



Windy Boy 3300
Windy Boy 3800
Inverter for Wind Energy Power Plants



Revision History

Document number	Changes	Author
WB33_38-11:SE2506	First edition	Welzel

Explanation of Symbols used in this Document

This symbol indicates information that is essential for a trouble-free and safe operation of the product. Please read these sections carefully in order to avoid any damages of the equipment and for optimal personal protection.



This symbol indicates information that is required for the optimal operation of the product. Read these sections carefully in order to ensure an optimal operation of the product and all its features.



This symbol indicates an example.



Liability exclusion

The information contained in this documentation are the property of **SMA Technologie AG**. No part of this documentation may be published without written permission from **SMA Technologie AG**. A reproduction for internal purposes for the evaluation of the product or an appropriate application is permitted and does not require authorization.

All information are based on our "General Terms and Conditions of Delivery of **SMA Technologie AG**". The content of this documentation is reviewed continuously and adjusted, if necessary. **SMA Technologie AG** provides this documentation without exclusion of deviations and without warranty of completeness. You will find the current version on the Internet at www.SMA.de or can obtain it via the usual sales channels. Warranty or liability claims for all kinds are excluded in case of damages due to:

- Inappropriate use of the product
- Operation of the product in an improper environment
- Operation of the product without considering the relevant safety regulations
- Non-fulfillment of the warnings or safety instructions described in the documentation for the product
- Operation of the product under faulty conditions concerning security and protection
- Arbitrary changing of the product or the provided software
- Failure of the product due to interference of connected or contiguous devices out of legal limit values
- Disasters and force majeure

Software Licensing

The use of the provided software by **SMA Technologie AG** is subject to the following conditions: The software may be reproduced for internal purposes and installed on any number of computers. Provided source codes can be changed and adjusted on the company's own authority according to the internal purpose. Driver may be ported to other operating systems as well. No part of the source codes may be published without written permission of **SMA Technologie AG**. Sublicensing of the software is not acceptable.

Liability limitation: **SMA Technologie AG** disclaims liability for any direct or indirect consequential damages arising from the use of the software produced by **SMA Technologie AG**. The same applies for the provision and/or non-provision of support.

Provided software not produced by **SMA Technologie AG** is subject to the respective licensing and liability agreements of the manufacturer.

Trademarks

All brand and product names used herein are trademarks or registered trademarks of their respective holders, although they may not be specifically designated as such.

SMA Technologie AG

Hannoversche Strasse 1-5

34266 Niestetal

Germany

Tel. (+49) 5 61 95 22 – 0

Fax (+49) 5 61 95 22 – 100

www.SMA.de

E-Mail: info@SMA.de

© 2006 **SMA Technologie AG**. All rights reserved.

Table of Contents

1	Foreword	9
2	Safety instructions	11
3	Overview	13
3.1	Unit description	13
3.2	External dimensions	14
3.3	OptiCool	15
4	Installation requirements	17
4.1	Installation site requirements	17
4.2	DC Input Requirements	19
4.3	Low Voltage Utility 230 V (AC)	20
4.4	Stand-alone grids	24
5	Installation	25
5.1	Mounting the unit	25
5.2	Electrical installation	26
5.3	Commissioning	31
6	Opening and closing the Windy Boy	35
6.1	Opening the Windy Boy	35
6.2	Closing the Windy Boy	35
7	Checking heat dissipation	37
7.1	Cleaning the fan	37
7.2	Checking the fan	38
7.3	Cleaning the fan gills	39
8	Replacing the varistors	41
9	The communications interface	45
9.1	Connection of the interface	46
9.1.1	Jumper functions	47

9.2 RS232 connection for the PC 48

9.2.1 Cabling recommendations48

9.2.2 Wiring diagram49

10 Contact. 51

1 Foreword

The Windy Boy may only be installed by trained specialists. Installers must be approved by the local energy supplier. Please carefully read this installation manual. All prescribed safety regulations, the technical connection requirements of the local energy supplier and all applicable provisions must be adhered to.



This installation manual is intended solely for qualified electricians and is supposed to help you install the SMA inverter of the type "Windy Boy 3300 / 3800" quickly and without any problems.

For detailed information on troubleshooting and on how to use the Windy Boy and the various communications options, please see the operating instructions.

The Windy Boy is externally identical to the Sunny Boy inverter for photovoltaic systems. For this reason, it can also be used as a PV inverter. Please download the Sunny Boy instruction manual from www.SMA.de and contact the SMA hotline if you intend to use the inverter in this manner.

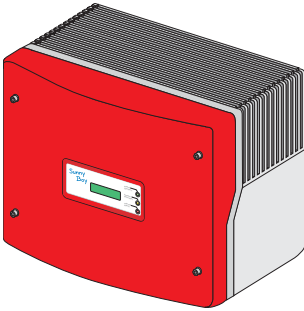
The Windy Boy 3300 / 3800 contains an independent mains disconnection device, the "SMA grid guard". It ensures that the Windy Boy 3300 / 3800 complies with the VDEW (Verband der Elektrizitätswirtschaft – German Electricity Industry Association) regulations for the connection and parallel operation of electrical power units to the low-voltage grid of the electricity supply company and with DIN VDE 0126-1-1, which forms a part of these regulations.



If you require further information, please call the SMA hotline on the following number:

+ 49 561 95 22 - 499

2 Safety instructions



Protect the Windy Boy 3300 / 3800 against overvoltages. Overvoltages can damage the Windy Boy 3300 / 3800 and cause deflagration, which can be extremely dangerous.



Work on the Windy Boy with the cover removed must be carried out by a qualified electrician! High voltages are present in the device. Before working on the Windy Boy with the cover removed, the AC and DC voltages must be disconnected from the Windy Boy and the capacitors must be discharged.



The Windy Boy must be disconnected from the mains grid and precautions must be taken to prevent the grid being reconnected. In addition, the connections to the DC voltage must be removed.

After isolating the AC and DC voltage you must wait approx. 30 minutes for the capacitors in the Windy Boy to discharge. Only then is it safe to open the unit by removing the cover. You must also make sure that no voltage is present in the device.

