

Ducted Split System Air Conditioners

Technical Data

ISD 86KY / OSA 86RK
ISD 114KY / OSA 114RK
ISD 139KY / OSA 139RK
ISD 159KY / OSA 159RK
ISD 184KY / OSA 184RK



ISD 86–184 KY SERIES – DUCTED SPLIT SYSTEM AIR CONDITIONERS

GENERAL

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. The system has been successfully tested at 50°C ambient.

APPLICATIONS

These units have been specifically developed for air conditioning of light commercial and residential premises, eg offices, motels, shops and homes.

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.

User Friendly. The air conditioning system is available with an optional SAT 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".

Efficient. Indoor units include a high efficiency electronically commutated (EC) motor. Each outdoor unit incorporates a high efficiency rotary compressor. Heat exchange coils use inner grooved (rifled) tube for better heat transfer.

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

Separable. The indoor units are separable for ease of installation through small man holes – minimum 550 mm sq. clear aperture. It may be desirable in some applications to keep the two separate parts of the unit apart and joined by ducting, eg over a ceiling joist. A pair of the optional Spigot Plate Adaptors are available to facilitate this option.

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.

Slimline. The compact up-right design of the outdoor units requires only a 100 mm gap on the coil side where installation is against a wall. Their slimline cabinets are particularly practical where there is restricted space, e.g. side access pathways, balconies, narrow ledges, etc. A vertical discharge grille is available to deflect prevailing winds and reduce clearances. The unit is free standing, but can be fitted on a wall using the optional wall mounting brackets.

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 and a galvanised steel safety drain tray.

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 (1989) 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 optional Signal Isolator will be required for continuously variable speed control applications.

Self Diagnostics. The Outdoor Unit Controller (OUC or UC7) has a display of LEDs 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. The ISD 139/159/184KY-DL versions supplied with SAT controller include zone control functionality via a plug'n play board in the electrical box, allowing up to 4 zone dampers to be switched from the SAT wall control. Standard damper motors, 230/240 volt or 24 volt, can be used with drive open/drive close or drive open/spring closed.

OPTIONAL EQUIPMENT

Outdoor Unit:

1. Vertical discharge grille.
2. Wall mounting brackets.
3. Anti-vibration mounts (rubber)

4. Drain connection - right angle
5. Soft Starter for lowering starting current (OSA 86, 114 and 139 only).

Indoor Unit:

1. **temperzone** SAT Controller (or TZT-100 Controller for UC7/digital versions).
2. Spring mounting kit.
3. Spigot Plate Adaptors – Double Inlet (for use when separating indoor unit)
ISD 86KY: Ø350 mm
ISD 114KY: Ø400 mm
ISD 139/159/184 KY: Ø450 mm
4. Filter Box c/w EU2/G2 rated filter.
5. Signal Isolator (Item no. 201-000-129) for using EC motors in a 0–10V DC continuously variable speed mode.

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. Compressor minimum run time to ensure oil return.
8. 24V control circuit.

COMPRESSOR

Each high efficiency rotary compressor is hermetically sealed, quiet running and supported on rubber mounts to minimise vibration. *Note: OSA 139/159/184 are available with a digital compressor for variable capacity and close control applications.*

REFRIGERATION PIPING

The standard unit contains allows for a line length up to 60 m. For pipe length capacity loss, refer page 4 or **temperzone's Split Systems Installation Guide** ([refer www.temperzone.biz/Technical Support](http://www.temperzone.biz/Technical_Support)).

Maximum line length for OSA 86–184RK when extended is 60 m.

Max. height separations between units are:
Outdoor unit above indoor unit : 16 m
Outdoor unit below indoor unit : 16 m.

Each OSA unit is shipped from the factory with a charge of HFC-410A (R410A) refrigerant sufficient for a 10 m 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:

OSA 86/114/139/159/184 RKS :
1 phase 200–252 V a.c. 50 Hz with neutral and earth.

OSA 114/139/159/184 RKT :
3 phase 342–436 V a.c. 50 Hz with neutral and earth.

A control panel, with 24V control circuit, located in each outdoor unit, is fully wired ready to accept the main power supply. Each system conforms with emission standards EN 55014-1, EN 60335-1 and EN 60335-2-40.

