Installation Manual

AUTOMATIC BACKUP UNIT

BUUxx-US-10
SBS-ABU-xx-US-10
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1 Information on this Document

1.1 Validity
This document is valid for:
• SBS-ABU-50-US-10 / BUUS1-US-10
• SBS-ABU-100-US-10 / BUUM2-US-10
• SBS-ABU-200-US-10 / BUUM3-US-10

1.2 Target Group
The tasks described in this document must only be performed by qualified persons. Qualified persons must have the following skills:
• Training in how to deal with the dangers and risks associated with installing, repairing and using electrical devices and installations
• Training in the installation and commissioning of electrical devices and installations
• Knowledge of all applicable laws, standards and directives
• Knowledge of and compliance with this document and all safety information

1.3 Levels of warning messages
The following levels of warning messages may occur when handling the product.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="DANGER" /></td>
<td>Indicates a hazardous situation which, if not avoided, will result in death or serious injury.</td>
</tr>
<tr>
<td><img src="image" alt="WARNING" /></td>
<td>Indicates a hazardous situation which, if not avoided, could result in death or serious injury.</td>
</tr>
<tr>
<td><img src="image" alt="CAUTION" /></td>
<td>Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.</td>
</tr>
<tr>
<td><img src="image" alt="NOTICE" /></td>
<td>Indicates a situation which, if not avoided, can result in property damage.</td>
</tr>
</tbody>
</table>

1.4 Symbols in the Document

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="i" /></td>
<td>Information that is important for a specific topic or goal, but is not safety-relevant</td>
</tr>
<tr>
<td><img src="image" alt="☐" /></td>
<td>Indicates a requirement for meeting a specific goal</td>
</tr>
<tr>
<td><img src="image" alt="☑" /></td>
<td>Desired result</td>
</tr>
</tbody>
</table>
1.5 Typographies in the document

<table>
<thead>
<tr>
<th>Typography</th>
<th>Use</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>bold</strong></td>
<td>• Messages</td>
<td>• Connect the insulated conductors to the terminals X703:1 to X703:6.</td>
</tr>
<tr>
<td></td>
<td>• Terminals</td>
<td>• Enter 10 in the field Minutes.</td>
</tr>
<tr>
<td></td>
<td>• Elements on a user interface</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Elements to be selected</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Elements to be entered</td>
<td></td>
</tr>
<tr>
<td>&gt;</td>
<td>• Connects several elements to be selected</td>
<td>• Select Settings &gt; Date.</td>
</tr>
<tr>
<td>[Button]</td>
<td>• Button or key to be selected or pressed</td>
<td></td>
</tr>
<tr>
<td>[Key]</td>
<td></td>
<td>• Select [Enter].</td>
</tr>
</tbody>
</table>

1.6 Designation in the document

<table>
<thead>
<tr>
<th>Complete designation</th>
<th>Designation in this document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic Backup Unit</td>
<td>Automatic transfer switch, product</td>
</tr>
<tr>
<td>SMA Solar Technology America LLC</td>
<td>SMA</td>
</tr>
<tr>
<td>SMA Solar Technology Canada Inc.</td>
<td>SMA</td>
</tr>
</tbody>
</table>
2 Safety

2.1 Intended Use

The Automatic Backup Unit is an automatic transfer switch. In the event of grid failure, the automatic transfer switch disconnects the PV system, loads and the Sunny Boy Storage from the utility grid and creates a battery-backup grid. The battery-backup grid supplies loads that should continue to be supplied with electricity in the event of grid failure. In the event of grid failure, the Sunny Boy Storage supplies the loads with energy after a short switching time. The PV system supplies additional energy that can be used to supply the loads and charge the battery.

The product is certified for use with the following SMA inverters:

Use of the product with inverters of manufacturers other than SMA is not permitted.

The product is suitable for indoor and outdoor use.

The product may only be operated with one of the energy meters approved by SMA. An updated list of energy meters approved by SMA is available at www.SMA-Solar.com.

