

# EcoPower<sup>®</sup> Hybrid Ventilation







Established in 1934, Edmonds® is a pioneer in home, commercial and industrial ventilation solutions in Australia as well as across the globe.

Edmonds is passionate about delivering superior comfort and performance whilst reducing the overall impact on the environment. It is this vision of a 'sustainable future' which has resulted in the design and development of many energy efficient innovations. These include natural, wind-driven; hybrid and turbine ventilation technology.

Regarded as a leading industry innovator, Edmonds Ventilation products are engineered and manufactured at its ISO9001 accredited facility in Seven Hills, Australia. Edmonds was awarded the AIRAH Excellence in Sustainability Award in 2013 and Achiever Award in 2008. It was also recognised with a Good Design Award at the 2013 Australian International Design Awards and Master Builders Australia 2012 National Export Award.

With strong synergies between insulation and ventilation in the building industry, Edmonds was acquired by CSR Building Products Limited in 2005. Its mission remains to create Technologies for a Sustainable Future.



National Export Award for Edmonds Business



HVAC Achiever award for EcoPower®



Excellence in Sustainability award for Odyssey®



Quality Management standard for Edmonds Seven Hills facility

EcoPower® was selected by The University of Washington, Molecular Engineering Building to achieve LEED Gold certification.



EcoPower installed at Edmonds Seven Hills, NSW, Australia.

## EcoPower®

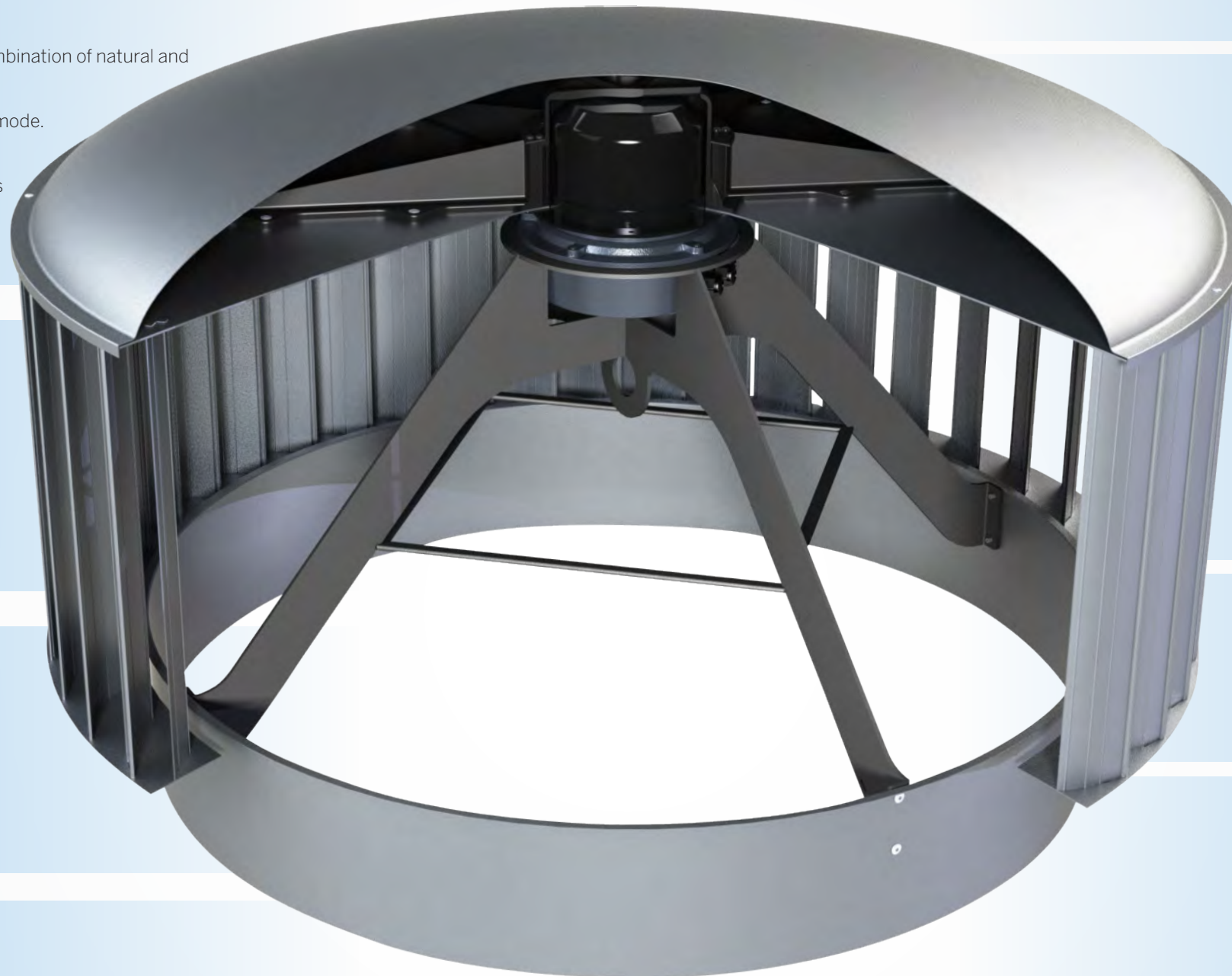
In a world first, EcoPower is a hybrid ventilation unit which incorporates Australian-engineered True-Hybrid™ technology.

