SINKO

AIR HANDLING UNIT

MD

COOL JOY series

High-efficiency, energy saving, and

highly reliable air handling units

built on Japanese technology

CJ-08-B

SINKO

SINKO's history is air handling units for Japanese business use

SINKO, leading the forefront of business-use air handling unit technology

SINKO Industries LTD., incorporated in 1950, has constantly maintained its leadership position in the central air conditioning system industry as Japan's top manufacturer of Air Handling Units for varied commercial and industrial applications.
SINKO has two major manufacturing plants in Japan, both equipped with the latest hi-tech manufacturing facilities, machinery, and testing technologies to satisfy the diversified needs of the customers, both in Japan and abroad.
More recently, in order to meet with the overseas customer demand for the low-cost yet reliable and quality-assured AHU series, SINKO now offers COOL JOY Series AHUs from its manufacturing facility in Thailand, based on the full technical and engineering backup support extended from SINKO Japan.

SINKO advances the technology in the severe environments of Japan

Japan is located in a temperate region roughly 2000 km long from north to south, and it varies in height more than 3000 m from the mountain country to the plains, with the widest point from east to west being no more than 200 km. Because of this fact, the temperature and humidity change greatly from season to season. Japan's severely changing weather demands high performance Air Handling Units to maintain comfort year-round. SINKO has been at the forefront of business-use Air Handling Unit Technology as the top Japanese manufacturer for over 50 years. In various environments, SINKO proudly provides the world the reliability and comfort of our high-level, quality products.

Worldwide Installations

MEDINAT JUMEIRAH
(Dubai UAE)

THE VENETIAN MACAU
(Macau)

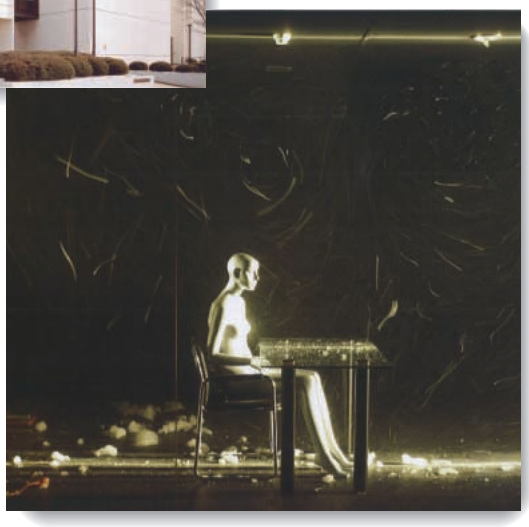
CENTRAL JAPAN
INTERNATIONAL AIRPORT
(Nagoya Japan)

HOTEL WINDSOR
(Australia)

SINKO Research & Development

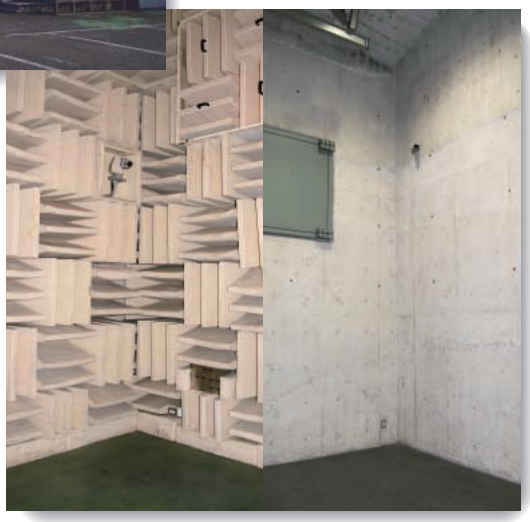
SINKO Laboratory is located in Neyagawa, Osaka, and it is recognized as one of the foremost industrial research centers in Japan's HVAC industry for developing and testing new systems.
Our laboratory features the most modern facilities comprising overall HVAC testing functions: an air movement test room, air purity test room, transparent air flow & velocity measurement room, calorimetry measurement room, temperature and humidity measurement room, sound-proof acoustic room, and reverberation room. Attached to SINKO's AHU factory in Hadano City, Kanagawa, is a branch Laboratory for product and system improvements. Here our research continues on air-conditioning systems and manufacturing technologies, including research for ways to expand improvements on existing product lines. Also included is a showroom that allows visitors to see, touch, and experience our products, so that we can foster greater understanding among customers visiting our facilities.

