

**Ducted Vertical
Packaged Air Conditioner/Heat Pump**

Technical Data
VPA 120, 160

R410A



**Wide Ambient
Capabilities**

**Variable Capacity
2kW–12/16kW**

**High Efficiency
EC Plug Fan**

Versatile Configuration

**Extra Long Life
Epoxy Coated Coils**

**Nominal Cooling Capacity
12.2 kW 16.1 kW**

diGital



**Including Controller &
Digital Scroll Compressor
for close temperature control**

VPA 120, 160 – DUCTED PACKAGED AIR CONDITIONERS

GENERAL

This VPA Series is a range of reverse cycle (heat pump) packaged air conditioners designed and developed to comply with and exceed AS/NZS 3823 specified conditions (i.e. guaranteed cooling cycle performance at 43°C outdoor temperature). These units are designed to operate in the -15 to 52°C outdoor temperature range.

APPLICATIONS

These units have been specifically developed for air conditioning of residential and light commercial premises, e.g. homes, banks, offices, motels, shops, food outlets and restaurants.

The VPA is particularly designed for use in the harsh environment of the mining communities of the Australian outback. It also operates well with New Zealand's cold South Island conditions. Being tall and narrow, the unit can snugly fit alongside a house without interfering with gardens and pathways. It is also possible to mount the unit high on the wall of commercial premises to keep clear of driveways.

There are a number of installations, particularly in Western Australia, that have similar units made by another manufacturer. The VPA is designed as a quick and easy replacement.

Air Flow Selection

If the air returning to the indoor coil is regularly expected to be above 50%RH, then the coil face velocity should be limited to be 2.5 m/s or less (refer Air Flow graph; 2.5 m/s is clearly marked).

High humidity levels can occur in tropical or subtropical conditions, and/or when heavily moisture laden fresh air is introduced. Consideration must always be given to selecting an air flow and face velocity that avoids water carry-over problems.

Applications using full or high proportions of fresh air should be referred to your nearest **temperzone** sales office to establish the correct selection of units.

FEATURES

Digital Scroll Compressor. Each unit includes a digital scroll compressor. Digitals provides a variable capacity ability that enables closer control of room temperature. This is achieved by avoiding on/off cycling of the compressor. These compressors have proven very reliable because of their design simplicity. They have 70% fewer moving parts than some other compressor types. Electrical harmonic noise is very low.

Extended Capability. Digitals are particularly suitable for applications requiring long periods of part load operation, full or high proportions of fresh air, VAV or close control.

Refrigerant R410A. Each complete system uses refrigerant R410A which is deemed to have zero ozone depletion potential.

Efficient. Each unit incorporates a high efficiency scroll compressor. Heat exchange coils incorporate inner grooved (rifled) tube for better heat transfer.

Performance. 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.

User Friendly. The supplied room temperature controller has been designed to maintain a high level of comfort for room occupants. Emphasis has been placed on providing controls that are easy to use — despite the sophisticated microprocessor system that runs it. Use of the Auto and Timer function settings allows you to "set it and forget it".

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 acoustic 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. Acoustic insulation has been used in the indoor air section to ensure no particles are introduced into the air stream and to provide minimal thermal loss. The insulation is foil faced and meets fire test standards AS 1530.3.

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 stainless 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 conditions.

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 access panel latches need an allen key to open, thus giving security against accidental opening by children. The VPA has a unit on/off isolator fitted and internal electrical protection. A grille protects inquisitive fingers from the outdoor fan.

Self Diagnostics. The Unit Controller (UC) has a display to indicate faults and running conditions. A non-specific fault indicator is included for interface to external systems.

SAFETY FEATURES

1. HP and loss of refrigerant protection.
2. Anti-rapid cycle timer and internal overload for compressor protection.
3. Circuit breaker control circuits.
4. Time-and-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 scroll type compressor is hermetically sealed, quiet running and supported on rubber mounts to minimise vibration.

REFRIGERATION SYSTEM

The VPA units are factory charged with HFC-410A (R410A) refrigerant. Electronic expansion valves (EEVs) control the flow of refrigerant.

WIRING

The electrical supply required (including voltage fluctuation limits) is:
3 phase 342–462 V a.c. 50 Hz with neutral and earth.

The compressor crankcase heater requires a 24 hour power supply.

