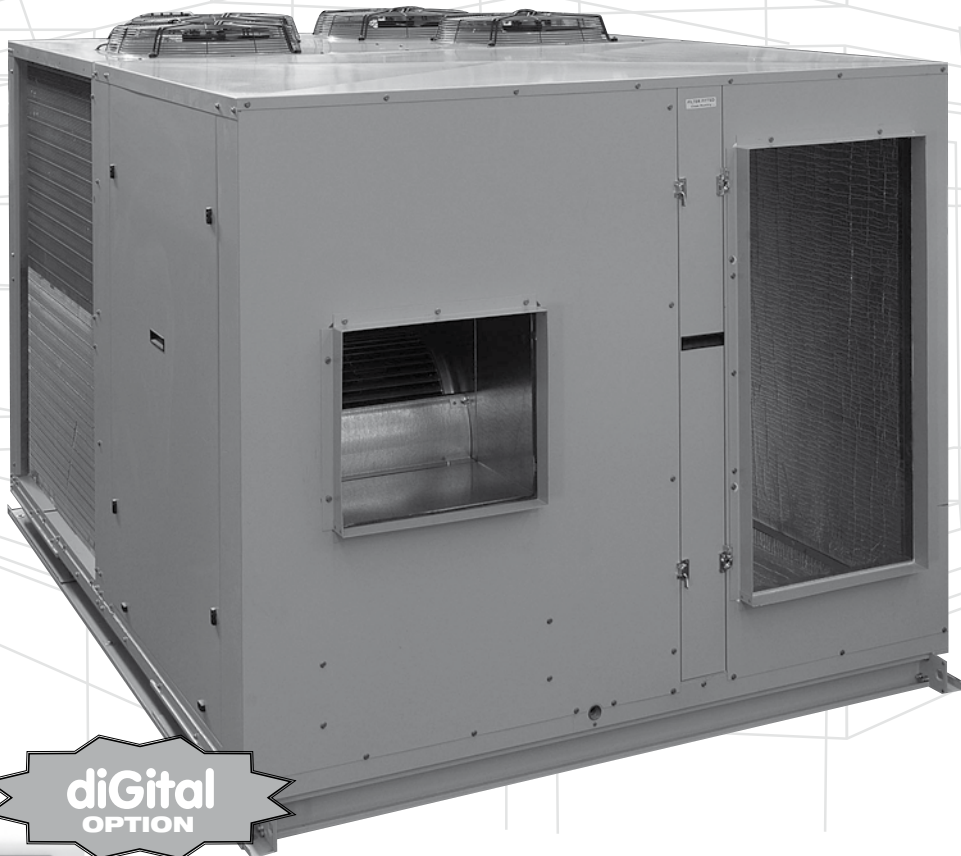


**Ducted Three Phase
Packaged Air Conditioners**

Technical Data
OPA 440 – 960

R410A

Twin System Enables Staging
Extra Long Life
Epoxy Coated Outdoor Coil



diGital
OPTION



**TZT-701 Controller &
Digital Scroll Compressor
for close temperature control**

**Nominal Cooling Capacity
44 kW – 96 kW**

OPA 440, 595, 650, 850, 960 - 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.

OPA 440 is available with or without a **digital** scroll type compressor:

OPA 440RKTB - standard version

OPA 440RKTBGD - digital version c/w digital compressor & TZT-701 Controller.

Refer to **temperzone** engineering for made-to-order digital versions of the other models.

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

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

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

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. 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. Fan motor bearings are sealed for life so as not to incur regular maintenance.

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.

Self Diagnostics. Each system includes a controller (OUC) that has a display of LEDs to indicate faults and running conditions. A non-specific fault indicator is included for interface to external systems.

CONFIGURATIONS

Two standard versions are available for each model:

1. Horizontal supply/return air with box mounting channel (OPA*RKTBH),
2. Downward supply/return air with box mounting channel (OPA*RKTBU).

OPTIONAL EQUIPMENT

1. Filters (rated EU4).
2. Economiser (factory fitted) - includes dampers, weatherhood.
3. Adjustable fresh air damper and weatherhood.
4. Outdoor air coil protection guards.
5. TZT-701 thermostat.
6. 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 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.

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. An alternative way of removing return air may be required when operating on 100% fresh air.

