



## Air Cooled Packaged Units Technical Data

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OPA 2100 Eco Ultra

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Cooling Capacity  
15kW - 200kW

Heating Capacity  
15kW -186kW

# Air Cooled Packaged Units

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# Air Cooled Packaged Units

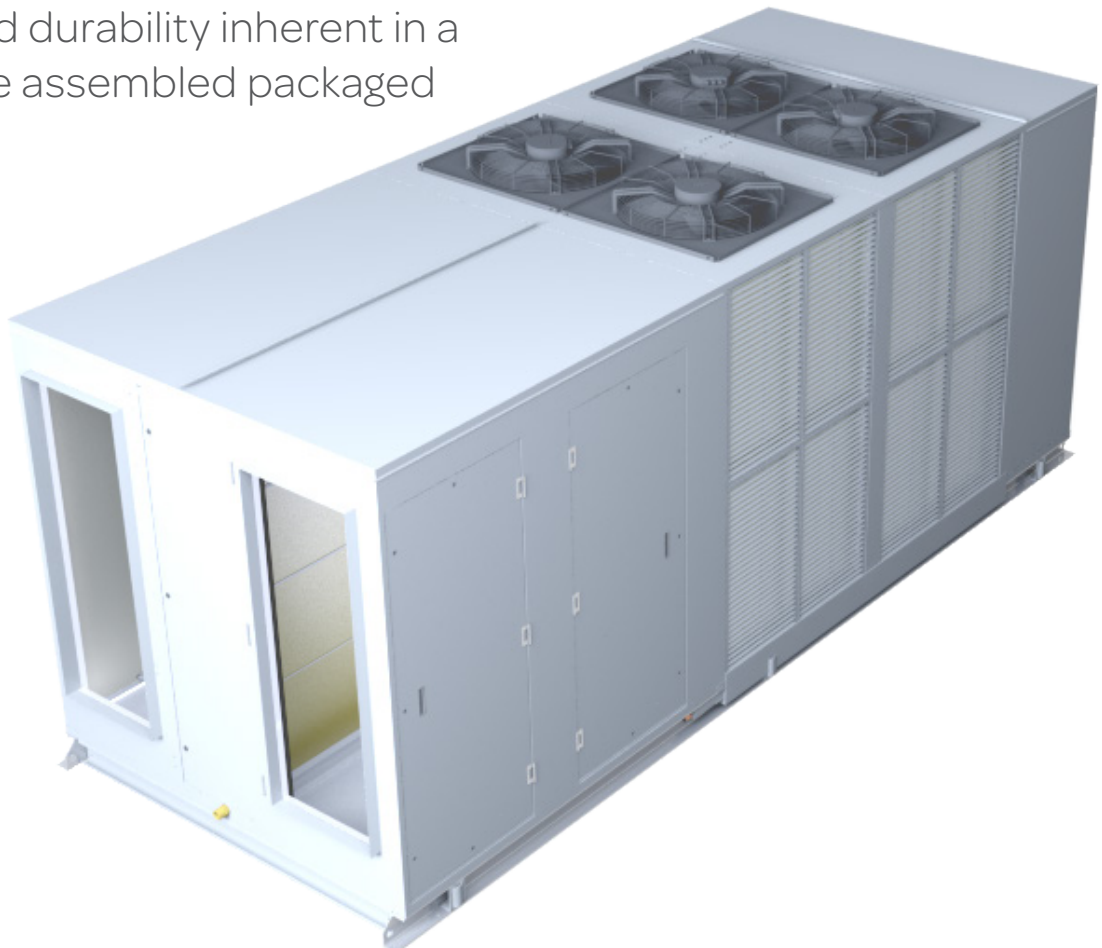
## OPA 2100 Eco Ultra



Eco Ultra Packaged rooftop HVAC units provide the ultimate flexibility and performance demanded in open plan commercial environments.

Key benefits:

- energy efficiency
- patent pending humidity control
- adaptive controls to suit changing ambient conditions
- low start-up current (just 24 amps)
- wide operating range:  $-15^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  ambient conditions
- noise isolation from occupied areas
- ease of fresh air integration
- reliability and durability inherent in a Temperzone assembled packaged unit



# Air Cooled Packaged Units

## OPA 2100 Eco Ultra



### Applications

Specifically developed for air conditioning of large commercial premises eg retail warehouses, supermarkets, shopping malls and auditoriums

### FEATURES

#### Energy Efficient

- As most air conditioners operate at part load for the vast majority of the time, it makes sense for each unit to incorporate four inverter scroll compressors which are very efficient at part load.
- Part load efficiency can be even further enhanced by indoor fan part load operation at low loads (75% airflow equates to 55% power use).
- Each plug fan incorporates a high efficiency electronically commutated (EC) motor (up to 25% efficiency; significantly better than belt drive centrifugal fans).
- Large heat exchange coils incorporate inner grooved (rifled) tube for better heat transfer.

#### Better Comfort

- Eco ULTRA variable speed technology enables fine tuning of the system – which ultimately delivers temperature stability and therefore better comfort to the occupants in the air conditioned space.

#### Intelligence

- Eco ULTRA incorporates intelligent technology. Its software understands the surrounding environment and self-adjusts to generate required temperature and humidity levels.
- Operates to maximise part-load efficiency and maximise reliability.

#### Quiet

- Generous use of insulation, load sensitive variable speed fans and enclosed compressor compartment ensures a quiet unit.
- A large supply air spigot reduces exit velocities and therefore less noise down ductwork.

#### Insulation

- Closed cell foam insulation is used in indoor air section to ensure no particles in air stream, and in the outdoor air section to reduce sound and condensation.
- The insulation is foil faced & meets fire test standards AS1530.3 (1989) & BS 476 parts 6 & 7.

#### Durable

- The cabinet and drain tray are constructed from high grade galvanized steel-polyester powdered coated (Grey) for all weather protection.
- External fasteners are stainless steel.
- Mounting rails are hot dipped galvanised.
- Heat exchange coils comprise aluminium plate fins on mechanically expanded rifled copper tube.
- Coil fins are epoxy coated for extra protection in corrosive environments ie salt laden sea air. Indoor coil fins are also epoxy coated. Outdoor air coil protection guards are supplied as standard. These guards are effective protection against hail damage and are removable to enable easy coil cleaning.
- Fan motor bearings are sealed for life so as not to incur regular maintenance.

#### Lower Installation Costs

- A low start-up current means lower infrastructure costs for cabling and transformers.

#### Self Diagnostics

- The unit is easy to maintain and service thanks to its smart control interface with easy to read LCD display.
- System operation information is displayed, such as: high/low pressures, system temperatures, supply air volume, fault codes. No need to connect pressure gauges.

### REFRIGERATION SYSTEM

- Four independent refrigeration systems to provide the flexibility and economy of four stage operation i.e. utilizing one to four systems as conditions vary plus staggered starting (25%-100% range). 50% redundancy is also achievable for critical applications, ie if one system was down, the other would act as a backup.

