

North West Sailing



Power

Power

- Batteries 12v or 24v
 - Charging
- Generator
 - Fixed
 - Portable
- Alternative
 - Wind
 - Solar
 - Water

Batteries

- The basics
- Fully charged 12.7v
- 50% charged 12.2v
- Flat 11.8v
- Subject to temperature

Amp/Hour

- Ohms Law $W = V \times I$
- A Nav light
 - 10w @ 12.7v = 0.78 amps
 - 110 A/H battery
 - Discharge to 50%
 - 70 Hours

Tri colour vers Bi +stern

- Tri colour
 - 70 hours
- Bi Colour and Stern light
 - 3 x 10w bulb
 - 30w at 12.7v = 2.36 amps
 - 110 A/H battery
 - Discharge to 50%
 - 23.3 hours (2 nights)

Power Calculation

- Electronics
- Lights
 - Nav
 - Cabin
- Fridge/Freezer
- Water pump
- Other

Amps per day

Item	Power (w)	Amps	Time/hour	Time in 24H	Amp/Hour
Chartploter		5.0	1.00	24	120.00
Fridge		2.0	0.50	24	24.00
Nav light	10	0.8	1.00	12	9.45
Water pump		2.0	0.02	24	0.80
Cabin lights	30	2.4	0.17	12	4.72
				Total	158.97

Battery Bank

- For 160 amps per day
 - 50% so we need 320 amp/hour bank
- Replacing 160 amps per day
 - Engine
 - 60 Amp alternator (expect 40 amps)
 - Needed to be run for 4 hours

Engine charging

- 10 day trip
 - Engine run for 4 hours per day
 - 40 hours
 - 2lts/hour (35hp engine)
 - 80 lts of fuel for charging
 - 6lts/hour (100hp engine)
 - 240lts of fuel for charging

Generator Charging

- 4KW Gen Set
 - 1.2 ltrs/hour
 - 10 day trip 4 hours per day (40 hours)
 - 48lts of fuel for charging
- 2KW suitcase generator
 - 0.8ltr/hour
 - 10 day trip 4 hours per day (40 hours)
 - 32lts of fuel for charging
 - Disadvantage separate fuel type

Gen Set

- 4 to 10 KW of power
- Mains voltage
- Use
 - Charging
 - Water production
 - Cooking



Alternative power

- Solar
- Wind
- Water

Solar power

- Small return for cost
- Needs the sun
- 120W will give 9.4 Amps
- Typically 2-4 amps
- So
 - 6 hours at 4 amps
 - 24 amps
 - Still need 136 amps



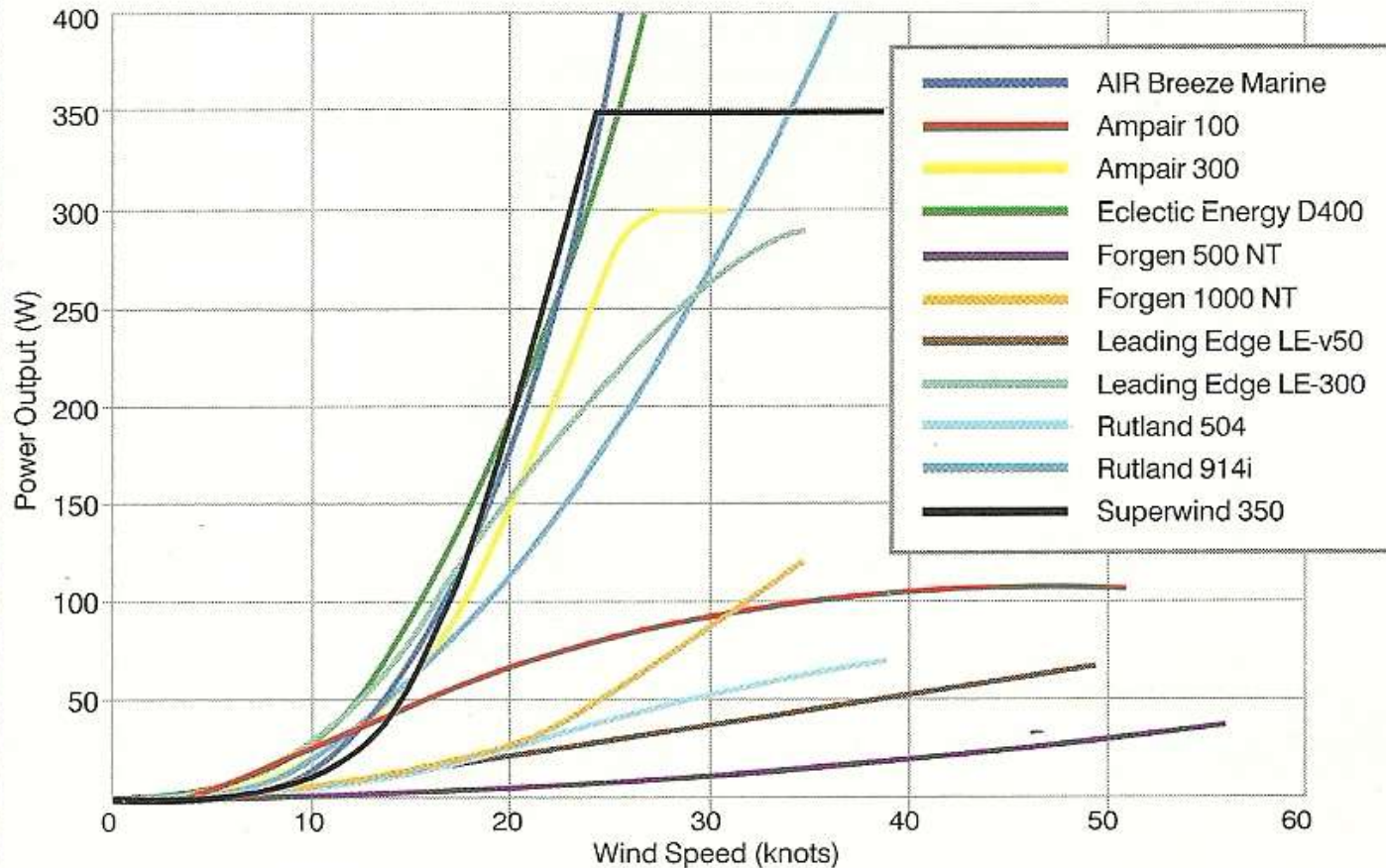
Wind

- Needs wind
- 2 amps at 13 knots
- 6 amps at 20 knots
- Apparent wind
- Either
 - 48 amps in 24 hours
 - 144 amps in 24 hours



Power output graph

Based on manufacturers' claimed performance. Many quote peak rather than mean power



Water

- Needs boat speed
- 8 amps at 6 knots boat speed
- 192 amps in 24 hours
 - Surplus power
 - 32 amps spare

