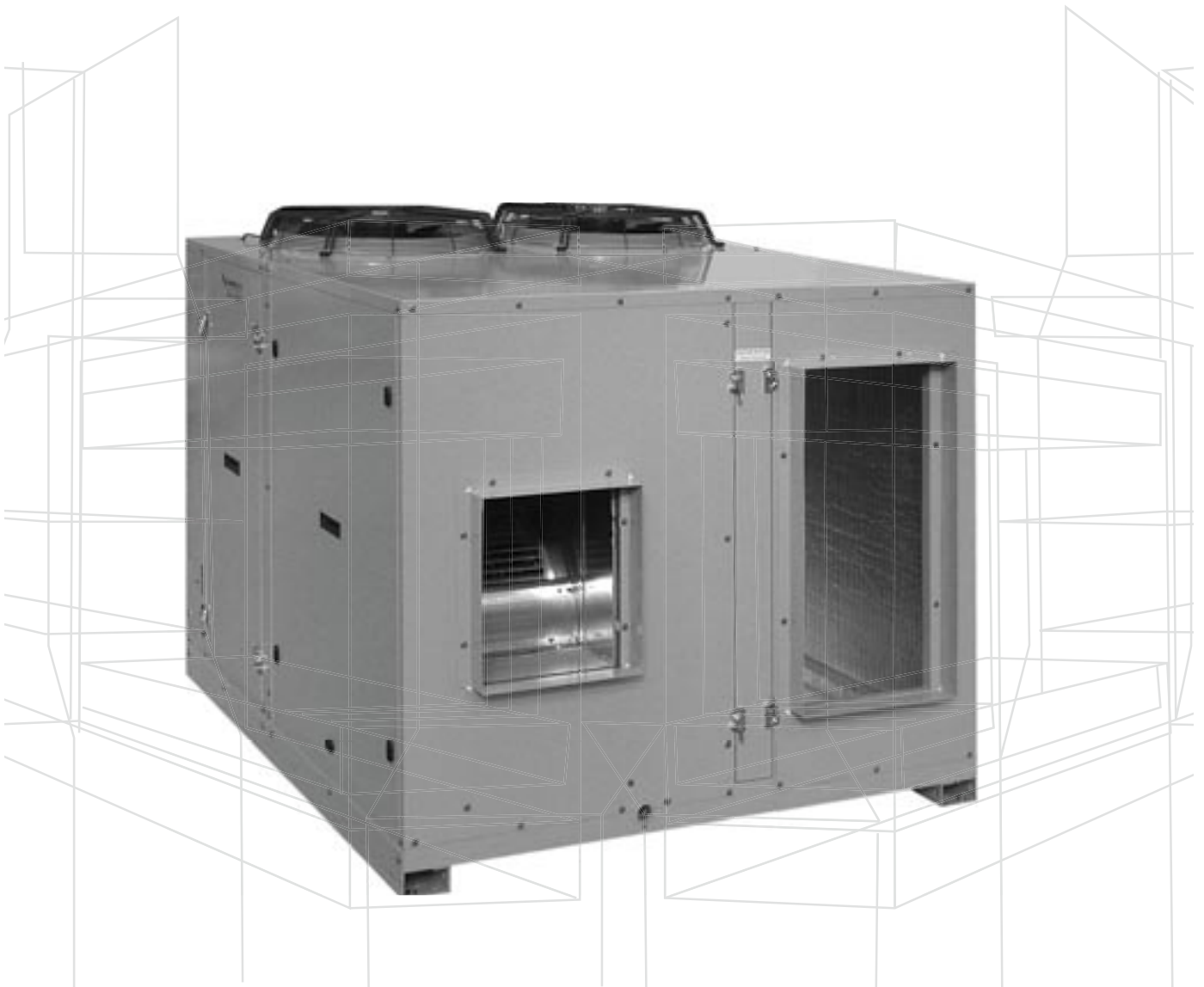


Ducted Three Phase Packaged Air Conditioners

Technical Data

OPA 210 – 410



Staging Systems Included

**Extra Long Life
Epoxy Coated Outdoor Coil**

**Nominal Cooling Capacity
21 kW – 41 kW**

OPA 210 - 410 – DUCTED PACKAGED ROOF TOP AIR CONDITIONERS

GENERAL

- OPA** - A general designation
- OPA *C** - Cooling only version
- OPA *R** - Reverse cycle version
- OPA *CA** - Cooling only version with tandem compressor system
- OPA *RA** - Reverse cycle version with tandem compressor system

This OPA Series is a range of three phase 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).

APPLICATIONS

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

The OPA 260 A, 290 A and 410 A have tandem compressor (single circuit) systems, providing the facility for capacity control (staging) or staggered starting. The second compressor starts only when required to meet the current load conditions, thereby lowering operating costs.

