

**Ducted Three Phase
Packaged Air Conditioners**

Technical Data

OPA 465-960 RKTBG-P



eco
SERIES

Plug Fan with High Efficiency
EC Motor and High External Static
Economiser Option



diGital



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



R410A

**Nominal Cooling Capacity
47 kW - 96 kW**

OPA 465, 550, 705, 800, 850, 960 - ECO SERIES DUCTED PACKAGED ROOF TOP AIR CONDITIONER

GENERAL

This OPA Series is a range of reverse cycle (heat pump) packaged roof top air conditioner designed and developed to comply with AS/NZS 3823 specified conditions. The system has been tested and proven for cooling operation in outdoor temperatures up to 50°C.

APPLICATIONS

These units have been specifically developed for air conditioning of commercial premises, e.g. banks, supermarkets, shopping malls, food outlets, auditoriums and restaurants.

These Digital models are particularly suitable for applications requiring full or high proportions of fresh air, VAV, close control and supply air temperature control.

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.

FEATURES

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

Economy. Each OPA unit has two independent refrigeration circuits to provide the flexibility and economy of two stage operation, i.e. utilising one or two circuits as conditions vary, plus the advantage of staggered starting. An economiser option is available to lower operating costs further during the cooling cycle.

Efficient. Heat exchange coils incorporate inner grooved (rifled) tube for better heat transfer. The indoor air coil is interlaced for efficient part load performance.

Performance. The system includes two compressors, one of which is Digital thereby providing 15–100% variability and closer temperature control. The OPA also uses a backward curved plug fan for fine tuning of the indoor air 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. Electronic expansion valves (EEV) assist in optimising refrigerant flow. The system includes a digital temperature sensing head pressure control (via pressure transducers) 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 plug fan 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.

Durable. The cabinet and drain tray are constructed from high grade galvanised steel - polyester powder coated (colour Grey) for increased durability. External fasteners are stainless steel. The unit includes a polyester powder coated drain tray. Heat exchange coils comprise aluminium plate fins on mechanically expanded rifled copper tube. The outdoor coil fins are epoxy coated for extra protection in corrosive environments, eg salt laden sea air. Outdoor coil hail protection guards are supplied.

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 (1989) and BS 476 parts 6 & 7.

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.

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 EC plug motor is controlled variably by a 0–10 volt DC signal supplied by, or via, the unit's UC6 Controller. This UC6 controller is BMS compatible with multi-unit control possible – either via digital and analogue signals or via Modbus. Refer to temperzone for other protocols available.

Self Diagnostics. The OPA's Unit Controller (UC6) has a 7 segment LED display to indicate faults and running conditions. Many operating status conditions (including history) can be determined, without gauges, simply by using the built-in *Service Interface* graphical display.

OPTIONAL

1. **temperzone** TZT-100 Controller kit.
2. Filters (rated EU4).
3. Economiser (factory fitted)
- includes dampers, weatherhood.
4. Manually adjustable fresh air damper and weatherhood.
5. Electronic control systems
- available by special arrangement.
6. Downward supply/return air with box mounting channel.

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 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

COMPRESSOR

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

REFRIGERATION SYSTEM

The OPA units are factory charged with HFC-410A (R410A) refrigerant. Electronic expansion valves (EEVs) control 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. The unit's control panel is fully wired ready to accept the main power supply.

ECONOMISER OPTION

(Controls by others)