R & D Center
Located in Neyagawa, Osaka



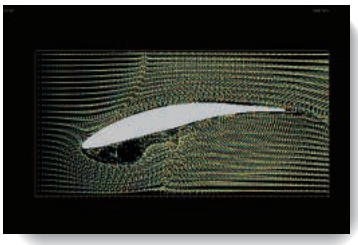
Visualized Airflow Test Room

R & D Center
Located in Hadano, Kanagawa

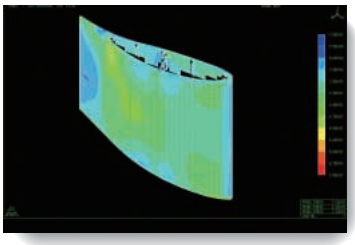


Insulated Acoustic Room
(Semi-Anechoic Wall)

Reverberation Chamber



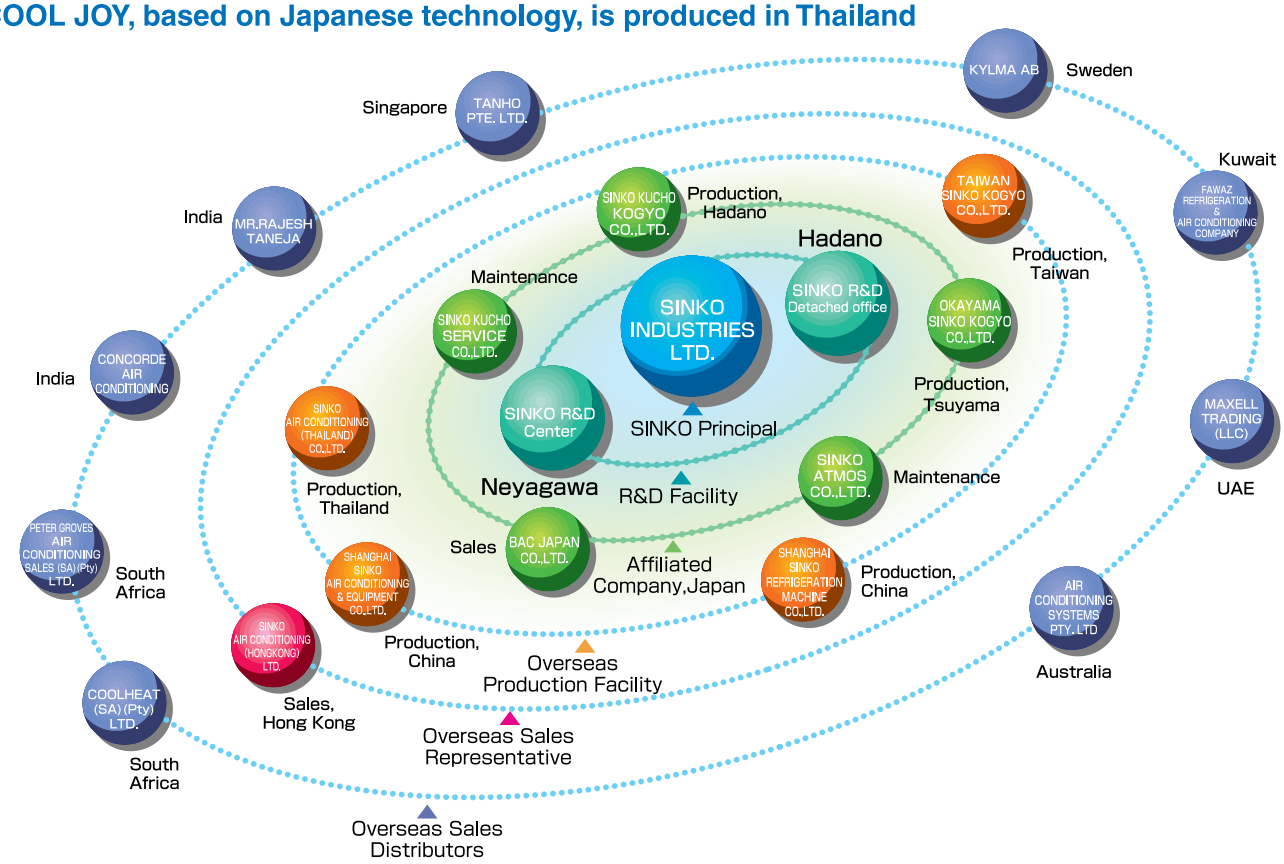
Fluid Analysis



Struture Analysis

SINKO Group Companies

COOL JOY, based on Japanese technology, is produced in Thailand



SINKO Industries Ltd.

International Department
2-57-7, Nihonbashi Hamacho
Chuo-ku, Tokyo 103-0007 Japan
Tel : (81) 3-5640-4167
Fax : (81) 3-5640-4306
http://www.sinko.co.jp/skeng/index.html
Mail : intnl@sinko.co.jp