In tropical (high humidity) locations care must be taken to select an airflow which gives a suitable coil face air velocity that prevents water carry-over. Applications using full or high proportions of fresh air should be referred to your nearest **temperzone** sales office for the most suitable selection of units.

FEATURES

Economy. An economiser option is available to lower operating costs during the cooling cycle. OPA 260 A, 290 A and 410 A models provide the additional economy of two stage operation, i.e. utilising one or two compressors as conditions vary, plus the advantage of staggered starting.

Efficient. Heat exchange coils incorporate inner grooved (rifled) tube for better heat transfer. Thermostatic expansion valves are used to ensure the system remains efficient over a wide range of operating conditions.

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. The unit's generous insulation ensures a quiet unit.

Insulation. Foil faced closed cell foam insulation has been used in the indoor air section to ensure no particles are introduced into the air stream.

Durable. The cabinet and drain tray are constructed from high grade galvanised steel - polyester powder coated for increased durability. External fasteners are stainless steel. 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, e.g. salt laden sea air.

Self Diagnostics. The OPA's Outdoor Unit Controller (OUC) has a display of LEDs to indicate faults and running conditions. A general fault indicator is included for interface to external systems. (Note: OPA *R only).

CONFIGURATIONS

Three versions are available for each model:

1. Horizontal supply/return air with mounting rails.
2. Downward supply air with mounting rails.
3. Downward supply air with plinth mount.

OPTIONAL EQUIPMENT

1. HAN-L6 Controller.
2. LP switch.
3. Fault indicating auxiliary relay board.
4. Filters (rated EU4).
5. Electric booster heat kit (internal)
 - 4.5 kW for OPA 210
 - 6.0 kW for OPA 250–300
 - 9.0 kW for OPA 390, 410Complete with heater safety cutout required to meet AS/NZS 3350.2.40 1997.
6. Economiser (factory fitted)
 - includes dampers, weatherhood, hot gas bypass and HP fan speed controller.
7. Adjustable fresh air damper and weatherhood.
8. Outdoor air coil protection guard.
9. Electronic control systems
 - 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 (OPA *R only).
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.

COMPRESSOR/S

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

REFRIGERATION SYSTEM

The OPA units are factory charged with HCFC-22 (R22) refrigerant. Thermostatic 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 temperature 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. The compressor(s) will then operate to provide more cooling if required. An alternative way of removing return air may be required when operating on 100% fresh air.

The manufacturer operates a quality management system that conforms to AS/NZS ISO 9001:2000.

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	W.B. °C	D.B. °C	23		27		31		35		39		43	
					Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.
OPA 210	HIGH	1260	17	23	22.5	16.1	21.8	15.8	21.1	15.5	20.3	15.2	19.6	14.9	18.9	14.6
			19	27	23.8	18.5	23.1	18.2	22.3	17.9	21.5	17.6	20.8	17.3	20.0	17.0
			21	31	25.2	20.8	24.4	20.5	23.6	20.3	22.8	20.0	21.9	19.7	21.1	19.4
OPA 250	HIGH	1500	17	23	27.3	20.1	26.5	19.8	25.8	19.5	25.0	19.1	24.3	18.8	23.5	18.5
			19	27	28.8	23.1	28.0	22.8	27.3	22.5	26.5	22.2	25.6	21.9	24.9	21.6
			21	31	30.4	26.1	29.6	25.8	28.8	25.5	27.9	25.2	27.1	25.0	26.3	24.7
OPA 260 A	HIGH	1500	17	23	26.6	19.0	25.9	18.7	25.2	18.4	24.5	18.1	23.7	17.8	23.0	17.5
			19	27	28.1	21.8	27.4	21.5	26.7	21.2	26.0	20.9	25.2	20.7	24.4	20.4
			21	31	29.7	24.5	29.0	24.3	28.2	24.0	27.5	23.7	26.7	23.5	25.9	23.2
OPA 290 A	HIGH	1800	17	23	29.7	21.8	28.9	21.4	28.1	21.1	27.3	20.8	26.5	20.5	25.6	20.1
			19	27	31.5	25.1	30.6	24.8	29.8	24.5	29.0	24.2	28.1	23.9	27.2	23.5
			21	31	33.4	28.5	32.5	28.2	31.6	27.9	30.7	27.5	29.9	27.2	29.0	26.9
OPA 300	HIGH	1800	17	23	31.0	22.3	30.2	22.0	29.3	21.6	28.5	21.3	27.7	20.9	26.8	20.6
			19	27	32.8	25.6	32.0	25.3	31.2	25.0	30.3	24.7	29.4	24.3	28.5	24.0
			21	31	34.8	28.9	33.9	28.6	33.0	28.3	32.1	28.0	31.2	27.7	30.3	27.4
OPA 390	HIGH	2300	17	23	40.2	30.1	39.1	29.6	38.0	29.2	36.9	28.7	35.7	28.3	34.6	27.8
			19	27	42.6	34.8	41.4	34.3	40.2	33.9	39.1	33.4	37.9	33.0	36.7	32.5
			21	31	45.0	39.4	43.8	39.0	42.5	38.5	41.3	38.1	40.1	37.7	38.8	37.3
OPA 410 A	HIGH	2300	17	23	42.2	30.9	41.1	30.4	39.9	29.9	38.7	29.5	37.6	29.0	36.4	28.5
			19	27	44.6	35.6	43.4	35.1	42.2	34.6	41.0	34.2	39.8	33.7	38.5	33.2
			21	31	47.2	40.2	45.9	39.7	44.7	39.3	43.4	38.8	42.1	38.4	40.8	38.0

