RUTLAND HRS CHARGE REGULATOR

INSTALLATION & OPERATION

Models:
HRS503/12 12v
HRS913/12 12v
HRS913/24 24v

CE

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Congratulations and thank you for purchasing Marlec's new HRS Charge Regulator. This product has been introduced as the latest technology for voltage regulation of small wind turbines and solar panels. You may have ordered the previous model, the SR200 Shunt Regulator, and we have substituted this with the new HRS type regulator to give you improved performance and simpler installation. We are confident that you will be fully satisfied with this product and if you have any questions please contact your local dealer.

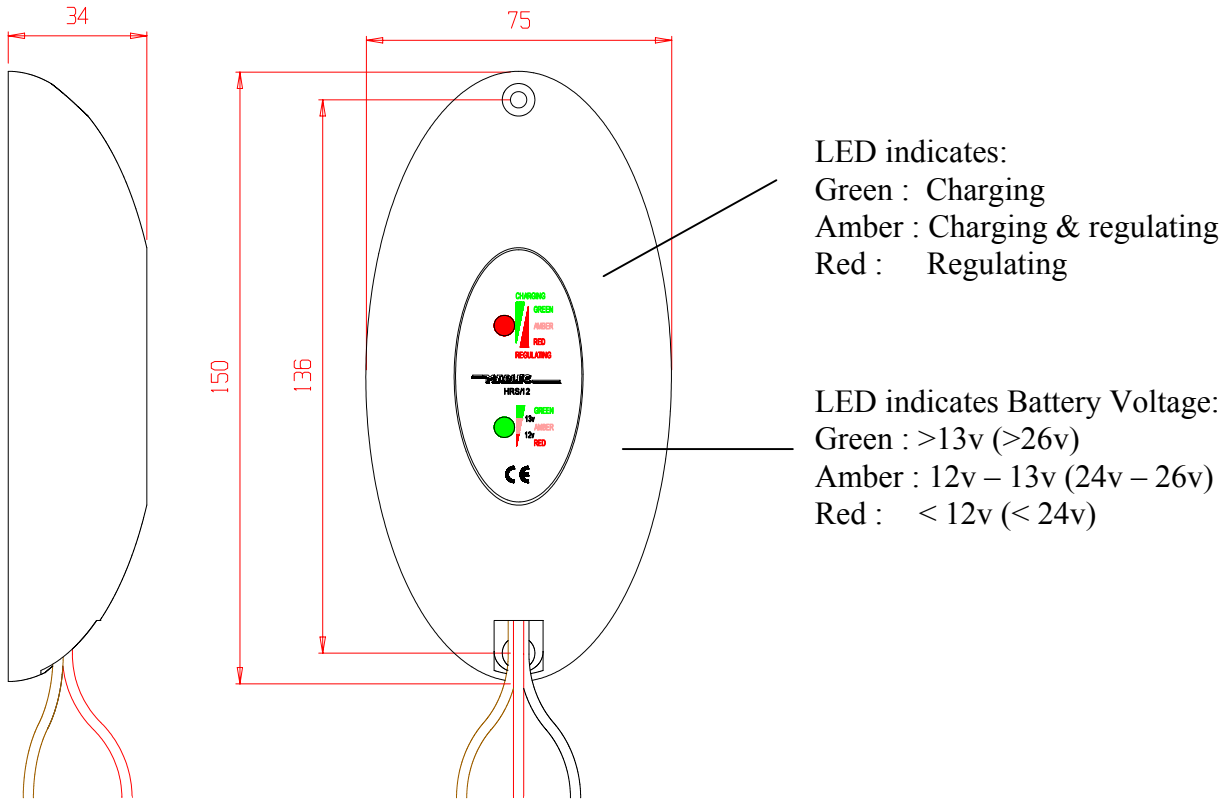
INTRODUCTION

Please read and understand these instructions before installing the regulator.

