

# Rutland 1200 Terrain Windcharger

When you need a reliable source of power at an off-grid site, take a look at the Rutland 1200T turbine.

Designed, developed and manufactured by Marlec in the UK, our latest Rutland 1200 Terrain captures the energy in the wind to provide the power you need for operating low energy devices at remote locations. The energy is stored in batteries, ready for when it is needed and these can also be separately charged in parallel with solar panels or generators.



## Suitable Applications:

- Railways & Highways
- Environmental Monitoring Sites
- Telecommunications Sites
- Remote Homes
- Caravans & Motorhomes

## Generate Power For:

- CCTV
- Telecommunication
- Instrumentation
- Street lighting and signage
- Lighting, refrigeration, TV etc



Railway Monitoring System



Seismic Monitoring System



Traffic Control



CCTV System

The Rutland 1200 Terrain combines a highly efficient wind turbine with innovative design features and a technologically advanced controller. Together they generate real-life levels of power that lead the market of micro wind turbines.

# Rutland 1200 Turbine Features

## Unique Tri-Namic Aerofoil Blades

The refined aerofoil blade profile is purpose designed for quietness, low windspeed start up and high wind peak aerodynamic performance. Each injection moulded blade is identical and perfectly balanced for smooth operation.

### Benefits

- A rotor that remains virtually silent across all windspeeds.
- A very low cut-in windspeed that starts charging at <math>3\text{m/s}</math> (6mph/9kmph)
- Unrivalled power generation of 250W at 10m/s (23mph/37kmph) and peak power of 483W @ 15m/s.

Our efficient, finely profiled Tri-namic blades ensure that the Rutland 1200 converts the maximum energy available in the wind to charge your batteries.

## Elegant and Aerodynamically Styled

The sculpted nose and nacelle efficiently direct the flow of air leading to the built-in tail fin which directs the rotor to the prevailing wind.

## Our Build Quality

The Rutland 1200 Turbine sets the standard for micro wind turbines in both performance and reliability. At our manufacturing facility in Corby, UK we use high grade materials to create a robust, high quality and long lasting turbine. Distinctive blue hard anodized marine grade aluminium, modern and lightweight UV stable injection mouldings and stainless steel components and fasteners perform in temperatures experienced from the Arctic to the equator.

Available in 12V 24V & 48V versions.

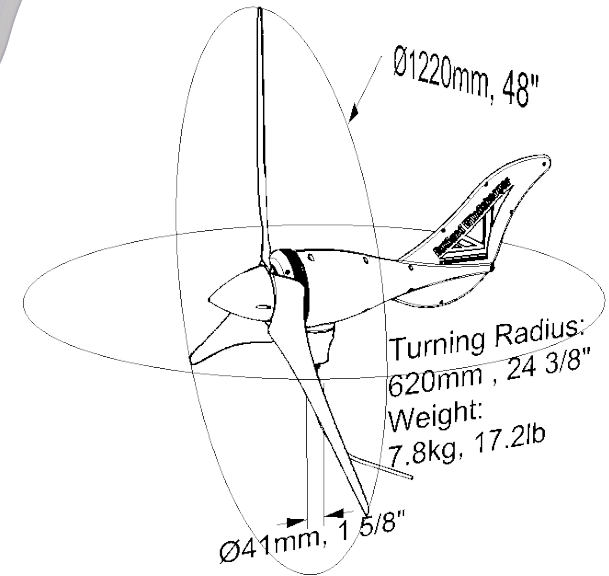


## Generator

The Rutland 1200T generator is based on Marlec's pioneering disk type design. Its low resistance AC operation combines the latest powerful rare earth type magnets with a 3-phase winding and low friction bearings. This is housed in a protective aluminium casing and all manufactured by Marlec in the UK.

### Benefits

- Cool operation which increases efficiency and reliability.
  - The low resistance generator works in harmony with the aerofoil blades and controller to ensure that across the whole range of windspeeds the Rutland 1200T generates the maximum energy possible from the available wind.
  - The generator is sealed to withstand weather conditions around the world.
- The overall benefit is greater Ampere hours of energy delivered to your battery.