# Air Cooled Packaged Units

## OPA 2100 Eco Ultra



- Each high efficiency inverter scroll type compressor is soft starting, hermetically sealed, quiet running and supported on rubber mounts to minimize noise and vibration.
- Factory charged with R410A refrigerant which is deemed to have zero ozone depletion potential.
- Electronic expansion valves (EEV) accurately control the flow of refrigerant, responding to variable load demand and protecting the compressors for increased longevity.

### ELECTRICAL SYSTEM

- 3 phase 400V ac 50Hz with neutral & earth (Contact Temperzone for neutral free applications).
- Control panel is fully wired ready to accept the main power supply and controls cable.

### SYSTEM PROTECTION FEATURES

- HP & LP loss of refrigerant protection.
- Anti rapid cycle timer/internal overload for compressor protection.
- Circuit breakers on all systems.
- Automatic de-ice 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.
- Automatic oil flush cycle to protect compressors.
- External power isolation switch.
- Self diagnostic reporting.

### ECONOMISER OPTION

- An Economiser option is available to lower operating costs during the cooling cycle. This includes Return Air and Outside Air motorised dampers and a weathercowl to shield from the rain.
- Temperature and humidity sensors fitted with this option allow the controller to determine whether its is more efficient to use the air returning from the space or the air from outside. An alternate way of exhausting air may be required when operating on 100% fresh air (ie spill air option).

### CONTROLLER

- Patent pending control strategy designed to be flexible, comprehensive and user friendly.
- Fully integrated Carel c.PCO master controller (customised by Temperzone) to control every function of the unit – including Return air sensor, Supply air sensor, Room air sensor and Outdoor air sensor/dampers with the Economiser option.
- Each of the four systems is individually controlled by its own UC8 controller.

There are four Quick Start settings to suit your application:

1. Standard mode - optimised for average/comfort climate conditions
2. High Efficiency mode
3. High Performance mode
4. Custom User-Defined mode

The master controller provides uninterrupted heating, thanks to the controller which manages when each system goes into de-ice. A preheat delay minimises cold drafts on start-up in the heating cycle.

- Master controller is BMS compatible with common communication protocols (eg Modbus, BACnet)
- Constant or continuously variable supply air volume set-up
- Remote/stop start and fire alarms
- 24/7 day time clock scheduler with programmable operating times (two on/off cycles per day). 12 special event days.
- Programmable for daylight saving time.

### REHEAT COIL CONTROL

The Reheat Coil option enables increased humidity control which is important for some applications, eg supermarkets. This OPA 2100 option features:

- 3 way modulation valve allows precise control over reheat capacity. This allows accurate control of the Supply Air when required.
- Modulating valve eliminates variability caused by differences in outdoor temperature and indoor airflow, thereby enabling the correct amount of reheat when required. Such an outcome would not be possible with a traditional reheat system.

# Air Cooled Packaged Units

## OPA 2100 Eco Ultra



### INDOOR AIR FANS

#### Efficient

- Each plug fan incorporates a high efficiency EC motor (up to 25% more efficient than belt drive centrifugal fans).

#### Performance

- Backward curved plug fans enable fine tuning of the air flow to match the application requirements. Constant air flow is standard for improved comfort and efficiency. Fan performance can be Modbus monitored.

#### Quiet

- Each motor can vary from zero to full speed. This allows slow ramp up with no sudden noise change.

#### Low Maintenance

- Commissioning and maintenance costs are reduced through use of a fan that doesn't require a pulley (no belt dust) and belt adjustment or changes like traditional fans.

#### Soft Starting

- EC motors are soft starting and therefore low in-rush current.

#### Control Option

- Fixed and stable air flows are achieved through use of a differential air pressure transducer to compensate for varying duct static caused by dirty filters or modulating dampers. Commissioning and air balancing is thereby made easier.

### OUTDOOR AIR FANS

- Outdoor fans are variable speed high efficiency EC motor type.
- High ambient rating/humidity protection, ensuring their suitability to the harshness of the Australian and New Zealand climate.
- Eco ULTRA's smart controller adjusts the fan speed to suit the operating conditions.
- For plant rooms or ducted applications, maximum external static pressure for the outdoor fans is 120 Pa.
- EC fans contribute to increasing the overall efficiency of an application. Keeping the refrigerant pressure constant (rather than having it rise and fall as fans switch on and off) has been found to reduce compressor loads.

### EASE OF MAINTENANCE

- Smart control interface for display of fault codes.
- Slide rails enable easy filter replacement.
- Access doors are hinged for easy access.
- Built-in sloping drain trays minimise pooling of water when unit is installed level.
- Factory fitted isolation switch.
- No maintenance indoor air fan type.
- Single phase power socket for running auxiliary equipment.
- Outdoor coils feature external access drain trays for easy cleaning.

### OPTIONAL EQUIPMENT

1. Factory fitted Reheat coil for humidity control.
2. Filters rated G4 to AS 1324.1:2001.
3. Factory fitted economiser -includes dampers, weatherhood, temperature and humidity sensors.
4. Adjustable fresh air damper & weather hood.
5. Multiple handing options (refer Configurations p.15).

A summary list of Features is shown on pages 19 & 20.

# Air Cooled Packaged units

## Eco ULTRA Performance Data



### COOLING CAPACITY (KW)

TC = Total Capacity (kW).

SC = Sensible Heat Capacity (kW).

PI = Power Input (kW)

○ = Nominal Capacity (kW) @ load specified

**Note:** Capacities are **gross** and do not include allowance for fan motor heat loss.

Nominal Air Flow: **10 000 l/s**

#### OPA 2100 Eco ULTRA @Maximum Capacity (10 000 l/s)

Indoor coil E.A.T.

Outdoor coil entering air temperature (E.A.T.) °C D.B.

