PV Inverter

SUNNY BOY 3300/3800

User Manual

SB33_38-BA-BEN114230 | TBEN-SB33-38-11 | Version 3.0

EN

Table of Contents

1 Information on this Manual

1.1 Validity

This manual applies to the following devices:

- SB 3300-11
- SB 3800-11

1.2 Target Group

This manual is intended for the operator.

1.3 Additional Information

You will find additional information on the device-specific technical data in the installation manual provided.

You will find additional information on special subjects (e.g. description of the operating parameters) in the download area at www.SMA.de/en.

1.4 Symbols Used

The following types of safety precautions and general information are used in this manual:

DANGER!

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

WARNING!

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION!

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

NOTICE!

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

Information

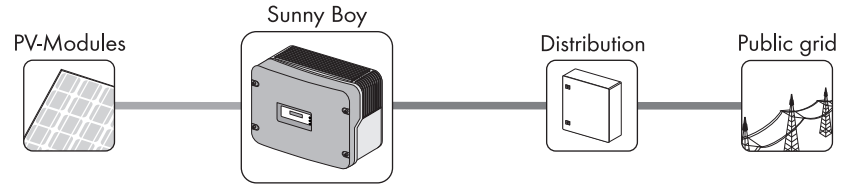
Information provides tips that are valuable for the optimum operation of the product.

2 Safety

2.1 Intended Use

The Sunny Boy is a PV inverter which converts the DC current of the PV array to AC current and feeds it into the power distribution grid.

Principle of a PV plant with this Sunny Boy device



The Sunny Boy may only be operated with PV arrays (PV modules and cabling) of protection class II. Do not connect any sources of energy other than PV modules to the Sunny Boy.

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

Do not use the Sunny Boy for purposes other than those described here. Alternative uses, modifications to the Sunny Boy or the installation of component parts not expressly recommended or sold by SMA Solar Technology AG shall void any warranty claims and the operation permission.

2.2 Safety Precautions

DANGER!

Electric shock caused by high voltage in the inverter.

Even when no external voltage is present, there can still be high voltages in the inverter. The following work may only be carried out by an electrically qualified person:

- Electrical installation
- Repairs
- Modifications

CAUTION!

Risk of burns through contact with the enclosure during operation

- Only touch the enclosure lid and display during operation.

NOTICE!

Damage to the inverter through overvoltage, if the yellow LED flashes 4 times

- Inform your installer immediately if the yellow LED should start flashing and the following display message appears.

2.3 Explanation of Symbols

2.3.1 Symbols on the Inverter

Symbol	Explanation
	Operation display.
	Ground fault or varistor defective. Inform your installer.
	An error has occurred. Inform your installer **immediately**.
	You can operate the display by tapping the enclosure lid: • Single tap: The backlight switches on or the display scrolls one message further. • 2 taps in quick succession*: The inverter displays the device type, the firmware version and the configured country setting (see section 4.2 "Display Messages during Operation" (page 12)).
	QR-Code®** for SMA bonus program You will find information on the SMA bonus program at www.SMA-Bonus.com.

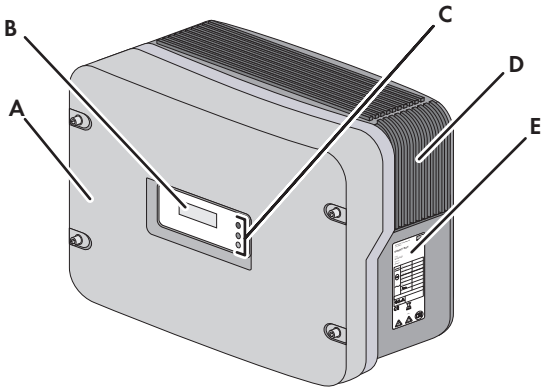
* This function is valid from firmware version 4.00.

** QR-Code is a registered trademark of DENSO WAVE INCORPORATED.

2.3.2 Symbols on the Type Label

Symbol	Explanation
	Beware of hazardous voltage. The inverter operates at high voltages. All work on the inverter may be carried out by electrically qualified personnel only.
	Beware of hot surface. The inverter can become hot during operation. Avoid contact during operation.
	Observe all documentation that accompanies the inverter.
	The inverter must not be disposed of together with the household waste. Further information on disposal can be found in the enclosed installation manual.
	CE marking. The inverter complies with the requirements of the applicable EC guidelines.
	The inverter has a transformer.
	Direct current (DC).
	Alternating current (AC).
	Degree of protection IP65 The inverter is protected against dust intrusion and water jets from any angle.
	RAL quality mark for solar products. The inverter complies with the requirements of the German Institute for Quality Assurance and Labeling.

