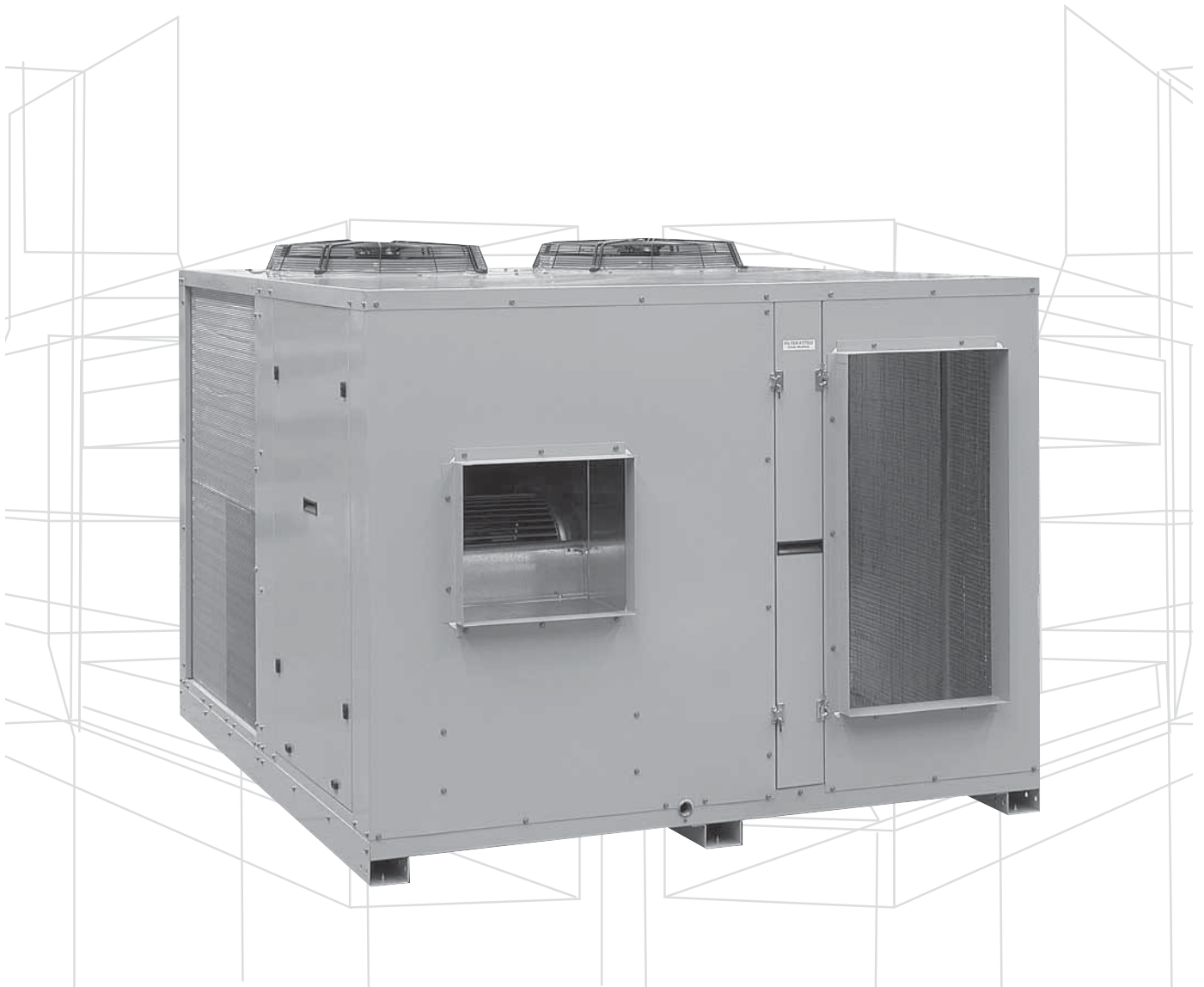


**Ducted Three Phase
Packaged Air Conditioners**

Technical Data
OPA 500 – 920



Twin System Enables Staging

**Extra Long Life
Epoxy Coated Outdoor Coil**

**Nominal Cooling Capacity
53 kW – 92 kW**

OPA 500, 600, 780, 920 - DUCTED PACKAGED ROOF TOP AIR CONDITIONER

GENERAL

OPA - A general designation
OPA *CB - Outdoor unit, cooling only version
OPA *RB - Outdoor unit, reverse cycle version

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.

