

**Ducted Split System
Air Conditioner**

Technical Data

ISD 87KYX / OSA 87RKSH



**Optional SAT-3 or TZT-100
Room Temperature Controller**

High Efficiency EC Motor

**Extra Long Life
Epoxy Coated Outdoor Coil**

**Nominal Cooling Capacity
8.5 kW**

ISD 87KYX / OSA 87RKSH DUCTED SPLIT SYSTEM AIR CONDITIONER

GENERAL

The ISD indoor unit, together with its associated OSA outdoor unit, provides a reverse cycle (heat pump) split system air conditioner designed and developed to comply with AS/NZS 3823 specified conditions. The system has been tested and proven for cooling operation in outdoor temperatures up to 52°C.

APPLICATIONS

These units have been specifically developed for air conditioning of light commercial and residential premises, e.g. 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 (for reference 2.0 m/s is marked on the graph below).

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-3 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. Part load operation at low loads (75% airflow equates to 55% power use) using temperzone algorithms. 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 unit requires only a 100 mm gap on the coil side where installation is against a wall. Its slimline cabinet is particularly practical where there is restricted space, e.g. side access pathways, balconies, narrow ledges, etc.

Durable. The outdoor coil fins are epoxy coated for extra protection in corrosive environments, e.g. salt laden sea air. The 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 plate fins on mechanically expanded rifled copper tube. The 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. Outdoor coils are protected with louvred anti-hail guards.

Service Access. The indoor unit's built-in drain tray can be removed for ease of cleaning and service accessibility.

Insulation. Closed cell foam insulation has been used in the indoor unit's 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.

Self Diagnostics. The Unit Controller (UC8) has a display of LEDs to indicate faults and running conditions. A non-specific fault indicator is included for interface to external systems.

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 or TZT-100 Room Temperature Controller.
2. Spring mounting kit.
3. Supply & return air spigots.
4. Spigot Plate Adaptors
– Double Inlet 350 dia. x2
(for use when separating indoor unit).
5. Filter Box c/w EU2/G2 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 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 scroll type compressor is hermetically sealed, quiet running and supported on rubber mounts to minimise vibration.

REFRIGERATION PIPING

Maximum line length is 40 m.

Max. height separations between units are:

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

The OSA 87 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. Accurator expansion devices control the flow of refrigerant. The matched indoor unit is shipped with a holding charge of nitrogen. Both units have brazed pipe connections.

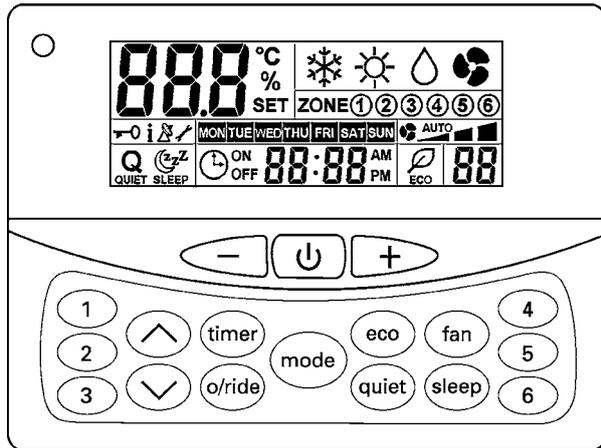
WIRING

The electrical supply required (including voltage fluctuation limits) is: 1 phase 200–252 V a.c. 50 Hz with neutral and earth.

The compressor crankcase heater requires a 24 hour power supply. 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-3 CONTROLLER (Optional)



Features Summary

- Cool / Dry / Fan modes.
- Heat / Auto modes
- Auto / High / Medium / Low fan speed selection (customisable).
- Connects to either indoor unit or outdoor unit, ie IUC or UC8.
- Temperature setting range from 15°C – 30°C (customisable).
- Room temperature display.
- Real time clock.
- 7 day timer – up to four start and/or stops per day
- On demand countdown run timer, up to 3 hours.
- Auto-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
- Sleep function – improves night time comfort and saves energy.
- Eco mode – for economical operation.
- Quiet mode – for outdoor unit when cooling.
- Battery backup (Lithium).
- Low voltage control cable.
- Colour: white and light grey (Keypad - green and blue).
- Optional:
Remote air temperature sensor/s,
Extra Wall Control plaque.

