Main Box) or the sub-distributor (e.g. Sunny String-Monitor).
4. Switch off the AC circuit breaker.
5. Disconnect the external voltage supply externally.
6. Disconnect any additional external voltage.
7. Switch off the miniature circuit-breaker of the external voltage supply and if necessary, disconnect the internal power supply transformer.



8. Switch off the miniature circuit-breaker of the grid monitoring.
9. Ensure that all poles are dead.
10. Earth and short-circuit.
11. Cover or safeguard any adjacent live components.
12. Wait 12 minutes for the capacitors to discharge.

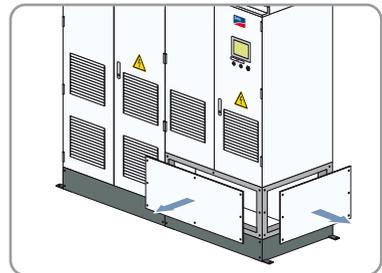


6.2 Disassembling the Panels

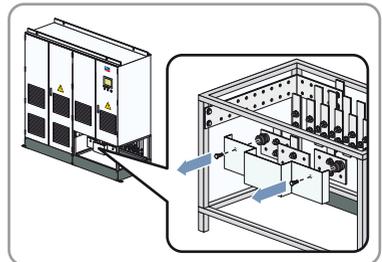
1. **DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).
2. Remove the panel screws using a Torx screwdriver.
 3. Loosen the earthing cables of the panels.
 4. Remove the panels.



5. Remove protective covers.



6. Ensure that no voltage is present:
 - AC connection lugs
 - DC connection lugs/DC busbars/DC terminals

6.3 Replacing Ventilation Grid Mats

Replacement of the ventilation grid mats

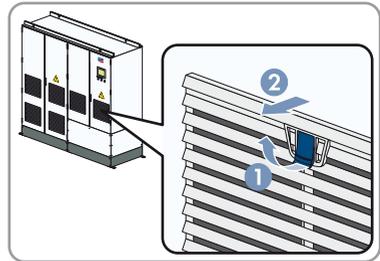
Ventilation grid mats are wearing parts. They must be replaced after 2 years at the latest. Depending on the pollution of the ventilation grid mats, e.g. exposure to high levels of dust, it may be necessary to replace these more frequently. New ventilation filter mats can be purchased from SMA Solar Technology AG or your specialist dealer using the SMA order number 65-1077.

1. **DANGER**

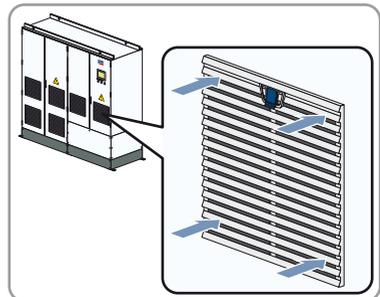
Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).

2. Push the button of the ventilation grid upwards. This releases the ventilation grid.



3. Remove the ventilation grid mats.
4. Insert new ventilation grid mats. For this purpose, the fine side must be pointing outwards.
5. Close the ventilation grid. The ventilation grid audibly engages.



6.4 Maintaining the Interior of the Switch Cabinet

6.4.1 Disassembling the Protective Covers

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).

2. Remove protective covers.

6.4.2 Checking the Interior of the Switch Cabinet

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).

2. Remove dirt and dust from the interior of the switch cabinet and from all assemblies (e.g. DC switch-disconnector and AC circuit breaker).

3. Remove moisture. To do this, use a cloth.

6.4.3 Checking the Fuses/Disconnecting Blades

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).

2. Check the LV/HRC fuses/disconnecting blades and tension springs for discolouration or changes to their appearance.

If the LV/HRC fuses/disconnecting blades or tension springs are discoloured or if there are changes to their appearance, replace them.

3. Check insulation and terminals for discolouration and changes to their appearance.

If the insulation or terminals are discoloured or if there are changes to their appearance, contact the SMA Service Line.

6.4.4 Checking the Surge Arrester

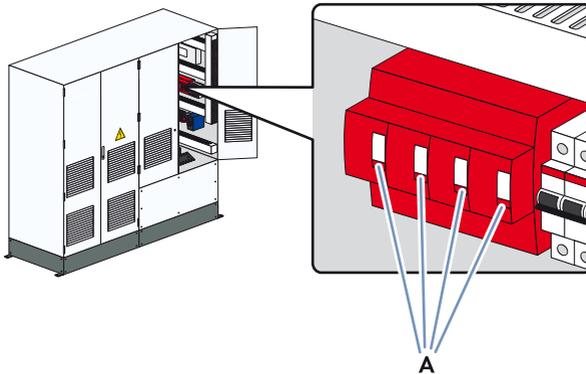


Figure 5: DEHNventil

Item	Description
A	Ready indicator

Additional maintenance material that is required but not included in the scope of delivery:

- A surge arrester testing device approved by the manufacturer of the surge arrester such as the PM20 by DEHN + SÖHNE GmbH + Co. KG.

i Item number of the surge arrester

You can find the item numbers of the surge arrester in the circuit diagram. For information on a specific item number, please contact the SMA Service Line.

1. **DANGER**

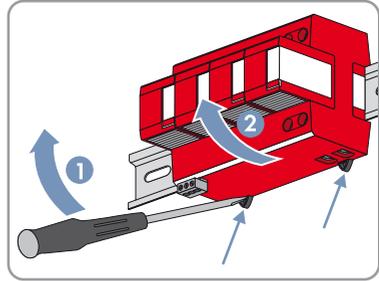
Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).
2. Check whether the ready indicator is red.

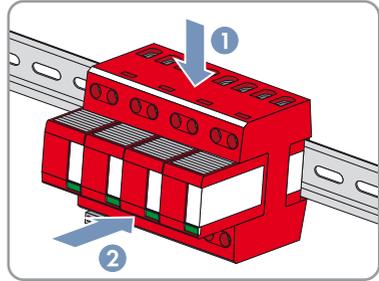
If the ready indicator on the surge arrester is red, replace the surge arrester.

 - Remove the cables. Mark the cables in the process. They must be connected to the same terminals again later.

- Depress the lever and lift the surge arrester upwards out of the top-hat rail.



- Insert the new surge arrester into the top-hat rail from above and press it against the top-hat rail.



- Connect the cables to the terminals from which you removed them before.
3. Use the testing device to check that the surge arrester is operational (instructions for testing are included in the testing device user manual).
Replace the surge arrester if it is faulty.

6.4.5 Replacing the GFDI/Soft Grounding Relay

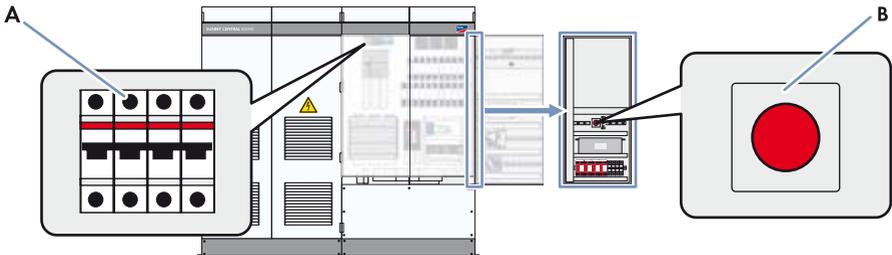


Figure 6: Position of the GFDI and the soft grounding relay

Item	Description
A	GFDI
B	Soft grounding relay

1. **⚠ DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).
2. If the GFDI or the soft grounding relay have been tripped 100 times due to short-circuit, replace the components.
 - Remove the cables. Mark the cables in the process. They must be connected to the same terminals again later.
 - Release the components and remove from the top-hat rail in an upwards direction.
 - Insert the new components into the top-hat rail from above and press against the top-hat rail.
 - Connect the cables to the terminals from which you removed them before.
 3. If the GFDI has been replaced, set the current value to 5 A.
 4. If the soft grounding relay has been replaced, make the following settings:

Item	Configuration value
Upper potentiometer	0.8
Middle potentiometer	0 s
Lower potentiometer	0.9

6.4.6 Checking the Screw Connections of the Power Cabling

NOTICE

Damage to screw connections from over-tightening

- Only apply the prescribed torque to tighten loose screw connections. Torque specifications are shown in the circuit diagram of the inverter. Contact the SMA Service Line if specifications are missing.