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

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 I/s	D.B. °C	W.B. °C	23		27		31		35		39		43	
OPA 465	HIGH	2500	21	15	45.8	36.2	45.2	36.2	43.9	35.5	41.9	34.3	39.1	32.4	35.7	29.9
			23	17	48.2	35.4	47.6	35.4	46.3	34.8	44.3	33.7	41.5	32.0	38.1	29.7
			27	19	50.7	40.5	50.1	40.6	48.8	40.0	46.7	38.8	44.0	36.9	40.5	34.4
			31	21	53.1	48.0	52.5	48.0	51.2	47.4	49.1	46.1	46.4	44.0	42.9	41.2
OPA 550	HIGH	2800	21	15	55.1	43.5	54.3	43.5	52.8	42.7	50.3	41.2	47.0	39.0	42.9	36.0
			23	17	58.0	42.5	57.3	42.5	55.7	41.8	53.2	40.5	49.9	38.4	45.7	35.7
			27	19	60.9	48.7	60.2	48.7	58.6	48.0	56.1	46.6	52.8	44.4	48.7	41.4
			31	21	63.8	57.7	63.1	57.7	61.5	57.0	59.1	55.4	55.8	52.9	51.6	50.1
OPA 705	HIGH	3700	21	15	70.7	55.8	69.8	55.8	67.6	54.6	64.5	52.7	60.2	50.0	55.0	46.0
			23	17	74.4	54.6	73.4	54.6	71.6	53.7	68.2	51.8	64.2	49.4	58.7	45.7
			27	19	78.1	62.7	77.1	62.6	75.3	61.6	71.6	59.8	67.9	56.7	62.4	53.0
			31	21	82.1	73.9	81.1	73.9	79.0	73.0	75.9	70.8	71.6	67.8	66.4	63.4
OPA 800	HIGH	4250	21	15	77.2	61.0	76.2	61.0	74.0	59.9	70.6	57.9	66.0	54.7	60.1	50.5
			23	17	81.3	59.6	80.3	59.6	78.1	58.7	74.7	56.8	70.1	53.9	64.2	50.0
			27	19	85.4	68.4	84.4	68.4	82.2	67.4	78.7	65.4	74.1	62.3	68.3	58.1
			31	21	89.5	80.9	88.5	81.0	86.3	80.0	82.9	77.7	78.2	74.3	72.4	69.5
OPA 850	HIGH	4200	21	15	83.9	65.9	82.9	62.5	80.4	64.4	76.7	62.2	71.6	59.0	65.4	54.3
			23	17	88.4	64.4	87.3	64.4	85.1	63.4	81.1	61.2	76.3	58.3	69.8	53.9
			27	19	92.8	74.1	91.7	73.9	89.5	72.3	85.1	70.6	80.7	67.0	74.1	62.6
			31	21	97.5	87.3	96.4	87.3	93.9	86.2	90.2	83.6	85.1	80.0	78.9	74.9
OPA 960	HIGH	5200	21	15	94.8	74.4	93.5	74.4	90.6	72.8	86.5	70.3	80.8	66.6	73.7	61.3
			23	17	99.7	72.8	98.5	72.8	96.0	71.5	91.5	69.1	86.1	65.8	78.7	60.9
			27	19	104.6	83.6	103.4	83.4	100.9	82.1	96.0	79.7	91.1	75.6	83.6	70.7
			31	21	110.0	98.5	108.8	98.5	105.9	97.3	101.8	94.4	96.0	90.3	89.0	84.6

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

PERFORMANCE DATA

HEATING CAPACITY (kW)

G = Gross Heating Capacity kW, based on nominal air flow.

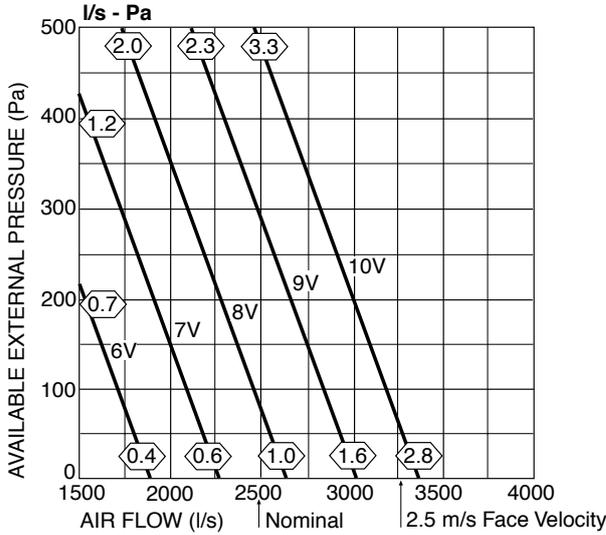
N = Net Heating Capacity kW allowing for average defrost.

