

Site Considerations

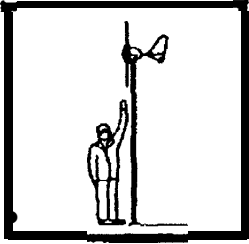


Figure 2

The wind generator **should** be mounted in a **safe** Position, a minimum of 2.3 metres (7.6 feet) above the deck and away from other obstacles which could interfere with the blades or tail assembly (Figure 2).

Tower Considerations

The Rutland 913 is designed to fit inside an aluminium or stainless steel tube with an internal diameter of 41mm .

Suitable Tubes: Stainless Steel $1\frac{3}{4}$ " 16 SWG
 Aluminium $1\frac{7}{8}$ " 10 SWG

Suggested Tower Constructions

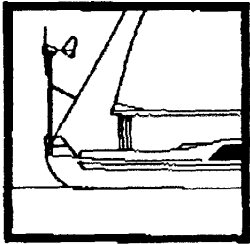


Figure 3

Pushpit

A suitable nounting pole of 2.3 metres (7.6 feet) in length mounted to the deck with deck plate and guy ropes is the most popular method of mounting the Windcharger on yachts. We are able to provide a complete mounting kit Marlec part no. CA-12/02 (figure 3).

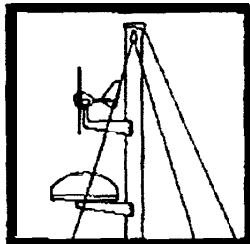


Figure 4

Mizzen

Mizzen mounting is suitable on larger yachts, taking advantage of greater wind flow the higher the wind turbine is mounted (Figure 4).

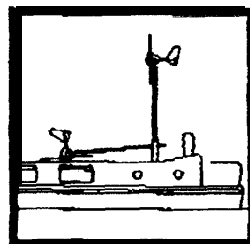


Figure 5

River-boats

A pivot pole is ideal for river boats as the windcharger can easily be raised and lowered (Figure 5).

LAND BASED SYSTEMS

The Rutland 913 is designed to fit inside an aluminium, stainless or steel tube with an internal diameter of 41 mm.

You may choose according to preference and site conditions:-

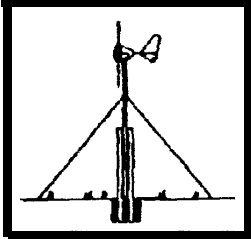


Figure 6

a) Pivot pole supported by guy ropes (Figure 6).

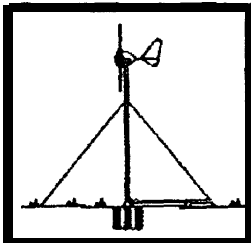


Figure 7

b) Tilting tower with gin poles supported by guy ropes (Figure 7).

Suggested Tower Constructions

A suitable mounting tower can be erected using a 6.5 metre (21 feet) galvanised (medium) water pipe. The tube must be a continuous length and be supported by a minimum of four guy lines.

The attachment points for the guy lines to the tower should be securely fixed to the tower. Guy ropes should be terminated with ground anchors or stakes.

The guy wires should be a minimum of 4mm in diameter.

The shackles should be a minimum 5mm in diameter.

Rigging screws should be a minimum 5mm in diameter.

All items should be galvanised or stainless steel for protection against corrosion.

Where guy lines are looped, the loop must incorporate a thimble and be fitted with a minimum of three rope grips.

PRE-ASSEMBLY (Batteries)

Leisure/Deep Cycle batteries are specifically designed for good Performance in terms of charge/discharge cycles. Batteries are the **most important part** of your battery charging system and should be sized according to your load requirements and provide at least 3 days reserve capacity. This will reduce cycling, prolong the life of the battery and ensure system reliability during periods of low winds.

We strongly recommend the SR.200 or RWS200 are fitted to prevent battery gassing in strong winds and is essential with gel/sealed batteries.

Linking two or more batteries

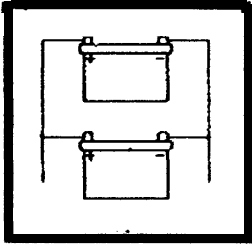


Figure 8

In parallel to increase amp hours (Figure 8).

In series to increase voltage. (Figure 9).

Permanent connections should always be made to the battery terminals. Never use crocodile clips or similar devices.

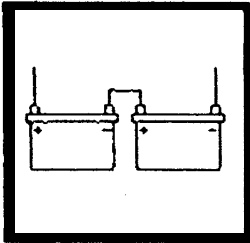


Figure 9

Battery terminals should be well greased with petroleum jelly or similar.

PRE-ASSEMBLY (Cable Specification)

The cable used for connection of the Windcharger to the batteries should be in accordance with the table below.

| Cable Run (metres) | Cable Size (mm ²) | |
|-----------------------|-------------------------------|---------|
| | 12 volt | 24 volt |
| 01-20 | 2.5 | 1.5 |
| 21-30 | 4 | 2.5 |
| 31-45 | 6 | 4 |
| 46-80 | 10 | 6 |

The use of a smaller cable than recommended will reduce the Performance of the charging system.

APPLICATION

The SR200 is designed for use with the Rutland 913 Windcharger or solar arrays of up to 200 watts. An internal blocking diode allows more than one windcharger and regulator to be used in parallel charging a single battery or when a secondary charging source is used, (eg. marine alternator, mains battery charger, etc.)

Maximum power: 200 Watts

Recommended battery ampere hours: 100-300 Ah, CS 00, 12/24V.

