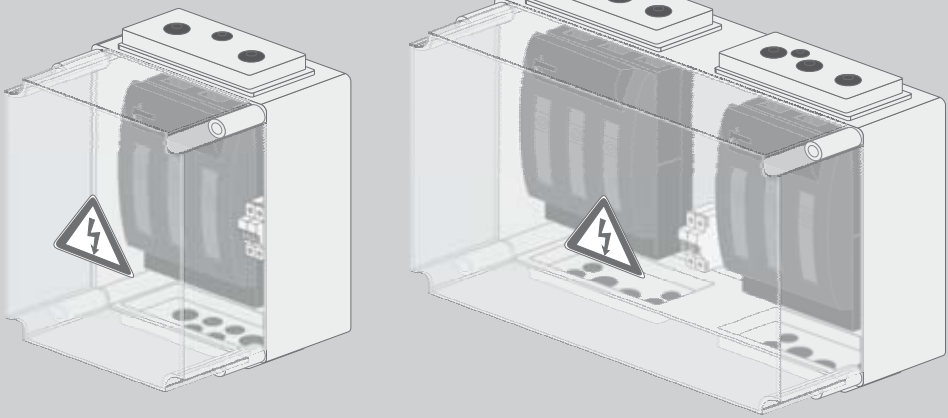
Operating Manual

BATFUSE-B.01 / B.03



Legal Provisions

SMA Warranty

You can download the current warranty conditions from the Internet at www.SMA-Solar.com.

Trademarks

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

Table of Contents

1 Information on this Document

1.1 Validity

This document is valid for the following device types:

- BatFuse-B.01
- BatFuse-B.03

1.2 Target Group

This document is intended for qualified persons. Only persons with the appropriate skills are allowed to perform the activities described in this document (see Section 2.2 "Skills of Qualified Persons", page 7).

1.3 Symbols

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

Symbol	Explanation
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
⚠ WARNING	Indicates a hazardous situation which, if not avoided, can result in death or serious injury
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, can result in minor or moderate injury
NOTICE	Indicates a situation which, if not avoided, can result in property damage
i	Information that is important for a specific topic or goal, but is not safety-relevant
☐	Indicates a requirement for meeting a specific goal
☑	Desired result
✖	A problem that might occur

2 Safety

2.1 Intended Use

The BatFuse is a battery fuse box that acts as a DC fuse by protecting the DC cables of the Sunny Island. The BatFuse-B.01 is designed for connecting no more than one Sunny Island and BatFuse-B.03 is designed for connecting a maximum of three Sunny Island inverters.