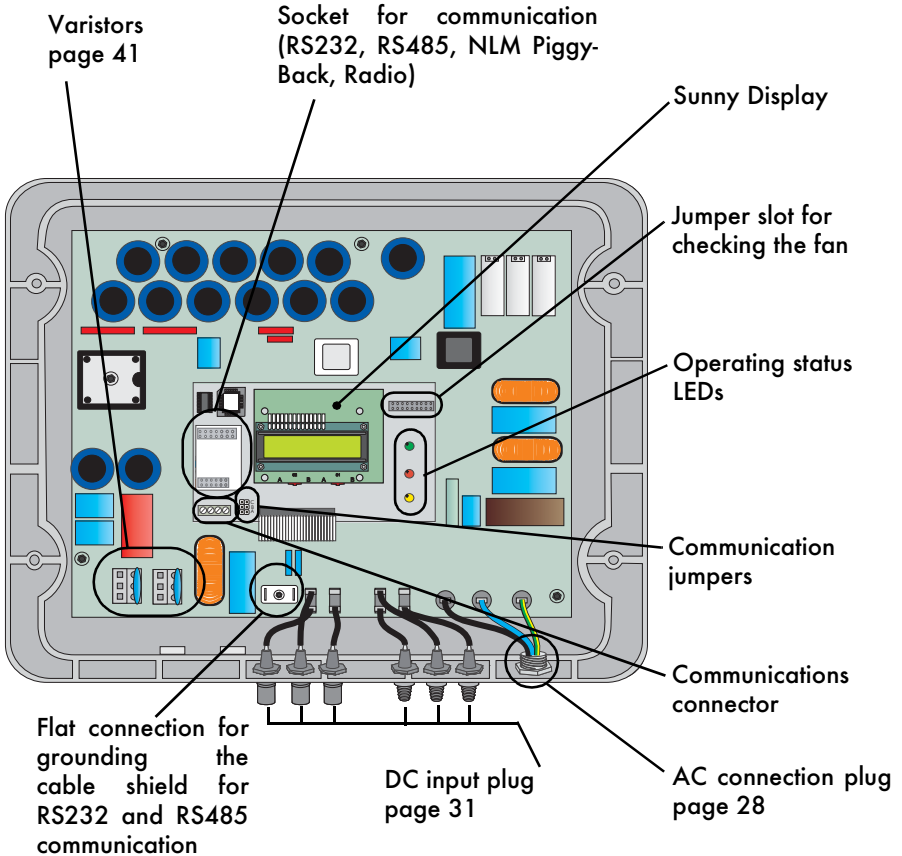
When working on the and handling the components in the Windy Boy 3300 / 3800, remember to observe all ESD safety regulations. Electronic components are vulnerable in terms of electrostatic charge. Discharge any electrostatic charge by touching the grounded enclosure before handling any electronic component.



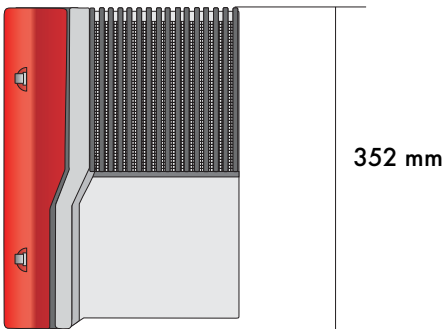
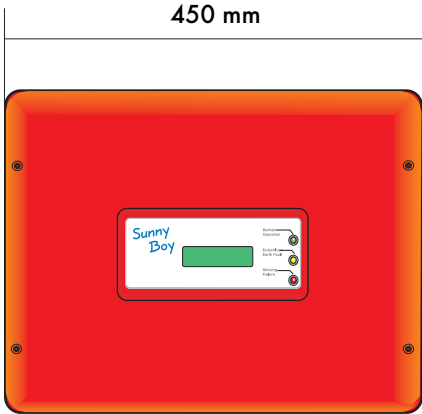
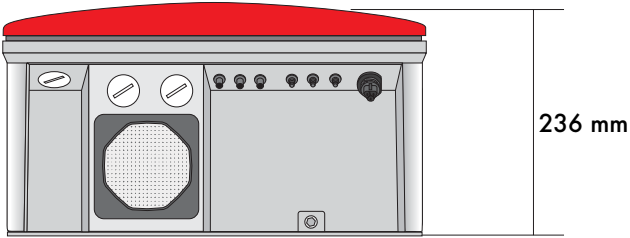
3 Overview

3.1 Unit description

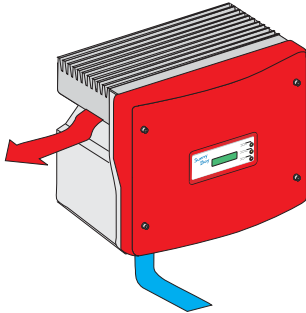
The following diagram gives a schematic overview of the various components and connection points inside the Windy Boy 3300 / 3800 with the cover removed:



3.2 External dimensions

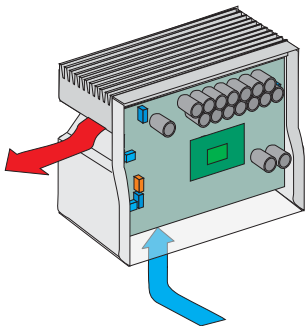


3.3 OptiCool

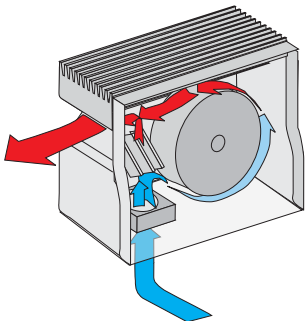


The Windy Boy 3300 / 3800 is equipped with the patented OptiCool dual-compartment cooling system. The enclosure is part of the temperature management and does not only protect the internal components but also is an air and heat distributor.

As the central component of passive heat dissipation, the heat sink is integrated into the enclosure, thus dividing it into two compartments.



The front compartment containing the electronic components is especially sealed and thus protected against contamination by water, dust or dirt. In addition, the heat sink, functioning as a compartment wall, provides enough space for the installation of the heat-producing components.



The rear enclosure chamber contains the components that develop heat, depending on their function, such as chokes and transformers, which themselves are each especially sealed and are immune against external influences.

An active cooling unit is installed in the bottom part of the second compartment which has been specially designed for this purpose. Depending on the temperature of the power transistors and the coils this cooling unit is automatically activated with a variable speed. for an optimum temperature within the enclosure.

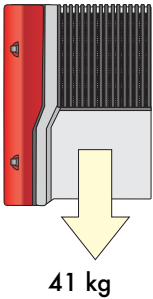
The air current provided by the fan is channelled via a current tunnel and extracts the waste heat both from the heat sink and the other components in this area.

OptiCool results in low component temperatures throughout the inverter. This leads to high reliability and excellent overload performance which both have considerable influence on the performance and reliability of the inverter. This results in an optimum performance of your entire wind power plant.

4 Installation requirements

Please check that all of the requirements listed below are met before installing and commissioning the Windy Boy 3300 / 3800.

4.1 Installation site requirements



The Windy Boy 3300 / 3800 weighs 41 kg. Please keep the weight in mind when selecting the location for installing the device.

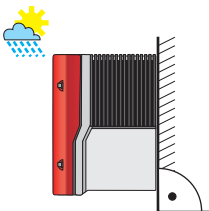
The ambient temperature should not exceed $-25\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$.



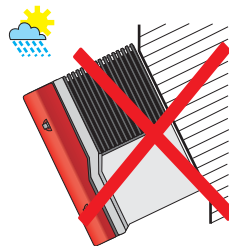
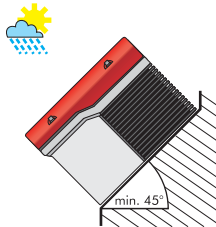
The Windy Boy 3300 / 3800 should be installed in a place where it is not exposed to direct sunlight. An increased ambient temperature can reduce the yield of the system.

The Windy Boy is designed to be mounted on a vertical wall. If absolutely necessary, however, the Windy Boy can be installed tilted back at a maximum angle of 45° . For an optimum energy yield and the most convenient operation, vertical installation at eye-level is preferable. If installing the unit outdoors, make sure that it is not tilted forward. The rear panel is designed such that the Windy Boy 3300 / 3800 is tilting slightly backward on a vertical wall.

We advise against installing the unit in a horizontal position outdoors.



Install the inverter vertically or tilting to the rear.



Never install the inverter horizontally or so that it tilts



When choosing the installation site, be sure to note the following:



Unintentionally pulling out the DC plug connectors under load can damage the plugs and result in injury or death! Install the Windy Boy in such a way that it is not possible (e.g. for children) to unintentionally unplug the DC plug connectors.



