



superwind

**Superwind Charge Regulator 12V (Marine)
Manual**

09-2016

www.superwind.com



INSTALLATION

PLEASE DO NOT PROCEED UNTIL
YOU HAVE READ
ALL INSTRUCTIONS
AND
SAFETY INFORMATION

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MANUAL VERSION 09-2016

1. GENERAL INFORMATION

1.1 General Information

The Superwind Charge Regulator (SCR) 12V (Marine) is a charge regulator of the highest quality and will perfectly and reliably charge your batteries for many years.

However, reliable operation not only will depend on product quality but also on accurate assembly and proper wiring. Please read this manual carefully before you start the installation. Please also keep in mind our safety instructions and warning notices. Our main concern is with your safety.

1.2 Labelling

This manual refers to the **Superwind Charge Regulator (SCR) 12V (Marine)**.

Manufacturer:

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You will find the label with the serial number and the nominal voltage on the side of the housing.

1.3 Intended use and range of application

The SCR 12V (Marine) is designed to sense and limit the output voltage of a Superwind 350 12V wind generator and thus to prevent batteries from becoming overcharged.

It is suitable for lead acid batteries, gel batteries, and AGM (Absorbed Glass Mat) batteries, and has two battery charging outputs isolated by Schottky blocking diodes. This allows the wind turbine to charge two batteries totally independent of each other.

The SCR 12V (Marine) is not influenced by other power sources connected to the batteries like alternators, gensets, solar arrays, and battery chargers. For that reason, it can be used very well in complex systems and hybrid systems.

The regulator is fully potted to protect the electronics against humidity and vibration.

Fields of application can be sailing yachts, campers, summer cottages, mountain shelters, as well as industrial applications like navigational aids, traffic management systems, environmental monitoring stations, or transmitters.

2. WARRANTY

2.1 Warranty

superwind GmbH warrants this product to be in good working order during the warranty period. In the event that the product is found to be defective within the warranty period, repair service will be provided free of charge by superwind GmbH or an authorized service partner.

Free repair service may only be obtained by providing the warranty card and original purchase invoice issued to the customer by the retailer. The warranty card must state the purchaser's name, the retailer's name and address, the serial number and the date of purchase of the product. superwind GmbH reserves the right to refuse warranty service if this information is not complete or has been removed or changed after the original purchase of the product from the retailer.

2.2 Warranty period

The warranty is valid for two years from the date of purchase by the purchaser, as evidenced by the above mentioned documents.

2.3 To obtain warranty service

Warranty service is available at superwind GmbH and Superwind authorized service partners. Any costs of secure transportation of the product to and from superwind GmbH / Superwind authorized service partners will be borne by the customer.

2.4 Limitations

superwind GmbH does not warrant the following:

- ✧ Periodic check-ups, maintenance and repair or replacement of parts due to normal wear and tear.
- ✧ Defects caused by modifications carried out without superwind's approval.
 - Includes damage caused by improper use, handling or operation, in particular defects caused by improper installation and installation on inadequate masts or support structures.
- ✧ Installation on inadequate masts or support structures (to obtain warranty service the purchaser has to provide evidence that masts or support structures are as recommended in the Superwind 350 manual).
- ✧ Accidents or disasters or any cause beyond the control of superwind GmbH, including but not limited to lightning, flooding, fire etc.
- ✧ Costs for disassembly and reassembly of the product to enable shipment for warranty reasons.

2.5 Others

Superwind GmbH reserves the right to decide whether the product or parts thereof shall be repaired or replaced under warranty. Should neither repair nor replacement by superwind GmbH be possible, the purchaser solely will be entitled to a full or partial refund (prorated when returned to the manufacture after more than 1 year of use).

This warranty does not affect the purchaser's statutory rights under applicable national legislation in force, nor the purchaser's right against the retailer arising from the sales / purchase contract. In the absence of applicable national legislation, this warranty will be the purchaser's sole and exclusive remedy, and superwind GmbH shall not be liable for any incidental or consequential damages for breach of any expressed or implied warranty of this product.

THE GENERAL CONDITIONS FOR THE SUPPLY OF PRODUCTS AND SERVICES OF THE ELECTRICAL AND ELECTRONICS INDUSTRY APPLY WITH APPROPRIATE LIMITS AND STANDARDS.

