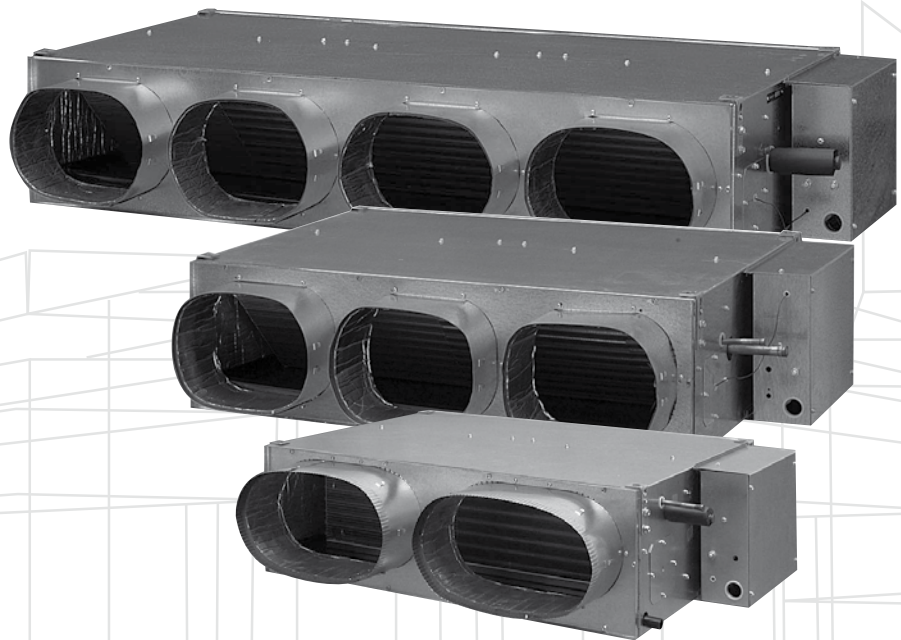


Ducted Split System Air Conditioners

Technical Data ISDL-K Series



R410A



**Optional
SAT Controller**

Extra Long Life
Epoxy Coated Outdoor Coil

Nominal Cooling Capacity
5.2 kW – 11.2 kW

ISDL-K SERIES – DUCTED SPLIT SYSTEM AIR CONDITIONERS

GENERAL

ISDL *K - Indoor unit

OSA *RK - Outdoor unit, reverse cycle

The ISDL 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 specified conditions (i.e. guaranteed cooling cycle performance at 43°C outdoor temperature).

APPLICATIONS

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

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-1 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. 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 motor enables fine tuning of the indoor unit to match the supply air requirements. The system includes a temperature sensing head pressure control which enables the system to compensate for outdoor ambient temperatures below 20°C on cooling cycle, and above 15°C on heating cycle.

Low Profile. The indoor units have a low 260 mm height making them ideal for small ceiling spaces.

Quiet. 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. The units are free standing, but can be fitted on a wall using the optional wall mounting brackets.

Durable. The 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 45). 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.

Serviceable. To enable a thorough cleanse, the indoor units' drain tray is removeable.

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.

Compatibility. The supply air spigots on the indoor unit have been designed to fit standard flexible ducting. Alternatively they can easily be removed for attaching rigid ducting.

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 via the optional relay board.

OPTIONAL EQUIPMENT

Outdoor Unit:

1. Fault indicating auxillary relay board.
2. Vertical discharge grille.
3. Wall mounting brackets.
4. Anti-vibration mounts (rubber)
5. Drain connection - right angle
6. Soft Starter for lowering starting current.

Indoor Unit:

1. SAT Controller.
2. Filter box (c/w polypropylene net filter)
3. Spring mounting kit.
4. Electric booster heat (add-on box)
 - 1.5 kW for ISDL 55K
 - 2 kW for ISDL 56K, 80K
 - 2 kW for ISDL 95K, 96K
 - 3 kW for ISDL 110KComplete with safety cutouts 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. Compressor minimum run time to ensure oil return.