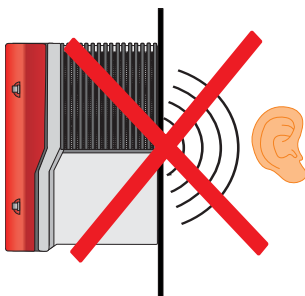
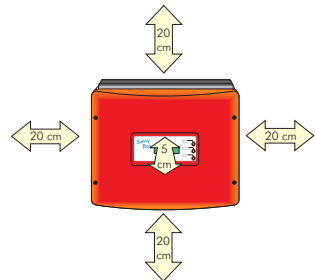
The temperature of the individual parts of the case and components within the Windy Boy can reach more than 60 °C. Touching could result in burns!



Do not install the Windy Boy on flammable construction materials, in areas where highly inflammable materials are stored or in potentially explosive environments!

When choosing the installation site, ensure there is enough space for heat to dissipate. Under normal conditions, the following guidelines should be applied for the space to be kept clear around the Windy Boy 3300 / 3800:

	Minimum clearance
Sides	20 cm
Top	20 cm
Underneath	20 cm
Front	5 cm



In domestic installations, the unit should not be mounted on plasterboard walls or similar as otherwise audible vibrations are likely to result.

We recommend securing the unit to a solid surface.

The Windy Boy can make noises when in use which can, in the domestic setting, be seen as a nuisance.

4.2 DC Input Requirements

Your Windy Boy 3300 / 3800 is equipped with multi-contact (3 mm) DC plug connectors as standard. Depending on your order, the Windy Boy 3300 / 3800 can be equipped with other connector systems instead, such as multi-contact (4 mm) or Tyco.

The device has six DC plug connectors for connecting an upstream rectifier / overvoltage protection unit of the wind turbine. A pre-plugged set for connecting loose cables to the appropriate DC connector system of the Windy Boy 3300 / 3800 is available as an optional accessory. The SMA order codes for the various connectors are as follows:

- Multi-contact 3mm: "SWR-MC"
- Multi-contact 4 mm: "MC-SET"
- Tyco: "TYCO-SET"

Limit values for DC input	Windy Boy 3300	Windy Boy 3800
Max. open-circuit voltage	500 V (DC)	500 V (DC)
Max. input current	20 A (DC)	20 A (DC)

The input current of a single DC input may not exceed 16 A!



Please make sure that the input voltage never exceeds 500 V. Higher input voltages will damage the Windy Boy 3300 / 3800 and lead to loss of any guarantee!

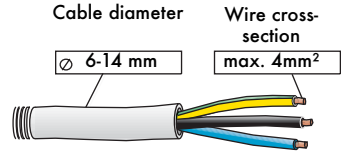


4.3 Low Voltage Utility 230 V (AC)

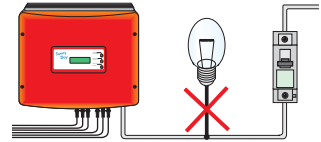
The Windy Boy must have a three-conductor connection to the mains grid (L, N, PE).

The grid connection terminals on the AC connection socket included in the accessories kit can take wires with a cross-section of up to 4 mm². The AC connection socket accessories kit contains two sealing rings for differing cable diameters. The threaded sleeve comes from the factory already equipped with a sealing ring for cable diameters from 10 to 14 mm.

If you want to install cable with a diameter of between 6 and 10 mm, you will have to exchange the sealing ring against the one included in the accessories kit. For detailed instructions, see section "Connecting the AC plug" (Page 29).



Depending on the cable cross-section being applied, please use a 20, or maximum 25A, B-type circuit breaker. No loads may be connected to this circuit.



Rating for a line circuit breaker



When installing the circuit breakers, please take the information in the manufacturer's data sheets into account, e.g. in terms of installation distance and thermal characteristics.

Various factors should be taken into account when selecting line circuit breakers. These include, for example:

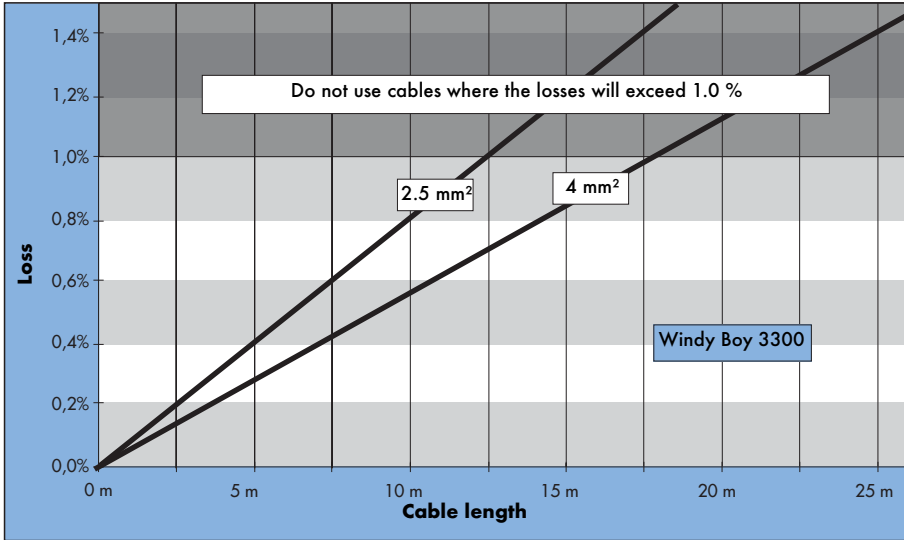
- The type of cable used (conductor material and insulation)
- Ambient temperatures affect the cables (higher temperatures result in a reduced maximum ampacity)
- Method of laying the cable (reduces the ampacity of the conductor)
- Bundling cables together (reduces the ampacity of the conductor)
- Loop impedance [Z] (in the event of a body contact this limits the current that can flow and therefore determines the response behavior of the circuit breaker)
- Sufficient distance between the circuit breakers so as to avoid increased temperatures (heat can trigger the circuit breakers prematurely).
- Selectivity
- Protection class of the connected load (e.g. VDE 0100, part 410, protection against electric shock)

The following standards should be followed in all cases:

- DIN VDE 0298-4 (Cable laying methods and ampacity)
- DIN VDE 0100; part 430 (Protective measures; protection of cables and lines against overcurrent)
- DIN VDE 0100; part 410 (Protective measures; protection against electric shock)

AC cable grid impedance may not exceed 1 ohm. This is necessary, amongst other things, for the correct operation of impedance monitoring. In addition, we recommend dimensioning the conductor cross-section so that line losses do not exceed 1 % at a nominal power. Line losses depending on the cable length and cross-section are shown in the graphs below. Multi-wire cables with copper forward and return conductors are used.

