temperzone
QUALITY AIR CONDITIONING

Ducted Split System Air Conditioners
Technical Data

ISD 294, ISD 324

Cooling Capacity
27.9kW - 34kW

Heating Capacity
28.2kW -32.2kW

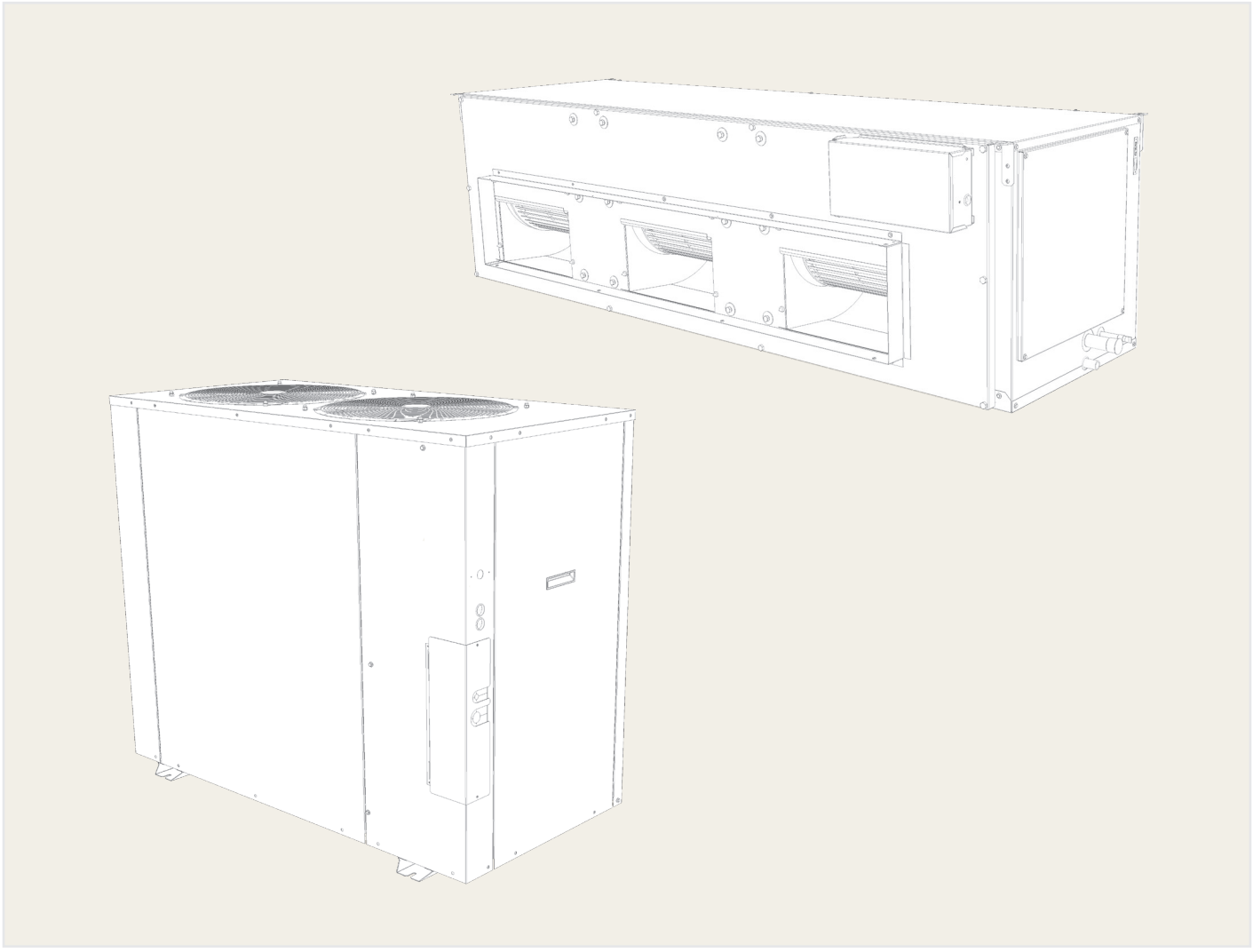
Ducted Split System Air Conditioners

Contents

Ducted Split System Air Conditioners

ISD 294, 324 KYX

The ISD indoor units, together with their associated OSA outdoor units, provide a reverse cycle (heat pump) split system air conditioner designed and developed to comply with and exceed AS/NZS 3823. Each system has been successfully tested at 52°C ambient.