COMPRESSOR

Each high efficiency rotary compressor is hermetically sealed, quiet running and supported on rubber mounts to minimise vibration.

REFRIGERATION PIPING

The standard unit contains allows for a line length up to 30 m. For line lengths between 30 m and 40 m, refer to **temperzone's Split Systems Installation Guide** (refer www.temperzone.biz/Technical Support).

Maximum line length for OSA 80–110RK when extended is 40 m.

Max. height separations between units are:

OSA 55RK:

Outdoor unit above indoor unit : 12 m

Outdoor unit below indoor unit : 12 m.

OSA 80– 110RK:

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 55 – 110 RKS :

1 phase 200–252 V a.c. 50 Hz
with neutral and earth.

OSA 110RKT :

3 phase 342–436 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.

DISTRIBUTING CAPACITY

Two half capacity indoor units can be coupled to one single compressor outdoor unit and controlled from one room thermostat. This tandem arrangement is often quieter than a larger single unit and permits air distribution closer to where it's needed most. A slave version of each indoor unit and a Tandem Kit is available to facilitate this arrangement.

NOTE

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

The manufacturer operates a quality management system that conforms to AS/NZS ISO 9001:2000.

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 Unit / Outdoor Unit	INDOOR FAN		INDOOR COIL E.A.T.		OUTDOOR COIL ENTERING AIR TEMPERATURE °C D.B.											
	SPEED	AIR l/s	W.B. °C	D.B. °C	23		27		31		35		39		43	
					Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.	Total	Sens.
ISDL 55K / OSA 55	HIGH	270	15	21	5.1	3.9	4.9	3.8	4.8	3.8	4.6	3.7	4.5	3.7	4.3	3.6
			17	23	5.3	3.9	5.2	3.8	5.1	3.8	4.9	3.7	4.8	3.7	4.6	3.6
			19	27	5.7	4.5	5.5	4.4	5.4	4.3	5.2	4.3	5.1	4.3	4.9	4.2
			21	31	6.0	5.1	5.8	5.0	5.7	4.9	5.5	4.9	5.4	4.9	5.2	4.8
ISDL 56K / OSA 55	HIGH	280	15	21	5.4	4.3	5.4	4.3	5.2	4.2	5.0	4.1	4.6	3.8	4.2	3.5
			17	23	5.7	4.2	5.6	4.2	5.5	4.1	5.3	4.0	4.9	3.8	4.5	3.5
			19	27	6.0	4.8	5.9	4.8	5.8	4.7	5.4	4.6	5.2	4.4	4.8	4.1
			21	31	6.3	5.7	6.2	5.7	6.1	5.6	5.8	5.5	5.5	5.2	5.1	4.9
ISDL 80K / OSA 80	HIGH	340	15	21	7.4	5.6	7.2	5.6	7.0	5.5	6.8	5.5	6.6	5.4	6.3	5.2
			17	23	7.8	5.8	7.7	5.6	7.4	5.5	7.2	5.5	7.0	5.4	6.8	5.3
			19	27	8.3	6.5	8.1	6.5	7.9	6.4	7.7	6.4	7.4	6.3	7.2	6.2
			21	31	8.8	7.4	8.6	7.3	8.3	7.3	8.1	7.2	7.9	7.1	7.6	7.0
ISDL 95K / OSA 95	HIGH	400	15	21	8.5	6.7	8.4	6.7	8.2	6.6	7.8	6.4	7.3	6.0	6.6	5.6
			17	23	9.0	6.6	8.9	6.6	8.6	6.5	8.2	6.3	7.7	5.9	7.1	5.5
			19	27	9.4	7.5	9.3	7.5	9.1	7.4	8.7	7.2	8.2	6.9	7.5	6.4
			21	31	9.9	8.9	9.8	8.9	9.5	8.8	9.1	8.6	8.6	8.2	8.0	7.7
ISDL 96K / OSA 95	HIGH	500	15	21	9.3	7.4	9.2	7.4	8.9	7.2	8.5	7.0	8.0	6.6	7.3	6.1
			17	23	9.8	7.2	9.7	7.2	9.4	7.1	9.0	6.9	8.5	6.5	7.8	6.0
			19	27	10.3	8.3	10.2	8.3	9.9	8.1	9.5	7.9	9.0	7.5	8.3	7.0
			21	31	10.8	9.8	10.7	9.8	10.4	9.7	10.0	9.4	9.5	9.0	8.7	8.4
ISDL 110K / OSA 110	HIGH	500	15	21	11.0	8.7	10.9	8.7	10.6	8.6	10.1	8.3	9.4	7.8	8.6	7.2
			17	23	11.6	8.5	11.5	8.5	11.2	8.4	10.7	8.1	10.0	7.7	9.2	7.1
			19	27	12.2	9.8	12.1	9.8	11.7	9.6	11.2	9.3	10.6	8.9	9.8	8.3
			21	31	12.8	11.6	12.6	11.6	12.3	11.4	11.8	11.1	11.2	10.6	10.3	9.9