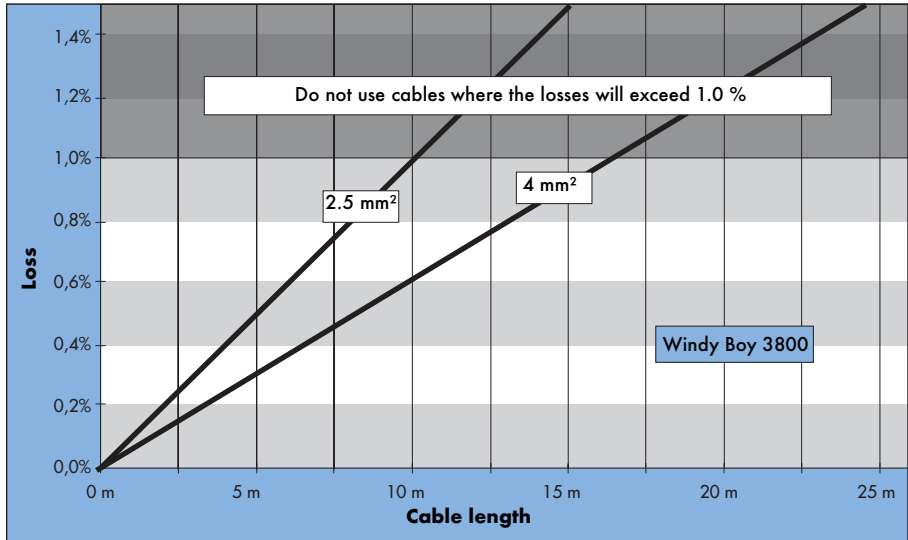
Line losses of the Windy Boy 3300



The maximum cable lengths for the different cable cross-sections are as follows:

Cable cross-section	2.5 mm ²	4 mm ²
Max. length	11.5 m	18 m

Line losses of the Windy Boy 3800



The maximum cable lengths for the different cable cross-sections are as follows:

Cable cross-section	2.5 mm²	4 mm²
Max. length	10 m	16 m

The Windy Boy 3300 / 3800 is designed for operation on 220 - 240 V grids and is equipped with an automatic 50 Hz / 60 Hz grid frequency detection. It can therefore be connected to a 50 Hz oder 60 Hz grid without any further configuration changes. When connecting an inverter to the public grid, please adhere to the local connection requirements of your grid operator.

	Limit values for AC output
Voltage range (complying with DIN VDE 0126-1-1)	198 V ... 253 / 260 V ^a
Frequency range (complying with DIN VDE 0126-1-1)	47.55 Hz ... 50.2 Hz
Voltage range (extended operating range)	180 V ... 265 V
Frequency range (extended operating range)	50 Hz: 45.5 Hz ... 54.5 Hz 60 Hz: 55.5 Hz ... 64.5 Hz

- a The Windy Boy can feed into the public grid at a maximum output voltage of 230 V for brief periods. However, DIN VDE 0126-1-1 stipulates that the average voltage over 10 minutes must not exceed 253 V. I. e., if the grid voltage remains constant at 254 V, the inverter is automatically disconnected from the grid. In this case, contact the local grid operator for assistance. DIN VDE 0126-1-1 only applies in Germany. See the Operating Instructions of the Windy Boy 3300 / 3800 for the country-specific parameter settings.

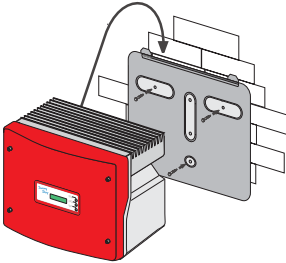
4.4 Stand-alone grids



When providing electricity using Sunny Island systems: configure the according to the Sunny Island manual.

5 Installation

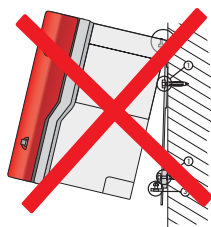
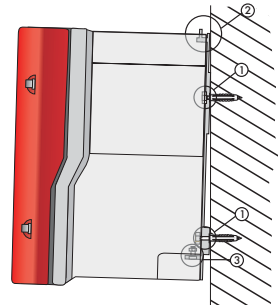
5.1 Mounting the unit



Only use the original wall bracket for installation. For vertical installation on solid concrete or block walls, for example, you can fit the bracket using 8 mm x 50 mm hexagon bolts to DIN 571 standard, stainless steel type, and with wall plugs type SX10.

When selecting the mounting materials, be sure to take into account the weight of the Windy Boy 3300 / 3800 (41 kg). The Windy Boy 3300 / 3800 is equipped with ergonomic handles on the sides. Use these to hang it on the bracket.

1. Remove the transport bracket and fit the wall bracket (1). To mark the positions to drill the holes, you can use the wall bracket as a drilling template.
2. Fill in the holes in the wall bracket which are not necessary for installation using the sealing plugs provided in the accessories kit. The sealing plugs must be entered in the wall bracket from the outside, i.e. the side that will be placed against the wall.
3. Now fit the Windy Boy 3300 / 3800 by inserting its upper mounting slots onto the wall bracket (2).
4. Secure the Windy Boy 3300 / 3800 against lifting out by screwing the supplied M6x16 bolt to the underside of the enclosure (3). You must use the supplied washer with the teeth facing towards the enclosure. The screw must be tightened with approximately 5 Nm torque.
5. Make sure the Windy Boy 3300 / 3800 is positioned securely on the bracket.
6. Close the recessed grips with the fan gills provided in the accessories kit.



If you remove the Windy Boy 3300 / 3800 from the wall bracket, lift it upwards in a vertical position. Make sure not to tilt the Windy Boy 3300 / 3800!

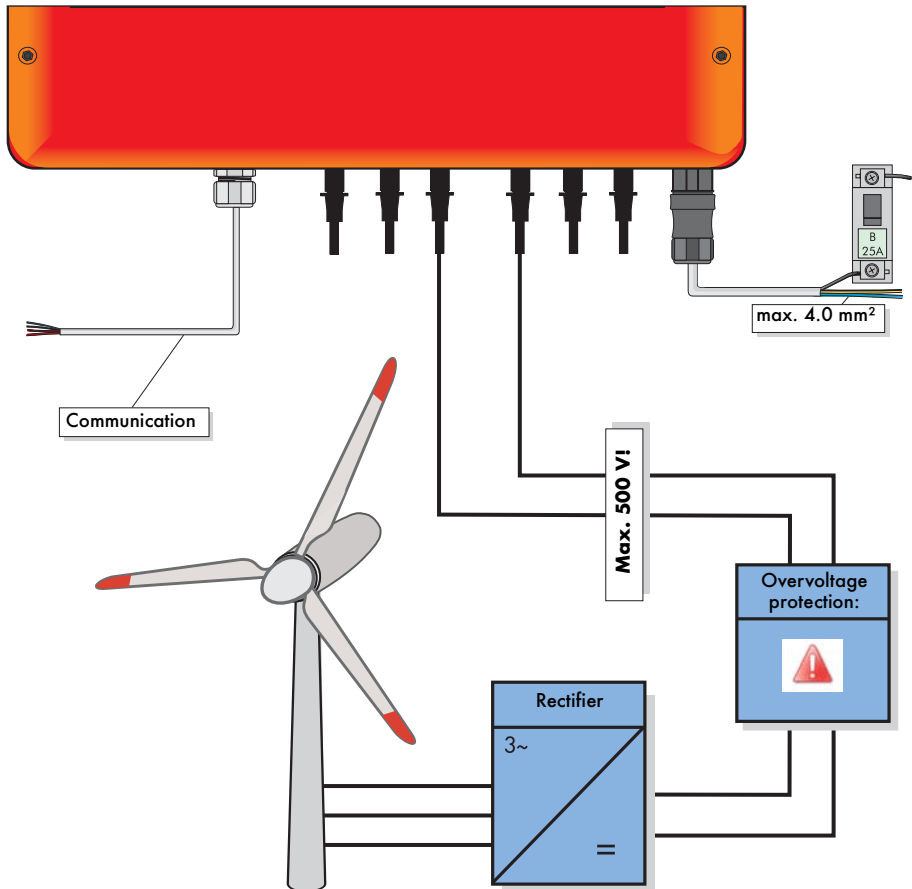


5.2 Electrical installation



Make sure to check the polarity of the DC input before connecting it!