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

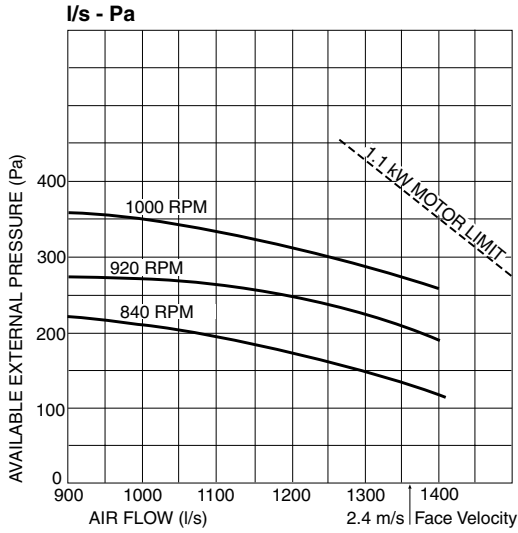
MODEL	INDOOR ENTERING AIR TEMP. °C D.B.	OUTDOOR COIL ENTERING AIR TEMPERATURE (E.A.T.) °C D.B.															
		-5		-3		-1		1		3		5		7		9	
		G	N	G	N	G	N	G	N	G	N	G	N	G	N	G	N
OPA 210R	15	14.6	13.2	15.8	14.2	16.9	15.2	18.0	15.8	19.1	16.1	20.5	18.5	21.8	21.6	22.9	22.9
	20	14.3	12.9	15.5	14.0	16.6	14.9	17.7	15.5	18.7	15.8	20.1	18.1	21.4	21.2	22.5	22.5
	25	13.8	12.4	14.9	13.4	16.0	14.4	17.0	15.0	18.0	15.2	19.4	17.4	20.6	20.4	21.6	21.6
OPA 250R	15	17.8	15.6	19.3	16.6	20.6	17.0	22.0	17.4	23.3	17.6	25.0	19.4	26.6	20.8	28.0	28.0
	20	17.5	15.3	18.9	16.3	20.2	16.7	21.5	17.0	22.8	17.2	24.5	17.9	26.1	20.4	27.4	27.4
	25	16.8	14.7	18.2	15.7	19.5	16.1	20.7	16.4	22.0	16.6	23.6	17.2	25.1	19.6	26.4	26.4
OPA 260RA	15	18.9	16.6	20.5	17.6	21.9	18.1	23.3	18.4	24.7	18.7	26.6	20.6	28.3	22.0	29.7	29.7
	20	18.6	16.2	20.1	17.3	21.5	17.7	22.9	18.1	24.2	18.3	26.0	19.0	27.7	21.6	29.1	29.1
	25	17.9	15.6	19.3	16.6	20.7	17.1	22.0	17.4	23.3	17.6	25.1	18.3	26.7	20.8	28.0	28.0
OPA 290RA	15	19.1	16.7	20.7	17.8	22.1	18.3	23.6	18.6	25.0	18.9	26.8	20.8	28.6	22.3	30.0	30.0
	20	18.8	16.4	20.3	17.5	21.7	17.9	23.1	18.2	24.5	18.5	26.3	19.2	28.0	21.8	29.4	29.4
	25	18.1	15.8	19.5	16.8	20.9	17.2	22.2	17.6	23.6	17.8	25.3	18.5	27.0	21.0	28.3	28.3
OPA 300R	15	19.5	17.1	21.1	18.2	22.6	18.7	24.1	19.0	25.5	19.3	27.4	21.3	29.2	22.8	30.6	30.6
	20	19.2	16.8	20.7	17.8	22.2	18.3	23.6	18.6	25.0	18.9	26.9	19.6	28.6	22.3	30.0	30.0
	25	18.5	16.1	20.0	17.2	21.3	17.6	22.7	18.0	24.1	18.2	25.9	18.9	27.5	21.5	28.9	28.9
OPA 390R	15	26.9	23.6	29.1	25.1	31.1	25.7	33.2	26.2	35.2	26.5	37.8	29.3	40.2	31.3	42.2	42.2
	20	26.4	23.1	28.6	24.6	30.5	25.2	32.5	25.7	34.5	26.0	37.0	27.0	39.4	30.7	41.4	41.4
	25	25.4	22.2	27.5	23.7	29.4	24.3	31.3	24.7	33.2	25.1	35.7	26.0	37.9	29.6	39.8	39.8
OPA 410RA	15	28.0	24.5	30.3	26.1	32.4	26.7	34.5	27.3	36.6	27.6	39.3	30.5	41.8	32.6	43.9	43.9
	20	27.5	24.0	29.7	25.6	31.8	26.2	33.8	26.7	35.9	27.1	38.5	28.1	41.0	32.0	43.1	43.1
	25	26.5	23.1	28.6	24.6	30.6	25.2	32.6	25.7	34.5	26.1	37.1	27.1	39.5	30.8	41.5	41.5