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

CUSTOMISATION

temperzone can meet your individual needs by customising your unit, for example:

1. Cabinet colour to suit.
2. Different filter types.
3. Single phase power supply.
4. Water heating module.

A downward supply and return air version named the VPA-RKTGU is also available. This model is suited to under-floor ducting. It can also be mounted on the roof of a commercial building and fitted directly onto the return and supply air ducts, thus ensuring a weatherproof seal.

The manufacturer operates a quality management system that conforms to AS/NZS ISO 9001:2008.

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. For fan motor heat loss refer to Air Handling graphs.

MODEL	INDOOR FAN		INDOOR COIL E.A.T.		OUTDOOR COIL ENTERING AIR TEMPERATURE °C D.B.											
	SPEED	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 120	HIGH	800	21	15	12.0	10.2	11.8	10.2	11.5	10.0	10.9	9.7	10.2	9.1	9.3	8.4
			23	17	12.6	10.0	12.5	10.0	12.1	9.8	11.6	9.5	10.9	9.0	10.0	8.3
			27	19	13.2	11.4	13.1	11.4	12.7	11.2	12.2	10.9	11.5	10.4	10.6	9.7
			31	21	13.9	13.5	13.7	13.5	13.4	13.3	12.8	12.8	12.1	12.1	11.2	11.2
VPA 160	HIGH	1000	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.

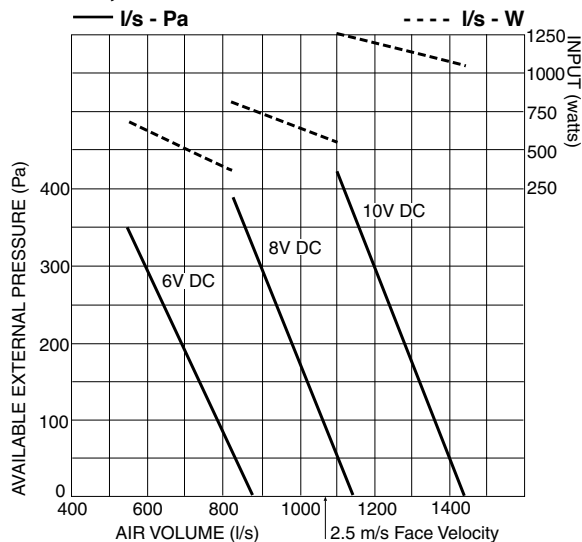
○ = Nominal Capacity (kW)

MODEL	INDOOR ENTERING AIR TEMP. °C D.B.	OUTDOOR COIL ENTERING AIR TEMPERATURE (E.A.T.) °C 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 120	15	8.4	7.6	9.1	8.2	9.7	8.8	10.4	9.1	11.0	9.3	11.8	10.6	12.6	12.4	13.2	13.2
	20	8.2	7.4	8.9	8.0	9.5	8.6	10.2	8.9	10.8	9.1	11.6	10.4	12.3	12.2	12.9	12.9
	25	7.9	7.1	8.6	7.7	9.2	8.3	9.8	8.6	10.4	8.8	11.1	10.0	11.8	11.7	12.4	12.4
VPA 160	15	11.1	9.9	12.0	10.8	12.8	11.5	13.6	12.0	14.5	12.2	15.5	14.0	16.5	16.4	17.4	17.4
	20	10.9	9.8	11.8	10.6	12.6	11.3	13.4	11.8	14.2	12.0	15.2	13.7	16.2	16.0	17.0	17.0
	25	10.5	9.4	11.3	10.2	12.1	10.9	12.9	11.3	13.7	11.5	14.7	13.2	15.6	15.4	16.4	16.4

AIR HANDLING

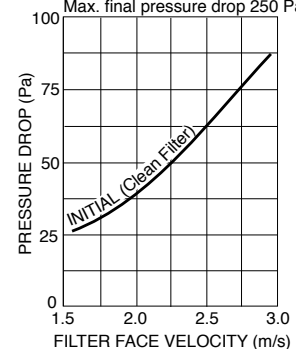
Note: Airflows are for a dry coil. Reduce airflow by 5% in high moisture removal conditions. Air flows given are for units installed without filters.

VPA 120, 160



OPTIONAL FILTERS - PRESSURE DROP

Based on Koch Multi-Pleat HC filter. Max. final pressure drop 250 Pa.



