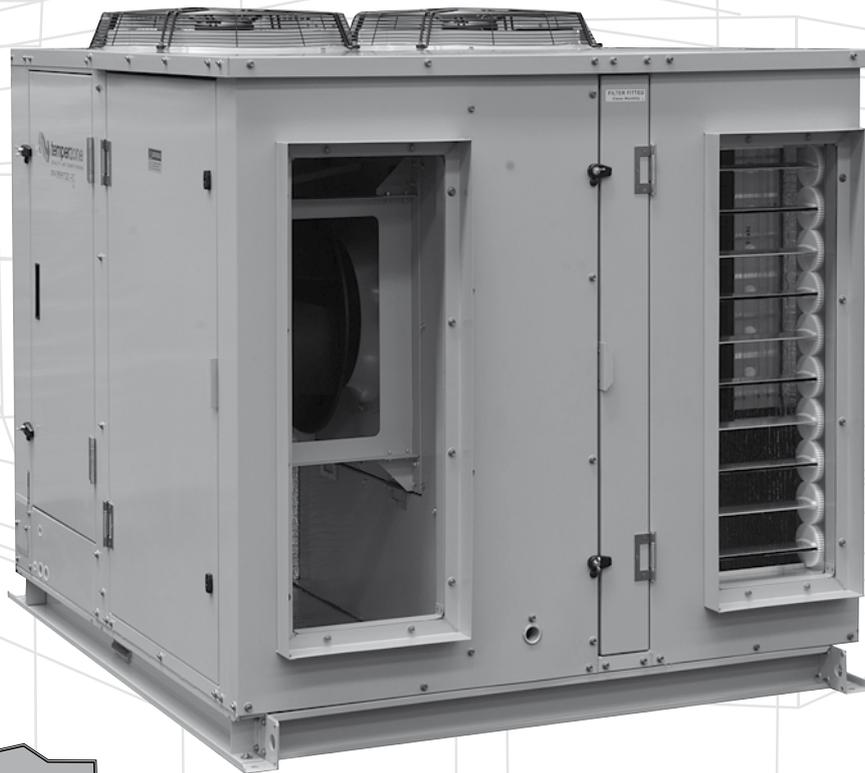


**Ducted Three Phase  
Packaged Air Conditioners**

**Technical Data**  
**OPA 280RKT(G)-P**

**R410A**

Extra Long Life  
Epoxy Coated Outdoor Coil



**diGital**  
OPTION

**Plug Fan  
with High Efficiency  
EC Motor and High External Static  
Nominal Cooling Capacity  
27.1 kW**

## OPA 280RKT(G)-P – DUCTED PACKAGED ROOF TOP AIR CONDITIONERS

### GENERAL

The OPA 280 is a reverse cycle (heat pump) packaged roof top air conditioners designed and developed to comply with and exceed AS/NZS 3823 specified conditions. The system has been successfully tested at 50°C ambient.

OPA 280 is available with or without a digital scroll type compressor.

### APPLICATIONS

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

### 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 Handling graph).

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

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

**Economy.** An economiser option is available to lower operating costs during the cooling cycle on all models.

**Efficient.** Each unit incorporates high efficiency scroll compressors. Each plug fan incorporates a high efficiency electronically commutated (EC) motor (95–98% compared to 50–70% for belt drive centrifugal fans). Heat exchange coils incorporate inner grooved (rifled) tube for better heat transfer.

**Performance.** The OPA 280 uses a backward curved plug fan for fine tuning of the indoor unit to match higher static pressure supply air requirements. These EC motor fans have a fully integrated speed control that enables soft starting. Fan speed can be stepped to your own requirements or continuously variable using a 0–10V DC control signal. Each system includes a temperature sensing 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.** Each 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. A large aperture supply air spigot reduces exit velocities and therefore less noise down ductwork. Generous use of insulation also ensures a quiet unit.

**Insulation.** Closed cell foam insulation has been used in the indoor air section to ensure no particles are introduced into the air stream. The insulation is foil faced and meets fire test standards AS 1530.3 (1999) and BS 476 parts 6 & 7.