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

SAT CONTROLLER (Optional)



Features Summary

- Cool / Dry / Fan modes.
- Heat / Auto modes
- Auto / High / Medium / Low fan speed selection.
- Temperature setting range from 16°C – 30°C.
- LED to indicate status of the unit [Power On/Off].
- Room temperature display.
- Real time clock.
- 7 day timer – two start and/or stops per day
- On demand countdown run timer, up to 9 hours.
- Auto-Restart or No Restart after power failure.
- 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.
- Zone Control – up to four zones.
- Audible beep to acknowledge key entry or wireless remote control.
- Low voltage control cable.
- Colour: white and light grey (Keypad - gold and blue).
- Optional:
Infra Red Remote controller
Remote return air sensor,
Extended interface lead,
Zone Control board,
Zone Control transformer 220/240V to 24V ac, 65VA.
Extra Wall Control plaque.

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 (refer page 6).

MODELS Indoor / Outdoor Unit	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	
			Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.
ISD 86K / OSA 86	HIGH	520	21	15	8.4	6.6	8.2	6.6	8.0	6.5	7.6	6.3	7.1	5.9
			23	17	8.7	6.5	8.7	6.5	8.5	6.4	8.1	6.1	7.6	5.8
			27	19	9.2	7.4	9.1	7.4	8.9	7.3	8.5	7.1	8.0	6.7
			31	21	9.7	8.8	9.6	8.8	9.3	8.7	9.0	8.4	8.5	8.0
ISD 114K / OSA 114	HIGH	650	21	15	11.5	9.1	11.4	9.1	11.0	8.9	10.5	8.6	9.8	8.2
			23	17	12.1	8.9	12.0	8.9	11.6	8.8	11.1	8.5	10.4	8.0
			27	19	12.7	10.2	12.6	10.2	12.3	10.1	11.7	9.8	11.1	9.3
			31	21	13.3	12.1	13.2	12.1	12.9	11.9	12.4	11.6	11.7	11.1
ISD 139K / OSA 139	HIGH	850	21	15	13.6	10.7	13.4	10.7	13.0	10.5	12.4	10.2	11.6	9.6
			23	17	14.3	10.5	14.1	10.5	13.7	10.3	13.1	10.0	12.3	9.5
			27	19	15.2	12.0	14.9	12.0	14.5	11.9	13.8	11.5	13.0	11.0
			31	21	15.7	14.2	15.6	14.3	15.2	14.1	14.6	13.7	13.8	13.1
ISD 159K / OSA 159	HIGH	900	21	15	15.9	12.5	15.7	12.5	15.2	12.3	14.5	11.9	13.5	11.2
			23	17	16.7	12.3	16.5	12.3	16.0	12.1	15.3	11.7	14.4	11.1
			27	19	17.5	14.0	17.3	14.0	16.9	13.8	16.1	13.4	15.2	12.8
			31	21	18.4	16.6	18.2	16.6	17.7	16.4	17.0	16.0	16.1	15.3
ISD 184K / OSA 184	HIGH	1020	21	15	18.0	14.2	17.8	14.2	17.3	14.0	16.5	13.5	15.4	12.8
			23	17	19.0	13.9	18.7	13.9	18.2	13.7	17.4	13.3	16.3	12.6
			27	19	19.9	16.0	19.7	16.0	19.2	15.7	18.4	15.3	17.3	14.5
			31	21	20.9	18.9	20.7	18.9	20.1	18.7	19.3	18.1	18.3	17.3

Indoor Air Flow Correction Factors @ nominal conditions

	-20%	-10%	Rated	+10%
Total Capacity	0.95	0.975	1.0	1.025
Sensible Capacity	0.89	0.950	1.0	1.050