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

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 / Outdoor Unit / Unit	INDOOR FAN		INDOOR COIL E.A.T.		OUTDOOR COIL ENTERING AIR TEMPERATURE °C D.B.											
	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 87KYX / OSA 87RK	HIGH	480	21	15	8.3	6.5	8.2	6.5	7.9	6.4	7.6	6.2	7.1	5.8	6.5	5.4
			23	17	8.8	6.4	8.7	6.4	8.5	6.3	8.1	6.1	7.6	5.8	6.9	5.3
			27	19	9.2	7.3	9.1	7.3	8.9	7.2	8.5	7.0	8.0	6.6	7.4	6.2
			31	21	9.6	8.7	9.6	8.7	9.3	8.5	8.9	8.3	8.5	7.9	7.8	7.4

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)

G = Gross Heating Capacity kW, based on nominal air flow of 1300 l/s.
N = Net Heating Capacity kW allowing for average defrost.

○ = Nominal Capacity (kW)

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
ISD 87KYX / OSA 87RK	15	5.9	5.5	6.2	5.5	6.5	5.5	6.9	5.9	7.2	6.6	7.5	7.5	7.9	7.9	8.2	8.2
	20	5.8	5.5	6.1	5.4	6.4	5.5	6.8	5.8	7.1	6.5	7.4	7.4	7.8	7.8	8.1	8.1
	25	5.6	5.3	5.9	5.3	6.3	5.3	6.6	5.7	6.9	6.4	7.3	6.3	7.6	7.6	7.9	7.9

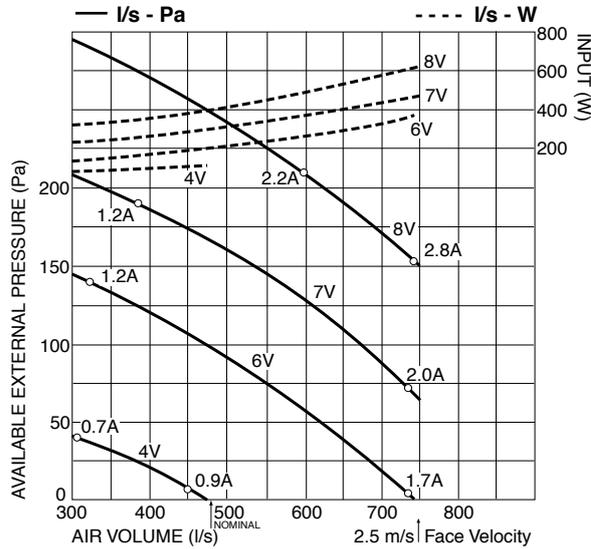
PERFORMANCE DATA

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 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

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

FAN SPEED	SWL dB(A)	OCTAVE BAND FREQUENCY Hz					
		125	250	500	1 k	2 k	4 k
4V	56	58	54	54	50	48	44
6V	68	68	65	65	64	60	58
8V	76	73	73	71	72	69	68

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.

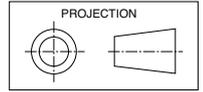
ROOM TYPE	OCTAVE BAND FREQ. Hz					
	125	250	500	1k	2k	4k
SOFT	4	8	11	11	11	11
MEDIUM	3	7	8	9	9	9
HARD	0	1	3	4	4	5

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
OSA 87	LOW	65	69	66	62	61	55	50	49	53	50	46	45	39	34
	MED	66	70	66	63	61	56	51	50	54	55	47	45	40	35
	HIGH	67	70	68	64	63	57	52	51	54	52	48	47	41	36

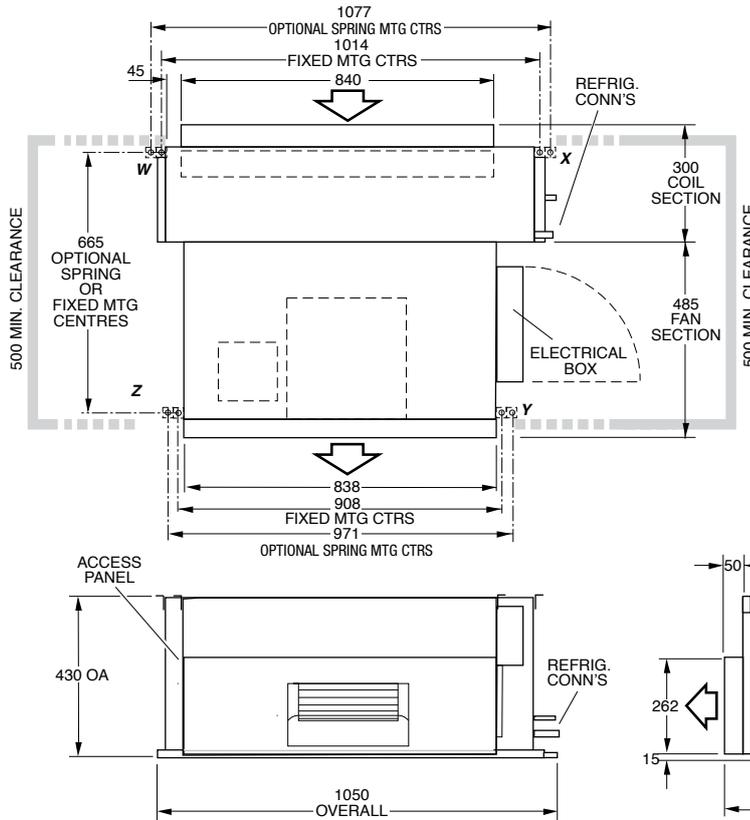
Sound Pressure Level (SPL) in decibels re 20 µPa.