**Durable.** The cabinet is constructed from high grade galvanised steel - polyester powder coated (colour Grey) 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. A coil protection guard is supplied. Both the indoor and outdoor air coil fins are epoxy coated for extra protection in corrosive environments, e.g. salt laden sea air. Fan motor bearings are sealed for life so as not to incur regular maintenance.

**Lower Installation Cost.** A large supply air spigot which lessens the need for duct transitions.

**Low Maintenance.** Commissioning and maintenance costs are reduced through use of a fan that requires no pulley and belt adjustments or changes like traditional fans.

**Soft Starting.** EC motors are soft starting therefore have none of the problems associated with high inrush current.

**Control Option.** Fixed and stable air flows can be achieved through use of a differential pressure transducer and controller (supplied by others) to compensate for varying duct static pressures caused by dirty filters or modulating dampers. Commissioning is also made easier. The system is set up for the EC motor to be controlled variably by a 0–10 volt DC signal that can be supplied either by a BMS system, a sophisticated controller or temperzone's optional TZT-100 Controller.

**Self Diagnostics.** The OPA's Unit Controller (UC7) has an LED display to indicate faults and running conditions. A non-specific fault indicator is included for interface to external systems.

### OPTIONAL EQUIPMENT

1. temperzone TZT-100 Wall Plaque.
2. Zone control.
3. Filters - pleated 50mm, rated EU4.
4. Economiser (factory fitted) - includes dampers, weatherhood.
5. Manually adjustable fresh air damper and weatherhood.
6. Electronic control systems (eg Viking) - available by special arrangement.

### 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.
9. Phase rotation protection device.
10. 24V control circuit

### COMPRESSORS

Each high efficiency scroll type compressor is hermetically sealed, quiet running and supported on rubber mounts to minimise vibration.

### REFRIGERATION SYSTEM

Each OPA unit is factory charged with HFC-410A (R410A) refrigerant. An electronic expansion device controls the flow of refrigerant.

### WIRING

The electrical supply required is: 3 phase 380-415 V a.c. 50 Hz with neutral and earth.

The compressor crankcase heater requires a 24 hour power supply. A control panel, with 24V control circuit, is located in the outdoor unit and is fully wired ready to accept the main power supply.

### ECONOMISER OPTION

If the outdoor air heat content or wet bulb temperature (dry bulb not recommended) is below that of the return air, the fresh air damper opens and the return air damper closes to provide the first stage of cooling. Operating costs are reduced as free cooling is obtained. (Note: A spill air facility in the building may be necessary for when the return air damper is closed.) Fresh air dampers close to a minimum setting and return air dampers open before normal compressor operation resumes.

### Digital Version:

**Digital Scroll Compressor.** 'Digital' systems include a digital scroll compressor. The digital version of this unit 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. Electrical harmonic noise is very low.

**Extended Capability.** Digitals are particularly suitable for applications requiring full or high proportions of fresh air, VAV, close control. Supply air temperature control is also possible using BMS or other controls.

**Control Option.** The system is set up for the compressor to be controlled variably by a 0–10 volt DC signal that can be supplied either by a BMS system, a sophisticated controller or temperzone's optional TZT-100 Controller.

**User Friendly.** The optional TZT-100 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".

# 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.

MODEL	INDOOR FAN AIR FLOW l/s	INDOOR COIL E.A.T.		OUTDOOR COIL ENTERING AIR TEMPERATURE °C D.B.											
		D.B. °C	W.B. °C	23		27		31		35		39		43	
				Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.
OPA 280RKT-P	1500	21	15	26.64	21.0	26.3	21.0	25.5	20.7	24.3	20.0	22.8	18.9	20.7	17.4
		23	17	28.1	20.6	27.7	20.6	26.9	20.2	25.8	19.6	24.2	18.6	22.1	17.3
		27	19	29.5	23.6	29.1	23.6	28.4	23.3	27.1	22.6	25.6	21.5	23.6	20.0
		31	21	30.9	27.9	30.5	27.9	29.8	27.6	28.6	26.8	27.0	25.6	25.0	24.0