Ducted Split System Air Conditioners

ISD 294, 324 KYX series

Applications

These units have been specifically developed for air conditioning of commercial premises, e.g. offices, motels, shops and restaurants.

Suitable for applications using full or high proportions of fresh air (nb pre-heating on heating cycle may be required). Also suitable for VAV, close control and supply air temperature control.

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 has a zero ozone depletion potential.

User Friendly

The air conditioning system is available with an optional SAT-3 or TZT-100 Controller which is wired to the Indoor or Outdoor unit. These thermostats have 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".

Economy

Both the ISD/OSA 294 & 324 systems have variable capacity compressors which use less energy than alternative types of compressor.

Efficient

Indoor units include a high efficiency electronically commutated (EC) motor. Part load operation at low loads (75% airflow equates to 55% power use) using temperzone algorithms. Each outdoor unit incorporates a high efficiency compressor. Heat exchange coils use inner grooved (rifled) tube for better heat transfer.

Performance

The variable capacity compressor technology can provide close comfort control of the room temperature. The OSA 294F and 324F have an extra boost capacity available for fast response when well away from set point at start-up.

A dynamically balanced forward curved fan with a multi-speed EC motor enables fine tuning of the indoor unit to match the supply air requirements. These EC motor fans have a fully integrated speed control that enables soft starting. Fan speed can be stepped to your own requirements or continuously variable using a 0–10V DC control signal. The system includes a temperature sensing head pressure control which enables the

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system to compensate for outdoor ambient temperatures below 20°C on cooling cycle, and above 15°C on heating cycle.

Quiet

Each integral high efficiency EC motor can vary from zero to full speed. This allows slow ramp up with no sudden noise change. The motor can be controlled to have the best air flow for the ducting and requirements as well as used for de-humidifying the space.

The outdoor units' coil design permits low fan speeds and hence low noise levels. The compressor is isolated in a built-in, insulated compartment to minimise noise. The indoor unit is also insulated for noise attenuation.

Durable

Both indoor and outdoor coil fins are epoxy coated for extra protection in corrosive environments, e.g. salt laden sea air. Each outdoor unit's cabinet is constructed from high grade galvanised steel - polyester powder coated (grey) for all weather protection (IP 44). External fasteners are stainless steel. Heat exchange coils comprise aluminium corrugated plate fins on mechanically expanded rifled copper tube. Each indoor unit's cabinet is constructed from high grade galvanised steel and includes a plastic drain tray for complete corrosion resistance. Outdoor coils are protected with louvred anti-hail guards.

Low Maintenance.

Commissioning and maintenance costs are reduced through use of a fan that requires no pulley and belt adjustments or changes like traditional fans.

Soft Starting

EC motors are soft starting therefore have none of the problems associated with high in rush current.

Insulation

Closed cell foam insulation has been used in the indoor units' cabinet to ensure no particles are introduced into the air stream. The insulation is foil faced and meets fire test standards AS 1530.3 (1999) and BS 476 parts 6 & 7.

Control Option

Commissioning is made easier when the EC motor to be controlled variably (within a restricted range) by a 0–10 volt DC signal that can be supplied either by a BMS system, a sophisticated controller or temperzone's optional TZT-100 Controller.

The systems' UC8 controller is BMS compatible with multi-unit control possible – either via digital and analogue signals or via Modbus. Refer to temperzone for other protrocols available.

Self Diagnostics

The Outdoor Unit Controller (UC8) has a LED display to indicate faults and running conditions. A non-specific fault indicator is included for interface to external systems via the optional relay board.

Zone Control

ISD-KYX versions using SAT-3 controller can be fitted with the optional Zone Control kit which allows up to 6 zone dampers to be switched from the SAT-3 wall control. Standard damper motors, 24 volt ac, can be used with drive open/drive close.

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OPTIONAL EQUIPMENT

Outdoor Unit:

1. Anti-vibration mounts (rubber)
2. Drain connection - right angle
3. Fault relay board (201-000-105)

Indoor Unit:

1. temperzone SAT-3 Controller or TZT-100 Controller.
2. Six Zone Control kit for SAT-3.
3. Spring mounting kit.
4. Supply & return air spigots (available in New Zealand only)
5. Filter Box c/w EU4/G4 rated filter.

