



Accessories for Wind Power Inverter

WINDY BOY PROTECTION BOX 400 / 500 / 600

Installation Guide



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1 Notes on this Guide

1.1 Validity

This guide applies to the following device types:

- WBP-Box 400-11
- WBP-Box 500-11
- WBP-Box 600-11

1.2 Target Group

This guide is for qualified personnel. The tasks described in this guide may only be performed by qualified personnel.

1.3 Additional Information

You will find further information on the Windy Boy Protection Box in the download area of www.SMA.de/en.

1.4 Symbols Used

The following types of safety warnings and general information are used in this guide:

DANGER

"DANGER" indicates a hazardous situation which, if not avoided, will 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 that can result in property damage if not avoided.



Important

"Important" indicates important information.

2 Safety

2.1 Appropriate Usage

The Windy Boy Protection Box converts the variable AC voltage of a small wind turbine system into DC voltage. The Windy Boy Protection Box sends the DC voltage to the wind power inverter. At the same time, the Windy Boy Protection Box protects the wind power inverter against overvoltage. Depending on the device type, the Windy Boy Protection Box restricts the DC voltage to 400 V, 500 V or 600 V (see section 10 "Technical Data", page 22).

The Windy Boy Protection Box has been designed to allow up to 3 wind power inverters to be connected. Various combinations with SMA wind power inverters are possible (see the Technical Information "Windy Boy Protection Box" at www.SMA.de/en).

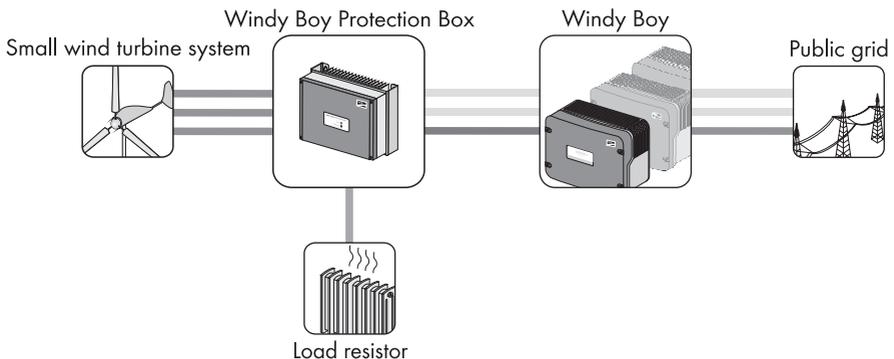
The output voltage and output current of the small wind turbine system, among other factors, determine the systems for which the Windy Boy Protection Box is suitable. Observe all restrictions imposed by the manufacturer. Ensure that the permitted operating range of all components is maintained at all times.

The Windy Boy Protection Box is only suitable for use with original SMA accessories or with accessories recommended by SMA Solar Technology AG.

Do not use the Windy Boy Protection Box for purposes other than those described here. Modifications and the installation of components void the warranty claims and operation permit.

This guide forms part of the Windy Boy Protection Box. Follow all tasks in this guide. Keep this guide in a convenient place for future reference.

Principle of a small wind turbine system with Windy Boy Protection Box



2.2 Safety Precautions

DANGER

Danger to life due to high voltages.

- All work on the Windy Boy Protection Box must be carried out exclusively by qualified personnel.

2.3 Symbols on the Type Label

Symbol	Designation
	Beware of dangerous electrical voltage. The Windy Boy Protection Box operates at high voltages. All work on the Windy Boy Protection Box must be carried out exclusively by qualified personnel.
	Beware of hot surface. The Windy Boy Protection Box can become hot during operation. Avoid contact during operation.
	Observe all documentation included with the Windy Boy Protection Box.
	The Windy Boy Protection Box must not be disposed of together with the household waste. For more information on disposal, see section 9.4 "Disposing of the Windy Boy Protection Box", page 21.
	CE mark. The Windy Boy Protection Box complies with the requirements of the applicable EC guidelines.
	Direct Current (DC).
	Alternating Current (AC).