PERFORMANCE DATA

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

MODELS Indoor / Outdoor Unit	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
ISD 86K / OSA 86	15	5.5	4.9	5.9	5.3	6.3	5.6	6.7	5.8	7.1	6.1	7.7	7.3	8.1	8.1	8.6	8.6
	20	5.4	4.8	5.8	5.2	6.2	5.5	6.6	5.7	7.0	6.0	7.5	7.1	8.0	8.0	8.4	8.4
	25	5.1	4.6	5.6	5.0	6.0	5.3	6.3	5.5	6.7	5.8	7.2	6.8	7.7	7.7	8.1	8.1
ISD 114K / OSA 114	15	7.5	6.7	8.1	7.3	8.6	7.7	9.2	7.9	9.8	8.4	10.5	10.0	11.2	11.2	11.7	11.7
	20	7.3	6.6	7.9	7.1	8.5	7.6	9.0	7.8	9.6	8.2	10.3	9.78	11.0	11.0	11.5	11.5
	25	7.1	6.4	7.6	6.9	8.2	7.2	8.7	7.5	9.2	7.9	9.9	9.32	10.5	10.5	11.1	11.1
ISD 139K / OSA 139	15	8.7	7.9	9.5	8.5	10.1	9.0	10.8	9.3	11.4	9.8	12.3	11.7	13.1	13.1	13.7	13.7
	20	8.6	7.7	9.3	8.3	9.9	8.8	10.6	9.1	11.2	9.6	12.0	11.4	12.8	12.8	13.4	13.4
	25	8.3	7.4	8.9	8.0	9.6	8.5	10.2	8.7	10.8	9.2	11.6	10.9	12.3	12.3	12.9	12.9
ISD 159K / OSA 159	15	9.9	8.9	10.7	9.7	11.5	10.2	12.2	10.5	13.0	11.1	13.9	13.2	14.8	14.8	15.5	15.5
	20	9.7	8.7	10.5	9.4	11.3	10.0	12.0	10.3	12.7	10.9	13.6	13.0	14.5	14.5	15.2	15.2
	25	9.4	8.4	10.1	9.1	10.8	9.6	11.5	9.9	12.2	10.5	13.1	12.4	14.0	14.0	14.7	14.7
ISD 184K / OSA 184	15	11.7	10.6	12.7	11.4	13.6	12.1	14.5	12.4	15.3	13.1	16.5	15.6	17.5	17.5	18.4	18.4
	20	11.5	10.4	12.5	11.2	13.3	11.8	14.2	12.2	15.0	12.9	16.1	15.3	17.2	17.2	18.0	18.0
	25	11.1	10.0	12.0	10.8	12.8	11.4	13.6	11.7	14.5	12.3	15.5	14.6	16.5	16.5	17.4	17.4

PIPE LENGTH CAPACITY LOSS

ON COOLING CYCLE DUE TO PRESSURE DROP

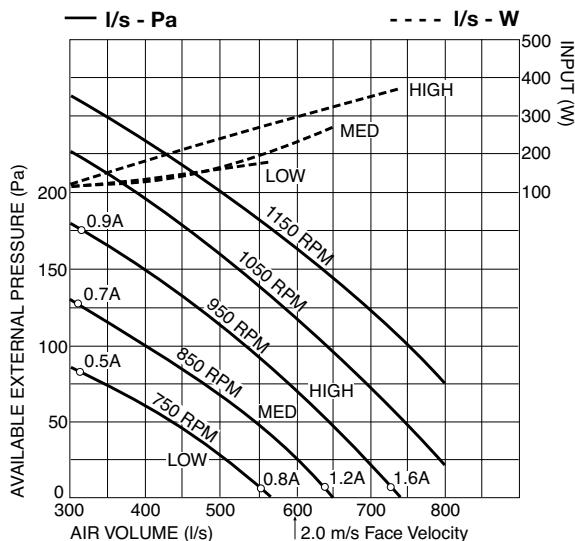
Note: Loss percentage is approximate only.
No allowance made for vertical piping.

System	Pipe Size (mm)		Performance Loss per additional 10 m beyond first 5 m	Suction Pipe Size OD	Additional Pipe Length to allow per Bend Long 90° Radius (2 x pipe dia.)
	Liquid	Suction			
ISD 86KY / OSA 86	10	16	2.0 %		
ISD 114KY / OSA 114	10	16	2.5 %		
ISD 139KY / OSA 139	10	16	3.0 %		
	10	19	1.5 %		
ISD 159KY / OSA 159	10	16	4.0 %		
	13	22	2.1 %		
ISD 184KY / OSA 184	10	19	4.0 %		
	13	22	2.1 %		

PERFORMANCE DATA

AIR HANDLING

ISD 86KY



Note: 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.