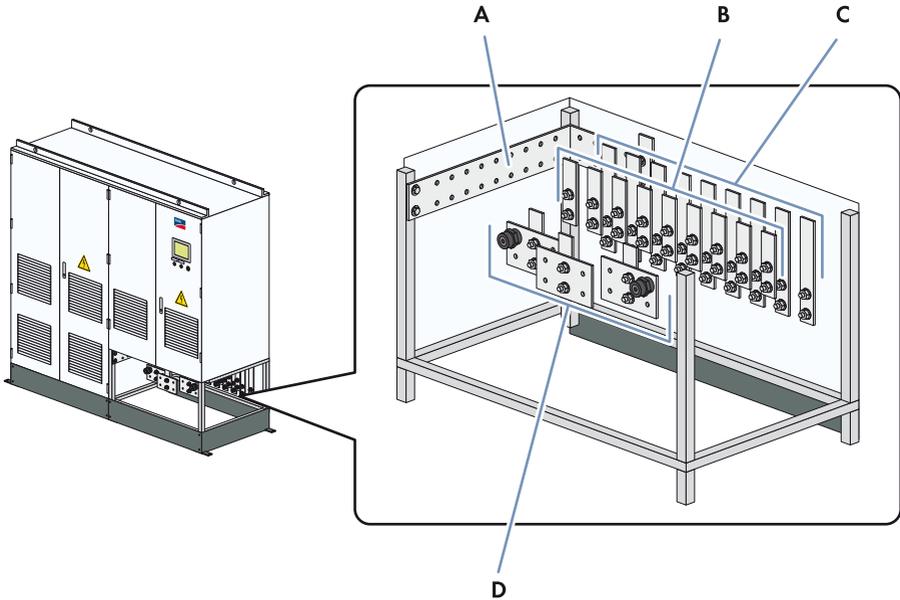


Figure 7: Position of the power cabling

Item	Description
A	Connection bar, earthing cables
B	Connection lugs, AC cables
C	Connection lugs, DC+ cables
D	Connection lugs, DC- cables

1. **DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).
2. Check that all screw connections on the power cables are tight.
If screw connections are loose, tighten them with a torque wrench.
 3. Check the insulation and connections for discolouration and changes to their appearance.
If the insulation or connections are discoloured or if there are changes to their appearance, contact the SMA Service Line.
 4. Check screw connections for damage and contact elements for corrosion.
If screw connections are damaged or contact elements are corroded, replace them.

6.4.7 Checking Labels

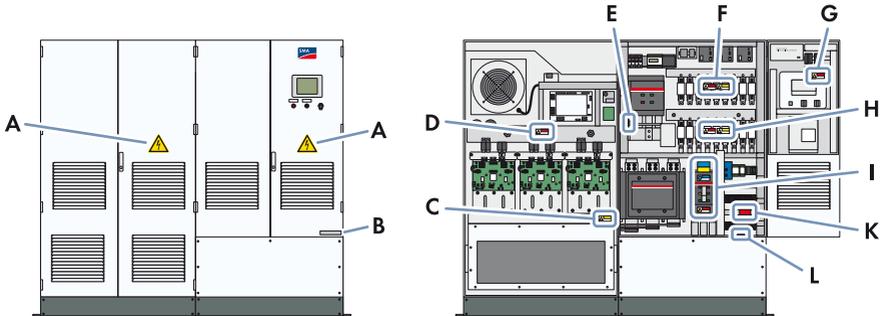


Figure 8: Position of the labels

Item	SMA order number	Description
A	86-05200	Beware of hazardous voltage
B	-	Serial number
C	86-108670105	Danger of burn injury
D	86-10867022	Risk of electrical shock even when the device is disconnected
E	86-10867022	Risk of electrical shock even when the device is disconnected
F	86-10867023	Risk of electric shock due to active power source
	86-108670106	Danger of burn injury
G	86-108670103	Risk of electric shock due to active power source
H	86-10867023	Risk of electric shock due to active power source
	86-108670106	Danger of burn injury
I	86-0032311	5 safety rules
	86-108670108/ 86-108670107	The positive/negative pole of the PV generator is earthed in the inverter*
	86-10867024	Unintended tripping due to modified settings
	86-108670104	Risk of electric shock due to active power source
K	86-0032310	Plant protected by conductors
L	86-108670103	Risk of electric shock due to active power source

* Depending on the PV array earthing

1. **DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).

2. Ensure that safety messages and labels are present and undamaged.

Replace the safety messages and labels if they are missing or illegible. If necessary, you can purchase labels from SMA Solar Technology AG or your specialist dealer using the SMA order number stated above.

6.5 Checking the Switch Cabinet from the Outside

6.5.1 Checking the Door Seals

There are seals on the doors of the inverter.

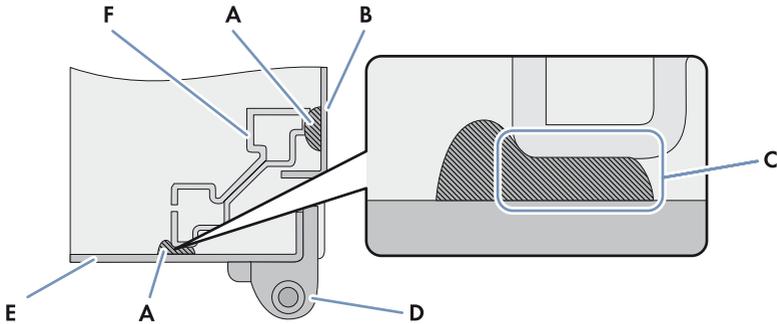


Figure 9: Section drawing with top view of seals (example)

Item	Description
A	Seal
B	Side panel
C	Sealing area
D	Hinge
E	Door
F	Frame construction

1. **DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).

2. Check whether the seals in the sealing area show signs of damage. Tip: the sealing area is not visible when the door is closed.
If seals are damaged, contact the SMA Service Line.
3. Maintain the seals using talcum powder, petroleum jelly or wax. This prevents frost damage.
4. If the side panels are disassembled: check whether the seals in the side panels show any signs of damage in the sealing area.
If seals are damaged, contact the SMA Service Line.

6.5.2 Checking the Locking Devices and Hinges

Required maintenance material (not included in the scope of delivery):

- A suitable, water-free and heat-resistant lubricant, e.g. WD40.
- Non-lubricating antifreeze, e.g. PS88.

1. **DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).
2. Check that the doors latch easily. Open and shut the doors several times in the process.
If the doors do not latch easily, lubricate all moving parts of the latch.
 3. Check that the doors can be held in place.
If the doors cannot be held in place, lubricate the door stops.
 4. Check that the door hinges move easily.
If the door hinges do not move easily, lubricate them.
 5. Lubricate all moving latch elements and movement points.
 6. If the inverter is installed in a region where below-freezing temperatures occur, treat the profile cylinder of the door lock and the key switch with a non-lubricating antifreeze to prevent them freezing over.

