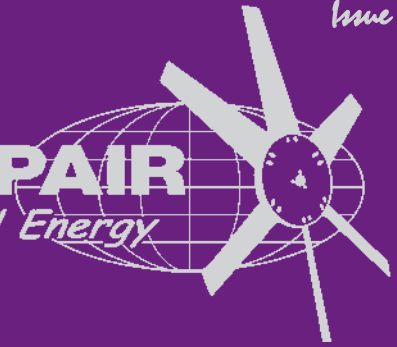




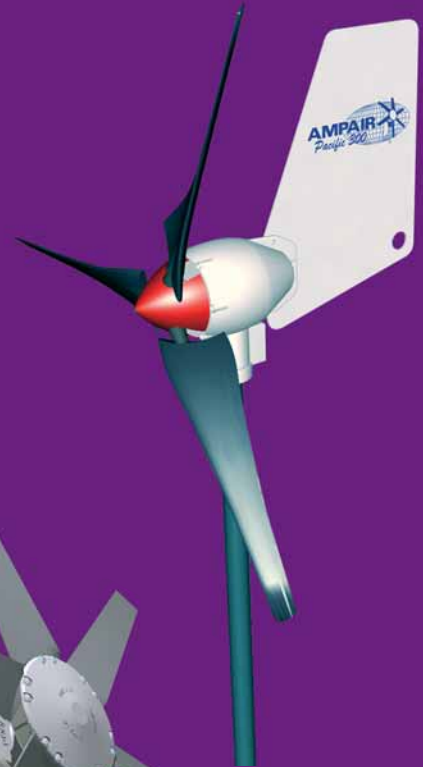
**AMPAIR**  
Natural Energy



# Wind and Water Power Catalogue

Other Catalogues Available

- 2** SOLAR POWER & EQUIPMENT FOR BATTERY POWERED SYSTEMS
- 3** SOLAR TOYS, KITS & EDUCATION PROJECTS
- 4** GRID & POWER SYSTEM EQUIPMENT



WIND



UNDERWATER



WATER

*Over 25 YEARS Experience  
in Renewable Energy!*

**AMPAIR NATURAL ENERGY**  
 Park Farm, West End Lane,  
 Warfield, Berkshire, RG42 5RH UK  
 Tel: +44 (0)1344 303 313  
 Fax: +44 (0)1344 303 312  
 Web Site: [www.ampair.com](http://www.ampair.com)

# Our Credentials

For more than 25 years Ampair has been working in the Renewable Energy Field.

Ampair **Wind driven** generators have been designed to survive the severest environments on land and sea.

Low speed turbines, aerodynamic blades and rugged construction ensures long life and reliability in situations where maintenance can often be difficult

**Water driven** (towed) generators have proved their worth in thousands of ocean crossings while submerged generators have been used by the commercial market for many years. Interestingly these underwater units are now providing power from the fast flowing streams near many remote "wilderness" homes.



Original Winner 2000

2003 Results! WIND

"There were 24 wind generators in our survey, the most popular being the Ampair/Aquair 100, which is a dual purpose model that can be converted from a towing generator to a wind generator and vice versa."

## WATER

"In its towing mode the Ampair/Aquair 100 was the most popular: There were 8 of these used as water generators, comments were very flattering "Excellent, after sales service is really good", Outstanding, and - interestingly - "saved our bacon"

Ampair

From: Paul Gipe [pgipe@igc.org]  
01 October 2001 23:44  
Sent: ases@ases.org; tom\_gray@aweaa.org; ampair@ampair.com; appacom@adam.es; appa@adam.es; oromero@retemail.es; info@gatev.de; aoc@vermontel.net; info@awts.pe.ca; atlantis-windkraft@t-online.de

Subject:

October 1,  
For immedia

"Noise is critical to siting small wind turbines," says Paul Gipe in an article in the current issue of the Danish trade magazine WindStats. The previous article examined the power curves of several small turbines and appeared in the Summer 2000 (Vol. 13, No. 3) issue.

Like the top small machine literature. Wind Turbine Field in Cal Gipe found meet their p two of the expected for noisy.

The article on acoustic noise from small turbines is the second in a series of hard-hitting articles by Gipe, a WindStats contributing editor. The previous article examined the power curves of several small turbines and appeared in the Summer 2000 (Vol. 13, No. 3) issue.

Like the top small machine literature. Wind Turbine Field in Cal

Gipe found meet their p two of the expected for noisy.

The measurement reports about like a god wind turbine was threaten turbine-permanently. The turbine has since become a "nice wind sculpture," the owner complains in the article.

However, Gipe found that small wind turbines are not inherently noisy. The third turbine tested, the Ampair 100, was 20-dBA quieter when charging in strong winds than the other two turbines. The Ampair was so quiet it was difficult to measure, reports Gipe.

WindStats is one of the few magazines in the world that publishes technical articles on small wind turbines. As its name implies, the magazine regularly reports on the performance of wind turbines worldwide, and most of its pages are devoted to statistics on electricity production, failure rates, and other industry arcane

However, Gipe found that small wind turbines are not inherently noisy. The third turbine tested, the Ampair 100, was 20 dBA quieter when charging in strong winds than the other two turbines. The Ampair was so quiet it was difficult to measure, reports Gipe.

# WHY AMPAIR?

**CHECK THE FACTS BEFORE YOU BUY!**

**1**

## COPIES DON'T ALWAYS WORK!



Over 4000 AQUAIRS have been sold for use by long distance sailors all over the world.