Osaka Headquarter
Tokyo, Osaka, Nagoya, Sapporo, Sendai, Fukuoka

R&D Center : Osaka, Kanagawa
Manufacturing Plants: Kanagawa, Okayama

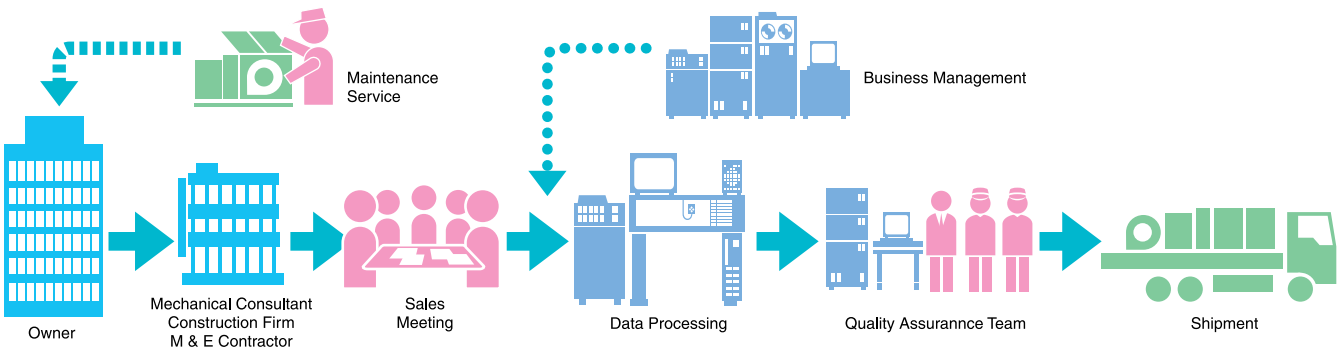
Overseas Group Companies

SINKO Air Conditioning (Thailand) Co., Ltd.
134/1 Moo 1, Hi-Tech Industrial Estate, Ban Po, Bangpa-In,
Phra Nakorn Sri Ayutthaya, Thailand
Tel : (66) 3-531-4009
Fax : (66) 3-531-4013
Mail : marketing@sinko-thai.co.th
http://www.sinko.co.jp/sti/

SINKO Air Conditioning (HK)Ltd.(China)
Shanghai SINKO Air Conditioning Equipment Co., Ltd.(China)
Shanghai SINKO Refrigeration Machine Co., Ltd.(China)
Taiwan SINKO Kogyo Co., Ltd.(Taiwan)