3 Product Overview



Position	Designation
A	Enclosure lid
B	Display
C	LEDs Green LED = Operation Red LED = Ground fault or varistor defective Yellow LED = Fault
D	Fan guard
E	Type label for the identification of the inverter via the serial number (Serial No.).

4 Display

4.1 Operation

The display shows the current values of your plant. The displayed values are updated every 5 seconds.

You can operate the display by tapping the enclosure lid:

Single tap:

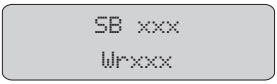
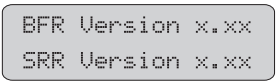
The backlight is switched on. After 2 minutes, the backlight switches off.

2 taps in quick succession (valid from firmware version 4.00):

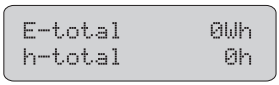
The inverter successively displays the device type, the firmware version and the configured country setting.

4.2 Display Messages during Operation

After commissioning, the inverter successively displays the device type, the firmware version and the configured country setting. If you want to view the display messages of the startup phase again while the inverter is in operation, double tap the enclosure lid (from firmware version 4.00).

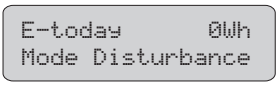
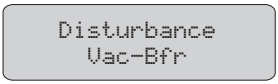
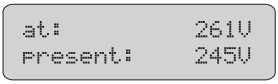
Display message	Description
	Inverter device type
	Firmware version of internal processors
	Default national standard of inverter, example: "GER/VDE0126-1-1"

Upon error-free connection of the inverter to the power distribution grid, after approximately one minute, the display starts alternating between the messages shown below. Each message appears for 5 seconds, and then the cycle restarts from the beginning.

Display message	Description
	Energy generated on the current day Status message "MPP"
	Current feed-in power Voltage of the PV array
	After a further 5 seconds or a tap, the current values of the reactive power Qac and of the displacement power factor cos φ (PF) are displayed.
	Total amount of energy fed in Total number of operating hours in feed-in operation

4.3 Display Messages during a Disturbance

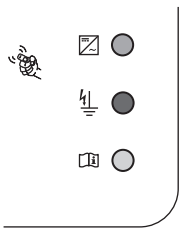
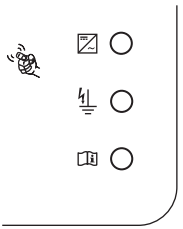
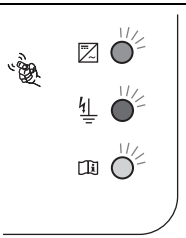
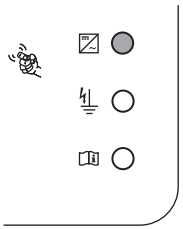
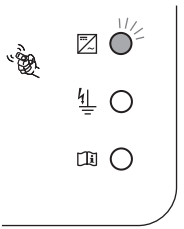
In the event of a disturbance, the inverter displays the status "Disturbance" and an error message. Inform your installer. The following messages will be displayed:

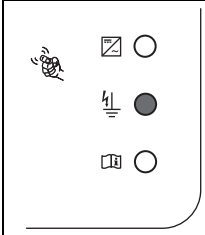
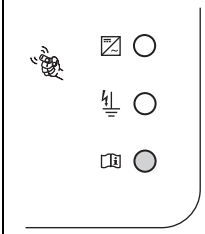
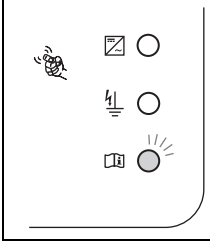
Display message	Description
	Energy generated on the current day Status message "Disturbance"
	Operating state Error message
	Measured value at the time of the disturbance Current measured value (only displayed if a measured value is responsible for the disturbance)

4.4 DC Overvoltage

Display message	Description
	The DC input voltage is too high at the inverter. Inform your installer **immediately**!

5 LED Signals

Status		Description
	All LEDs are on	The inverter is initializing.
	All LEDs are off	The DC input voltage at the inverter is too low for feed-in.
	All LEDs are flashing	The inverter is in the startup phase.
	Green LED is on	The inverter is feeding in to the power distribution grid.
	Green LED is flashing	This flashing can have the following reasons: • The inverter is monitoring the power distribution grid and is waiting for the DC voltage to reach a defined limit so that it can begin feeding the grid. • Operation interrupted. • Power limitation in the inverter.