Hybrid ventilation is defined as a "two mode (or multi-mode) system that is controlled to minimise energy consumption, while maintaining acceptable indoor air quality and thermal comfort"\*. EcoPower hybrid ventilation will work to ensure a constant supply of fresh air. It combines natural ventilation with a high efficiency electronically commutated (EC) motor in a single unit to ensure reliable and on-demand peak performance.

EcoPower is capable of operating unhindered in natural wind mode, or in both natural and energy efficient mechanical modes simultaneously. When required, performance is boosted by activating mechanical operation to ensure desired airflow rates are achieved. Even during mechanical operation, wind mode can improve flow rate performance.

\*Source : Luther, Mark and Chen, Zhendong 2002-2011, Emerging Technologies in Ventilation, BEDP Environment Design Guide, Vol. Tec 12, pp 1-10.





## TRUE-HYBRID OPERATION

- Australian-engineered world's first 'true-hybrid' patented ventilation technology.
- Hybrid ventilation technology that innovatively combines natural wind driven and efficient mechanical ventilation
- Wind mode (natural wind ventilation) or powered mode (combination of natural and efficient mechanical ventilation).
- Reliable airflow rate available when required through power mode.
- Natural ventilation generated by thermal buoyancy and wind siphoning pressure, can be utilised for further energy savings if conditions are suitable.
- Improved indoor air quality and occupant comfort.

## UNIQUE OPEN THROAT DESIGN

- Eliminated axial fan increases energy efficiency by minimising air friction.
- Patented hybrid design that enables an open throat to improve airflow performance.
- Improved co-efficient of discharge (Cd), providing better air flow rate in wind mode.

## HIGH PERFORMANCE EDMONDS VERTICAL VANE™ TECHNOLOGY

- Unique design allows ventilator turbine top to act as the centrifugal impeller.
- Improved co-efficient of flow (Cf), in natural mode compared to traditional spherical vents.

## CONTROLS

- Simple on/off operation.
- On/off control through optional external temperature and humidity controllers.
- BMS compatible for optional 0-10V variable speed control\*.
- Optional built-in variable speed control that responds to factory pre-set temperature range\*.

\* EP900 model only. Must be specified at the time of purchase

Note: Image for illustrative purposes only.

## HIGH EFFICIENCY EC MOTOR

- Advanced EC motor for long lasting performance and durability
- 0-10V variable speed control option available. Factory pre-programming required.\*
- Large input voltage range 200-277VAC and 50-60Hz.

## MATERIALS

- Exterior turbine constructed with marine grade, or better, aluminum alloy for superior corrosion resistant properties
- Mill finish or powder coated options to match most COLORBOND® colours.