Sales, Production, After Sales Service

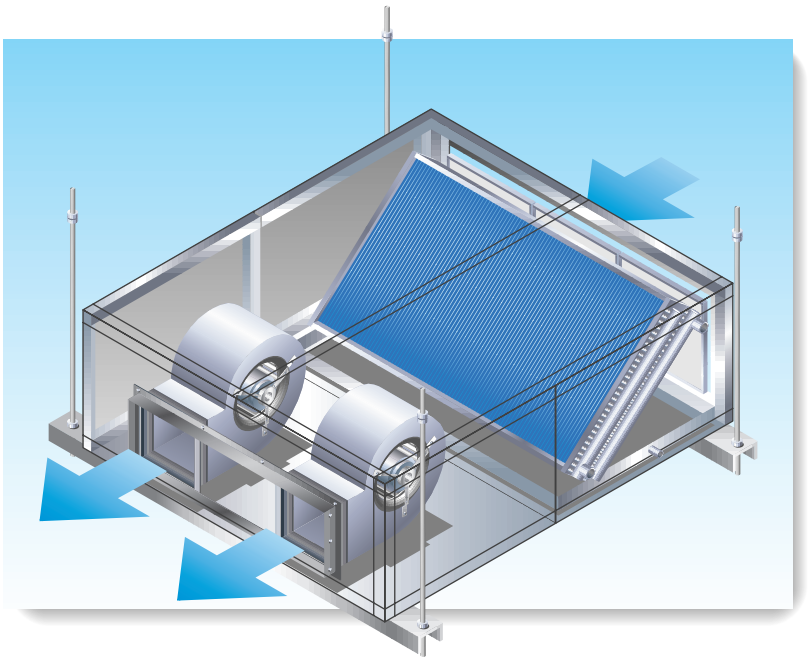
SINKO quickly responds to your various needs in the planning, production, and maintenance phases.



Indoor Air Recirculation, Ceiling Mount Type

MD

A high efficiency model for indoor air recirculation



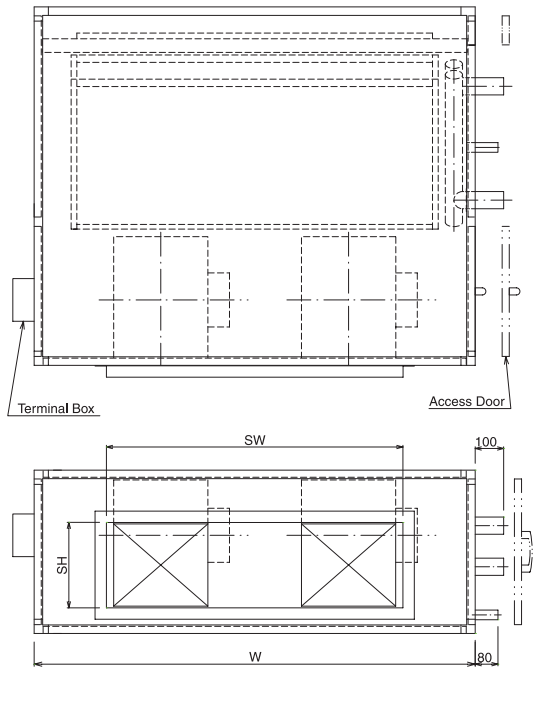
Standard specifications

Main Component	Main Part Name	Standard Specifications
Casing	Panel	25mm thick double skinned casing with foamed Urethane insulation ·Internal/external panel : 0.5mm thick pre-coated steel sheet ·Density of polyurethane foam : 40[kg/m³]
	Main Frame	Aluminum
Drain Pan	Drain Pan	Stainless steel 304
Fan & Motor	Fan	Centrifugal forward curved DIDW direct-driven type
	Motor	Permanent split capacitor 3-speed type with ball bearing
	Power Source	AC220-240V／1ph／50Hz
Coil	Water Coil	Max.working pressure : 0.98 [MPa] Higher working pressure available on request
	Main Tube	3/8"dia copper tube
	Fin	Aluminum , 0.115mm thickness , Bare surface
	Header	Steel , Epoxy paint finished
Filter	Main-filter	20mm panel filter , Non-woven type