### 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)

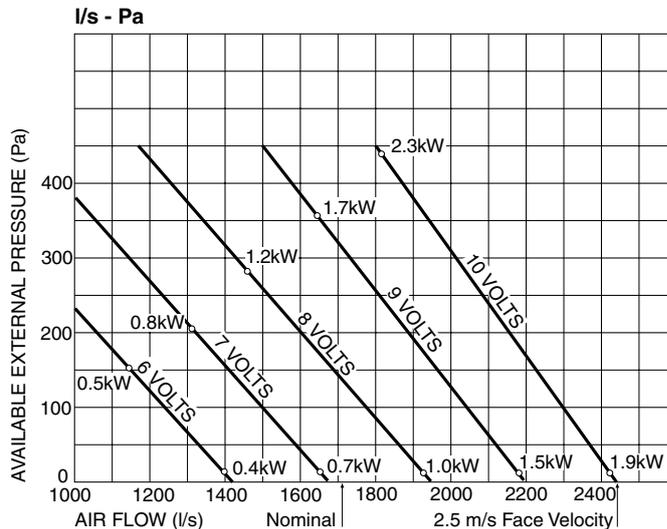
### Reverse Cycle Systems

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
OPA 280RKT-P	15	19.4	18.3	20.5	18.1	21.6	18.3	22.7	19.5	23.8	21.8	24.9	24.9	26.1	26.1	26.9	26.9
	20	19.1	18.1	20.2	17.9	21.3	18.1	22.4	19.2	23.6	21.6	24.7	24.7	25.8	25.8	26.9	26.9
	25	18.5	17.6	19.6	17.4	20.7	17.3	21.8	18.7	22.9	21.1	24.0	24.0	25.2	25.2	26.3	26.3

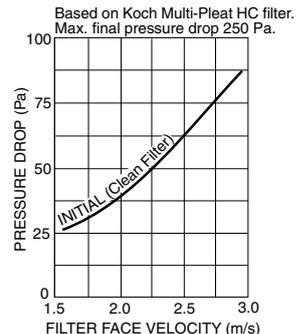
## AIR HANDLING

**Note:** Airflows are for a dry coil. Reduce airflow by 5% in high moisture removal conditions. In a free blow or low resistance application, beware of exceeding indoor fan motor's full load amp limit (refer back page). As filters are optional, the fan air flows given are for units installed without filters.

### OPA 280 c/w Plug fan



### OPTIONAL FILTERS - Pressure Drop



## 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					
OPA 280	HIGH	73	80	73	68	68	62	60

#### Sound Pressure Levels (SPL)

Measured in decibels re 20 µPa, 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					
OPA 280	HIGH	57	64	57	52	52	46	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.

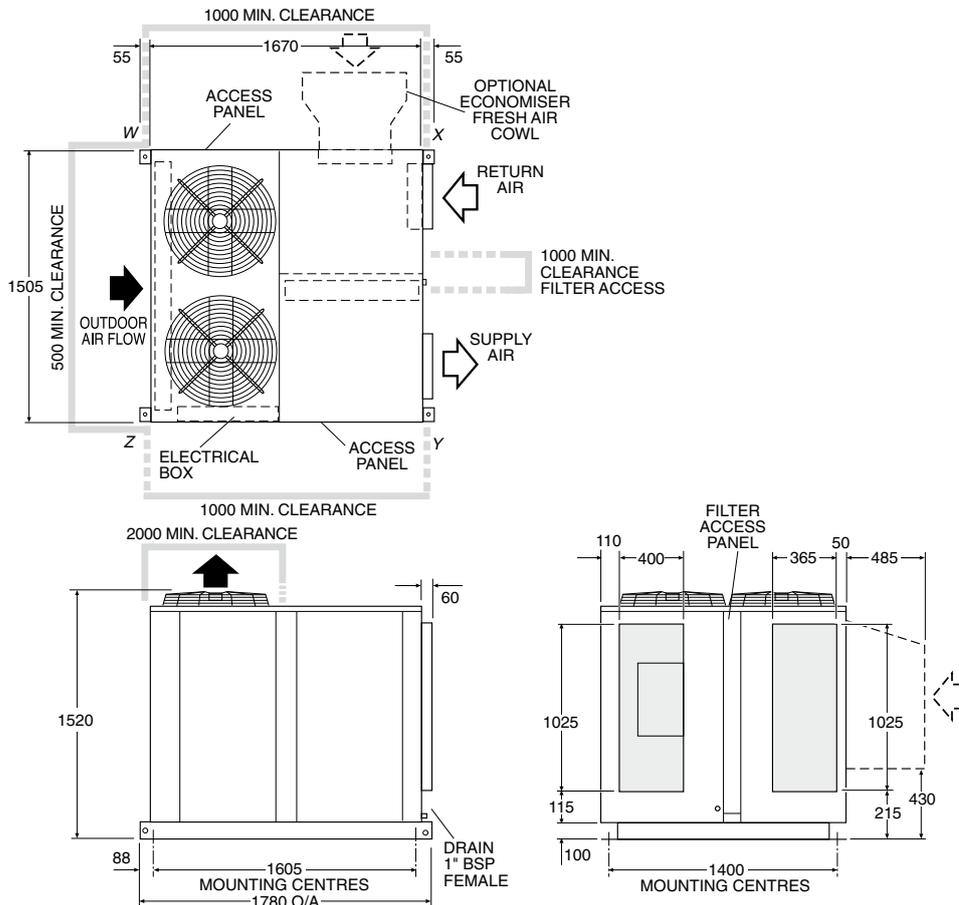
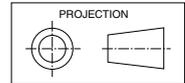
### SUPPLY AIR OUTLET