Unlike some imitations, these generators are built up to a standard and not down to a price. Slender turbine blades and a long towline provide a reliable self-alignment system that operates independently of the yacht's motion and with negligible drag.

All round seals keep out the salt atmosphere while the gimbaling system has proved ultra reliable over many years and thousands of sea miles. Aquair is the Number 1 choice of serious sailors.

**2**

## IT MAY BE "TURNING" BUT IS IT CHARGING ?

One of the most common misconceptions is that if a wind driven generator is "turning" it is charging! Because of their design some competitor's machines freewheel long before they actually start charging. In light airs this may look as though they are working but they are not! AMPAIR'S Permanent Magnet Alternator design means that **WHEN AN AMPAIR IS TURNING, IT IS CHARGING!** This fact often means that an AMPAIR will generate more power over a period at low wind speeds.

**3**

## QUIETER BECAUSE OF THE DESIGN

AMPAIR machines are recognised as the quietest in the world. Some competitor's machines are even "banned" from marinas. Ask around, it's your sleep that will be disturbed!

**4**

## BUILD QUALITY?

Take a good look at any wind or water driven generator that you are thinking of buying. It is going to have to withstand the rigours of the ocean, hot and cold weather, salt water and massive thrust onto its bearings from the force of the wind .

**Compare the Rugged, Superbly Engineered construction of an AMPAIR against some of its "plastic" competitors!**



**IMPORTANT FACTS!**

**6**

## HIGH OUTPUT - BUT ONLY IN A STORM!

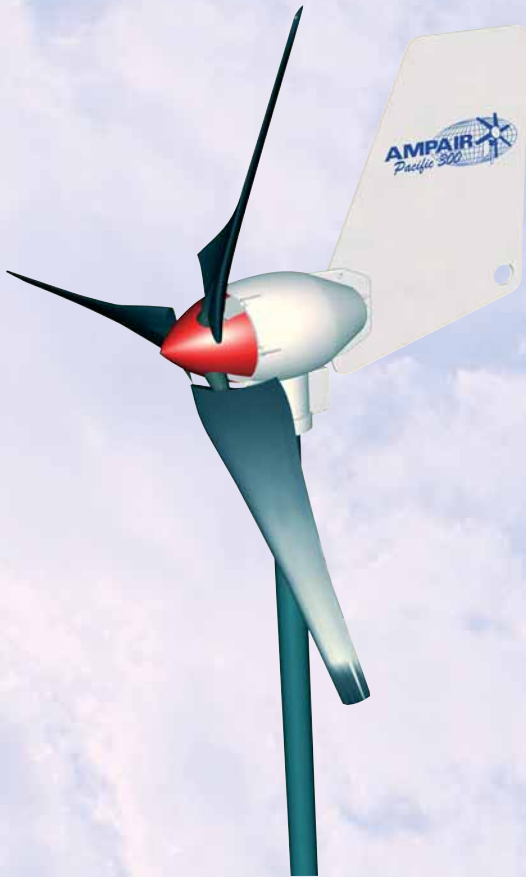
Don't be fooled by the suggestion that maximum charge is a regular occurrence. If you check, most "maximums" are achieved in near hurricane wind speeds. Typically the "average" wind speeds that can be expected during a wind driven generator's working life are below 20 knots. **AMPAIR generators are designed to produce OPTIMUM POWER in these conditions, yet are safe in a storm.**

**7**

## BUT IT'S HEAVY!

A Slow Turning Wind Turbine produces the least noise and vibration. It may be heavier, but will certainly last far longer. As the wind speed increases, so the thrust on the turbine can exceed the machine weight many times. Heavy-duty parts resist those forces, whilst lightweight units prove much less durable.

# Ampair Pacific 300 *300W Battery Charging Power 12V or 24V models*



- *High-Tech design of the PACIFIC 300 combines modern styling with low visual impact and non-intrusive operation.*
- *The accurate aerofoil construction of each turbine blade minimises noise and vibration optimising performance and improving the power to weight ratio.*
- *Integral sealing system protects internal components from condensation and corrosion.*
- *A powerful, low-speed alternator converts the turbine motion to 3 phase AC electricity.*
- *The vertical pivot gives current pick-up through slip rings and weather cocking via a balanced direction fin for upwind performance.*
- *Simple pole mounting allows easy fit to any mast or tower.*
- *Power outputs are continuous.*
- *The PACIFIC 300 operates without the need for thermal cutouts, chokes, commutator brushes or complex control electronics.*

## **OPTIMISED TURBINE DESIGN “LOW NOISE - HIGH OUTPUT”**

*Advanced aerodynamic design ensures that the Pacific 300 blades do not make “whooping” (vibration), “motorboating” (resonance) or “screaming” (flutter) noise.*

*The automatic blade “pitch control” provides a smooth turbine transition to constant speed in strong winds .*