The product is not suitable for supplying life-sustaining medical devices. A power outage must not lead to personal injury.

All components must remain within their permitted operating ranges and their installation requirements at all times.

The product is approved for the US and Canadian market.

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

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of SMA. Unauthorized alterations will void guarantee and warranty claims and in most cases terminate the operating license. SMA shall not be held liable for any damage caused by such changes.

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

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.

This document does not replace and is not intended to replace any local, state, provincial, federal or national laws, regulations or codes applicable to the installation, electrical safety and use of the product. SMA assumes no responsibility for the compliance or non-compliance with such laws or codes in connection with the installation of the product.

The type label must remain permanently attached to the product.

2.2 IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This section contains safety information that must be observed at all times when working on or with the product.
The product has been designed and tested in accordance with international safety requirements. As with all electrical or electronical devices, there are residual risks despite careful construction. To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

⚠️ **DANGER**

Danger to life due to electric shock when live components or cables are touched

High voltages are present in the conductive components or cables of the product. Touching live parts and cables results in death or lethal injuries due to electric shock.

- Do not touch non-insulated parts or cables.
- Disconnect the system from voltage sources and make sure it cannot be reconnected before working on the device.
- Wear suitable personal protective equipment for all work on the product.

---

**NOTICE**

Damage to the product due to sand, dust and moisture ingress

Sand, dust and moisture penetration can damage the product and impair its functionality.

- Only open the product if the humidity is within the thresholds and the environment is free of sand and dust.
- Do not open the product during a dust storm or precipitation.
- The product must only be closed during operation.

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ℹ️ Electrical installations (for North America)

All installations must conform with the laws, regulations, codes and standards applicable in the jurisdiction of installation (e.g. National Electrical Code® ANSI/NFPA 70 or Canadian Electrical Code® CSA-C22.1.).

- Before connecting the inverter to the utility grid, contact your local grid operator. The electrical connection of the inverter must be carried out by qualified persons only.
- Ensure that the cables or conductors used for electrical connection are not damaged.
3 Scope of Delivery

Figure 1: Components included in the scope of delivery

<table>
<thead>
<tr>
<th>Position</th>
<th>Number</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Automatic Backup Unit</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>Wall mounting bracket incl. mounting material</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>Switch cabinet key</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>Installation Manual</td>
</tr>
</tbody>
</table>
4 Product Overview

4.1 Product Description

![Design of the Product](image)

<table>
<thead>
<tr>
<th>Position</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Enclosure door</td>
</tr>
<tr>
<td>B</td>
<td>Connecting plate</td>
</tr>
<tr>
<td>C</td>
<td>Type label</td>
</tr>
<tr>
<td></td>
<td>The type label clearly identifies the product. The type label must remain permanently attached to the product. You will find the following information on the type label:</td>
</tr>
<tr>
<td></td>
<td>• Information of the manufacturer</td>
</tr>
<tr>
<td></td>
<td>• Device type (Model)</td>
</tr>
<tr>
<td></td>
<td>• Serial number (Serial No. or S/N)</td>
</tr>
<tr>
<td></td>
<td>• Date of manufacture</td>
</tr>
<tr>
<td></td>
<td>• Device-specific characteristics and designations</td>
</tr>
</tbody>
</table>

4.2 Symbols on the Product

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Beware of electrical voltage</td>
</tr>
<tr>
<td></td>
<td>The product operates at high voltages.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Beware of hot surface</td>
</tr>
<tr>
<td></td>
<td>The product can get hot during operation.</td>
</tr>
</tbody>
</table>
Observe all documentation supplied with the product.