○ = 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
OPA 465	15	29.7	25.5	32.2	27.2	34.4	27.5	36.6	28.2	38.8	28.5	41.7	33.3	44.4	44.4	46.6	46.6
	20	29.2	25.1	31.6	26.6	33.7	26.9	35.9	27.6	38.1	28.0	40.9	30.7	43.5	43.5	45.7	45.7
	25	28.1	24.1	30.4	25.7	32.5	26.0	34.6	26.6	36.7	26.9	39.4	29.5	41.9	41.9	44.0	44.0
OPA 550	15	33.9	29.1	36.6	31.0	39.2	31.3	41.7	32.1	44.2	32.5	47.5	37.9	50.5	50.5	53.1	53.1
	20	33.2	28.5	35.9	30.3	38.4	30.7	40.9	31.5	43.3	31.9	46.6	34.9	49.5	49.5	52.0	52.0
	25	32.0	27.5	34.6	29.2	37.0	29.6	39.4	30.3	41.7	30.7	44.8	33.6	47.7	47.7	50.1	50.1
OPA 705	15	52.3	45.8	55.3	45.3	58.3	46.0	61.3	48.9	64.2	55.2	67.2	65.7	70.2	70.2	73.2	73.2
	20	51.3	45.2	54.5	44.7	57.5	45.4	60.5	48.3	63.5	54.6	66.5	65.1	69.4	69.4	72.4	72.4
	25	49.9	43.9	52.9	43.3	55.9	44.1	58.8	47.0	61.8	53.3	64.8	63.8	67.8	67.8	70.8	70.8
OPA 800	15	48.3	43.4	52.3	47.1	55.9	49.7	59.5	51.2	63.1	54.0	67.8	64.4	72.1	72.1	75.7	75.7
	20	47.4	42.6	51.3	46.1	54.8	48.8	58.3	50.2	61.9	52.9	66.5	63.1	70.7	70.7	74.2	74.2
	25	45.6	41.1	49.4	44.4	52.8	47.0	56.2	48.3	59.6	50.9	64.0	60.2	68.1	68.1	71.5	71.5
OPA 850	15	57.0	49.9	61.8	53.1	66.0	54.4	70.3	55.5	74.5	56.3	80.0	62.2	85.2	66.5	89.4	89.4
	20	56.0	48.1	60.5	51.2	64.7	51.8	68.9	53.0	73.1	53.7	78.5	58.9	83.5	83.5	87.7	87.7
	25	53.8	47.2	58.3	50.1	62.3	51.4	66.3	52.4	70.4	53.1	75.6	55.2	80.4	62.7	84.4	84.4
OPA 960	15	61.5	53.8	66.6	57.2	71.2	58.7	75.8	59.9	80.3	60.7	86.3	67.1	91.8	71.6	96.4	96.4
	20	60.3	52.7	65.3	56.2	69.8	57.5	74.3	58.7	78.8	59.5	84.6	61.7	90.0	70.2	94.5	94.5
	25	58.1	50.9	62.8	54.0	67.1	55.4	71.5	56.5	75.9	57.2	81.5	59.5	86.7	67.6	91.0	91.0

PERFORMANCE DATA

OPA 465-P

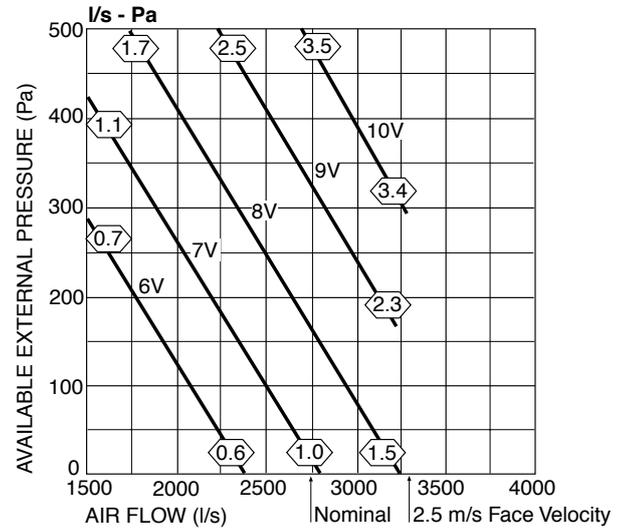


AIR HANDLING

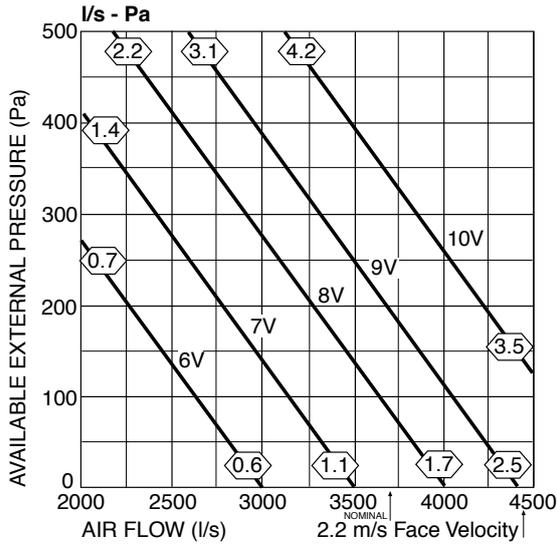
Note: Airflows are for a dry coil. Reduce airflow by 5% in high moisture removal conditions. In a free blow or low resistance application, beware of exceeding indoor fan motor's full load amp limit (refer back page). As filters are optional, the fan air flows given are for units installed without filters.