## **THE AMPAIR PEDIGREE**

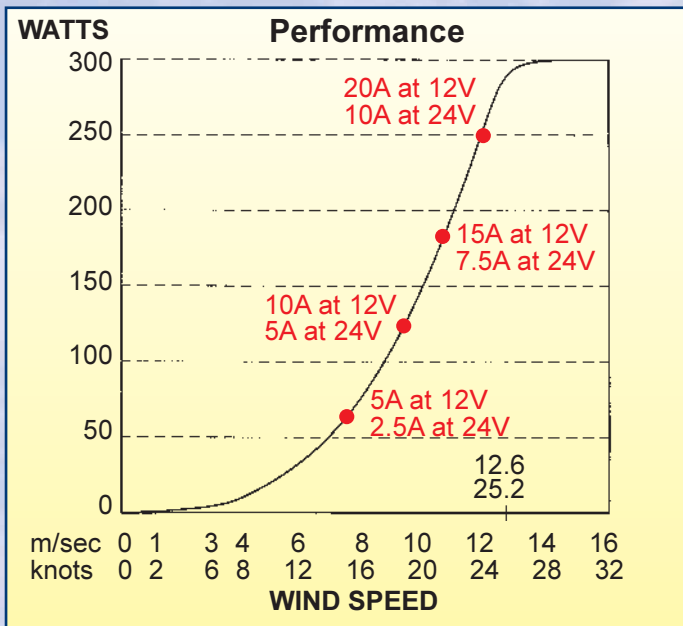
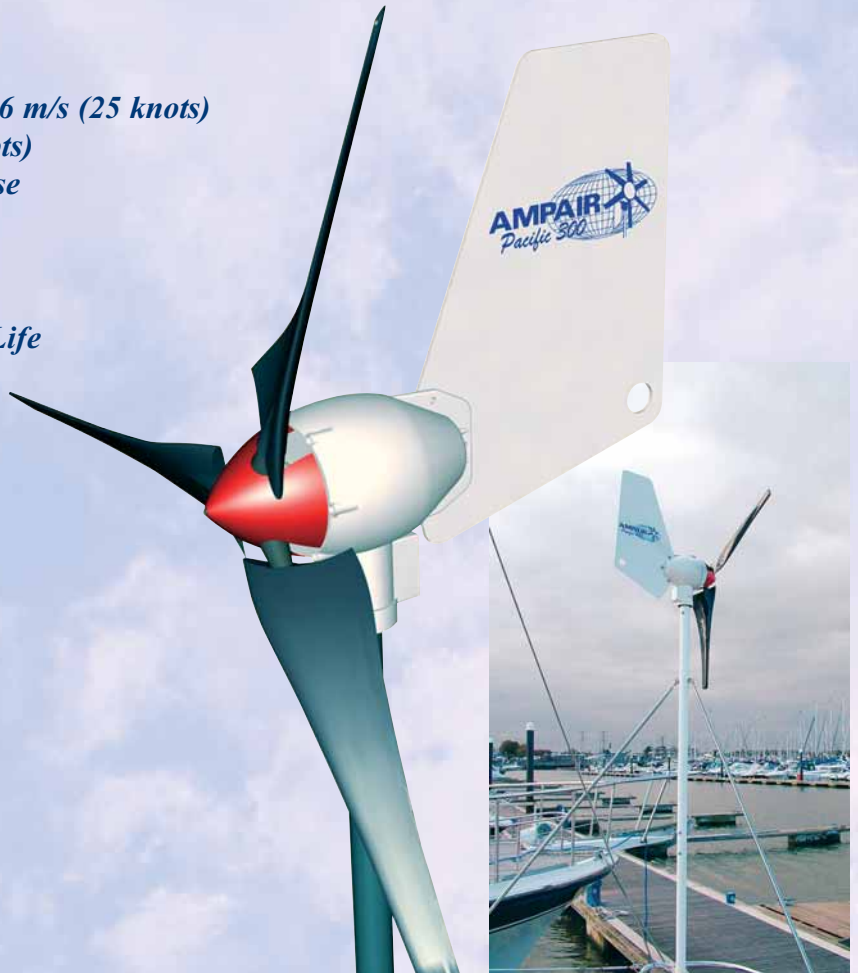
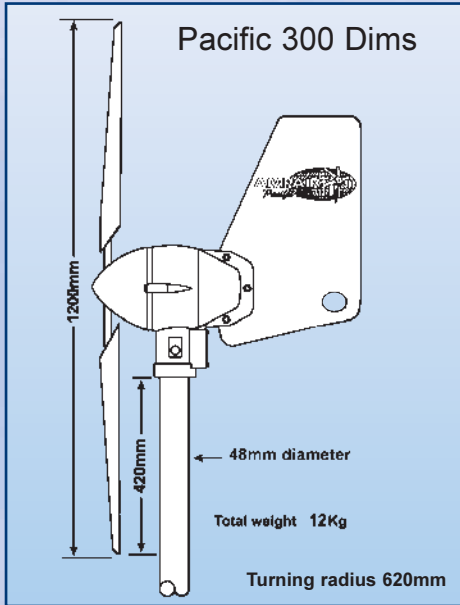
*The PACIFIC 300 has developed from over 25 years of continuous production of small wind-driven and water-driven generating systems for battery charging.*

*The knowledge and background for the design has evolved from a sequence of previous machines. Models rated from 50 watts through 75 watts to 100 watts being manufactured and marketed under the Ampair Natural Energy banner. The PACIFIC 300 is based on the practical experience gained by distributing thousands of these units worldwide.*

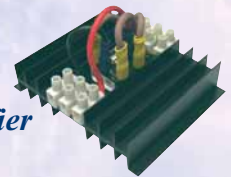


# Specifications

- 300 W Continuous Rating at 12.6 m/s (25 knots)
- Start-up Windspeed 3 m/s (6 knots)
- Performance without compromise
- Energy without Pollution
- Power where it's needed
- Strength where it counts
- Overspeed Protection for Long Life