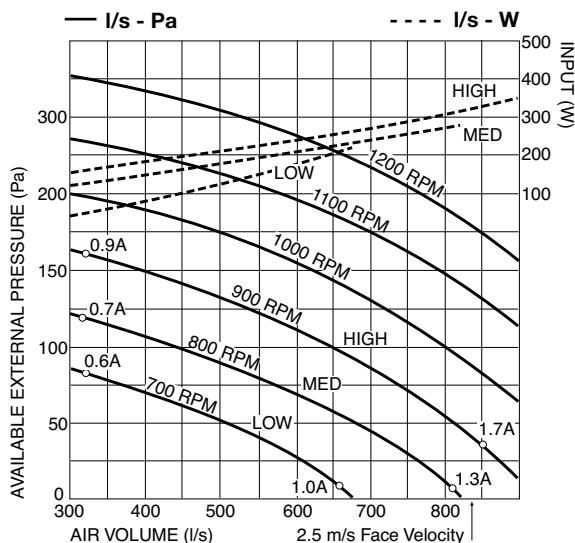
Air flows given are for ISD units without filter installed.

If using EU-2 filter media, provide 0.08 m² face area per 100 l/s of airflow to maximise efficiency.

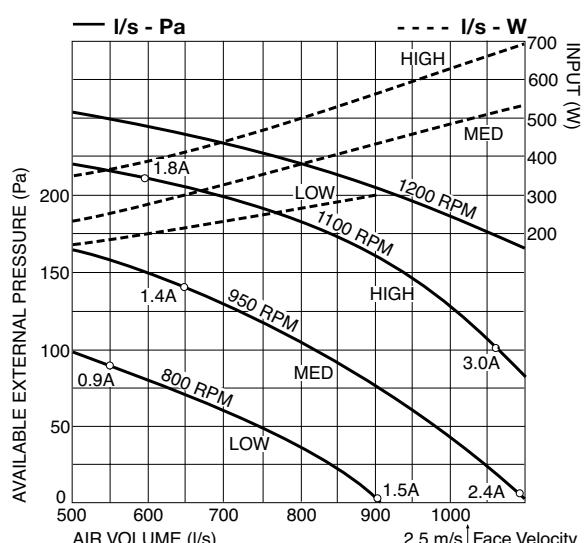
Optional Filter Box c/w EU2/G2 rated media (clean):