2.6 Expenses and Responsibilities

All associated expenses (shipping to and from the repair facility, insurance, etc) are the full responsibility of the buyer or his shipping agent, unless the buyer is notified otherwise by the manufacturer.

Upon receipt of your unit:

- ✧ The crate should be opened and inspected immediately for damage.
- ✧ Note any damage to the outside of the package (dents, scratches, etc.) and document it on the Bill of Lading before signing and keep a copy. Documenting damage with photos is also highly recommended.
- ✧ Unpack the unit at once and perform a visual inspection to determine if it is dented, bent or scratched.
- ✧ If for any reason the unit should need to be returned, the original crate is the best way to ship it back to the manufacturer.

2.7 Claims

Claims that occur during transportation must be filed by the consignee (the buyer) as shipping terms are FOB-EX-WORKS (our distribution point as contracted).

BUYER IS RESPONSIBLE FOR ALL SHIPPING EXPENSES INCLUDING CUSTOMS DUTIES AND VAT (IMPORT DUTIES).

2.8 Exclusion of liability

The manufacturer shall not be liable for damages caused by use other than as intended or mentioned in this manual, or if the recommendations of the battery manufacturer were neglected. The manufacturer shall also not be liable if there has been service or repair carried out by any unauthorized person, unusual use, incorrect installation, or inappropriate system design. Opening the charge regulator voids the warranty.

3 SAFETY INSTRUCTIONS

Please carefully study this manual before starting assembly and installation. The information provided is to ensure your safety during mounting, operation, and in case of trouble. If you have any additional questions please contact your dealer, a Superwind service partner, or the manufacturer.

3.1 General safety recommendations



- ✧ Always abide by the acknowledged rules of any technology and the rules for accident prevention when working on the electrical system!
- ✧ Take care that work on the electrical system like installation, maintenance, and repair is carried out by qualified persons only. These persons must also have studied the instructions given in this manual.

Batteries store a large amount of energy. In any circumstance, avoid short-circuiting the battery. For your safety, connect a fuse to each of the battery cables.

Charging lead-acid batteries produces inflammable hydrogen gas. Unsealed lead-acid batteries have vent holes, releasing hydrogen, which forms detonating gas when mixed with ambient air. A small spark (e.g. from an electrical switch) can detonate the explosive gas mixture. For prevention, always provide sufficient ventilation.

Avoid touching and short-circuiting wires or terminals. Be aware that the voltage on specific terminals or wires can be significantly higher than the nominal battery voltage. Only use isolated tools, stand on dry grounds, and keep your hands dry.

Please also follow the instructions of the wind turbine operation manual and the safety recommendations provided by the battery manufacturer.

4. SPECIFICATIONS

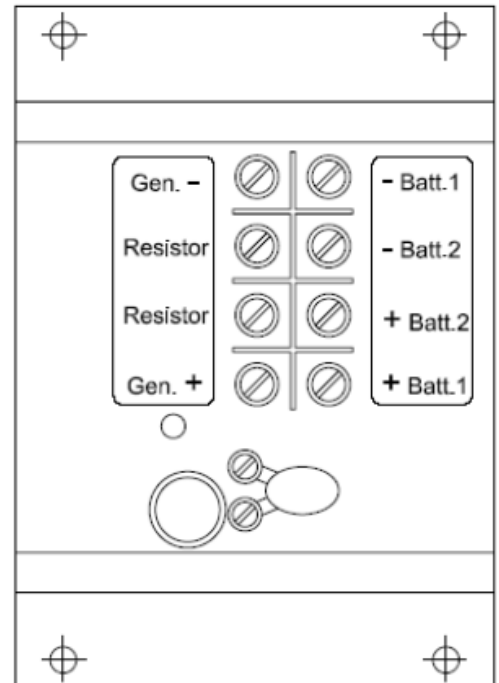
4.1 Technical Data

Nominal voltage	12V
Max charging voltage (20° C)	14.4V
Temperature compensation	30 mV / °C
Max. current	40 A
Total resistance of power resistor	0.35 Ohm
Number of charging outputs	2
Method of voltage regulation	PWM
Connectors	M 4

LED indicating that max. charging voltage has been achieved (batteries are fully charged).

Option to connect external temperature sensor.

