

Underceiling/Console Split System Air Conditioners

Technical Data ISU Series



Featuring
SAT-2 Controller &
Long Life Epoxy Coated Outdoor Coil



Nominal Cooling Capacity
8.6 kW – 15 kW

ISU SERIES – UNDERCEILING OR CONSOLE SPLIT SYSTEM AIR CONDITIONERS

GENERAL

ISU – Indoor Unit.

OSA *RK – Outdoor unit, reverse cycle.

Application

Typically installed in office areas, shops, restaurants, night clubs and other commercial and public spaces where unobtrusive air conditioning is required.

Underceiling units are ideal for rooms with limited or no ceiling space. Sloping ceilings are not a problem as the units can still be suspended level.

ISU/OSA systems are available for reverse cycle (heat pump) applications.

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.

Design

The slimline low profile styling allows the Indoor Unit to be suspended unobtrusively under the ceiling, where it does not use valuable office wall or floor space. Alternatively, if it is more convenient the unit can be mounted vertically as a console, e.g. under a window.



The Outdoor Unit is designed to be freestanding, or wall mounted with the optional wall mounting brackets.



User Friendly

ISU units are supplied with a SAT-2 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'.

Quiet

The carefully designed fans ensure the ISU units' emit minimal noise, while maintaining the efficiency of the unit.

The Outdoor Unit is also very quiet with a compressor/motor within a hermetically sealed casing which in turn is mounted in an acoustically insulated compartment.

Circulates

The air discharge louvre is motorised to distribute conditioned air high and low into the room. If preferred, however, the motor can be switched off and the louvre can be set at a fixed angle. Left and right air distribution is manually set to suit.

Accessible

The filter is easily accessible for periodic cleaning via the indoor unit's hinge down/removable return air filter panel.

Durable Outdoor Unit

The Outdoor Unit is built to withstand the rigours of the weather, year in and year out. The cabinet is made from the high quality galvanised steel, finished with tough oven-cured polyester powder coating and fixed with stainless steel fasteners. The outdoor coil fins are epoxy coated for extra protection in corrosive environments, e.g. salt laden sea air.

Refrigerant R410A

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



Efficient

These reverse cycle (heat pump) systems are very efficient. For every 1 kW of power consumed approx. 3 kW of heating is created. The outdoor unit incorporates a high efficiency scroll compressor. Heat exchange coils incorporate inner grooved (rified) tube for better heat transfer.

Self Diagnostics

The Outdoor Unit's Controller (OUC) has a display of LEDs to indicate faults and running conditions. A general fault indicator is included for interface to external systems.

OPTIONAL ACCESSORIES

Outdoor Unit:

1. Fault indicating auxiliary relay board.
2. Wall mounting brackets.

Technical Backup

Manufacturer's representation assures quality technical backup, quick and efficient parts and service.

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

SAT-2 CONTROLLER

Features

- 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.
- 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,
 - Extra Wall Control plaque.

COOLING CAPACITY (kW)

ISU Series

MODELS Outdoor / Indoor Unit / 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.
ISU 90 / OSA 95	HIGH	335	15	21	7.8	6.2	8.0	6.3	7.7	6.1	7.2	5.7	6.3	5.4	6.3	5.4
			17	23	8.7	6.3	8.7	6.3	8.2	6.1	7.9	5.9	7.5	5.6	7.0	5.5
			19	27	9.5	7.2	9.5	7.3	8.9	6.8	8.6	6.7	8.2	6.7	7.0	5.5
			21	31	10.2	8.1	10.3	8.2	9.8	8.0	9.3	7.6	8.9	7.4	8.7	7.0
ISU 140 / OSA 140	HIGH	570	15	21	12.0	9.5	12.3	9.6	11.8	9.3	11.0	8.7	9.6	8.2	9.6	8.2
			17	23	13.3	9.7	13.3	9.7	12.5	9.4	12.1	9.0	11.5	8.6	10.7	8.4
			19	27	14.5	11.0	14.5	11.2	13.6	10.4	13.2	10.3	12.5	10.2	11.4	9.6
			21	31	15.6	12.4	15.8	12.5	15.1	12.3	14.2	11.7	13.7	11.4	13.4	10.8
ISU 160 / OSA 160	HIGH	800	15	21	13.6	10.8	14.0	11.0	13.5	10.6	12.5	9.9	11.0	9.4	11.0	9.4
			17	23	15.2	11.1	15.2	11.1	14.3	10.7	13.8	10.2	13.1	9.8	13.0	11.0
			19	27	16.5	12.5	16.5	12.7	15.5	11.9	15.0	11.7	14.3	11.7	13.0	11.0
			21	31	17.8	14.1	17.9	14.3	17.2	14.0	16.2	13.3	15.6	13.0	15.2	12.3