Air Flow Selection

The nominal indoor air flow and temperature /humidity conditions meet ASHRAE rating standards (incl. 50%RH). 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

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. Thermostatic expansion valves are used to ensure the system remains efficient over a wide range of operating conditions. The indoor air coil is interlaced for efficient part load performance.

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

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

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.

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.

CONFIGURATIONS

Three standard 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.

STANDARD EQUIPMENT

Indoor Air Section:

1. Coil - interlaced circuits
2. Fan - forward curved centrifugal
3. Fan motor - belt drive, variable speed pulley
4. Drain tray - sloping, powder coated
5. Supply & return air spigots

Outdoor Air Section

1. Compressor (x2)
2. Coil (x2)
3. Fans - propeller
4. Fan motors - multi-speed, direct drive
5. Fan guards
6. High/low pressure switches
7. Thermostatic expansion device (x2)
8. Circuit breaker control
9. 24V control circuit
10. External current overloads on compressors
11. Compressor crankcase heaters.

OPA *RB version also includes:

12. Reversing valves (x2)
13. Time/temperature electronic de-ice control (x2)

OPTIONAL EQUIPMENT

1. **temperzone** HP Fan Speed Controller - recommended where cooling is required in below 20°C ambient conditions for long periods of time.
2. Filters (rated EU4).

3. Electric booster heat (factory fitted)
 - 12 kW for OPA 500, 600
 - 18 kW for OPA 780, 920Complete with safety cutouts required to meet AS/NZS 3350.2.40 1997.
4. Economiser (factory fitted)
 - includes dampers, weatherhood, hot gas bypass and HP fan speed controller.
5. Adjustable fresh air damper and weatherhood.
6. Outdoor air coil protection guards.
7. Phase rotation protection device.
8. Electronic control systems
 - available by special arrangement.
9. Hot gas bypass.

SAFETY FEATURES

1. HP switch (auto reset), LP switch (auto reset) and an anti rapid cycle timer for compressor protection. The compressor also has internal and external overload protection.
2. Circuit breaker control circuits.
3. Time-and-temperature controlled electronic de-ice switch prevents icing up of the outdoor coil during heating cycle (OPA *RB only).
4. Crankcase heaters prevent liquid refrigerant condensing in the compressors during the 'off' cycle.

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 HCFC-22 (R22) 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 units control panel 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.

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 500 B	HIGH	3000	17	23	54.5	38.3	53.0	37.7	51.5	37.1	50.0	36.4	48.5	35.8	46.9	35.2
			19	27	57.7	43.8	56.2	43.2	54.6	42.6	53.0	42.0	51.5	41.4	49.9	40.8
			21	31	61.1	49.3	59.5	48.7	57.9	48.1	56.2	47.6	54.6	47.0	53.0	46.4
OPA 600 B	HIGH	3600	17	23	64.8	48.3	63.1	47.6	61.3	46.8	59.5	46.1	57.7	45.4	55.9	44.7
			19	27	68.5	55.7	66.7	55.0	64.9	54.3	63.0	53.6	61.1	52.9	59.3	52.2
			21	31	72.4	63.1	70.5	62.5	68.6	61.8	66.6	61.1	64.8	60.5	62.8	59.8
OPA 780 B	HIGH	4750	17	23	80.2	58.0	78.0	57.1	75.8	56.3	73.6	55.3	71.3	54.4	69.0	53.5
			19	27	84.9	66.8	82.6	65.9	80.2	65.0	78.0	64.2	75.5	63.3	73.1	62.4
			21	31	89.8	75.5	87.4	74.6	84.9	73.8	82.5	73.0	80.0	72.1	77.5	71.2
OPA 920 B	HIGH	5500	17	23	95.1	71.6	92.5	70.5	89.7	69.4	87.0	68.2	84.3	67.2	81.5	66.0
			19	27	100.6	82.8	97.8	81.7	94.9	80.7	92.0	79.6	89.2	78.5	86.3	77.4
			21	31	106.3	93.9	103.3	92.9	100.3	91.8	97.4	90.8	94.3	89.8	91.4	88.8