Stop Switch



Rectifier



Waterproof Deck Plug & Socket



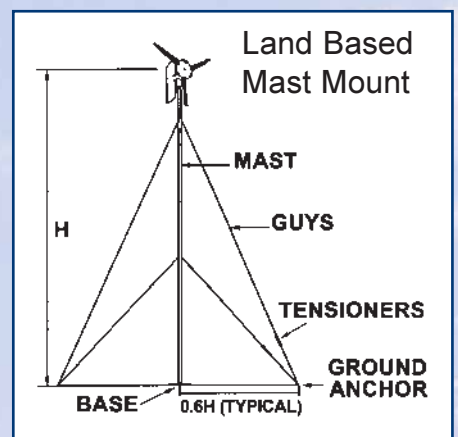
**REGULATION**  
see "Regulators" page 10

## TECHNICAL SPECIFICATIONS:

Power Rating	300 Watts at 12.6 m/s (25 knots) windspeed
Voltage Options	12 V or 24 V DC
Output	3 phase AC - External rectifier supplied
Start-up Windspeed	3 m/s (6 knots)
Over speed protection	Blade pitch control
Turbine Diameter	1.2 m
Weight	12 kg
Blades (3)	Glass filled polypropylene
Housing	Die cast aluminium (powder coated)
Colours	White or Black/Silver

## OPTIONAL ACCESSORIES:

Electrical - Waterproof Connector, Stop Switch, Ammeter, Battery Regulator  
Mounting - Stern Poles (sloop), Mizzen Mount (ketch), Land Based Mast



# Ampair Pacific 100

**Reliable Battery  
Charging All-day,  
Every-day  
FREE POWER for Years  
and Years**

*In true Ampair tradition, the Pacific 100 is a wind powered generator built up to a standard, not down to a price. Once installed, the Pacific 100 will go a long way towards having an energy independent system and the energy is free and non-polluting! The sleeker, more elegant Pacific 100 retains the proven features of its predecessors; simplicity of the design and uncompromised engineering. Driven by 6 cambered and twisted blades, turbine power is directly coupled to the generator. Up to 100 watts of continuous power can be produced by the permanent magnets rotating inside heavy duty windings that safeguard the generator from burn-out and eliminate the need for thermal cut-outs, chokes or 'state-of-the-art-electronics.' Electrical slip-rings and brushes allow the Pacific 100 to seek the wind and feed the simple two-wire battery connection.*

## PERFORMANCE

*The mechanical and electrical design of the Ampair Pacific 100 has resulted in the optimum matching of the turbine to the alternator, producing maximum conversion efficiency at normal everyday wind speeds (7-18 knots). The Ampair Pacific 100 out-performs its competitors at these windspeeds whilst still giving a safe and continuous output in storm force winds. Not just for cruising yachts, Ampair wind generators can be found on hunting cabins in Scandinavia, beach chalets in Tasmania, radar stations in Finland, and are used for radio repeaters in South Africa, telecommunications in the Falklands, several Antarctic Expeditions, in fact at any location where 12v or 24v battery charging is required.*

## RELIABILITY

*Engineered to be smooth running, quiet and vibration-free, the Ampair Pacific 100 is designed to survive the severest marine environments. All components are sealed to prevent corrosion.*