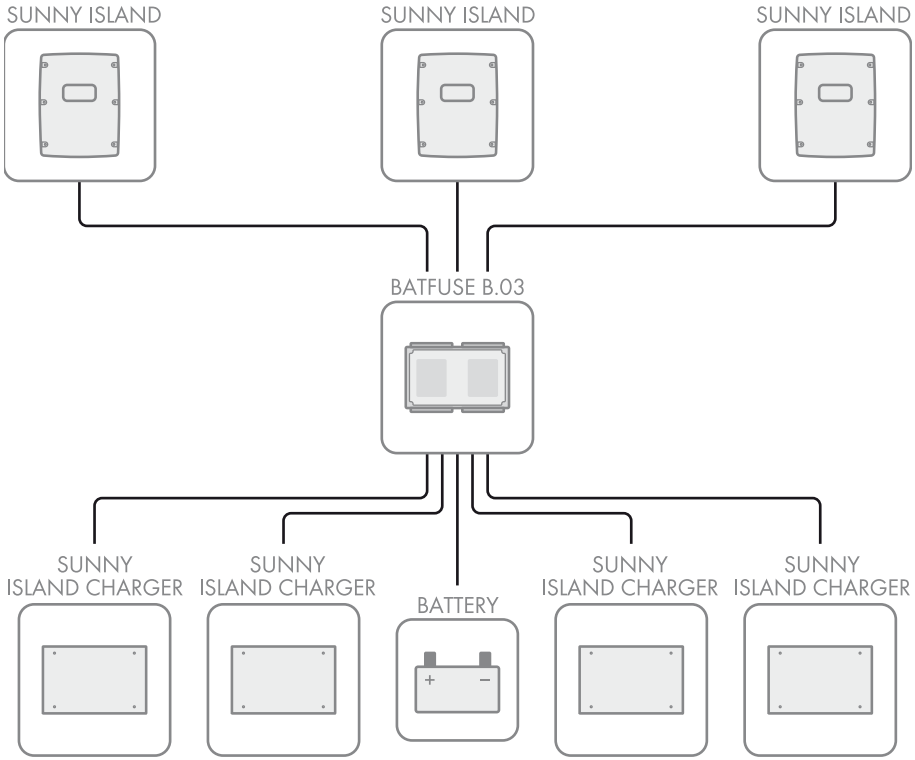


Figure 1: Principle of a Sunny Island system with a BatFuse

The BatFuse is designed for indoor use only.

The conductors of all connection cables must be made of copper.

Use this product only in accordance with the information provided in the enclosed documentation and with the locally applicable standards and directives. Any other application may cause personal injury or property damage.

Alterations to the product, e.g. modifications or conversions, are only allowed with the express written permission of SMA Solar Technology AG. Unauthorized changes will void the warranty and is likely to result in invalidation of the operating permit. SMA Solar Technology AG shall not be held liable for any damage caused by such changes.

Any use of the product other than described in the Intended Use section does not qualify as appropriate.

The enclosed documentation is an integral part of this product. Keep the documentation in a convenient place for future reference and observe all instructions contained therein.

The type label must remain permanently attached to the product.

2.2 Skills of Qualified Persons

Qualified persons must have the following skills:

- Training in off-grid systems from SMA Solar Technology AG
- Training in how to deal with the dangers and risks associated with installing and operating electrical devices and batteries
- Training in the installation and commissioning of electrical devices
- Knowledge of and adherence to the local standards and directives
- Knowledge of and compliance with this document and all safety precautions

2.3 Safety Precautions

This section contains safety precautions that must be observed at all times when working on or with the product.

To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and follow all safety precautions at all times.

⚠ WARNING

Risk of injury due to short-circuit currents

Short-circuit currents in the battery can cause heat build-up and electric arcs. Burns or eye injuries due to flashes may result.

- Follow all safety and maintenance instructions provided by the battery manufacturer.
- Remove watches, rings and other metal objects.
- Use insulated tools.
- Do not place tools or metal parts on the battery.
- When working on the installation, make sure that all DC cables have been removed from the pole connections of the battery and that the BatFuse is voltage-free.
- Make sure that the polarity of the cables to the battery is correct.
- Make sure that the mechanical connection at the terminals is tight.
- Open the load-break switch quickly and then close it.
- Ensure that the enclosure lid of the BatFuse is closed when the load-break switch is closed.

3 Scope of Delivery

Check the scope of delivery for completeness and any externally visible damage. Contact your distributor if the scope of delivery is incomplete or damaged.

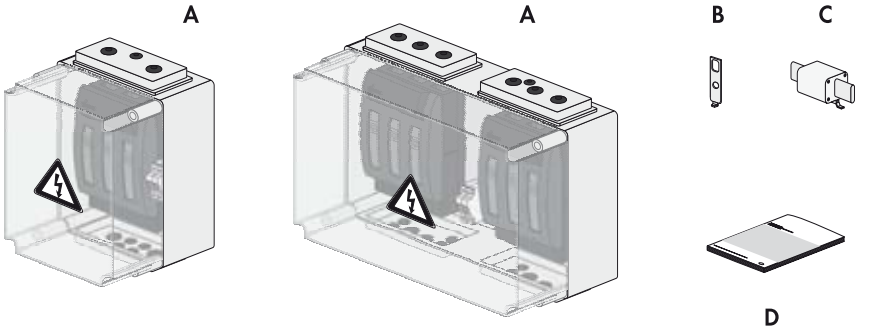


Figure 2: Components included in the scope of delivery

Position	Quantity for BatFuse-B.01	Quantity for BatFuse-B.03	Designation
A	1	1	BatFuse
B	4	4	Anchorage brackets for wall mounting
C	2	6	Spare fuses LV/HRC size 1
D	1	1	Operating manual

4 Product Description

4.1 BatFuse

The BatFuse is a battery fuse box that acts as a DC fuse by protecting the DC cables of the Sunny Island. The BatFuse enables disconnection on the DC side.