PERFORMANCE DATA

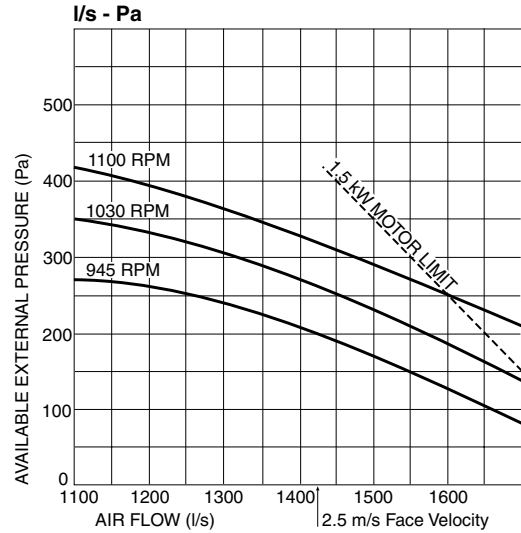
AIR HANDLING

Note: 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.

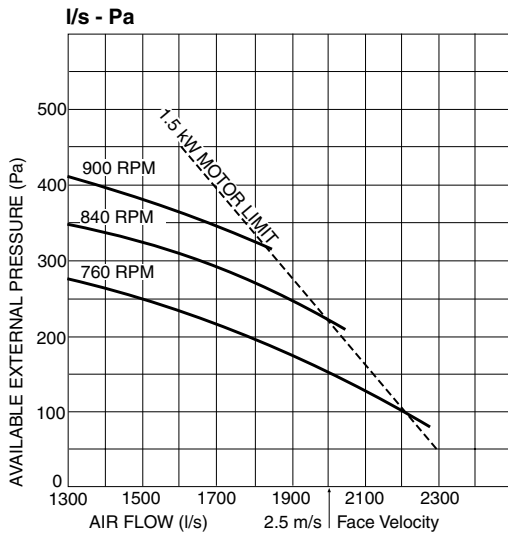
OPA 210



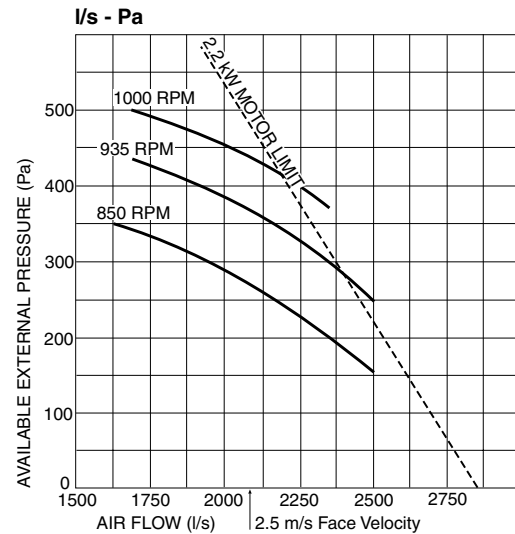
OPA 250, 260 A



OPA 290 A, 300

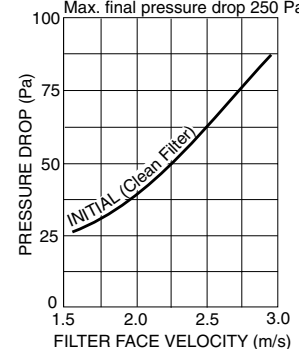


OPA 390, 410 A



OPTIONAL FILTERS - PRESSURE DROP

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



Model :		OPA 210	OPA 250	OPA 260 A	OPA 290 A	OPA 300	OPA 390	OPA 410 A
Std Motor Size	kW	1.1	1.5	1.5	1.5	1.5	2.2	2.2
Max. D.O.L. Motor	kW	2.2	2.2	2.2	3.0	3.0	3.0	3.0
Max. Fan Speed	RPM	1500	1500	1500	1400	1400	1400	1400
Std Pulley Range	RPM	840-1000	945-1100	945-1100	760-900	760-900	850-1000	850-1000
Factory Setting	RPM	920	1025	1025	830	830	925	925

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 210	LOW	73	83	71	68	68	62	61
	HIGH	74	83	73	70	69	62	61
OPA 250	MED	74	82	72	71	70	65	62
	HIGH	75	82	73	71	69	65	62
OPA 260 A	HIGH	75	82	73	71	69	65	62
OPA 290 A	LOW	81	83	81	79	77	73	68