D.B. °C	W.B. °C	23			27			31			35			39			43		
		TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI
21	14	188.5	148.8	54.7	183.6	148.1	57.3	178.3	146.9	60.2	172.4	145.0	63.6	166.0	142.4	67.4	158.8	138.9	71.7
	15	195.2	137.3	55.2	190.1	136.4	57.8	184.5	135.0	60.8	178.4	132.9	64.1	171.6	130.2	68.0	164.1	126.8	72.2
	16	202.2	124.2	55.8	196.8	123.0	58.4	190.9	121.4	61.4	184.5	119.2	64.7	177.4	116.4	68.5	169.5	113.0	72.8
	17	209.3	109.3	56.4	203.6	107.8	59.0	197.5	105.9	61.9	190.7	103.6	65.3	183.3	100.8	69.1	175.1	97.4	73.4
23	15	194.3	160.8	55.1	189.2	160.2	57.8	183.6	159.0	60.7	177.5	157.1	64.1	170.8	154.3	67.9	163.3	150.6	72.2
	16	200.2	149.9	55.6	194.9	149.1	58.2	189.1	147.7	61.2	182.7	145.6	64.6	175.7	142.8	68.4	168.0	139.1	72.7
	17	207.2	138.3	56.2	201.7	137.2	58.8	195.6	135.6	61.8	188.9	133.4	65.1	181.6	130.5	69.0	173.5	126.8	73.3
	18	214.5	125.0	56.8	208.6	123.6	59.4	202.3	121.8	62.4	195.3	119.5	65.7	187.6	116.5	69.5	179.1	112.9	73.9
27	18	213.4	174.7	56.7	207.6	174.1	59.3	201.3	172.7	62.3	194.4	170.5	65.6	186.7	167.4	69.5	178.3	163.2	73.8
	19	219.8	164.7	57.2	213.8	163.8	59.8	207.2	162.3	62.8	200.0	160.0	66.1	192.0	156.8	70.0	183.3	152.6	74.3
	20	226.3	153.4	57.7	220.0	152.2	60.3	213.2	150.5	63.3	205.6	148.0	66.7	197.4	144.8	70.5	188.3	140.7	74.8
	22	239.7	126.0	58.8	232.9	124.4	61.4	225.5	122.3	64.3	217.4	119.6	67.7	208.5	116.4	71.5	198.7	112.5	75.9
31	21	235.2	190.1	58.4	228.6	189.3	61.0	221.3	187.7	64.0	213.4	185.2	67.3	204.7	181.6	71.2	195.2	176.9	75.5
	22	240.9	179.9	58.9	234.0	178.9	61.5	226.6	177.1	64.4	218.4	174.5	67.8	209.5	171.0	71.6	199.6	166.3	76.0
	23	246.7	168.4	59.3	239.6	167.2	61.9	231.9	165.3	64.8	223.5	162.6	68.2	214.3	159.1	72.0	204.1	154.5	76.4
	25	259.8	142.2	60.3	252.3	140.6	62.9	244.0	138.4	65.8	235.0	135.5	69.2	225.1	132.0	73.0	214.3	127.6	77.4

# Air Cooled Packaged units

## Eco ULTRA Performance Data at part load



### OPA 2100 Eco ULTRA @100% Nominal Capacity (10 000 l/s)

Indoor coil E.A.T.

Outdoor coil entering air temperature (E.A.T.) °C D.B.

D.B. °C	W.B. °C	23			27			31			35			39			43		
		TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI
21	14	174.1	150.4	47.9	171.9	150.8	50.2	166.6	147.8	52.8	159.1	143.1	55.7	148.6	136.0	59.0	135.8	125.4	62.7
	15	180.3	139.2	48.4	178.0	139.3	50.7	172.5	136.2	53.3	164.6	131.6	56.2	153.6	124.7	59.5	140.3	114.8	63.2
	16	186.6	126.4	48.9	184.2	126.0	51.2	178.4	122.9	53.8	170.3	118.4	56.7	158.8	111.9	60.0	145.0	102.7	63.7
	17	193.2	111.8	49.4	190.6	111.0	51.7	184.6	107.8	54.3	176.1	103.5	57.2	164.2	97.4	60.5	149.8	89.0	64.3
23	15	177.9	157.6	48.3	175.8	158.2	50.6	171.5	156.2	53.2	163.5	151.4	56.1	154.0	144.9	59.4	140.9	134.6	63.1
	16	183.3	147.2	48.8	181.0	147.6	51.0	176.6	145.4	53.6	168.3	140.7	56.5	158.5	134.4	59.8	144.9	124.6	63.6
	17	189.7	136.2	49.3	187.4	136.2	51.5	182.7	133.9	54.1	174.0	129.3	57.0	163.8	123.2	60.4	149.7	114.0	64.1
	18	196.3	123.5	49.8	193.8	123.2	52.0	188.9	120.7	54.6	179.9	116.2	57.6	169.3	110.4	60.9	154.7	101.9	64.6
27	18	193.4	165.7	49.7	191.1	165.5	52.0	186.6	163.3	54.6	177.5	158.7	57.5	168.5	150.8	60.8	154.8	141.2	64.6
	19	199.1	156.5	50.1	196.8	156.1	52.4	192.1	153.8	55.0	182.7	149.2	57.9	173.2	141.5	61.3	159.1	132.4	65.0
	20	205.0	146.1	50.6	202.5	145.4	52.9	197.6	143.0	55.4	187.9	138.4	58.4	178.1	131.1	61.7	163.6	122.4	65.5
	22	217.1	120.9	51.5	214.4	119.7	53.8	209.1	117.1	56.4	198.7	112.8	59.3	188.3	106.2	62.7	172.7	98.6	66.5
31	21	209.3	184.4	51.2	206.9	184.4	53.5	201.5	182.1	56.0	193.6	176.7	59.0	182.7	169.1	62.3	169.3	158.4	66.1
	22	214.4	174.8	51.6	211.9	174.6	53.8	206.3	172.2	56.4	198.2	166.9	59.4	186.9	159.5	62.7	173.2	149.2	66.5
	23	219.5	164.1	52.0	217.0	163.6	54.2	211.1	161.1	56.8	202.8	155.9	59.8	191.2	148.7	63.1	177.1	138.9	66.9
	25	231.3	139.4	52.8	228.4	138.4	55.1	222.2	135.7	57.7	213.3	130.8	60.6	201.0	124.2	64.0	186.1	115.5	67.8

### OPA 2100 Eco ULTRA @ 90% Nominal Capacity (10 000 l/s)

Indoor coil E.A.T.

Outdoor coil entering air temperature (E.A.T.) °C D.B.

D.B. °C	W.B. °C	23			27			31			35			39			43		
		TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI
21	14	154.3	135.8	38.5	150.4	134.9	40.3	146.2	133.7	42.3	141.7	132.0	44.6	136.9	129.8	47.2	131.7	126.5	50.1
	15	159.8	126.9	38.8	155.6	125.8	40.7	151.3	124.4	42.7	146.6	122.6	45.0	141.6	120.3	47.6	136.2	117.5	50.5
	16	165.4	116.7	39.2	161.0	115.4	41.0	156.5	113.7	43.1	151.6	111.8	45.4	146.4	109.4	48.0	140.7	106.5	50.9
	17	171.1	105.0	39.6	166.6	103.4	41.4	161.9	101.6	43.5	156.8	99.5	45.8	151.3	97.0	48.4	145.4	94.1	51.4
23	15	159.0	146.0	38.8	154.9	145.2	40.6	150.5	144.0	42.6	145.9	140.7	44.9	140.9	135.7	47.5	135.5	130.3	50.5
	16	163.7	137.5	39.1	159.5	136.5	40.9	155.0	135.2	43.0	150.2	133.4	45.3	145.0	131.0	47.9	139.4	128.1	50.8
	17	169.4	128.5	39.5	165.0	127.3	41.3	160.3	125.8	43.3	155.3	123.8	45.7	149.9	121.4	48.3	144.1	118.4	51.2
	18	175.3	118.2	39.9	170.7	116.7	41.7	165.8	115.0	43.7	160.6	112.9	46.1	154.9	110.4	48.7	148.8	107.4	51.7
27	18	174.4	158.8	39.8	169.9	157.9	41.6	165.0	156.6	43.7	159.8	154.6	46.0	154.2	149.0	48.6	148.1	142.9	51.6
	19	179.6	151.1	40.2	174.8	150.0	42.0	169.8	148.5	44.0	164.4	146.6	46.4	158.6	144.0	49.0	152.3	140.8	52.0
	20	184.8	142.2	40.5	179.9	141.0	42.3	174.7	139.3	44.4	169.1	137.2	46.7	163.1	134.6	49.4	156.6	131.3	52.4
	22	195.7	120.9	41.2	190.5	119.2	43.0	184.9	117.2	45.1	178.9	114.9	47.4	172.4	112.1	50.1	165.5	108.8	53.1
31	21	192.0	172.9	41.0	186.9	171.9	42.8	181.4	170.5	44.8	175.6	168.4	47.2	169.3	164.1	49.8	162.5	157.3	52.9
	22	196.6	164.9	41.3	191.4	163.9	43.1	185.7	162.3	45.1	179.7	160.1	47.5	173.2	157.3	50.2	166.2	153.7	53.2
	23	201.3	156.0	41.6	195.9	154.8	43.4	190.1	153.0	45.4	183.9	150.8	47.8	177.3	147.9	50.5	170.0	144.3	53.5
	25	212.0	135.7	42.2	206.3	134.0	44.0	200.1	131.9	46.1	193.5	129.4	48.5	186.4	126.5	51.2	178.7	122.9	54.2