The BatFuse serves as DC busbar for the installation of the Sunny Island Charger.

The BatFuse is available with various fuse links for the different power classes of the Sunny Island inverters.

Fuse Links of the BatFuse-B.01 for a Maximum of One Sunny Island

Device type Sunny Island	Recommended fuse link
Sunny Island 3.0M	80 A
Sunny Island 4.4M	100 A
Sunny Island 6.0H	160 A
Sunny Island 8.0H	200 A
Sunny Island 5048	250 A

Fuse Links of the BatFuse-B.03 for a Maximum of Three Sunny Island Inverters

Device type Sunny Island	Recommended fuse link
Sunny Island 3.0M	80 A
Sunny Island 4.4M	100 A
Sunny Island 6.0H	160 A
Sunny Island 8.0H	200 A
Sunny Island 5048	250 A

The BatFuse features a battery voltage tap to which the following loads can be connected:

- Sunny Island load-shedding contactor
- DC-to-DC converter for supplying a Sunny WebBox, a Sunny Boy Control or a battery room fan

The battery voltage tap guarantees an interruption-free supply of the connected loads when the AC grid is switched off or under fault conditions.

4.2 Type Label

The type label clearly identifies the product.

You will find the following information on the type label:

- Manufacturer contact information
- Device type (Model)
- Serial number (Serial No.)
- Device-specific characteristics

You will require the information on the type label to use the product safely and when seeking customer support from the SMA Service Line.

Symbols on the Type Label

Symbol	Explanation
	Danger to life due to high voltages The product operates at high voltages. All work on the product must be carried out by qualified persons only.
	Risk of burns due to hot surfaces The product can get hot during operation. Avoid contact during operation. Allow the product to cool down sufficiently before carrying out any work. Wear personal protective equipment such as safety gloves.
	Observe the documentation. Observe all documentation supplied with the product.
	WEEE designation Do not dispose of the product together with the household waste but in accordance with the locally applicable disposal regulations for electronic waste.
CE	CE marking The product complies with the requirements of the applicable EU directives.
	Degree of protection The product is protected against dust intrusion and water jets from any angle.

5 Transport and Mounting

5.1 Transport

There are no special requirements for transport. The BatFuse can be transported without any aids.

5.2 Mounting the BatFuse

Requirements for the mounting location:

- ☐ The BatFuse must be mounted on a stable support surface, e.g. concrete, walls.
- ☐ The mounting location must be suitable for the weight and dimensions of the BatFuse (see Section 10 "Technical Data", page 21).
- ☐ The mounting location must be clear and safely accessible at all times without the need for any auxiliary equipment (e.g. scaffolding or lifting platforms).
- ☐ The mounting location must not hinder access to disconnection devices.
- ☐ Above and below the BatFuse, a clearance of 300 mm to walls, other devices or objects must be maintained.
- ☐ The mounting wall must be vertical.
- ☐ The climatic conditions must be met to ensure proper operation (see Section 10.8 "Ambient Conditions", page 22).

Dimensions for wall mounting:

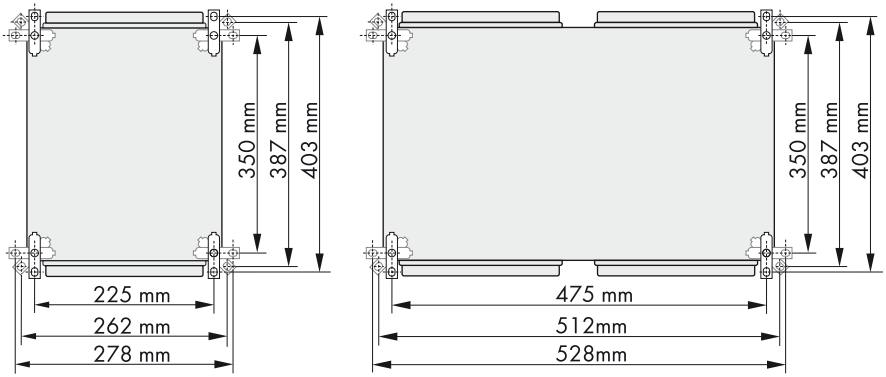


Figure 3: Dimensions of the drill holes

Additionally required mounting material (not included in the scope of delivery):

- ☐ At least four screws that are suitable for the support surface
- ☐ At least four washers that are suitable for the screws
- ☐ If necessary, at least four screw anchors suitable for the support surface and the screws

⚠ WARNING

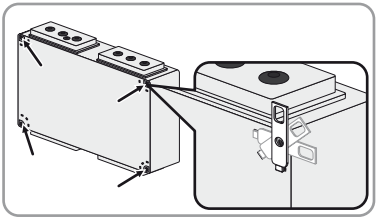
Danger to life due to fire or explosion

Despite careful construction, electrical devices can cause fire.