The complete wiring for a Windy Boy 3300 / 3800 is shown schematically in the following diagram:

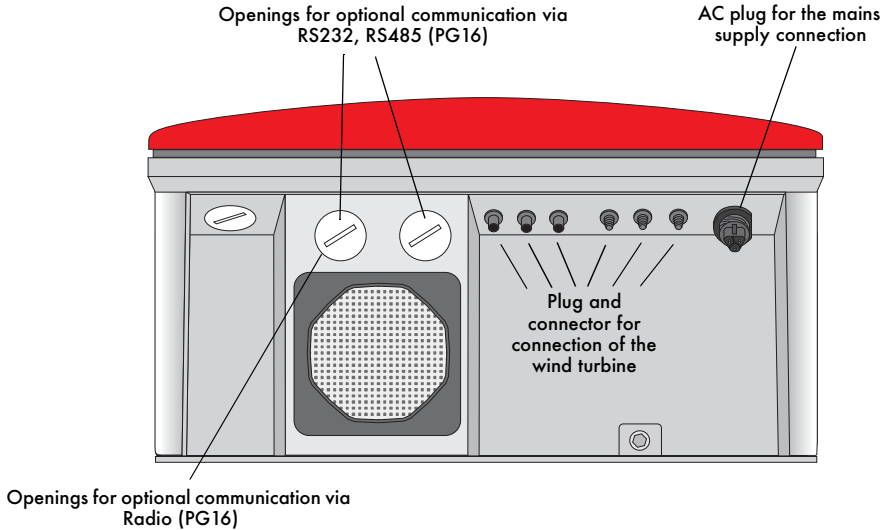


Make sure that the DC input voltage never exceeds 500 V. Higher input voltages will damage the Windy Boy and will lead to the loss of any guarantee.

No more than 16 A may be connected to each DC input. Two DC inputs must always be connected in parallel at higher input current levels.



Windy Boy 3300 / 3800 View from below



Connecting the AC output

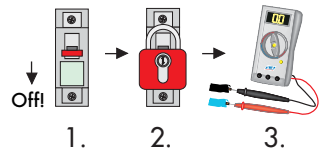


Before you connect the mains cable to the AC connection socket, make sure that no voltage is present at the cable.

A round plug connector system is used, which allows various cable cross-sections to be used in the cable outlet.

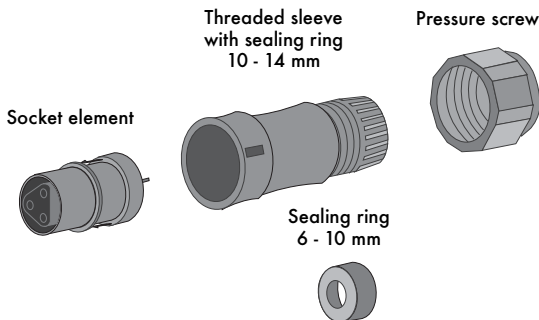
To connect the AC output, follow these steps:

1. Check the grid voltage. If this is constantly higher than 253 V, the Windy Boy 3300 / 3800 will not be fully operational. In this case, contact the local utility operator for assistance.
2. Isolate the grid connection (switch the line circuit breaker to its "off" position), make sure it cannot be switched back on, and test to make sure no voltage is present.



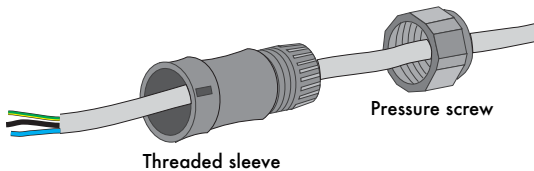
1. 2. 3.
You must make sure that no voltage is present at the AC output before working on the Windy Boy.

3. Now take the AC connection socket parts from the accessories kit and connect the cable, with shielding and insulation stripped, as described on the following pages.

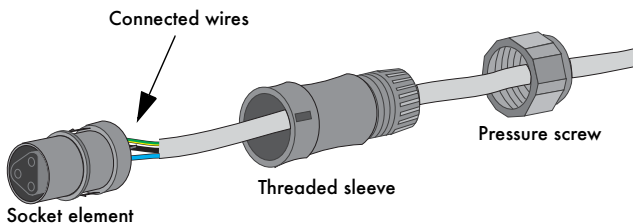
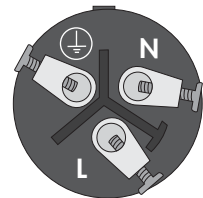


Connecting the AC plug

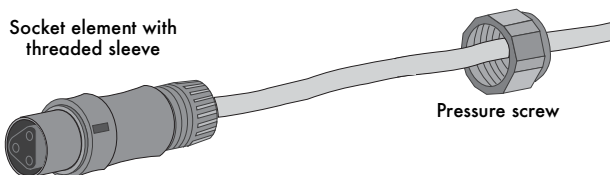
1. Check which sealing ring is suitable for your AC connection cable. A sealing ring for a cable diameter of 10 - 14mm is installed in the threaded sleeve at the factory. If you want to use a cable with a smaller diameter (i.e. from 6 - 10 mm), you will have to replace the sealing ring in the threaded sleeve with the sealing ring included in the accessories kit.
2. Push or pull the sealing ring designed for a larger cable diameter off the threaded sleeve and then replace it with the sealing ring designed for lower diameters.
3. Once this is done, slide the pressure screw over the AC connection cable. Then slide the threaded sleeve with the suitable sealing ring over the cable.



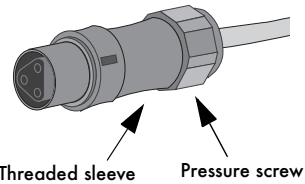
4. Now connect the individual conductors to the socket element.
 - Protective earth PE (green/yellow) to the screw terminal with the earth sign. Make sure that the PE wire is longer than the N and L wires.
 - Neutral conductor N (blue) to screw terminal N.
 - Live L (brown or black) to screw terminal L.
5. Make sure the conductors are securely connected.



6. Press the threaded sleeve into the socket element until it audibly clicks.



7. Now screw the pressure screw into the threaded sleeve.
8. Firmly tighten the screw fitting for sealing and strain-relief.



The AC connecting socket is now fully assembled.

If you are not going to immediately connect the Windy Boy, close the socket element using the cap supplied in the accessories kit.

If the Windy Boy is already installed, you can now connect the fully assembled AC connection socket to the plug on the Windy Boy. To do this, remove the protective cap from the flange plug on the Windy Boy. Press the AC connection socket firmly against the flange plug until it audibly clicks in order both to seal and secure the connection. Observe the correct alignment for the AC connection socket.

