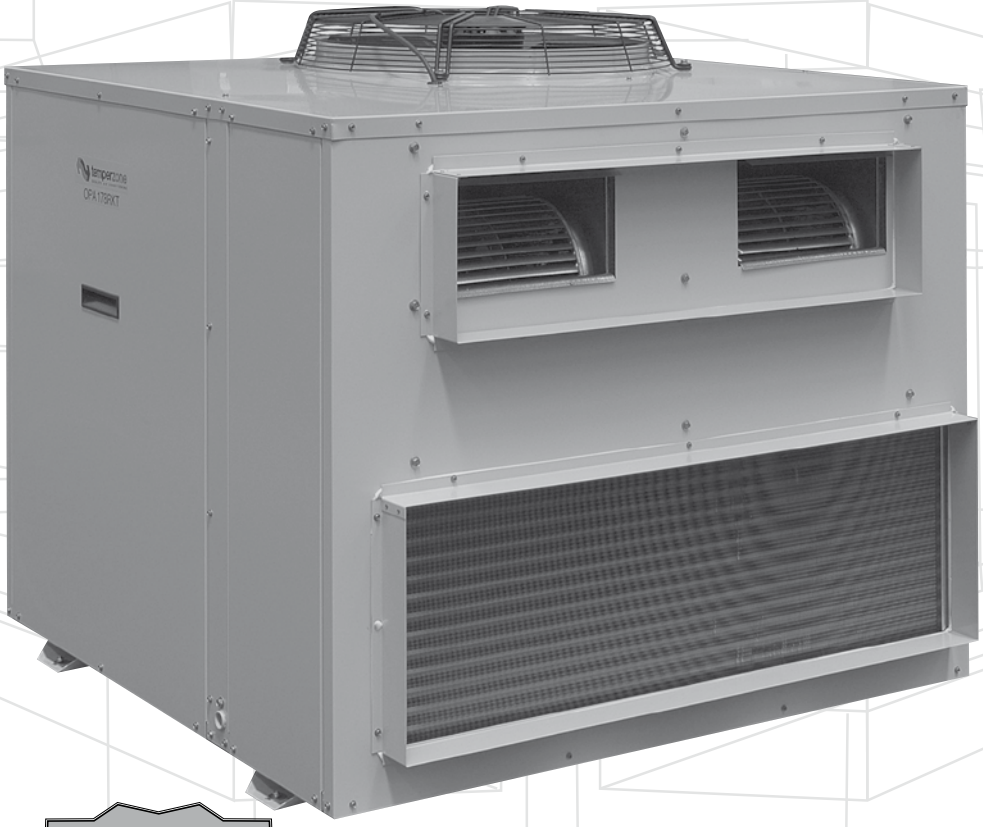
temperzone
QUALITY AIR CONDITIONING

Ducted Three Phase Packaged Air Conditioner

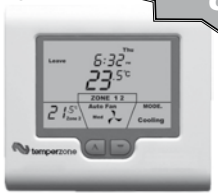
Technical Data

OPA 100, 135, 170

R410A



diGital OPTION



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

Extra Long Life
Epoxy Coated Coils

Nominal Cooling Capacity
10.6 kW – 16.8 kW

APRIL 2011

OPA 100, 135, 170 – 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).

OPA 170 is available with or without a **digital** scroll type compressor:

OPA 170RKTH - standard version
OPA 170RKTGDH - digital version.

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

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

Performance. A dynamically balanced forward curved fan with a multi-speed motor enables fine tuning of the indoor unit 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 compressor is isolated in a built-in compartment to minimise noise. 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. The outdoor and indoor coil fins are epoxy coated for extra protection in corrosive environments, e.g. salt laden sea air.

Self Diagnostics. The 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.

OPTIONAL EQUIPMENT

1. **temperzone** TZT-701 Controller kit, or SAT-2 (230V) Controller kit, the latter of which is not suitable for digital systems.
2. Electric booster heat kit (internal)
   - 3.0 kW for OPA 100
   - 4.5 kW for OPA 135, 170
   Complete with heater safety cutout required to meet AS/NZS 3350.2.40 1997.

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.
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.

COMPRESSOR

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 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.

The units control panel is fully wired ready to accept the main power supply.

OPA 170 Digital Versions:

Digital Scroll Compressor. 'Digital' systems include a 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. Supply air temperature control is also possible using BMS or other controls, but not using the optional TZT-701 controller.

