

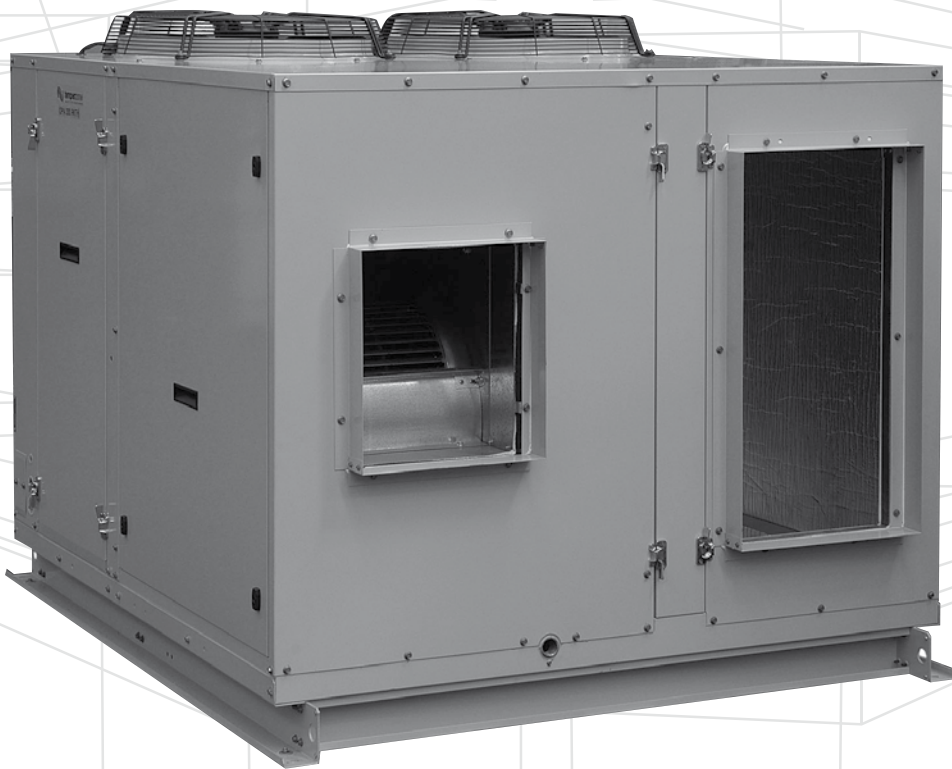
**Ducted Three Phase
Packaged Air Conditioners**

Technical Data

OPA 205, 280, 294, 333



R410A



Extra Long Life
Epoxy Coated Outdoor Coil

Nominal Cooling Capacity
20 kW – 34 kW

OPA 205, 280, 294, 333 – DUCTED PACKAGED ROOF TOP AIR CONDITIONERS

GENERAL

This OPA Series is a range of reverse cycle (heat pump) packaged roof top 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).

The OPA 294 is different to the other three models in that it has a twin circuit refrigeration system, which enables staging.

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.

Staging: The OPA 294 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.

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

Performance. An adjustable pulley on the indoor air fan motor enables fine tuning to match the supply air requirements. 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. 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 (1989) 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. 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.

Self Diagnostics. The OPA's Outdoor Unit Controller (OUC) has a display of LEDs to indicate faults and running conditions. A non-specific fault indicator is included for interface to external systems.

CONFIGURATIONS

There is also choice of two supply air configurations:

- Horizontal supply/return air with box mounting channel (OPA***RKTH**), or
- Downward supply/return air with box mounting channel (OPA***RKTU**).

OPTIONAL EQUIPMENT

- temperzone** TZT-701 Controller kit, or SAT-2 (24V) Controller kit.
- Filters (rated EU4).
- Economiser (factory fitted) - includes dampers, weatherhood.
- Manually adjustable fresh air damper and weatherhood.
- Outdoor air coil protection guard (nb supplied on OPA 294).
- Electronic control systems - available by special arrangement.
- 6 kW Electric booster heat (factory fitted) complete with heater safety cutout required to meet AS/NZS 3350.2.40 1997.