3 Scope of Delivery

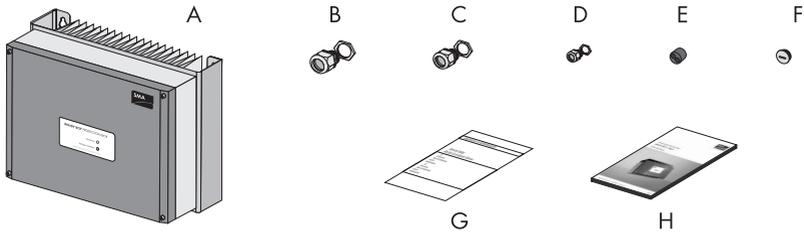


Figure 1: Components included in delivery

Position	Quantity	Designation
A	1	Windy Boy Protection Box
B	1	M25 cable gland
C	4	M20 cable gland
D	1	M12 cable gland
E	3	Multiple seal inserts for M20 cable gland
F	2	Sealing plugs for enclosure opening
G	1	EC Declaration of Conformity
H	1	Installation Guide

4 Mounting the Windy Boy Protection Box

Requirements for the mounting location:

- Mount on a solid surface.
- The mounting surface and surrounding area are non-flammable.
- The mounting surface is suitable for the weight and dimensions of the Windy Boy Protection Box.
- The mounting location is accessible at all times.
- The ambient temperature is between $-25\text{ }^{\circ}\text{C}$ and $65\text{ }^{\circ}\text{C}$.
- The mounting location is not at risk of explosion.

Mounting position:

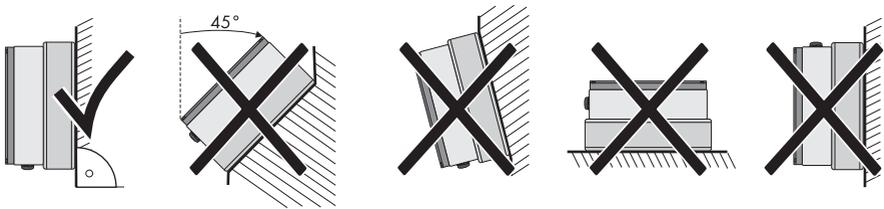


Figure 2: Permitted and prohibited mounting positions

Minimum clearances:

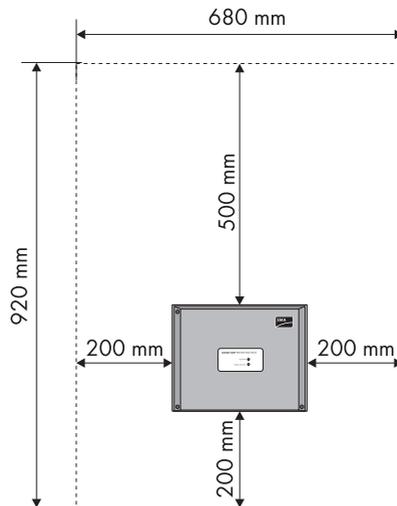


Figure 3: Obligatory clearances

Fixing points:

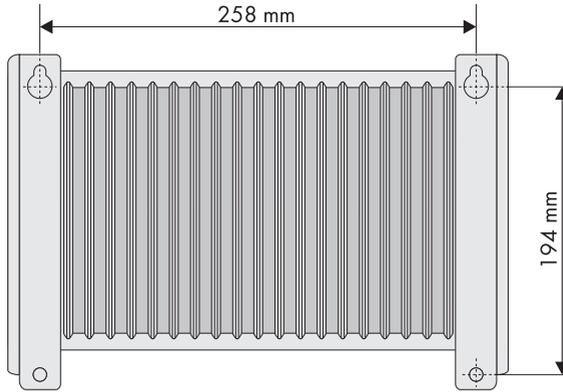


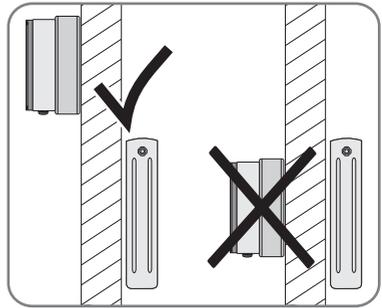
Figure 4: Fixing point distances

NOTICE

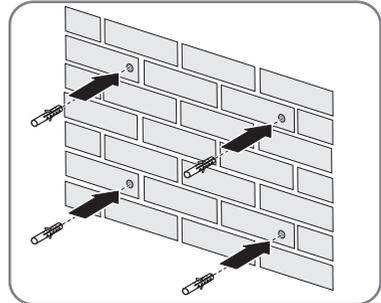
Destruction of the Windy Boy Protection Box due to overheating.

If you mount the load resistor directly in line with the Windy Boy Protection Box on the rear of the wall, this will adversely affect the functionality of the Windy Boy Protection Box.

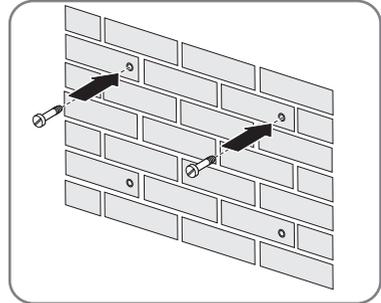
- Mount the load resistor in an offset position to the Windy Boy Protection Box on the rear of the wall.



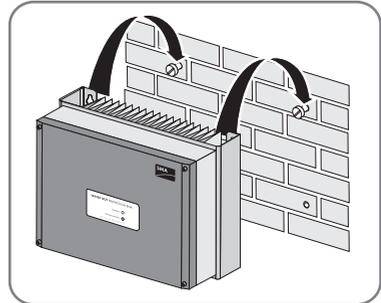
1. Mark the position of the drill holes. Observe the fixing point distances when doing so.
2. Drill the holes according to the markings and insert wall anchors.



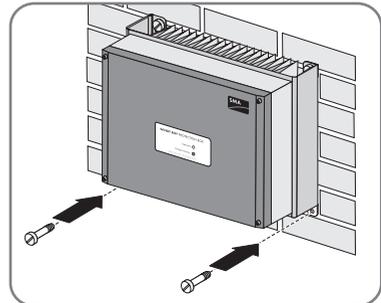
3. Insert 2 screws into the 2 upper holes. Leave the screws protruding out by 3 mm.



4. Hang the Windy Boy Protection Box onto the upper screws using the mounting links.



5. Secure the Windy Boy Protection Box using the lower fixing points.



6. Tighten both upper screws.

5 Electrical Connection

5.1 Overview of the Connection Area

5.1.1 Interior View

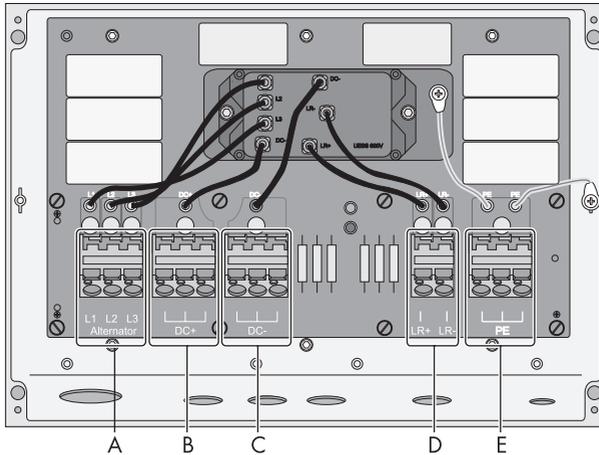


Figure 5: Connection terminals

Position	Designation
A	Alternator connection terminal for small wind turbine system
B	DC+ connection terminal for wind power inverter
C	DC – connection terminal for wind power inverter
D	LR+ and LR – connection terminals for load resistor
E	PE connection terminal for grounding the Windy Boy Protection Box, the load resistor and its cable shield