Control Option. The system is set up for the compressor to be controlled variably by a 0–10 volt DC signal that can be supplied either by a BMS system, a sophisticated controller or temperzone's optional TZT-701 Controller.

User Friendly. The optional TZT-701 Controller 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 205–333 models (20–34 kW)

NOMENCLATURE

e.g. **O P A 1 7 0 R K T G H**

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 **G** - Digital compressor system **H** - Horizontal discharge supply air fan

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.											
					23		27		31		35		39		43	
	SPEED	AIR l/s	W.B. °C	D.B. °C	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.
OPA 100	HIGH	550	15	21	10.3	7.8	10.0	7.8	9.7	7.7	9.4	7.6	9.1	7.4	8.8	7.3
			17	23	10.8	8.0	10.6	7.8	10.3	7.7	10.0	7.6	9.7	7.4	9.4	7.3
			19	27	11.5	9.1	11.2	9.0	10.9	8.8	10.6	8.8	10.3	8.7	9.9	8.6
			21	31	12.2	10.3	11.8	10.2	11.5	10.1	11.3	10.0	10.9	9.9	10.5	9.8
OPA 135	HIGH	775	15	21	13.7	10.8	13.5	10.8	13.1	10.6	12.5	10.2	11.7	9.7	10.6	8.9
			17	23	14.4	10.6	14.2	10.6	13.8	10.4	13.2	10.1	12.4	9.6	11.4	8.9
			19	27	15.2	12.1	14.9	12.1	14.6	11.9	13.9	11.6	13.1	11.0	12.1	10.3
			21	31	15.9	14.3	15.7	14.3	15.3	14.2	14.7	13.8	13.8	13.1	12.8	12.3
OPA 170	HIGH	900	15	21	16.5	13.0	16.3	13.0	15.8	12.8	15.1	12.4	14.1	11.7	12.8	10.8
			17	23	17.4	12.7	17.2	12.7	16.7	12.5	15.9	12.1	15.0	11.5	13.7	10.7
			19	27	18.2	14.6	18.0	14.6	17.6	14.4	16.8	14.0	15.8	13.3	14.6	12.4
			21	31	19.1	17.3	18.9	17.3	18.4	17.1	17.7	16.6	16.7	15.9	15.5	14.8

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

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)

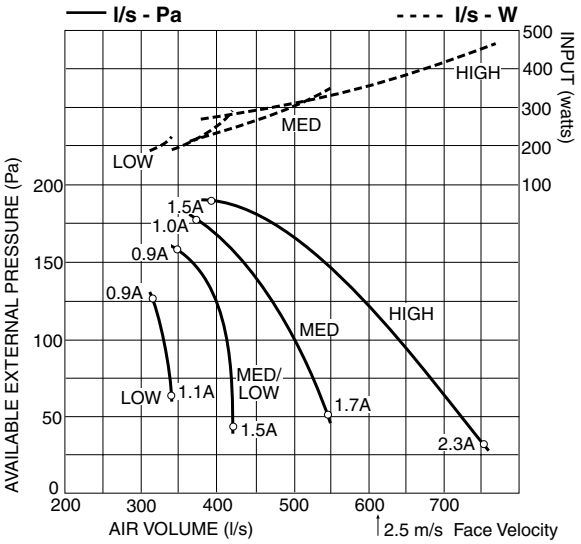
MODEL	INDOOR ENTERING AIR TEMP. °C D.B.	OUTDOOR COIL ENTERING AIR TEMPERATURE (E.A.T.) °C D.B.															
		– 5		– 3		– 1		1		3		5		7		9	
		G	N	G	N	G	N	G	N	G	N	G	N	G	N	G	N
OPA 100	15	7.3	6.6	7.9	7.1	8.4	7.6	9.0	7.9	9.5	8.0	10.2	9.2	10.9	10.8	11.4	11.4
	20	7.1	6.4	7.7	7.0	8.3	7.4	8.8	7.7	9.3	7.9	10.0	9.0	10.7	10.5	11.2	11.2
	25	6.9	6.2	7.4	6.7	8.0	7.2	8.5	7.5	9.0	7.6	9.6	8.7	10.3	10.2	10.8	10.8
OPA 135	15	9.2	8.0	9.9	8.5	10.6	8.7	11.3	8.9	12.0	9.1	12.9	10.0	13.7	10.7	14.4	14.4
	20	9.0	7.9	9.7	8.4	10.4	8.6	11.1	8.8	11.8	8.9	12.6	9.2	13.4	10.5	14.1	14.1
	25	8.6	7.6	9.4	8.1	10.0	8.3	10.7	8.4	11.3	8.6	12.2	8.9	12.9	10.1	13.6	13.6
OPA 170	15	11.2	10.1	12.1	10.9	13.0	11.5	13.8	11.9	14.6	12.5	15.7	14.9	16.7	16.7	17.5	17.5
	20	11.0	9.9	11.9	10.7	12.7	11.3	13.5	11.6	14.3	12.3	15.4	14.6	16.4	16.4	17.2	17.2
	25	10.6	9.5	11.4	10.3	12.2	10.9	13.0	11.2	13.8	11.8	14.8	13.9	15.8	15.8	16.6	16.6