OPA 440 Digital Version:

Digital Scroll Compressor. 'Digital' systems include one conventional scroll compressor and one 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 and supply air temperature control.

User Friendly. Each digital air conditioning system is supplied the TZT-701 Controller. This thermostat 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".

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

Also available:

OPA 225–385 models (23–38 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. 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	
					Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.
OPA 440	HIGH	2350	21	15	43.8	34.7	43.3	34.6	42.0	34.0	40.1	32.9	37.5	31.1	34.2	26.7
			23	17	46.2	33.9	45.6	33.9	44.4	33.3	42.4	32.3	39.8	30.6	36.5	28.4
			27	19	48.5	38.8	48.0	38.8	46.7	38.3	44.7	37.1	42.1	35.4	38.8	33.0
			31	21	50.9	46.0	50.3	46.0	49.0	45.4	47.1	44.1	44.4	42.2	41.1	39.5
OPA 595	HIGH	3000	21	15	55.9	44.2	55.2	44.2	53.6	43.4	51.1	41.9	47.8	39.6	43.5	36.5
			23	17	58.9	43.2	58.2	43.2	56.6	42.5	54.1	41.2	50.7	39.1	46.5	36.2
			27	19	61.9	49.5	61.1	49.5	59.4	48.8	57.0	47.4	53.7	45.1	49.5	42.0
			31	21	64.8	58.6	64.1	58.7	62.5	57.9	60.0	56.3	56.7	53.8	52.4	50.4
OPA 650	HIGH	3500	21	15	62.8	47.7	61.0	47.5	59.2	46.8	57.4	46.0	55.6	45.3	53.4	44.2
			23	17	65.9	48.5	64.6	47.5	62.8	46.8	61.0	46.0	59.2	45.3	57.4	44.5
			27	19	70.3	55.2	68.2	54.7	66.4	53.7	64.6	53.6	62.8	52.9	60.6	52.2
			31	21	74.3	62.7	72.2	61.9	70.4	61.2	68.5	60.9	66.4	60.2	64.2	59.4
OPA 850	HIGH	4200	21	15	82.7	62.8	80.3	62.5	78.0	61.6	75.6	60.6	73.2	59.7	70.4	58.2
			23	17	86.8	63.9	85.1	62.5	82.7	61.6	80.3	60.6	78.0	59.7	75.6	58.6
			27	19	92.6	72.8	89.8	72.1	87.5	70.7	85.1	70.6	82.7	69.6	79.8	68.7
			31	21	97.9	82.6	95.1	81.6	92.7	80.7	90.3	80.2	87.5	79.3	84.6	78.3
OPA 960	HIGH	5200	21	15	93.3	70.8	90.6	70.5	87.9	69.5	85.3	68.4	82.6	67.3	79.4	65.7
			23	17	97.9	72.1	96.0	70.5	93.3	69.5	90.6	68.4	87.9	67.3	85.3	66.1
			27	19	104.5	82.1	101.3	81.3	98.7	79.8	96.0	79.7	93.3	78.6	90.1	77.5
			31	21	110.4	93.2	107.2	92.0	104.5	91.0	101.9	90.4	98.7	89.4	95.4	88.3

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)