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 ensures icing up of the outdoor coil during heating cycle is kept to a minimum.
5. Frost protection on cooling cycle.
6. Sensor fault indication.
7. Compressor minimum run time to ensure oil return.
8. 12V control circuit.

COMPRESSOR

Each high efficiency variable capacity compressor is hermetically sealed, quiet running and supported on rubber mounts to minimise vibration. Digital compressors have proven very reliable because of their design simplicity; electrical harmonic noise is very low.

REFRIGERATION PIPING

Maximum line length is 90m.

Max. height separations between units are:

Outdoor unit **above** indoor unit: 20m
Outdoor unit **below** indoor unit: 20m.

Each OSA unit is shipped from the factory with a charge of HFC-410A (R410A) refrigerant sufficient for a 10m line length. Liquid and suction service valves are provided. The matched indoor unit is shipped with a holding charge of nitrogen. Both units have brazed pipe connections.

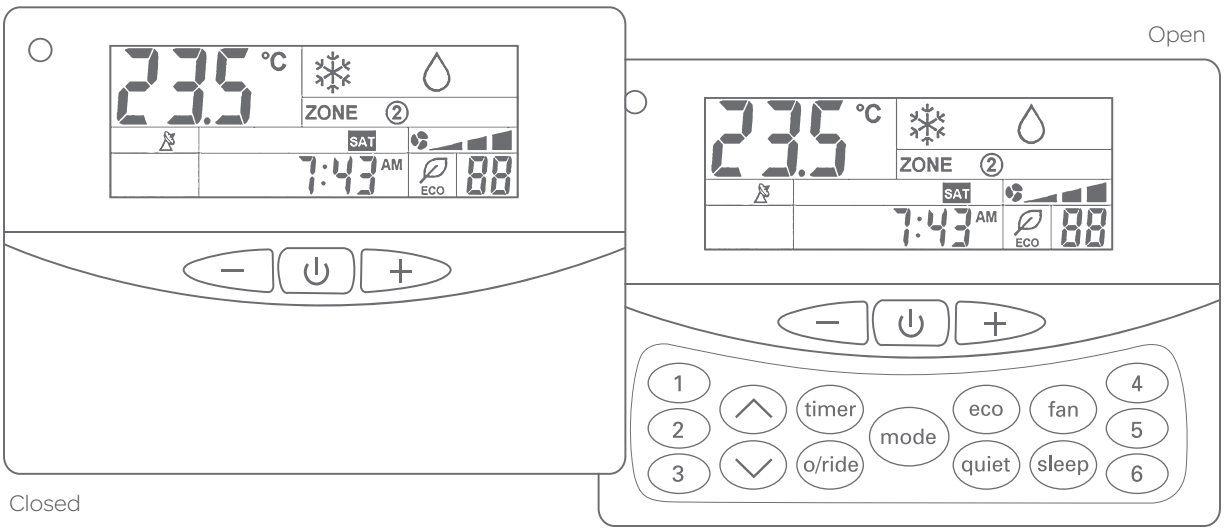
WIRING

The electrical supply required (including voltage fluctuation limits) is: 3 phase 380–440 V a.c. 50 Hz with neutral and earth.

A control panel, located in each outdoor unit, is fully wired ready to accept the main power supply. Each system complies with the requirements of the Regulatory Compliance Mark (RCM) for electrical safety (AS/NZS 60335.2.40) and EMC (AS/NZS CISPR.14).

Provision has been made for compliance with DRED, ie demand response enabling device standard AS/NZS 4755.3.1.

Ducted Split System Air Conditioners
SAT-3 Controller (Optional)



FEATURES SUMMARY

- Cool / Dry / Fan modes.
- Heat / Auto modes
- Auto / High / Medium / Low fan speed selection. (customisable).
- Temperature setting range from 16°C – 30°C.
- Room temperature display.
- Real time clock.
- **7 day timer** – up to four start and/or stops per day
- Override countdown run timer; up to 4 hours.
- Continuous or Intermittent selection of fan run-on in dead zone.
- Backlit screen for ease of reading; changes colour for each mode.
- Soft touch tab keys
- Battery backup (Lithium).
- **Sleep function** – improves night time comfort and saves energy.
- **Eco mode** – for ecomical operation.
- **Quiet mode** – for outdoor unit.
- Low voltage control cable.
- Connects to either indoor unit or outdoor unit.
- Colour: white and light grey (Keypad - green and blue).