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). Air flows given are for units installed without filters. If using EU-2 filter media, provide 0.08 m² face area per 100 l/s of airflow to maximise efficiency.

OPA 100



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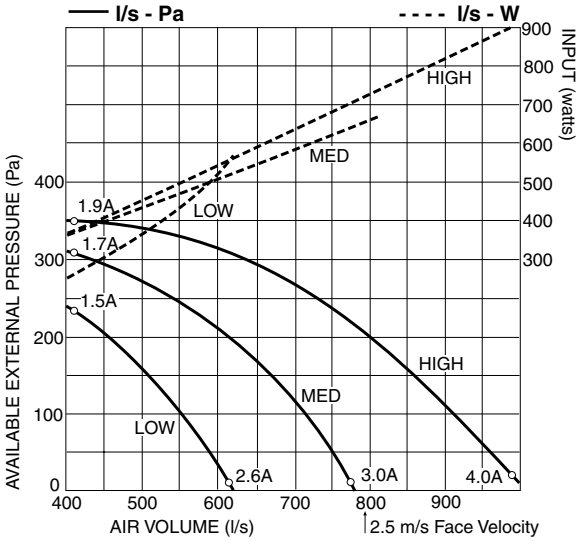

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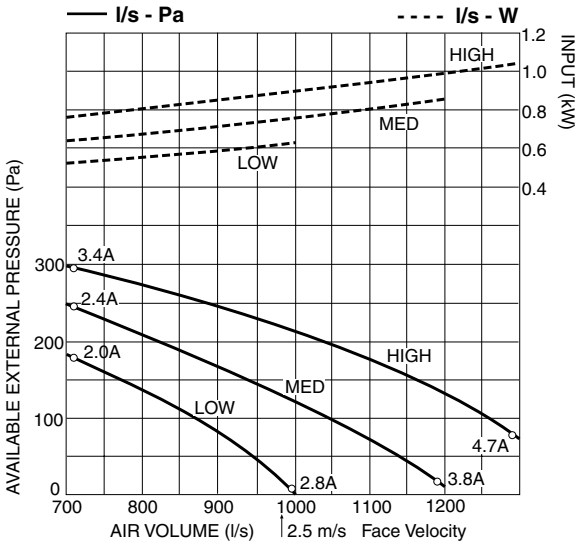


PERFORMANCE DATA

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 100	LOW	63	67	61	60	60	51	47
	MED	65	68	64	63	61	53	48
OPA 135	MED	70	75	71	68	64	60	53
	HIGH	71	77	72	69	66	61	55
OPA 170	MED	68	81	67	63	60	54	48
	HIGH	71	83	70	67	63	59	52

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 100	LOW	47	51	45	44	44	35	31
	MED	49	52	48	47	45	37	32
OPA 135	MED	54	59	55	52	48	44	37
	HIGH	55	61	56	53	50	45	39
OPA 170	MED	52	65	51	47	44	38	32
	HIGH	55	67	54	51	47	43	36

Supply Air Outlet

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.