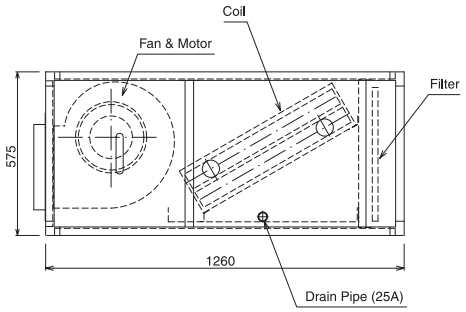
Basic specifications

Model-Size		MD- 25	MD- 50	MD-100	MD-150
Rated Air Volume	[l/s]	417	833	1667	2500
	[m³/h]	1500	3000	6000	9000
	[CFM]	883	1766	3531	5297
Coil	No. of Row	4 ~ 6 Rows			
	Fin Spacing	11 FPI			
	Max Header Size	25A	25A	32A	32A
Motor Capacity [Watt] X Qty		245W X 1	550W X 1	550W X 2	550W X 3
		350W X 1	750W X 1	750W X 2	750W X 3
Filter		20mm panel filter			

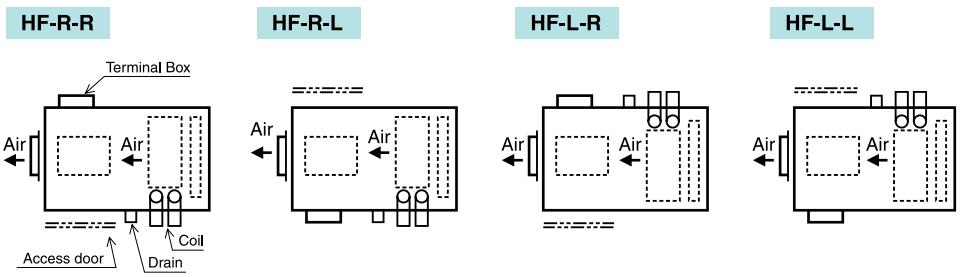
Dimensions



Model	Dimensions [mm]		
	W	SH	SW
MD- 25	650	270	240
MD- 50	1000	300	340
MD-100	1500	300	950
MD-150	2100	300	1550



Piping / Access Door Arrangement



Note : R , L is decided facing air discharged from the unit.

Sound Power Level

Model	Air Volume [l/s]	Air Volume [m³/h]	Air Volume [CFM]	External Static Pressure [Pa]	Octave Band Center Frequency [Hz]	63	125	250	500	1000	2000	4000	8000
MD- 25	417	1500	883	150 (70)	Discharge Side Sound Power Level [dB]	87 (83)	83 (79)	79 (75)	73 (69)	70 (66)	65 (61)	63 (59)	60 (56)
					Radiated Sound Pressure Level [dB]	74 (70)	65 (61)	51 (47)	42 (38)	36 (32)	34 (30)	30 (26)	25 (21)
MD- 50	833	3000	1766	180 (110)	Discharge Side Sound Power Level [dB]	89 (88)	85 (84)	81 (80)	75 (74)	72 (71)	67 (66)	65 (64)	62 (61)
					Radiated Sound Pressure Level [dB]	76 (75)	67 (66)	53 (52)	44 (43)	38 (37)	36 (35)	32 (31)	27 (26)
MD-100	1667	6000	3531	170 (80)	Discharge Side Sound Power Level [dB]	92 (91)	88 (87)	84 (83)	78 (77)	75 (74)	70 (69)	68 (67)	65 (64)
					Radiated Sound Pressure Level [dB]	79 (78)	70 (69)	56 (55)	47 (46)	41 (40)	39 (38)	35 (34)	30 (29)
MD-150	2500	9000	5297	150 (50)	Discharge Side Sound Power Level [dB]	94 (93)	90 (89)	86 (85)	80 (79)	77 (76)	72 (71)	70 (69)	67 (66)
					Radiated Sound Pressure Level [dB]	81 (80)	72 (71)	58 (57)	49 (48)	43 (42)	41 (40)	37 (36)	32 (31)

Note 1)Radiated Sound Pressure Level (Semi-free sound field "r=1.0m")
2)Sound data is based on 6 rows coil and "HIGH" fan-speed.
3)Sound data given in ( ) is based on "MED" fan-speed.

