

# Rutland FM1803 Furlmatic Windcharger

Are you living off-grid or need power at a remote site? Then take advantage of the abundant power of the wind to generate your own free power using the FM1803-2 Furlmatic wind turbine.

This 1.8m diameter turbine needs only the lightest breeze to generate power which is conveniently stored in batteries ready for whenever it is needed. The FM1803-2 Furlmatic is designed for installation on land based applications and is renowned for its robust build and proven track record to withstand tough weather conditions.

## Suitable Applications:

- Railways
- Highways
- Environmental Monitoring Sites
- Telecommunications Sites
- Remote Homes

## Generate Power For:

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



Traffic Control



Seismic Monitoring System



CCTV

The Furlmatic 1803-2 turbine combines a robust and proven turbine and controller that can provide a valuable source of clean energy for critical equipment at isolated sites.

A Furlmatic 1803-2 turbine and solar panel hybrid system designed by Marlec can reduce or eliminate costly and difficult to access site visits.

# Rutland FM1803 Furlmatic Turbine Features

## Generator

The FM1803-2 generator is based on Marlec's pioneering disk type generator developed for our first micro wind turbine back in 1978. The rotor directly drives a 3 phase, brushless AC generator now incorporating high power rare earth magnets and low friction bearings. This produces variable frequency alternating current at approximately 120V L-L under normal conditions. Sliprings and brushgear enable the turbine to free yaw 360° on the tower to seek the wind without cables twisting.

### Benefits

- The high Voltage AC output enables the turbine to be optimally located at long distances if necessary from the controller using modest sizes and costs of cable
- The low torque generator is part of the holistic Marlec design optimising the aerofoil blades to the generator to extract maximum power available in the wind.
- The rotor and generator design create a high level of inertia that keeps the rotor spinning and generating power between gusts of wind thus increasing the potential ampere hours of power generation compared with other commercial turbines.
- Cool operation increases efficiency and reliability.

## Aerofoil Blades & Rotor

The rotor consists of 3 efficient aerofoil blades held at an optimised fixed pitch for variable speed operation over a wide range of windspeeds. A nose cone directs the flow of wind to the rotor.

### Benefits

- Each blade is individually injection moulded so equal weight and fine balance is achieved every time without manual adjustment.
- This consistency ensures quiet and smooth operation in service.
- The aerodynamic rotor runs in just 2m/s winds and generation starts at 3m/s.

## Furling Tail System

The FM1803-2 incorporates Marlec's well established protective mechanical furling system which in normal operation directs the turbine to face the prevailing wind direction. In wind speeds over 15m/s (35mph / 56kph) wind pressure activates the off-set tail fin rotating the turbine on its tower at right angles to the prevailing wind until the high winds subside.

### Benefits

- When active the furling tail naturally causes the rotor speed to reduce.
- This in turn provides protection from the forces exerted on the tower in high winds.
- Electrical output is also reduced promoting cooling within the generator.
- The simple gravity-induced furling mechanism occurs and re-sets automatically. It cycles in high winds and provides assurance of longevity of service at isolated and high wind sites.



## Our Build Quality

The FM1803-2 Furlmatic has been tried and tested over many decades and benefits from our continuous development and introduction of enhancements to power and service performance. Durable materials such as aluminium, stainless steel, glass filled injection mouldings and high quality paint finishes combine with the high build quality standards at our factory in Corby, UK to make this a turbine that will give many years of good service.

Available in 12V, 24V & 48V versions.

# NEW MPC-2 Controller

The Marlec designed and built MPC-2 Controller key functions are;

- To transform and rectify the high voltage AC to DC for battery charging
- Electronically optimise the performance of the turbine and prevent batteries becoming overcharged.

For the user it includes a built-in digital display, a Run / Stall / Reset button and connection features for increasing the effectiveness of charging the batteries to maximum capacity.

## Operating Technologies

**3-Phase Transformer and Full Wave Bridge Rectifier** - the turbine's raw high voltage AC input is converted to DC for battery charging at the rated voltage of the model. This feature enables the user to site the turbine at the best location for wind flow which may be some distance from the batteries and controller using smaller cables than would otherwise be required.

**Low and High Wind Modes** - Electronics switch power ratios between high wind and low wind operation to optimise the performance of the rotor according to the wind conditions. This enables the system to generate as much power as possible across the range of windspeeds and increase daily energy yields.

**Battery Overcharge Control** - The system charges continuously until the batteries reach 14.4V (per 12V) before switching to "stalled" mode to prevent the turbine from charging. Operation resumes to "charge" mode when the batteries fall to 12.5V (per 12V). The shutdown can be over-ridden to re-start the turbine before the lower voltage level is reached using the re-set button.

**Over Temperature Electronic Shutdown** – Built-in sensors activate fan cooling and in the event of high internal controller temperatures the turbine is temporarily stalled.

**Backlit LCD Display** – Displays user information and warnings including the mode of operation, battery volts, Amps, Watts and Ampere hours of generation.