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

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 / 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
ISDL 55K / OSA 55	15	3.2	2.9	3.4	3.1	3.7	3.3	3.9	3.4	4.1	3.5	4.4	4.0	4.7	4.7	5.0	5.0
	20	3.1	2.8	3.4	3.0	3.6	3.2	3.8	3.4	4.1	3.4	4.4	3.9	4.6	4.6	4.9	4.9
	25	3.0	2.7	3.2	2.9	3.5	3.1	3.7	3.2	3.9	3.3	4.2	3.8	4.5	4.4	4.7	4.7
ISDL 56K / OSA 55	15	3.2	2.8	3.5	3.0	3.7	3.1	4.0	3.1	4.2	3.2	4.5	3.5	4.8	3.8	5.1	5.1
	20	3.2	2.8	3.4	3.0	3.7	3.0	3.9	3.1	4.1	3.1	4.4	3.2	4.7	3.7	5.0	5.0
	25	3.0	2.7	3.3	2.8	3.5	2.9	3.8	3.0	4.0	3.0	4.3	3.1	4.6	3.5	4.8	4.8
ISDL 80K / OSA 80	15	5.2	4.7	5.6	5.1	6.0	5.4	6.4	5.6	6.8	5.7	7.3	6.6	7.8	7.7	8.1	8.1
	20	5.0	4.6	5.5	5.0	5.9	5.3	6.3	5.5	6.7	5.6	7.1	6.4	7.6	7.5	8.0	8.0
	25	4.9	4.4	5.3	4.8	5.7	5.1	6.0	5.3	6.4	5.4	6.9	6.2	7.3	7.3	7.7	7.7
ISDL 95K / OSA 95	15	6.0	5.4	6.5	5.8	6.9	6.2	7.4	6.5	7.8	6.6	8.4	7.6	8.9	8.8	9.4	9.4
	20	5.9	5.3	6.3	5.7	6.8	6.1	7.2	6.4	7.7	6.5	8.2	7.4	8.8	8.7	9.2	9.2
	25	5.6	5.1	6.1	5.5	6.5	5.9	7.0	6.1	7.4	6.2	7.9	7.1	8.4	8.3	8.9	8.9
ISDL 96K / OSA 95	15	5.9	5.3	6.4	5.7	6.8	6.1	7.3	6.4	7.7	6.5	8.3	7.4	8.8	8.7	9.2	9.2
	20	5.8	5.2	6.2	5.6	6.7	6.0	7.1	6.3	7.5	6.4	8.1	7.3	8.6	8.5	9.0	9.0
	25	5.6	5.0	6.0	5.4	6.4	5.8	6.8	6.0	7.3	6.1	7.8	7.0	8.3	8.2	8.7	8.7
ISDL 110K / OSA 110	15	6.8	6.2	7.4	6.7	7.9	7.1	8.4	7.4	8.9	7.5	9.6	8.6	10.2	10.1	10.7	10.7
	20	6.7	6.0	7.3	6.5	7.8	7.0	8.3	7.3	8.8	7.4	9.4	8.4	10.0	9.9	10.5	10.8
	25	6.5	5.8	7.0	6.3	7.5	6.7	7.9	7.0	8.4	7.1	9.0	8.2	9.6	9.5	10.1	10.4