Optional:

1. Remote return air sensor
2. Six Zone Control kit

Note: Not backwards compatible with units using SAT-2.

TZT-100:

Refer www.temperzone.biz for information.

Ducted Split System Air Conditioners
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. Capacities are for close coupled systems. Interconnecting pipework will reduce capacity..

Models	Indoor Fan		Indoor coil E.A.T.		Outdoor coil entering air temperature °C D.B.											
Indoor Unit Outdoor Unit	Speed	Air l/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.
ISD 294 OSA294G	High	1570	21	15	28.0	21.4	27.6	21.4	26.8	20.9	25.6	202	23.9	19.1	21.8	17.6
			23	17	29.4	20.9	29.1	20.9	28.4	20.5	27.0	19.8	25.5	18.9	23.3	17.5
			27	19	30.9	24.0	30.6	23.9	29.8	23.6	28.4	22.9	26.9	21.7	24.7	20.3
			31	21	32.5	28.3	32.2	28.3	31.3	27.9	30.1	27.1	28.4	25.9	26.3	24.3
ISD 294 OSA294F	High	1570	21	15	27.6	21.2	27.2	21.2	26.4	20.8	25.2	20.1	23.5	19.0	21.5	17.5
			23	17	29.0	20.8	28.7	20.8	27.9	20.4	26.6	19.7	25.1	18.8	22.9	17.4
			27	19	30.4	23.9	30.1	23.8	29.4	23.4	27.9	22.7	26.5	21.6	24.3	20.2
			31	21	32.0	28.1	31.6	28.1	30.8	27.7	29.6	26.9	27.9	25.7	25.8	24.1
ISD 324 OSA324G	High	1725	21	15	31.9	24.7	31.5	24.7	30.5	24.1	29.1	23.3	27.1	22.1	24.8	20.3
			23	17	33.5	24.1	33.1	24.1	32.3	23.7	30.8	22.9	29.0	21.8	26.4	20.2
			27	19	35.2	27.7	34.8	27.6	34.0	27.2	32.3	26.4	30.6	25.1	28.1	23.4
			31	21	37.0	32.7	36.6	32.7	35.6	32.2	34.2	31.3	32.3	29.9	29.9	28.0
ISD 324 OSA324F	High	1725	21	15	33.6	25.7	33.2	25.7	33.1	25.1	30.7	24.2	28.6	23.0	26.1	21.1
			23	17	35.3	25.1	34.9	25.1	34.0	24.7	32.4	23.8	30.5	22.7	27.9	21.0
			27	19	37.1	28.8	36.7	28.8	35.8	28.3	34.0	27.5	32.3	26.1	29.6	24.4
			31	21	39.0	34.0	38.6	34.0	37.5	33.6	36.1	32.6	34.0	31.2	31.5	29.2

Refer page 8 for Indoor Air Flow Correction factors

Ducted Split System Air Conditioners
Performance Data - Reverse Cycle Systems

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).