## INSTALLATION BENEFITS

- Significant weight advantage (<40kg). Two-person installation may be achieved versus crane-lift for heavier competitor options.
- Lightweight design means additional structural strengthening of roof may not be required.
- Variable pitch base design can adapt to most roof angles. Special Bases can be custom made for known roof pitch

## SINGLE PHASE

- Ideal for retrofitting existing sites. No expensive 3-phase conversion required.
- Single phase power distribution are more commonly used, such as rural areas.

## QUIET OPERATION

- Virtually inaudible from typical background sound pressures, at 45.5 dB(A) at 3m for EP900, even in power mode.
- Ideal for residential areas, especially during night-time operation.

## WARRANTY

- EP400, EP600 and EP900: 10 year warranty for turbine body/2 year warranty for motor and accessories
  - EP100 and EP150: 5 year warranty for turbine body/2 year warranty for accessories/1 year warranty for motor
- Please refer to [edmonds.com.au](http://edmonds.com.au) for full warranty conditions





# ENERGY SAVINGS

An EP900 can save up to \$13,000\* on electricity cost over a 10 year period as measured against National Construction Code of Australia 2015 requirement.

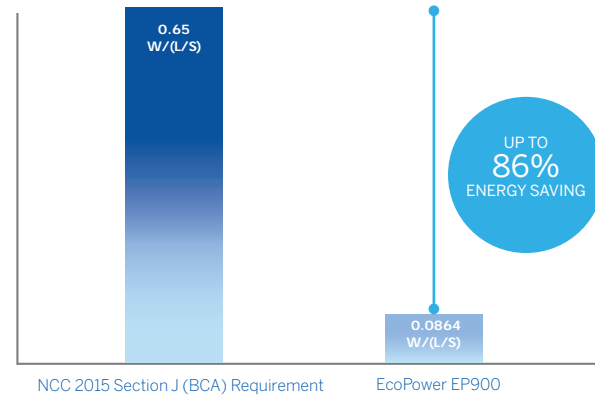
For a system without filters, the National Construction Code (NCC) 2015 Building Code of Australia (BCA) Section J 5.2a, states "when the air flow rate of a mechanical ventilation system is more than 1000 L/s, the system must have a fan power to air flow rate ratio" of 0.65 W/(L/s).

When measuring performance against the NCC requirement, an EcoPower EP900 has a fan power to air flow ratio of 0.0864 W/(L/s). This equates to an energy reduction of 86%.

Annual electricity cost calculation for a commercial building installed with 8 ventilators based on:

- 12 hours on and 12 hours off x 365 days
- Flow rate of 2,778 L/s per EP900 unit

This translates to a saving of up to \$10,000 per annum (86%) or up to \$100,000 over a 10 year period life when compared to the NCC 2015 BCA Section J requirement.



Technology	Power Usage (kW)	Fan Motor power to air flow ratio W/(L/s)	Annual Electricity Cost *(\$)
NCC# requirement	1.8	0.65	\$1576
EcoPower EP900	0.24	0.0864	\$210
Improvement	1.56 (86%)	0.5646 (86%)	\$1366

\* Based on 12 hours on / 12 hours off @ \$0.20 per kWh x 365 days for 1 unit  
# Versus NCC 2015 BCA Section J Requirements



EcoPower hybrid vents with temperature variable speed control was installed in Singapore's principle warehouse for Caterpillar products and spare parts for regional distribution.

# APPLICATIONS

## AUDITORIUMS, HALLS AND GYMNASIUMS.

Large spaces with high occupancy usage load are often accompanied by excess heat build-up. In many cases, natural ventilation is not adequate during times of high usage periods. EcoPower allows demand controlled ventilation to significantly increase the rate of extraction. This delivers better airflow control, improved occupant comfort and reduces the load on air conditioning systems.

## MULTI-STORY BUILDINGS - VENTILATION SHAFTS.

The Park at Pearl Ridge, Honolulu utilised EcoPower to replace noisy axial fans in the ventilation shafts. This delivered significant noise reduction for the apartment occupants as well as energy savings of up to 80% versus the previous system.