Coil Face Velocity (m/s)	1.5	2.0	2.5
Pressure Loss (Pa)	5	9	13

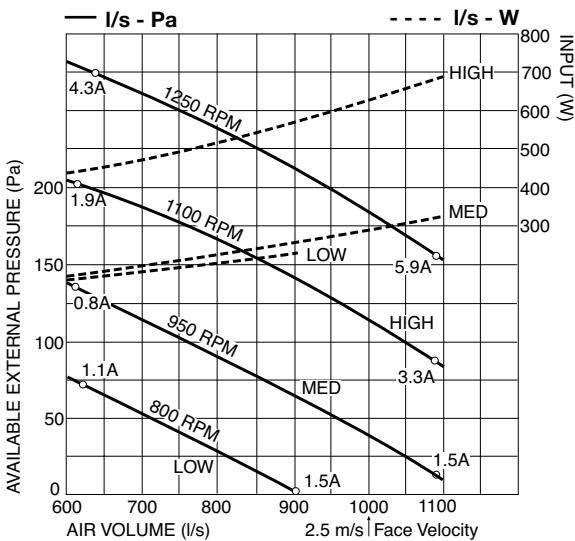
ISD 114KY



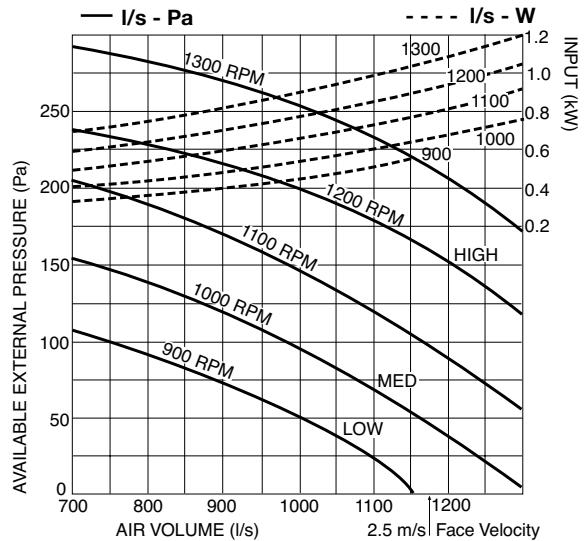
ISD 139KY



ISD 159KY



ISD 184KY



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

MODEL	FAN SPEED	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1 k	2 k	4 k
			SOUND POWER LEVELS (SWL) dB					
ISD 86KY	LOW	62	61	59	59	56	55	53
	MED	67	65	64	63	62	60	59
	HIGH	72	70	67	67	69	64	63
ISD 114KY	LOW	65	63	60	63	60	57	54
	MED	70	67	65	67	66	63	60
	HIGH	74	71	70	70	69	67	64
ISD 139KY	LOW	64	64	61	62	58	56	53
	MED	69	68	65	66	64	62	59
	HIGH	74	71	70	70	69	67	64
ISD 159KY	LOW	66	62	60	62	59	57	54
	MED	69	67	65	66	65	62	59
	HIGH	73	70	69	69	69	67	64
ISD 184KY	LOW	68	71	64	63	62	61	58
	MED	72	75	69	67	67	65	63
	HIGH	76	76	71	70	71	69	67

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.

ROOM TYPE	OCTAVE BAND FREQ. Hz					
	125	250	500	1k	2k	4k
	ROOM ABSORPTION EFFECT					
SOFT	4	8	11	11	11	11
MEDIUM	3	7	8	9	9	9
HARD	0	1	3	4	4	5

Outdoor Unit

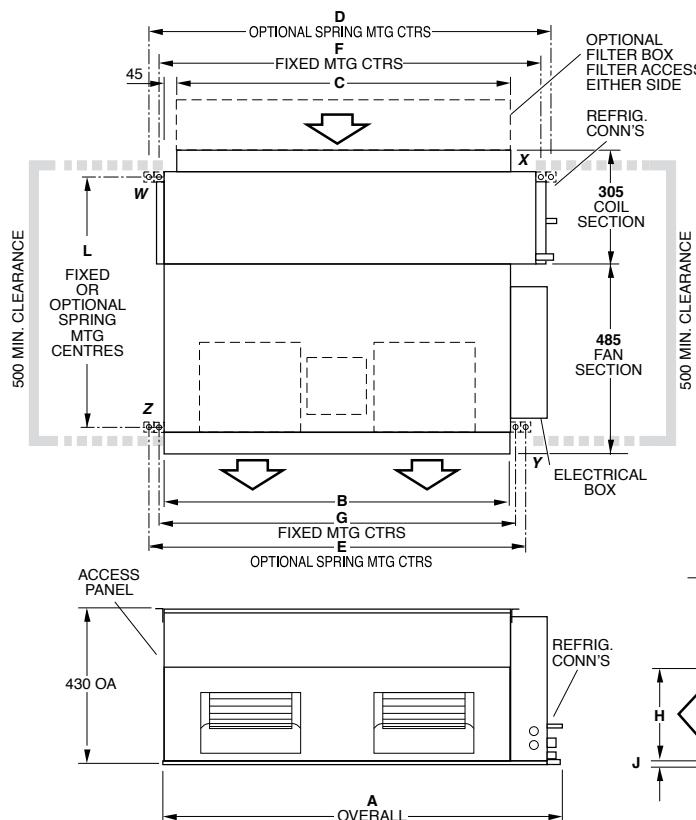
MODEL	FAN SPEED	SWL dB(A)	OCTAVE BAND FREQ. Hz						SPL @ 3 m dB(A)	OCTAVE BAND FREQ. Hz					
			125	250	500	1 k	2 k	4 k		125	250	500	1 k	2 k	4 k
			SOUND POWER LEVELS dB							SOUND PRESSURE LEVELS dB					
OSA 86	LOW	60	58	62	57	54	49	44	44	42	46	41	38	33	28
	MED	62	63	65	59	57	51	45	46	47	49	43	41	35	29
	HIGH	64	67	66	61	59	52	52	48	51	50	45	43	36	36
OSA 114	LOW	70	82	71	66	63	59	52	54	66	55	50	47	43	36
	MED	73	87	71	70	64	59	53	57	71	55	54	48	43	37
	HIGH	77	92	75	69	66	62	55	61	76	59	53	50	46	39
OSA 139	LOW	69	80	70	65	62	58	52	53	64	54	50	46	42	36
	MED	72	85	72	67	64	60	53	56	69	56	51	48	44	37
	HIGH	75	89	73	68	65	61	54	59	73	57	52	49	45	38
OSA 159	LOW	63	70	61	61	57	53	46	47	54	45	45	41	37	30
	MED	64	72	63	61	59	53	47	48	56	47	45	43	37	31
	HIGH	66	77	63	62	60	55	48	50	61	47	46	44	39	32
OSA 184	LOW	65	70	64	63	60	56	49	49	49	48	48	47	44	33
	MED	67	74	64	65	61	57	50	51	58	48	49	45	41	34
	HIGH	68	77	65	66	63	59	51	52	61	49	50	47	43	35