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 100	LOW	320	53	51	51	51	47	44	40
	MED-LOW	400	59	56	56	57	53	52	50
	MED	500	65	60	61	63	59	58	56
	HIGH	625	69	63	64	66	63	61	60
OPA 135	LOW	550	67	67	65	63	62	61	56
	HIGH	850	73	72	69	68	69	66	64
OPA 170	LOW	900	66	61	55	50	45	40	37
	MED	1000	68	81	67	63	60	54	48
	HIGH	1100	71	83	70	67	63	59	52

SPECIFICATIONS

Model		OPA 100	OPA 135	OPA 170
Cooling Capacity *1	kW	10.6	13.9	16.8
Net Cooling Capacity *1	kW	10.4	13.2	16.0
Heating Capacity *2	kW	10.7	13.4	16.4
EER / AEER (Cooling)		2.92 / 2.90	3.01 / 2.99	2.95 / 2.89
Air Flow *3	l/s	575	775	900
Power Source *4		3 phase 342–436 V a.c. 50 Hz		
Indoor Fan Full Load Amps	A	1.89	5.0	6.3
Running Amps (Total System)	A/ph.	7 / 5 / 6	11 / 8 / 8	12 / 11 / 11
Recommended External Fuse	A/ph.	25	25	25
Finish		grey polyester powder coat		
Net Weight	kg	172	189	219
Shipping Weight (approx.)	kg	214	225	248

Notes:

*1 Nominal Cooling Capacity at AS/NZS 3823 conditions:
Indoor Entering Air Temp. 27°C D.B., 19°C W.B.;
Outdoor Entering Air Temp. 35°C D.B.
Subtract indoor fan power to calculate Net Capacity.

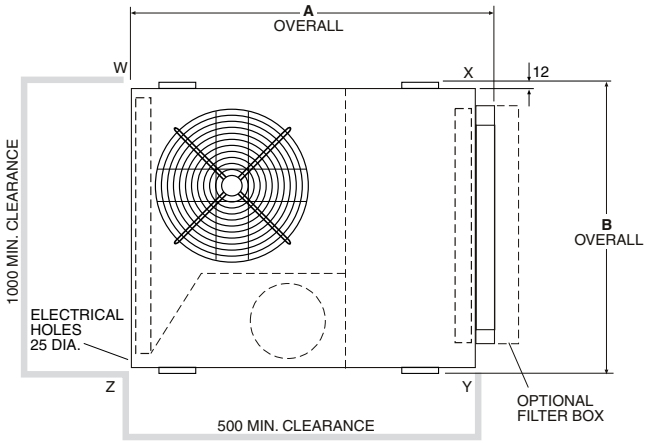
*2 Heating Capacity at AS/NZS 3823 conditions:
Indoor Entering Air Temp. 21°C D.B.;
Outdoor Entering Air Temp. 7°C D.B., 6°C W.B.

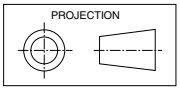
*3 Supply air flow at Nominal Cooling Capacity conditions stated above.

*4 Power source includes voltage limits.

DIMENSIONS (mm)

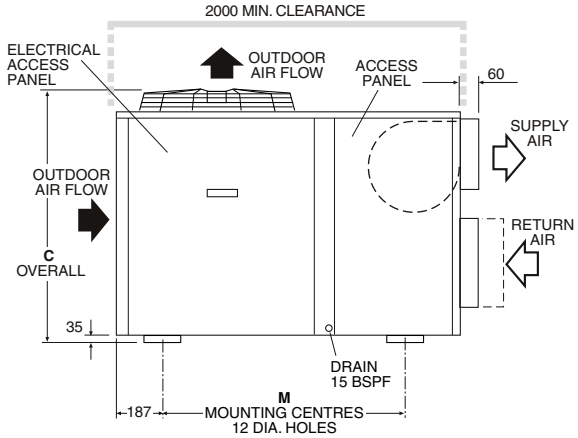
Not to Scale

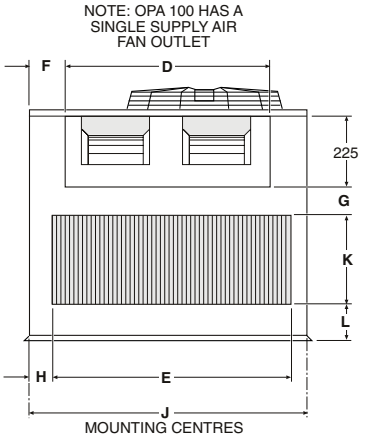




MODEL	A	B	C	D	E	F	G	H	J	K	L	M
OPA 100	1160	1050	980	400	831	315	162	100	1035	342	110	725
OPA 135	1110	1200	910	860	1065	160	140	80	1154	283	105	675
OPA 170	1160	1200	1070	860	1062	160	205	75	1154	342	110	725

MODEL	POINT LOADS (kg)			
	W	X	Y	Z
OPA 100	40	37	46	49
OPA 135	36	43	58	52
OPA 170	40	47	61	54





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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