6.5.3 Checking the Surface of the Switch Cabinet

1. **DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).
2. Check surfaces for signs of damage or corrosion.
If surfaces are damaged, repair them without delay or within 3 weeks at the latest.
If surfaces are corroded, repair them without delay or within 3 weeks at the latest.

6.5.4 Checking the Switch Cabinet for Corrosion

Required maintenance material (not included in the scope of delivery):

- Touch-up sticks, brushes or cans of spray paint or, alternatively, 2K-PUR acrylic paint in the appropriate RAL colour can be used to repair minor surface damage. Observe the relevant instructions of the paint manufacturer.
- Touch-up paint or 2K-PUR acrylic paint in the appropriate RAL colour can be used to repair large-area surface damage. Observe the relevant instructions of the paint manufacturer.

Item	RAL colour	Colour scheme
Enclosure, door, roof	RAL 7035	Light grey
Base	RAL 7024	Graphite grey

- Abrasive cloth
 - Degreaser
1. Remove dirt.
 2. To remove small-area surface damage:
 - Sand the surface.
 - Clean the surface with degreaser.
 - Paint the surface.
 3. To remove large-area surface damage:
 - Sand the surface.
 - Clean the surface with degreaser.
 - Paint the entire surface.

6.6 Mounting the Protective Covers

1.  **DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).
2. Mount the protective covers. For this purpose, use a torque wrench (torque: 10 Nm).

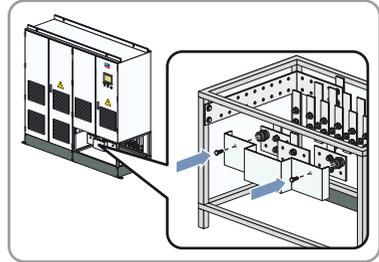
6.7 Mounting the Panels

1. **DANGER**

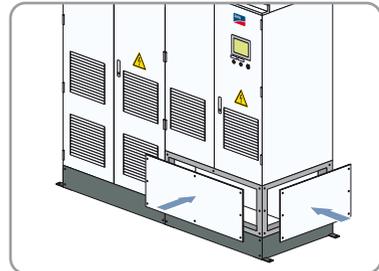
Danger to life from electric shock or electric arc when touching live components.

- Disconnect the inverter (see Section 6.1).

2. Mount the protective covers (torque: 10 Nm).



3. Fasten the earthing cables to the panels of the interface cabinet (torque: 8 Nm).
4. Ensure that the earthing cables are securely in place.
5. Fasten the panels (torque: 2 Nm ... 3 Nm).



6.8 Maintenance after Connecting the Control Voltage

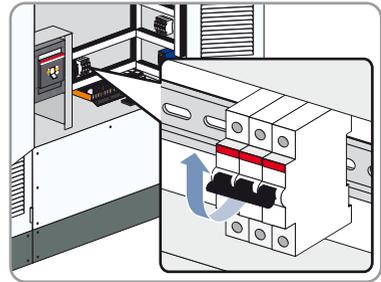
6.8.1 Connecting the Voltage

⚠ WARNING

High voltages that can cause fatal electric shocks are present in the live components of the inverter.

- Move the key switch to the "Stop" position and ensure it cannot be reconnected accidentally.
- Do not touch any live components in the inverter or the medium-voltage grid. Comply with all applicable safety regulations for handling medium-voltage grids.
- All previously removed protective covers must be mounted.

1. Open the doors of the interface cabinet.
2. Switch on the grid monitoring miniature circuit-breaker.

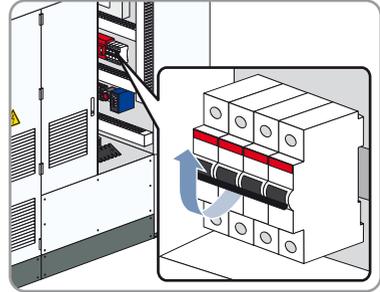


3. Connect additional external voltage.
4. Connect external voltage supply externally.
5. Connect AC circuit breaker.
6. Connect the DC voltage in the main distributor or the sub-distributor.
7. Connect the AC voltage of the medium-voltage transformer externally.

6.8.2 Checking the Fans

- The miniature circuit-breaker of the external voltage supply is switched off.

1. Open the doors.
2. Switch on the miniature circuit-breaker of the external voltage supply.
 - The fans should soon start to run.
 - Have the fans failed to start?
 - Contact the SMA Service Line.



3. Close the doors.

6.8.3 Checking the Heating Element and Hygrostat

CAUTION

Risk of burns due to hot heating elements.

During the function test, the heating element will become hot. There is a risk of burns if you touch the heating element without protective gloves on.

- Do not touch heating elements with bare hands.
- Wear personal protective equipment.
- Always maintain a safe distance when checking the function of heating elements.



Low humidity

If the humidity is below 50%, you will not be able to perform the function test since the minimum value of the hygrostat is 50%.

Requirements:

- The miniature circuit-breaker of the external voltage supply must be switched on.

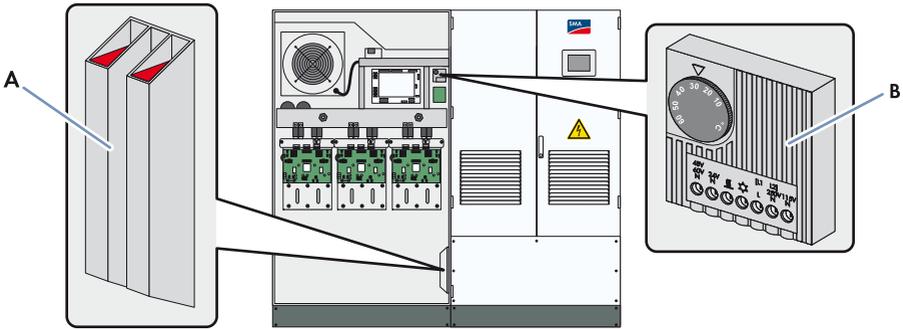


Figure 10: Position of the heating element and hygrostat

Position	Description
A	Heating element
B	Hygrostat

1. Open the doors.
2. Set the hygrostat to the minimum value.
 - If the humidity exceeds the set value, the heating will start.
 - Has the heating failed to start?
 - Wait at least 5 minutes. If the heating element does not start, contact the SMA Service Line.
3. Reset the hygrostat to the initial value. The initial value is included in the circuit diagram.
4. Close the doors.

7 Maintaining the Accessories

7.1 Maintaining the Sunny String-Monitor

7.1.1 Disconnecting the Sunny String-Monitor

DANGER

Danger to life from electric shock when touching live components of the Sunny String-Monitor.

- Observe the safety rules:
 - Disconnect.
 - Ensure that the device cannot be reconnected.
 - Ensure that no voltage or current is present.
 - Cover or safeguard any adjacent live components.
- Maintenance must only be carried out when the device has been turned off and is dead.
- Only open the isolation terminals when the device is off.
- Only unplug the DC connector when the device is off.

1. If there is a DC circuit-breaker in the Sunny String-Monitor, disconnect it. This ensures that there is no current flowing through the Sunny String-Monitor.
2. If there is no DC circuit-breaker, disconnect the Sunny Central (see the Sunny Central installation manual).
3. If there are fuses in the Sunny Central, remove them (see the Sunny Central installation manual).
4. If there are no fuses in the Sunny Central, remove the fuses from the DC main distributor.