DIMENSIONS (mm)

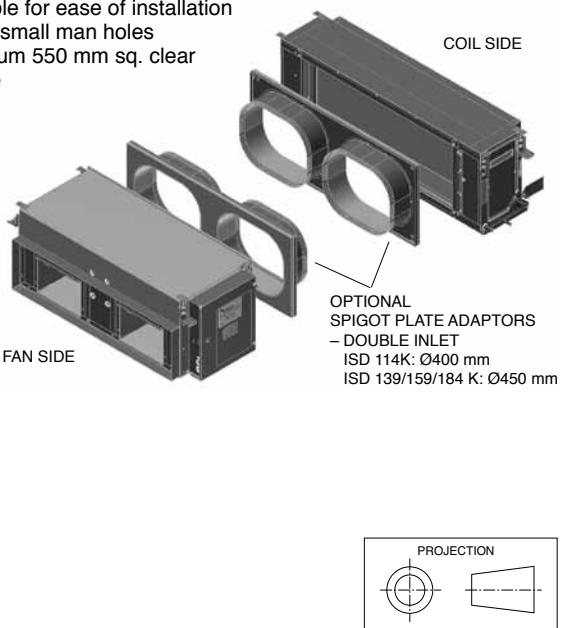
Not to Scale

ISD Indoor Unit

MODEL	A	B	C	D	E	F	G	H	J	K	L
ISD 86KY	1020	835	837	1045	934	982	870	262	17	355	647
ISD 114KY	1115	965	932	1140	1063	1077	1000	262	17	355	647
ISD 139KY	1280	965	1097	1305	1063	1242	1000	276	7	359	665
ISD 159KY	1310	1095	1097	1305	1197	1242	1134	276	7	359	665
ISD 184KY	1513	1098	1289	1496	1197	1433	1134	276	7	359	665

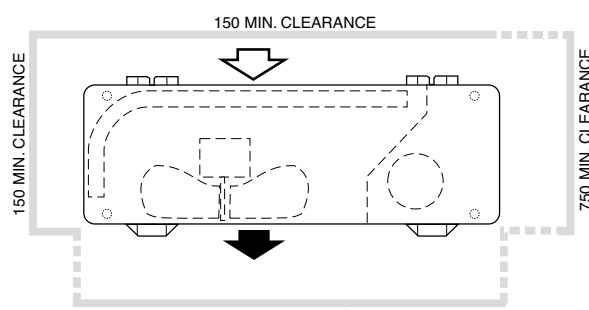


Separable for ease of installation
through small man holes
– minimum 550 mm sq. clear
aperture