⬡ kilowatts

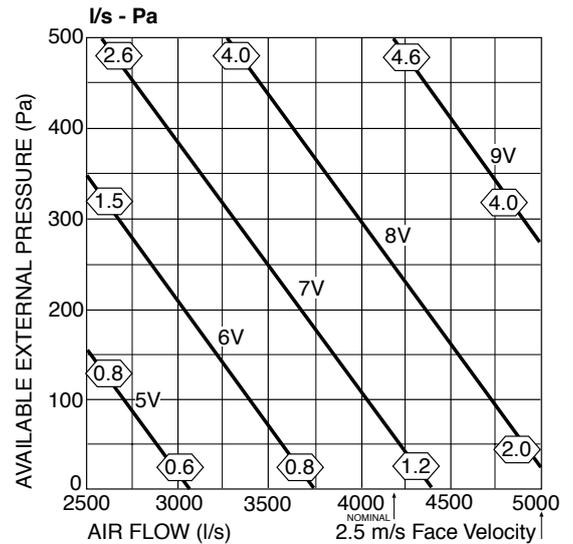
OPA 550-P



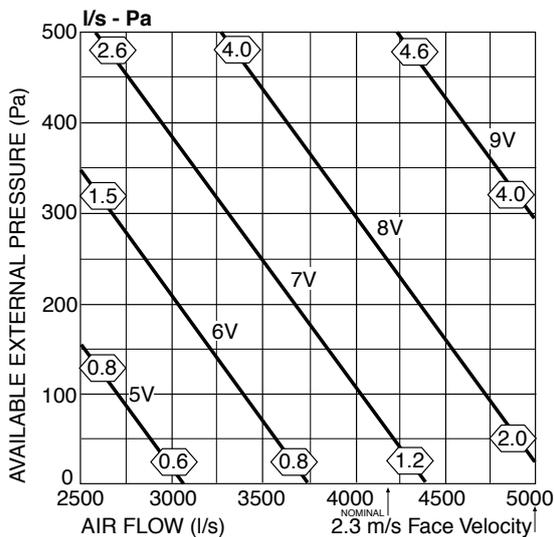
OPA 705-P



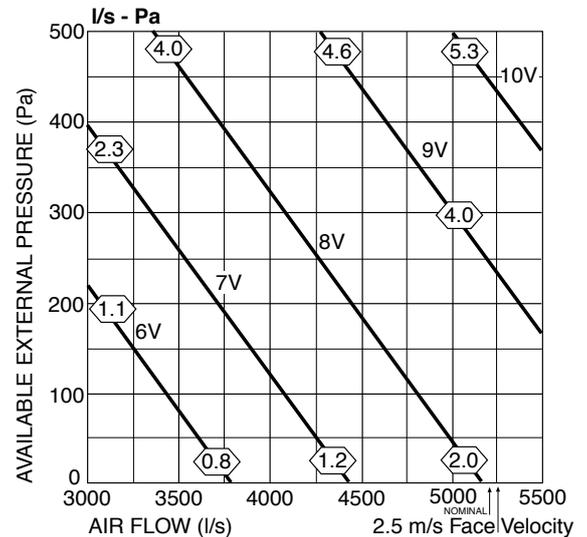
OPA 800-P



OPA 850-P

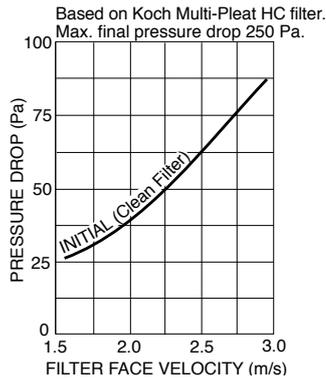


OPA 960-P



PERFORMANCE DATA

OPTIONAL FILTERS - PRESSURE DROP



SOUND LEVELS

RADIATED

Sound Power Levels (SWL)

Measured in decibels re 1 picowatt.