Cooling Capacity : 4 Rows

On coil air temperature : DB26[°C] / WB18.7[°C]

Model	Air Volume		On coil water temperature 5.5 [°C]						On coil water temperature 7 [°C]					
	[l/s]	[m³/h]	Water Temperature Difference [K]	Water Flow [l/s]	Water Flow [l/min]	Capacity Sensible [kW]	Capacity Total [kW]	Water Side Pressure Drop [kPa]	Water Temperature Difference [K]	Water flow [l/s]	Water flow [l/min]	Capacity Sensible [kW]	Capacity Total [kW]	Water Side Pressure Drop [kPa]
MD- 25	250	900	7	0.18	11	3.9	5.1	5.9	5	0.25	15	3.9	5.0	8.8
			8	0.15	9	3.8	4.8	3.9	7	0.15	9	3.6	4.3	3.9
			9	0.12	7	3.6	4.3	2.9	9	0.10	6	3.4	3.7	2.0
	333	1200	7	0.22	13	5.0	6.0	6.9	5	0.28	17	4.9	5.9	10.8
			8	0.17	10	4.7	5.5	4.9	7	0.18	11	4.6	5.2	5.9
			9	0.15	9	4.7	5.2	3.9	9	0.12	7	4.3	4.4	2.9
	417	1500	7	0.23	14	5.8	6.7	7.8	5	0.33	20	5.9	6.8	14.7
			8	0.20	12	5.8	6.3	5.9	7	0.20	12	5.6	5.8	5.9
			9	0.17	10	5.5	5.9	4.9	9	0.13	8	5.0	5.0	2.9
MD- 50	500	1800	7	0.38	23	8.3	11.3	32.4	5	0.52	31	8.1	10.8	53.9
			8	0.33	20	8.1	10.7	25.5	7	0.33	20	7.6	9.6	25.5
			9	0.27	16	7.9	10.1	17.7	9	0.23	14	7.2	8.5	13.7
	667	2400	7	0.47	28	10.4	13.3	45.1	5	0.57	34	9.8	11.8	9.8
			8	0.38	23	10.1	12.6	32.4	7	0.40	24	9.6	11.4	34.3
			9	0.32	19	9.8	11.8	23.5	9	0.27	16	9.1	10.0	17.7
	833	3000	7	0.53	32	12.4	15.3	56.9	5	0.65	39	11.9	13.5	12.7
			8	0.43	26	11.9	14.2	39.2	7	0.45	27	11.6	13.0	42.2
			9	0.37	22	11.7	13.4	29.4	9	0.32	19	11.0	11.5	23.5
MD-100	1000	3600	7	0.75	45	16.3	21.8	21.6	5	1.02	61	16.0	21.0	36.3
			8	0.62	37	15.7	20.5	15.7	7	0.63	38	15.0	18.5	15.7
			9	0.52	31	15.2	19.2	11.8	9	0.43	26	14.0	16.1	8.8
	1333	4800	7	0.88	53	20.3	25.7	28.4	5	1.20	72	20.1	24.8	48.1
			8	0.73	44	19.9	24.2	20.6	7	0.75	45	19.1	22.0	21.6
			9	0.60	36	19.2	22.3	14.7	9	0.52	31	17.9	19.2	11.8
	1667	6000	7	1.00	60	24.4	29.0	35.3	5	1.35	81	23.9	28.1	58.8
			8	0.82	49	23.5	27.4	24.5	7	0.87	52	22.8	25.0	27.5
			9	0.68	41	23.1	25.4	18.6	9	0.58	35	21.5	22.0	13.7
MD-150	1833	6600	7	1.20	72	27.9	34.9	10.8	5	1.65	99	27.9	34.4	18.6
			8	1.08	65	28.3	36.3	57.9	7	1.13	68	27.0	32.9	62.8
			9	0.92	55	27.7	34.2	44.1	9	0.77	46	25.4	28.8	32.4
	2167	7800	7	1.33	80	31.9	38.9	12.7	5	1.80	108	31.6	37.6	21.6
			8	1.18	71	32.1	39.7	67.7	7	1.13	68	29.5	32.8	9.8
			9	1.00	60	31.6	37.6	51	9	0.85	51	29.4	31.9	38.2
	2500	9000	7	1.43	86	35.5	41.8	14.7	5	1.97	118	35.3	41.1	25.5
			8	1.17	70	34.9	38.8	10.8	7	1.23	74	33.4	36.0	11.8
			9	1.08	65	35.5	40.3	57.9	9	0.93	56	33.1	34.9	45.1