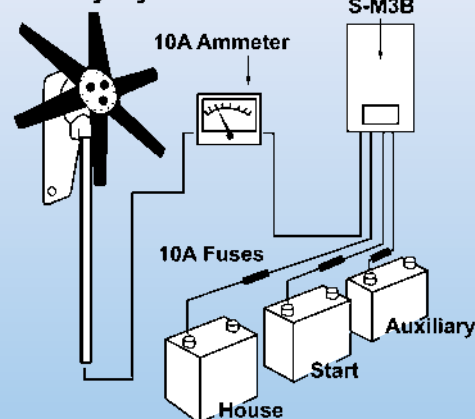


**Produces maximum output at normal coastal windspeeds**



**Hawk Colour Note!**  
*Land based version finished in unobtrusive black/silver*

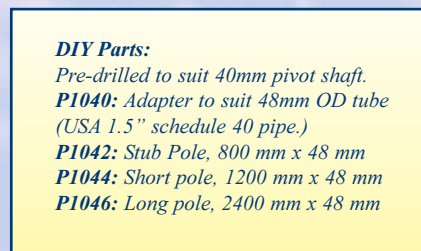
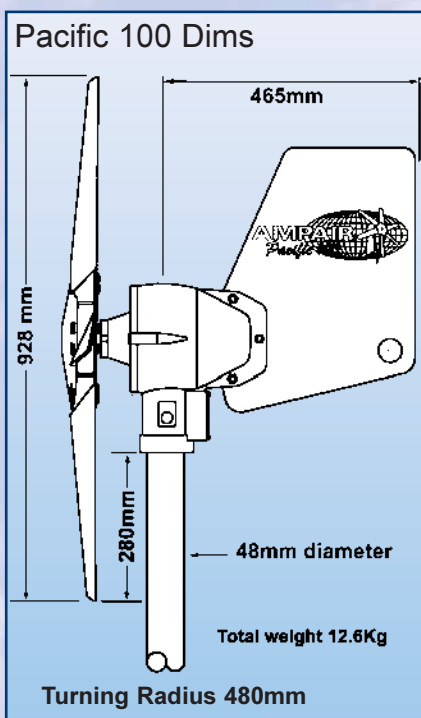
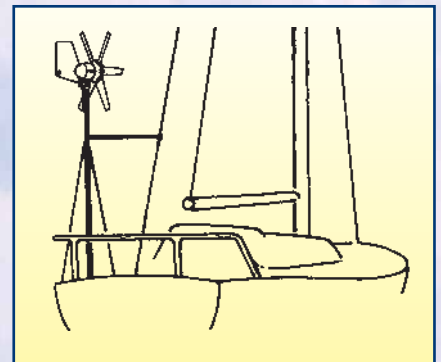
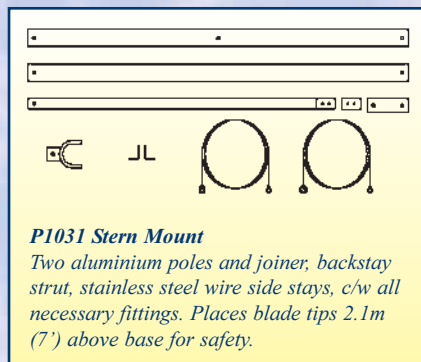
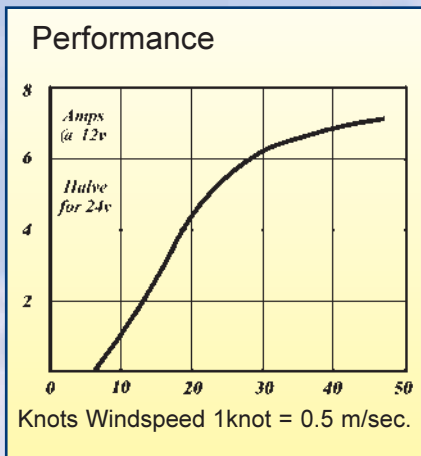
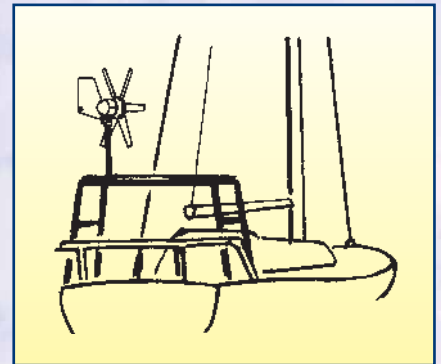
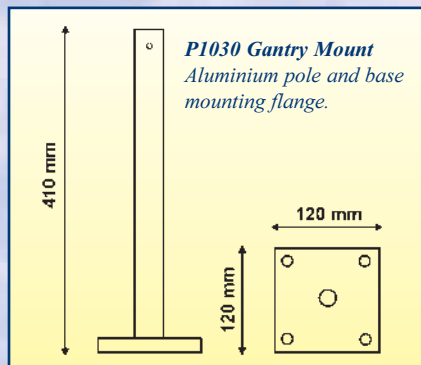
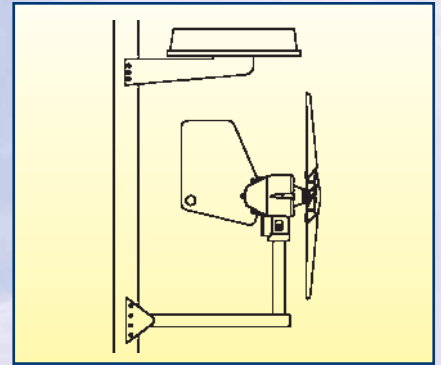
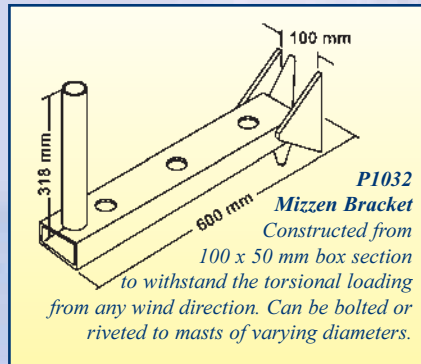
## Battery System



- Charges at Low Windspeeds.
- Charges Batteries from Flat.
- Extends Battery Life.
- Charging levels do not diminish appreciably as battery voltage increases.
- Smooth and quiet running.
- Easy to maintain, Simple to service.
- Sleek, Tough and Elegant.
- Totally Sealed for Long Life.
- Direct drive permanent magnet alternator with AC-DC rectifiers.
- No commutator brushes to wear out or give electrical noise.
- Built to survive Extreme Weather Conditions.

## Mounting Options

The Standard Generator is supplied with a 40mm diameter pivot shaft, 3 metres of output cable and a fitted gland. All poles and brackets are powder coated for long life.



- Turbine Blades:**
- Multi-blade turbine for easy start up.
  - Glass-fibre reinforced polypropylene gives high strength and excellent fatigue resistance.
  - Accurately Balanced.
  - UV resistant.



**REGULATION**  
see "Regulators" page 10

# Aquair 100

**Long Distance Power to Rely on**

**Proven over thousands of Ocean Crossings**

## **VERSATILE**

The Aquair 100 is easily mounted and de-mounted using simple rope system.

A Wind Turbine conversion is available for use at anchor.



## **THE AQUAIR PEDIGREE**

This machine has been proven over thousands of miles of ocean cruising. Reliability is achieved by using a towed turbine on a 30 metre line directly coupled to the shaft of the totally sealed alternator. The stainless steel gimbal ring provides a simple and automatic alignment method. Built to professional standards for long term endurance and backed by full manufacturer's warranty, the Aquair 100 is constructed of marine grade materials for minimal maintenance.

Only a spare turbine is recommended to cater for accidental loss.

## **ADVANTAGES**

Use of an Aquair 100 greatly reduces the frequency of engine running to recharge service batteries. The Turbine generates sufficient power to run an autopilot, maintain navigation equipment or support a fridge. It produces a continuous output of up to 6 Amps at 12 volts. Its Permanent magnet alternator with built-in rectifiers has no commutator brushes and the windings cannot overheat so it requires no thermal cut-outs or protection choke.