OPA 300	LOW	81	83	81	79	77	73	68
	HIGH	82	85	82	79	78	74	69
OPA 390	MED	83	86	82	80	78	76	71
	HIGH	84	87	82	80	79	77	72
OPA 410 A	LOW	82	84	81	78	78	74	69

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 210	LOW	57	67	55	52	52	46	45
	HIGH	58	67	57	54	54	46	45
OPA 250	MED	58	66	56	55	54	49	46
	HIGH	59	66	57	55	53	49	46
OPA 260 A	HIGH	59	66	57	55	53	49	46
OPA 290 A	LOW	65	67	65	63	61	45	52
OPA 300	LOW	65	67	65	63	61	45	52
	HIGH	66	69	66	63	62	46	53
OPA 390	MED	67	70	66	60	62	60	55
	HIGH	68	71	66	60	63	61	56
OPA 410 A	LOW	66	68	65	62	62	58	53

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					
OPA 210	1000 RPM	1260	79	78	74	75	75	70	68
OPA 250	1100 RPM	1500	81	77	74	75	77	74	72
OPA 260 A	1100 RPM	1500	81	77	74	75	77	74	72
OPA 290 A	900 RPM	1800	84	79	78	80	80	77	74
OPA 300	900 RPM	1800	84	79	78	80	80	77	74
OPA 390	935 RPM	2300	85	79	77	79	81	78	77
OPA 410 A	935 RPM	2300	85	79	77	79	81	78	77

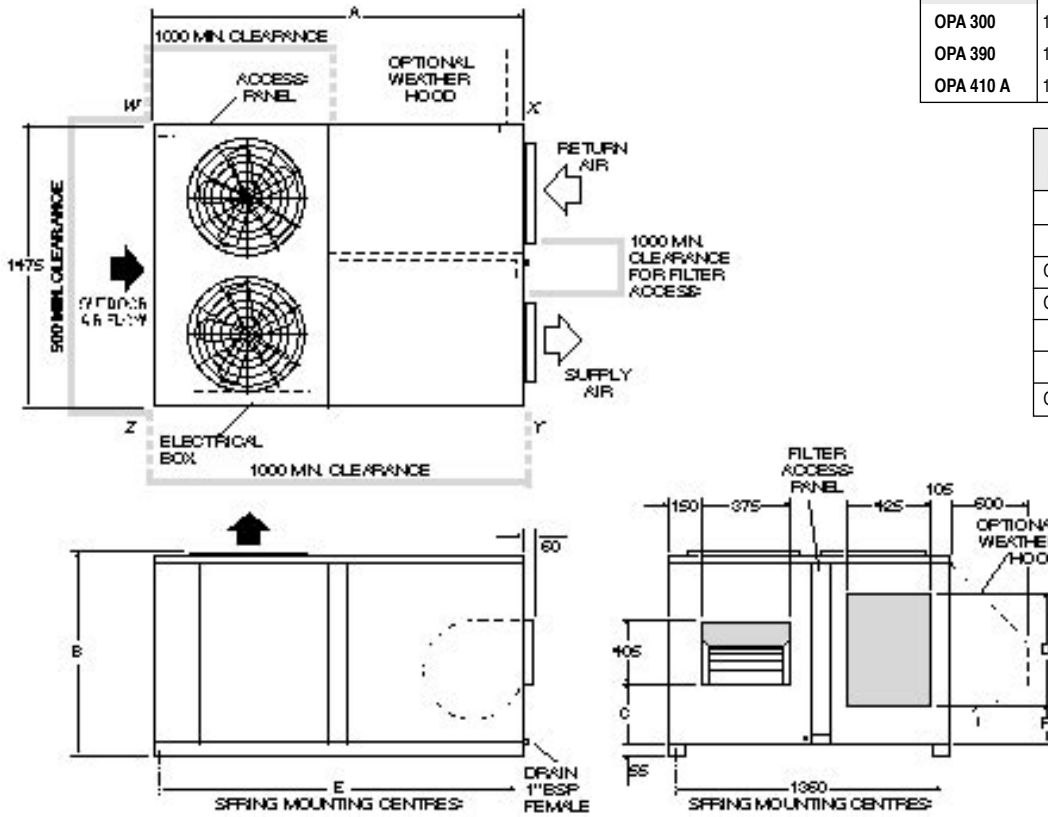
DIMENSIONS (mm)