5. DANGER

Danger to life from electric arcs when opening isolation terminals.

- Open the isolation terminals. Only do this when the Sunny String-Monitor is switched off.

6. DANGER

Danger to life from electric arcs when removing the DC connectors.

- Open all DC connectors. Only do this when the Sunny String-Monitor is switched off.

7.1.2 Maintenance Interval

- Maintenance is to be performed on the Sunny String-Monitor every 24 months.

7.1.3 Overview of the Main Components

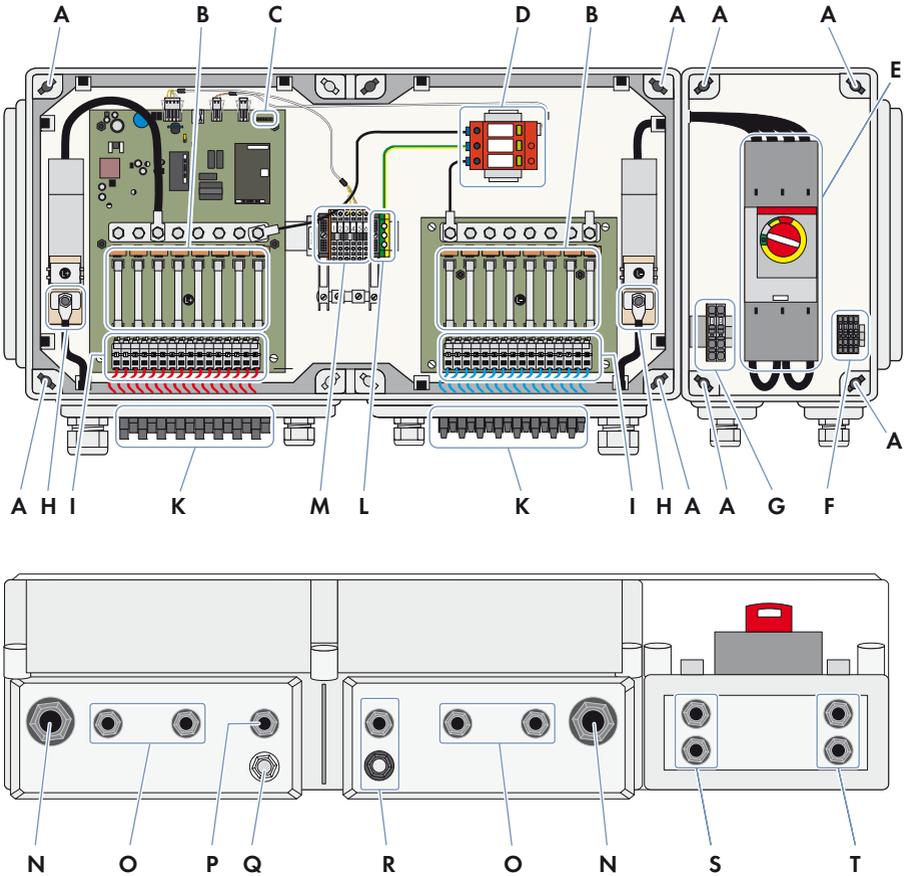


Figure 11: Main components of the Sunny String-Monitor SSM

Item	Description
A	Cover latch
B	DC fuses
C	LEDs for displaying the operating state
D	Surge arrester
E	DC switch
F	Terminals for connecting the signalling cable for the response contact*
G	Terminals for connecting the control of the auxiliary trigger*

Item	Description
H	Stud terminal for connecting the DC main cable
I	Spring clamp terminals for the string connections
K	Plugs for connecting the strings
L	Terminals for the earth connection
M	Terminals for connecting the data cable
N	Cable gland for connecting the DC main cable
O	Cable glands for the string connections
P	Cable glands for the earth connection
Q	Vent plug
R	Cable glands for the communication connection
S	Cable glands for connecting the remote tripping *
T	Cable glands for connecting the response contact *

* optional

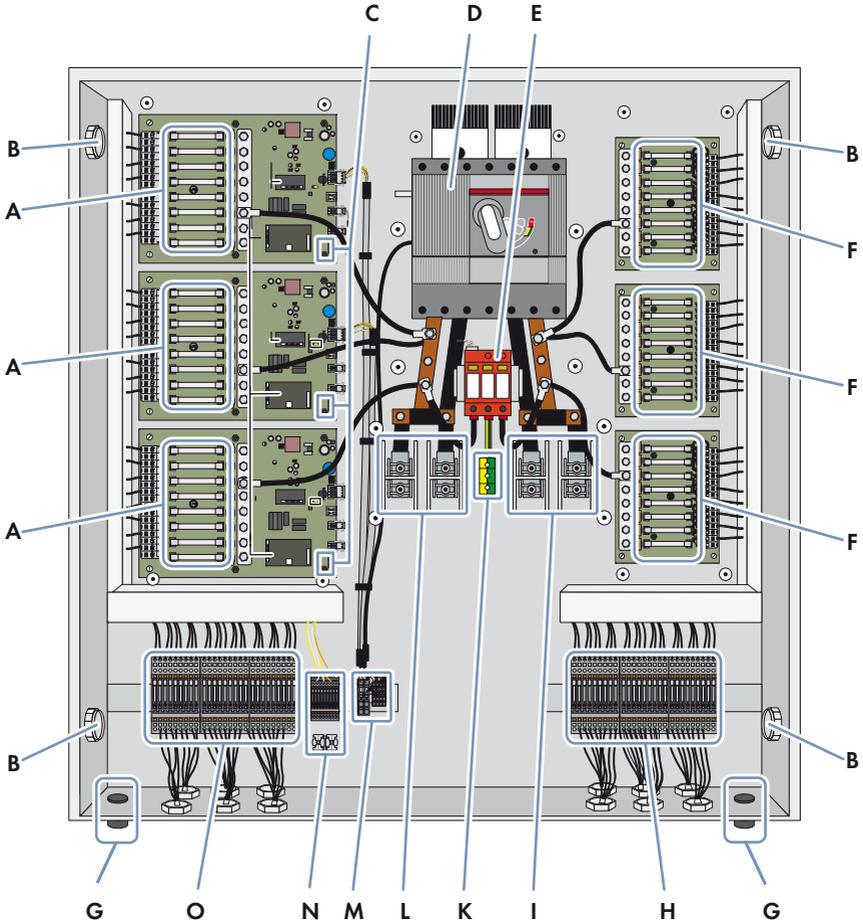


Figure 12: Main components of the Sunny String-Monitor SSM 24-11 (example)

Item	Description
A	DC fuses, positive pole
B	Vent plug
C	LEDs for displaying the operating state
D	DC switch
E	Surge arrester with ready indicator
F	DC fuses, negative pole
G	Drain plugs

Item	Description
H	String connections, negative pole
I	DC main line, negative pole
K	Earthing terminal
L	DC main line, positive pole
M	Terminal for remote tripping (optional)
N	Communication terminal
O	String connections, positive pole

7.1.4 Checking the Mounting Location and Installation

- Remove all inflammable materials.
- Ensure that the Sunny String-Monitor is securely in place.
- Ensure that the Sunny String-Monitor is not exposed to direct solar irradiation.