- Do not mount the BatFuse on flammable construction materials.
- Do not mount the BatFuse near highly flammable materials.
- Do not mount the BatFuse in potentially explosive areas.

Procedure:

1. Ensure that no cables are laid in the wall which could be damaged when drilling holes.
2. Attach the anchorage brackets either vertically, horizontally or diagonally on the rear panel of the BatFuse.



3. Mark the position of the drill holes at the mounting location.
4. Drill the holes.
5. Insert screw anchors into the drill holes if necessary.
6. Fasten the BatFuse with at least four suitable screws and the anchorage brackets.
7. Ensure that the BatFuse is firmly attached.

6 Electrical Connection

6.1 Connection Area

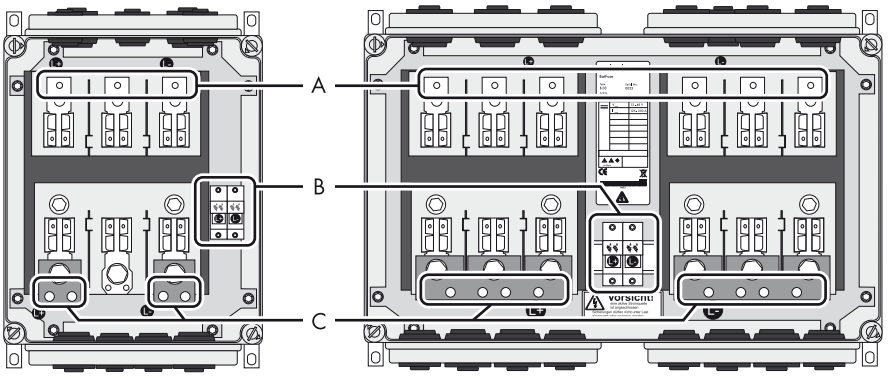


Figure 4: Connection area of the BatFuse

Position	Designation	Explanation
A	Inverter side	Terminal for Sunny Island
B	Battery voltage tap	Terminals for loads
C	Battery side	Terminal for battery and Sunny Island Charger

Terminals Inverter Side (A)

	BatFuse-B.01	BatFuse-B.03
Number of components to be connected	One Sunny Island	A maximum of three Sunny Island inverters
External diameter of cables for the Sunny Island	14 mm to 21 mm	14 mm to 21 mm
Terminal lug	M8, maximum width: 25 mm	M8, maximum width: 25 mm

Terminals Battery Side (C)

	BatFuse-B.01	BatFuse-B.03
Number of components to be connected	One battery and a maximum of two Sunny Island Charger devices	One battery and a maximum of four Sunny Island Charger devices
External diameter of cables for the battery	1 x 14 mm to 21 mm	2 x 14 mm to 21 mm
External diameter of cables for the Sunny Island Charger	9 mm to 16 mm	9 mm to 16 mm
Terminal lug	M8, maximum width: 25 mm	M8, maximum width: 25 mm

6.2 Connecting the Sunny Island

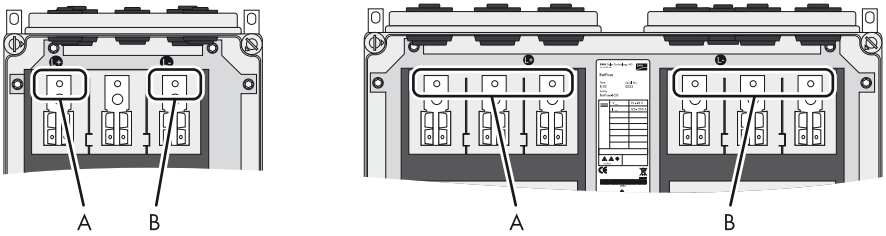


Figure 5: Overview of terminals

Position	Designation
A	Terminal L+
B	Terminal L −

Cable requirements:

- ☐ Conductor cross-section: specified by the Sunny Island
- ☐ External diameter: 14 mm to 21 mm
- ☐ Material of the conductor: copper
- ☐ Terminal lugs size M8, maximum width: 25 mm

Procedure:

1. Loosen the four screws of the enclosure lid.
2. Remove the enclosure lid of the BatFuse.
3. Open the load-break switch and remove it from the support.
4. Remove the cover.
5. Mount the terminal lugs on the DC+ cable and on the DC − cable of the Sunny Island.

6. On the inverter side, pierce the double-membrane seals with the larger diameter from the outside with a sharp object.
7. Lead the DC+ cable of the Sunny Island through the double-membrane seal into the BatFuse and connect it to terminal **L+** (torque: 4.0 Nm to 5.7 Nm).
8. Lead the DC − cable of the Sunny Island through the double-membrane seal into the BatFuse and connect it to terminal **L** − (torque: 4.0 Nm to 5.7 Nm).

6.3 Connecting the Sunny Island Charger

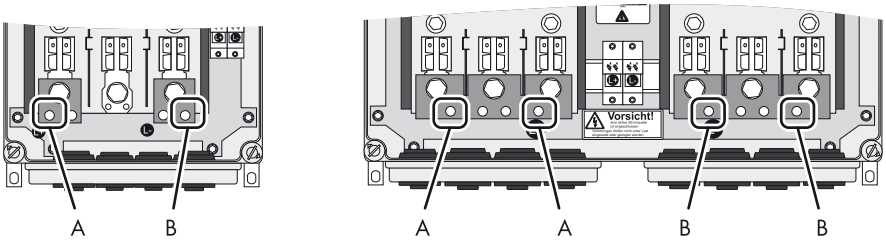


Figure 6: Overview of terminals

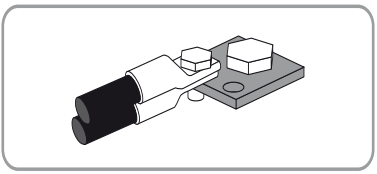
Position	Designation
A	Terminal L+
B	Terminal L −

Cable requirements:

- ☐ Maximum conductor cross-section: 16 mm²
- ☐ External diameter: 9 mm to 16 mm
- ☐ Terminal lugs of size M8, maximum width: 16 mm
- ☐ Material of the conductor: copper

Procedure:

1. Mount the terminal lugs on the DC+ cable and on the DC − cable of the Sunny Island.
2. On the battery side, pierce the double-membrane seals with the smaller diameter with a sharp object from the outside.
3. Lead the DC+ cable of the Sunny Island Charger devices through the double-membrane seals into the BatFuse and connect it to terminal **L+** (torque: 4.0 Nm to 5.7 Nm). Always connect two Sunny Island Charger devices to one terminal.



4. Lead the DC − cable of the Sunny Island Charger devices through the double-membranes seal into the BatFuse and connect it to terminal **L** − (torque: 4.0 Nm to 5.7 Nm). Always connect two Sunny Island Charger devices to one terminal.

6.4 Connecting Loads to the Battery Voltage Tap

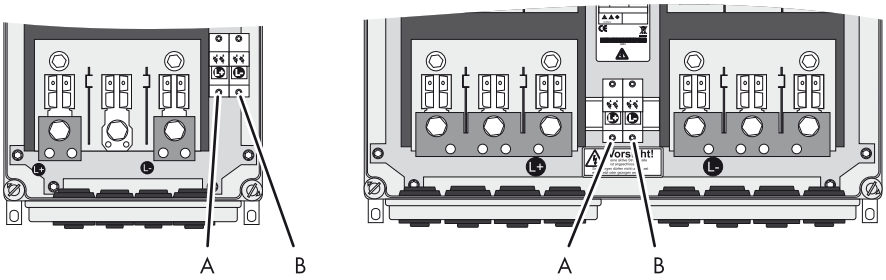


Figure 7: Overview of terminals

Position	Designation
A	Terminal L+
B	Terminal L −

Requirements:

- ☐ Electrical current strength: maximum 8 A
- ☐ Maximum conductor cross-section: 6 mm²
- ☐ External diameter of the cable: 9 mm to 16 mm
- ☐ Material of the conductor: copper

Procedure:

1. Mount the terminal lugs on the DC+ cable and on the DC − cable of the load.
2. On the inverter side, pierce the double-membrane seals with the smaller diameter with a sharp object from the outside.
3. Lead the cable of the load through the double-membrane seal into the BatFuse and connect it to terminals **L+** and **L** − on the battery voltage tap (torque: 4.0 Nm to 5.7 Nm).