SAFETY FEATURES

- HP and loss of refrigerant protection.
- Anti-rapid cycle timer and internal overload for compressor protection.
- Circuit breaker control circuits.
- Time-and-temperature controlled electronic de-ice switch prevents icing up of the outdoor coil during heating cycle.
- Frost protection on cooling cycle.
- Sensor fault indication.
- Crankcase heater prevents liquid refrigerant condensing in the compressors during the 'off' cycle.
- Compressor minimum run time to ensure oil return.
- Phase rotation protection device.
- 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. Accurator expansion devices control the flow of refrigerant.

WIRING

The electrical supply required (including voltage fluctuation limits) is:
3 phase 342-436 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.

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

Also available:

OPA 440-960 models (43-96 kW)

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		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	
					Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.
OPA 205	HIGH	1260	21	15	19.4	15.3	19.1	15.3	18.6	15.0	17.7	14.5	16.5	13.7	15.1	12.7
			23	17	20.4	15.0	20.2	15.0	19.6	14.7	18.7	14.3	17.6	13.5	16.1	12.6
			27	19	21.4	17.1	21.2	17.2	20.6	16.9	19.7	16.4	18.6	15.6	17.1	14.6
			31	21	22.5	20.3	22.2	20.3	21.7	20.1	20.8	1.5	19.6	18.6	18.2	17.4
OPA 280	HIGH	1650	21	15	27.9	22.0	27.5	22.0	26.7	21.7	25.5	20.9	23.8	19.8	21.7	18.2
			23	17	29.4	21.6	29.0	21.5	28.2	21.2	27.0	20.5	25.3	19.5	23.2	18.1
			27	19	30.9	24.7	30.5	24.7	29.7	24.4	28.4	23.6	26.8	22.5	24.7	21.0
			31	21	32.3	29.2	32.0	29.3	31.2	28.9	29.9	28.1	28.3	26.8	26.2	25.1
OPA 294	HIGH	1600	21	15	28.9	22.9	28.6	22.8	27.7	22.4	26.4	21.7	24.7	20.5	22.5	18.9
			23	17	30.5	22.3	30.1	22.3	29.3	22.0	28.0	21.3	26.2	20.2	24.0	18.7
			27	19	32.0	25.6	31.6	25.6	30.8	25.2	29.5	24.5	27.8	23.3	25.6	21.7
			31	21	33.5	30.3	33.1	30.3	32.3	29.9	31.0	29.1	29.3	27.8	27.1	26.0
OPA 333	HIGH	1800	21	15	33.3	26.3	32.9	26.3	31.9	25.9	30.5	25.0	28.5	23.6	25.9	21.8
			23	17	35.1	25.7	34.7	25.7	33.7	25.3	32.2	24.5	30.2	23.3	27.7	21.6
			27	19	36.9	29.5	36.4	29.5	35.5	29.1	34.0	28.2	32.0	26.9	29.5	25.0
			31	21	38.6	34.9	38.2	35.0	37.2	34.5	35.8	33.5	33.8	32.0	31.2	30.0