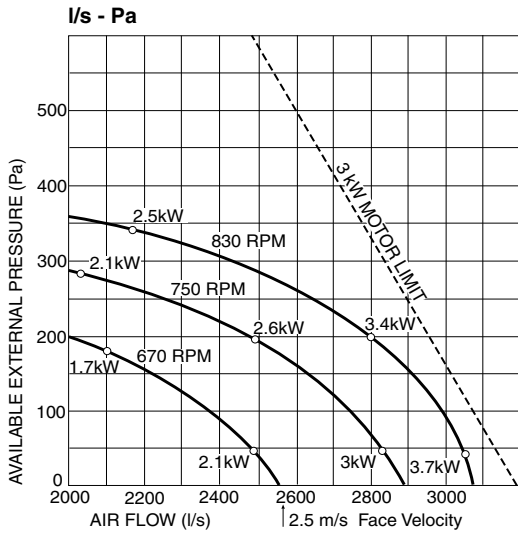
MODEL	INDOOR ENTERING AIR TEMP. ° C D.B.	OUTDOOR COIL ENTERING AIR TEMPERATURE (E.A.T.) ° C D.B.															
		-5		-3		-1		1		3		5		7		9	
		G	N	G	N	G	N	G	N	G	N	G	N	G	N	G	N
OPA 440	15	29.6	26.0	32.1	27.6	34.3	28.3	36.5	28.9	38.7	29.2	41.6	32.3	44.3	34.5	46.5	46.5
	20	29.1	25.4	31.5	27.1	33.6	27.8	35.8	28.3	38.0	28.7	40.8	29.8	43.4	33.9	45.6	45.6
	25	28.0	24.5	30.3	26.1	32.4	26.7	34.5	27.2	36.6	27.6	39.3	28.7	41.8	32.6	43.9	43.9
OPA 595	15	34.3	29.5	37.1	31.3	39.6	31.7	42.2	32.5	44.8	32.9	48.1	38.4	51.1	51.1	53.7	53.7
	20	33.6	28.9	36.4	30.7	38.9	31.1	41.4	31.9	43.9	32.3	47.1	35.4	50.1	50.1	52.7	52.7
	25	32.4	27.8	35.0	29.6	37.4	29.9	39.8	30.7	42.3	31.1	45.4	34.0	48.3	48.3	50.7	50.7
OPA 650	15	41.6	36.4	45.0	38.7	48.1	39.7	51.2	40.5	54.4	41.0	58.4	45.3	62.1	48.5	65.2	65.2
	20	40.8	35.7	44.2	38.0	47.2	38.9	50.2	39.7	53.3	40.2	57.2	41.8	60.9	47.5	63.9	63.9
	25	39.3	34.4	42.5	36.6	45.5	37.5	48.4	38.2	51.3	38.7	55.1	40.2	58.6	45.7	61.6	61.6
OPA 850	15	57.1	49.9	61.7	53.1	66.0	54.5	70.3	55.5	74.5	56.3	80.1	62.2	85.2	66.4	89.4	89.4
	20	55.9	49.0	60.5	52.1	64.7	53.4	68.9	54.4	73.1	55.2	78.5	57.3	83.5	65.1	87.7	87.7
	25	53.9	47.1	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	71.1	58.7	75.7	59.8	80.3	60.6	86.3	67.0	91.8	71.6	96.4	96.4
	20	60.3	52.8	65.3	56.1	69.8	57.5	74.3	58.7	78.8	59.5	84.6	61.8	90.0	70.2	94.5	94.5
	25	58.1	50.8	62.8	54.0	67.2	55.4	71.5	56.5	75.8	57.3	81.5	59.5	86.7	67.6	91.0	91.0

PERFORMANCE DATA

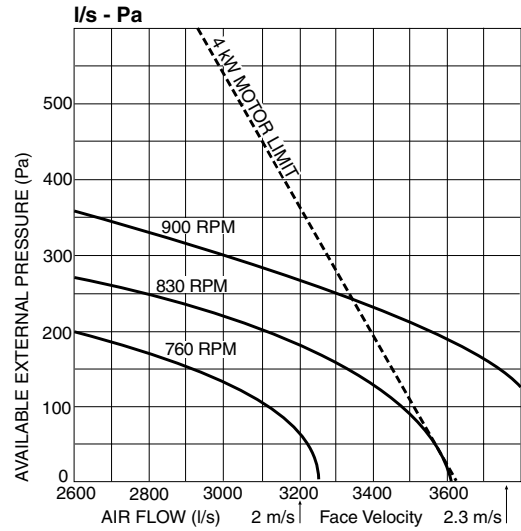
AIR HANDLING

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.