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

NOTE: An optional fan speed controller is available and is recommended where cooling is required in below 20°C ambient conditions for long periods of time.

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

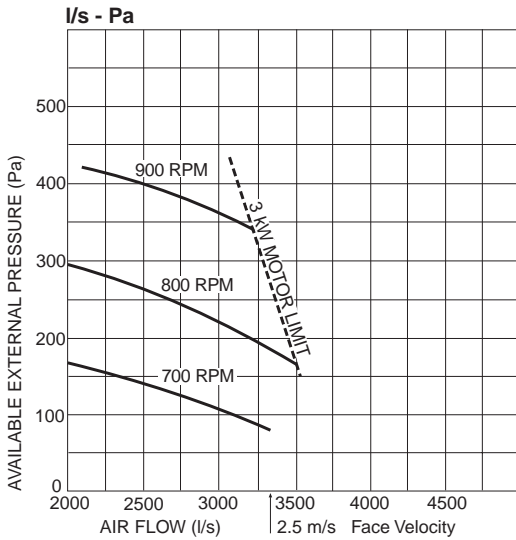
MODEL	INDOOR ENTERING AIR TEMP. °C D.B.	OUTDOOR COIL ENTERING AIR TEMPERATURE (E.A.T.) °C D.B.															
		-4		-2		0		2		4		6		8		10	
		G	N	G	N	G	N	G	N	G	N	G	N	G	N	G	N
OPA 500RB	15	36.6	28.8	39.2	30.0	41.8	30.1	44.4	29.8	47.0	29.6	50.4	33.5	53.6	49.8	55.4	55.4
	20	35.7	28.1	38.3	29.3	40.8	29.4	43.4	29.1	45.9	28.9	49.2	32.7	52.2	48.6	54.1	54.1
	25	34.5	27.2	37.0	28.3	39.5	28.4	41.9	28.1	44.4	27.9	47.6	31.6	50.5	47.0	52.3	52.3
OPA 600RB	15	42.0	33.1	45.0	34.4	48.0	34.6	51.0	34.2	54.0	33.9	57.9	38.4	61.5	57.2	63.6	63.6
	20	41.0	32.2	43.9	33.6	46.8	33.7	49.7	33.4	52.6	33.1	56.5	37.5	60.0	55.8	62.0	62.0
	25	39.6	31.2	42.4	32.5	45.3	32.6	48.1	32.3	50.9	32.0	54.6	36.3	58.0	53.9	60.0	60.0
OPA 780RB	15	54.6	49.1	58.5	52.7	62.4	55.5	66.3	57.0	70.2	59.7	75.3	68.5	80.0	80.0	82.7	82.7
	20	53.3	47.9	57.1	51.4	60.9	54.2	64.7	55.6	68.5	58.2	73.4	66.8	78.0	78.0	80.7	80.7
	25	51.5	46.4	55.2	49.7	58.9	52.4	62.6	53.8	66.2	56.3	71.0	64.6	75.4	75.4	78.0	78.0
OPA 920RB	15	64.4	50.7	69.0	52.8	73.6	53.1	78.2	52.5	82.8	52.1	88.8	59.0	94.3	87.7	97.6	97.6
	20	62.9	49.5	67.4	51.5	71.8	51.8	76.3	51.2	80.8	50.8	86.7	57.6	92.0	85.6	95.2	95.2
	25	60.8	47.9	65.1	49.8	69.5	50.1	73.8	49.5	78.2	49.2	83.8	55.7	89.0	82.8	92.0	92.0