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

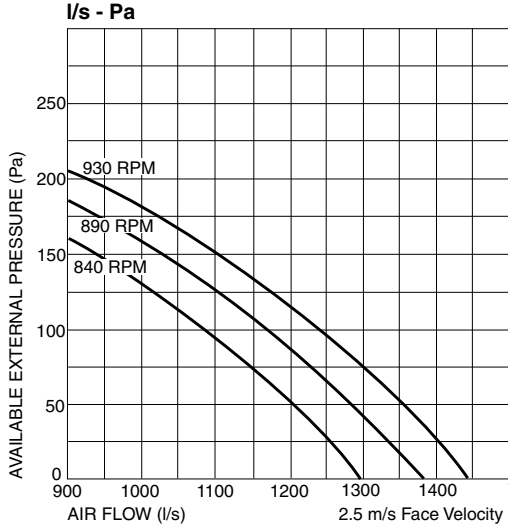
MODEL	INDOOR ENTERING AIR TEMP. °C D.B.	OUTDOOR COIL ENTERING AIR TEMPERATURE (E.A.T.) °C D.B.															
		-5		-3		-1		1		3		5		7		9	
		G	N	G	N	G	N	G	N	G	N	G	N	G	N	G	N
OPA 205	15	14.4	12.3	15.5	13.1	16.6	13.2	17.7	13.6	18.7	13.8	20.1	16.0	21.4	21.4	22.5	22.5
	20	14.1	12.1	15.2	12.9	16.3	13.0	17.3	13.3	18.4	13.5	19.7	14.8	21.0	21.0	22.1	22.1
	25	13.5	11.7	14.7	12.4	15.7	12.5	16.7	12.8	17.7	13.0	19.0	14.3	20.2	20.2	21.2	21.2
OPA 280	15	18.6	16.0	20.1	16.0	21.5	17.2	22.9	17.6	24.3	17.8	26.1	20.8	27.7	27.7	29.1	29.1
	20	18.2	15.7	19.7	16.7	21.1	16.9	22.4	17.3	23.8	17.5	25.6	19.2	27.2	27.2	28.6	28.6
	25	17.6	15.1	19.0	16.1	20.3	16.2	21.6	16.6	22.9	16.9	24.6	18.5	26.2	26.2	27.5	27.5
OPA 294	15	18.6	16.8	20.1	18.1	21.5	19.2	22.9	19.7	24.3	20.8	26.1	24.8	27.8	27.8	29.2	29.2
	20	18.3	16.4	19.8	17.8	21.1	18.8	22.5	19.3	23.8	20.4	25.6	24.3	27.2	27.2	28.6	28.6
	25	17.6	15.8	19.0	17.1	20.3	18.1	21.6	18.6	23.0	19.6	24.7	23.2	26.2	26.2	27.5	27.5
OPA 333	15	21.5	19.1	23.0	20.7	24.6	21.9	26.2	22.5	27.8	23.7	29.8	28.3	31.7	31.7	33.3	33.3
	20	20.8	18.7	22.5	20.3	24.1	21.5	25.7	22.1	27.2	23.3	29.2	27.8	31.1	31.1	32.7	32.7
	25	20.1	18.1	21.7	19.5	23.2	20.7	24.7	21.3	26.2	22.4	28.2	28.5	30.0	30.0	31.5	31.5

PERFORMANCE DATA

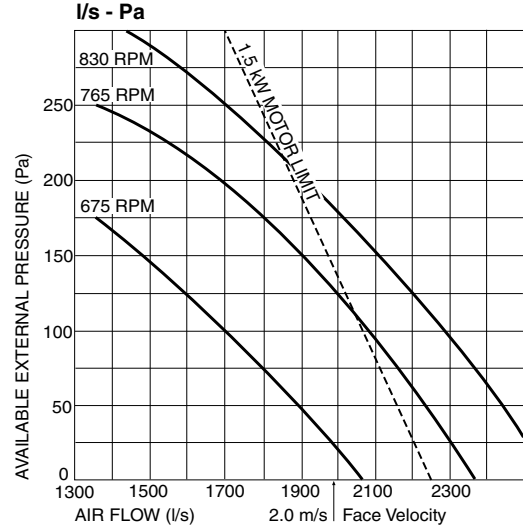
AIR HANDLING

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.

