temperzone
QUALITY AIR CONDITIONING

eco series

Air Cooled Packaged Units
Technical Data

VPA 160 (Eco)

Cooling Capacity
6.9 kW - 16.1 kW

Heating Capacity
6.3 kW - 15.8 kW

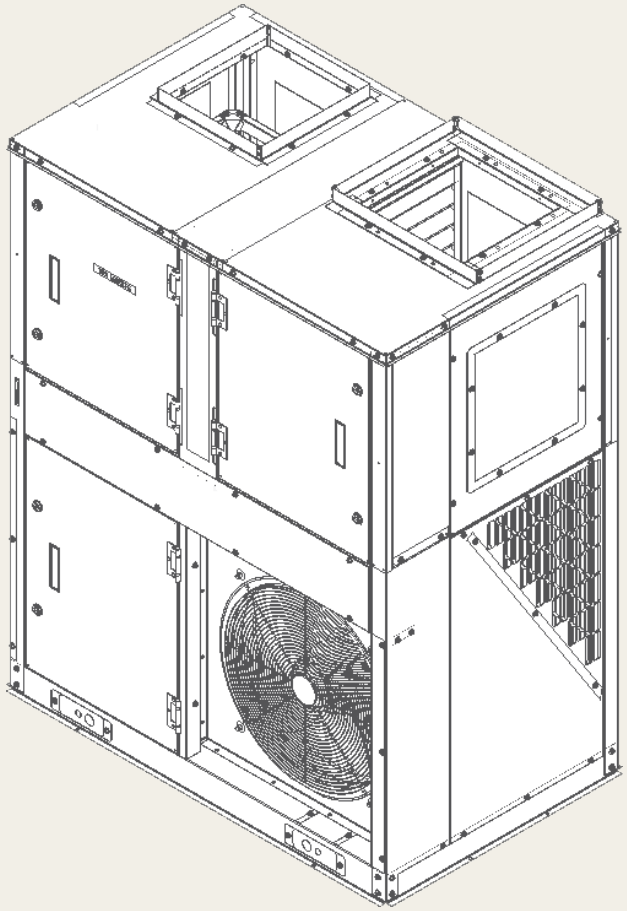
Air Cooled Packaged units

Contents

Air Cooled Packaged units

VPA 160 Eco

Packaged HVAC units provide the flexibility and performance demanded in harsh environments, eg mining communities of the Australian outback or cold New Zealand conditions. Key benefits are snug fit alongside buildings, supply air flexibility and the reliability and durability inherent in a factory assembled packaged system. The VPA 160 efficiently delivers controlled indoor environments from -15°C to +52°C ambient conditions.



Air Cooled Packaged units

VPA 160 Eco

Applications

Specifically developed for air conditioning of residential and light commercial premises i.e. homes, motels, shops and restaurants

AIR FLOW SELECTION

If air returning to the indoor coil is regularly expected to be above 50% relative humidity then the coil face velocity should be limited to 2.5m/s or less (refer fan curves page 8).

Consideration must be given to selecting an airflow and coil face velocity that avoids water carry - over problems, i.e. in high humidity (tropical/subtropical) conditions or when heavily moisture laden fresh air is introduced.

Applications using complete or high proportion of fresh air should be discussed with a Temperzone sales engineer to establish the correct selection of unit.

FEATURES

Refrigerant R410A

R410A used which has zero ozone depletion potential.

Efficiency

Heat exchange coils incorporate inner grooved (rifled) tube for superior heat transfer.

The indoor coil is interlaced for efficient part load performance.

Performance

Eco units provide a variable capacity ability that enables close control of room temperature.

Eco units include a highly efficient EC plug fan and provide high static capability for a wide range of indoor air flows. A continuous range for fan speeds are achieved via a 0–10V DC signal (by others). They also make commissioning and air balancing easy.

Digital compressor technology is particularly suitable for applications requiring full or high proportions of fresh air, VAV, close control and supply air temperature control.

Dual electronic expansion valves (EEV), together with indoor fan speed regulation and compressor capacity modulation, ensure the VPA unit will continue operating when the outdoor temperature is extremely high or very low.

Each system includes a head pressure control which enables the system to compensate for outdoor ambient temperatures below 20°C on cooling cycle, and above 15°C on heating cycle.