6.5 Connecting the Battery

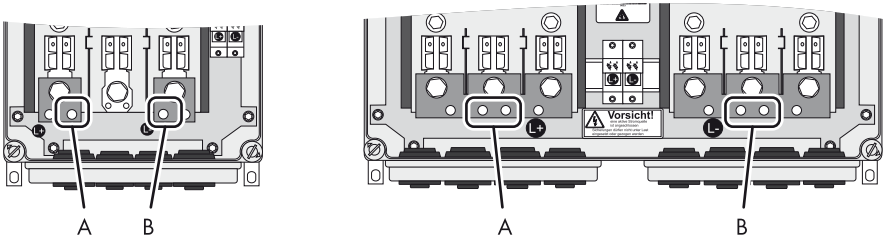


Figure 8: Overview of terminals

Position	Designation
A	Terminal L+
B	Terminal L –

Cable requirements:

- ☐ Maximum conductor cross-section: 95 mm²
- ☐ External diameter: 14 mm to 21 mm
- ☐ Material of the conductor: copper
- ☐ Terminal lugs of size M8, maximum width: 25 mm

Procedure:

1. Ensure that the DC – cables are free of voltage and not connected to any pole of the battery.
2. Mount the terminal lugs on the DC+ and on the DC – cable.
3. On the battery side, pierce the double-membrane seals (having the larger diameter) with a sharp object from the outside.
4. Lead the DC+ cable of the battery through the double-membrane seal into the BatFuse and connect it to terminal **L+** on the battery side (torque: 4.0 Nm to 5.7 Nm).
5. Lead the DC – cable of the battery through the double-membrane seal into the BatFuse and connect it to terminal **L –** on the battery side (torque: 4.0 Nm to 5.7 Nm).
6. Insert the cover.

7 Commissioning the BatFuse

⚠ WARNING

Risk of injury due to short-circuit currents

Short-circuit currents in the battery can cause heat build-up and electric arcs. Burns or eye injuries due to flashes may result.

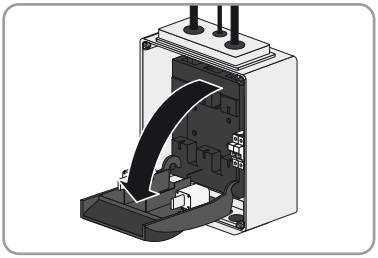
- Follow all safety and maintenance instructions provided by the battery manufacturer.
- Make sure that the BatFuse load-break switch is only closed once the system is being commissioned.
- Remove watches, rings and other metal objects.
- Use insulated tools.
- Do not place tools or metal parts on the battery.
- Make sure that the polarity of the cables to the battery is correct.
- Make sure that the mechanical connection at the terminals is tight.

Procedure:

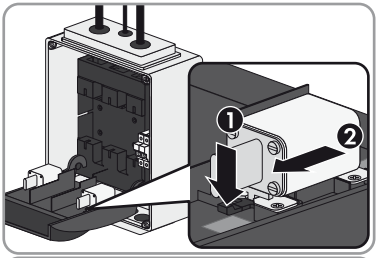
1. Make sure that all installation work has been completed and that all live components are protected from being touched.
2. Connect the DC cables to the battery (see documentation of the battery manufacturer).
3. Select fuse links (see Section 4 "Product Description", page 9) and insert them into the load-break switch.
4. Attach the load-break switch to the support and close it quickly.
5. Close the enclosure lid of the BatFuse.