The default setting for the maximum charging voltage can be adapted to special customer requirements. Since special devices are needed, proper calibration can only be performed by the manufacturer.



Graphic 1.6.1

4.2 Description of functions

The SCR 12V (Marine) has been especially designed for the Superwind 350 12V wind generator and guarantees optimum charging of the batteries. The secondary function of the SCR 12V (Marine) is to electronically keep the wind generator under load. When the batteries have reached their maximum charging voltage, the SCR 12V (Marine) PWM circuit automatically diverts the wind turbine's surplus power to the power resistor. Thus, with batteries even fully charged, the wind turbine continues operation and provides useable power as soon as electric consumers are switched on. This state of charge is indicated by the LED and the resistor will make a very slight buzzing sound when operating and dissipating power.

5. Assembly

5.1 Choosing the position

The charge regulator and the power resistor are designed for indoor use and shall be mounted at a place well protected from the effects of weather. As the charge regulator has a temperature sensor in order to adapt the charging voltage to the battery temperature, it should be placed in the same room with the batteries or in a room with the same temperature level. If this is not possible, an external temperature sensor is available which then replaces the standard sensor mounted at the regulator housing.

The distance between the regulator and the battery should be a minimum of 30 cm but not exceed 200 cm. The distance between the regulator and the power resistor should not exceed 200 cm. The power resistor must be ventilated properly. Never mount the power resistor on a flammable surface and take care that no flammable items will be close to the resistor. Consider the resistor will dissipate all the wind turbine's power into heat when the batteries are fully charged.

As a note: if installing on a yacht, a good place for the power resistor is the engine compartment.

5.2 Connecting the charge regulator



- ⚠ Before connecting the charge regulator, prevent your wind turbine from unintended starting. Connect the two generator cables together (CAUTION: make sure to disconnect the battery before!) or tie one of the rotor blades loosely to the mast (if accessible).

Slide the regulator's black cover sideways and take it off.

Mount the regulator and the power resistor to a dry, plain, and non-flammable surface. Use appropriate mounting holes.

For connecting the cables to the charge regulator, use the yellow solderless terminals. The solderless terminals provided are suitable for cable cross-sections from 2.5 mm² to 6.0 mm² (AWG 13 to AWG 10).

Use a crimping tool suitable for insulated terminals and check that the terminal has been securely crimped to the bared part of the cable.

Connect the regulator as shown in Diagram 1.8.1 below.



- ⚠ To prevent your system from damages, the cables must be connected in the order described below.

1. Connecting the power resistor

Connect the power resistor to the terminals labeled 'Resistor' on the charge regulator. The cross-section of the cables must be a minimum of 4 mm² (AWG 12).

2. Connecting the wind generator

Connect the wind generator to the terminals labeled 'Gen +' and 'Gen -' on the charge regulator.



- ⚠ Never interchange the polarity of the cables. Interchanged polarity would destroy the charge regulator and void the warranty.

Marking of the connecting cables at the Superwind 350:

POSITIVE (+): RED
NEGATIVE (-): BLACK

If you are not sure of the polarity of the cables led down from the wind generator, you can identify POSITIVE (+) and NEGATIVE (-) easily by means of a simple multimeter before connecting the cables to the charge regulator.

Select DC (range 10 VDC) on your multimeter. There is normally a red measuring line connected to the V plug and black line to the COM plug. Connect the measuring lines to the cables coming from the wind turbine. Ask an assistant to turn the rotor of the wind turbine slowly by hand (avoid touching the blades). The wind turbine will produce low voltage that is measurable by the multimeter. If the voltage is indicated by (+) or without prefix, the red measuring line is connected to the POSITIVE (+) cable. If the voltage is indicated by (-), the red measurement line is connected to the NEGATIVE (-) cable of the wind turbine.

3. Connecting the batteries

You may connect one or two batteries to the SCR 12V (Marine). Use the terminals '+ Batt. 1' and '- Batt. 1' to connect your first battery and use the terminals '+ Batt. 2' and '- Batt. 2' to connect to your second battery. If two batteries are connected, they are charged independently and are protected from discharging each other by the regulator's internal Schottky blocking diodes.



⚠ In order to avoid accidentally short-circuiting, first connect the cables to the charge regulator and then to the battery

Graphic 1.8.1

12 Volt-system