UL 1741 und CSA C22.2 No. 107.1 are the standards applied by Underwriters Laboratories to the product to certify that it meets the requirements of the National Electrical Code®, the Canadian Electrical Code® and IEEE 1547.
5 System Structure

The system consisting of battery inverters, PV inverters and an automatic transfer switch must be set up in accordance with the following schematic diagram. At the same time, the local regulations and standards must be observed.
Figure 3: System overview of the battery-backup system with Sunny Boy Storage
Delivery of overload and short-circuit current

- During ramp-up: delivery of overload current for a maximum of one minute. Thereafter, the inverter shuts down.
- During operation: overload current for a maximum of 500 ms. Thereafter, the inverter shuts down.
- Automatic restart after shutdown: maximum of three reconnect attempts
- Waiting time between each reconnect attempt: 90 s

Measures for guaranteeing the fail-safe operation in the battery inverter

- Insulation monitoring of the battery voltage
- Monitoring of the N-PE terminal of the battery inverter
- Redundant grid disconnection relays in the battery inverter
6 Mounting

6.1 Requirements for Mounting

⚠️ WARNING

Danger to life due to fire or explosion

Despite careful construction, electrical devices can cause fires.

- Do not mount the product in areas containing highly flammable materials or gases.
- Do not mount the product in potentially explosive atmospheres.

Mounting location:

☐ A solid, flat support surface must be available for mounting.
☐ The mounting location must be suitable for the weight and dimensions of the product (see Section 10 "Technical Data", page 27).
☐ The mounting location should be freely and safely accessible at all times without the need for any auxiliary equipment (such as scaffolding or lifting platforms). Non-fulfillment of these criteria may restrict servicing.
☐ The mounting location must not hinder access to disconnection devices.
☐ The mounting location must not be exposed to direct solar irradiation. Direct solar irradiation can cause the product to overheat.
☐ All ambient conditions must be met (see Section 10, page 27).
☐ The product may only be mounted in a permitted mounting position.

Permitted und prohibited mounting position:

Figure 4: Permitted and prohibited mounting positions
Dimensions for mounting:

Figure 5: Dimensions of the product (Dimensions in mm (in))
6.2 Mounting the product

**CAUTION**

**Risk of injury due to weight of product**

Injuries may result if the product is lifted incorrectly or dropped while being transported or when attaching it to or removing it from the wall mounting bracket.

- Transport and lift the product carefully. Take the weight of the product into account.
- Wear suitable personal protective equipment for all work on the product.

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

☐ Four screws, washers and fastening material suitable for the support surface

**Procedure:**

1. Attach the wall mounting bracket to the enclosure using fastening material, torque: 10 Nm to 15 Nm (88.5 in-lb to 133 in-lb)).

![Diagram](image1.png)

2. Mark the position of the 4 drill holes and drill the holes (diameter: 10 mm (0.39 in)).

3. Attach the product to the wall using four suitable screws, washers and fastening material.

![Diagram](image2.png)

4. Ensure that the product is securely in place.
### 7 Electrical Connection

#### 7.1 Overview of the Connection Area

**Figure 6: Connection areas in the interior of the product**

<table>
<thead>
<tr>
<th>Position</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Terminal blocks -X200 for connection to the utility grid</td>
</tr>
<tr>
<td>B</td>
<td>Equipment grounding terminal for the equipment grounding conductor of the utility grid</td>
</tr>
<tr>
<td>C</td>
<td>Terminal blocks -X206 for connection to the household distribution system</td>
</tr>
<tr>
<td>D</td>
<td>Shield connection terminal for communication cables of the battery inverter</td>
</tr>
<tr>
<td>E</td>
<td>Shield connection terminal for the communication cable of the energy meter</td>
</tr>
<tr>
<td>F</td>
<td>Equipment grounding terminal for the equipment grounding conductor of the household distribution system</td>
</tr>
<tr>
<td>G</td>
<td>Circuit breaker -F201 for connecting the power cable of the battery inverter</td>
</tr>
<tr>
<td>H</td>
<td>Terminal blocks for the neutral conductor and equipment grounding conductor of the battery inverter</td>
</tr>
<tr>
<td>I</td>
<td>Circuit breaker -F202 for connecting the power cable of the PV inverter</td>
</tr>
<tr>
<td>J</td>
<td>Terminal blocks for the neutral conductor and equipment grounding conductor of the PV inverter</td>
</tr>
<tr>
<td>K</td>
<td>Terminal blocks for connecting the communication cable of the energy meter</td>
</tr>
</tbody>
</table>
Position | Designation
--- | ---
L | Jack for connecting the communication cable to the battery inverter
M | Backup Unit Controller

### 7.2 Inserting the Cables

Always insert the cables into the product according to the following procedure.