7.1.5 Checking the Enclosure

- Check whether the enclosure is damaged.
Replace the enclosure if it is badly damaged or cracked.
- Ensure that the vent plugs in the enclosure of the Sunny String-Monitor SSM 16/24 are intact and clean.
- Inspect the cover latches and cover screws of the Sunny String-Monitor SSM:
 - Check whether the cover latches are worn out.
If the cover latches are worn out, contact the SMA Service Line.
 - Check whether the cover screws are dirty or damaged.
If the cover screws are dirty or damaged, clean or replace them.
 - Ensure that the cover is securely in place.
- On the Sunny String-Monitor 16/24-11, ensure that the lock is working and intact.
- Check the side vent plugs for dirt.
Clean or replace the vent plugs if they are very dirty.

7.1.6 Checking the Enclosure Interior

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Check the sealing of the device.
 3. Ensure that the drain plugs and vent plugs are intact and clean.
 4. Ensure that there is no condensation water inside the enclosure.

7.1.7 Checking the Base Plate

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Ensure that the vent plug on the Sunny String-Monitor SSM is not dirty or damaged.
 3. If the vent plug is dirty or damaged, clean or replace it.
 4. Ensure that all cable glands are sealed and securely in place.
 5. Ensure that the connectors are intact and securely in place.

7.1.8 Checking the Covers and Labels

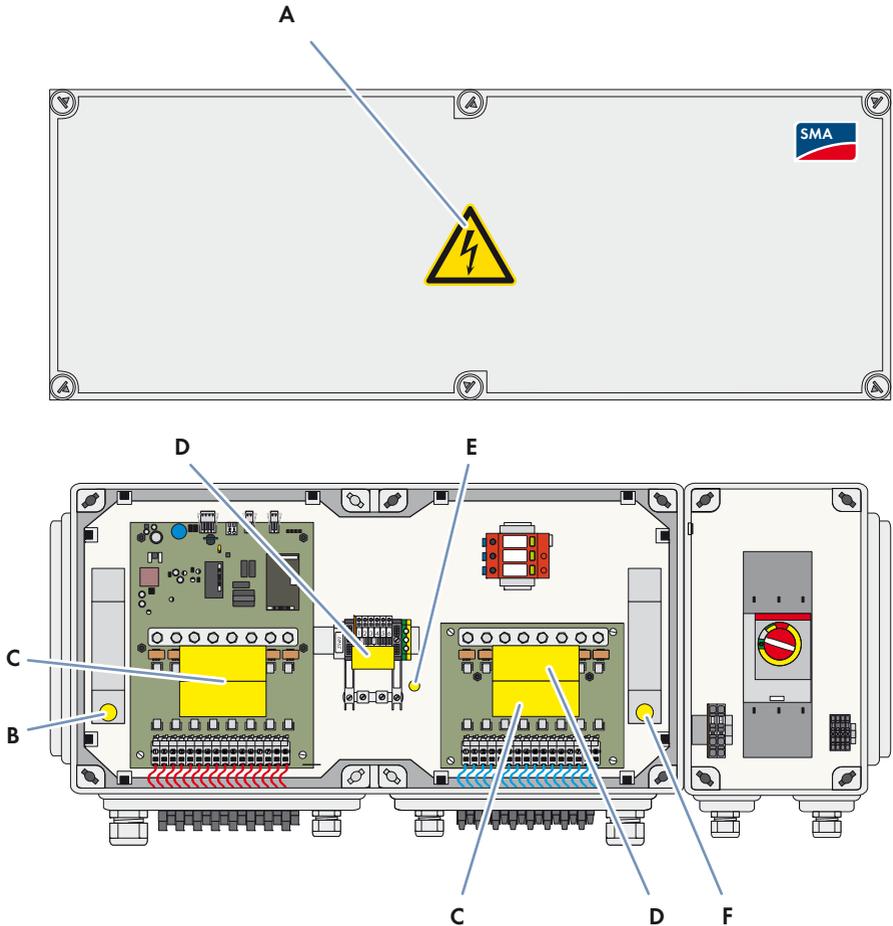


Figure 13: Position of the labels on the Sunny String-Monitor SSM

Item	SMA order number	Description
A	86-0520	Beware of hazardous voltage
B	86-0512	Positive pole
C	86-108670101 86-108670103	Damage to the plant due to incorrectly rated fuses Risk of electric shock due to active power source
D	86-004610	Incorrect connection leads to destruction of the device

Item	SMA order number	Description
E	86-0509	Earthing
F	86-0514	Negative pole

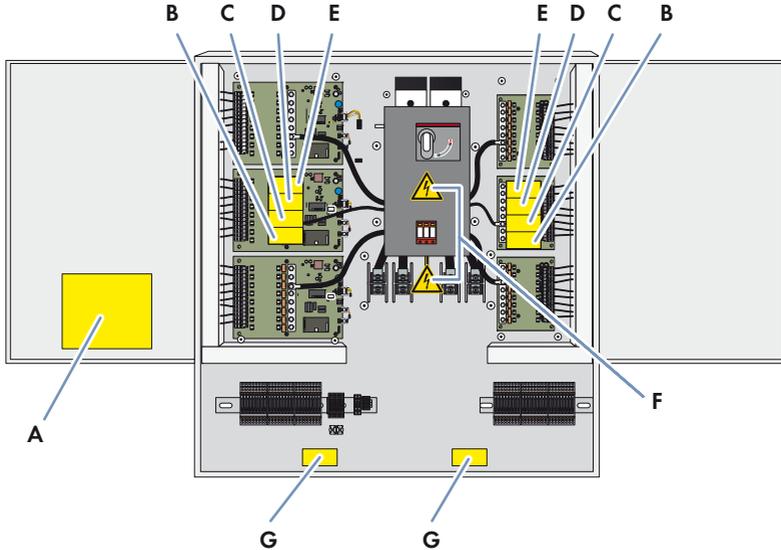


Figure 14: Position of the labels on the Sunny String-Monitor 16/24-11 (with SSM 24-11 as an example)

Item	SMA order number	Description
A	86-051488	Beware of hazardous voltage
B	86-108670101* 86-108670102**	Damage to the plant due to incorrectly rated fuses
C	86-108670106	Risk of burns due to hot components beneath the cover
D	86-108670109	Risk of an electric arc
E	86-108670103	Risk of electric shock due to active power source
F	86-051489	Beware of hazardous voltage
G	86-0514	Negative pole
H	86-1086701010	SSM isolation terminal – risk of an electric arc (do not remove isolation terminals under load)
I	86-0512	Positive pole

Item	SMA order number	Description
K	86-10868001	External view label for SSM 24-1 with cable glands
	86-10868002	External view label for SSM 24-1 with DC connector (24 string inputs)
	86-10868003	External view label for SSM 24-1 with DC connector (48 string inputs)
	86-10868004	External view label for SSM 16-11 with 8x cable gland
	86-10868005	External view label for SSM 16-11 with DC connector (16 string inputs)
	86-10868006	External view label for SSM 16-11 with DC connector (32 string inputs)

* for SSM16-11

** for SSM24-11

1. DANGER

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Ensure that the safety message labels on and inside the device are present and undamaged. Replace safety message labels if they are damaged or missing.
 3. Check that the cover latches are undamaged and securely in place. Replace the cover latches if they are damaged or loose.

7.1.9 Checking the Fuses and Fuse Holders

1. DANGER

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Ensure that the DC fuses and tension springs of the fuse holders are securely in place.