Not to Scale

Fig. 1 Horizontal Supply & Return Air / Mounting Rails Version 1

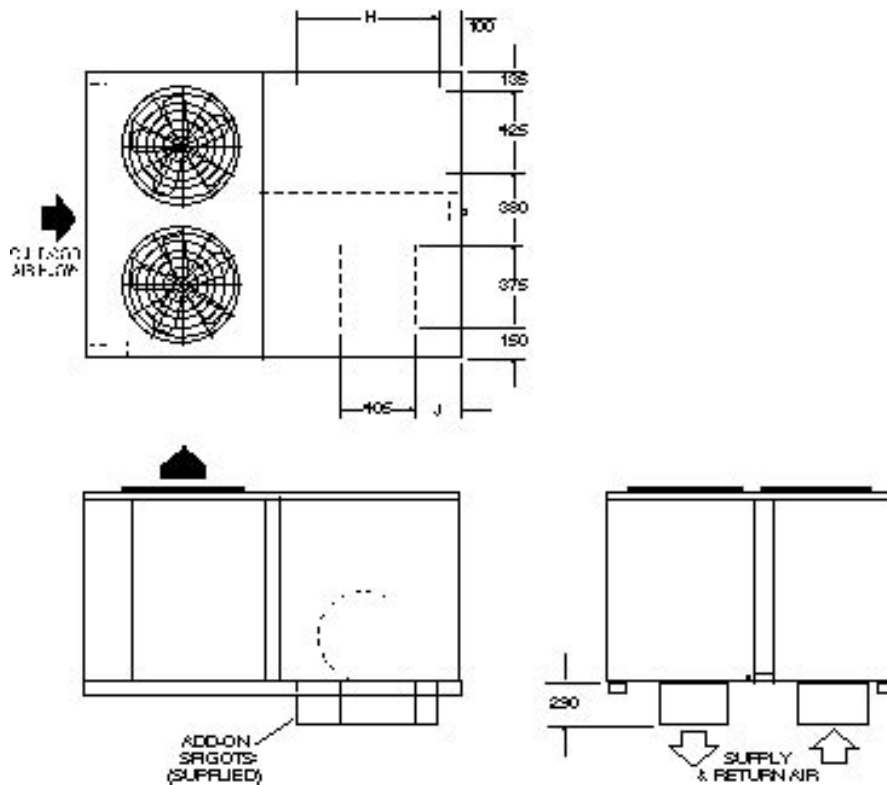
Note:
OPA 290–410 have the higher profile Ziehl fans.

MODEL	A	B	C	D	E	F
OPA 210	1580	980	200	600	1460	200
OPA 250	1580	980	200	600	1460	200
OPA 260 A	1580	980	200	600	1460	200
OPA 290 A	1680	1330	365	770	1560	225
OPA 300	1680	1330	365	770	1560	225
OPA 390	1680	1330	365 <td 770	1560	225	
OPA 410 A	1680	1330	365	770	1560	225



MODEL	POINT LOADS (kg)			
	W	X	Y	Z
OPA 210	79	60	75	95
OPA 250	128	102	66	92
OPA 260 A	132	105	68	96
OPA 290 A	122	93	108	137
OPA 300	119	90	105	134
OPA 390	127	99	113	140
OPA 410 A	126	98	111	138

Fig. 2 Downward Supply Air / Mounting Rails Version 2



MODEL	H	J
OPA 210	600	115
OPA 250	600	115
OPA 260 A	600	115
OPA 290 A	770	205
OPA 300	770	205
OPA 390	770	205
OPA 410 A	770	205

Note:
Refer to Fig.1 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. 3 Downward Supply Air / Plinth Mounted Version 3