If using EU-2 filter media, provide 0.08 m² face area per 100 l/s of airflow to maximise efficiency.

PERFORMANCE DATA

SOUND LEVELS

Radiated

Sound Power Levels (SWL)

Measured in decibels re 1 picowatt, at nominal airflow.

MODEL	OUTDOOR FAN SPEED	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1 k	2 k	4 k
			SOUND POWER LEVELS (SWL) dB					
VPA 120	HIGH	71	77	72	69	66	61	55
VPA 160	HIGH	76	77	74	73	73	67	60

Sound Pressure Levels (SPL)

Measured in decibels re 20 μ Pa, at nominal airflow.

MODEL	OUTDOOR FAN SPEED	SPL @ 3 m dB(A)	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1 k	2 k	4 k
			SOUND PRESSURE LEVELS (SPL) dB					
VPA 120	HIGH	55	61	56	53	50	45	39
VPA 160	HIGH	60	61	58	57	57	51	44

Sound Power Levels (SWL)

Test Conditions: BS 848 PT2 1985. Installation Type A (free inlet and outlet). Direct method of measurement (reverberant room). Measured in decibels re 1 picowatt.

Supply Air Outlet

MODEL	INDOOR FAN SPEED	AIR FLOW l/s	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
				125	250	500	1 k	2 k	4 k
				SOUND POWER LEVELS (SWL) dB					
VPA 120 or VPA 160	LOW	800	72	70	69	69	69	63	58
	MED	1000	74	72	71	71	71	65	60
	HIGH	1200	76	73	73	73	73	67	63

Supply Air Outlet + Insulated Duct

MODEL	INDOOR FAN SPEED	AIR FLOW l/s	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
				125	250	500	1 k	2 k	4 k
				SOUND POWER LEVELS (SWL) dB					
VPA 120 or VPA 160	LOW	800	65	68	67	65	61	50	42
	MED	1000	67	70	69	67	63	52	44
	HIGH	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.

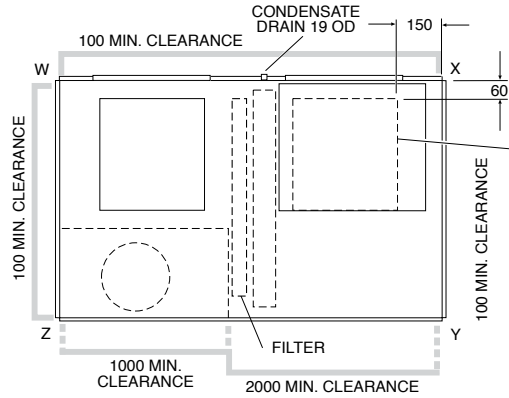
ROOM TYPE	OCTAVE BAND FREQ. Hz					
	125	250	500	1k	2k	4k
	ROOM ABSORPTION EFFECT					
SOFT	4	8	11	11	11	11
MEDIUM	3	7	8	9	9	9
HARD	0	1	3	4	4	5

DIMENSIONS (mm)