5.1.2 View from Below

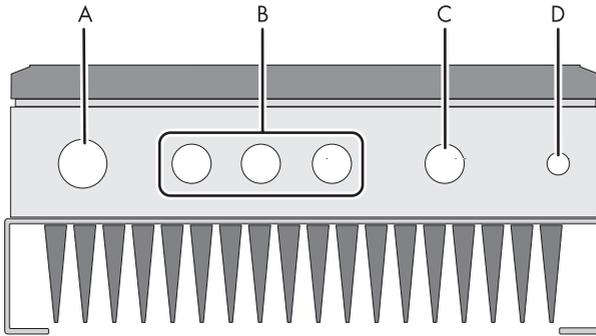


Figure 6: Enclosure openings for connections

Position	Designation
A	Enclosure opening for small wind turbine system
B	Enclosure openings for wind power inverter
C	Enclosure opening for load resistor
D	Enclosure opening for grounding the Windy Boy Protection Box, the load resistor and its cable shield

5.2 Grounding the Windy Boy Protection Box

1. Stop the small wind turbine system and secure against restart.
2. Disconnect the wind power inverter from voltage sources (see the manual for the wind power inverter).
3. Ensure that no voltage is present in the system.
4. Loosen the screws of the enclosure lid and carefully remove the lid. Disconnect the enclosure lid PE from the Windy Boy Protection Box when doing so.
5. Attach the M12 cable gland to the enclosure opening for grounding.
6. Unscrew the cable gland's lock nut and pass it over the PE of the Windy Boy Protection Box.
7. Pass the PE through the cable gland and connect to the **PE** connection terminal.
8. Tighten the lock nut firmly to the cable gland.

5.3 Connecting the Small Wind Turbine System

Grounding the small wind turbine system:

The small wind turbine system is not grounded through the Windy Boy Protection Box. You must ground the small wind turbine system by other means than the Windy Boy Protection Box. Observe all manufacturer instructions when doing so.

NOTICE

Destruction of the Windy Boy Protection Box due to excessive power from the small wind turbine system.

- Observe the maximum power that can be connected (see section 10 "Technical Data", page 22).
 - If the power of the small wind turbine system exceeds the maximum power that can be connected to the Windy Boy Protection Box, use several Windy Boy Protection Boxes in the system.
1. If there are rectifiers and overvoltage protection between the small wind turbine system and the wind power inverter, remove the rectifiers and overvoltage protection.
 2. Attach the M25 cable gland to the enclosure opening for the small wind turbine system.
 3. Unscrew the cable gland's lock nut and pass it over the cable.
 4. Pass L1, L2, and L3 of the small wind turbine system through the cable gland and connect to the **Alternator** connection terminal.
 5. Tighten the lock nut firmly to the cable gland.

5.4 Connecting the Wind Power Inverter

Cable sizing:

- The cable has been sized for the maximum power of the wind power inverter.
- A stranded lead of type Silivolt-E 4 mm² or a comparable lead is used.
- Maximum length is 2 m.
- Maximum cross section is 6 mm².

Connect each wind power inverter as per the following procedure.

1. Attach the M20 cable gland to the enclosure opening for the wind power inverter.
2. Unscrew the cable gland's lock nut and pass it over the cable.
3. Remove the seal from the cable gland.
4. Pass the multiple seal insert over DC+ and DC – and press into the cable gland.
5. Connect DC+ to the **DC+** connection terminal.
6. Connect DC – to the **DC –** connection terminal.
7. Tighten the lock nut firmly to the cable gland.
8. Close all enclosure openings that are not required with sealing plugs.