Quiet

The composite plastic aerofoil indoor fan is designed for very low noise levels. The integral high efficiency electronically commutated (EC) motor can vary from zero to full speed. This allows slow ramp up with no sudden noise change. The motor can be controlled to have the best air flow for the ducting and requirements as well as used for de-humidifying the space.

Outdoor noise is a function of how hard the unit needs to work. By using the latest low noise sickle blade outdoor fan, noise is kept to a minimum. When the VPA is not running at maximum capacity in mid- season the outdoor fan speed and noise reduces.

The compressor is isolated in a built-in compartment to minimise noise. Generous use of accoustic insulation also ensures a quiet unit.

Versatile

The VPA is "ambidextrous." This means that the airflow direction (left-to-right or right-to-left) can be changed easily on site. Furthermore, the return air inlet to the VPA can be quickly and easily changed from top, to back, to side. One of the entries can be used to introduce fresh air into the building. The supply air direction can be changed by simply moving a cover panel. Multiple return air entries

and supply air exits can be used at the same time. This allows the multiple supply air ducts to go to various spaces or rooms directly from the VPA.

Insulation

Closed cell foam insulation is used in indoor air section to ensure no particles enter the air stream and to provide minimal thermal loss. The insulation is foil faced & meets fire test standards AS1530.3 (1999) & BS 476 parts 6 & 7.

Durable

The cabinet is constructed from high grade galvanised steel - polyester powder coated (colour Grey) both inside and out for all weather protection. External fasteners are maine grade steel. The units include a polyester powder coated drain tray. Heat exchange coils comprise aluminium corrugated plate fins on mechanically expanded rifled copper tube. The coil fins are epoxy coated for extra protection in corrosive environments, e.g. salt laden sea air. A totally enclosed box section ensures the base is vermin resistant.

Dehumidifies

Moisture is removed from the indoor air when the unit is cooling in subtropical climates or other high humidity conditions. The dual electronic expansion valves (EEV) enables great moisture removal during off peak duty condition by activatng Dry mode..

Superior Air Filtration

The G4/F4 rated washable filter is 50 mm deep in an extruded aluminium frame with a great dust holding capacity. The replaceable filter media is held in with a stainless steel wire clipped rack.

Safety

The VPA has a unit on/off isolator fitted and internal electrical protection. A grille protects inquisitive fingers from the outdoor fan..

Easy Access

These packaged outdoor units are typically installed along side a building, where maintenance access is relatively easy during operating hours.

Control Options

The VPA is supplied with a TZT-100 wall thermostat for room temperature control. Alternatively, the unit's UC8 controller is BMS compatible with multi-unit control possible – either via digital and analogue signals or via Modbus/485. A BACnet/IP option is available for client fitting.

Self Diagnosis

Each unit controller (UC8) has a display of LEDS to indicate faults & running conditions. A common fault indicator is included for interface to external systems.

OPTIONAL EQUIPMENT

1. Vertical Discharge Grille (for reducing front clearance).
2. Interface to BACnet/IP networks.
3. Opposite hand supply and return air configurations (also changeable on site).

Temperzone can meet your individual needs by customising your unit, for example:
- Cabinet colour to suit.
- Different filter types.
- Single phase power supply.
- Stainless steel cabinet.

SAFETY FEATURES

1. HP & loss of refrigerant protection
2. Anti rapid cycle timer internal overload for compressor protection
3. Circuit breaker control circuits
4. Time & temperature controlled electronic de-ice switch prevents icing up of the outdoor coil during heating cycle
5. Frost protection on cooling cycle
6. Sensor fault indication
7. Crankcase heater prevents liquid refrigerant condensing in the compressors during the “off” cycle
8. Compressor minimum run time to ensure oil return

COMPRESSOR

Each high efficiency digital scroll type compressor is hermetically sealed quiet running and supported on rubber mounts to minimize vibration

WIRING

The electrical supply required is 3 phase 400V ac 50Hz.

The units control panel is fully wired ready to accept the main power supply. A power isolation switch is supplied.

Air Cooled Packaged units

Performance Data

COOLING CAPACITY (KW)

Total = Total Capacity (kW).
Sens. = Sensible Capacity (kW).
E.A.T. = Entering Air Temperature .
⬭ = Nominal Capacity (kW).

Note: Capacities are **gross** and do not include allowance for fan motor heat loss.