Models	Indoor Entering Air Temp. °C	Outdoor coil entering air temperature °C D.B.															
Indoor Unit Outdoor Unit	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.
ISD 294 OSA294G	15	21.3	20.1	22.5	19.8	23.7	20.1	24.9	21.3	26.1	23.9	27.4	27.4	28.6	28.6	29.8	29.8
	20	21.0	19.8	22.2	19.6	23.4	19.9	24.6	21.1	25.8	23.6	27.0	27.0	28.2	28.3	29.5	29.5
	25	20.3	19.3	21.5	19.1	22.7	19.3	23.9	20.6	25.2	23.1	26.4	26.4	27.6	27.6	28.8	28.8
ISD 294 OSA 294F	15	20.7	19.5	21.9	19.3	23.1	19.6	24.3	20.8	25.4	23.2	26.6	26.6	27.8	27.8	29.0	29.0
	20	20.4	19.3	21.6	19.1	22.8	19.3	24.0	20.5	25.1	23.0	26.3	26.3	27.5	27.5	28.7	28.7
	25	19.8	18.8	20.9	18.5	22.1	18.8	23.3	20.0	24.5	22.5	25.7	25.7	26.8	26.8	28.0	28.0
ISD 324 OSA 324G	15	22.8	21.5	24.1	21.3	25.4	21.6	26.7	22.9	28.0	28.0	29.3	29.3	30.6	30.6	31.9	31.9
	20	22.5	21.3	23.8	21.0	25.1	21.3	26.4	22.6	27.7	27.7	29.0	29.0	30.3	30.3	31.6	31.6
	25	21.8	20.7	23.1	20.4	24.4	20.7	25.7	22.0	27.0	27.0	28.3	28.3	29.6	29.6	30.9	30.9
ISD 324 OSA 324F	15	24.3	22.9	25.6	22.6	27.0	22.9	28.4	24.3	29.8	29.8	31.2	31.2	32.6	32.6	33.9	33.9
	20	23.9	22.6	25.3	22.3	26.7	22.6	28.1	24.0	29.4	29.4	30.8	30.8	32.2	32.2	33.6	33.6
	25	23.1	22.0	24.5	21.7	25.9	22.0	27.3	23.4	28.7	28.7	30.1	30.1	31.4	31.4	32.8	32.8

INDOOR AIR FLOW CORRECTION FACTORS @ NOMINAL CONDITIONS

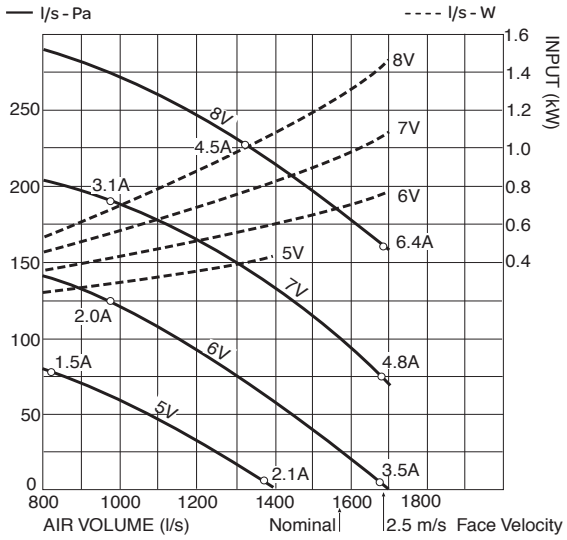
	Indoor Air Flow (%)			
	-20	-10.	Rated	+10
Total Capacity	0.95	0.975	1.0	1.025
Sensible Capacity	0.89	0.950	1.0	1.050

Ducted Split System Air Conditioners
Performance Data

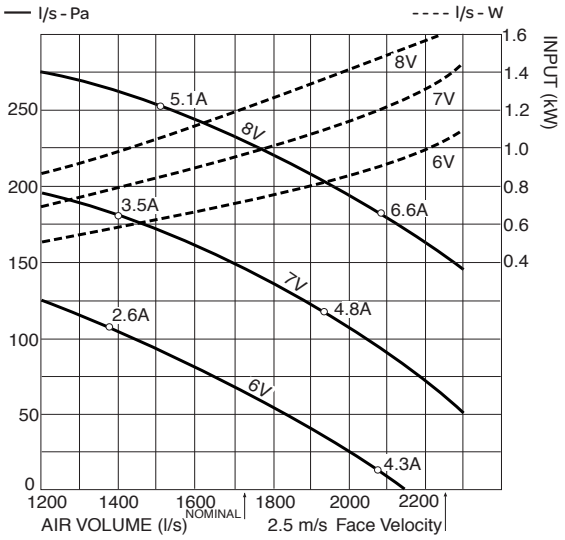
AIR HANDLING

Airflows are for a dry coil. Reduce airflow by 10% in high moisture removal conditions. In a free blow application, beware of exceeding indoor fan motor's full load amp limit. Refer back page for filter losses. **Air flows given are for ISD units without filter installed.**

ISD 294KYX

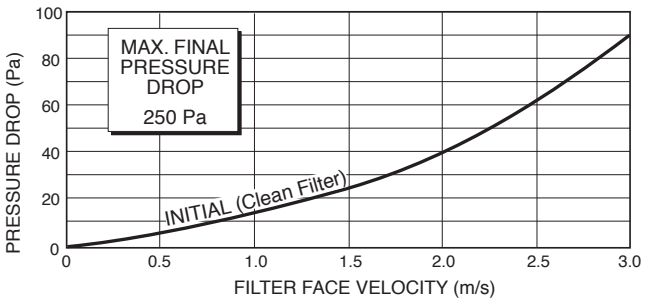


ISD 324KYX



Filter Pressure Drop

EU4/G4 rated filter media (used in optional Filter Box)



Ducted Split System Air Conditioners
Performance Data

SOUND LEVELS

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.