7.1.10 Checking the Screw Connections and Clamp Connections

1. **⚠ DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Ensure that the screw connections of the power cables are securely in place.
 3. Ensure that the clamp connections of the strings are securely in place.
 4. Ensure that the clamp connections of the optional DC circuit-breaker are securely in place.
 5. Check the screw and clamp connections to the insulation and the clamps for discolouration or changes to their appearance.
If the screw and clamp connections are discoloured or if there are changes to their appearance, replace them.
 6. Ensure that the shield clamping saddle is securely in place.

7.1.11 Checking the Surge Arrester

1. **⚠ DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Check whether the ready indicator on the surge arrester is red.
If the ready indicator is red, replace the protection module.

7.1.12 Checking the Supply Voltage

Required maintenance material (not included in the scope of delivery):

- Voltmeter

Requirements

- The miniature circuit-breaker of the voltage supply for the Sunny Central must be switched on.

1. **⚠ DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Measure the supply voltage at the terminals.
 - Supply voltage must be at least 30 V.
 - Is the supply voltage less than 30 V?
 - Check the clamp connections. Attach the cable if necessary.

7.1.13 Checking Shunt Release (Optional)

1. **⚠ DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Open the Sunny String-Monitor.
 3. At the shunt release, apply a voltage of 230 V.
 - ☑ The DC switch switches to the **OFF** position.
 - ✗ Has the DC switch not switched to the **OFF** position?
Possible cause: the voltage is outside the range of 70% to 110% of the nominal voltage of the shunt release.
 - Ensure that the voltage at the shunt release is in the range of 70% to 110% of the nominal voltage.
 - Contact the SMA Service Line.
 4. Switch the DC switch to the **ON** position again.
 5. Close the Sunny String-Monitor.

7.1.14 Checking the Undervoltage Release (Optional)

1. **⚠ DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Open the Sunny String-Monitor.
 3. Disconnect the voltage at the undervoltage release.
 4. Check whether the DC switch has switched to the **OFF** position.
If the DC switch has not switched to the **OFF** position, contact the SMA Service Line.
 5. Switch the DC switch to the **ON** position again.
 6. Close the Sunny String-Monitor.

7.1.15 Checking the Earth Connection

1. **⚠ DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. Check the earth connection and contact resistance to the earth potential.

7.1.16 Checking the LEDs on the Measurement PCB

1. **⚠ DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny String-Monitor (see Section 7.1.1).
2. If the red LED of the operating status indicator is on, contact the SMA Service Line.

7.2 Maintaining the Sunny Main Box

7.2.1 Disconnecting the Sunny Main Box

⚠ DANGER

Danger to life from electric shock when live components of the Sunny Main Box are touched.

- Observe the safety rules:
 - Disconnect.
 - Ensure that the device cannot be reconnected.
 - Ensure that no voltage or current is present.
 - Cover or safeguard any adjacent live components.
 - Maintenance must only be carried out when the device has been turned off and is dead.
1. If there are DC circuit-breakers in the DC sub-distributor, for example Sunny String-Monitors, these are to be disconnected. This ensures that there is no current flowing through the Sunny String-Monitor.
 2. If there are no DC circuit-breakers in the DC sub-distributor, for example Sunny String-Monitors, remove the fuses in the DC sub-distributor (see the DC sub-distributor installation manual).
 3. If there are fuses in the Sunny Central, remove them (see the Sunny Central installation manual).
 4. If there are no fuses in the Sunny Central, the maintenance can only be performed when it is dark.

7.2.2 Maintenance Interval

Maintenance is to be performed on the Sunny String-Monitor every 24 months.

7.2.3 Overview of the Main Components

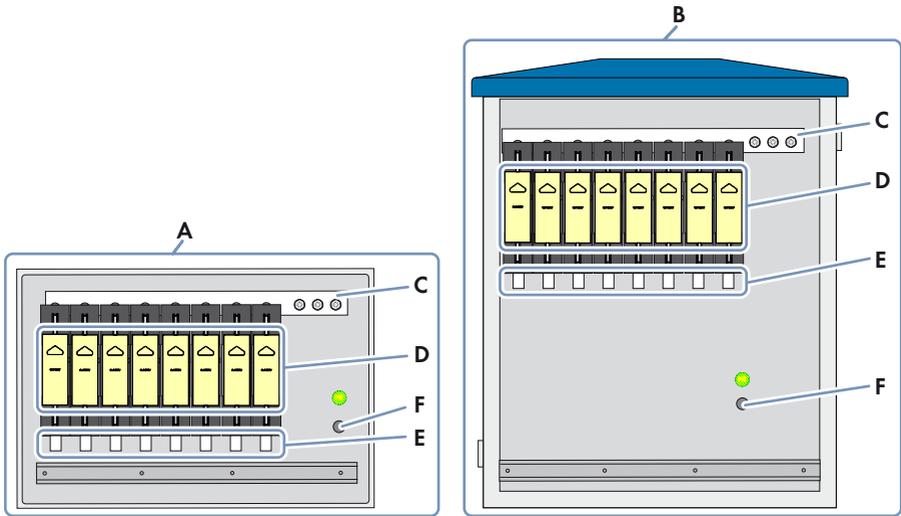


Figure 15: Main interior components

Item	Description
A	Sunny Main Box
B	Sunny Main Box Cabinet
C	DC busbar, positive pole or negative pole depending on PV plant
D	DC fuses or disconnecting blades
E	DC inputs, positive pole or negative pole depending on PV plant
F	Earthing terminal

7.2.4 Checking the Mounting Location and Installation

- Ensure that the mounting location is accessible.
- Ensure that the Sunny Main Box is securely in place.
- Remove all inflammable materials.
- Ensure that the Sunny Main Box is not exposed to direct solar irradiation.

7.2.5 Checking the Enclosure

- Check whether the enclosure is damaged.
If the enclosure is damaged, contact the SMA Service Line.
- Check the sealing of the enclosure.

7.2.6 Checking the Enclosure Interior

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny Main Box (see Section 7.2.1).
2. Check whether the enclosure interior is damaged.
If the enclosure interior is damaged, contact the SMA Service Line.
 3. Remove any dirt build-up on the enclosure opening for the connection cables. Replace damaged or unsealed enclosure openings for connection cables.
 4. Ensure that there is no condensation water inside the enclosure.
 5. Ensure that the door mechanism is securely in place and sealed.

7.2.7 Checking the Base Plate

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny Main Box (see Section 7.2.1).
2. Ensure that the foam on the base plate is intact.

7.2.8 Checking the Covers and Labels

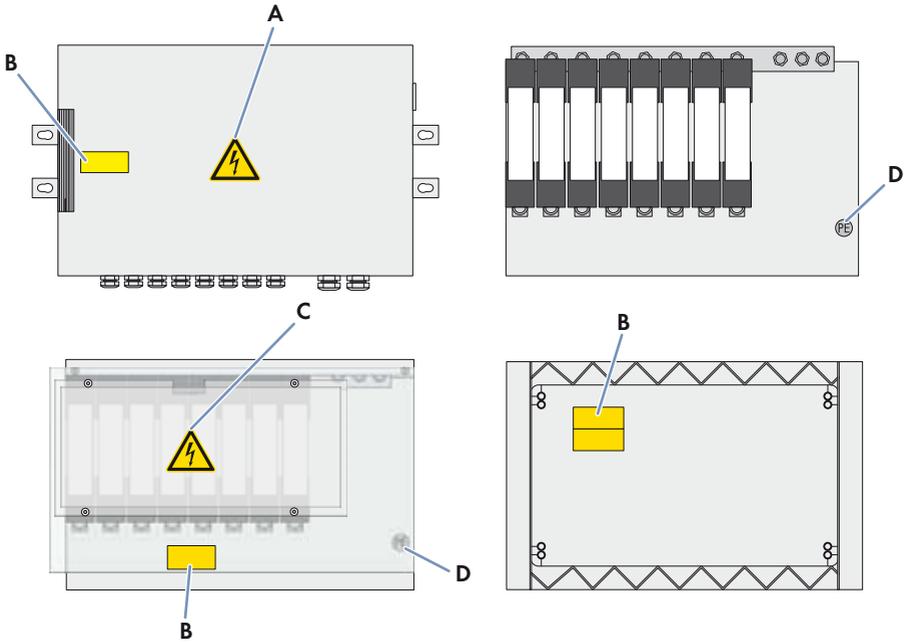


Figure 16: Position of the labels on the Sunny Main Box

Position	SMA order number	Description
A	86-0520	Active power source
B	86-108670103	Risk of electric shock due to active power source
	86-108670109	Risk of an electric arc
C	86-051489	Dangerous voltage
D	86-05081	Protective earth