**Additionally required material (not included in the scope of delivery):**
- Conduits
- Listed rain-tight conduit fittings for wet locations

**Procedure:**
1. Open the product using the switch cabinet key.
2. Unscrew the seven screws of the dead front using a flat-blade screwdriver (blade width: 5 mm (0.2 in)) and then remove it.
3. Cut openings into the connection plate on the bottom of the enclosure.
4. Insert the conduit fitting into the opening and tighten from the inside using the counter nut.
5. Attach the conduit to the conduit fitting.
6. Guide the conductors from the conduit into the product.
7. Ensure that the amount of conductor inserted is of a sufficient length for the selected terminal block.

### 7.3 Connecting the communication cable of the battery inverter

**Additionally required material (not included in the scope of delivery):**
- One communication cable between inverter and automatic transfer switch
- If cables are used for outdoors: one waterproof cable gland

**Cable requirements:**
- Twisted pair conductors
- Cable category: minimum CAT5e
- Shielding: yes
- Conductor cross-section: 0.25 mm² to 0.34 mm² (24 AWG to 16 AWG)
- Recommended number of conductor pairs: 4
- External diameter: 6 mm to 8 mm (0.24 in to 0.3 in)
- Maximum cable length between battery and inverter and, in battery-backup systems, between automatic transfer switch and inverter: 10 m (33 ft)
- The cable has to be insulated for 600 V.
- UV-resistant for outdoor use.
- Comply with the requirements of the battery manufacturer.
**Terminal block**

<table>
<thead>
<tr>
<th>Position</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Not assigned</td>
</tr>
<tr>
<td>B</td>
<td>Enable</td>
</tr>
<tr>
<td>C</td>
<td>GND</td>
</tr>
<tr>
<td>D</td>
<td>CAN L</td>
</tr>
<tr>
<td>E</td>
<td>CAN H</td>
</tr>
<tr>
<td>F</td>
<td>+12 V*</td>
</tr>
</tbody>
</table>

* Depending on the battery type, the connection is not strictly required.

**Procedure:**

1. Insert the communication cable (see Section 7.2, page 18).
2. Strip the communication cable 130 mm (5.12 in).
3. Trim the cable shield to a length of 20 mm (0.79 in) and fold it over the cable sheath.
4. Strip the insulation on the insulated conductors each by 6 mm (0.24 in). The **CAN L** and **CAN H** must be a twisted pair.
5. If necessary, trim unused insulated conductors flush with the cable sheath or fold it over the cable sheath.
6. Connect the conductors of the communication cables to the 6-pole terminal block. Pay attention to the assignment of the terminal block and communication connection on the battery inverter and make sure that **CAN L** and **CAN H** consist of a pair of conductors.
7. Make sure that the conductors are plugged into the terminal points tightly by pulling slightly on the conductors.
8. Insert the terminal block for the communication connection into the jack X2504 on the Backup Unit Controller.

9. Connect the communication cable with cable shield to the shield connection terminal. In this process, press down the shield connection terminal using a flat-blade screwdriver (blade width: max. 10 mm (3/8 in)) and insert the cable shield of the communication cable from the side.

10. Ensure that the rotary switch S2101 is on position 0.
11. Ensure that the rotary switch S2100 is on position 8.

7.4 Connecting to utility grid and household distribution system

Requirements:
☐ All electrical installations must be carried out in accordance with the local standards and the National Electrical Code® ANSI/NFPA 70 or the Canadian Electrical Code® CSA C22.1.
☐ The AC and DC electric circuits are isolated from the enclosure. If required by the National Electrical Code® ANSI/NFPA 70 or Canadian Electrical Code® CSA C22.1, the installer is responsible for grounding the system.
☐ The connection requirements of the grid operator must be met.
☐ The grid voltage must be within the permissible range.