INDOOR UNIT - SUPPLY AIR OUTLET

			OCTAVE BAND FREQUENCY Hz					
			125	250	500	1K	2K	4K
Models	FAN SPEED	SWL dB(A)	SOUND POWER LEVELS (SWL) dB					
ISD 294	4 V	64	64	59	62	58	57	54
	6 V	68	67	63	66	63	61	58
	8 V	73	70	67	71	68	65	64
ISD 324	6 V	64	64	59	62	58	57	54
	7 V	68	67	63	66	63	61	58
	8 V	73	70	67	71	68	65	64

SOUND PRESSURE LEVELS (SPL) WITHIN A ROOM

Deduct the room absorption effect below from the Sound Power Levels (SWL) above to obtain Sound Pressure Levels within a room.
Note: Occupant at least 1.5 m from sound source.

	OCTAVE BAND FREQUENCY Hz					
	125	250	500	1K	2K	4K
Room type	ROOM ABSORPTION EFFECT					
Soft	4	8	11	11	11	11
Medium	3	7	8	9	9	9
Hard	0	1	3	4	4	5

Ducted Split System Air Conditioners
Performance Data

SOUND LEVELS

Sound Power Levels (SWL)

OUTDOOR UNIT

			OCTAVE BAND FREQUENCY Hz					
			125	250	500	1K	2K	4K
Models	FAN SPEED	SWL dB(A)	SOUND POWER LEVELS (SWL) dB					
OSA 294	LOW	69	80	70	65	62	58	52
	MED	72	85	72	67	64	60	53
	HIGH	75	89	73	68	65	61	54
OSA 324	LOW	69	80	70	65	62	58	52
	MED	72	85	72	67	64	60	53
	HIGH	75	89	73	68	65	61	54

Models	FAN SPEED	SPL @ 3 m dB(A)	SOUND PRESSURE LEVELS (SPL) dB					
OSA 294	LOW	53	64	54	50	46	42	36
	MED	56	69	56	51	48	44	37
	HIGH	59	73	57	52	49	45	38
OSA324	LOW	53	64	54	50	46	42	36
	MED	56	69	56	51	48	44	37
	HIGH	59	73	57	52	49	45	38

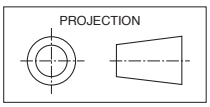
Sound Pressure Level (SPL) in decibels re 20 μPa.