PERFORMANCE DATA

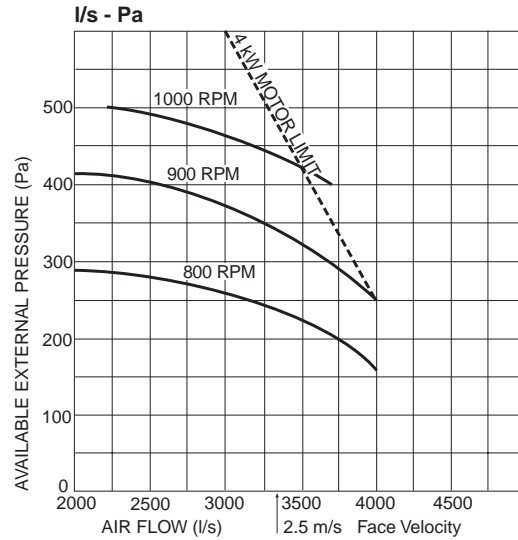
AIR HANDLING

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.

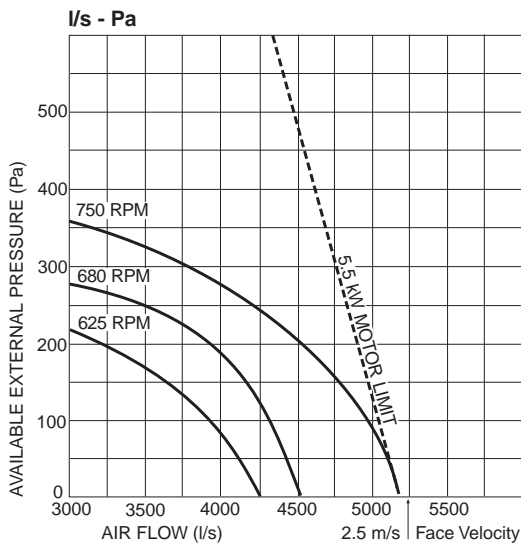
OPA 500 B



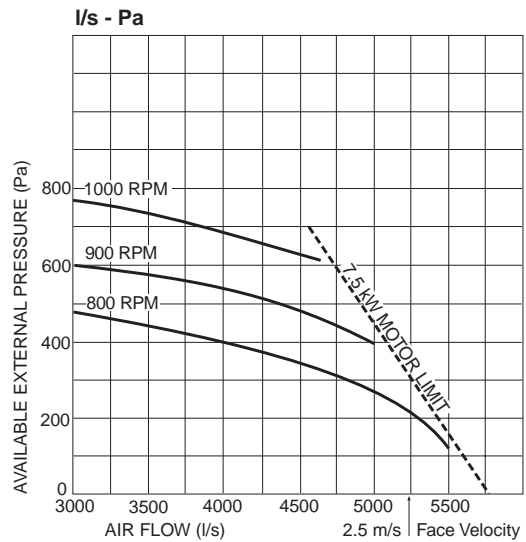
OPA 600 B



OPA 780 B



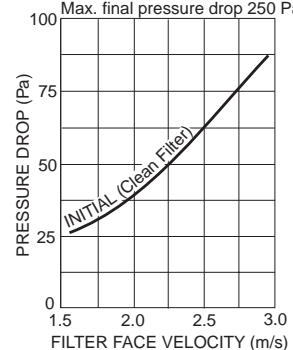
OPA 920 B



Model :		OPA 500	OPA 600	OPA 780	OPA 920
Standard Motor Size	kW	3	4	5.5	7.5
Maximum D.O.L. Motor	kW	4	4	7.5	7.5
Maximum Fan Speed	RPM	900	1000	950	1000
Standard Pulley Range	RPM	750-900	850-1000	600-750	780-970
Factory Setting	RPM	830	925	680	825