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 465	HIGH	78	84	78	76	74	69	61
OPA 550	HIGH	84	85	80	80	79	77	69
OPA 705	HIGH	82	82	81	82	79	76	71
OPA 800	HIGH	82	85	80	79	78	73	66
OPA 850	HIGH	84	82	81	82	79	76	71
OPA 960	HIGH	85	78	77	80	81	79	77

Sound Pressure Levels (SPL)

Measured in decibels re 20 μ Pa.

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 465	HIGH	62	68	62	60	58	54	47
OPA 550	HIGH	68	69	64	64	63	61	53
OPA 705	HIGH	66	64	63	64	61	58	53
OPA 800	HIGH	66	69	64	63	62	57	50
OPA 850	HIGH	66	64	63	64	61	58	53
OPA 960	HIGH	67	73	66	64	62	57	49

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.

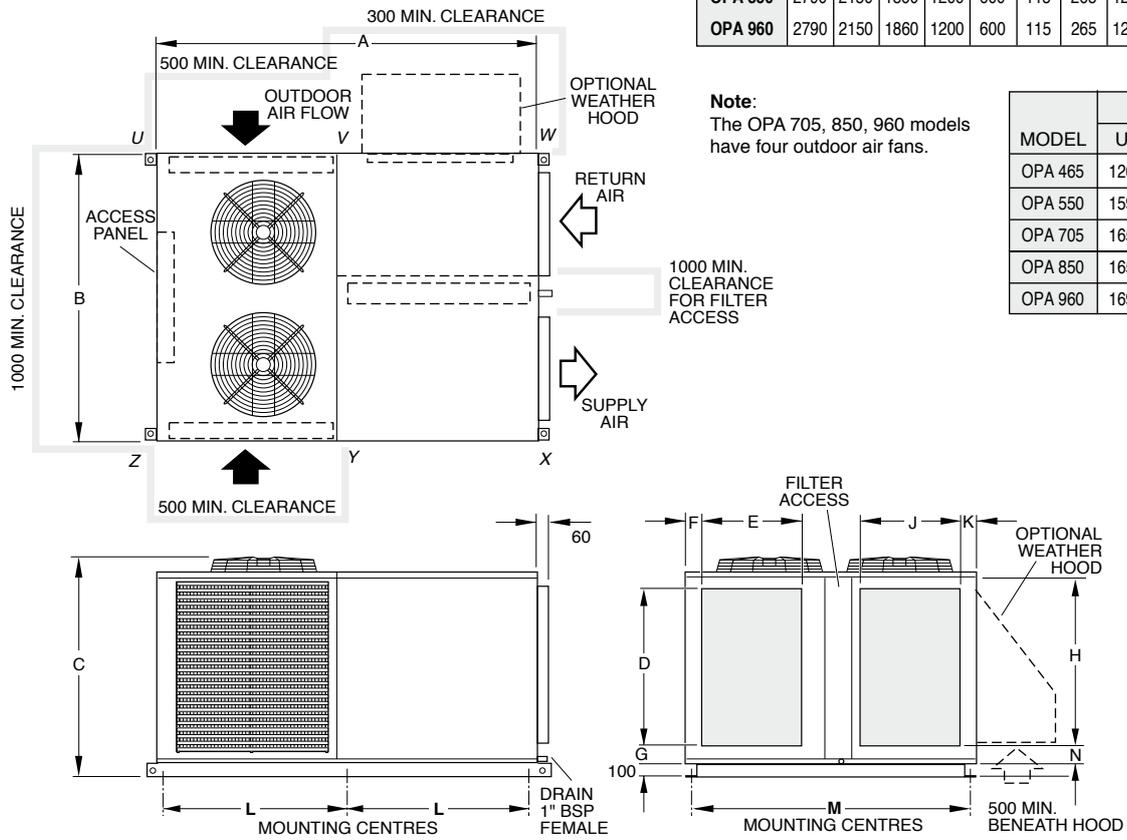
SUPPLY AIR OUTLET

MODEL	INDOOR AIRFLOW @300Pa Static	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1 k	2 k	4 k
			SOUND POWER LEVELS (SWL) dB					
OPA 465	2500 l/s	83	84	81	81	77	73	70
OPA 550	2800 l/s	79	77	78	77	73	70	64
OPA 705	3700 l/s	83	81	81	82	79	72	69
OPA 800	4250 l/s	83	84	82	83	78	74	70
OPA 850	4200 l/s	83	84	82	83	78	74	70
OPA 960	5200 l/s	87	87	85	86	82	78	75

DIMENSIONS (mm)

Not to Scale

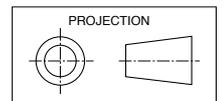
**Fig. 1 Horizontal Supply & Return Air
OPA *RKTBG01-P**