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)		Equivalent Line Pipe Length (m)					Suction Pipe Size OD	Additional Pipe Length to allow per Bend Long 90° Radius (2 x pipe dia.)
	Liquid	Suction	5	10	15	20	25		
ISDL 55K or 56K / OSA 55	6	13	4 %	6 %	9 %	–	–	16 mm	0.30 m
	6	16	–	1.5 %	2.5 %	3.5 %	5 %		
ISDL 80K / OSA 80	Liquid	Suction	5	10	15	20	30	19 mm	0.42 m
	10	16	2 %	4 %	6.5 %	9 %	13 %		
ISDL 95K / OSA 95	10	19	–	–	3 %	4 %	6 %	19 mm	0.42 m
	10	16	2 %	4 %	6 %	8 %	12 %		
ISDL 96K / OSA 95	10	19	1 %	1.5 %	2.5 %	3.5 %	5 %	19 mm	0.42 m
	10	19	1 %	1.5 %	2.5 %	3.5 %	5 %		
ISDL 110K / OSA 110	10	19	0.75 %	1.5 %	2.25 %	3 %	5 %	19 mm	0.42 m

PERFORMANCE DATA

AIR HANDLING

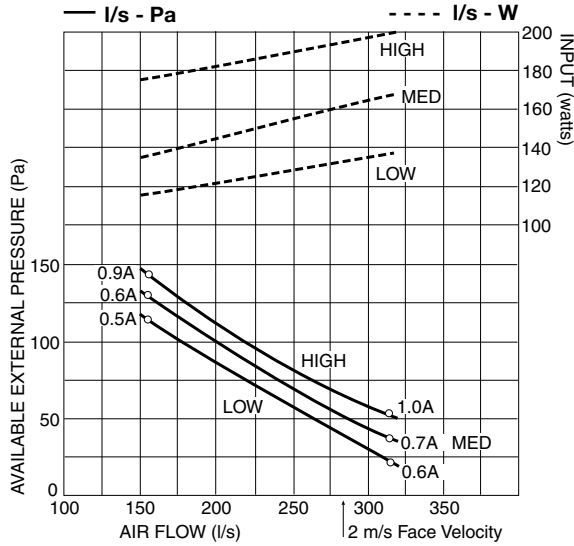
Note: Airflows are for a dry coil. Reduce airflow by 10% in high moisture removal conditions.

In a free blow application, beware of exceeding indoor fan motor's full load amp limit.

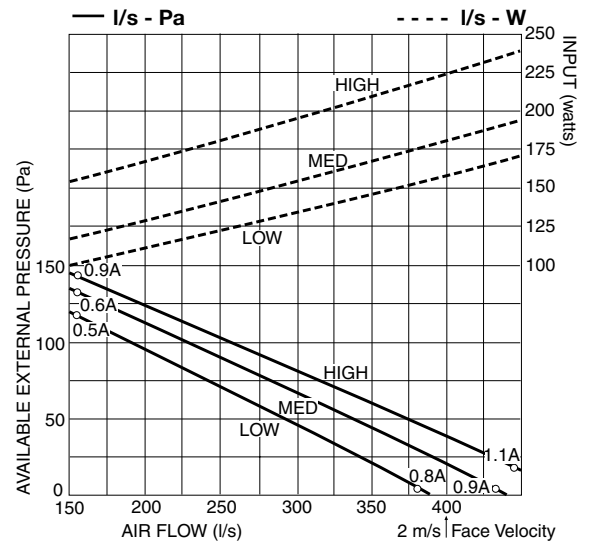
Air flows given are for ISDL units without filter installed.