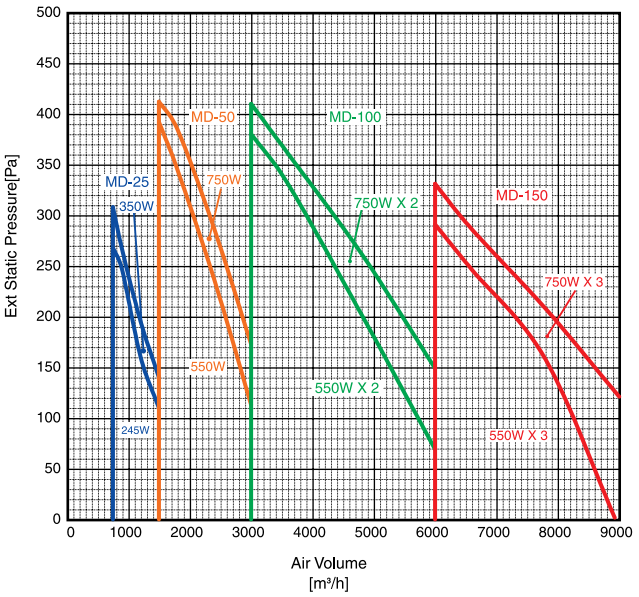
Cooling Capacity : 6 Rows

On coil air temperature : DB26[°C] / WB18.7[°C]