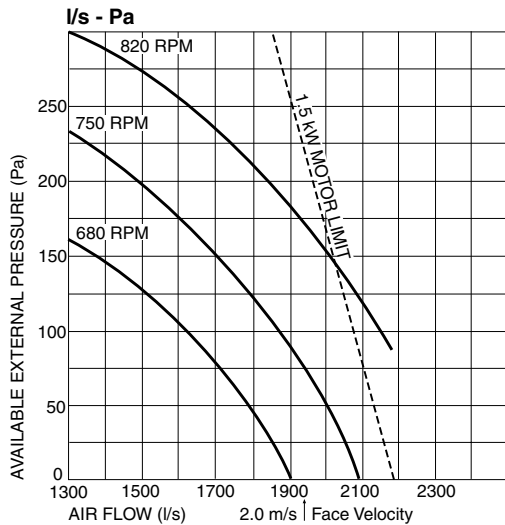
OPA 205



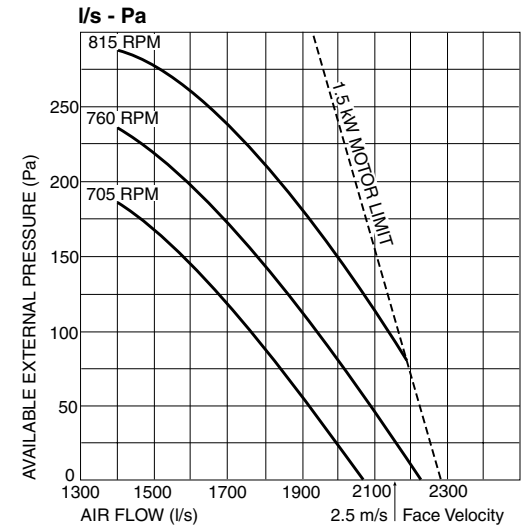
OPA 280



OPA 294

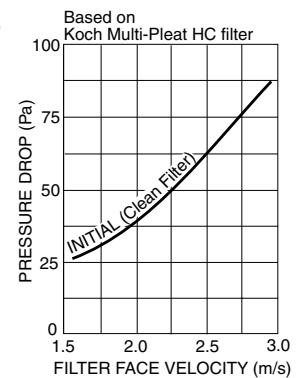


OPA 333



Model :		OPA 205	OPA 280	OPA 294	OPA 333
Std Motor Size	kW	1.1	1.5	1.5	1.5
Max. D.O.L. Motor	kW	2.2	3.0	3.0	3.0
Max. Fan Speed	RPM	1500	1500	1500	1400
Std Pulley Range	RPM	840-1000	660-820	660-820	660-820
Factory Setting	RPM	920	725	725	760

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 205	LOW	72	79	70	68	68	61	60
	HIGH	73	80	73	68	68	62	60
OPA 280	HIGH	73	80	73	68	68	62	60
OPA 294	HIGH	73	80	73	68	68	62	60
OPA 333	HIGH	81	82	79	79	76	71	64

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 205	LOW	56	63	54	52	52	45	44
	HIGH	57	64	57	52	52	46	44
OPA 280	HIGH	57	64	57	52	52	46	44
OPA 294	HIGH	57	64	57	52	52	46	44
OPA 333	HIGH	65	66	63	63	60	55	48

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.

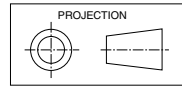
SUPPLY AIR OUTLET

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 205	840 RPM	81	77	74	79	77	73	71
OPA 280	675 RPM	74	71	69	72	69	67	65
	765 RPM	81	75	73	78	76	73	71
	830 RPM	82	75	74	79	78	75	73
OPA 294	680 RPM	74	71	69	72	69	67	65
	750 RPM	81	75	73	78	76	73	71
	820 RPM	82	75	74	79	78	75	73
OPA 333	760 RPM	87	82	81	83	83	80	77

DIMENSIONS (mm)

Not to Scale

**Fig. 1 Horizontal Supply & Return Air
OPA 205/280/294 RKTH**



MODEL	A	B	C	D	E	F	G
OPA 205	1570	1245	350	600	1500	290	1680
OPA 280	1670	1500	445	770	1605	305	1780
OPA 294	1670	1500	540	770	1605	265	1780