Total = Total Capacity (kW)
Sens. = Sensible Capacity (kW)

E.A.T. = Entering Air Temperature
○ = Nominal Capacity (kW)

Note: Allow for pipe length capacity loss (refer overleaf).

Indoor Air Flow Correction Factors @ nominal conditions

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

HEATING CAPACITY (kW) – Reverse Cycle Systems

MODELS Outdoor / Indoor 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
ISU 90 / OSA 95R	15	5.6	5.0	6.1	5.5	6.5	5.8	6.9	6.1	7.3	6.2	7.9	7.1	8.4	8.3	8.8	8.8
	20	5.5	4.9	5.9	5.3	6.4	5.7	6.8	6.0	7.2	6.1	7.7	6.9	8.2	8.1	8.6	8.6
	25	5.3	4.8	5.7	5.2	6.1	5.5	6.5	5.7	6.9	5.8	7.4	6.7	7.9	7.8	8.3	8.3
ISU 140 / OSA 140R	15	8.6	7.8	9.3	8.4	10.0	9.0	10.6	9.3	11.2	9.5	12.1	10.9	12.9	12.7	13.5	13.5
	20	8.5	7.6	9.1	8.2	9.8	8.8	10.4	9.2	11.0	9.3	11.8	10.7	12.6	12.5	13.2	13.2
	25	8.1	7.3	8.8	7.9	9.4	8.5	10.0	8.8	10.6	9.0	11.4	10.3	12.1	12.0	12.7	12.7
ISU 160 / OSA 160R	15	10.0	9.0	10.8	9.7	11.5	10.4	12.3	10.8	13.0	11.0	14.0	12.6	14.9	14.7	15.6	15.6
	20	9.8	8.8	10.6	9.5	11.3	10.2	12.0	10.6	12.8	10.8	13.7	12.3	14.6	14.4	15.3	15.3
	25	9.4	8.5	10.2	9.2	10.9	9.8	11.6	10.2	12.3	10.4	13.2	11.9	14.1	13.9	14.8	14.8

G = Gross Heating Capacity kW, based on nominal air flow.
N = Net Heating Capacity kW allowing for average defrost.

Note: Allow for pipe length capacity loss.

○ = Nominal Capacity (kW)

PIPE LENGTH CAPACITY LOSS

ON COOLING CYCLE DUE TO PRESSURE DROP

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

MODELS Indoor / Outdoor Unit / Unit	Interconnecting Pipe Size OD (mm)		Equivalent Pipe Length (m)				
	Liquid	Suction	5	10	15	20	30
ISU 90 / OSA 95	10	16	2 %	4 %	6 %	8 %	12 %
ISU 140 / OSA 140	10	19	0.75 %	1.5 %	2.25 %	3 %	5 %
ISU 160 / OSA 160	13	22	0.7 %	2.1 %	3.4 %	4.7 %	6.1 %

Additional Pipe Length to allow per Bend			
Suction Pipe Size OD	16 mm	19 mm	22 mm
Long 90° Radius (2 x pipe dia.)	0.30 m	0.43 m	0.46 m

SOUND LEVELS

ISU Indoor Units

Sound Pressure Levels (SPL)

As measured in an anechoic chamber, 1 m below and to the side of the unit. No allowance for sound reflection within a room. Add 13 dB to convert to Sound Power Levels (SWL).