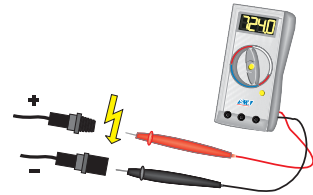


Do not switch the line circuit breaker on yet! The Windy Boy 3300 / 3800 may only be connected to the AC grid once the DC cables are connected and the device is securely closed.

DC Connection

To connect the input, follow these steps:

1. Check that the DC connections have the right polarity and do not exceed the maximum input voltage of 500 V (DC), see also chapter 4.2 "DC Input Requirements" (Page 19).



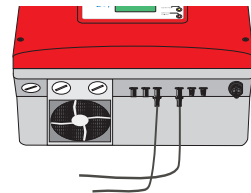
Any DC connection must not be exposed to more than 16 A!



Caution! Dangerous high voltages may be present!



2. Connect the DC connectors of the generator to the Windy Boy 3300 / 3800. Make sure that the polarity is correct.
3. Close the unused DC input connectors with the caps included in the delivery.



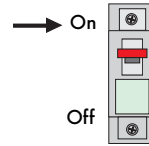
5.3 Commissioning

You can start up the Windy Boy 3300 / 3800 when

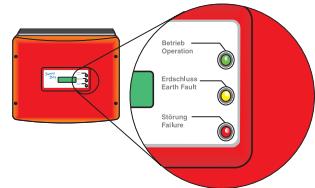
- The lid of the enclosure is securely screwed shut
- The AC (mains) cable is connected correctly
- The DC cables are fully connected and the unused DC plug connectors on the bottom of the enclosure are closed using the protective caps,
- You are sure that the input voltage cannot exceed 500 V, and
- The DC input voltage is sufficient for supplying the onboard electronics.

How to start up the inverter

1. First of all, switch the line circuit breaker to the "on" position.



2. Now look at the LED display and consult the table on the following page to check whether the Windy Boy 3300 / 3800 is in a fault-free and expedient operating mode. Once the inverter is in a fault-free operating mode, startup has successfully completed.



If the bottom yellow LED flashes four times at intervals of one second, the grid voltage and the DC voltage must be disconnected from the Windy Boy 3300 / 3800 immediately! There is a risk of damage to the inverter resulting from excessive DC input voltage!

Check the input voltage again to make sure it is within the limits stated in section 4.2 "DC Input Requirements" (Page 19). If the voltages are too high, the wind turbine's planner/installer should be called upon for assistance.

If despite checking the input voltage the LED signal occurs again when the DC voltage is reconnected to the, remove the DC connection from the Windy Boy again and contact SMA Technologie AG (see section 10 "Contact" (Page 51)).

Green	Red	Yellow	Mode
Is constantly on	Is off	Is off	OK (working mode)
	Is constantly on	Is off	Warning
		Is constantly on	OK (initialization)
Flashes quickly (3 x per second)	Is not illuminated	Is off	OK (stop)
	Is constantly on	Is off	Warning
Flashes slowly (1 x per second)	Is off	Is off	OK (waiting, grid monitoring)
	Is constantly on	Is off	Warning
Briefly goes out (approx. 1 x per second)	Is off	Is off	OK (derating, see chapter 7 "Checking heat dissipation" (Page 37))
	Is constantly on	Is off	Warning
Is off	Is off	Is off	OK (overnight shutdown)
		on/flashing	Fault
	Is constantly on	Is off	Fault
		on/flashing	Fault

The above mentioned error messages and other operating modes are also shown on the display.

For a detailed description of the fault messages and their causes, see the operating instructions of the Windy Boy 3300 / 3800.

6 Opening and closing the Windy Boy

If you need to open the device for whatever reason, please pay attention to section 2 "Safety instructions" (Page 11).



6.1 Opening the Windy Boy

Caution: Follow the sequence below under all circumstances.



1. Switch the line circuit breaker to the "off" position or pull out the AC plug.
2. Remove the DC inputs from the Windy Boy 3300 / 3800.
- 3. Wait 30 minutes!**
4. Remove the four screws from the enclosure cover and pull the cover forward smoothly. Put the cover, the screws and the washers to one side so that they do not get lost.

6.2 Closing the Windy Boy

Caution: Follow the sequence below under all circumstances.



1. Now secure the enclosure cover to the Windy Boy 3300 / 3800 by tightening the four screws evenly. The screws must be tightened with approximately 9 Nm torque in order to guarantee both the sealing of the enclosure and the grounding of the cover. Do not forget to reattach the washers with the teeth facing toward the housing cover. If you should lose a screw or washer, the accessories kit contains a spare screw and spare washer.
2. Connect the DC inputs. Make sure that the polarity of the DC input plugs is correct. Close the unnecessary DC input sockets with the caps included in the delivery.
3. Switch the line circuit breaker to the "on" position or connect the AC plug.
4. Now check whether the LED display on the Windy Boy 3300 / 3800 indicates that the device is functioning correctly.

7 Checking heat dissipation

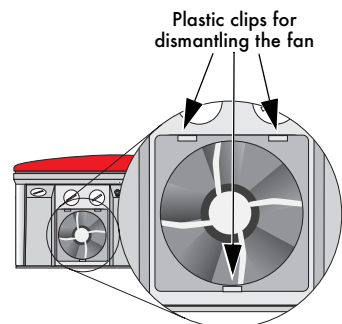
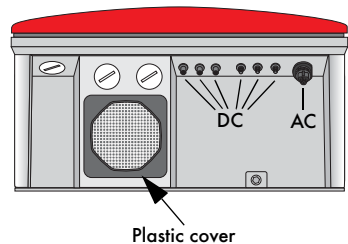
You need only check the heat dissipation of the Windy Boy 3300 / 3800 if, during a visual inspection, you notice a clogging of the fan guard or the inverter is increasingly observed to be in derating mode. The switching to derating mode depends on the ambient temperature and cooling efficiency.

7.1 Cleaning the fan

If the fan guard is only covered in loose dust, it can be cleaned with a vacuum-cleaner. If you do not achieve satisfactory results with a vacuum-cleaner, you can dismantle the fan for cleaning.

The Windy Boy 3300 / 3800 is fitted with a fan on its underside. In order to clean the fan, follow the following procedure:

1. Disconnect the Windy Boy 3300 / 3800 from both the DC and AC connections.
2. Wait for the fan to stop.
3. Slide the catches in the black plastic cover aside and carefully remove these along with the fan guard mounted behind them. Slide the catches in the black plastic cover aside and carefully remove these along with the fan guard mounted behind them. If the fan is very dirty, you can clean it following the procedure laid out in point 4.
4. The fan is attached to the enclosure with three plastic clips. Loosen these with a screwdriver, gently pushing into the holes where the plastic clips are located.
5. Carefully remove the fan. The fan is attached by cables within the Windy Boy 3300 / 3800. These cables are long enough for the fan to be removed for cleaning purposes. Do not pull the cables too hard in order not to damage them.
6. Clean the fan with a soft brush, a paint-brush or a cloth. Under no circumstances should you use compressed air to clean the fan as this damage it.
7. After cleaning, replace everything in reverse order. Subsequently check that the fan is functional as described in the following section.