MODEL	POINT LOADS (kg)			
	W	X	Y	Z
OPA 205	95	92	104	108
OPA 280	134	110	120	145
OPA 294	100	121	119	176

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

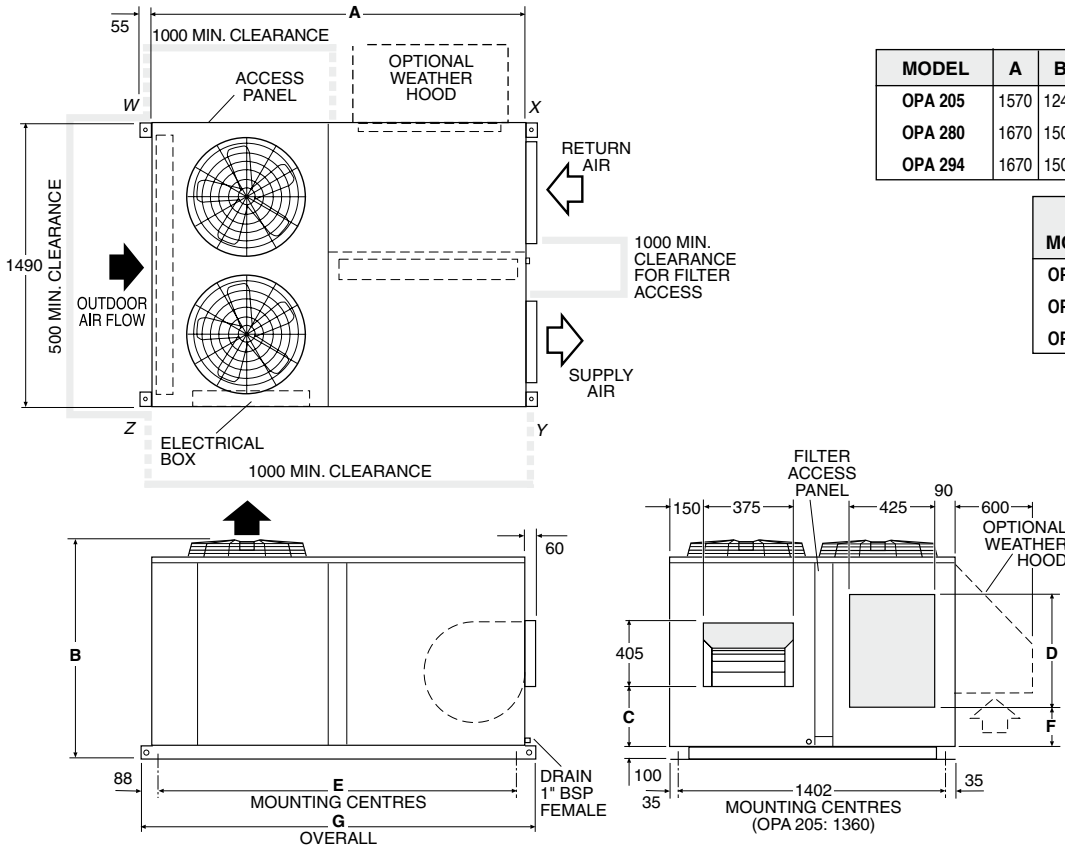
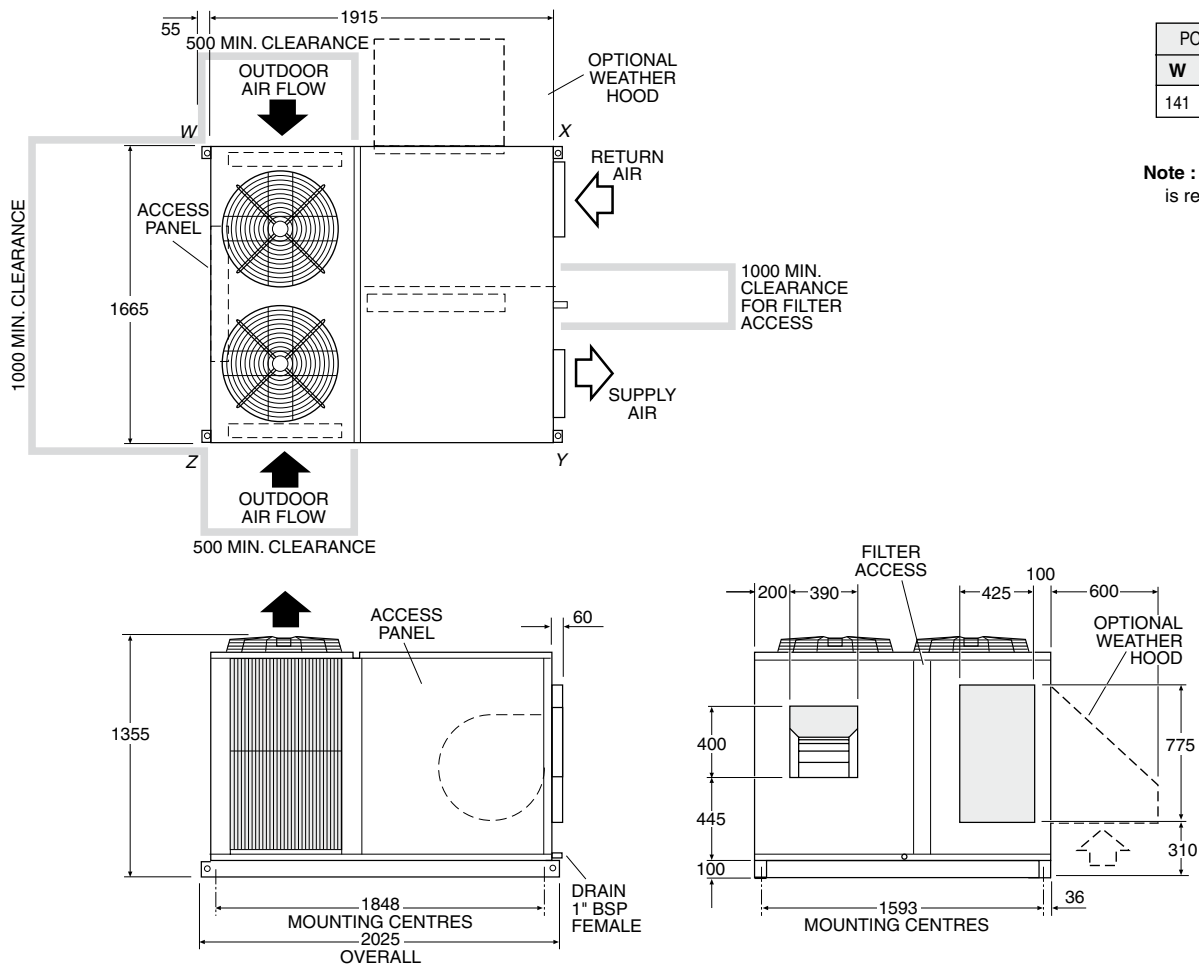