Requirements on the AC conductors:
☐ The maximum permitted temperature for the terminal block of the AC connection of 105°C (221°F) must be observed.
☐ Maximum permissible conductor temperature class: 75°C (+167°F) and 90°C (194°F)
☐ The conductors with regards to its ampacity, rated temperatures, operating conditions and its power loss must be made in accordance with the local standards and the National Electrical Code® ANSI/NFPA 70 or the Canadian Electrical Code® CSA C22.1.
☐ Conductor type: copper wire
☐ The conductors must be made of solid wire, stranded wire or fine stranded wire. When using fine stranded wire, bootlace ferrules must be used.

Procedure:
1. Insert the cables (see Section 7.2, page 18).
2. Connect to the utility grid and household distribution system by attaching the equipment grounding conductors to the respective equipment grounding terminals:
   - Strip the insulation of the equipment grounding conductor by 29 mm (1.14 in).
   - Put the equipment grounding conductor of the utility grid into the equipment grounding terminal PE on the right side of the -X200 and tighten it using an Allen key (torque: 31 Nm (274 in-lb)).
   - Put the equipment grounding conductor of the household distribution system into the equipment grounding terminal PE on the right side of the -X206 and tighten it using an Allen key (torque: 31 Nm (274 in-lb)).
   - Make sure that each equipment grounding conductor is securely in place in the equipment grounding terminal.
3. Strip off the conductor insulation of L1, L2 and N (see Section 10 "Technical Data", page 27).
4. Connect the conductors L1, L2 and N of the utility grid to the terminal block -X200 in accordance with the labeling. Insert and press down the screwdriver into the square-shaped opening of the terminal block.
5. Connect the conductors L1, L2 and N of the household distribution system to the terminal block -X206 in accordance with the labeling. Insert and press down the screwdriver into the square-shaped opening of the terminal block.
6. Ensure that the conductors sit securely in the terminal point of the terminal block.
7.5 Connecting the power cables of the inverter

Requirements on the AC conductors:

☐ Maximum permissible conductor temperature class: 75°C (+167°F) and 90°C (194°F)
☐ The conductors with regards to its ampacity, rated temperatures, operating conditions and its power loss must be made in accordance with the local standards and the National Electrical Code® ANSI/NFPA 70 or the Canadian Electrical Code® CSA C22.1.
☐ Conductor type: copper wire
☐ The conductors must be made of solid wire, stranded wire or fine stranded wire. When using fine stranded wire, bootlace ferrules must be used.

Procedure:

1. Insert the cables (see Section 7.2, page 18).
2. Strip off the conductor insulation of N and PE by 18 mm (0.71 in).
3. Connect the conductor N and the equipment grounding conductor of the battery inverter to the terminal blocks on the right side of the circuit breaker -F201 in accordance with the color coding. Insert each conductor into the corresponding terminal point (round opening) up to the stop.

4. Connect the conductor N and the equipment grounding conductor of the PV inverter to the terminal blocks on the right side of the circuit breaker -F202 in accordance with the color coding. Insert each conductor into the corresponding terminal point (round opening) up to the stop.
5. Strip off the conductor insulation of L1 and L2 by 14.1 mm (9/16 in) each.
6. Connect the conductors L1 and L2 of the battery inverter to the terminal blocks of the circuit breaker -F201. To do so, insert each conductor into the respective terminal point (round opening) and tighten it using a flat-blade screwdriver (blade width: 8 mm (5/16 in); torque: 2.8 Nm (24.8 in-lb)).