**Run / Stall Button** – Starts, stops and re-sets operation of the turbine.

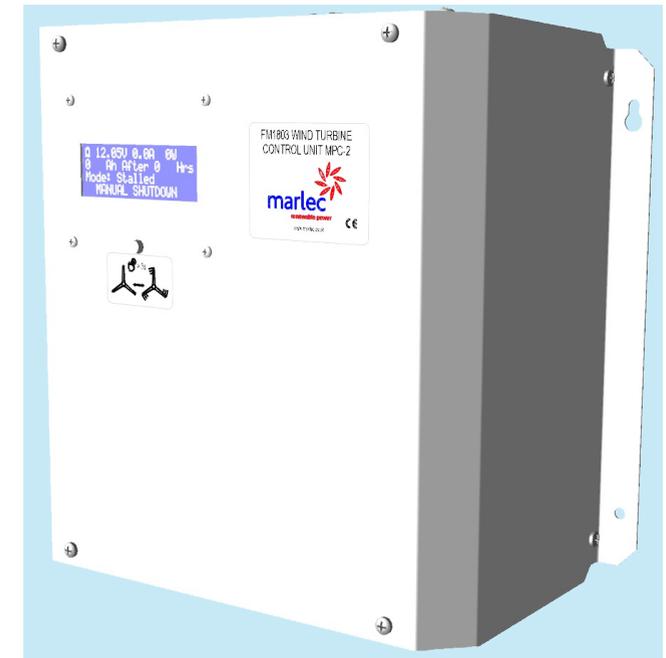
## Connection Features

### Sensor Wires

Optimal performance of battery regulation is determined by the accuracy of voltage level readings and the Rutland MPC-2 Controller includes vital connection facilities to support good performance of your battery bank. These are:

**Temperature Compensation** – A temperature sensor is included and this feature automatically adjusts the pre-set levels according to any deviation from the standard 25°C ensuring batteries reach and maintain full capacity whatever the ambient temperature. The sensor must be fitted.

**Remote Voltage Sensor** – This optional 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.

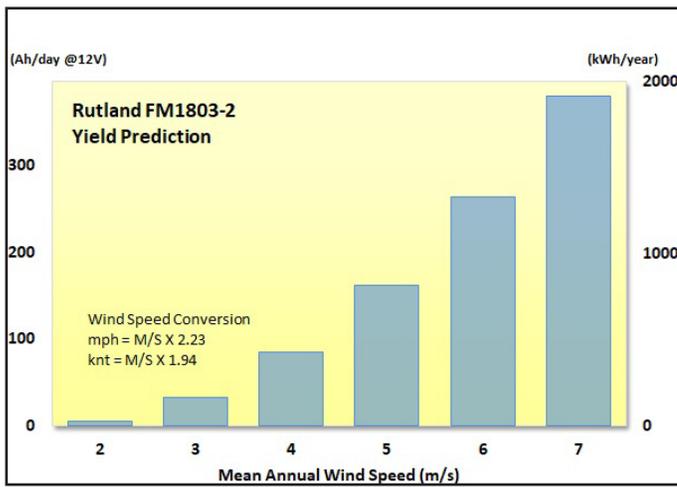
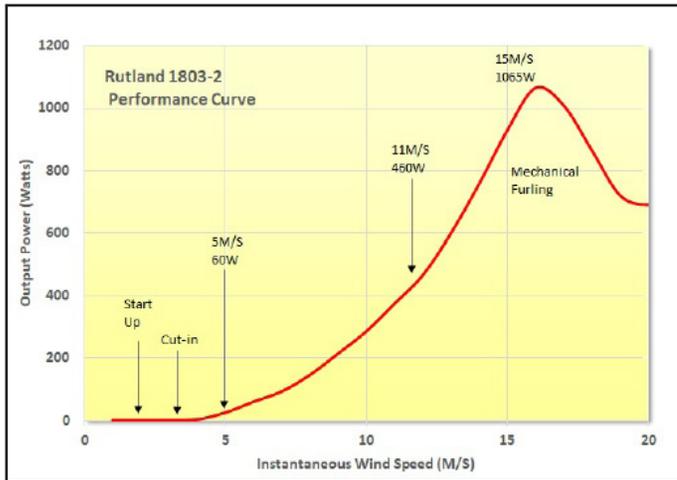


**Serial Data Socket** – Provides a connection for user options; Optional Remote Display, data collection for professional systems or Marlec Controller Interface Cable with App for programming of Voltage parameters and auto shut-down required for other battery types, e.g. Lithium.

**Remote Shutdown Connection Point** – this provides a volt free contact connection for the user enabling a remotely activated switch or relay in the circuit to shutdown the turbine.

**RUN/STOP SWITCH** – A separate RUN/STOP switch is supplied for connection between the turbine and controller enabling the turbine to held in a parked position if required.

# 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
<b>Power / Current Ratings:</b>			
5m/s 11mph	60W (4A)	60W (2A)	60W (1A)
11m/s 25mph	460W (32A)	460W (16A)	460W (8A)
15m/s 33mph	1065W (74A)	1065W (37A)	1065W (18.5A)
Cut in Windspeed	3 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	1. Electronic stalling for electrical protection and to prevent over-charging 2. Furling tail in high winds		
Post Fixing Internal / External Diameter	81mm / 91mm over a minimum of 1m length to clear blade tips		
Minimum Tower Height	6.5m on land (21.5ft)		
Turbine Diameter	1800mm (71in)		
Turning Radius	1145mm (45in)		
Turbine Net Weight	29kg (63.9lbs)		
Controller Dimensions & Weight	310 x 290 x 147mm, 12kg (12.2 x 11.41 x 5.78in, 26.4 lbs) NB: 10cm clearance required on all sides		
Packed Weight & Dimensions	1200 x 675 x 520mm, 75kg (47.24 x 26.57 x 20.47in, 165.3lbs)		



## 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.**

SB-145A 02.03.2021