5.5 Connecting the Load Resistor

Requirements:

- Load resistor never exceeds 54 Ω at the operating temperature.
- Load resistor never drops below 30 Ω when switched off.
- Load resistor has been designed for the maximum voltage of the Windy Boy Protection Box.
- The heat from the load resistor is permanently conducted away.

Cable sizing:

- Cable of type "RADOX GKW - LW/S 3x2.5 mm²" or a comparable cable used.
- Maximum length is 3 m.
- Maximum cross section is 6 mm².

1. Measure the resistance of the load resistor.

The resistance is above 30 Ω .

The resistance is below 30 Ω ?

The load resistor is not suitable for connection to the Windy Boy Protection Box.

- Select another load resistor. Observe the requirements when doing so.

2. Attach the M20 cable gland to the enclosure opening for the load resistor.
3. Unscrew the cable gland's lock nut and pass it over the cable.
4. Connect PE to the **PE** connection terminal.
5. Connect the cable shield to the **PE** connection terminal.
6. Connect LR+ to the **LR+** connection terminal.
7. Connect LR – to the **LR –** connection terminal.
8. Tighten the lock nut firmly to the cable gland.

6 Commissioning the Windy Boy Protection Box

Requirements:

- The small wind turbine system is correctly connected.
- The wind power inverter and load resistor are correctly connected.
- The Windy Boy Protection Box, load resistor and load resistor cable shield are grounded.
- The small wind turbine system is grounded according to the manufacturer specifications.
- All unused enclosure openings are closed with sealing plugs.

1. Mount the enclosure lid onto the enclosure. Connect the PE of the enclosure lid to the Windy Boy Protection Box when doing so.
2. Secure the enclosure lid with screws.
3. Commission the small wind turbine system. Observe all manufacturer specifications when doing so.
4. Commission the wind power inverter (see the manual for the wind power inverter).

Green LED is glowing.

Green LED and red LED are glowing?

The Windy Boy Protection Box restricts overvoltage. As soon as the wind power inverter feeds into the public distribution grid, the red LED will go out.

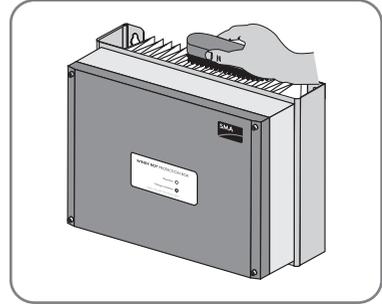
All LEDs are off?

There is probably a fault.

- Eliminate the fault (see section 8 "Troubleshooting", page 20).

7 Cleaning the Cooling Fins of the Windy Boy Protection Box

- If the cooling fins of the Windy Boy Protection Box are very dirty, clean them with a soft brush.



8 Troubleshooting

Symptom	Cause	Corrective measures
<input type="radio"/> All LEDs are off. <input type="radio"/>	The small wind turbine system is stopped; there is no voltage.	<ul style="list-style-type: none"> Commission the small wind turbine system. Observe all manufacturer specifications when doing so.
<input type="radio"/> All LEDs are off. <input type="radio"/>	There is no voltage.	<ul style="list-style-type: none"> Check the connection of the small wind turbine system. See section 5.3 "Connecting the Small Wind Turbine System", page 15 for this. If the Windy Boy Protection Box is permanently in this state, contact the SMA Serviceline.

9 Decommissioning

9.1 Removing the Windy Boy Protection Box

1. Stop the small wind turbine system (see the manufacturer manual).
2. Decommission the wind power inverter (see the manual for the wind power inverter).
3. Loosen the screws of the enclosure lid and carefully remove the lid. Disconnect the enclosure lid PE from the Windy Boy Protection Box when doing so.
4. Disconnect the small wind turbine system from the Windy Boy Protection Box.
5. Disconnect the wind power inverter from the small wind turbine system (see the manual for the wind power inverter).
6. Disconnect the load resistor and the load resistor cable shield from the Windy Boy Protection Box.
7. Disconnect PE from the Windy Boy Protection Box.
8. Place the enclosure lid onto the enclosure and secure with screws.
9. Loosen all fixing screws.
10. Lift the Windy Boy Protection Box from the upper fixing screws.