The HRS503 and HRS913 Charge Regulators are designed for regulating the charge current to a single battery bank from the Rutland 503, 913 or FM910-3 Windcharger plus solar array up to 100w maximum. Ensure the regulator selected corresponds to the type of windcharger used. An internal blocking diode allows connection of additional charge sources (e.g. engine alternator, mains charger).
Note: Additional charge sources must be connected directly to the battery and not to the input of the HRS regulator.
The HRS protects batteries from overcharge, avoiding the loss of electrolyte through gassing and prolongs battery life. This also helps protect other electronic equipment from damage due to high battery voltage.

PRINCIPLE OF OPERATION

The HRS constantly monitors the battery voltage and when the pre-set cut-in level is reached (see table 1.) tapers the charge current down until no charge current is flowing into the battery. The regulator will be fully on (ie no current flowing into the battery) at approx 0.5v above the initial cut-in voltage. The regulator achieves this by shunting excess current and slowing the generator, reducing it's output. The charging / regulating LED indicator on the front of the unit will light red/amber when the regulator cuts in.



LED indicates:
Green : Charging
Amber : Charging & regulating
Red : Regulating

LED indicates Battery Voltage:
Green : >13v (>26v)
Amber : 12v – 13v (24v – 26v)
Red : < 12v (< 24v)

Unless stated otherwise when ordered, the regulator is set in accordance with table 1. This setting is suitable for lead-acid, absorbed glass matt and most gel batteries**. (Check the max voltage rating for the battery before wiring your system)**. If the regulator is to be used with any other battery type e.g. Nickel Cadmium and some gel types, the regulator may require re-setting according to the battery manufacturer's recommendations.

Table 1

Nominal Battery Voltage	Cut-in Voltage	Max Voltage
12	13.8	14.4v
24	27.6	28.8v

INSTALLATION

Ensure the voltage indicated on the label on the HRS is correct for your battery system and the correct model of regulator is used for the type of windcharger.

Mounting

- Choose a suitable location for the regulator within a maximum run of 1.5m of cable from the battery. Mount the regulator to a flat, surface via the two mounting holes provided. Ensuring the aluminium plate and screw heads on the back of the unit cannot touch anything metallic which may be connected to ground or other system potential.

Electrical Connection

- Select suitable wiring and connectors for the interconnections that are capable of continuously carrying 10Amps minimum.

- Keep wiring lengths to a minimum to eliminate unnecessary voltage drop, maximum cable length between regulator and battery should be 1.5m to ensure accurate voltage sensing.

- **Ensure that the wind generator is restrained from turning, solar panels are covered, and all other charge sources are switched off before connecting the regulator to the system. Ensure correct polarity is observed at all times during connection. Failure to do this at time of installation and on subsequent disconnection and reconnection may irreparably damage the regulator, invalidating the warranty.**

- Follow the basic wiring diagram (Fig 2, or 3 overleaf) as appropriate.

- Connect the regulator BLACK lead to the battery and charge source negative.

- Connect the regulator BROWN lead to the charge source positive lead.

- Connect the regulator RED lead to the battery positive via the charge fuse.