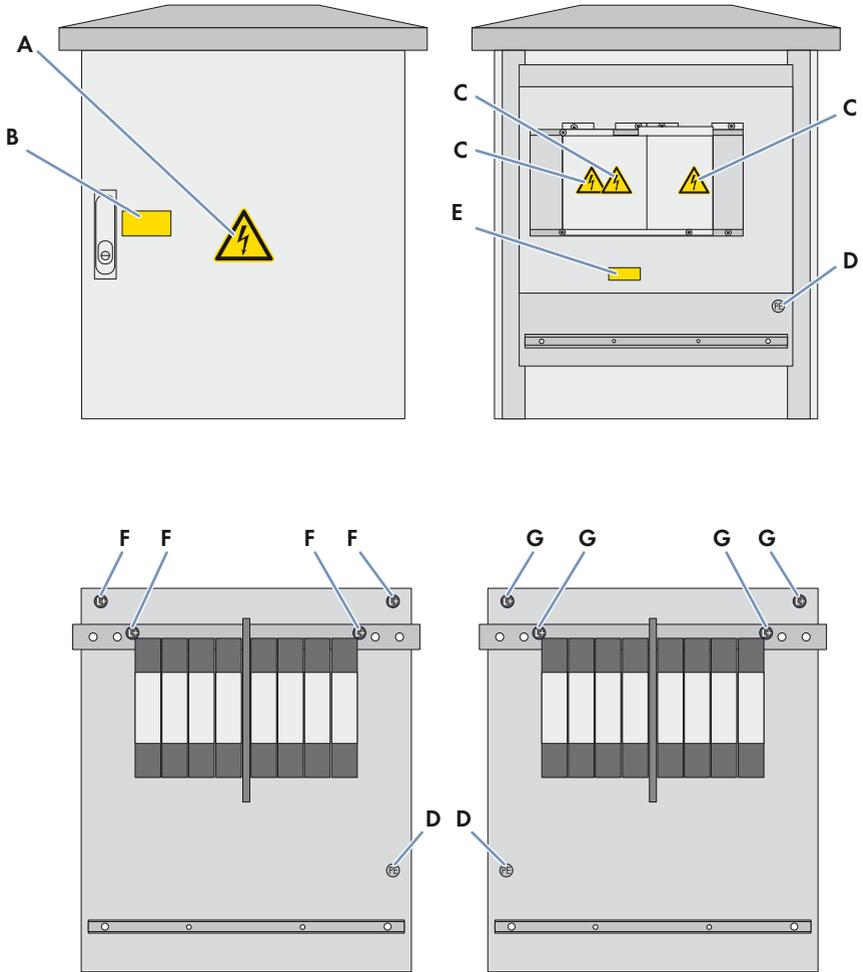


Figure 17: Position of the labels on the Sunny Main Box Cabinet

Position	SMA order number	Description
A	86-0520	Active power source
B	86-108670103	Risk of electric shock due to active power source
	86-108670109	Risk of an electric arc
C	86-051489	Dangerous voltage
D	86-05081	Protective earth

Position	SMA order number	Description
E	86-108670105	Danger of burn injury
	86-108670109	Risk of an electric arc
F	86-0512	L+
G	86-0514	L-

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny Main Box (see Section 7.2.1).
2. Ensure that the latches of the Plexiglas covers are undamaged and securely in place. Replace the latches if they are damaged or loose.
 3. Ensure that the safety message labels on and inside the device are present and undamaged. Replace safety message labels if they are damaged or missing.

7.2.9 Checking the Fuses and Fuse Holders

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny Main Box (see Section 7.2.1).
2. Ensure that the DC fuses and tension springs of the fuse holders are securely in place. Replace the DC fuses or fuse holders if they are loose.

7.2.10 Checking the Screw Connections and Clamp Connections

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the Sunny Main Box (see Section 7.2.1).
2. Ensure that the screw and clamp connections are securely in place.
 3. Ensure that the strain relief of the entire cabling is intact.

7.3 Maintaining the SMA String-Combiner

7.3.1 Disconnecting the SMA String-Combiner

DANGER

Danger to life due to electric shock.

High voltages are present in the live components of the SMA String-Combiner.

- Disconnect the SMA String-Combiner before carrying out any work:
 - Turn off the DC switch-disconnector in the SMA String-Combiner.
 - Remove the DC fuses on the central inverter after switching it off. Use an LV/HRC fuse handle to do this.
 - If the central inverter is equipped with the "Optiprotect" option, switch the miniature circuit-breakers in the central inverter off.
 - Only open the fuse holders in the SMA String-Combiner when it is switched off.
 - Only plug in or unplug the DC connector when it is switched off.

WARNING

Risk of burns from touching hot components.

- Wear safety gloves when working on the device.
1. If there is a DC switch-disconnector in the SMA String-Combiner, disconnect it. This ensures that there is no current flowing through the SMA String-Combiner.
If there is no DC switch-disconnector, disconnect the Sunny Central (see the Sunny Central installation manual).
 2. If there are fuses in the Sunny Central, remove them. Use an LV/HRC fuse handle to do this.
 3. If the central inverter is equipped with the "Optiprotect" option, switch the miniature circuit-breakers in the central inverter off.
 4. If there are no fuses in the Sunny Central, remove the fuses from the DC main distributor.
 5. Only open the fuse holder in the SMA String-Combiner when it is switched off.
 6. Disconnect all DC connectors.

7.3.2 Maintenance Interval

- Service the SMA String-Combiner every 24 months.

7.3.3 Checking the Mounting Location and Installation

- Remove all inflammable materials.
- Ensure that the SMA String-Combiner is securely in place.
- Ensure that the SMA String-Combiner is not exposed to direct solar irradiation.

7.3.4 Checking the Base Plate

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the SMA String-Combiner (see Section 7.3.1).
2. Check whether the drainage plugs are dirty or damaged.
Clean or replace the drainage plugs if they are damaged or dirty.
 3. Ensure that all cable glands are securely in place.
 4. Ensure that the connectors are intact and securely in place.

7.3.5 Checking the Enclosure and Enclosure Interior

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the SMA String-Combiner (see Section 7.3.1).
2. Ensure that the enclosure is undamaged and clean.
If the enclosure is severely damaged, contact the SMA Service Line.
 3. Ensure that the door lock is intact and clean.
 4. Check that the perimeter seals on the door frames are intact.
If the seals are damaged, replace them.
 5. Ensure that there is no condensation water inside the enclosure.
 6. Ensure that all cable glands are sealed.

7.3.6 Checking the String Cables

1. **⚠ DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the SMA String-Combiner (see Section 7.3.1).