9.2 Packaging the Windy Boy Protection Box

- Package the Windy Boy Protection Box in the original packaging if available.
- If the original packaging is not available, use a box that is suited to the weight and dimensions of the Windy Boy Protection Box.

9.3 Storing the Windy Boy Protection Box

Requirements for the storage location:

- The storage location is dry.
- The ambient temperature is between -25 °C and 65 °C .

9.4 Disposing of the Windy Boy Protection Box

- Dispose of the Windy Boy Protection Box in accordance with the applicable disposal regulations for electronic waste.
- or**
- Return the Windy Boy Protection Box to SMA Solar Technology AG with shipping paid by the sender. When doing so, label the packaging "ZUR ENTSORGUNG" ("FOR DISPOSAL").

10 Technical Data

10.1 Windy Boy Protection Box 400

Small wind turbine system connection

Quantity	1 x 3-phase
Voltage	3 x 0 V ... 500 V
Current	3 x 0 A ... 11.5 A
Frequency	0 Hz ... 400 Hz
Nominal power	1 kW ... 3 kW

Wind power inverter connection

Maximum number	3
Voltage limitation	400 V
Total power	3 kW

Load resistor connection

Quantity	1
Nominal voltage	400 V
Continuous power	3 kW

General data

Width x height x depth	280 mm x 220 mm x 130 mm
Weight	5 kg
Rectifier	Integrated
Peak efficiency	99.95 %
Operating temperature range	- 25 °C ... 65 °C
Protection rating *	IP54
Load loss at continuous power	15 W

* According to IEC 60529

10.2 Windy Boy Protection Box 500

Small wind turbine system connection

Quantity	1 x 3-phase
Voltage	3 x 0 V ... 500 V
Current	3 x 0 A ... 11.5 A
Frequency	0 Hz ... 400 Hz
Nominal power	3 kW ... 5 kW

Wind power inverter connection

Maximum number	1
Voltage limitation	500 V
Voltage limitation with connection to a Windy Boy 5000TL	550 V
Total power	5 kW

Load resistor connection

Quantity	1
Nominal voltage	500 V
Continuous power	5 kW

General data

Width x height x depth	280 mm x 220 mm x 130 mm
Weight	5 kg
Rectifier	Integrated
Peak efficiency	99.95 %
Operating temperature range	- 25 °C ... 65 °C
Protection rating *	IP54
Load loss at continuous power	20 W

* According to IEC 60529

10.3 Windy Boy Protection Box 600

Small wind turbine system connection

Quantity	1 x 3-phase
Voltage	3 x 0 V ... 500 V
Current	3 x 0 A ... 11.5 A
Frequency	0 Hz ... 400 Hz
Nominal power	2 kW ... 7 kW

Wind power inverter connection

Maximum number	2
Voltage limitation	600 V
Total power	7 kW

Load resistor connection

Quantity	1
Nominal voltage	600 V
Continuous power	7 kW

General data

Width x height x depth	280 mm x 220 mm x 130 mm
Weight	5 kg
Rectifier	Integrated
Peak efficiency	99.95 %
Operating temperature range	- 25 °C ... 65 °C
Protection rating *	IP54
Load loss at continuous power	30 W

* According to IEC 60529

11 Contact

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

- Device type (see "Type/Model" on the type label)
- Serial number (see "SerialNo." on the type label)
- Type of connected small wind turbine system
- Type and number of connected wind power inverters
- Technical data of the connected load resistor

SMA Solar Technology AG

Sonnenallee 1

34266 Niestetal, Germany

www.SMA.de

SMA Serviceline

Inverters: +49 561 9522 1499

Communication: +49 561 9522 2499

Fax: +49 561 9522 4699

E-Mail: Serviceline@SMA.de

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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

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SMA Solar Technology AG

www.SMA.de