MODEL	FAN SPEED	AIR FLOW l/s	SPL dB(A)	OCTAVE BAND FREQUENCY Hz					
				125	250	500	1 k	2 k	4 k
				SOUND PRESSURE LEVELS (SPL) dB					

INDOOR UNITS

ISU 90	LOW	240	44	41	44	46	36	29	22
	MED	280	46	43	46	46	41	34	27
	HIGH	335	50	47	49	49	45	39	32
ISU 140	LOW	380	43	44	44	43	36	28	19
	MED	480	48	48	48	48	41	35	25
	HIGH	570	53	50	52	52	47	41	32
ISU 160	LOW	650	55	53	53	54	49	43	35
	MED	710	56	55	55	55	52	45	38
	HIGH	800	58	56	53	58	54	47	40

Sound Pressure Levels (SPL) Within A Room

Indoor Units: Add the room reflection effect below to the anechoic Sound Pressure Levels above to obtain Sound Pressure Levels within a room.

ROOM TYPE	OCTAVE BAND FREQ. Hz					
	125	250	500	1k	2k	4k
	ROOM REFLECTION EFFECT					
SOFT	9	5	2	2	2	2
MEDIUM	10	6	5	4	4	4
HARD	13	12	10	9	9	8

OSA Outdoor Units

Sound Power Levels (SWL)

MODEL	FAN SPEED	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
			125	250	500	1 k	2 k	4 k
			SOUND POWER LEVELS (SWL) dB					

OUTDOOR UNITS

OSA 95	LOW	65	67	66	66	58	51	47
	MED	65	69	67	66	60	54	49
OSA 140	LOW	67	73	68	65	61	56	49
	MED	69	74	69	66	63	58	51
OSA 160	LOW	70	77	71	68	65	59	52
	MED	71	77	73	69	66	60	52

Sound Pressure Levels (SPL)

Outdoor Units: Deduct 16 dB from Sound Power Level above to obtain Sound Pressure Level at 3 metres.

DIMENSIONS (mm)