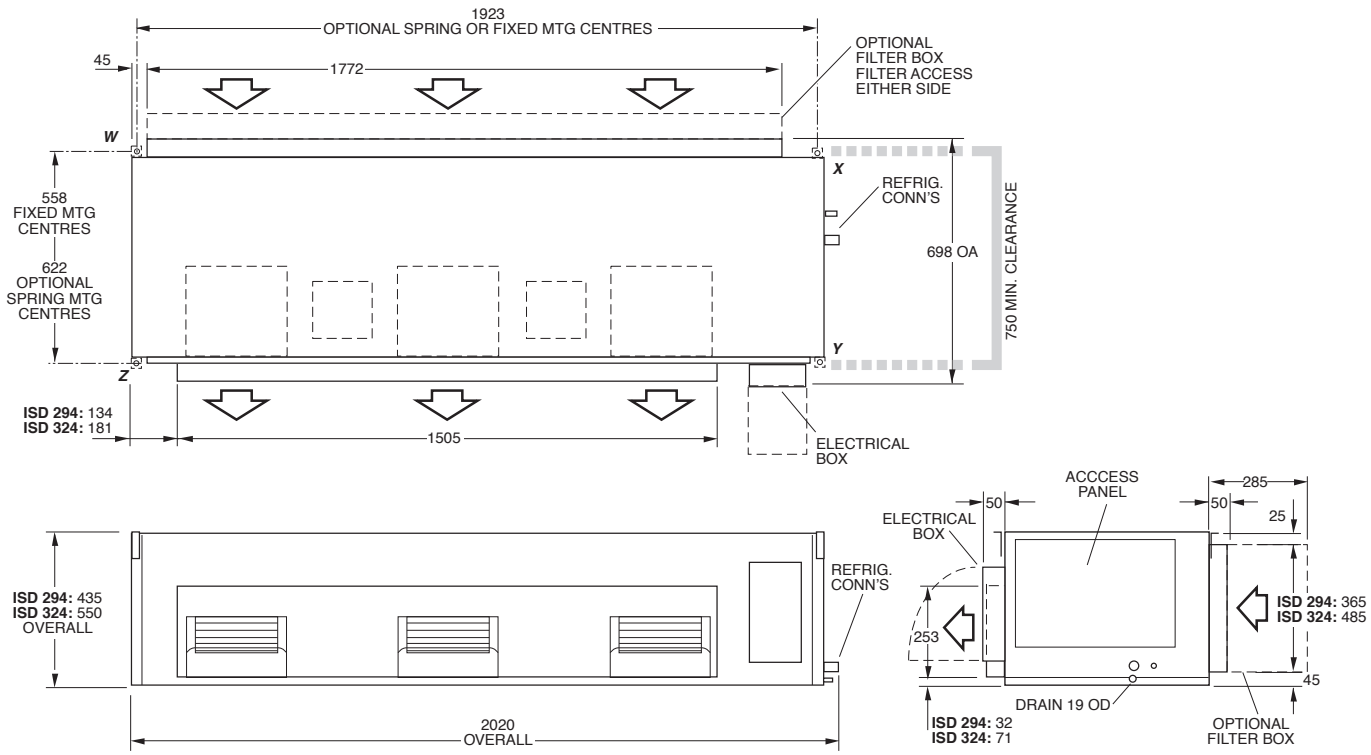
Ducted Split System Air Conditioners
Dimensions (mm)

ISD INDOOR UNIT

	POINT LOADS (kg)			
MODEL	W	X	Y	Z
ISD 294	31	27	37	32
ISD 324	32	35	39	37

Note: Fan motor can be accessed from panel above or sides: no more than two panels at once.





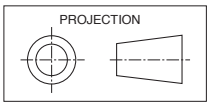
Drawings are NOT TO SCALE

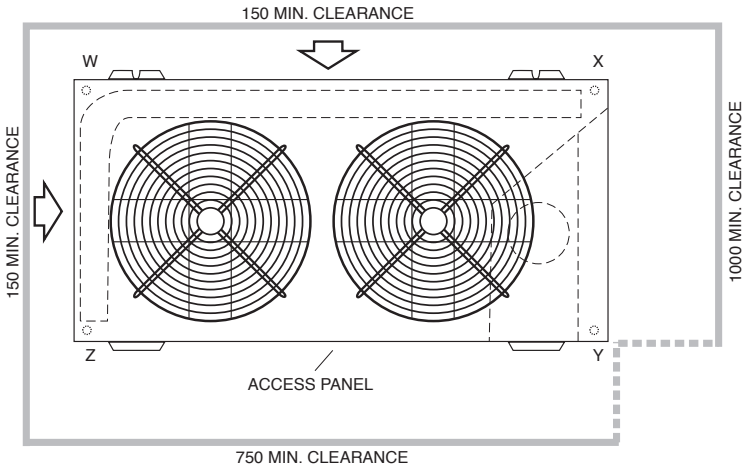
Materials and specifications are subject to change without notice due to the manufacturer's ongoing research and development programme.

Ducted Split System Air Conditioners
Dimensions (mm)