OPTIONAL FILTERS - PRESSURE DROP

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



PERFORMANCE DATA

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 500B	LOW	82	85	80	80	79	77	69
	HIGH	85	85	82	82	80	77	70
OPA 600B	LOW	82	85	80	80	79	77	69
	HIGH	85	85	82	82	80	77	70
OPA 780B	LOW	84	82	81	82	79	76	71
OPA 920B	LOW	85	78	77	80	81	79	77

Sound Pressure Levels (SPL)

Measured in decibels re 20 µPa.

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 500B	LOW	66	69	64	64	63	61	53
	HIGH	69	69	66	66	64	61	54
OPA 600B	LOW	66	69	64	64	63	61	53
	HIGH	69	69	66	66	64	61	54
OPA 780B	LOW	68	66	65	66	63	60	55
OPA 920B	LOW	69	62	61	64	65	63	61

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

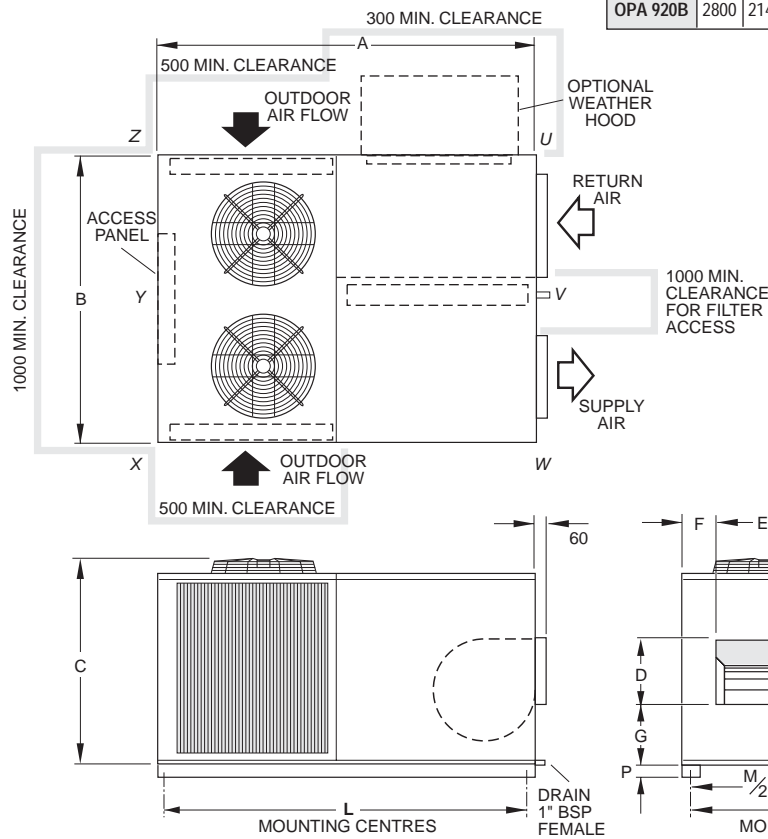
MODEL	INDOOR FAN SPEED	AIR FLOW l/s	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
				125	250	500	1 k	2 k	4 k
				SOUND POWER LEVELS (SWL) dB					
OPA 500B	750 RPM	2500	84	83	81	79	79	78	76
	900 RPM	3000	85	83	82	79	80	78	76
OPA 600B	800 RPM	3000	84	83	81	79	79	78	76
	1000 RPM	3600	89	86	84	82	84	83	81
OPA 780B	750 RPM	4400	84	82	83	82	79	76	72
	800 RPM	4750	90	88	89	88	86	82	78
OPA 920B	800 RPM	4400	86	84	85	84	81	78	74
	850 RPM	5500	92	90	91	90	87	84	80