See below for Indoor Air Flow Correction factors

Models	Indoor Fan	Indoor coil E.A.T.		Outdoor coil entering air temperature °C D.B.											
Unit	Air l/s	D.B. °C	W.B. °C	23		27		31		35		39		43	
				Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.
VPA 160	825	21	15	15.8	10.6	15.6	10.6	15.1	10.5	14.4	10.1	13.5	9.5	12.3	8.8
		23	17	16.6	10.4	16.4	10.4	16.0	10.2	15.3	9.9	14.3	9.4	13.1	8.7
		27	19	17.5	11.9	17.3	11.9	16.8	11.8	16.1	11.4	15.2	10.9	14.0	10.1
		31	21	18.3	14.1	18.1	14.1	17.7	14.0	17.0	13.6	16.0	13.0	14.8	12.1

INDOOR AIR FLOW CORRECTION FACTORS @ NOMINAL CONDITIONS

	Indoor Air Flow (%)			
	-20%	-10%	Rated	+10%
Total Capacity	0.95	0.975	1.0	1.025
Sensible Capacity	0.89	0.950	1.0	1.050

HEATING CAPACITY (KW)

G = Gross Heating Capacity kW, based on nominal air flow.
N = Net Heating Capacity kW allowing for average defrost.
⬭ = Nominal Capacity (kW).

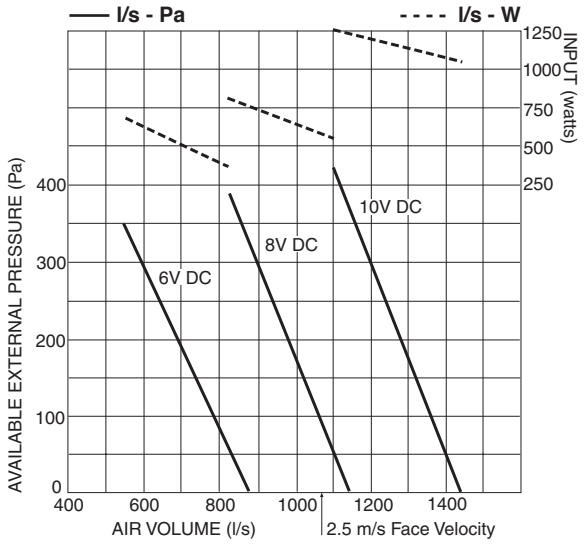
Models	Indoor Entering Air Temp. °C	Outdoor coil entering air temperature °C D.B.															
Unit	D.B.	-5		-3		-1		1		3		5		7		9	
		G	N	G	N.	G	N	G	N	G	N	G	N	G	N	G	N
VPA 160	15	11.9	11.2	12.6	11.1	13.2	11.2	13.9	12.2	14.6	13.3	15.3	15.3	15.9	15.9	16.6	16.6
	20	11.7	11.1	12.4	10.9	13.1	11.1	13.7	12.0	14.4	13.2	15.1	15.1	15.8	15.7	16.4	16.4
	25	11.3	10.8	12.0	10.6	12.7	10.8	13.7	11.5	14.0	12.9	14.7	14.7	15.4	15.4	16.1	16.1

Air Cooled Packaged units

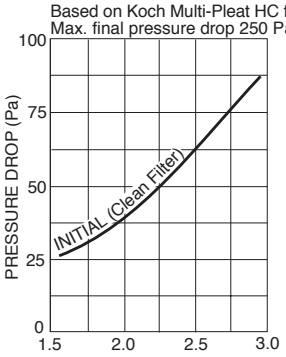
Performance Data

AIR HANDLING

Note: Airflows are for a dry coil. Reduce airflow by 10% for wet coil conditions. Air flows given are for units installed without filters.



FILTER - Pressure Drop



If using EU-2 filter media, provide 0.08 m^2 face area per 100 l/s of airflow to maximise efficiency.

SOUND LEVELS - OUTDOOR

Sound Power Levels (SWL) - Radiated

Measured in decibels re 1 picowatt, at nominal airflow.

			OCTAVE BAND FREQUENCY Hz					
	OUTDOOR		125	250	500	1K	2K	4K
Model	FAN SPEED	SWL dB(A)	SOUND POWER LEVELS (SWL) dB					
VPA 160	HIGH	74	80	78	71	69	63	57

Sound Pressure Levels (SPL)

Measured in decibels re 20 μPa, at nominal airflow.