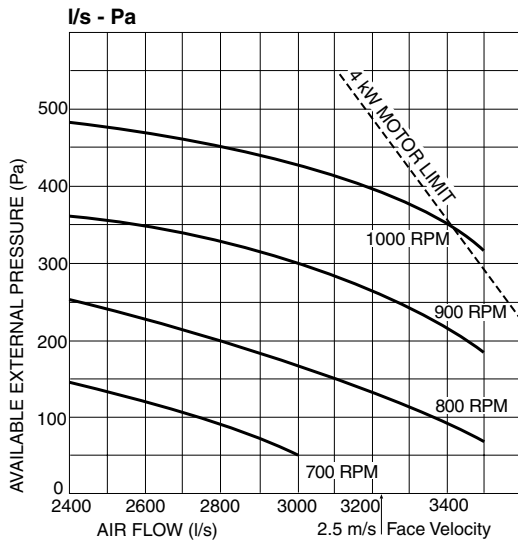
OPA 440



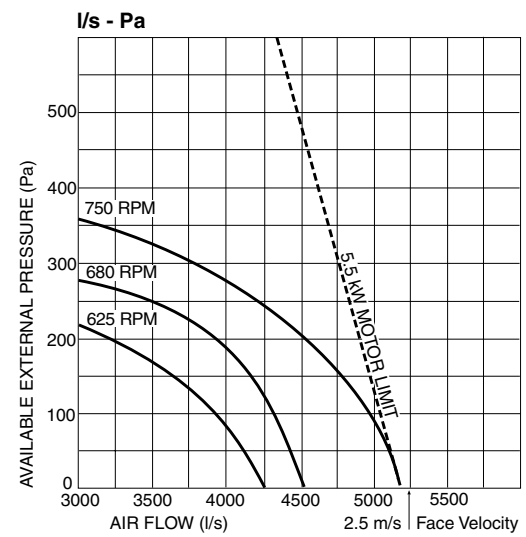
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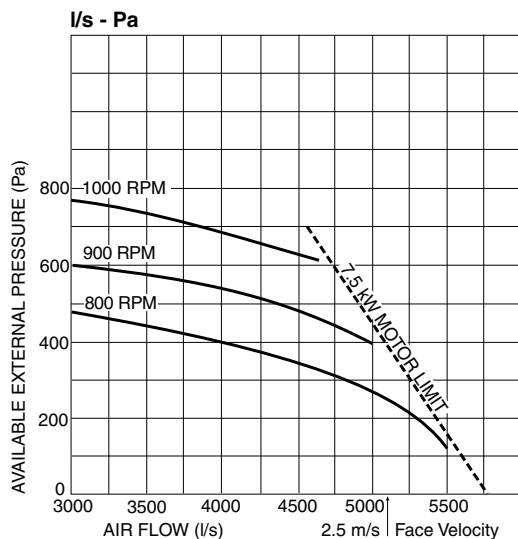
OPA 650



OPA 850



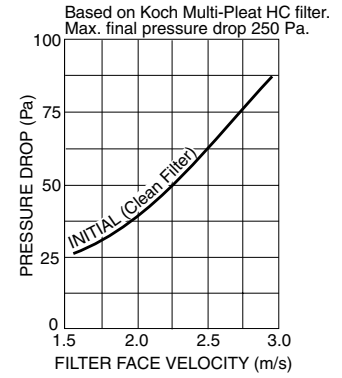
OPA 960



PERFORMANCE DATA

Model :	OPA 440	OPA 595	OPA 650	OPA 850	OPA 960
Std Motor Size kW	3	4	4	5.5	7.5
Max. D.O.L. Motor kW	4	4	4	7.5	7.5
Max. Fan Speed RPM	850	900	1000	950	1000
Std Pulley Range RPM	670-850	750-900	850-1000	600-750	780-970
Factory Setting RPM	750	830	925	680	825

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 440	HIGH	78	84	78	76	74	69	61
OPA 595	HIGH	82	85	80	80	79	77	69
OPA 650	HIGH	82	85	80	80	79	77	69
OPA 850	HIGH	84	82	81	82	81	76	71
OPA 960	HIGH	85	78	77	80		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 440	HIGH	62	68	62	60	58	54	47
OPA 595	HIGH	66	69	64	64	63	61	53
OPA 650	HIGH	66	69	64	64	63	61	53
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.