## CLASSROOM.

When ducted to the ceiling, EcoPower allows natural ventilation during the day to meet or exceed minimum outdoor air ventilation rates requirements of AS1688.2 and ASHRAE standard 62.1. The powered mode can be activated at night, by a timer or temperature sensor. The night purge operation removes excess heat in the room or building, allowing cool night air to cool the building down. This reduces air conditioning load and lowers energy consumption.

## INDUSTRIAL, FACTORIES AND WAREHOUSE FACILITIES.

EP900 can be configured and programmed to automatically respond to set temperatures. Applications include meat and dairy processing plants, refrigerated warehouses, dry goods storage and data centres.

List of EcoPower case studies at [edmonds.com.au](http://edmonds.com.au)

Epsom Girls Grammar Gymnasium, Auckland, NZ. 5 x EP900



The Park at Pearl Ridge, Hawaii, USA. 8 x EP600



Alexandra Hills State School, Queensland, AUS. 12 x EP600



Lifestyle workplace, New South Wales, AUS. 18 x EP600





Model	EP100	EP150	EP400	EP600	EP900
Power Source	Hybrid - Wind and electrical				
Dimensions on varipitch*					
Height Overall (mm)	323	343	574	734	962
Diameter Turbine (mm)	290	332	561	766	1093
Flashing Length (mm)	430	430	750	1000	1200
Flashing Width (mm)	430	430	700	1000	1200
Throat area (m <sup>2</sup> )	0.009	0.019	0.132	0.285	0.632
Mass*(kg)	2.5	2.7	9.4	18.2	36.0
Material					
Turbine Top	Aluminium 5005				
Varipitch	Aluminium 5005				
Flashing	Aluminium 5005				
Finish	Mill / Powdercoat				
Roof slope range - varipitch	0-45°	0-45°	0-45°	0-45°	0-22.5°
Sound					
Sound Pressure Level (LA) @ 3m distance & ΔP=0 (dB(A))	n/a	n/a	46	49	45.5
Electrical					
Phase	n/a	n/a	Single	Single	Single
Motor	Electronic Commutating (EC)				
Input Voltage	6-9 VDC	6-9 VDC	200-277 VAC	200-277 VAC	200-277 VAC
Input Voltage (Hz)	n/a	n/a	50/60	50/60	50/60
Max. running current draw (A)	1	1.1	0.28	0.47	1.21
Max. running power consumption (W)	9	9.9	68	116	240
Flow rate at ΔP=0 #					
m <sup>3</sup> /hr	116	255	2,400	4,280	10,000
m <sup>3</sup> /s	0.032	0.071	0.67	1.19	2.78
l/hr	116,000	255,000	2,400,000	4,280,000	10,000,800
l/s	32.2	70.8	667	1,189	2,778
Accessories					
Electric Dampers	No	No	Yes	Yes	Yes
Temperature Variable Speed Control	No	No	No	No	Yes
Thermostat	Yes	Yes	Yes	Yes	Yes
Humidistat	Yes	Yes	Yes	Yes	Yes
0-10V variable speed control	No	No	No	No	Yes
Special bases - spigot slope	No	No	Yes	Yes	Yes
Special bases - spigot ridge	No	No	Yes	Yes	Yes
Special bases - square to round slope	No	No	Yes	Yes	Yes
Special bases - square to round ridge	No	No	Yes	Yes	Yes
Special bases - spigot curb mount	No	No	Yes	Yes	Yes
Special bases - square to round pyramid	No	No	Yes	Yes	Yes
Special bases - spigot pyramid	No	No	Yes	Yes	Yes
Special bases - EX base	No	No	Yes	Yes	Yes
Sparkguard	No	No	Yes	Yes	Yes
Australian designed and built	Yes	Yes	Yes	Yes	Yes
Manufactured in ISO 9001 facility	Yes	Yes	Yes	Yes	Yes

\* Tolerance: Dimension +/- 5mm. Weight +/- 0.5kg

# Flow rate figures are based on testing conducted by CSR Edmonds and in accordance to ISO5801. Published flow rate results are optimal figures based on precision testing input and the other formulas are derived from fluid mechanics. Application results may vary due to external environmental factors, internal heat load, supply air capacity, construction materials and installation factors etc.

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