2. Check if the DC connectors are securely in place.

If the DC connectors are loose, reconnect the string cables to the SUNCLIX DC connector (see SMA String-Combiner installation manual).

Replace the DC connectors if they do not snap in correctly.

3. Ensure that the screw terminals are securely attached to the fuse holders.

If the screw terminals are detached from the fuse holders, reconnect the string cables to the fuse holders (see the SMA String-Combiner installation manual).

7.3.7 Checking the Covers and Labels

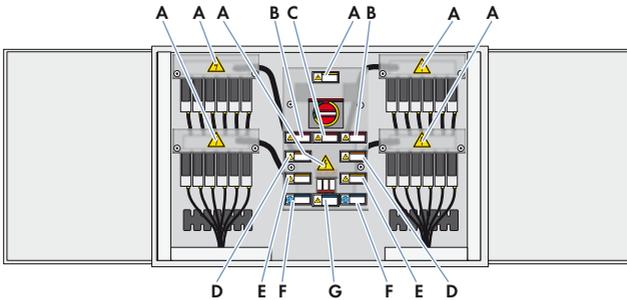


Figure 18: Position of the labels on the SMA String-Combiner

Item	Description
A	Dangerous voltage symbol
B	Risk of electric shock from fuse holder
C	Risk of electric shock under the cover
D	Risk of an electric arc
E	Danger of burn injury
F	PV array earthing
G	Fuse rating

1. ⚠ DANGER

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the SMA String-Combiner (see Section 7.3.1).
2. Ensure that the safety message labels on and inside the device are present and undamaged. Replace safety message labels if they are damaged or missing. The safety message labels can be ordered from SMA using the SMA order number 86-0043660.
 3. Check that the cover latches are undamaged and securely in place. Replace the cover latches if they are damaged or loose.

7.3.8 Checking the Fuses and Fuse Holders

1. ⚠ DANGER

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the SMA String-Combiner (see Section 7.3.1).
2. Ensure that all fuse holders are closed.
 3. Ensure that the screw connections of the power cables are securely in place.

7.3.9 Checking the Screw Connections and Clamp Connections

1. ⚠ DANGER

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the SMA String-Combiner (see Section 7.3.1).
2. Check that the clamp connections of the string cables are securely in place. Replace the clamp connections on the string cables if they are loose.
 3. Check that the clamp connections on the optional DC switch-disconnector are securely in place. Replace clamp connections if they are loose.
 4. Check the screw and clamp connections to the insulation and check the clamps for discolouration or changes to their appearance. Replace the screw and clamp connections if they are discoloured or if there are changes to their appearance.

7.3.10 Checking the Surge Arrester

1. ** DANGER**

Danger to life from electric shock or electric arc when touching live components.

- Disconnect the SMA String-Combiner (see Section 7.3.1).
2. Check whether the ready indicator on the surge arrester is red.
If the ready indicator is red, replace the protection module.

8 Contact

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

- Device type
- Serial number
- Fabrication version
- Installation address with GPS coordinates
- Plant name
- Pictures of the faulty components
- Type and number of connected PV modules

Country	Company name	Subsidiary	SMA Service Line
Australia	SMA Australia Pty Ltd.	Sydney	Toll free for Australia: 1800 SMA AUS (1800 762 287) International: +61 2 9491 4200
Austria	See Germany		
Belgium	SMA Benelux bvba/sprl	Mechelen	+32 15 286 730
Bulgaria	See Greece		
China	SMA Beijing Commercial Company Ltd.	Beijing	+86 10 51501685-602
Czech Republic	SMA Central & Eastern Europe s.r.o.	Prague	+420 235 010 417
Denmark	See Germany		
France	SMA France S.A.S.	Lyon	Sunny Boy / Sunny Mini Central / Sunny Tripower Inverters: +33 472 09 04 40 Communication: +33 472 09 04 41 Sunny Island: +33 472 09 04 42 Sunny Central: +33 472 09 04 43
Germany	SMA Solar Technology AG	Niestetal	Sunny Boy / Sunny Mini Central / Sunny Tripower Inverters: +49 561 9522-1499 Communication: +49 561 9522-2499 SMS with "Rückruf": +49 176 888 222 44 Sunny Island: +49 561 9522-399 Sunny Central: +49 561 9522-299
Greece	SMA Hellas AE	Athens	+30 210 9856-666
Hungary	See Czech Republic		
India	SMA Solar India Pvt. Ltd.	Mumbai	+91 22 61713844
Italy	SMA Italia S.r.l.	Milan	+39 02 89347-299
Japan	SMA Japan K.K.	Tokyo	+81 3 3451 9530
Korea	SMA Technology Korea Co., Ltd.	Seoul	+82 2 508-8599
Luxembourg	See Belgium		

Country	Company name	Subsidiary	SMA Service Line
Netherlands	See Belgium		
Poland	See Czech Republic		
Portugal	SMA Solar Technology Portugal, Unipessoal Lda	Lisbon	+351 2 12 37 78 60
Romania	See Czech Republic		
Slovakia	See Czech Republic		
Spain	SMA Ibérica Tecnología Solar, S.L.U.	Barcelona	+34 900 14 22 22
Switzerland	See Germany		
Thailand	SMA Solar (Thailand) Co., Ltd.	Bangkok	+662 670 6999
United Arab Emirates	SMA Middle East LLC	Abu Dhabi	+971 2 698-5080
United Kingdom	SMA Solar UK Ltd.	Milton Keynes	+44 1908 304899
Other countries	International SMA Service Line	Niestetal	00800 SMA SERVICE (+800 762 7378423)

Legal Provisions

The information contained in this document is the property of SMA Solar Technology AG. Publishing its content, either partially or in full, requires the written permission of SMA Solar Technology AG. Any internal company copying of the document for the purposes of evaluating the product or its correct implementation is allowed and does not require permission.

SMA Factory Warranty

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

Trademarks

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

The *Bluetooth*[®] word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by SMA Solar Technology AG is under licence.

QR Code[®] is a registered trademark of DENSO WAVE INCORPORATED.

SMA Solar Technology AG

Sonnenallee 1
34266 Niestetal
Germany

Tel. +49 561 9522-0
Fax +49 561 9522-100
www.SMA.de
E-Mail: info@SMA.de

© 2004 to 2012 SMA Solar Technology AG. All rights reserved

SMA Solar Technology

www.SMA-Solar.com

SMA Solar Technology AG

www.SMA.de

SMA Australia Pty. Ltd.

www.SMA-Australia.com.au

SMA Benelux bvba/sprl

www.SMA-Benelux.com

SMA Beijing Commercial Company Ltd.

www.SMA-China.com.cn

SMA Central & Eastern Europe s.r.o.

www.SMA-Czech.com

SMA France S.A.S.

www.SMA-France.com

SMA Hellas AE

www.SMA-Hellas.com

SMA Ibérica Tecnología Solar, S.L.U.

www.SMA-Iberica.com

SMA Solar India Pvt. Ltd.

www.SMA-India.com

SMA Italia S.r.l.

www.SMA-Italia.com

SMA Japan K.K

www.SMA-Japan.com

SMA Technology Korea Co., Ltd.

www.SMA-Korea.com

SMA Middle East LLC

www.SMA-Me.com

SMA Portugal - Niestetal Services Unipessoal Lda

www.SMA-Portugal.com

SMA Solar (Thailand) Co., Ltd.

www.SMA-Thailand.com

SMA Solar UK Ltd.

www.SMA-UK.com