MODEL	INDOOR FAN SPEED	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1 k	2 k	4 k
			SOUND POWER LEVELS (SWL) dB					
OPA 280-P	LOW (6V)	68	73	66	67	61	59	53
	HIGH (9V)	81	73	86	79	73	72	67

## DIMENSIONS (mm)

**Fig. 1 Horizontal Supply & Return Air**  
OPA 280RKT(G)-P (c/w Plug fan)

Not to Scale

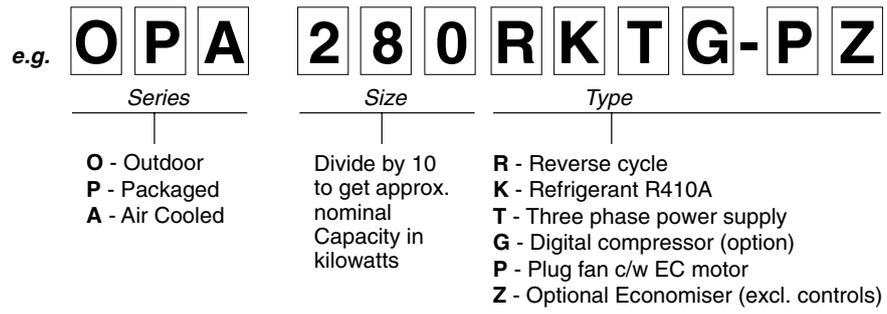


POINT LOADS (kg)			
W	X	Y	Z
139	106	110	145

Net Weight 500 kg

**Note :** A 2 m clearance is required above the exhaust air fans

## NOMENCLATURE



## SPECIFICATIONS

Model	OPA 280RKT(G)-P	
Nominal Cooling Capacity *1	kW	27.1
Net Cooling Capacity	kW	26.57
Heating Capacity *2	kW	25.76
EER / AEER – Cooling *4		3.28 / 3.27 (3.13 / 3.12)
COP (Heating)		3.55 / 3.54
Indoor air fan type		backward curved
Indoor air fan motor		EC plug
Air Flow *3	l/s	1500
Power Source		3 phase 380–415 V a.c. 50 Hz
Indoor Fan Full Load Amps	A/ph.	4.3
Running Amps (Total System)	A/ph.	16
Max. Running Amps (Total Sys.)	A/ph.	20
Finish (outdoor unit)		Grey polyester powder coat
Net Weight *4	kg	500 (567)
Shipping Weight – approx. *4	kg	585 (652)

### 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 (reverse cycle units only) 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 Bracketed figures are for OPA 280RKTG-PZ digital c/w economiser.

### NOTE

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



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