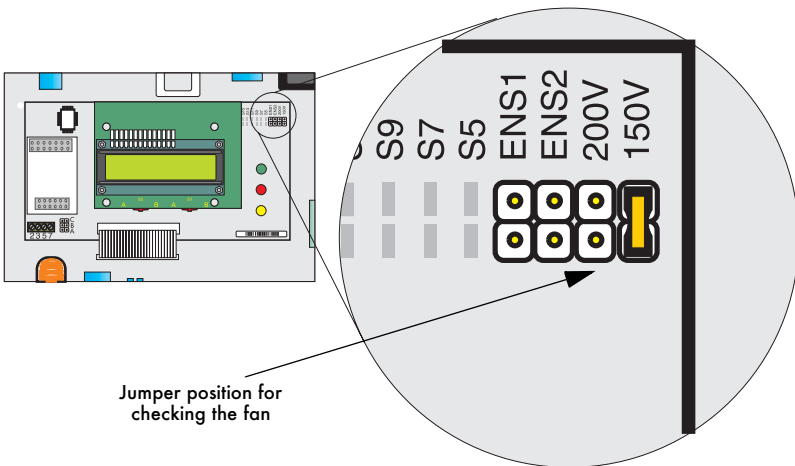
7.2 Checking the fan

If necessary, there are two different ways to check whether the fan is operating correctly:

- Set the "Fan Test" parameter in the installer mode to "1" (using Sunny Data, Sunny Data Control or the Sunny Boy Control data logger) or
- place the jumper on the controller board (the jumper required to check the fan is included in the accessories kit of the Windy Boy 3300 / 3800).

Check the fan as follows:

1. Open the Windy Boy 3300 / 3800as described in section 6.1 "Opening the Windy Boy" (Page 35).
2. Plug the jumper into the corresponding pins on the controller board, as described in the following.



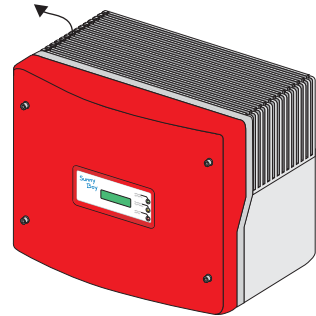
Jumper position for checking the fan

3. Close the Windy Boy 3300 / 3800as described in section 6.2 "Closing the Windy Boy" (Page 35).
4. The Windy Boy 3300 / 3800 recognizes the jumper only once the system has been restarted (i. e., all LEDs must have gone off before the system is restarted).
5. Once you have put the jumper in position, you must restart the Windy Boy 3300 / 3800. Check the fan's air-flow; the Windy Boy 3300 / 3800 sucks air in from underneath and then blows it back out on the upper left-hand side. Look out for any unusual noise which could indicate incorrect installation or that the fan is defective.
6. Once you have checked the fan, you must set the "Fan Test" parameter back to 0 or respectively remove the jumper following the instructions as laid out in section 6 "Opening and closing the Windy Boy" (page 35).

7.3 Cleaning the fan gills

There are fan gills on either side of the Windy Boy 3300 / 3800. The Windy Boy 3300 / 3800 sucks air in from underneath via the fan and blows it out again on the left-hand side. For optimum heat dissipation within the device, all you have to do is clean the left-hand fan gill. Proceed as follows when cleaning the fan gill(s):

- The Windy Boy 3300 / 3800's fan gills are to be found on the side of the enclosure. Place your finger in the space between the top of the enclosure and the fan gill and gently pull the fan gill out of its socket.
- Clean the fan gills with a soft brush, a paint-brush or compressed air.
- Insert the fan gills back into the Windy Boy 3300 / 3800.



Remove the left-hand fan gill for cleaning.

Make sure that you do not mix up which fan gill is which when replacing them. The fan gills are specially designed for each side of the Windy Boy 3300 / 3800. If you are unsure which fan gill is designed for the left-hand and which for the right-hand side of the, you will find the correct side noted inside the gill at the bottom. You will find either 'Rechts/Right' or 'Links/Left' written for either side of the Windy Boy 3300 / 3800.

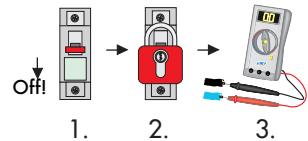


8 Replacing the varistors

The Windy Boy 3300 / 3800 is a complex high-technology device. As a result, the possibilities for fixing faults on site are limited to just a few items. Please do not try to carry out repairs other than those described here. Use the SMA Technologie AG 24-hour exchange service and repair service instead.

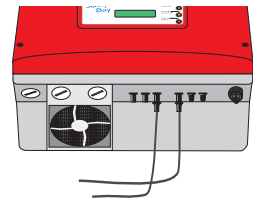
If the red LED on the status display is on continuously during operation, you should first of all make sure that there is no ground fault in the wind generator.

1. Disconnect the Windy Boy 3300 / 3800 from the utility (switch the line circuit breaker to its "off" position or pull out the AC plug).



You must make sure that no voltage is present at the AC output before opening the Windy Boy!

2. Loosen the DC plug connectors on the DC inputs.



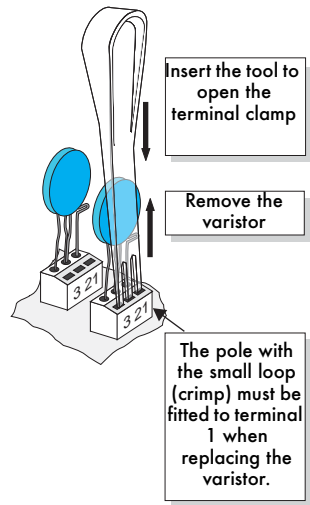
Disconnect the Windy Boy from the wind turbine.

Caution! Dangerous high voltages may be present!



3. Remove the screws that secure the cover and remove the cover from the Windy Boy 3300 / 3800. Make sure that no voltage is present.
4. Check all the varistors to see if there is a conducting connection between connectors 2 and 3. If not, then the respective varistor is not working. The position of the varistors in the Windy Boy 3300 / 3800 is shown in chapter 3.1 "Unit description" (Page 13).

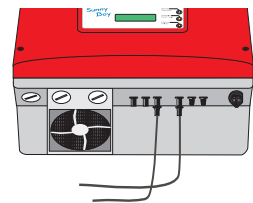
5. Replace the varistor concerned with a new one as shown in the drawing to the right. Ensure the varistor is installed the right way! If you did not receive a special tool for operating the terminal clamps with your replacement varistors, please contact SMA. As an alternative, the terminal contacts can be operated using a suitable screwdriver. Since the failure of one varistor is generally due to factors that affect all varistors in a similar way (temperature, age, inductive overvoltages), it is highly recommended that you replace all varistors, not just the one that is obviously defective. The varistors are specially manufactured for this purpose in the and are not commercially available. They must be ordered directly from SMA Technologie AG (SMA order code: "SB-TV4").



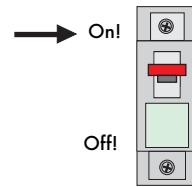
If no spare varistors are available on site, the Windy Boy 3300 / 3800 can still feed into the grid. The input is no longer protected against overvoltages! Replacement varistors should be obtained as soon as possible. In systems with a high risk of overvoltages, the Windy Boy 3300 / 3800 should not be operated with defective varistors!



6. Close the Windy Boy 3300 / 3800. Do not forget to reattach the washers with the teeth facing toward the enclosure cover.
7. Connect the DC plug connectors.
8. Close the unused DC input sockets with the caps included in the delivery.



9. Switch the line circuit breaker to the "on" position.
10. Now check whether the LED display on the Windy Boy 3300 / 3800 indicates that the device is functioning correctly.