## **WATER DRIVE VERSUS WIND DRIVE**

Sailing downwind at 6 knots, the Aquair 100 Water Drive generates approximately 5 amps continuous charge. To obtain 5 amps of generation from the wind driven version while underway, the wind speed required is typically 30 knots (24 knots plus 6 knots boat speed).

**THE HYBRID SYSTEM**  
**Towed Turbine Generator when sailing.**  
**Wind Driven Generator when at anchor**



## **WIND OPTION**

Wind Conversion consists of a 6-blade wind turbine, direction fin plus swivel poles (or pole mount). This enables the Aquair 100 to be hoisted in the rigging or stern mounted for use at anchor.

## *Simplicity at Sea*

- **Reliable power on long voyages**
- **Totally quiet in operation**
- **Can be connected direct to battery**
- **Converts to Wind Operation in minutes**
- **High and Low speed turbines available**
- **Will charge a Flat Battery**

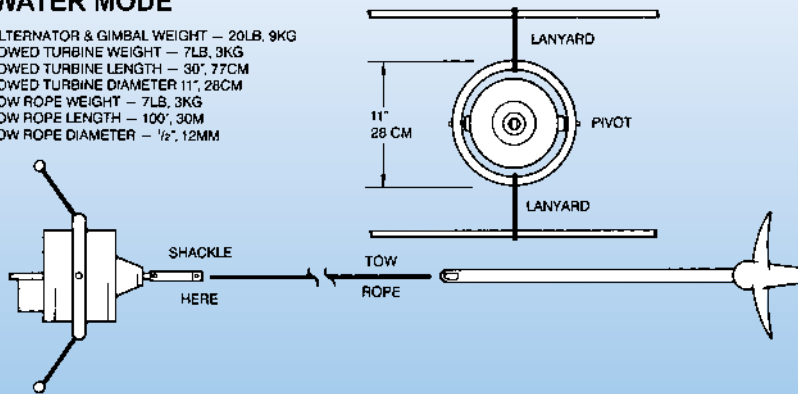


# Mounting Options



## WATER MODE

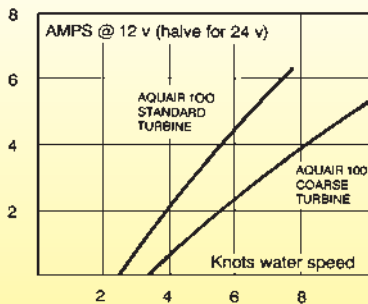
ALTERNATOR & GIMBAL WEIGHT — 20LB, 9KG  
 TOWED TURBINE WEIGHT — 7LB, 3KG  
 TOWED TURBINE LENGTH — 30", 77CM  
 TOWED TURBINE DIAMETER 11", 28CM  
 TOW ROPE WEIGHT — 7LB, 3KG  
 TOW ROPE LENGTH — 100', 30M  
 TOW ROPE DIAMETER — 1/2", 12MM



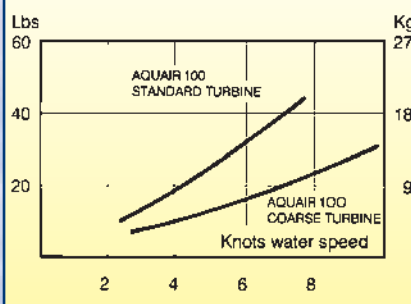
## WATER MODE

The AQUAIR is designed for yachts cruising at 4-7 kts. The standard pitch turbine surfaces at 7-8 kts and skips at higher speeds. The coarse pitch turbine suits yachts which sail at 8-12 kts. For yachts in between, use thicker tow rope or extended length, or add sinker weight to the turbine. The shaft connector will break if the turbine becomes trapped, to save the generator and rail. At normal cruising speeds the turbine will not noticeably slow the yacht.

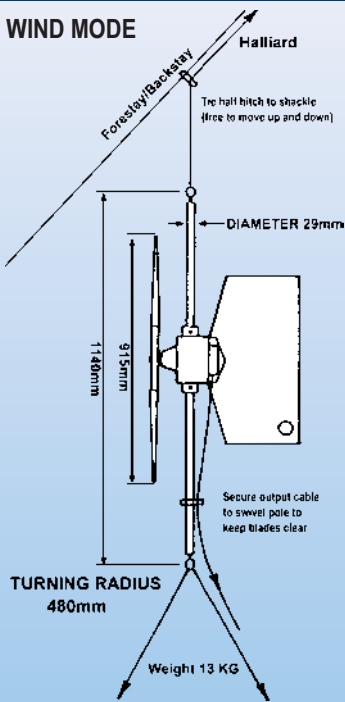
## WATER DRIVEN PERFORMANCE



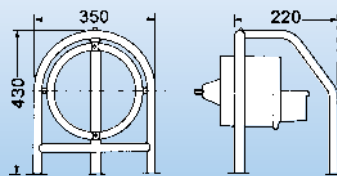
## DRAG



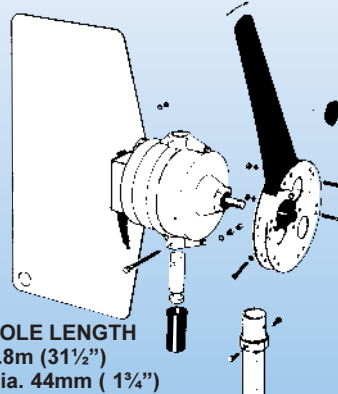
## WIND MODE



## DECK MOUNT (MULTIHULLS)



## POLE MOUNT



POLE LENGTH  
 0.8m (31 1/2")  
 Dia. 44mm ( 1 3/4")

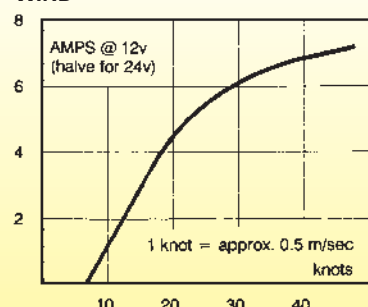
## WIND MODE

Rope only, use hoist-in-the-rigging system. Halyard lifts the AQUAIR into clear air, away from busy cockpit. No noise or vibration to worry about! Use the pole mount for yachts with stern gantry or similar. A short pole is welded, clamped etc. to an existing structure. A single electrical connection then serves wind and water modes.