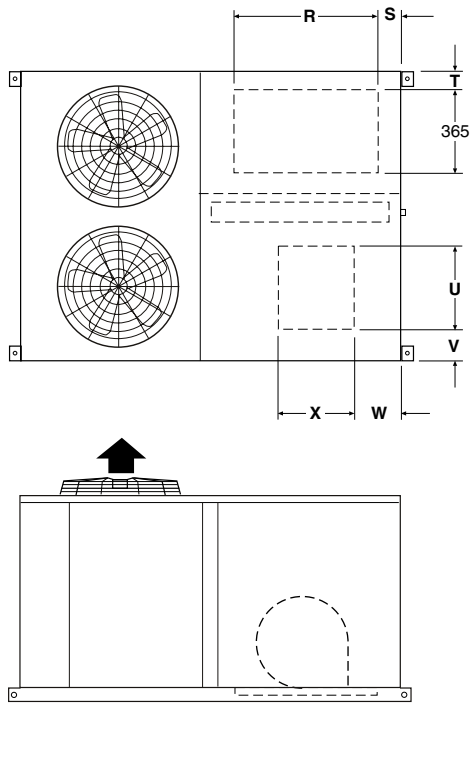
Fig. 2 OPA 333RKTH – Horizontal Supply & Return Air

POINT LOADS (kg)			
W	X	Y	Z
141	120	136	156

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



**Fig. 3 Downward Supply & Return Air
OPA*RKTU**



MODEL	R	S	T	U	V	W	X
OPA 205	575	115	180	310	185	150	340
OPA 280	745	110	180	330	170	210	405
OPA 294	745	110	180	375	140	240	405
OPA 333	745	100	165	330	225	210	400

Note:
Refer to Fig.1 or 2 for overall dimensions and clearances.