# Air Cooled Packaged units

## Eco ULTRA Performance Data at part load



### OPA 2100 Eco ULTRA @ 80% Nominal Capacity (10 000 l/s)

Indoor coil E.A.T.

Outdoor coil entering air temperature (E.A.T.) °C D.B.

D.B. °C	W.B. °C	23			27			31			35			39			43		
		TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI
21	14	137.0	128.5	32.1	133.5	127.5	33.5	129.9	124.7	35.2	126.1	120.9	37.0	122.0	116.8	39.1	117.7	112.5	41.4
	15	141.7	120.8	32.4	138.1	119.6	33.8	134.4	118.2	35.5	130.4	116.5	37.3	126.2	114.4	39.4	121.6	111.9	41.7
	16	146.6	112.0	32.7	142.9	110.6	34.1	139.0	109.0	35.8	134.8	107.2	37.6	130.4	105.0	39.7	125.7	102.4	42.1
	17	151.6	101.9	33.0	147.8	100.3	34.4	143.7	98.5	36.1	139.4	96.5	38.0	134.8	94.2	40.1	129.9	91.6	42.4
23	15	141.0	135.8	32.3	137.5	132.3	33.8	133.7	128.5	35.4	129.8	124.6	37.3	125.6	120.4	39.3	121.0	115.8	41.7
	16	145.2	130.4	32.6	141.5	129.3	34.0	137.6	128.0	35.7	133.6	126.3	37.5	129.2	124.0	39.6	124.5	119.3	42.0
	17	150.2	122.7	32.9	146.4	121.4	34.3	142.3	119.9	36.0	138.1	118.1	37.9	133.5	115.8	40.0	128.7	113.2	42.3
	18	155.3	113.8	33.2	151.3	112.3	34.7	147.2	110.6	36.3	142.7	108.6	38.2	138.0	106.3	40.3	132.9	103.6	42.7
27	18	154.6	149.4	33.1	150.6	145.4	34.6	146.5	141.3	36.3	142.1	136.9	38.1	137.4	132.2	40.3	132.3	127.1	42.6
	19	159.1	143.1	33.4	155.0	142.0	34.9	150.7	140.6	36.5	146.1	138.7	38.4	141.3	136.1	40.5	136.0	130.8	42.9
	20	163.7	135.5	33.7	159.5	134.2	35.2	155.0	132.7	36.8	150.3	130.7	38.7	145.3	128.3	40.8	139.9	125.4	43.3
	22	173.2	117.1	34.2	168.7	115.5	35.7	164.0	113.6	37.4	158.9	111.3	39.3	153.6	108.8	41.5	147.8	105.8	43.9
31	21	170.0	163.0	34.0	165.6	160.4	35.5	160.9	155.7	37.2	156.0	150.8	39.1	150.8	145.6	41.3	145.1	139.9	43.7
	22	174.0	156.2	34.3	169.5	155.1	35.8	164.7	153.5	37.4	159.7	151.6	39.4	154.3	149.1	41.5	148.4	143.2	44.0
	23	178.2	148.5	34.5	173.5	147.2	36.0	168.6	145.6	37.7	163.4	143.5	39.6	157.9	140.9	41.8	151.9	137.8	44.2
	25	187.5	131.0	35.0	182.6	129.4	36.5	177.4	127.4	38.2	171.9	125.1	40.2	166.0	122.3	42.4	159.6	119.1	44.8

### OPA 2100 Eco ULTRA @ 70% Nominal Capacity (10 000 l/s)

Indoor coil E.A.T.

Outdoor coil entering air temperature (E.A.T.) °C D.B.

D.B. °C	W.B. °C	23			27			31			35			39			43		
		TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI
21	14	119.7	113.4	26.8	116.8	111.6	28.0	113.7	108.5	29.3	110.4	105.2	30.8	107.0	101.8	32.5	103.3	98.1	34.3
	15	123.9	106.8	27.0	120.8	105.8	28.2	117.6	104.6	29.5	114.2	103.1	31.0	110.6	101.4	32.7	106.8	99.3	34.6
	16	128.1	99.1	27.2	124.9	97.9	28.4	121.6	96.5	29.8	118.1	95.0	31.3	114.4	93.1	33.0	110.4	90.9	34.9
	17	132.5	90.3	27.4	129.1	88.9	28.6	125.7	87.4	30.0	122.1	85.7	31.5	118.2	83.7	33.2	114.0	81.5	35.2
23	15	123.3	118.1	26.9	120.2	115.0	28.1	117.0	111.8	29.5	113.7	108.5	31.0	110.1	104.9	32.7	106.3	101.1	34.6
	16	126.9	115.2	27.1	123.7	114.3	28.3	120.4	113.1	29.7	117.0	111.7	31.2	113.3	108.1	32.9	109.3	104.1	34.8
	17	131.2	108.5	27.3	127.9	107.4	28.5	124.5	106.1	29.9	120.9	104.5	31.5	117.1	102.7	33.2	113.0	100.5	35.1
	18	135.7	100.7	27.5	132.2	99.5	28.8	128.7	98.0	30.2	125.0	96.3	31.7	121.0	94.3	33.4	116.7	92.1	35.4
27	18	135.0	129.8	27.5	131.6	126.4	28.7	128.1	122.9	30.1	124.4	119.2	31.7	120.4	115.2	33.4	116.2	111.0	35.3
	19	138.9	126.4	27.7	135.4	125.5	28.9	131.8	124.3	30.3	127.9	122.7	31.9	123.8	118.6	33.6	119.5	114.3	35.6
	20	142.9	119.8	27.9	139.3	118.7	29.1	135.5	117.4	30.5	131.6	115.7	32.1	127.3	113.7	33.9	122.8	111.3	35.8
	22	151.2	103.9	28.2	147.4	102.4	29.5	143.3	100.8	30.9	139.1	98.9	32.5	134.6	96.7	34.3	129.8	94.2	36.3
31	21	148.4	143.2	28.1	144.6	139.4	29.4	140.7	135.5	30.8	136.6	131.4	32.4	132.1	126.9	34.2	127.4	122.2	36.2
	22	151.9	137.9	28.3	148.0	137.0	29.5	144.0	135.7	31.0	139.8	134.1	32.6	135.2	130.0	34.4	130.4	125.2	36.4
	23	155.5	131.3	28.4	151.5	130.2	29.7	147.4	128.8	31.2	143.0	127.1	32.8	138.4	124.9	34.6	133.4	122.3	36.6
	25	163.6	116.1	28.8	159.4	114.7	30.1	155.0	113.0	31.5	150.4	111.0	33.2	145.5	108.7	35.0	140.2	106.1	37.1

# Air Cooled Packaged units

## Eco ULTRA Performance Data at part load



OPA 2100 Eco ULTRA @ 60% Nominal Capacity (10 000 l/s)

Indoor coil E.A.T.