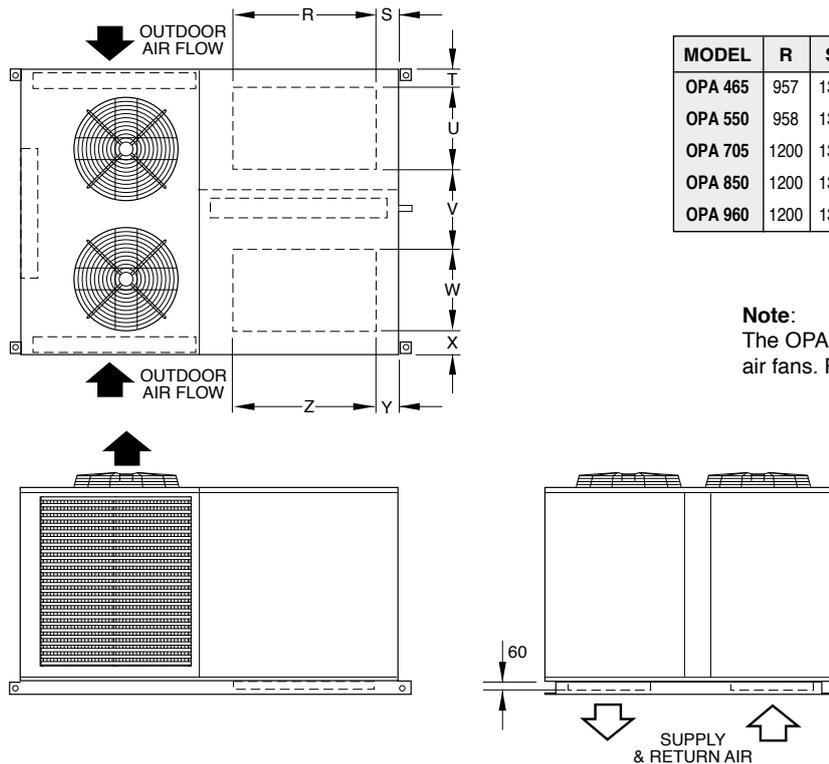
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N
OPA 465	2225	1950	1635	957	502	55	210	957	502	130	1080	1879	210
OPA 550	2225	1950	1750	958	502	70	210	958	502	130	1080	1879	210
OPA 705	2790	2150	1860	1200	600	115	265	1200	600	130	1364	2079	265
OPA 850	2790	2150	1860	1200	600	115	265	1200	600	130	1364	2079	265
OPA 960	2790	2150	1860	1200	600	115	265	1200	600	130	1364	2079	265

Note:
The OPA 705, 850, 960 models have four outdoor air fans.

MODEL	POINT LOADS (kg)					
	U	V	W	X	Y	Z
OPA 465	126	115	105	131	142	154
OPA 550	159	134	109	131	146	162
OPA 705	165	164	176	199	198	212
OPA 850	165	164	176	199	198	212
OPA 960	169	168	180	206	204	220



**Fig. 2 Downward Supply Air & Return Air
OPA *RKTBG23-P**



MODEL	R	S	T	U	V	W	X	Y	Z
OPA 465	957	130	130	502	760	502	55	55	957
OPA 550	958	130	130	502	745	502	70	70	958
OPA 705	1200	130	130	600	705	600	115	115	1200
OPA 850	1200	130	130	600	705	600	115	115	1200
OPA 960	1200	130	130	600	705	600	115	115	1200

Note: Above dimensions subject to confirmation

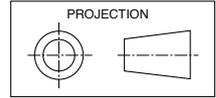
Note:
The OPA 850, 960 models have four outdoor air fans. Refer to Fig.1 for overall dimensions.

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

DIMENSIONS (mm)