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

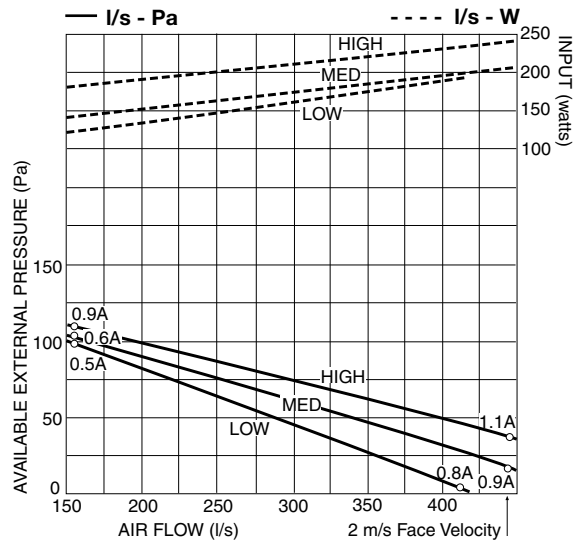
ISDL 55K



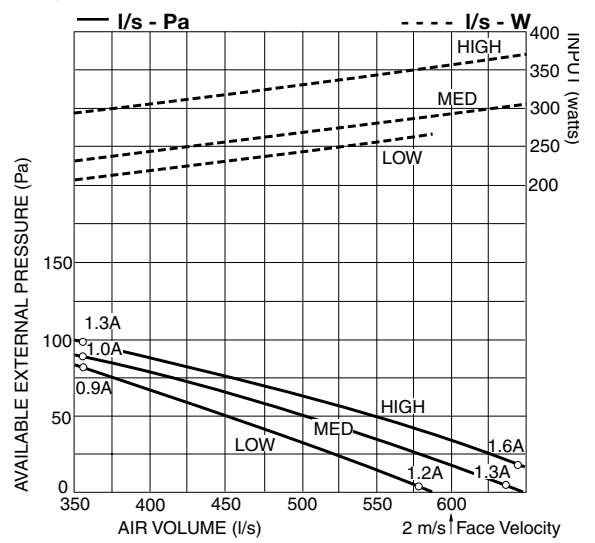
ISDL 56K, 80K



ISDL 95K



ISDL 96K, 110K



PERFORMANCE DATA

SOUND LEVELS

Test Conditions: JIS 8616. 0.6 m uninsulated flexible ducting.
Sound Pressure Levels (SPL) are at 1 m from source.
Sound Power Levels (SWL) are measured in decibels re 1 picowatt.

Indoor Unit: Supply Air Outlet

Return Air Inlet + Case Breakout

MODEL	FAN SPEED	SPL dB(A)	SWL dB(A)	OCTAVE BAND FREQ. Hz						SWL 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 POWER LEVELS dB					
ISDL 55K	LOW	52	55	57	54	54	450	46	38	57	57	57	57	51	44	37
	MED	53	56	59	55	55	52	48	40	58	59	55	55	52	48	40
	HIGH	55	58	61	56	56	53	49	41	60	61	56	56	53	49	41
ISDL 56/80 K	LOW	54	57	55	57	57	50	47	40	59	57	59	60	53	47	40
	MED	56	59	56	59	58	52	49	43	62	59	61	62	56	49	42
	HIGH	57	60	57	60	59	54	50	44	63	60	63	63	58	51	45
ISDL 95K	LOW	51	54	54	54	52	49	44	38	58	56	59	59	52	45	40
	MED	53	56	56	55	56	51	47	40	61	59	61	61	55	48	43
	HIGH	54	57	56	57	56	53	48	42	63	60	63	62	57	50	45
ISDL 96/110 K	LOW	54	57	55	55	56	51	48	40	57	55	55	56	51	48	40
	MED	55	58	57	57	57	53	50	42	58	57	57	57	53	50	42
	HIGH	56	59	58	58	58	55	51	44	59	58	59	58	55	51	44