DIMENSIONS (mm)

Not to Scale

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

MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
OPA 500B	2230	1940	1400	405	473	225	565	955	500	130	2130	1834	249	65	700
OPA 600B	2230	1940	1400	405	473	225	565	955	500	130	2130	1834	249	65	700
OPA 780B	2800	2140	1650	478	557	244	614	1200	600	130	2700	2034	250	65	850
OPA 920B	2800	2140	1650	478	557	244	614	1200	600	130	2700	2034	250	65	850



MODEL	POINT LOADS (kg)					
	U	V	W	X	Y	Z
OPA 500B	127	127	152	152	147	127
OPA 600B	134	134	159	162	159	137
OPA 780B	174	187	196	213	209	191
OPA 920B	194	208	218	236	232	212

Note:
The OPA 780B, 920B models have four outdoor air fans.

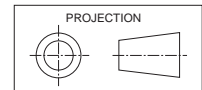
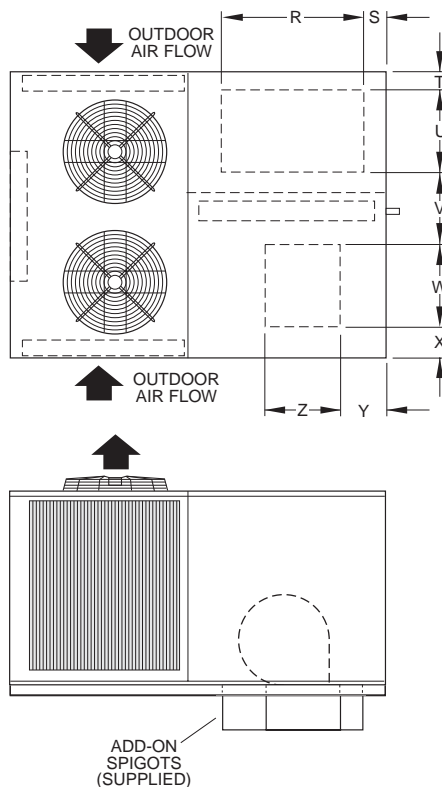


Fig. 2 Downward Supply Air / Mounting Rails Version 2



MODEL	R	S	T	U	V	W	X	Y	Z
OPA 500B	955	105	130	500	611	473	225	304	405
OPA 600B	955	105	130	500	611	473	225	304	405
OPA 780B	1200	158	195	600	544	557	244	421	478
OPA 920B	1200	158	195	600	544	557	244	421	478

Note:
The OPA 780B, 920B 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.