7. Connect the conductors L1 and L2 of the PV inverter to the terminal block of the circuit breaker -F202. To do so, insert each conductor into the respective terminal point (round opening) and tighten it using a flat-blade screwdriver (blade width: 8 mm (5/16 in); torque: 2.8 Nm (24.8 in-lb)).
8. Ensure that the conductors sit securely in the terminal point of the terminal block.
7.6 Connecting the energy meter (optional)

When the product is equipped with an energy meter, connect the energy meter as described in the following.

Additionally required material (not included in the scope of delivery):
- One data cable

Cable requirements:
- Cross-section: at least 2 x 2 x 0.22 mm² (2 x 2 x 24 AWG)
- Shielding: yes
- Twisted pair conductors
- UV-resistant for outdoor use.
- Maximum cable length: 10 m (33 ft)

Assignment of the terminal block:

<table>
<thead>
<tr>
<th>Plug</th>
<th>Position</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A−</td>
<td>Data+ (D+)</td>
<td></td>
</tr>
<tr>
<td>B+</td>
<td>Data− (D−)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Ground (GND)</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>Not assigned</td>
<td></td>
</tr>
</tbody>
</table>

Procedure:
1. Insert the communication cable (see Section 7.2, page 18).
2. Strip the communication cable 130 mm (5.12 in).
3. Trim the cable shield to a length of 20 mm (0.79 in) and fold it over the cable sheath.
4. Strip the insulation on the insulated conductors each by 6 mm (0.24 in).
5. If necessary, trim unused insulated conductors flush with the cable sheath or fold it over the cable sheath.
6. Insert the conductors into the terminal blocks and tighten it using a screwdriver.
7. Make sure that the conductors are plugged into the terminal points tightly by pulling slightly on the conductors.
8. Connect the communication cable with cable shield to the shield connection terminal. In this process, press down the shield connection terminal using a screwdriver (blade width: max. 10 mm (3/8 in)) and insert the cable shield of the communication cable from the side.
8 Commissioning the battery-backup system

1. Make sure that the product is correctly mounted and connected.
2. Insert the dead front and tighten the seven screws using a flat-blade screwdriver (torque: 0.5 Nm (4.4 lb-in)).
3. Lock up the product using the switch cabinet key.
4. Switch on the AC circuit breaker of the battery inverter and the PV system.
5. Commission the inverters (see inverter manual).
6. Configure the battery-backup system via the user interface of the battery inverter:
   - Activate the battery inverter user interface.
   - Log in as Installer.
   - Start the installation assistant.
   - Select [Start the installation assistant] in the context menu.
   - Select [Save and next] up to the step Configure battery-backup system.
7. Test the automatic switch:
   - At the step Configure battery-backup system, select the operating mode Force in the drop-down list.
   - If the test has been completed successfully, you must select in the drop-down list the operating mode Off or Automatic.
9 Compliance Information

FCC Compliance
This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s).
Operation is subject to the following two conditions:
1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.
L'exploitation est autorisée aux deux conditions suivantes :
1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications made to this equipment not expressly approved by SMA Solar Technology AG may void the FCC authorization to operate this equipment.

IC Compliance
This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
## 10 Technical Data


#### Connection to utility grid and household distribution

<table>
<thead>
<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Rated grid voltage</td>
<td>240 V</td>
<td>240 V</td>
<td>240 V</td>
</tr>
<tr>
<td>Output nom. voltage of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>line conductor</td>
<td>240 / 120 V</td>
<td>240 / 120 V</td>
<td>240 / 120 V</td>
</tr>
<tr>
<td>Rated power frequency</td>
<td>60 Hz</td>
<td>60 Hz</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Maximum input and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>output current</td>
<td>50 A</td>
<td>100 A</td>
<td>200 A</td>
</tr>
<tr>
<td>Minimum cross-section</td>
<td>16 mm² (6 AWG)</td>
<td>35 mm² (3 AWG)</td>
<td>120 mm² (4/0 AWG)</td>
</tr>
<tr>
<td>in accordance with NEC</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>when using 90°C cables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with an ambient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>temperature of 45°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clamping range of used</td>
<td>0.75 mm² to 16 mm²</td>
<td>10 mm² to 70 mm²</td>
<td>70 mm² to 150 mm²</td>
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<tr>
<td>terminals</td>
<td>(20 AWG to 6 AWG)</td>
<td>(8 AWG to 2/0 AWG)</td>
<td>(1/0 AWG to 300 kcmil)</td>
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<tr>
<td>Insulation stripping</td>
<td>18 mm (0.7 in)</td>
<td>30 mm (1.2 in)</td>
<td>40 mm (1.6 in)</td>
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<tr>
<td>length L1/L2/N</td>
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#### Connection of PV inverters and battery inverters