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

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

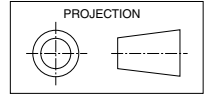
MODEL	FAN SPEED	SWL dB(A)	OCTAVE BAND FREQ. Hz						SPL @ 3 m dB(A)	OCTAVE BAND FREQ. Hz					
			125	250	500	1 k	2 k	4 k		125	250	500	1 k	2 k	4 k
			SOUND POWER LEVELS dB							SOUND PRESSURE LEVELS dB					
OSA 55	LOW	63	68	63	61	57	52	47	47	52	47	45	41	36	31
	MED	64	66	64	62	59	54	49	48	50	48	46	43	38	33
OSA 80	LOW	64	70	65	63	57	51	47	48	54	49	47	41	35	31
	MED	65	70	66	64	59	54	49	49	54	50	48	43	38	33
OSA 95	MED	66	69	67	66	60	54	49	50	53	51	50	44	36	33
	HIGH	68	70	68	68	63	55	50	52	54	52	52	47	39	34
OSA 110	MED	66	74	67	65	61	55	51	50	58	51	49	45	39	35
	HIGH	68	73	69	67	63	56	52	52	57	53	51	47	40	36

DIMENSIONS (mm)

Not to Scale

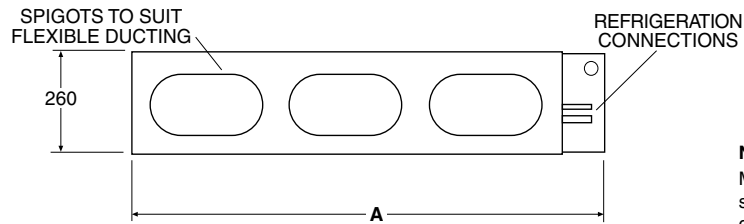
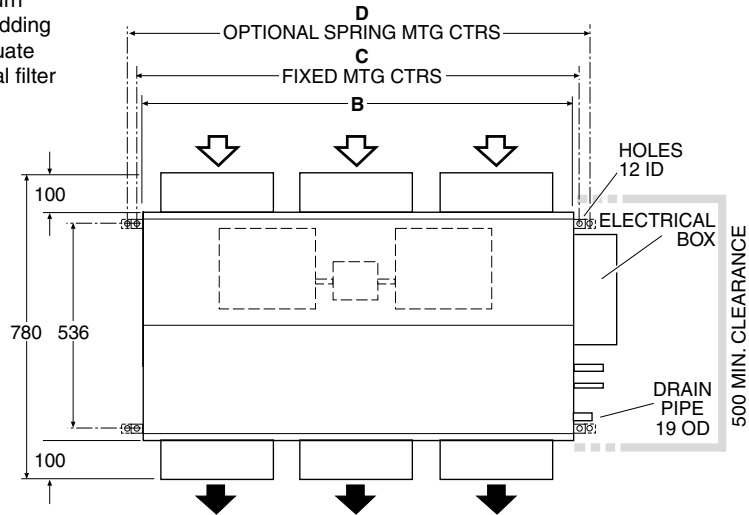
ISDL Indoor Unit

MODEL	A	B	C	D	Spigots
ISDL 55K	950	837	872	930	300 dia. (x4)
ISDL 56/80 K	1040	927	962	1020	250 dia. (x6)
ISDL 95K	1235	1122	1157	1215	250 dia. (x6)
ISDL 96/110 K	1430	1317	1352	1410	250 dia. (x8)



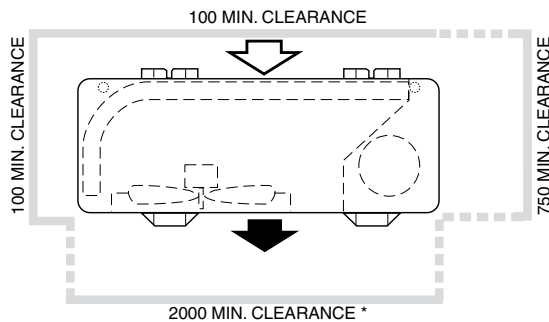
Optional Filter Box fits between return air spigot plate and main chassis, adding 95 mm to depth of unit. Allow adequate clearance either side for the optional filter to be removed.