			OCTAVE BAND FREQUENCY Hz					
	OUTDOOR		125	250	500	1K	2K	4K
Models	FAN SPEED	SPL @ 3m dB(A)	SOUND PRESSURE LEVELS (SPL) dB					
VPA 160	HIGH	58	64	62	55	53	47	41

Air Cooled Packaged units

Performance Data

SOUND LEVELS - INDOOR - PLUG FAN

Sound Power Levels (SWL) - Supply Air Outlet

Test Conditions: BS 848.2 : 2004.
Installation Type A (free inlet and outlet).
Direct method of measurement (reverberant room).
Measured in decibels re 1 picowatt.

			OCTAVE BAND FREQUENCY Hz					
INDOOR FAN SPEED	AIR FLOW l/s	SWL dB(A)	125	250	500	1K	2K	4K
			SOUND POWER LEVELS (SWL) dB					
6 V	700	67	66	65	64	64	59	52
8 V	1000	74	72	71	71	71	65	60
10 V	1200	76	73	73	73	73	67	63

Sound Power Levels (SWL) - Supply Air Outlet + Insulated Duct

			OCTAVE BAND FREQUENCY Hz					
INDOOR FAN SPEED	AIR FLOW l/s	SWL dB(A)	125	250	500	1K	2K	4K
			SOUND POWER LEVELS (SWL) dB					
6 V	700	65	68	67	65	61	50	42
8 V	1000	67	70	69	67	63	52	44
10 V	1200	69	71	71	69	65	54	46

SOUND PRESSURE LEVELS (SPL) WITHIN A ROOM

Deduct the room absorption effect below from the Sound Power Levels (SWL) above to obtain Sound Pressure Levels within a room.
Note: Occupant at least 1.5 m from sound source.

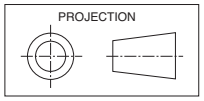
	OCTAVE BAND FREQUENCY Hz					
	125	250	500	1k	2k	4k
Room type	ROOM ABSORPTION EFFECT					
Soft	4	8	11	11	11	11
Medium	3	7	8	9	9	9
Hard	0	1	3	4	4	5

Air Cooled Packaged units

Dimensions (mm)

VPA 160RKTG - VERTICAL SUPPLY & RETURN AIR

Not to Scale



* 600 min. with optional Vertical Discharge Grille

POINT LOAD (kg)

W	X	Y	Z
51	27	37	145

Note 1:
Standard configuration is vertical supply and return air. Supply/Return air direction and alternative inlet/outlet positions are changeable on site.

Note 2: The manufacturer reserves the right to make changes in specifications at any time without notice or obligation. Certified data is available on request.