# MPPT Terrain Controller

This purpose designed Rutland 1200 Terrain charge controller incorporates hi-tech and other optional features to fully optimise power generation from the turbine system and prevent overcharging.

## Operating Technologies

**Maximum Power Point Tracking** - MPPT technology is an intelligent microprocessor controlled feature that electronically optimises power generation. This enables the Rutland 1200T system to commence charging at very low rotor speeds, maximising typical daily low to medium windspeeds.

**Overcharge Control**- Digital technology used by our engineers very effectively prevents batteries overcharging. Battery voltage levels are continuously monitored and as full capacity is reached the turbine speed is controlled thereby preventing overcharging. The blades may run slowly and automatically resume normal operation as the battery depletes.

**Multi-Stage Charging Regime** - An algorithm embedded within the overcharge control provides multi-stage charging to maintain it through Bulk, Absorption and Float phases. The system responds to changes in the state of the battery to deliver as much available energy to maintain or reach full charge capacity. This charging regime promotes good capacity and battery longevity.

The controller is a key component in the Rutland 1200T's holistic design providing intelligence at managing the energy, the turbine and the battery to achieve maximum Ampere hours of charge to the battery bank per day.

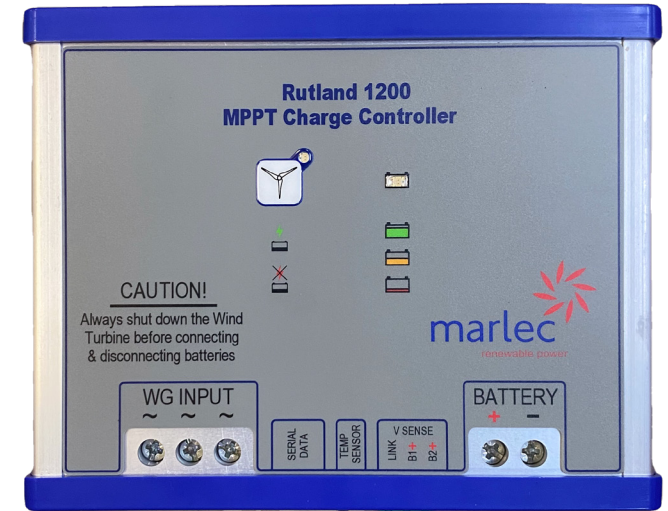
## Connection Features

Optimal performance of battery regulation is determined by the accuracy of voltage level readings and the Rutland 1200 Terrain controller includes vital connection facilities to support good performance of your battery bank. These are:

**Temperature Compensation** – A temperature sensor is included and when fitted this feature automatically adjusts the charging regime voltage levels according to any variation from the standard 25°C settings. This ensures batteries reach and maintain full capacity whatever the ambient temperature.

**Remote Voltage Sensor** – This sensor wire facility detects battery voltage levels for the controller operation when batteries are positioned >1.5m away. This overcomes voltage drop that may occur in long cables preventing full charging performance. 2 positions are available in the event that 2 separate battery banks are connected via a separate charge splitter.

**Serial Data Socket** - Provides a connection for user options; Optional Remote Display, data collection for professional systems or Marlec Controller Interface Cable with App for programming of Voltage parameters and auto shut-down required for other battery types, e.g. Lithium.