Status		Description
	Red LED is on	A ground fault has occurred or one of the thermally monitored varistors on the DC input side is defective. Inform your installer.
	Yellow LED is on	The inverter is in the operating state "Permanent shutdown". This can have several causes. Inform your installer.
	Yellow LED is blinking	The inverter displays a disturbance. This can have several causes. Inform your installer.

6 Visual Inspection, Maintenance and Cleaning

Visual inspection

Check the inverter and cables for any signs of external damage. Contact your installer if you find any damage. Do not perform any repair work yourself.

Maintenance and Cleaning

Ask your installer to check for correct inverter operation at regular intervals.

If the inverter is dirty and the visibility of the operating data and operating states of the inverter is limited, clean the enclosure lid, the display and the LEDs with a damp cloth. Do not use any corrosive substances (e.g., solvents or abrasives) for cleaning.

7 Troubleshooting

7.1 Status Messages

Your inverter can be in various operating states. These are displayed as status messages, which can vary according to the type of communication.

Message	Description
Derating	Overtemperature in the inverter. The inverter reduces its output to prevent overheating. To avoid unnecessary yield losses, check the design of the PV plant. Inform your installer.
Disturbance, disturbance	Disturbance. This message appears for safety reasons and ensures that the inverter does not connect to the power distribution grid. Inform your installer.
Error	An error has been detected. Inform your installer.
Grid monitoring	Grid monitoring This message appears during the startup phase, before the inverter is connected to the power distribution grid, predominantly in the morning and evening when the level of irradiation is too low, and after an error.
MPP	The inverter is operating in MPP mode. MPP is the standard display message when operating under normal irradiation conditions.
Offset	Offset adjustment of the measurement electronics.
Stop	Operation interrupted.
V-Const	Constant voltage operation.
Waiting	The connection conditions are not (yet) fulfilled.

7.2 Measurement Channels

If your inverter is equipped with a communication product, numerous measuring channels and messages can be transmitted for diagnostics.

Measurement channel	Description
E-total	Total amount of energy fed in
Event-Cnt	Number of events that have occurred
Fac	Power frequency
Error	Identification of the present disturbance/error
h-on	Total operating hours
h-total	Total number of operating hours in feed-in operation
Iac	Grid current
Ipv	Direct current
Is	Apparent current
Power On	Total number of grid connections
Pac	Generated AC power
PF	Displacement power factor cos φ
Phase	The phase to which the inverter is connected.
Qac	Reactive power
Riso	Insulation resistance of the PV plant before connecting to the power distribution grid.
Serial number	Inverter serial number
Status	Display of the current operating state
Vac	Grid voltage
Vpv	PV input voltage
Vpv-Setpoint	PV setpoint voltage

8 Glossary

AC

Abbreviation for "alternating current".

DC

Abbreviation for "direct current".

Derating

A controlled reduction in performance, usually dependent on component temperatures.

Electronic Solar Switch (ESS)

The Electronic Solar Switch is part of the inverter DC disconnection unit. The Electronic Solar Switch must be securely inserted into the bottom of the inverter and may only be removed by an electrically qualified person.

MPP (Maximum Power Point)

Operating point of the inverter derived from current/voltage of the PV array. The actual MPP changes constantly, depending on the level of irradiation, the cell temperature, etc.

PV

Abbreviation for photovoltaics.

Varistor

The varistors protect the electronics in the inverter from atmospherically coupled energy peaks, such as may occur when lightning strikes nearby.

9 Contact

If you have technical problems, first contact your installer. We require the following information in order to provide you with the necessary assistance:

- Inverter device type
- Inverter serial number
- Type and number of the PV modules connected
- Blink code or display message of the inverter
- Optional equipment (e.g. communication products)

SMA Solar Technology AG

Sonnenallee 1

34266 Niestetal, Germany

www.SMA.de

SMA Service Line

Inverters +49 561 9522 1499

Communication: +49 561 9522 2499

Fax: +49 561 9522 4699

E-Mail: ServiceLine@SMA.de

Exclusion of liability

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

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

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

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

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

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

SMA Factory Warranty

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

Trademarks

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

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 license.

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

SMA Solar Technology

www.SMA-Solar.com

SMA Solar Technology AG
www.SMA.de
SMA America, LLC
www.SMA-America.com
SMA Technology Australia Pty., Ltd.
www.SMA-Australia.com.au
SMA Benelux SPRL
www.SMA-Benelux.com
SMA Beijing Commercial Co., Ltd.
www.SMA-China.com
SMA Czech Republic 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.
www.SMA-Iberica.com
SMA Italia S.r.l.
www.SMA-Italia.com
SMA Technology Korea Co., Ltd.
www.SMA-Korea.com