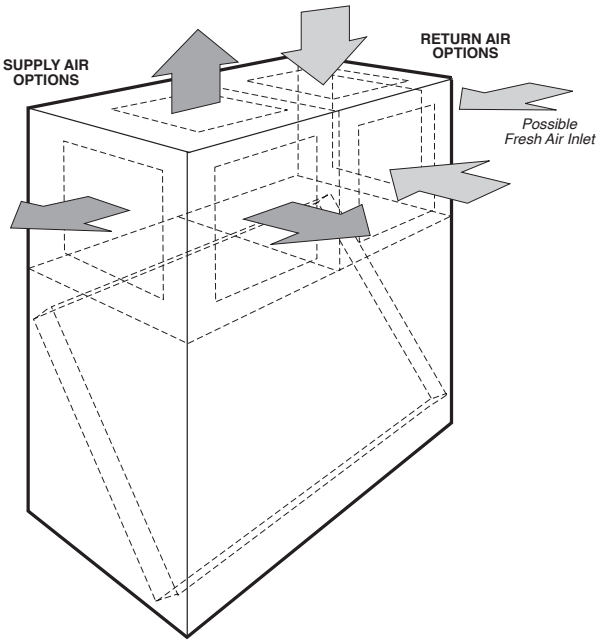
Air Cooled Packaged units

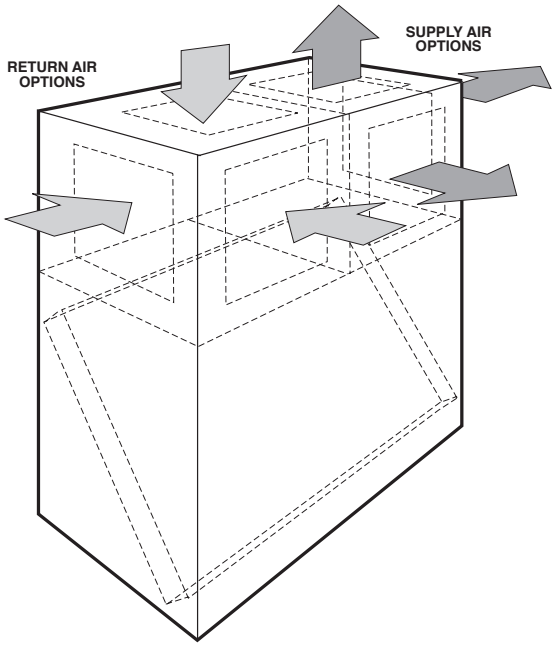
Configurations

SITE CHANGEABLE OPTIONS

Standard configuration is vertical supply and return air.

Fan Motor Handing & Supply/Return air direction is changeable on site.





Air Cooled Packaged units

Specifications

Eco Model		VPA 160
System		
Nominal Cooling Capacity *1	kW	6.9 ~ 16.1
Net Cooling Capacity (MEPS)	kW	15.7
Sensible Cooling Capacity	kW	12.9
Heating Capacity *2	kW	6.3 ~ 15.8
EER / AEER (cooling) *1		3.18 / 3.16
COP / ACOP (heating) *2		3.62 / 3.60
Air Flow *3	l/s	825
Air Flow Range	l/s	0 – 1400
Specific Fan Power *4		SFP 2
SPL in duct *5	dB (A)	58
SPL at 3m	dB(A)	58
Power Source		3 phase 400 V a.c. 50 Hz
Controller		UC8
Compressor		digital, variable speed
Indoor Air Fan Type		plug, EC motor
Indoor Fan Full Load Amps	A/ph	6
Running Amps (Total Sys.) *1		7.5 / 8 / 9
Max.Running Amps (Total Sys.)		11 / 11.5 / 12
Finish		
Exterior		grey polyester powder coat
Weight (kg)		
Net Weight		230
Shipping Weight (approx.)		347

Notes:

*1 Nominal Cooling Capacity at AS/NZS 3823 conditions:
- Indoor Entering Air Temperature 27°C D.B., 19°C W.B.;
- Outdoor Entering Air Temperature 35°C D.B.
Net Cooling Capacity at AS/NZS 3823 includes an allowance for indoor fan motor heat loss.

*2 Heating Capacity at AS/NZS 3823 conditions:
- Indoor Entering Air Temperature 21°C D.B.;
- Outdoor Entering Air Temperature 7°C D.B., 6°C W.B.

*3 Supply air flow at Nominal Cooling Capacity conditions stated above.

*4 Specific Fan Power to DIN EN 13779
SFP1 ≤ 500 W / (m3/s)
SFP2 ≤ 750 W / (m3/s)
SFP3 ≤ 1250 W / (m3/s)

*5 Measured to JIS 8616 (1m from source in an anechoic chamber)

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www.temperzone.biz

AUCKLAND

Head Office
38 Tidal Rd, Mangere, N.Z.
Private Bag 93303, Otahuhu,
NEW ZEALAND.

Email sales@temperzone.co.nz
Phone (09) 279 5250
Fax (09) 275 5637

WELLINGTON

Phone (04) 569 3262
Fax (04) 566 6249

CHRISTCHURCH

Phone (03) 379 3216
Fax (03) 379 5956

SYDNEY

Head Office
14 Carnegie Place, Blacktown,
NSW 2148
PO Box 8064, Seven Hills West,
NSW 2147, AUSTRALIA.

Email sales@temperzone.com.au
Phone (02) 8822 - 5700
Fax (02) 8822 - 5711

ADELAIDE

Phone (08) 8115 - 2111
Fax (08) 8115 - 2118

MELBOURNE

Phone (03) 8769 - 7600
Fax (03) 8769 - 7601

BRISBANE

Phone (07) 3308 - 8333 or
1800 - 897 - 253
Fax (07) 3308 - 8330

PERTH

Phone (08) 6399 - 5900
Fax (08) 6399 - 5932

NEWCASTLE

Phone (02) 4962 - 1155
Fax (02) 4961 - 5101

LAUNCESTON

Phone (03) 6331 - 4209
Fax (03) 6333 - 0224

JAKARTA

Phone +62 (21) 2963 4983
Fax +62 (21) 2963 4984

SINGAPORE

Phone +65 6733 4292
Fax +65 6235 7180

SHANGHAI

Phone +86 (21) 5648 2078

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