Not to Scale

Fig. 1 ISU 90, 140, 160 Underceiling/Console

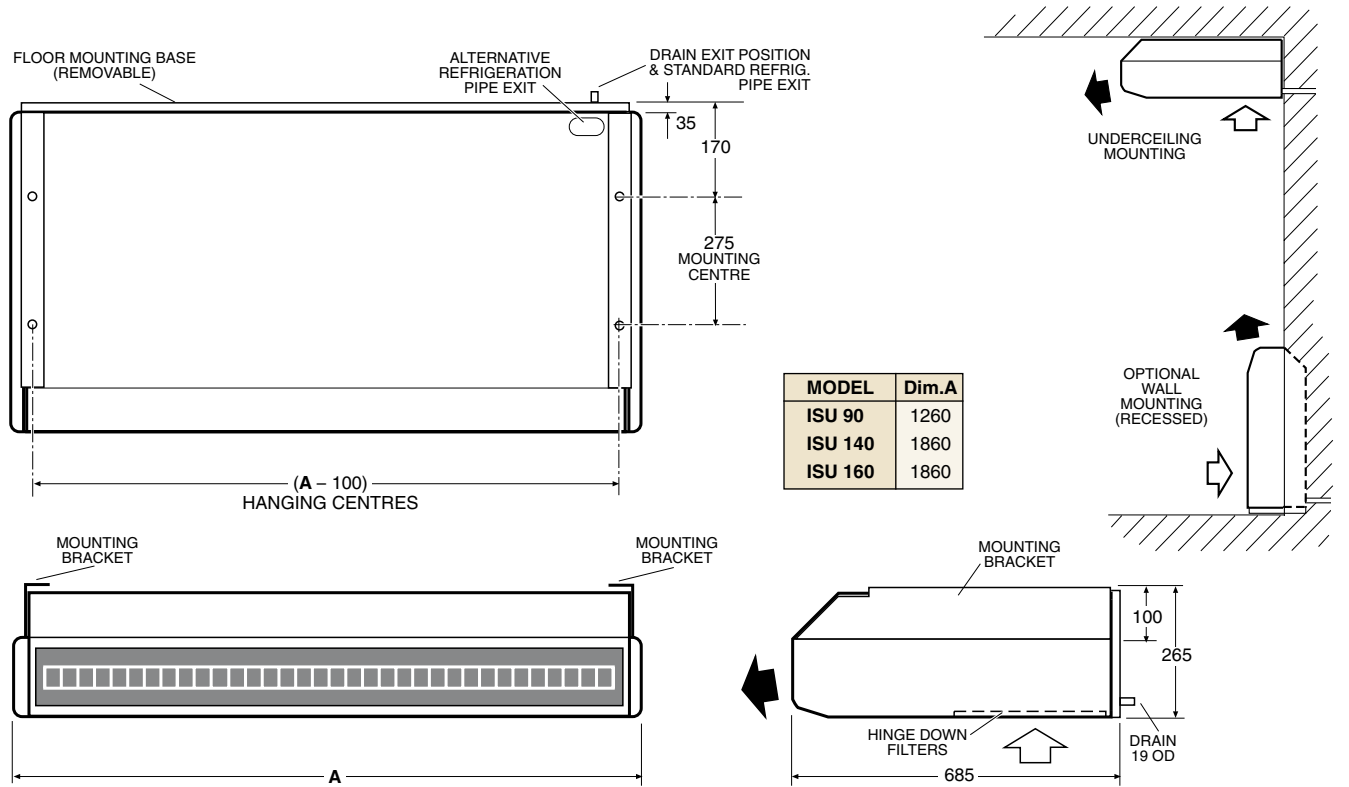
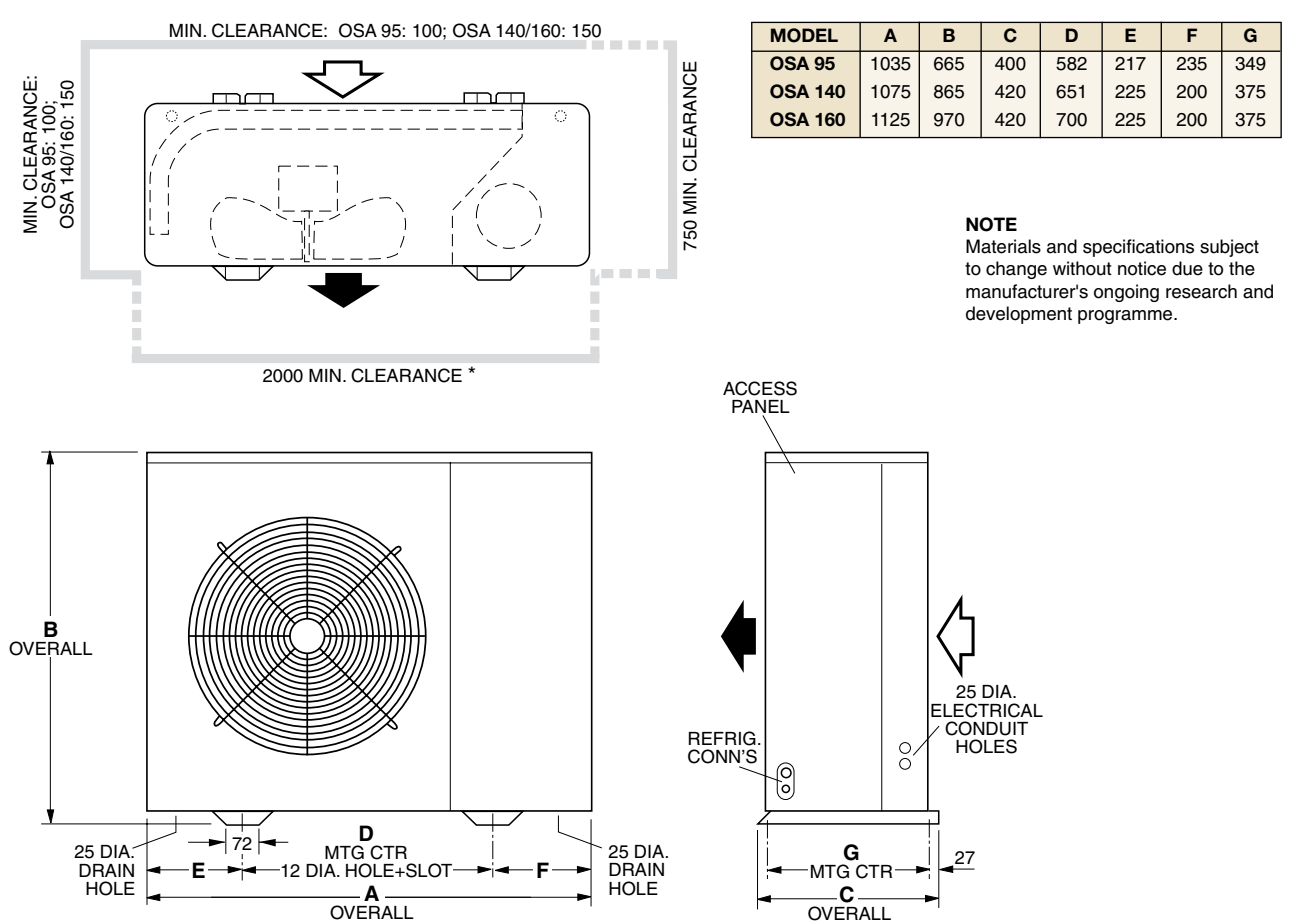


