

D400

Wind Generator

The D400 is a direct-drive wind generator, designed for a variety of marine or terrestrial applications. It is exceptionally quiet and vibration-free in operation, qualities that are of major importance for any wind generator operating in close proximity to people.

The D400 features a powerful 3-phase alternator, and computer-designed rotor blades optimised for low speed, user-friendly operation.

This innovative machine is extremely efficient in low wind speeds, yet is capable of sustained high power outputs of over 500 watts in higher winds. Distinctive and elegant in design, the D400 is superbly engineered for long, trouble-free service.



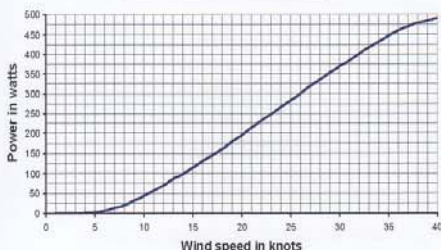
D400

- ▶ Rated output 400 W at 32knots (16 m/s)
- ▶ Available in 12 or 24 volt
- ▶ Rotor - 1.1 m. diameter
- ▶ Turning circle - 585 mm
- ▶ Weight 15 kilograms

Features of the D400:

- ▶ Specifically designed for installation on boats, and on or near buildings, caravans etc.
- ▶ Almost silent in operation
- ▶ Smooth running with optional integral anti-vibration mount
- ▶ Unparalleled low wind speed performance
- ▶ Low tip speed ratio, 1.1 metre diameter rotor
- ▶ Advanced variable camber airfoil blades
- ▶ Robustly engineered for long trouble-free service
- ▶ Highly efficient, low-speed, 3-phase axial field permanent magnet alternator
- ▶ Excellent heat dissipation with heavy duty encapsulated windings for sustained high output operation
- ▶ Aesthetically attractive design
- ▶ Corrosion-resistant materials used throughout
- ▶ Mounting tower 2" O/D tubing

D400 Wind Generator Output



D400.co.uk



Power Protection Solutions

30 Beach Street, Kippa-Ring, Qld 4021, Australia, P.O. Box 122, Redcliffe, Qld 4020, Australia

Phone +61 7 3283 7800, Fax +61 7 3283 7811

Email: office@powersolutions.com.au

Web: www.powersolutions.com.au

D400 Wind Turbine Specifications

Output	Rated Power (W)	400
	Max. power (W)	500 +
	Rated Wind Speed (m/s)	16.5
	Rated rotational speed (RPM)	1200
	Cut-in wind speed (m/s)	2.6
	Cut-out wind speed	none
Turbine	Turbine type	Horizontal upwind
	Number of blades	5
	Airfoil type	Low Reynolds - variable camber
	Diameter of turbine (m.)	1.1
	Swept area (sq. m.)	0.95
	Tip speed ratio	4
	Typical noise level	2 - 6 dbA over background
	Blade material	Glass-filled nylon
Alternator	Design	Direct Drive
		12 pole PMG
		3-phase AC
		Output DC
		High energy ferrite magnets
		Encapsulated stator
	Voltages available	12, 24, 48, 150 DC
	Materials	Alloy housing, hermetically sealed
		Alachrome and polyester powder coat
		316 S/S shafts
	EMI (electromagnetic emissions)	C.E. compliant
	Control system	Stall regulation
Brake system	Braking Switch	
Yaw System	Passive	Low resonance, formed aluminium tail
		Slip ring assembly with saddle spring loaded output brushes
Mounting	Stub tower	50mm O/D - 42mm I/D
Weight	Total	15 kg.
Finish	Colours available	White with white blades
		Black with translucent blades



Power Protection Solutions Pty Ltd

30 Beach Street, Kippa-Ring, Qld 4021, Australia

P.O. Box 122, Redcliffe, Qld 4020, Australia

Phone (07) 3283 7800

Fax (07) 3283 7811

Email office@powersolutions.com.au

Web www.powersolutions.com.au

Inverter / Chargers • Marine Switchboards • Battery Chargers • Desalinators • Generators

D400 Vs The Competition

(Taken from Practical Boat Owner Magazine Issue 467 Nov 2005)

*Best buy high output turbine for the bigger boat

This is a large machine with a large power output. The rotor was the same as the DuoGen, but is bolted onto the hub. This can be fitted the wrong way round, so follow the instructions. No mounting pole was supplied and Eclectic suggest the use of standard aluminium or steel scaffolding tubing.

Eclectic Energy claim that the D400 runs much more slowly than competing units and thus is much quieter - and indeed we found it to be exceptionally quiet. It gave a very impressive performance, cutting in at only five knots of wind speed.

Charging ability

With an average wind of only nine knots in July on the UK's south coast, output at low wind speed is going to be paramount.

The Aero2gen gives only about 0.3A at nine knots, producing about 7Ah per day. The Rutland 503, gave a little more at 0.4A, equating to about 10Ah per day.

The Aero4gen, AirX, Ampair Pacific 100 and Rutland 913 all produce about 1A at nine knots, so will produce about 24Ah per day - enough to run a very well insulated fridge.