Fig. 3 Downward Supply Air / Plinth Mounted Version 3

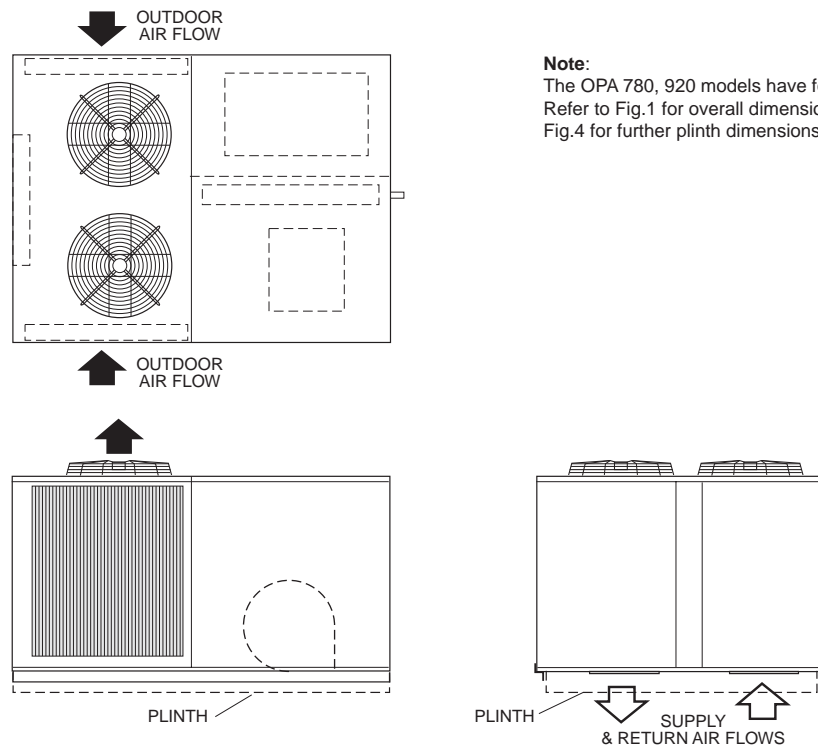
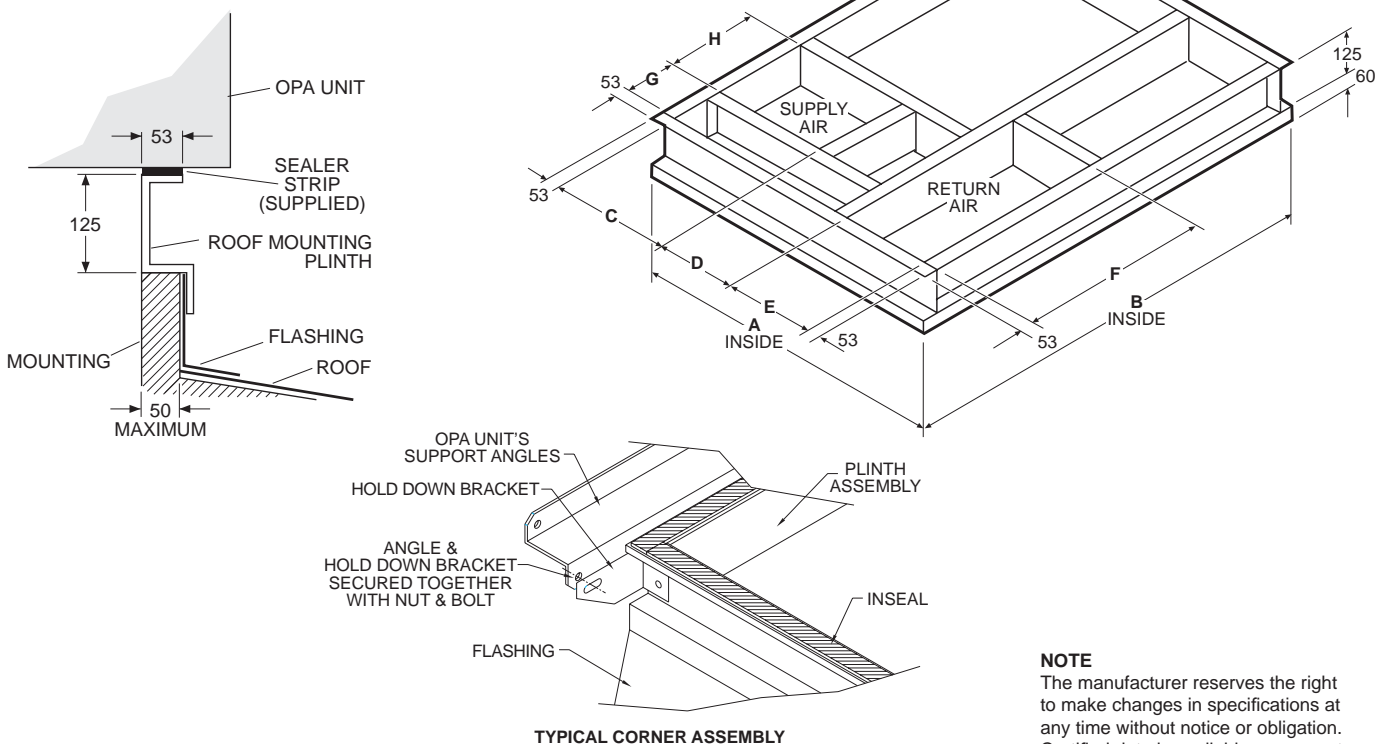