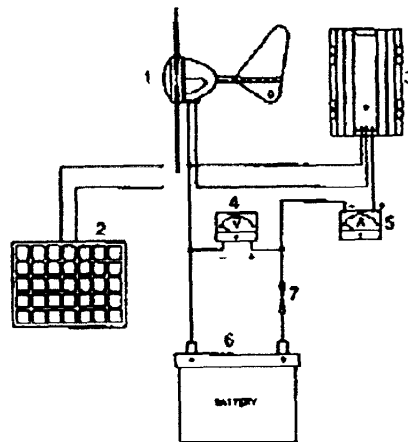
For higher charge current the SR200 can be paralleled. Contact manufacturer for more information.

SAFETY

Make sure the voltage label on the SR200 is the correct voltage for your system.

INSTALLATION

1. Ensure that any charging source is disconnected.
2. Mount the regulator in a safe position (see Warning).
3. Select cable connector block or crimp terminals capable of continuously conducting 15 Amps, keeping the wiring length to a minimum. The maximum distance from the battery should be 1.5 metres maximum.
4. Connect the negative lead first (- Black wire).
5. Connect the charging source lead (+ Gen, brown wire).
6. Connect the battery positive terminal (+ Batt, red wire).



1. Rutland 913 Windcharger
2. SR200
3. Voltmeter
4. Ammeter
5. Battery
6. Charge fuse (15 Amp)

Figure 13B. SR200 Wiring Diagram

7. UP AND RUNNING

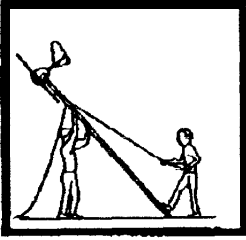


Figure 14

Before raising and securing the wind generator check that:

1. All final mechanical checks have been made.
2. The cable is not trapped.
3. All electrical connections are secure and safe.

The wind generator can now be raised into position (Figure 14).

Take care to avoid all moving parts when raising and lowering the wind generator.

When raised secure the structure firmly in an upright position. The performance of your windcharger can be impaired if the pole is not vertical. (Figure 15).

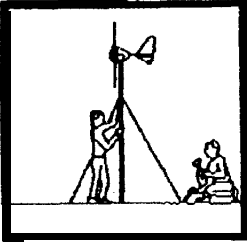
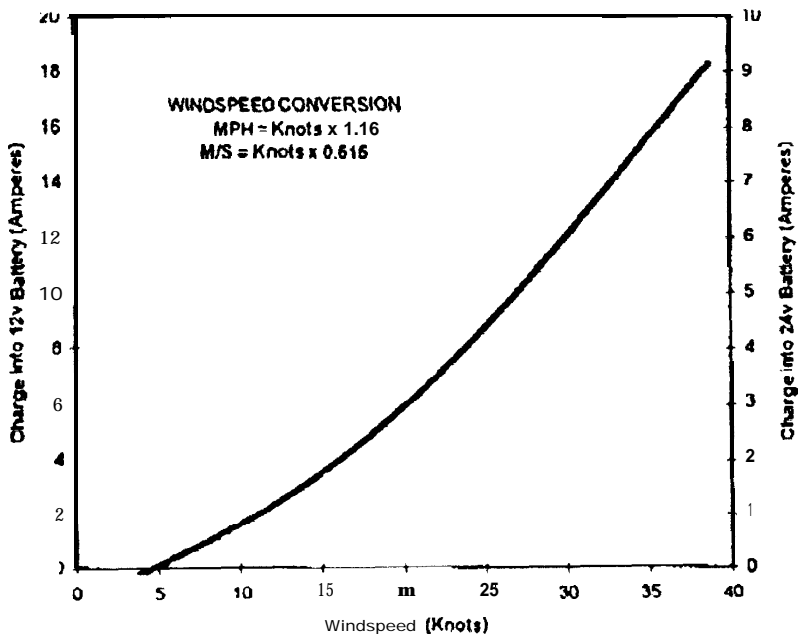


Figure 15

8. SPECIFICATION AND PERFORMANCE

Output Curve



Energy Stored

Ampere Hours (AH) of energy stored in leisure batteries from a Rutland 913 Windcharger over 24 hours.

| Average Windspeed (knots) | Output (Amps) 12v Battery | Total AmpHours 12v Battery | Output (Amps) 24v Battery | Total Amp Hour 24v Battery |
|---------------------------|---------------------------|----------------------------|---------------------------|----------------------------|
| 10 | 1.6 | 38.4 | 0.8 | 19.2 |
| 14.5 | 3.5 | 84 | 1.75 | 42 |
| 19.4 | 6.0 | 144 | 3 | 72 |
| 29.1 | 9.5 | 288 | 4.75 | 144 |

Wind speed Conversion : MPH = KNOTS x 1.15 M/S = KNOTS x 0.515

Wind Measurement Conversion Table

| Beaufort Number | Description of Wind | Knots | Average velocity | |
|-----------------|----------------------|----------|------------------|---------------|
| | | | Miles per Hour | Metres/Second |
| 0 | Calm | 0 | 0 | 0 |
| 1 | Light Air | 2 | 2.3 | 1 |
| 2 | Light Breeze | 5 | 5.8 | 2.6 |
| 3 | Gentle Breeze | 9 | 10.4 | 4.6 |
| 4 | Moderate Breeze | 13 | 15 | 6.7 |
| 5 | Fresh Breeze | 19 | 21.9 | 9.8 |
| 6 | Strong Breeze | 24 | 27.7 | 12.4 |
| 7 | Moderate Gale | 30 | 34.6 | 15.5 |
| 8 | Fresh Gale | 37 | 42.7 | 19.1 |
| 9 | Strong Gale | 44 | 50.8 | 22.7 |
| 10 | Whole Gale | 52 | 60 | 26.8 |
| 11 | Storm | 60 | 69.3 | 30.9 |
| 12 | Hurricane | 68 | 78.5 | 35 |