Outdoor coil entering air temperature (E.A.T.) °C D.B.

D.B. °C	W.B. °C	23			27			31			35			39			43		
		TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI	TC	SC	PI
21	14	102.5	96.3	22.4	100.0	94.8	23.5	97.4	92.2	24.6	94.7	89.5	25.9	91.9	86.7	27.3	88.9	83.7	28.9
	15	106.0	90.6	22.6	103.4	89.8	23.6	100.7	88.8	24.8	97.9	87.7	26.1	95.0	86.3	27.5	91.8	84.6	29.1
	16	109.6	84.0	22.7	106.9	83.0	23.8	104.1	81.9	24.9	101.2	80.7	26.2	98.1	79.2	27.7	94.8	77.4	29.3
	17	113.2	76.5	22.8	110.5	75.3	23.9	107.6	74.1	25.1	104.6	72.7	26.4	101.4	71.1	27.9	98.0	69.3	29.5
23	15	105.5	100.3	22.5	102.9	97.7	23.6	100.3	95.1	24.8	97.5	92.3	26.1	94.5	89.3	27.5	91.4	86.2	29.0
	16	108.5	97.8	22.6	105.9	97.0	23.7	103.1	96.1	24.9	100.3	95.0	26.2	97.2	92.0	27.6	94.0	88.8	29.2
	17	112.2	92.0	22.7	109.4	91.1	23.9	106.6	90.1	25.1	103.6	88.8	26.4	100.4	87.3	27.8	97.1	85.6	29.4
	18	115.9	85.3	22.9	113.1	84.3	24.0	110.1	83.1	25.2	107.0	81.8	26.5	103.8	80.2	28.0	100.2	78.3	29.7
27	18	115.4	110.2	22.8	112.6	107.4	24.0	109.6	104.4	25.2	106.5	101.3	26.5	103.3	98.1	28.0	99.8	94.6	29.6
	19	118.7	107.2	22.9	115.8	106.5	24.1	112.7	105.6	25.3	109.6	104.4	26.7	106.2	101.0	28.2	102.5	97.3	29.8
	20	122.0	101.5	23.0	119.0	100.7	24.2	115.9	99.6	25.4	112.6	98.3	26.8	109.1	96.7	28.3	105.4	94.8	30.0
	22	129.0	87.8	23.2	125.8	86.7	24.4	122.5	85.3	25.7	119.0	83.8	27.1	115.2	82.1	28.7	111.3	80.0	30.4
31	21	126.6	121.4	23.1	123.5	118.3	24.3	120.3	115.1	25.6	116.8	111.6	27.0	113.2	108.0	28.5	109.3	104.1	30.2
	22	129.6	116.9	23.2	126.4	116.2	24.4	123.0	115.2	25.7	119.5	113.9	27.1	115.8	110.6	28.7	111.8	106.6	30.4
	23	132.6	111.2	23.3	129.3	110.4	24.5	125.9	109.3	25.8	122.3	107.9	27.2	118.4	106.2	28.8	114.3	104.1	30.6
	25	139.4	98.2	23.4	136.0	97.0	24.7	132.3	95.7	26.0	128.5	94.1	27.5	124.4	92.2	29.1	120.0	90.1	30.9

# Air Cooled Packaged units

## Eco ULTRA Performance Data



### REHEAT CAPACITY (KW)

Capacity figures below are for unit installed with Reheat Coil option (nb coil alone)

#### OPA 2100 Eco ULTRA @Maximum Capacity (10 000 l/s)

Air on		Outdoor coil entering air temperature (E.A.T.) °C					D.B
D.B. °C	W.B. °C	23	27	31	35	39	43
21	14	107.2	107.0	106.8	106.7	106.5	106.3
	15	109.5	109.3	109.2	109.0	108.8	108.6
	16	111.6	111.5	111.3	111.1	110.9	110.8
	17	113.8	113.6	113.4	113.3	113.1	112.9
23	15	109.3	109.2	109.0	108.8	108.6	108.4
	16	111.5	111.3	111.1	110.9	110.8	110.6
	17	113.6	113.4	113.3	113.1	112.9	112.7
	18	115.8	115.6	115.4	115.2	115.0	114.9
27	18	115.6	115.4	115.2	115.0	114.9	114.7
	19	117.5	117.4	117.2	117.0	116.8	116.6
	20	119.5	119.3	119.1	119.0	118.8	118.6
	22	123.4	123.2	123.1	122.9	122.7	122.5
31	21	121.3	121.1	120.9	120.7	120.6	120.4
	22	123.1	122.9	122.7	122.5	122.4	122.2
	23	124.8	124.7	124.5	124.3	124.1	124.0
	25	128.2	128.1	127.9	127.7	127.5	127.3

# Air Cooled Packaged units

## Eco ULTRA Performance Data at part load



### HEATING CAPACITY (KW)

G = Gross Heating Capacity kW, based on nominal air flow.

N = Net Heating Capacity kW allowing for average defrost.

PI = Power Input kW

○ = Nominal Capacity (kW).

#### OPA 2100 Eco ULTRA @ 100% Nominal Capacity (10 000 l/s)

Air on	Outdoor coil entering air temperature (E.A.T.) °C												D.B.											
D.B.	-5			-3			-1			1			3			5			7			9		
	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI
15°C	141	39	52	149	38	53	157	40	54	161	42	54	173	64	54	181	93	55	189	135	56	197	195	57
20°C	139	38	55	147	36	56	155	38	57	159	41	57	171	63	57	179	91	58	187	134	59	195	193	60
25°C	134	34	59	142	33	60	150	34	61	154	37	61	166	59	61	174	88	62	182	130	63	190	190	64

#### OPA 2100 Eco ULTRA @ 90% Nominal Capacity (10 000 l/s)

Air on	Outdoor coil entering air temperature (E.A.T.) °C												D.B.											
D.B.	-5			-3			-1			1			3			5			7			9		
	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI
15°C	127	35	43	134	34	43	141	36	44	145	38	44	155	58	44	163	84	45	170	122	46	177	175	46
20°C	125	34	45	132	32	46	139	34	47	143	37	47	154	57	47	161	82	48	168	120	48	175	174	49
25°C	121	31	48	128	29	49	135	31	50	139	33	50	150	53	50	157	79	50	164	117	51	171	171	52