DIMENSIONS (mm)

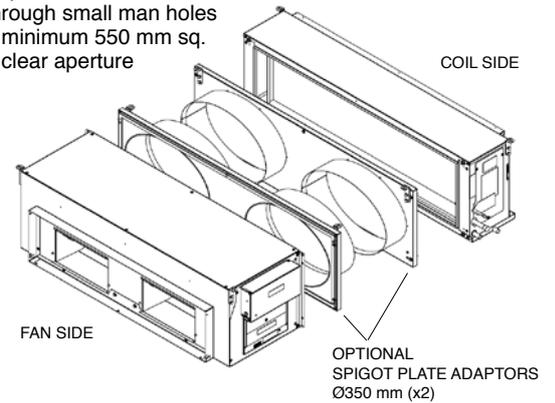


Not to Scale

ISD 87KYX Indoor Unit



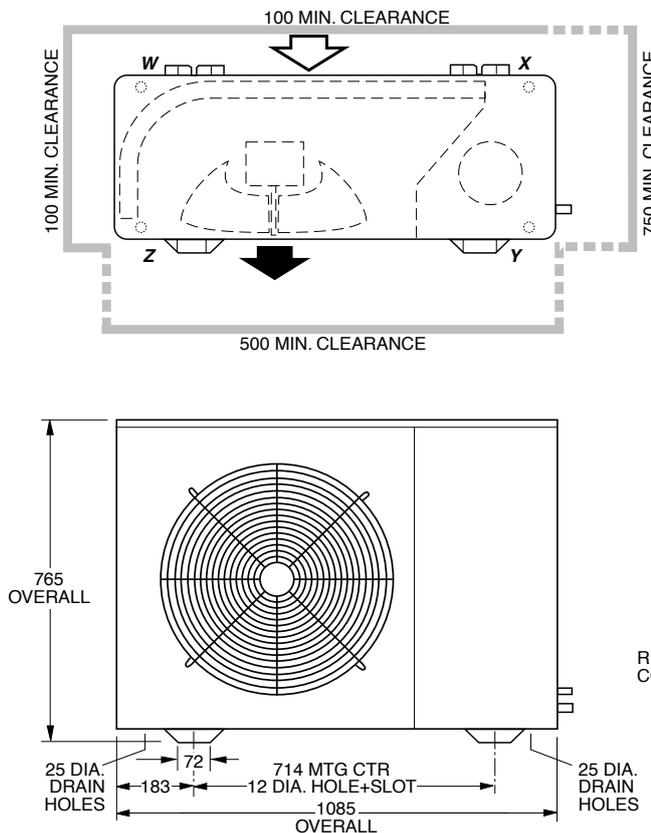
Separable for ease of installation through small man holes – minimum 550 mm sq. clear aperture



POINT LOADS (kg)			
W	X	Y	Z
15	14	15	14

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

OSA 87RKSH Outdoor Unit



POINT LOADS (kg)			
W	X	Y	Z
22	23	37	8

Recommended Connecting Pipe Sizes
 Suction : 16 mm OD
 Liquid : 10 mm OD

NOTE

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

SPECIFICATIONS

SYSTEM	Indoor Unit : Outdoor Unit :	ISD 87KYX OSA 87RKSH
Nominal Cooling Capacity *1	kW	8.5
Net Cooling Capacity (MEPS) *1	kW	8.3
EER / AEER (cooling)		3.25 / 3.21
Heating Capacity *2	kW	7.8
COP / ACOP (heating)		3.25 / 3.23
Air Flow *3	l/s	480
Sound Levels *4	Indoor Unit (SWL)	68
	Outdoor Unit (SPL)	51
Power Source *5		1 ph. 230 V a.c. 50 Hz
Compressor type		rotary
Indoor Fan Maximum Current	A	3
Running Amps (Total System)	A	11.1
Max. Running Amps (Total System)	A	14.0
Refrigerant		HFC-410A (R410A)
Maximum Vertical Separation	m	20
Maximum Line Length	m	40
Pipe Sizes (Suction/Liquid)	mm OD	16 / 10
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	58 / 69
	Outdoor Unit	90 / 103

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.



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