Fig. 2 OSA 95, 140, 160



SPECIFICATIONS SUMMARY

SPLIT SYSTEMS		Single Phase			Three Phase	
		ISU 90KD	ISU 140KD	ISU 160KD	ISU 140KD	ISU 160KD
Indoor Unit :						
Outdoor Unit :		OSA 95RKS	OSA 140RKS	OSA 160RKS	OSA 140RKT	OSA 160RKT
Cooling Capacity *1	kW	8.6	13.2	15.0	13.2	15.0
Heating Capacity *2	kW	8.2	12.6	14.6	12.6	14.6
E.E.R. (Cooling)		3.04	3.37	2.88	3.37	3.10
Power Source *3	volts	230	230	230	400	400
Recom'd Max. Line Length	m	40	50	50	50	50
Max. Height Separation Between Indoor & Outdoor Units: (Indoor Unit above Outdoor / Outdoor Unit above Indoor)						
	m	16/16	18 / 18	18 / 18	18 / 18	18 / 18
Running Amps (Total) / Ext'l Fuse	A	12.8 / 25	17 / 45	23 / 45	8.6,6.5,6.5 / 25	10.5,8,8 / 25

INDOOR UNITS

Air Flow (l/s)	Low	240	380	650	380	650
	Med	280	480	710	480	710
	High	335	570	800	570	800
Sound Pressure dB(A) (SPL) *4	Low	44	44	41	41	41
	Med	46	45	43	45	45
	High	50	46	48	50	50
Holding Charge		dry Nitrogen				
Heat Exchanger Type		aluminium corrugated plate fins to expanded inner grooved copper tube				
Indoor Fan Type		forward curved centrifugal				
Weight	kg	48	93	93	93	93

OUTDOOR UNITS

Sound Pressure (SPL) *5	dB(A)	52	54	57	54	57
Refrigerant		HFC - 410A (R 410A)				
Heat Exchanger Type		epoxy coated aluminium corrugated plate fins to expanded inner grooved copper tube				
Outdoor Fan Type		propeller				
Finish		grey polyester powder coat				
Approx. Weight	kg	86	116	133	116	133

Notes:

Capacities are for close coupled systems. Allowance must be made for pipe length, pipe size and bends.

*1 Cooling Capacity (net) to 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 to AS/NZS 3823 conditions: Indoor Entering Air Temperature 21°C D.B.;
Outdoor Entering Air Temperature 7°C D.B., 6.1°C W.B.

*3 Voltage fluctuation limits: 1 phase 200–252 V a.c. 50 Hz; 3 phase 342–436 V a.c. 50 Hz.

*4 Sound Pressure Level (SPL) for Indoor Units measured in an anechoic chamber 1 m below and to the side of the unit.

*5 Sound Pressure Level (SPL) for Outdoor Units is measured 3 m from exhaust air fans.

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



temperzone limited

Head Office, Auckland : 38 Tidal Rd, Mangere, N.Z.
Private Bag 93303, Otahuhu, NEW ZEALAND.
Email sales@temperzone.co.nz Website: www.temperzone.biz

temperzone australia pty ltd

Head Office, Sydney : 7A Bessemer St
PO Box 6448, Delivery Centre, Blacktown, NSW 2148,
AUSTRALIA. Email sales@temperzone.com.au

AUCKLAND

Ph. 0-9-279 5250
Fax 0-9-275 5637

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Ph. 0-4-569 3262
Fax 0-4-566 6249

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