#### OPA 2100 Eco ULTRA @ 80% Nominal Capacity (10 000 l/s)

Air on	Outdoor coil entering air temperature (E.A.T.) °C												D.B.											
D.B.	-5			-3			-1			1			3			5			7			9		
	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI
15°C	113	31	36	119	30	37	125	32	37	129	34	37	138	52	37	145	74	38	151	108	38	157	156	39
20°C	111	30	38	117	29	39	124	30	39	127	33	40	137	50	39	143	73	40	149	107	41	156	154	41
25°C	107	27	40	114	26	41	120	28	42	123	30	42	133	47	42	139	70	42	146	104	43	152	152	44

#### OPA 2100 Eco ULTRA @ 70% Nominal Capacity (10 000 l/s)

Air on	Outdoor coil entering air temperature (E.A.T.) °C												D.B.											
D.B.	-5			-3			-1			1			3			5			7			9		
	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI
15°C	98	27	31	104	26	32	110	28	32	113	30	32	121	45	32	127	65	33	132	95	33	138	136	33
20°C	97	26	33	103	25	33	108	27	34	111	28	34	119	44	34	125	64	34	131	94	35	136	135	35
25°C	94	24	35	100	23	35	105	24	36	108	26	36	116	42	36	122	61	36	128	91	37	133	133	37

#### OPA 2100 Eco ULTRA @ 60% Nominal Capacity (10 000 l/s)

Air on	Outdoor coil entering air temperature (E.A.T.) °C												D.B.											
D.B.	-5			-3			-1			1			3			5			7			9		
	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI
15°C	84	24	27	89	23	27	94	24	28	96	25	28	104	39	28	108	56	28	113	81	28	118	117	29
20°C	83	23	28	88	22	29	93	23	29	95	24	29	102	38	29	107	55	30	112	80	30	117	116	30
25°C	80	20	30	85	20	30	90	21	31	93	22	31	100	36	31	105	53	31	109	78	32	114	114	32

# Air Cooled Packaged units

## Eco ULTRA Performance Data at part load



### HEATING CAPACITY (KW)

G = Gross Heating Capacity kW, based on nominal air flow.

N = Net Heating Capacity kW allowing for average defrost.

PI = Power Input kW

#### OPA 2100 Eco ULTRA @ 50% Nominal Capacity (10 000 l/s)

Air on D.B.	Outdoor coil entering air temperature (E.A.T.) °C D.B.																													
	-5			-3			-1			1			3			5			7			9								
	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI	G	N	PI			
15°C	70	20	24	74	19	24	78	20	24	80	21	24	86	32	24	90	46	25	94	68	25	98	97	25						
20°C	69	19	25	73	18	25	77	19	26	79	20	26	85	31	26	89	46	26	<b>93</b>	67	26	97	97	27						
25°C	67	17	26	71	16	27	75	17	27	77	19	27	83	30	27	87	44	27	91	65	28	95	95	28						

# Air Cooled Packaged Units

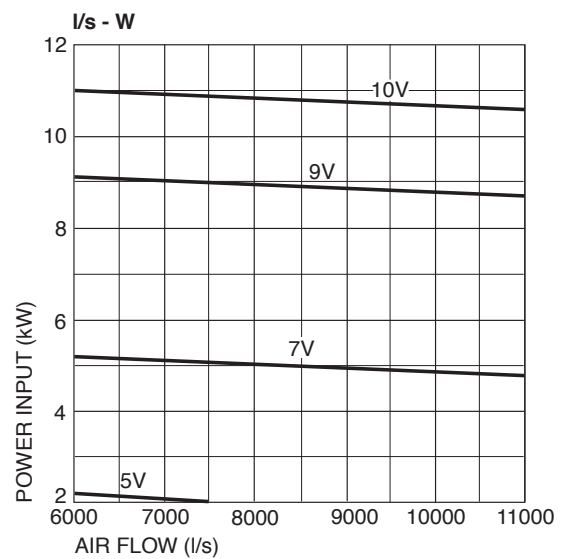
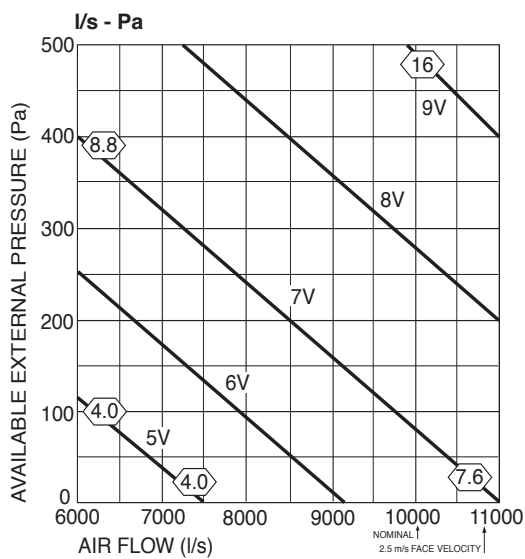
## Performance Data



### AIR HANDLING

**Note:** Airflows are for a dry coil. Reduce airflow by 5% in high moisture removal conditions. As filters are optional, the fan air flows given are for units installed without filters.

#### OPA 2100



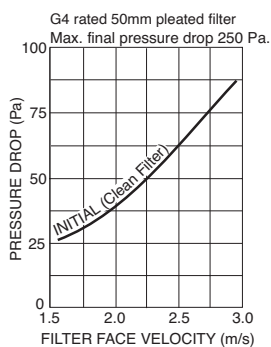
#### Note: Air Flow Selection

If air returning to the indoor coil is regularly expected to be above 50% relative humidity then the coil face velocity should be limited to 2.5m/s or less (refer air flow graph above)

Consideration must be given to selecting a airflow and coil face velocity that avoids water carry - over problems i.e. in high humidity (tropical/subtropical) conditions or when heavily moisture laden fresh air is introduced

Applications using complete or high proportion of fresh air should be discussed with a Temperzone sales engineer to establish the correct selection of unit.

#### OPTIONAL FILTERS - Pressure Drop



# Air Cooled Packaged Units

## Performance Data



### SOUND LEVELS

#### Sound Power Levels (SWL) - Radiated

Measured in decibels re 1 picowatt, at nominal airflow.

Model	OUTDOOR FAN SPEED	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1K	2K	4K
OPA 2100	HIGH	76	60	64	71	71	69	65

#### Sound Pressure Levels (SPL)

Measured in decibels re 20  $\mu$ Pa, at nominal airflow.

Model	OUTDOOR FAN SPEED	SPL dB(A) @ 3m	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1K	2K	4K
OPA 2100	HIGH	58	42	46	53	53	51	48

#### Sound Power Levels (SWL) - Supply Air Outlet

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 AIR FLOW l/s	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1K	2K	4K
OPA 2100	10 000	82	71	78	75	77	75	70

#### Sound Pressure Levels (SPL)

Measured in decibels re 20  $\mu$ Pa, at nominal airflow.