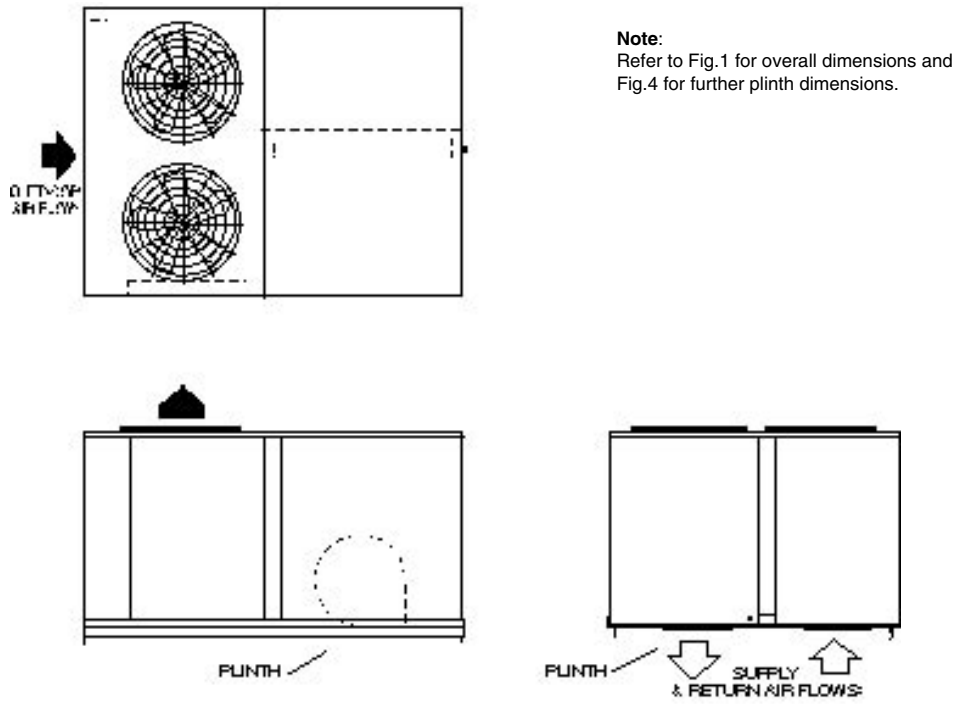
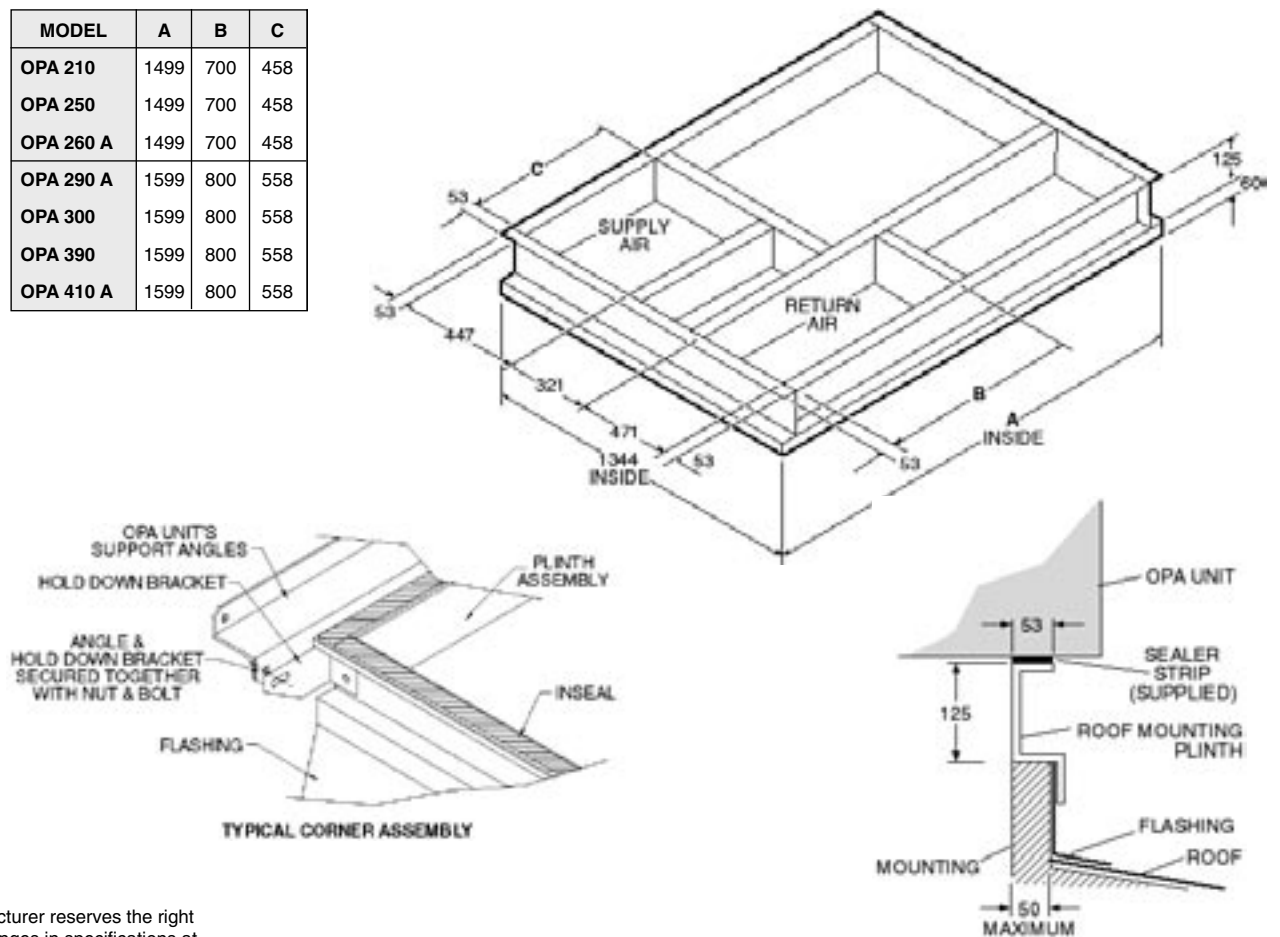