The Aero6gen and the DuoGen both give about 1.5A at nine knots (manufacturers' claimed figures), so provide 38Ah per day for our average day.

The large D400 produces 3.8A at nine knots, so you are looking at a very respectable 91Ah per day.



TEST RESULTS

	Wind speed knots	Amps	Volts	Noise level
AEROGEN				
Aero2gen	10		12.3	quiet
	15	1	12.4	
	21	2	12.5	
	27	2	12.6	
	35	4	12.8	
Aero4gen	9	1	12.4	quiet
	12	2	12.7	
	15	3	12.8	
	17	4	13	
	19	5	13	
	20	7	13.2	
Aero6gen	9	2	12.9	quiet
	18	10	13.8	
AIR-X				
Air-X	No output recorded			light noise
AMPAIR				
Pacific 100	9	1	12.7	
	11	3	13	
	16	4	13	
	18	6	13.2	
	20	6	13.3	some noise
	25	7	13.5	above 20 knots
DUOGEN AND D400				
DuoGen	15	2	12.3	slight noise
	20	3	12.4	
	25	7	13	
	30	10	13.1	
D400	7	3	12.4	quiet
	15	7	12.8	
	19	12	13	
	20	16	13.9	
	25	21	14.3	
	30	30	15	
RUTLAND				
503	13	1	12.4	quiet
	20	1.5	12.4	
	25	2	12.5	
	30	5	12.8	
913	12	1	12.3	quiet
	16	3	12.5	
	20	4	12.6	
	25	7	13	
	30	14	13.8	

Charging ability

With an average wind of only nine knots in July on the UK's south coast, output at low wind speed is going to be paramount.

The Aero2gen gives only about 0.3A at nine knots, producing about 7Ah per day. The Rutland 503, gave a little more at 0.4A, equating to about 10Ah per day.

The Aero4gen, Air-X, Ampair Pacific 100 and Rutland 913 all produce about 1A at nine knots, so will produce about 24Ah per day – enough to run a well insulated fridge.

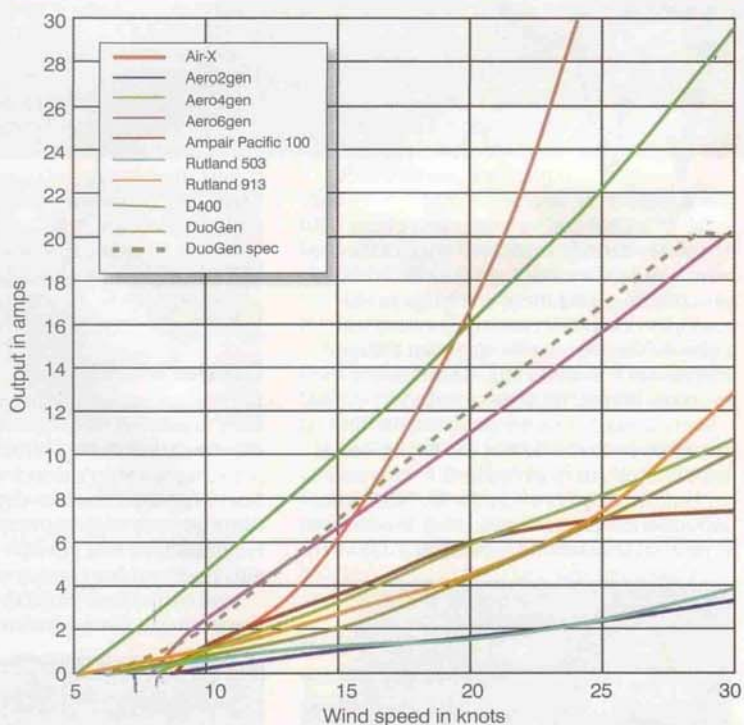
The Aero6gen and the DuoGen both give about 1.5A at nine knots (manufacturers' claimed figures), so provide 38Ah per day for our average day.

The D400 produces 3.8A at nine knots, so you are looking at a very respectable 91Ah per day.

* Manufacturers' figures

GENERATOR OUTPUT

	Amps at nine knots	Ah per day at nine knots
Aero2gen	0.3	7.2
Aero4gen	0.8	19.2
Aero6gen	1.6	38.4
Air-X	1*	24*
Ampair Pacific 100	1	24
DuoGen	1.5*	36*
D400	3.8	91.2
Rutland 503	0.4	9.6
Rutland 913	1	24

OUTPUT RESULTS

Conclusion

Wind turbines will be turning 24 hours a day, 365 days a year in all weathers and have a very hard life. Although we have indicated best buys, these cannot reflect the turbine's long term reliability or customer satisfaction. For that reason, personal recommendation and the use of the Internet forums (see www.ybw.com), will help the potential buyer to form his own opinion.

It's unlikely that wind energy will supply a cruising yacht's electrical requirements under average conditions. This mirrors what we found last month with solar panels. Using 60W of solar panels and a medium-sized wind turbine could produce around 50Ah per average day along the South Coast in summer – still well short of the average cruising yacht's requirements when not using marinas. However, in combination, they should allow extended time away from shore support if your battery bank is large enough.