Model	INDOOR FAN AIR FLOW l/s	SPL dB(A) @ 3m	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1K	2K	4K
OPA 2100	10 000	70	55	66	66	67	63	56

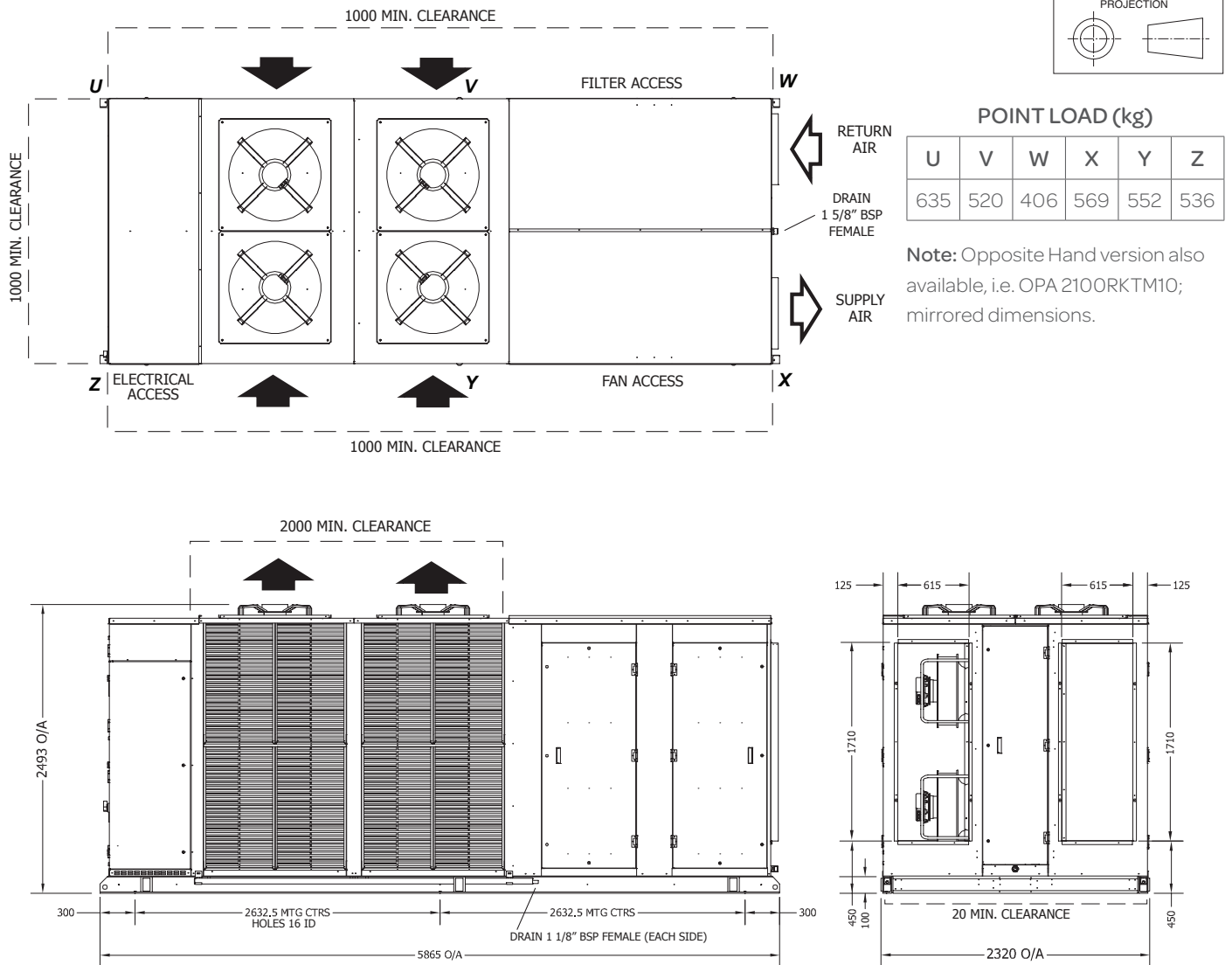
# Air Cooled Packaged Units

## Dimensions (mm)



FIG. 1 HORIZONTAL SUPPLY & RETURN AIR - OPA 2100RKTMO1-P

Not to Scale



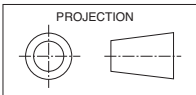


# Air Cooled Packaged Units

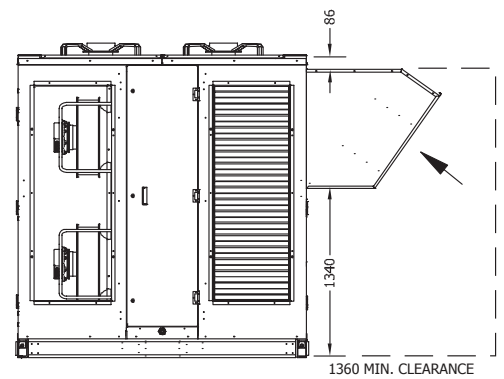
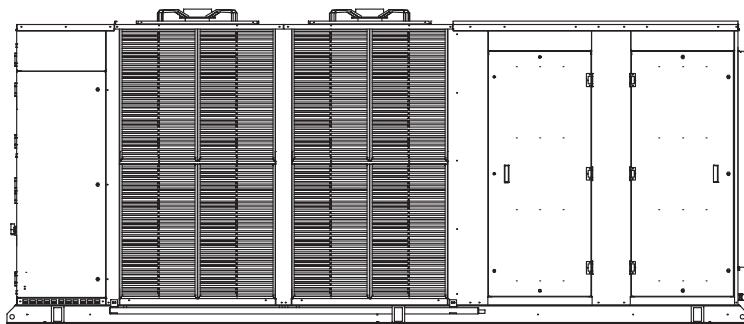
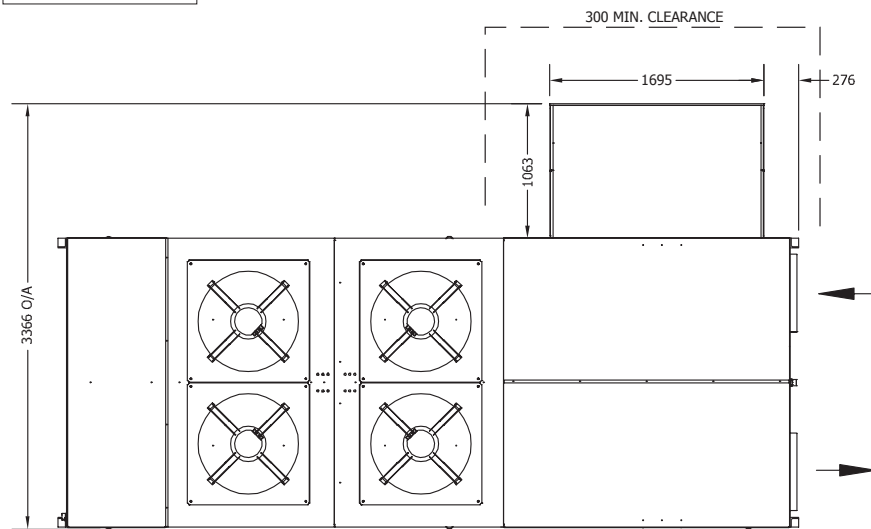
## Dimensions (mm)



FIG. 2 ECONOMISER & FRESH AIR INTAKE OPTIONS



Note: Refer page 16 for other dimensions..