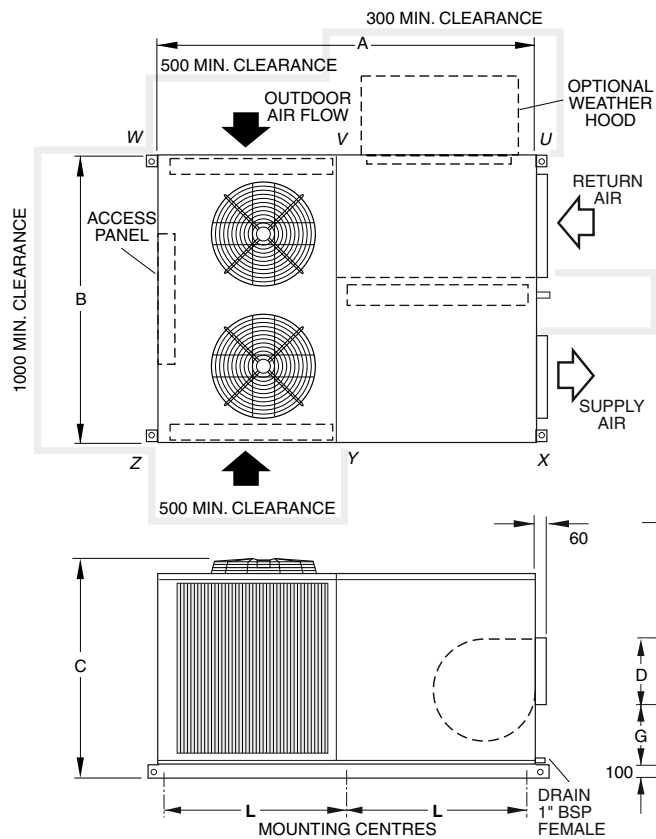
SUPPLY AIR OUTLET

MODEL	INDOOR FAN SPEED	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1 k	2 k	4 k
			SOUND POWER LEVELS (SWL) dB					
OPA 440	830 RPM	85	79	77	79	81	78	77
	750 RPM	84	83	81	79	79	78	76
OPA 595	900 RPM	85	83	82	79	80	78	76
	800 RPM	84	83	81	79	79	78	76
OPA 650	1000 RPM	89	86	84	82	84	83	81
	750 RPM	84	82	83	82	79	76	72
OPA 850	800 RPM	90	88	89	88	86	82	78
	800 RPM	86	84	85	84	81	78	74
OPA 960	850 RPM	92	90	91	90	87	84	80

DIMENSIONS (mm)

Not to Scale

Fig. 1 Horizontal Supply & Return Air
OPA *RKTBH



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N
OPA 440	1970	1675	1550	480	490	155	605	772	420	95	953	1614	335
OPA 595	2225	1950	1860	405	473	220	570	955	497	135	1080	1879	385
OPA 650	2225	1950	1860	405	473	220	570	955	497	135	1080	1879	385
OPA 850	2790	2150	1860	479	558	235	615	1200	596	130	1364	2079	266
OPA 960	2790	2150	1860	479	558	235	615	1200	596	130	1364	2079	266

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

MODEL	POINT LOADS (kg)					
	U	V	W	X	Y	Z
OPA 440	113	109	106	121	125	129
OPA 595	135	135	146	154	154	166
OPA 650	135	135	146	154	154	166
OPA 850	172	172	184	207	207	221
OPA 960	183	183	195	220	219	235

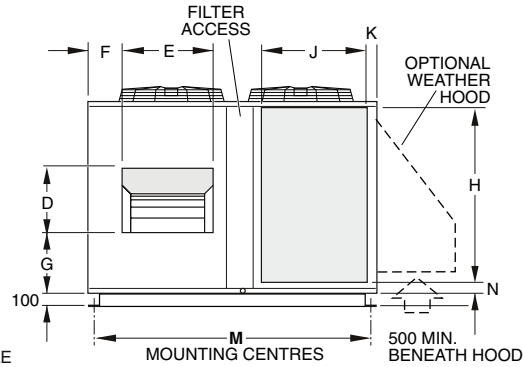
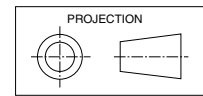
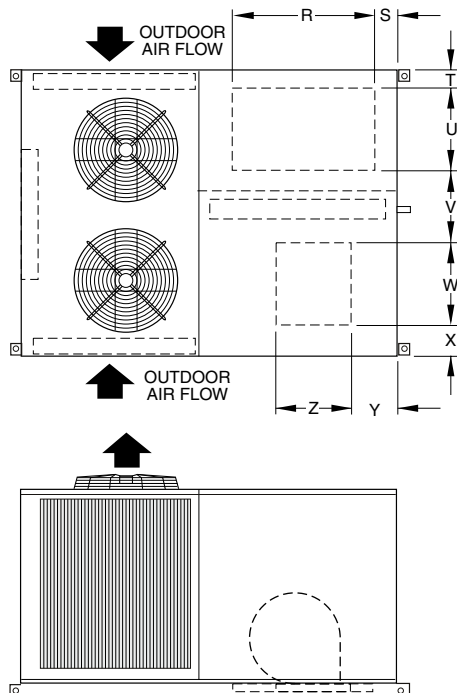
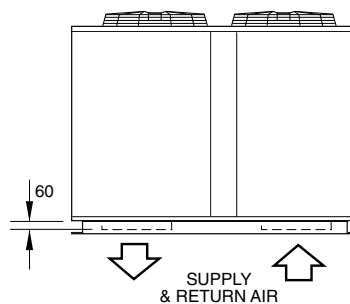