8 Replacing the Fuse Link

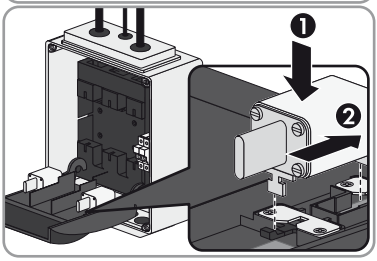
1. Remove the enclosure lid of the BatFuse.
2. Open the load-break switch.



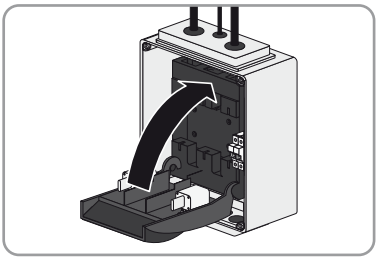
3. Push the interlock on the fuse holder down and slide the defective fuse link out of the fuse holder.



4. Put a new fuse link into the holder and slide it in.
   ☑ The fuse link snaps audibly into place.



5. Ensure that the correct fuse link is plugged into the fuse holder (see Section 4.1 "BatFuse", page 9).
6. Close the load-break switch quickly.



7. Close the enclosure lid of the BatFuse.

9 Decommissioning the BatFuse

⚠ WARNING

Risk of injury due to short-circuit currents

Short-circuit currents in the battery can cause heat build-up and electric arcs. Burns or eye injuries due to flashes may result.

- Follow all safety and maintenance instructions provided by the battery manufacturer.
- Remove watches, rings and other metal objects.
- Use insulated tools.
- Do not place tools or metal parts on the battery.

Procedure:

1. Switch off the Sunny Island system.
2. Open all circuit breakers of the Sunny Island devices and secure against reconnection.
3. Open the circuit breakers of the Sunny Island Charger devices and secure against reconnection.
4. Loosen the four screws of the BatFuse enclosure lid.
5. Remove the enclosure lid and open the load-break switch.
6. Remove the DC – cables on the battery side. Use insulated tools.
7. Make sure that all terminals of the BatFuse are voltage-free.
8. Remove the cover.
9. Remove all cables from the BatFuse.
10. Insert the cover and close the BatFuse enclosure lid.
11. Loosen the fastening screws of the BatFuse and take down the BatFuse.
12. If the BatFuse is to be stored or shipped in packaging, pack the BatFuse. Use the original packaging or packaging that is suitable for the weight and dimensions of the BatFuse.
13. If the BatFuse is to be disposed of, observe the locally applicable disposal regulations for electronic waste.

10 Technical Data

10.1 Fuse

	BatFuse-B.01	BatFuse-B.03
Type	LV/HRC size 1	LV/HRC size 1
Approved fuse links	80 A to 250 A	80 A to 250 A
Support	Fuse-switch-disconnector	Fuse-switch-disconnector
Quantity	2	6

10.2 Electrical Data

Rated voltage	12 V / 24 V / 48 V
Rated current depending on fuse link	80 A / 100 A / 160 A / 200 A / 250 A
Rated voltage of the battery voltage tap	12 V / 24 V / 48 V
Rated current for battery voltage tap	8 A

10.3 Battery Terminals

	BatFuse-B.01	BatFuse-B.03
Number of terminals	1	2
Terminal lug	M8	M8
Maximum width of the terminal lug	25 mm	25 mm
Maximum conductor cross-section	95 mm²	95 mm²
External diameter of cables	14 mm to 21 mm	14 mm to 21 mm

10.4 Sunny Island Charger Terminals

	BatFuse-B.01	BatFuse-B.03
Number of terminals	2	4
Terminal lug	M8	M8
Maximum width of the terminal lug	16 mm	16 mm
Maximum conductor cross-section	4 x 16 mm²	8 x 16 mm²
External diameter of cables	4 x 9 mm to 16 mm	8 x 9 mm to 16 mm

10.5 Sunny Island Terminals

	BatFuse-B.01	BatFuse-B.03
Number of terminals	1	3
Terminal lug	M8	M8
Maximum width of the terminal lug	25 mm	25 mm
Maximum conductor cross-section	95 mm²	95 mm²
External diameter of cables	14 mm to 21 mm	14 mm to 21 mm

10.6 Battery Voltage Tap Terminal

Number of terminals	1
Maximum conductor cross-section	6 mm²
External diameter of the cable	9 mm to 16 mm
Cylindrical fuse	2 x 8 A