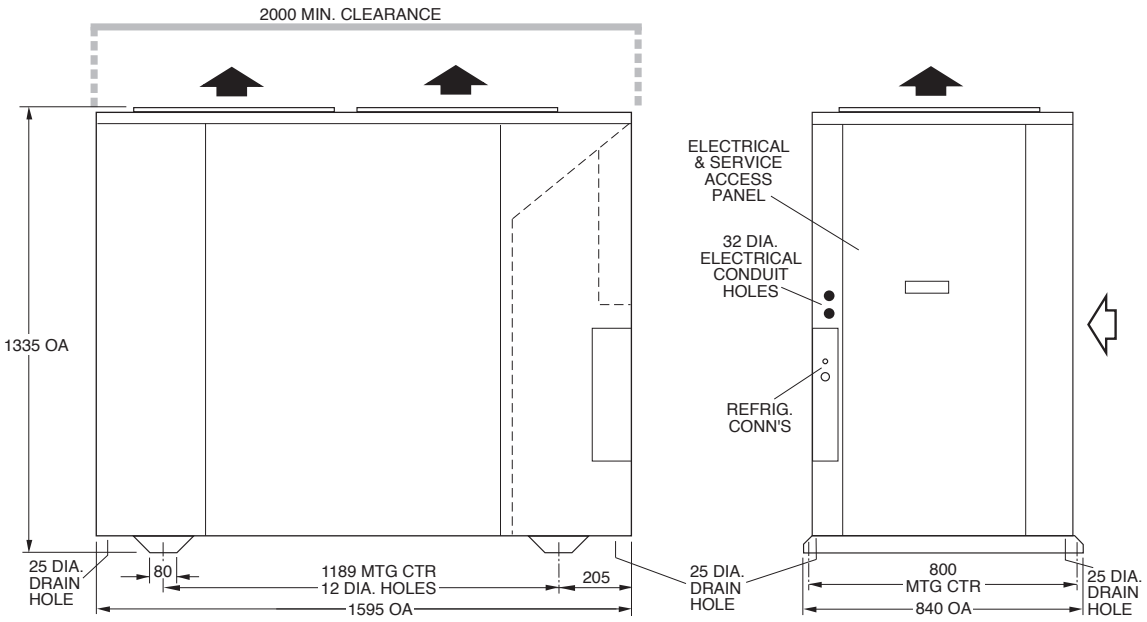
OSA OUTDOOR UNIT

POINT LOADS (kg)			
W	X	Y	Z
49	87	60	49





Recommended
Interconnecting Pipe Sizes
Suction : 28 mm OD
Liquid : 13 mm OD



Drawings are NOT TO SCALE

Ducted Split System Air Conditioners
Specifications

System				
Indoor Unit	ISD 294KYX	ISD 294KYX	ISD 324KYX	ISD 324KYX
Outdoor Unit	OSA 294G	OSA 294F	OSA 324G	OSA 324F
Nominal Cooling Capacity *[1] kW	11.5~28.4	16.8~27.9~32.1	12.9~32.3	21.3~34~38.5
Net Cooling Capacity (MEPS) *[1] kW	27.5	27.1	31.5	33.3
EER / AEER (cooling)	3.12 / 3.10	3.13 / 3.11	3.12 / 3.10	3.18 / 3.16
Heating Capacity *[2] kW	11.3~28.2	16.7~27.5~33.2	12.1~30.3	17.5~32.2~37.2
COP / ACOP (heating)	3.53 / 3.51	3.47 / 3.45	3.83 / 3.81	3.80 / 3.77
Air Flow*[3] l/s	1570	1570	1725	1725
Sound Levels *[4]				
Indoor Unit (SWL)	68	68	68	68
Outdoor Unit (SPL)	59	59	59	59
Power Source	3 phase 400 V a.c. 50 Hz			
Compressor type	digital	inverter	digital	inverter
Indoor Fan Max. Current A	10	10	12.5	12.5
Running Amps (Total) A/ph.	18.5 / 14 / 14	17	21.6	21
Refrigerant	HFC-410A (R410A)			
Maximum Vertical Separation m	20	20	20	20
Maximum Line Length m	90	90	90	90
Pipe Sizes (Suction/Liquid) mm OD	28 / 13	28 / 13	28 / 13	28 / 13
Operating Range (outdoor ambient)				
Cooling	-10°C to 52°C			
Heating	-15°C to 25°C			
Finish				
Indoor Unit	zinc galvanised steel			
Outdoor Unit	grey polyester powder coat			
Weight (net/shipping) kg				
Indoor Unit	127 / 150	127 / 153	143 / 169	143 / 169
Outdoor Unit	245 / 275	245 / 298	245 / 275	275 / 305

Notes:

*[1] Nominal Cooling Capacity (gross) 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] 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] Sound Levels are measured at nominal cooling capacity conditions stated above. SPL measured at 3m from unit.

temperzone
QUALITY AIR CONDITIONING

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