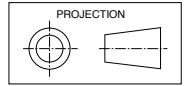
VPA 120/160 RKTG

Not to Scale

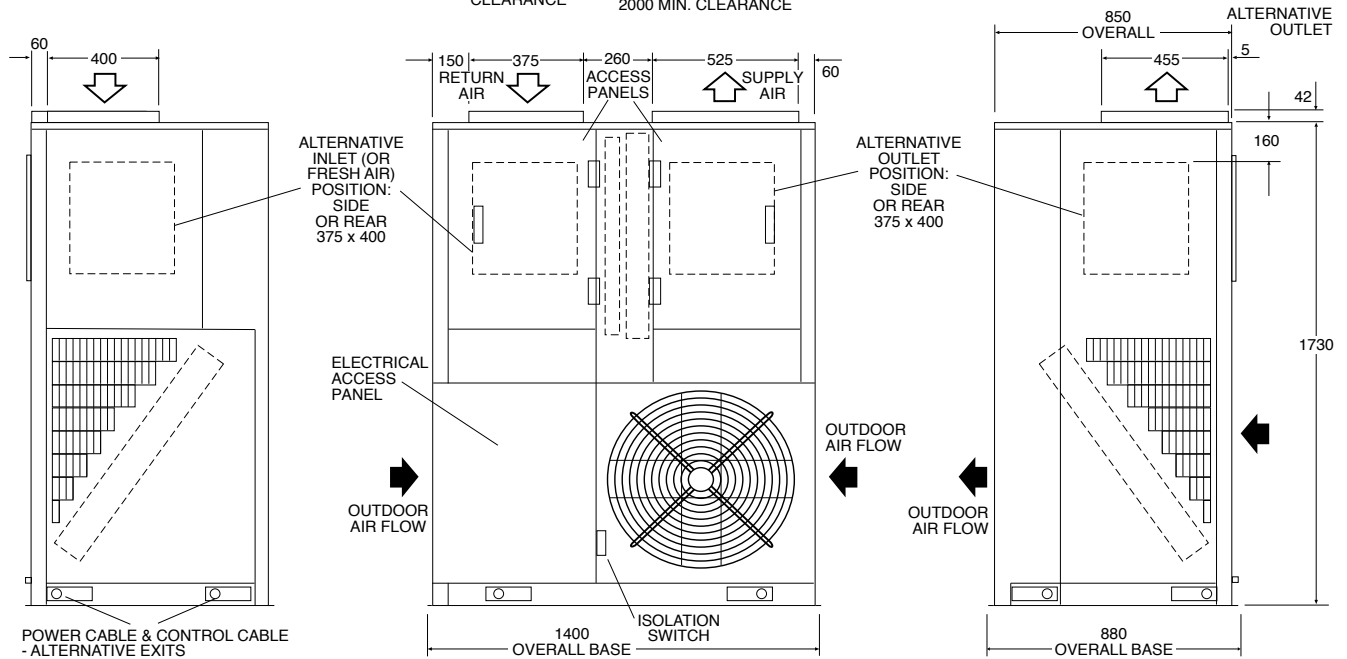
Note:
Standard configuration is vertical supply and return air. Supply/Return air direction and alternative inlet/outlet positions are changeable on site, but not with '-M' version.



SUPPLIED WITH ALTERNATIVE FIELD FITTED SPIGOT 375 x 400



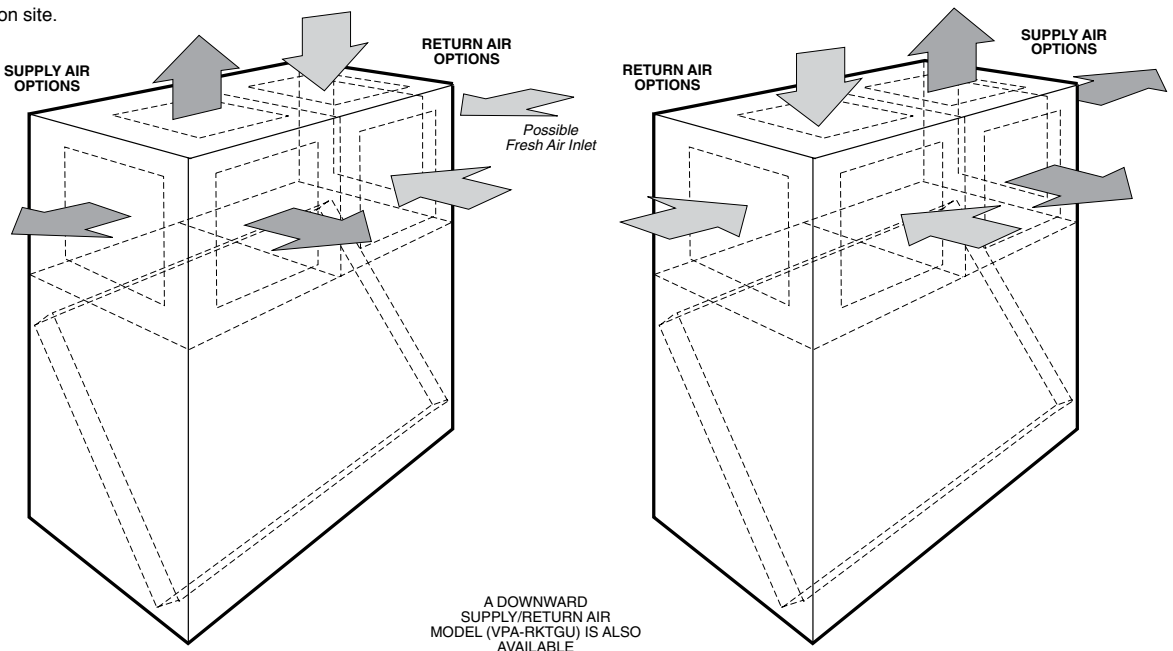
POINT LOADS (kg)			
W	X	Y	Z
51	27	37	145



CONFIGURATIONS

Standard configuration is vertical supply and return air. Supply/Return air direction is changeable on site.