10.7 Mechanical Data

	BatFuse-B.01	BatFuse-B.03
Width x height x depth	250 mm x 375 mm x 150 mm	500 mm x 375 mm x 225 mm
Weight	7 kg	16 kg

10.8 Ambient Conditions

Operating temperature range	− 20°C to + 60°C
Maximum moisture, no condensation	100%

10.9 General Data

Degree of protection as per IEC 60529	IP65
Assembly	Wall mounting
Certificates and approvals	www.SMA-Solar.com

11 Contact

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

- Type of BatFuse
- BatFuse serial number
- Type and number of connected Sunny Island inverters
- Type of battery connected
- Nominal battery capacity
- Nominal battery voltage
- Number of connected Sunny Island Chargers
- Loads connected to the battery voltage tap

Australia	SMA Australia Pty Ltd. Sydney	Toll free for Australia:	1800 SMA AUS (1800 762 287)
		International:	+61 2 9491 4200
Belgien/ Belgique/ België	SMA Benelux BVBA/SPRL Mechelen	+32 15 286 730	
Brasil	Vide España (Espanha)		
Česko	SMA Central & Eastern Europe s.r.o. Praha	+420 235 010 417	
Chile	Ver España		
Danmark	Se Deutschland (Tyskland)		
Deutschland	SMA Solar Technology AG Niestetal	Medium Power Solutions	
		Wechselrichter: Kommunikation:	+49 561 9522-1499 +49 561 9522-2499
		SMA Online Service Center: www.SMA.de/Service	
		Hybrid Energy Solutions	
		Sunny Island:	+49 561 9522-399
		PV-Diesel Hybridsysteme:	+49 561 9522-3199
		Power Plant Solutions	
		Sunny Central:	+49 561 9522-299

España	SMA Ibérica Tecnología Solar, S.L.U.	Llamada gratuita en España:	900 14 22 22
	Barcelona	Internacional:	+34 902 14 24 24
France	SMA France S.A.S.	Medium Power Solutions	
	Lyon	Onduleurs : Communication :	+33 472 09 04 40 +33 472 09 04 41
		Hybrid Energy Solutions	
		Sunny Island :	+33 472 09 04 42
		Power Plant Solutions	
		Sunny Central :	+33 472 09 04 43
India	SMA Solar India Pvt. Ltd.	+91 22 61713888	
	Mumbai		
Italia	SMA Italia S.r.l.	+39 02 8934-7299	
	Milano		
Κύπρος/ Kıbrıs	Βλέπε Ελλάδα/ Bkz. Ελλάδα (Yunanistan)		
Luxemburg/ Luxembourg	Siehe Belgien Voir Belgique		
Magyarország	lásd Česko (Csehország)		
Nederland	zie Belgien (België)		
Österreich	Siehe Deutschland		
Perú	Ver España		
Polska	Patrz Česko (Czechy)		
Portugal	SMA Solar Technology Portugal, Unipessoal Lda	Isento de taxas em Portugal:	800 20 89 87
	Lisboa	Internacional:	+351 2 12 37 78 60
România	Vezi Česko (Cehia)		
Schweiz	Siehe Deutschland		
Slovensko	pozri Česko (Česká republika)		
South Africa	SMA Solar Technology South Africa Pty Ltd.	08600 SUNNY (08600 78669)	
	Centurion (Pretoria)	International:	+27 (12) 643 1785
United Kingdom	SMA Solar UK Ltd.	+44 1908 304899	
	Milton Keynes		

Ελλάδα	SMA Hellas AE Αθήνα	801 222 9 222 International:	 +30 212 222 9 222
България	Вижте Ελλάδα (Гърция)		
ไทย	SMA Solar (Thailand) Co., Ltd. กรุงเทพฯ	+66 2 670 6999	
대한민국	SMA Technology Korea Co., Ltd. 서울	+82 2 508-8599	
中国	SMA Beijing Commercial Company Ltd. 北京	+86 10 5670 1350	
+971 2 234-6177	SMA Middle East LLC أبو ظبي		الإمارات العربية المتحدة
Other countries	International SMA Service Line Niestetal	Toll free worldwide: 00800 SMA SERVICE (+800 762 7378423)	

SMA Solar Technology

www.SMA-Solar.com