OSA Outdoor Unit

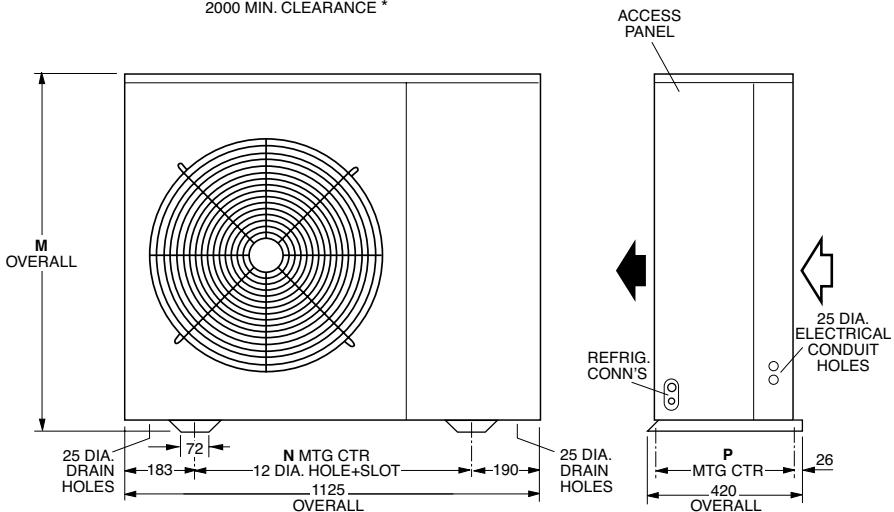
MODEL	M	N	P
OSA 86	765	714	375
OSA 114	970	750	375
OSA 139	970	750	375
OSA 159	1120	750	375
OSA 184	1270	765	381



Note

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

Note: The OSA 159/184 models have two exhaust air fans.



* Fan clearance:
800mm min. on
OSA 139/159/184 models;
600mm with optional vertical
discharge grille.

SPECIFICATIONS

SYSTEM	Indoor Unit : Outdoor Unit :	ISD 86KY OSA 86RK	ISD 114KY OSA 114RK	ISD 139KY OSA 139RK* ⁶	ISD 159KY OSA 159RK* ⁶	ISD 184KY OSA 184RK* ⁶
Nominal Cooling Capacity * ¹	KW	8.5	11.7	13.8	16.1 (14.5)	18.4
Net Cooling Capacity * ¹	KW	8.3	11.03	13.5	15.5 (14.2)	17.7
EER / AEER (cooling)		3.25 / 3.23	3.17 / 3.15	3.14 / 3.11	3.16 / 3.14	3.23 / 3.21
Heating Capacity * ²	KW	7.98	11.0	12.8	14.5 (13.3)	17.2
COP / ACOP (heating)		3.46 / 3.42	3.33 / 3.31	3.54 / 3.52	3.64 / 3.62	3.73 / 3.70
Air Flow * ³	I/s	520	650	850	900	1020
Sound Levels * ⁴	Indoor Unit (SWL)	67	70	69	69	72
	Outdoor Unit (SPL)	46	57	56	48	51
Power Source * ⁵		1ph. 230V ac 50Hz	1 ph. 230V a.c. 50Hz or 3 ph. 415V a.c. 50Hz		3ph. 415V ac 50Hz	
Indoor Fan Maximum Current	A	5	5	5	6.5	8
Running Amps (Total System)	OSA*RKS A	11.1	17.2	19.7	23.0	—
	OSA*RKT A/ph.	—	7.4 / 4.3 / 4.3	10 / 6 / 6	9.7 / 7 / 7	11.6 / 8 / 8
Refrigerant				H F C - 4 1 0 A (R 4 1 0 A)		
Maximum Vertical Separation	m	16	16	20	20	20
Maximum Standard Line Length	m	30	30	30	30	30
Maximum Extended Line Length	m	40	60	60	60	60
Pipe Sizes (Suction/Liquid)	mm OD	16 / 10	16 / 10	16 or 19 / 10	19 or 22 / 13	19 or 22 / 13
Finish	Indoor Unit			zinc galvanised steel		
	Outdoor Unit			grey polyester powder coat		
Weight (net/shipping) kg	Indoor Unit	68 / 79	75 / 88	85 / 98	92 / 106	95 / 116
	Outdoor Unit	100 / 103	124 / 130	132 / 138	149 / 157	152 / 167

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.

*⁵ Voltage fluctuation limits: Single phase systems 200–252 V; Three phase systems 342–436 V.

*⁶ Digital compressor version available for variable capacity and close control applications, ie OSA 139/159/184 RKTGH.

Vertical discharge models are also available of the OSA 184, ie OSA 184RKT and OSA 184RKTG (digital).

() Bracketed capacity is for digital version.

Note

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



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