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</thead>
<tbody>
<tr>
<td>Maximum overcurrent</td>
<td>30 A</td>
<td>50 A</td>
<td>50 A</td>
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<tr>
<td>protection of circuit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>breaker of PV inverter</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Maximum overcurrent</td>
<td>30 A</td>
<td>50 A</td>
<td>50 A</td>
</tr>
<tr>
<td>protection of circuit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>breaker of battery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>inverter</td>
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<tr>
<td>Clamping range of</td>
<td>0.75 mm² to 16 mm²</td>
<td>0.75 mm² to 16 mm²</td>
<td>0.75 mm² to 16 mm²</td>
</tr>
<tr>
<td>terminals N/PE</td>
<td>(20 AWG to 6 AWG)</td>
<td>(20 AWG to 6 AWG)</td>
<td>(20 AWG to 6 AWG)</td>
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<tr>
<td>Stripping length N/PE</td>
<td>18 mm (0.7 in)</td>
<td>18 mm (0.7 in)</td>
<td>18 mm (0.7 in)</td>
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10.2 General Data

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Clamping range of terminals L1/L2</td>
<td>1 mm² to 25 mm² (18 AWG to 4 AWG)</td>
<td>1 mm² to 25 mm² (18 AWG to 4 AWG)</td>
<td>1 mm² to 25 mm² (18 AWG to 4 AWG)</td>
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<tr>
<td>Torque of terminals L1/L2</td>
<td>2.8 Nm (24.8 in-lb)</td>
<td>2.8 Nm (24.8 in-lb)</td>
<td>2.8 Nm (24.8 in-lb)</td>
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</tbody>
</table>

**10.2 General Data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>Width x height x depth</td>
<td>500 mm x 700 mm x 250 mm (19.69 in x 27.56 in x 9.84 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 60 kg (133 lbs)</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-25°C to +60°C (-13°F to +140°F)</td>
</tr>
<tr>
<td>Maximum ambient temperature (without derating)</td>
<td>45°C (113°F)</td>
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<tr>
<td>Enclosure type in accordance with UL 50E</td>
<td>3R</td>
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<tr>
<td>Protection class</td>
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<tr>
<td>Grid configurations</td>
<td>240 V : 120 V split-phase system</td>
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<td>Approvals and national standards, as per 08/2018</td>
<td>UL 1741</td>
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11 Contact

If you have technical problems with our products, please contact the SMA Service Line. The following data is required in order to provide you with the necessary assistance:

- Device type
- Serial number

<table>
<thead>
<tr>
<th>United States</th>
<th>SMA Solar Technology America LLC</th>
<th>Toll free for USA and US Territories: +1 877-MY-SMATech (+1 877-697-6283)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rocklin, CA</td>
<td>International: +1 916 625-0870</td>
</tr>
<tr>
<td>Canada</td>
<td>SMA Solar Technology Canada Inc.</td>
<td>Toll free for Canada / Sans frais pour le Canada: +1 877-MY-SMATech (+1 877-697-6283)</td>
</tr>
<tr>
<td></td>
<td>Mississauga</td>
<td></td>
</tr>
<tr>
<td>México</td>
<td>SMA Solar Technology de México</td>
<td>Internacional: +1 916 625-0870</td>
</tr>
<tr>
<td></td>
<td>Mexico City</td>
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</tr>
</tbody>
</table>