ISDL 95K shown here

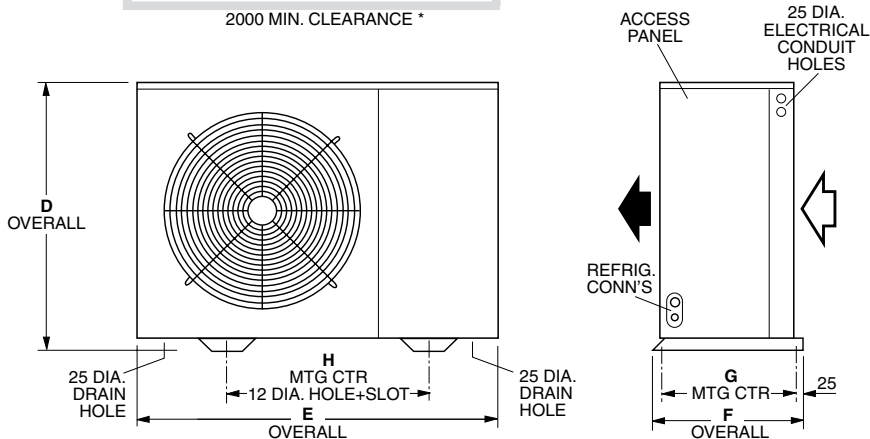


Note
Materials and specifications are subject to change without notice due to the manufacturer's ongoing research and development programme.

OSA Outdoor Unit



MODEL	D	E	F	G	H
OSA 55	665	885	330	331	500
OSA 80	655	885	380	331	500
OSA 95	665	1035	400	349	582
OSA 110	795	1035	400	349	582



SPECIFICATIONS

SYSTEM	Indoor Unit :	ISDL 55K	ISDL 56K	ISDL 80K	ISDL 95K	ISDL 96K	ISDL 110K	ISDL 110K
	Outdoor Unit :	OSA 55RKS	OSA 55RKS	OSA 80RKS	OSA 95RKS	OSA 95RKS	OSA 110RKS	OSA 110RKT
Cooling Capacity *1	kW	5.2	5.4	7.7	8.7	9.5	11.2	11.2
Heating Capacity *2	kW	4.6	4.7	7.6	8.8	8.6	10.0	10.0
E.E.R. (cooling)		2.75	2.91	2.95	2.76	2.91	2.98	2.98
Air Flow *3	l/s	270	280	340	400	500	500	500
Sound Levels (SWL) *4	Indoor Unit	55	57	57	54	56	56	56
	Outdoor Unit	63	63	64	66	66	66	66
Power Source *5		1 phase 230 V a.c. 50 Hz						3 ph. 415 V
Indoor Fan Motor Rating (4 pole)	W	75	150	150	150	75 + 150	75 + 150	75 + 150
Indoor Fan Full Load Amps	A	1.4	1.4	1.4	1.4	0.7 + 1.4	0.7 + 1.4	0.7 + 1.4
Running Amps (Total System)	A	8.4	11.5	11.5	13.4		16.3	6.7 / 5.7 / 5.7
Recommended External Fuse	A	20	20	25	25	25	25	25
Refrigerant		HFC - 410A (R410A)						
Maximum Vertical Separation	m	12	12	16	16	16	16	16
Maximum Standard Line Length	m	30	30	30	30	30	30	30
Maximum Extended Line Length	m	-	-	40	40	40	40	40
Pipe Sizes (Suction/Liquid)	mm OD	16 / 6	16 / 6	16 / 10	16 / 10	19 / 10	19 / 10	19 / 10
Finish	Indoor Unit	zinc galvanised steel						
	Outdoor Unit	grey polyester powder coat						
Weight (net/shipping) kg	Indoor Unit	28 / 30	30 / 37	30 / 37	33 / 43	42 / 53	42 / 53	42 / 53
	Outdoor Unit	73 / 78	73 / 78	78 / 85	86 / 94	86 / 94	88 / 96	88 / 96

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.
Subtract indoor fan power to calculate Net Capacity.

*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 Power Levels (SWL) are measured at nominal cooling capacity conditions stated above.

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

Note

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



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