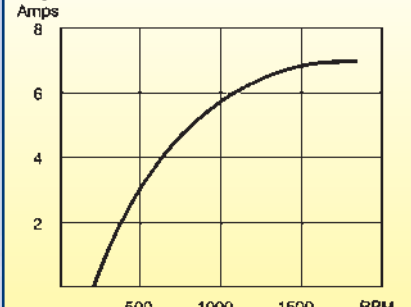
## REGULATION

A regulator is not normally required as the AQUAIR is usually used in a "live-aboard" situation.

## WIND



## TURBINE RPM



Waterproof deck plug & socket

# Aquair U.W.

## Pressure compensated sub-surface Generator

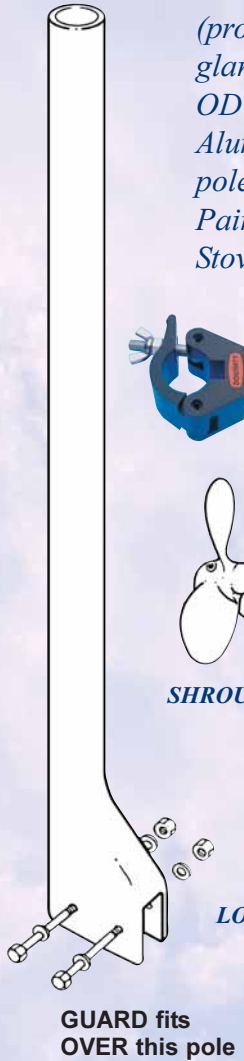
- 24 Hour Power
- Supplement Solar Power through Winter Months
- Operates under ice

The forward facing 3 bladed propeller drives a permanent magnet alternator producing up to 8 Amps output current for a 12-volt system. The shaft rotates in double seals for optimum protection, backed by twin "O" ring static seals at the rear of the casing. An internal moulding and external gland similarly double seals the cable exit.

The alternator body is filled with hydraulic fluid to eliminate corrosion and to equalise pressure changes caused by ambient temperature. Rectifiers supplied on separate heatsink.

**MICRO-HYDRO BATTERY CHARGING APPLICATIONS**  
Generate Up to 2.4 Kilowatts per day from any 400mm deep fast flowing stream. When mounted in a stream that flows at 15kph (slow jog), the Aquair U.W. produces 8 Amps continuously. This represents enough power to supply a typical remote home, independent of the main supply. Even a stream flowing at 10kph will produce 1.5 Kilowatts per day and this output can be increased by diverting the flow into a narrow culvert to increase flow.

**Mounting Pole**  
(protects cable & glands) 50mm OD x 1m or 1.5m Aluminium Alloy pole & casting. Paint finish, Stove White.



**Mounting Clamps**  
(fresh water)



**STANDARD**

**SHROUDED**

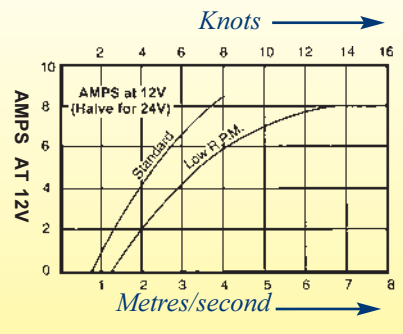


**LOW R.P.M.**



**GUARD fits OVER this pole**

### PERFORMANCE



### PROPELLER OPTIONS

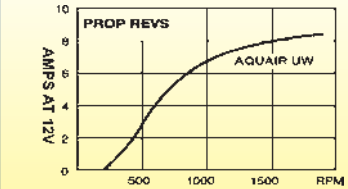
**STANDARD:** Ideal for low speed start-up (1.8kt). Charges at approx. 1Amp/kt thereafter Clockwise & counter clockwise propellers available, e.g. for twin installations on seismic floats.

**SHROUDED:** Shroud prevents fine rope or fishing line from winding around shaft and damaging seals.

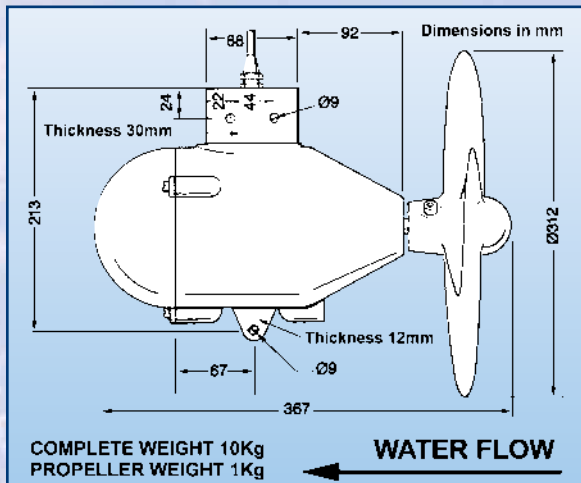
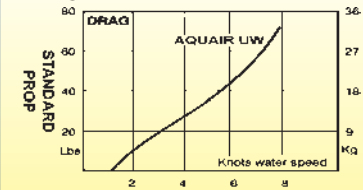
**LOW R.P.M.:** Designed for fast flows/high speed yachts. Delays charging and reduces drag until greater waterspeeds are reached



### PROP REVS



### DRAG



Stainless Steel (316-grade) guard protects propeller from damage by floating objects such as tree branches, weed and rope. 360mm dia. x 320 deep & fits over pole.



