
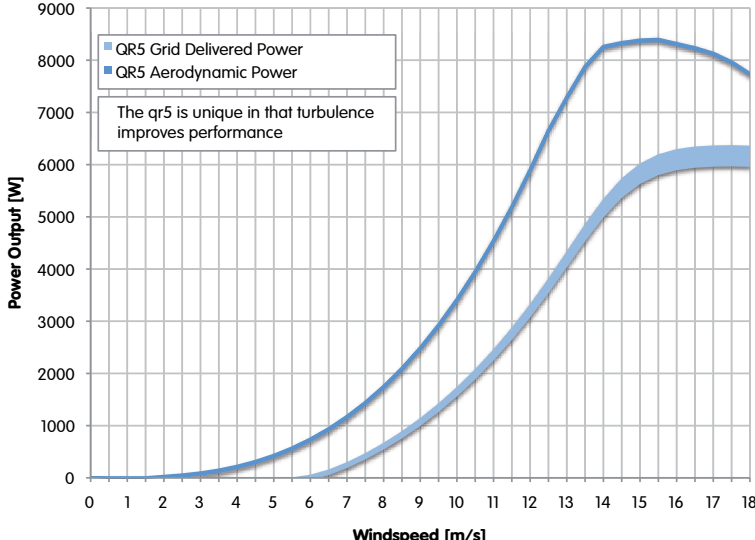


PRODUCT SPECIFICATION

qr5 VERTICAL AXIS WIND TURBINE

DESIGN	ROTOR SIZE	5m tall, 3.1m diameter Swept area 13.6m ² Mass 450kg																		
	MATERIALS AND COLOURS	Blades and spokes: Carbon and glass fibre Spool tube: Aluminium Static tube: Steel Turbines come in white (RAL 9010) Masts are galvanised steel as standard (silver) or can be painted																		
	MASTS	Turbines are mounted on 6m tilt down masts (shorter 3.4m alternative available for sites with space restrictions), or ground mounted on 15m tilt down mast																		
	GENERATOR	Direct-drive permanent magnet synchronous generator integrated into the base of the rotor																		
	OUTPUT	Up to 7,500 kWh per year (site wind dependant)																		
	POWER	The peak power at 15.5m/s is 8.2kW aerodynamic 7.1kW DC 6.0kW Grid The BWEA rated power at 11m/s is 4.6kW aerodynamic 3.3kW DC 2.3kW Grid (N.B. when comparing turbine ratings please ensure that the windspeeds are like for like. Alternative manufacturers may not quote at the BWEA rating windspeed, therefore comparisons should be made using the power curve)																		
	CONTROL ELECTRONICS	The Control Electronics Panels weigh approximately 36kg and measure 800mm wide by 1100mm tall by 300mm deep - this can be housed in a plant room or weatherproof enclosure. Multiple turbines can share a single metering board For more information the control system and electrical requirements, please contact us or visit our website: www.ocipenergy.com																		
TURBINE SYSTEM/UK PRICE	£20,000 (includes rotor, mast, control electronics)																			
ENERGY	ANNUAL ENERGY OUTPUT	<table border="1"> <caption>Annual Energy Output vs Average Mean Windspeed</caption> <thead> <tr> <th>Average Mean Windspeed [m/s]</th> <th>Annual Energy Output [kWh]</th> </tr> </thead> <tbody> <tr><td>4</td><td>~500</td></tr> <tr><td>4.5</td><td>~1000</td></tr> <tr><td>5</td><td>~1800</td></tr> <tr><td>5.5</td><td>~3000</td></tr> <tr><td>6</td><td>~4500</td></tr> <tr><td>6.5</td><td>~6500</td></tr> <tr><td>7</td><td>~8500</td></tr> <tr><td>7.5</td><td>~10000</td></tr> </tbody> </table>	Average Mean Windspeed [m/s]	Annual Energy Output [kWh]	4	~500	4.5	~1000	5	~1800	5.5	~3000	6	~4500	6.5	~6500	7	~8500	7.5	~10000
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SITE	GRID CONNECTION	<p>A three-phase grid connection is required – please note we do not currently offer a single phase or an off-grid/battery version. Included as part of the Control Electronics Panel is a turbine controller, inverter, Ofgem approved electricity meter and protection relay for grid connection</p> <p>A single qr5 can usually be grid connected with a simple notification to the electricity supplier. Multiple qr5s may require prior approval - applications to the electricity supplier can be completed by your qr5 installer</p> <p>For more information on grid connection please download our factsheet(s) from: www.ocipenergy.com</p>																		



POWER CURVE	<p>The graph below is the field measured power curve for wind speeds up to 18m/s. The graph shows Aero Power and Grid figures.</p>	  <p>Image of the qr5 during aerodynamic wind tunnel testing at the National Research Council of Canada (NRC)</p>
	KEY PRODUCT ADVANTAGES	<p>ACOUSTICS</p> <p>The aerodynamic helical blade design results in very smooth, quiet operation</p> <p>Various aspects of the vertical axis turbine design, including the low tip speed ratio, further reduce noise levels. In most instances the qr5 is quieter than background noise levels across its operating ranges</p> <p>For more information on noise, please contact us or visit our website: www.ocipenergy.com</p>
<p>REMOTE MONITORING</p>		<p>GPRS modem provides web-based monitoring of turbine performance</p>
<p>TURBINE SAFETY SYSTEM</p>		<p>Includes sensors incorporated into the design to detect any uncharacteristic behaviour or impact to the turbine and an emergency back up braking system</p>
<p>OPERATING WIND SPEEDS</p>		<p>Cut in at sustained 4.5m/s Cut out at sustained 19m/s, with power regulation above 14m/s Rotor speed 100-260RPM</p> <p>Minimum required Annual Mean Wind Speed (AMWS) 5.0m/s The qr5 turbine is optimised for operation on site with an AMWS of 5.5m/s</p>
PREDICTING ON SITE AMWS	<p>The effect of wind resource</p> <p>The biggest single factor on energy production for any wind turbine is the available wind resource. quietrevolution has invested considerable time and resource over the last few years to increase our understanding of the complex nature of on-site small scale wind resource. quietrevolution is now being recognised as an industry leader in methodologies for on-site wind prediction, especially where the wind environment is highly complex. We have provided information / input to the following organisations and projects:</p> <ul style="list-style-type: none"> • The Carbon Trust - to aid their verification of their on-line wind tool • The BRE - as part of their updates to the microgeneration installers standard • A partner company in the US funded DOE 2c wind prediction project • A lead company in the pan European project 'SmartCoDe' <p>We have also presented white papers on quietrevolution wind prediction methodology in the UK, Germany and the USA.</p> <p>quietrevolution use their understanding and knowledge of small wind prediction to instruct their distributors in how to better predict wind resource on complex and turbulent sites.</p>	