Fig.4 Roof Mounting Plinth (Kitset)

MODEL	A	B	C
OPA 210	1499	700	458
OPA 250	1499	700	458
OPA 260 A	1499	700	458
OPA 290 A	1599	800	558
OPA 300	1599	800	558
OPA 390	1599	800	558
OPA 410 A	1599	800	558



SPECIFICATIONS

Model		OPA 210	OPA 250	OPA 260 A *5	OPA 290 A *5	OPA 300	OPA 390	OPA 410 A *5
Cooling Capacity *1	kW	21.5	26.5	26.0	29.0	30.3	39.1	41.0
Heating Capacity *2 (OPA*R)	kW	21.4	26.1	27.7	28.0	28.6	39.4	41.0
E.E.R. (Cooling)		2.81	2.83	2.65	2.67	2.74	2.64	2.66
Air Flow *3	l/s	1260	1500	1500	1800	1800	2300	2300
Power Source *4		3 phase 342-436 V a.c. 50 Hz						
Indoor Fan Full Load Amps	A/ph.	2.7	3.3	3.3	3.6	3.6	4.9	4.9
Running Amps (Total System)	A/ph.	14 / 13 / 13	17 / 17 / 16	15 / 15 / 14	21 / 17 / 17	22 / 18 / 18	28 / 25 / 24	29 / 26 / 25
Recommended External Fuse	A/ph.	25	32	25	40	40	50	50
Finish		tan polyester powder coat						
Net Weight	kg	309	388	401	460	448	479	473
Shipping Weight (approx.)	kg	376	425	438	502	488	550	541

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.

*2 Nominal 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.

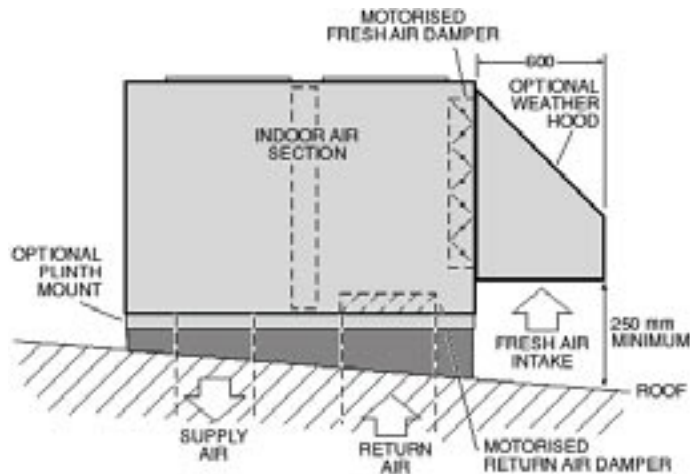
*3 Supply air flow at Nominal Cooling Capacity conditions stated above.

*4 Power source includes voltage limits.

*5 Tandem compressor (single circuit) model - enables staging and low start-up current.

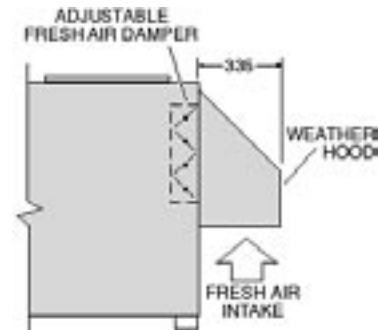
ECONOMISER OPTION

Fig. 5



FRESH AIR DAMPER OPTION

Fig. 6



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