Fig. 2 Downward Supply Air & Return Air
OPA *RKTBU



MODEL	R	S	T	U	V	W	X	Y	Z
OPA 440	745	105	155	365	525	440	180	115	480
OPA 595	930	120	210	475	560	470	225	305	405
OPA 650	930	120	210	475	560	470	225	305	405
OPA 850	1165	160	220	575	545	567	235	415	475
OPA 960	1165	160	220	575	545	567	235	415	475

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.

Fig. 3 Economiser Option

MODEL	P	Q
OPA 440	580	490
OPA 595	735	560
OPA 650	735	560
OPA 850	875	310
OPA 960	875	310

Dimensions (mm)

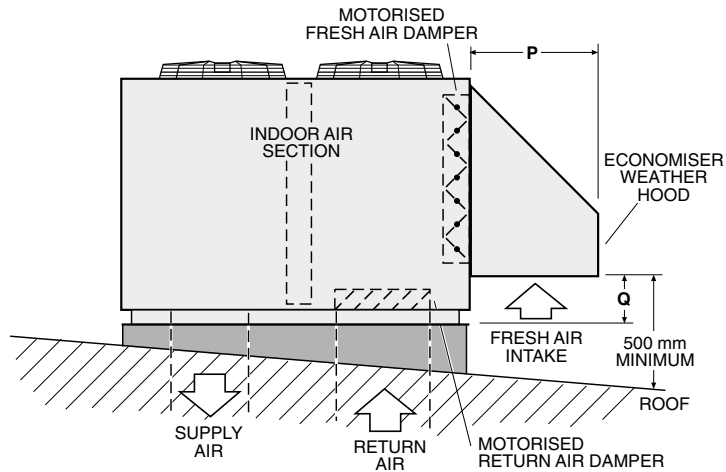
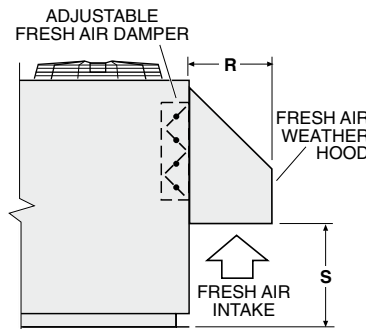


Fig. 4 Fresh Air Damper Option

MODEL	R	S
OPA 440	335	940
OPA 595	435	1005
OPA 650	435	1005
OPA 850	430	810
OPA 960	430	810



Nomenclature

e.g. **O P A 4 4 0 R K T B G D H**

<p><i>Series</i></p> <p>O - Outdoor P - Packaged A - Air Cooled</p>	<p><i>Size</i></p> <p>Divide by 10 to get approx. nominal Capacity in kilowatts</p>	<p><i>Type</i></p> <p>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>
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SPECIFICATIONS

Model		OPA 440 *5	OPA 595	OPA 650	OPA 850	OPA 960
Nominal Cooling Capacity *1	kW	44.7	57.0	64.6	85.1	96.0
Net Cooling Capacity	kW	42.7	53.9	60.5	80.1	87.9
Heating Capacity *2	kW	43.4	50.1	60.9	83.5	90.0
E.E.R. (Cooling)		2.93	2.92	2.75	3.04	2.80
Air Flow *3	l/s	2350	3000	3500	4200	5200
Power Source *4		3 phase 342-436 V a.c. 50 Hz				
Indoor Fan Full Load Amps	A/ph.	6.1	8.0	8.0	10.3	13.8
Running Amps (Total System)	A/ph.	31 / 26 / 26	38 / 34 / 34	41 / 36 / 36	51 / 46 / 46	68 / 59 / 59
Recommended External Protection	A/ph.	50	80	80	100	120
Finish		Grey polyester powder coat				
Net Weight	kg	703	890	890	1162	1233
Shipping Weight	kg	778	975	975	1264	1325

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.

*5 Digital version available, ie one of two compressors supplied is digital type .

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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