If no ground fault and no defective varistor were found, there is probably a fault in the Windy Boy. In this case, contact the SMA hotline to discuss what to do next.

9 The communications interface

Installation or replacement of the communications interface is only to be carried out by a qualified electrician.



The communications interface is used to communicate with SMA communication devices (e.g. Sunny Boy Control, Sunny WebBox) or a PC with appropriate software (e.g. Sunny Data Control). Depending on the selected communications interface, up to 2500 inverters can be connected. Detailed information on this topic can be found in the communication device documentation, or on the Internet at www.SMA.de.

Depending on the type of interface, there are three different ways to install the communications interfaces:

- RS232, RS485, Powerline, Sunny Beam (see section 9.1 "Connection of the interface" (Page 46))
- RS232 for communication with a PC (see section 9.2 "RS232 connection for the PC" (Page 48))

The detailed wiring diagram for the individual communications interfaces can be found in the communication device documentation. This wiring diagram includes:

- Specifications of the necessary cable type
- Which of the inverter's connections are used
- Whether jumpers need to be mounted, and if so, which jumpers
- Whether the PE needs to be connected to the cable shield

The next pages will describe the following:

- The enclosure feed-throughs for the communications interface
- The permitted cable route in the Windy Boy 3300 / 3800
- The location of the PE connector
- The location of the screw terminals for connection of communication cables
- The location of the jumper slots
- The location of the interface port

9.1 Connection of the interface



When opening the Windy Boy, follow all the safety instructions as described in section 6.1 "Opening the Windy Boy" (Page 35).

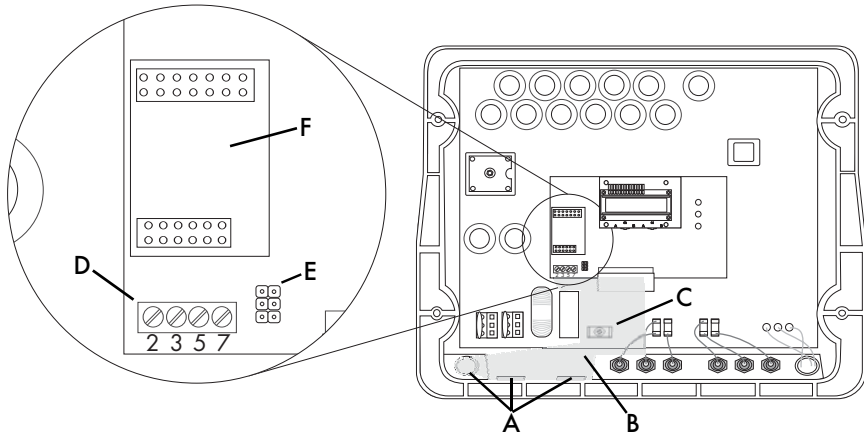


Electrostatic discharges are an acute danger to the Windy Boy and to the communications interface. Ground yourself by touching PE before removing the communications interface from the packaging, and before touching any components within the Windy Boy.



Read the communication device documentation before beginning installation work. Further wiring details can be found there.

1. Open the inverter as described in section 6.1 "Opening the Windy Boy" (Page 35).
2. Guide the PG screw fitting over the communication cable.
3. Thread the cable through the cable feed-through (A) of the Windy Boy.
4. Screw the PG screw fitting onto the Windy Boy.
5. Protect the cable inside the Windy Boy using the silicon tube provided. The silicon tube is imperative for safety reasons. Without this silicon tube, the interface is not to be operated.
6. Lay the cable in area (B) as shown in the figure to the right.
7. Ground the cable shield at the PE connector (C) if the connection diagram of the communication device indicates this as necessary.
8. Connect the communications cables to the screw terminal strip (D) as described in the terminal connection diagram of the communication device. Note down the connector color coding for the respective pin numbers. Connecting the receiver incorrectly can cause the devices to be damaged.
 - Pin 2 color: _____
 - Pin 3 color: _____
 - Pin 5 color: _____
 - Pin 7 color: _____
9. Connect the jumpers (E) if the connection diagram of the communication device indicates this as necessary. The table shown to the right provides an overview of the jumper functions.
10. Plug the communications interface into the board (F).
11. Close the Sunny Boy as described in section 6.2 "Closing the Windy Boy" (Page 35).



- A Enclosure feed-throughs in the base of the Windy Boy
- B Cable route (gray surface)
- C PE connector
- D Screw terminals for connection of the communications cables
- E Jumper slot
- F Interface port

9.1.1 Jumper functions

	Jumper A	Jumper B	Jumper C
RS232	-	-	-
RS485	Termination	Bias 1	Bias 2
NLM	-	-	-
Sunny Beam	-	-	-

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



9.2 RS232 connection for the PC

This section describes the RS232 interface connection (SMA order number 232PB-NR) in a Windy Boy which allows communication between the inverter and a PC. The "Sunny Data" program must be installed on the PC (available in the download section at www.SMA.de) in order for the PC to communicate with the inverter.

RS232 communication characteristics:

- One inverter can be connected to the PC via the RS232
- The inverter requires a RS232 Piggy-Back
- The maximum cable length is 12 m

9.2.1 Cabling recommendations

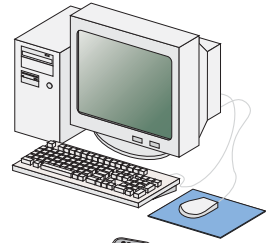
The cable length and quality can adversely affect the signal quality. To achieve good results, observe the following instructions.

- Use a shielded cable with a cross-section of 2 mm². We recommend a cable, such as LiYCY 4 x 2 mm² or AWG 23.
- If the cable is laid outdoors, make sure that it is weather and UV resistant.
- Do not excessively bend the cable.

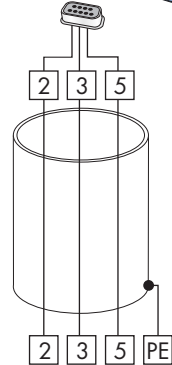
9.2.2 Wiring diagram

1. Use a 9-pole D-Sub socket to connect the Windy Boy to the PC.
2. Install the communications interface as described in section 9.1 "Connection of the interface" (Page 46). Do not mount any jumpers.
3. Connect pin 5 of the D-Sub socket with pin 5 of the Windy Boy. Connect the other pins directly to each other in the same way.

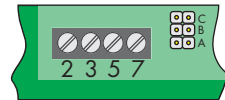
PC



9-pole D-Sub socket



Inverter communications interface (similar to figure)



10 Contact

If you have any questions or technical problems concerning the Windy Boy 3300 / 3800, please contact our hotline. Please have the following information available when you contact SMA:

- Inverter type
- Serial number of the Windy Boy
- Type and number of modules connected
- Communication method



Address:

SMA Technologie AG Hannoversche Strasse 1 - 5 D34266 Niestetal Germany

Tel.: +49 (561) 95 22 - 499

Fax: +49 (561) 95 22 - 4699

hotline@SMA.de

www.SMA.de

Sales
Solar Technology

www.SMA.de

SMA Technologie AG
Hannoversche Strasse 1-5
34266 Niestetal, Germany
Tel.: +49 561 9522 4000
Fax: +49 561 9522 4040
E-Mail: Info@SMA.de
Freecall: +800 SUNNYBOY
Freecall: +800 78669269



Innovation in Systems Technology
for the Success of Photovoltaics