## Operating Features

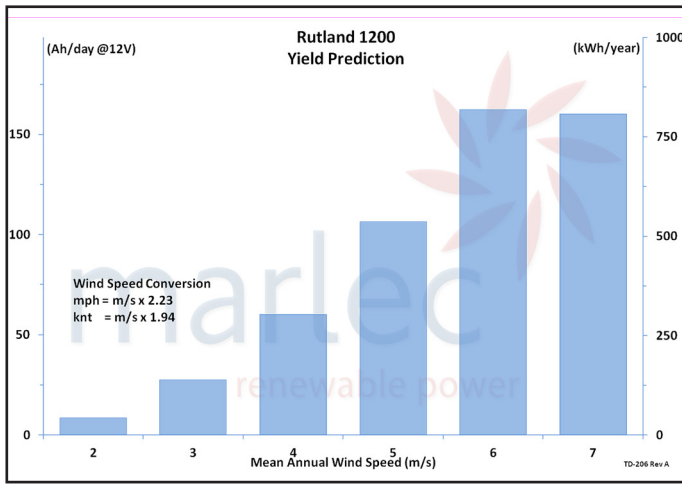
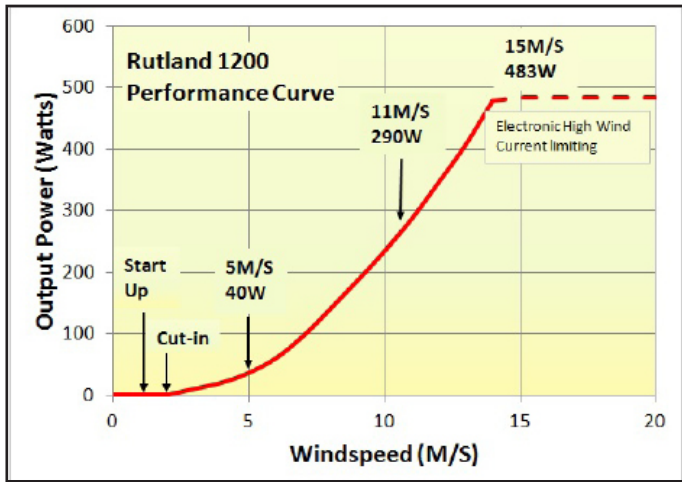
**Run / Stall Button with LED Indicator** – Used to manually start and soft stall operation. Soft-stall is a deceleration of the rotor until it eventually spins at a slow idle. Bi-colour LED indicates charging status; Standby, Charging and Regulating.

**Battery LED Indicator** – Tri-colour indicates battery charge level.

**Electronic Over Current Shut-down** – This protection automatically activates in high currents to reduce electrical load on the generator and mechanical load on the tower. This stalls the turbine and resets after 5 minutes, it may cycle in high winds.

**Electronic Over Temperature Shut-down** – Automatically activates if the controller internal operating temperatures are exceeded. The turbine is temporarily stalled.

# Performance



Windspeed Conversion: mph = m/s x 2.23 , knot = m/s x 1.94 , kph = m/s x 3.6

# Specification

Models Available	12V	24V	48V
Power / Current Ratings:			
5m/s 11mph	40W (2.9A)	40W (1.45A)	40W (0.75A)
11m/s 25mph	290W (21.3A)	290W (10.7A)	290W (5.35A)
15m/s 33mph	483W (35A)	483W (17.5A)	483W (8.75A)
Cut in Windspeed	2.5 m/s		
Generator Type	Low friction, brushless 3 phase alternator with high specification rare earth magnets		
Yaw Rotation	Slipping and brush gear for 360° free rotation		
Governing Devices	Electronic stalling for electrical protection and to prevent over-charging		
Post Fixing Internal / External Diameter	41mm / 48mm over a minimum of 600mm length to clear blade tips		
Minimum Tower Height	6m on land (20ft)		
Turbine Diameter	1200mm (48in)		
Turning Radius	620mm (24 3/8 in)		
Turbine Net Weight	7.8kg (17.2lbs)		
Controller Dimensions & Weight	168 x 147 x 52mm, 680g (6.6 x 5.7 x 2in, 1.49lbs) NB: 5cm clearance required on all sides		
Packed Weight & Dimensions	900 x 390 x 185mm, 11.25kg (35.4 x 15.3 x 7.2in, 24.8lbs)		



## Switch on to the benefits of using Marlec's clean renewable energy!

- Simpler, faster and lower cost installation compared to grid power
- Low or no running costs
- Enables installation of essential and safety equipment at remote sites
- An eco-friendly system to be proud of

*With over 40 years of micro wind turbine manufacturing and solar panel system designs, we have a wealth of experience in supplying renewable energy off grid, providing independent power for our customers. Contact our expert team for solutions you can trust.*

Designed, Developed and Manufactured in the UK by Marlec, **The UK's Oldest Renewable Energy Company.**

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