Not to Scale

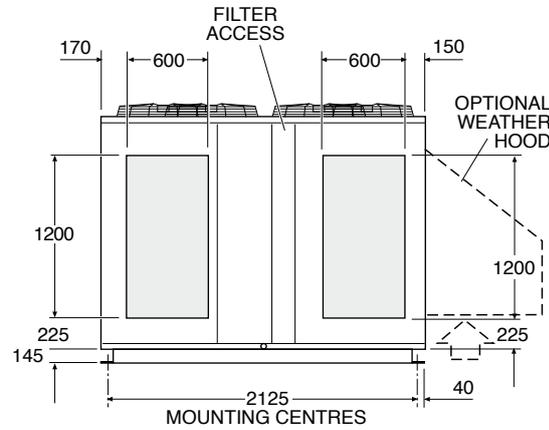
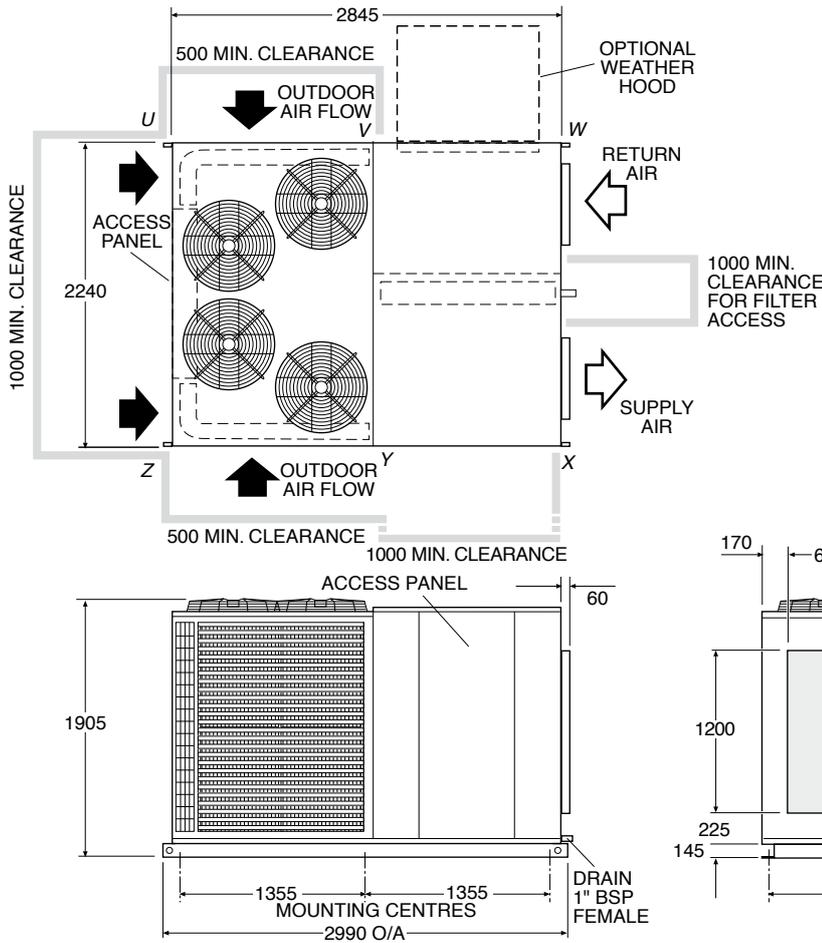
**Fig. 3 Horizontal Supply & Return Air
OPA 800RKTBG01-P**



POINT LOADS (kg)					
U	V	W	X	Y	Z
234	180	126	240	203	186

Opposite Hand version also available,
or OPA 800RKTB10

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



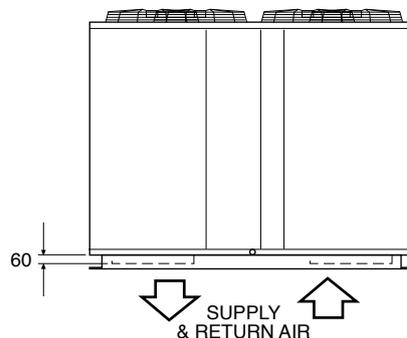
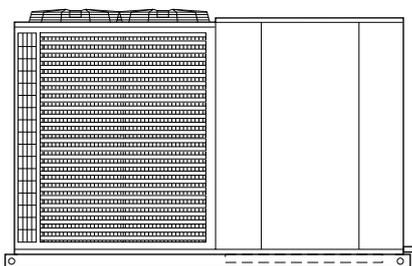
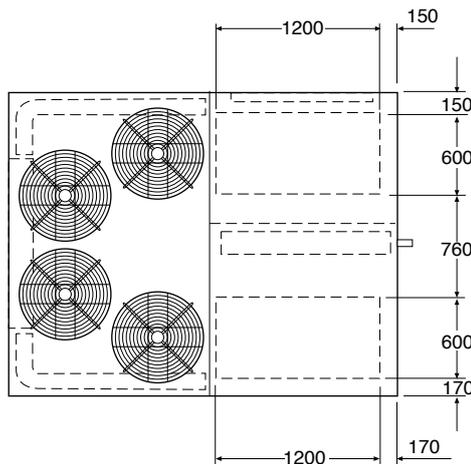
**Fig. 4 Downward Supply Air & Return Air
OPA 800RKTBG23-P**