## Applications

- Remote Cabins
- Aqueducts
- Water Pipes
- Barges
- Yachts

Or any situation where there is a continuous water flow and zero head

# Regulation



- Solid State Design
- 12V or 24V Control
- Split Battery Charging
- Twin Source Option



**PR 300 Regulator**

## AMPAIR M-SERIES REGULATOR RANGE

The Ampair Pacific 100 can charge a battery independently or simultaneously with other sources such as solar panels and engine alternators. A range of automatic charge control regulators is available to prevent overcharging. These are not the 'shunt' type regulators, which dissipate excess charge as heat, but an electronic power switch which disconnects the generator from the battery once the desired voltage is reached.

- S-M1B-12** 12-volt, Single 100-watt input, one battery bank
- S-M3B-12** 12-volt, Single 100-watt input, up to three battery banks
- D-M1B-12** 12-volt, Dual 100-watt inputs, one battery bank
- S-M1B-24** 24-volt, Single 100-watt input, one battery bank
- S-M3B-24** 24-volt, Single 100-watt input, up to three battery banks
- D-M1B-24** 24-volt, Dual 100-watt inputs, one battery bank

All single (S-M1B) and triple (S-M3B) outputs are diode isolated from the battery and have a choice of High (Hi-14v) or Low (Lo-13.6v) voltage connections (Double for 24v). D-M1B regulators combine the charge of 2 x 100 watt generators, (two wind generators, or wind./solar combination) to a single battery bank, switching both simultaneously at the regulation voltage.

The "New Generation" PR300 regulator prevents battery overcharge by regulating the Pacific 300 output. Besides PWM control, the regulator has LED indicators showing wind generator power available (Charging) and set-point voltage reached (Charged). Links allow field selection of system voltage, 12V or 24V, and facilitate either the charging of 2 independent battery banks **OR** the combination of 2 independent charging sources; e.g. wind generator and solar panels.

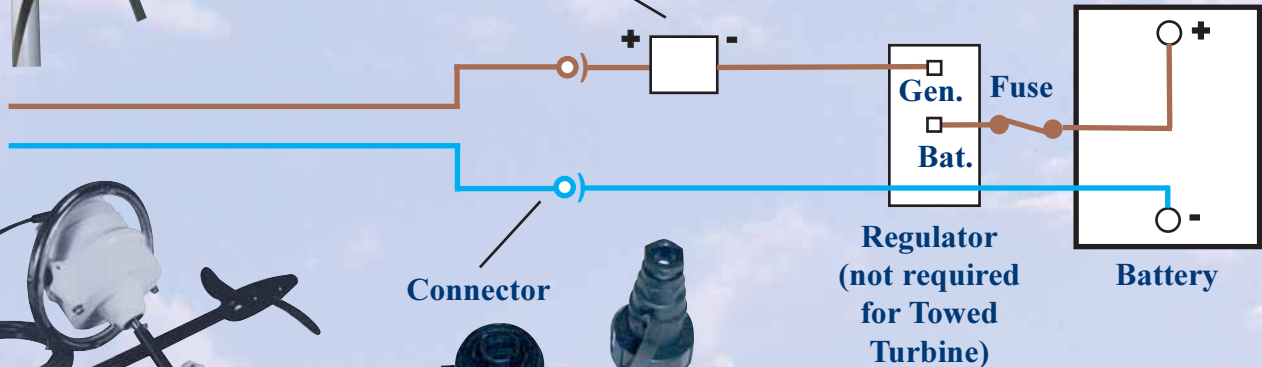


# Installations

**TYPICAL 100 Watt Installation**  
Two wire system, direct to battery  
Generator: deck connector,  
ammeter, safety fuse, regulator for Pacific  
(not normally required for towed turbine)



**Ammeter**



**Connector**

**Waterproof Deck Plug and Socket**





**Trailed for 10,000 miles since Dec. and still on the job.** At 30S 110W and heading for the Horn.

*Tim Trafford BT  
Inmarsat-C Fax*



## AMPAIR NATURAL ENERGY

**Park Farm, West End Lane,  
Warfield, Berkshire, RG42 5RH UK**

**Tel: +44 (0)1344 303 313**

**Fax: +44 (0)1344 303 312**

**Web Site: [www.ampair.com](http://www.ampair.com)**

**Greetings from the Frozen North.** I was already impressed with the performance and durability of the Ampair Pacific, but after the last 36 hours, even more so. It has stood in a very exposed spot for 4 months and endured winds of force 11 and flying ice. Yesterday and last night we were off the scale. Force 12 plus (65 knots). When we dug our way out of the tent it was still whizzing around. **A great bit of kit.**

*Mark Evans, [www.arcticyear.org](http://www.arcticyear.org)*



© This Catalogue is the copyright of Ampair Natural Energy, October 2005

**AMPAIR** is a division of Boost Energy Systems, manufacturing since 1957