SITE CHANGEABLE



SPECIFICATIONS

Model		VPA 120RKTG	VPA 160RKTG
Cooling Capacity *1	kW	2 ~ 12.2	2 ~ 16.1
Sensible Cooling Capacity	kW	10.9	11.4
E.E.R. (Cooling) *2		2.95	2.94
Heating Capacity *3	kW	12.3	16.2
C.O.P. (Heating)		3.17	3.17
Supply Air Flow (nominal) *4	l/s	800	1000
Supply Air Flow range	l/s	0 – 1400	
Specific Fan Power *5		SFP 2	
SPL in duct *6	dB(A)	56	58
SPL at 3m	dB(A)	55	60
Power Source *7		3 phase 400/415 V a.c. 50 Hz	
Running Amps (Total System)	A	10	14
Recom'd External Protection	A/ph.	15	20
Refrigerant		R410A	
Finish (standard)		grey polyester powder coat	
Net Weight	kg	255	260
Shipping Weight (approx.)	kg	460	465

Notes:

*1 Nominal Cooling Capacity at AS/NZS 3823 conditions:
Indoor Entering Air Temp. 27°C D.B., 19°C W.B.;
Outdoor Entering Air Temp. 35°C D.B.
Subtract indoor fan power to calculate Net Capacity.

*2 Registered for MEPS 2011 and meets South Australia's required EER.

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

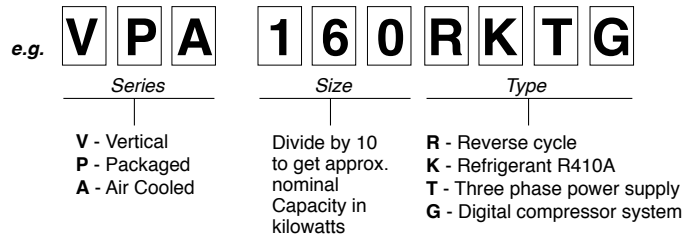
*4 Supply air flow at Nominal Cooling Capacity conditions stated above.

*5 Specific Fan Power to DIN EN 13779
SFP1 ≤ 500 W / (m³/s)
SFP1 ≤ 500 W / (m³/s)
SFP1 ≤ 500 W / (m³/s)

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

*7 Voltage fluctuation limits: 342–436 V

NOMENCLATURE



NOTE

The manufacturer reserves the right to make changes in specifications at any time without notice or obligation.



temperzone limited

Head Office, Auckland : 38 Tidal Rd, Mangere, N.Z.
Private Bag 93303, Otahuhu, NEW ZEALAND.
Email sales@temperzone.co.nz Website: www.temperzone.biz

temperzone australia pty ltd

Head Office, Sydney : 14 Carnegie Place
PO Box 6448, Delivery Centre, Blacktown, NSW 2148,
AUSTRALIA. Email sales@temperzone.com.au

AUCKLAND

Ph. 0-9-279 5250
Fax 0-9-275 5637

WELLINGTON

Ph. 0-4-569 3262
Fax 0-4-566 6249

CHRISTCHURCH

Ph. 0-3-379 3216
Fax 0-3-379 5956

SYDNEY

Ph. (02) 8822-5700
Fax (02) 8822-5711

ADELAIDE

Ph. (08) 8376-1505
Fax (08) 8376-1449

SINGAPORE

Ph. SNG 6733 4292
Fax SNG 6235 7180

MELBOURNE

Ph. (03) 8769-7600
Fax (03) 8769-7601

BRISBANE

Ph. (07) 3308-8333
Fax (07) 3308-8330

NEWCASTLE

Ph. (02) 4962-1155
Fax (02) 4961-5101



PERTH

Ph. (08) 9314-3844
Fax (08) 9314-3855

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Ph. (07) 4773-9566
Fax (07) 4773-9166

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Ph. (03) 6272-0066
Fax (03) 6272-0506

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