NOTE

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

Opposite Hand version also available,
or OPA 800RKTB32

Note: Bottom aperture dimensions
subject to confirmation

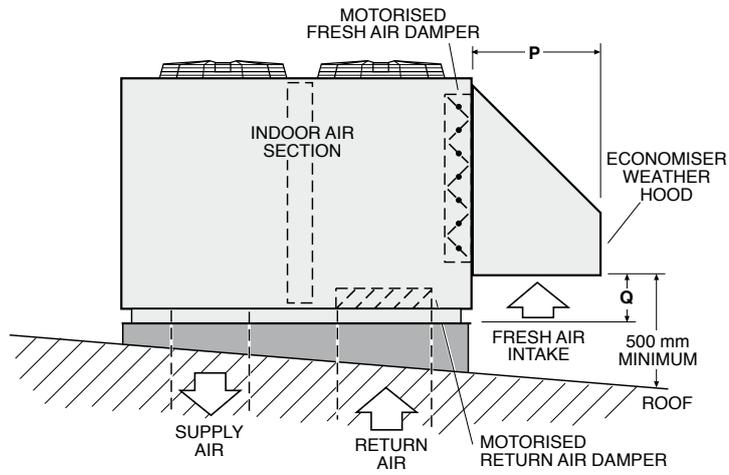


OPTIONS

Dimensions (mm)

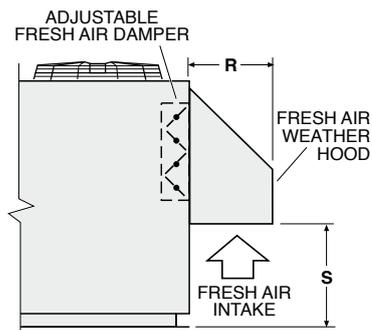
Economiser

MODEL	P	Q
OPA 465	735	335
OPA 550	735	335
OPA 705	875	310
OPA 800	975	370
OPA 850	875	310
OPA 960	875 <td 310	



Fresh Air Damper

MODEL	R	S
OPA 465	435	785
OPA 550	435	785
OPA 705	430	810
OPA 800	260	835
OPA 850	430	810
OPA 960	430	810



NOMENCLATURE

e.g.

Series	Size	Type
O - Outdoor P - Packaged A - Air Cooled	Divide by 10 to get approx. nominal Capacity in kilowatts	R - Reverse cycle K - Refrigerant R410A T - Three phase power supply B - Twin compressor system (twin circuit) G - Digital compressor system (single) D - TZT-701 Room Temp. Controller H - Horizontal discharge supply air fan U - Downward discharge supply air fan P - EC motor plug fan 01 - Std Horiz. S/A, Horiz. R/A 10 - Opp Hd Bott. S/A, Vert. R/A 23 - Std Bott. S/A, Bott. R/A 32 - Opp Bott. S/A, Bott. R/A

NOTES

SPECIFICATIONS

Model (OPA *RKTBG-P version) :		OPA 465	OPA 550	OPA 705	OPA 800	OPA 850	OPA 960
Nominal Cooling Capacity *1	kW	46.7	56.1	71.6	78.7	85.1	96.0
Net Cooling Capacity	kW	44.6	53.9	69.7	74.2	80.1	87.9
Heating Capacity *2	kW	43.5	49.5	69.4	70.7	83.5	90.0
E.E.R. (Cooling)		2.96	3.05	3.30	2.99	3.04	2.80
Air Flow *3	l/s	2500	2800	3700	4250	4200	5200
Power Source *4		3 phase 342 - 436 V a.c. 50 Hz					
Indoor Fan Full Load Amps	A/ph.	5.7	5.7	4 (x2)	5.7 (x2)	4.0 (x2)	4.0 (x2)
Running Amps (Total System)	A/ph.	31 / 27 / 27	38 / 30 / 29	40 / 34 / 35	50 / 40 / 40	49 / 44 / 44	68 / 59 / 59
Recom'd External Protection	A/ph.	50	80	100	120	100	120
Finish		Grey polyester powder coat					
Net Weight	kg	774	840	1139	1170	1113	1148
Shipping Weight	kg	869	949	1241	1315	1215	1240

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 Power source includes voltage limits.



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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