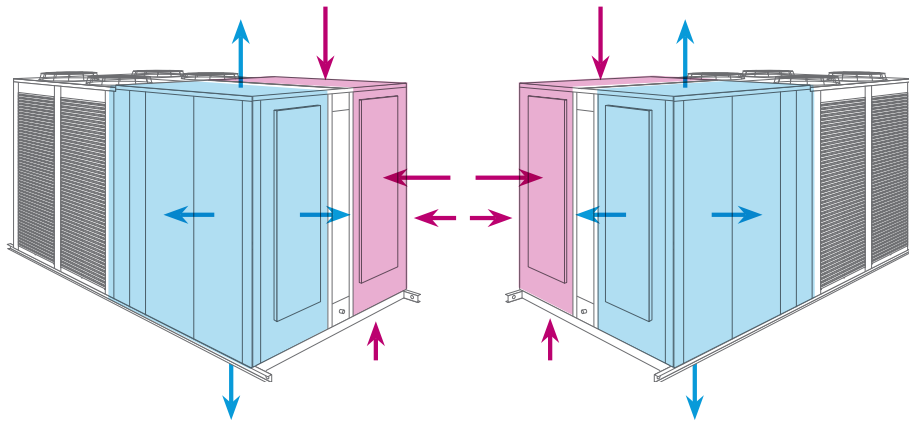
# Air Cooled Packaged Units

## Dimensions (mm)



### CONFIGURATIONS

The units are supplied left hand supply air (when facing the unit; as shown on page 16).  
Alternative configurations for supply air and return air openings are as follows:.



		Return Air w/o Economiser					
		Top	Front LH	Front RH	Down	Side LH	Side RH
Supply Air	Top	Yes	Yes	Yes	Yes	Yes	Yes
	Front LH	Yes	No	Yes	Yes	Yes	Yes
	Front RH	Yes	Yes	No	Yes	Yes	Yes
	Down	Yes	Yes	Yes	Yes	Yes	Yes
	Side LH	Yes	Yes	Yes	Yes	No	Yes
	Side RH	Yes	Yes	Yes	Yes	Yes	No

		Return Air with Economiser					
		Top	Front LH	Front RH	Down	Side LH	Side RH
Supply Air	Top	Yes	Yes	Yes	Yes	No	No
	Front LH	Yes	No	Yes	Yes	No	No
	Front RH	Yes	Yes	No	Yes	No	No
	Down	Yes	Yes	Yes	Yes	No	No
	Side LH	Yes	Yes	Yes	Yes	No	No
	Side RH	Yes	Yes	Yes	Yes	No	No

# Air Cooled Packaged Units

## Specifications



Model	OPA 2100RKTM-P	
<b>Performance</b>		
Total Cooling Capacity (gross) range *1	kW	18 ~ 200
Net Cooling Capacity	kW	178
Heating Capacity range	kW	17 ~ 187
Heating Capacity H1 *2	kW	186.7
EER / AEER (cooling)		3.08 / 3.06
COP / ACOP (heating)		3.16 / 3.15
Air Flow *	l/s	10 000
<b>Operating Range (outdoor ambient)</b>		
Cooling		-10°C to 50°C
Heating		-15°C to 25°C
<b>Controls</b>		
Slave Controllers		UC8 (x4)
Master Controller		Carel c.PCO
<b>Refrigeration Systems</b>		
Compressor type		Inverter (x4)
Refrigerant		R410A
<b>Electrical</b>		
Power Source		3 phase 400 V a.c. 50 Hz
Indoor fan type		EC Motor plug (x4)
Outdoor fan type		EC Motor axial (x4)
Indoor Fan Full Load Amps	A	5.4 ea.
Start-up Amps (IDF / IDF+Stage 1 / IDF+Stages 1 & 2)		8 / 12 / 24
Running Amps (Total System)	A/ph.	94 / 90 / 97
Max. Running Amps (Total System)	A/ph.	142 / 136 / 142
<b>Cabinet</b>		
Finish		grey polyester powder coat
IP Rating		IP44
Net Weight	kg	3218

### 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.

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.

Materials and specifications are subject to change without notice due to the manufacturer's ongoing research and development programme.

# Air Cooled Packaged Units

## Features



Model	OPA 2100RKTМ-P
<b>Electrical</b>	
Three Phase protection included on all motors controllers	Standard
Outdoor Temperature/Humidity RH Sensors	c/w Economiser
Indoor Temperature/Humidity RH Sensors	Standard
Full height electrical enclosure	Standard
Single phase power socket in electrical box for service work	Standard
IP55 Rated	Standard
<b>Refrigeration System</b>	
Bi-Flow Electronic Expansion Valves (EEV)	Standard
Fully modulating reheat valve control	Reheat Coil Model
Epoxy Coated Indoor Coil	Standard
Additional Coil Coat Protection (Indoor Section)	Optional
Epoxy Coated Outdoor Coil	Standard
Additional Coil Coat Protection (Outdoor Section)	Optional
Epoxy Coated Reheat Coil	Standard
Outdoor coils with external drain tray	Standard
Indoor coils with stainless steel drain tray	Optional
Hail Protection Louvre Coil Guards	Standard
Filter rails (to suit 50 or 100m thick panel filters)	Standard
Smart Crankcase heaters	Standard
<b>Variations</b>	
Duct Mesh Supply Air - Down Supply Air	Optional
Duct Mesh Return Air - Bottom Return Air	Optional
Economiser without Spill Air	Standard
Economiser with Spill Air	Optional
Reheat - For RH Control*	Reheat Coil Model

# Air Cooled Packaged Units

## Features



Model	OPA 2100RKTМ-P
Controls	
Control Interface with LCD Display for System Operation	Standard
'Temperzone Monitoring' ready (incl. data logging)	Optional
Remote software update ready	Standard
Built-in Economiser function ready	Optional
Power monitoring of all fans and compressors	Standard
Oil and refrigeration management system	Standard
Intelligent humidity control	Standard
7 Day Programmable Time-Clock – Night mode	Standard
Quick Start-up user settings	Standard
Adjustable Indoor Fan Airflow Setpoint	Standard
Supply Air control during high latent and dehumidification	Standard
Built-in data logging	Standard
Alarm Fault Data Logger	Standard
BMS Compatibility – Modbus/IP	Standard
BMS Compatibility – BACnet/IP	Standard
BMS Compatibility – BACnet/MSTP	Optional
Independent individual system controllers (UC8)	Standard
Rapid cycling protection	Standard
Loss of refrigerant protection	Standard
High and Low Pressure Protection (UC8)	Standard
Compressor Discharge Temperature Protection	Standard
EEV control based on Combined Superheat	Standard
Indoor Coil Frost Protection	Standard
Indoor heating warm startup	Standard
Night Mode – Quiet operation	Standard
Outdoor Coil de-ice management system	Standard
Economy Control 3rd Party Components	Optional

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