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

Fig. 4 Economiser Option

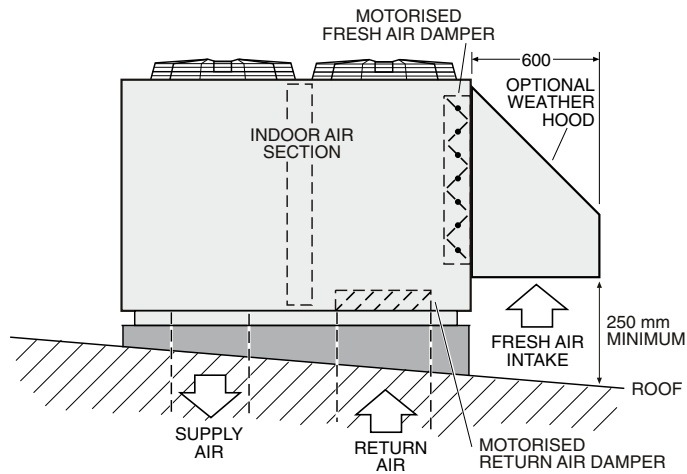
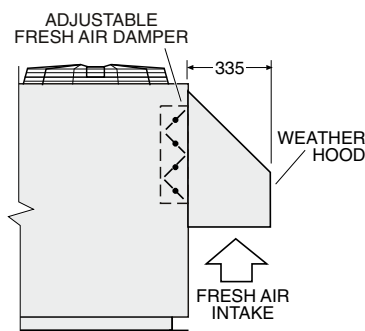


Fig. 5 Fresh Air Damper Option



SPECIFICATIONS

Model		OPA 205	OPA 280	OPA 294 B	OPA 333
Nominal Cooling Capacity *1	kW	19.7	28.4	29.5	34.0
Net Cooling Capacity	kW	18.90	27.30	28.3	32.40
Heating Capacity *2	kW	21.0	27.2	27.2	31.1
EER / AEER (Cooling)		2.93 / 2.93	3.06 / 3.06	3.21 / 3.22	3.11 / 3.10
Air Flow *3	l/s	1260	1650	1600	1800
Power Source *4		3 phase 342-436 V a.c. 50 Hz			
Indoor Fan Full Load Amps	A/ph.	2.6	3.1	3.1	3.3
Running Amps (Total System)	A/ph.	14 / 14 / 15	18 / 15 / 15	18 / 15 / 15	21 / 18 / 18
Recom'd External Protection	A/ph.	25	40	32	40
Finish		Grey polyester powder coat			
Net Weight	kg	393	509	516	560
Shipping Weight (approx.)	kg	446	605	595	634

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:

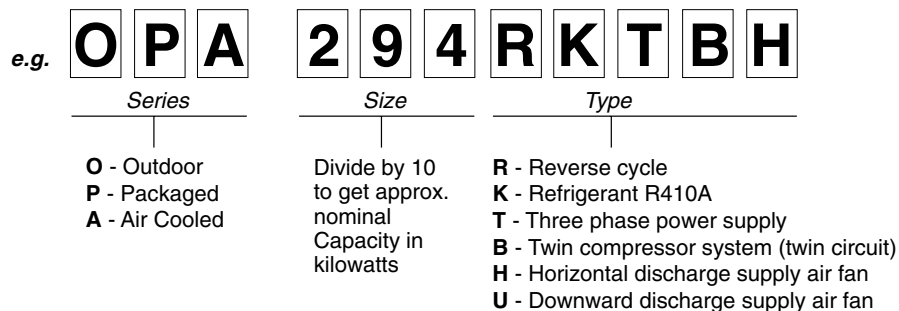
Indoor Entering Air Temperature 21°C D.B.;

Outdoor Entering Air Temperature 7°C D.B., 6°C W.B.

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

*4 Power source includes voltage limits.

NOMENCLATURE



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