Fig.4 Roof Mounting Plinth (Kitset)

MODEL	A	B	C	D	E	F	G	H
OPA 500 B	1681	2185	535	487	554	1018	203	459
OPA 600 B	1681	2185	535	487	554	1018	203	459
OPA 780 B	1881	2639	652	474	650	1253	264	538
OPA 920 B	1881	2639	652	474	650	1253	264	538



SPECIFICATIONS

Model		OPA 500 B	OPA 600 B	OPA 780 B	OPA 920 B
Cooling Capacity *1	kW	53	63	78	92
Heating Capacity *2 (OPA*RB)	kW	52	60	78	92
E.E.R. (Cooling)		2.72	2.62	2.50	2.61
Air Flow *3	l/s	3000	3600	4750	5500
Power Source *4		3 phase 342-436 V a.c. 50 Hz			
Indoor Fan Full Load Amps	A/ph.	6.1	8.0	11.0	13.0
Running Amps (Total System)	A/ph.	33 / 33 / 37	40 / 40 / 40	57 / 48 / 48	54 / 54 / 64
Recommended External Fuse	A/ph.	60	80	100	120
Finish		tan polyester powder coat			
Net Weight (OPA*CB / OPA*RB)	kg	800 / 832	855 / 885	1130 / 1170	1260 / 1300
Shipping Weight (OPA*CB / OPA*RB)	kg	840 / 872	895 / 925	1180 / 1220	1310 / 1350

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.

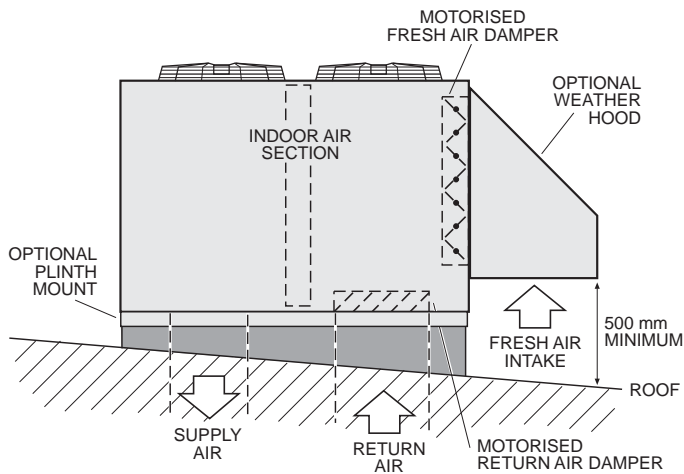
*2 Nominal Heating Capacity (reverse cycle units only) at AS/NZS 3823 conditions: Indoor Entering Air Temperature 21°C D.B.;
Outdoor Entering Air Temperature 7°C D.B., 6°C W.B.

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

*4 Power source includes voltage limits.

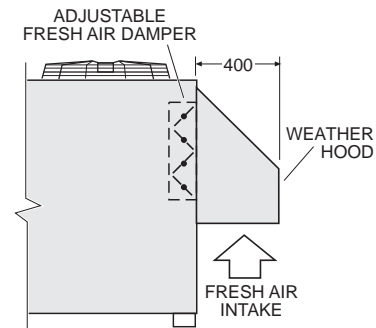
ECONOMISER OPTION

Fig. 5



FRESH AIR DAMPER OPTION

Fig. 6



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