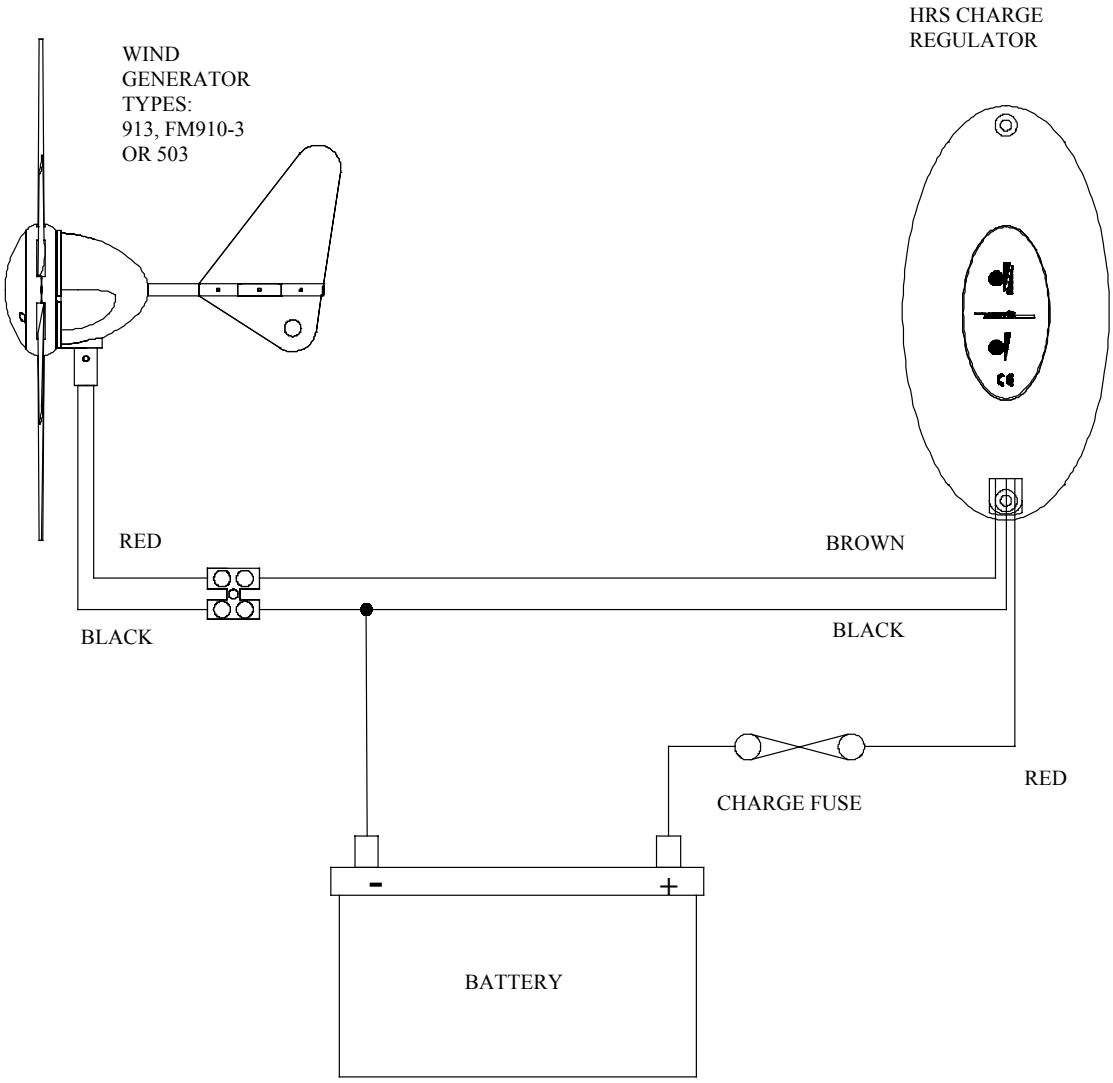


Fig 2. Basic wiring schematic – Windcharger + HRS Regulator

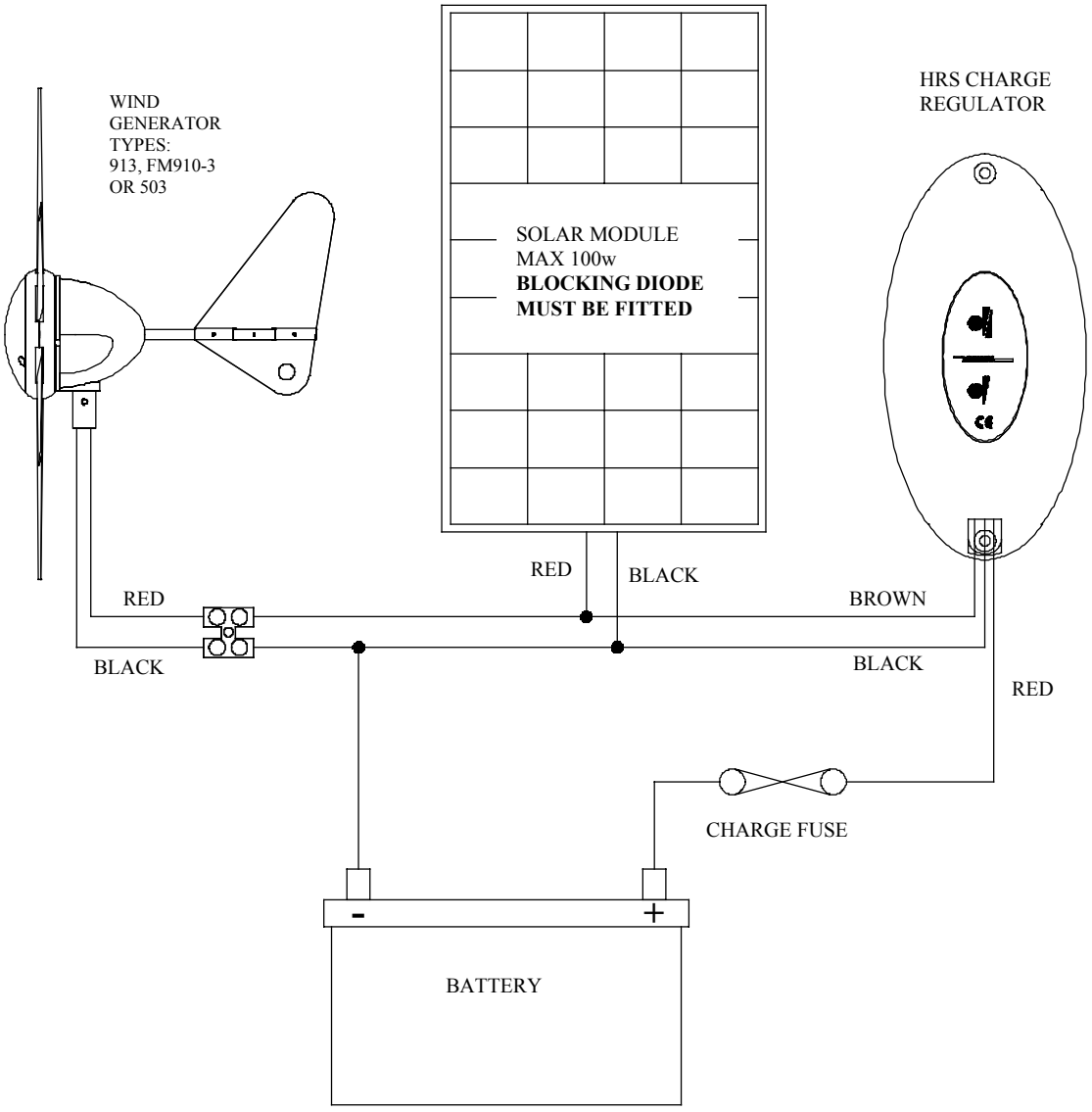


Fig 3. Basic wiring schematic – Windcharger + HRS Regulator + 100W Solar Module.

Note: If a solar module or array exceeding 100w is to be used, it must be regulated using a separate regulator.

LIMITED WARRANTY

The Marlec Engineering Company Limited Warranty provides free replacement cover for all defects in parts and workmanship for 12 months from the date of purchase. Marlec's obligation in this respect is limited to replacing parts which have been promptly reported to the seller and are in the seller's opinion defective and are so found by Marlec upon inspection. A valid proof of purchase will be required if making a warranty claim.

Defective parts must be returned by prepaid post to the manufacturer Marlec Engineering Company Limited, Rutland House, Trevithick Road, Corby, Northamptonshire, NN17 5XY, England, or to an authorised Marlec agent.

This Warranty is void in the event of improper installation, owner neglect, misuse, damage caused by flying debris or natural disasters including lightning and hurricane force winds. This warranty does not extend to support posts, inverters, batteries or ancillary equipment not supplied by the manufacturer.

No responsibility is assumed for incidental damage. No responsibility is assumed for consequential damage. No responsibility is assumed for damage caused by the use of any unauthorised components.

No responsibility is assumed for use of a non "furling" versions of the Rutland Windcharger where Marlec or one of its authorised agents finds that a generator incorporating a furling device should have been used.

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