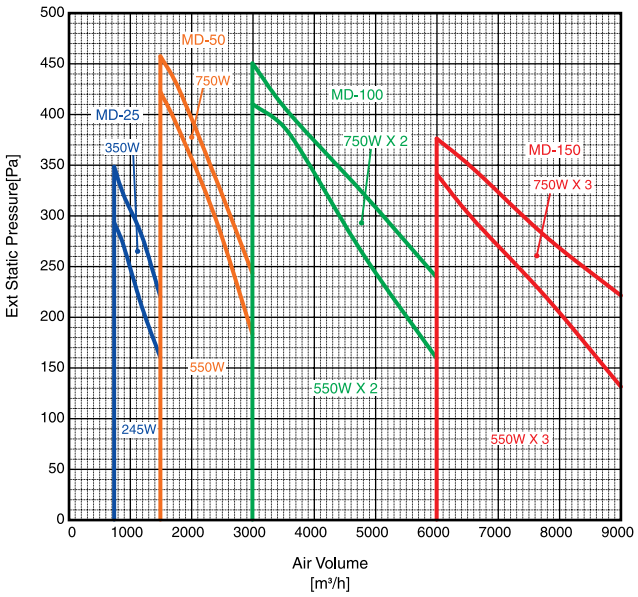
Model	Air Volume		On coil water temperature 5.5 [°C]						On coil water temperature 7 [°C]					
	[l/s]	[m³/h]	Water Temperature Difference [K]	Water Flow [l/s]	Water Flow [l/min]	Capacity Sensible [kW]	Capacity Total [kW]	Water Side Pressure Drop [kPa]	Water Temperature Difference [K]	Water Flow [l/s]	Water Flow [l/min]	Capacity Sensible [kW]	Capacity Total [kW]	Water Side Pressure Drop [kPa]
MD- 25	250	900	7	0.25	15	4.8	7.2	12.7	5	0.33	20	4.7	6.9	21.6
			8	0.22	13	4.7	6.9	10.8	7	0.22	13	4.4	6.3	10.8
			9	0.18	11	4.5	6.6	7.8	9	0.15	9	4.1	5.5	5.9
	333	1200	7	0.30	18	6.0	8.8	17.7	5	0.42	25	5.9	8.5	31.4
			8	0.25	15	5.9	8.4	12.7	7	0.27	16	5.6	7.6	14.7
			9	0.22	13	5.7	7.9	10.8	9	0.18	11	5.2	6.7	7.8
	417	1500	7	0.35	21	7.3	10.2	23.5	5	0.48	29	7.1	9.9	40.2
			8	0.30	18	7.1	9.8	17.7	7	0.30	18	6.7	8.8	17.7
			9	0.25	15	6.8	9.1	12.7	9	0.20	12	6.2	7.6	8.8
MD- 50	500	1800	7	0.50	30	9.6	14.4	11.8	5	0.67	40	9.3	13.7	18.6
			8	0.45	27	9.8	14.7	62.8	7	0.47	28	9.2	13.3	66.7
			9	0.38	23	9.6	14.1	48.1	9	0.33	20	8.6	12.1	37.3
	667	2400	7	0.60	36	12.1	17.5	15.7	5	0.82	49	11.8	16.9	26.5
			8	0.50	30	11.7	16.8	11.8	7	0.52	31	11.2	15.2	12.7
			9	0.47	28	12.0	17.2	66.7	9	0.40	24	11.0	14.7	51.0
	833	3000	7	0.70	42	14.5	20.5	20.6	5	0.95	57	14.2	19.8	35.3
			8	0.58	35	14.2	19.5	15.7	7	0.60	36	13.3	17.5	15.7
			9	0.48	29	13.6	18.1	10.8	9	0.47	28	13.1	17.0	66.7
MD-100	1000	3600	7	1.02	61	19.7	29.4	53.9	5	1.28	77	18.3	26.6	12.7
			8	0.85	51	19.1	28.5	39.2	7	0.90	54	18.2	26.0	43.2
			9	0.73	44	18.6	27.4	30.4	9	0.63	38	17.1	23.4	23.5
	1333	4800	7	1.17	70	23.7	33.9	10.8	5	1.57	94	23.1	32.6	17.7
			8	1.05	63	24.4	34.9	56.9	7	1.08	65	22.8	31.6	59.8
			9	0.90	54	23.8	33.5	43.2	9	0.77	46	21.6	28.4	33.3
	1667	6000	7	1.35	81	28.3	39.3	13.7	5	1.82	109	27.8	38.1	22.6
			8	1.10	66	27.6	36.8	9.8	7	1.15	69	26.2	33.6	10.8
			9	1.03	62	28.1	38.6	54.9	9	0.87	52	25.7	32.6	41.2
MD-150	1833	6600	7	1.72	103	34.5	50.0	29.4	5	2.28	137	33.4	47.7	48.1
			8	1.43	86	33.5	47.8	21.6	7	1.48	89	31.3	43.5	22.6
			9	1.22	73	32.4	45.6	16.7	9	1.03	62	29.3	38.6	12.7
	2167	7800	7	1.93	116	39.5	56.4	36.3	5	2.48	149	37.4	52.0	18.6
			8	1.62	97	38.2	53.8	26.5	7	1.67	100	36.1	48.8	28.4
			9	1.35	81	37.1	50.8	19.6	9	1.15	69	33.5	42.9	14.7
	2500	9000	7	2.13	128	44.1	62.2	43.2	5	2.73	164	41.7	57.1	21.6
			8	1.77	106	43.1	59.0	31.4	7	1.83	110	40.0	53.4	33.3
			9	1.48	89	41.2	55.6	22.6	9	1.25	75	37.6	47.1	17.7

Unit Selection Chart : 4 Rows Coil

Motor Speed "MED" (Coil : 4Rows)

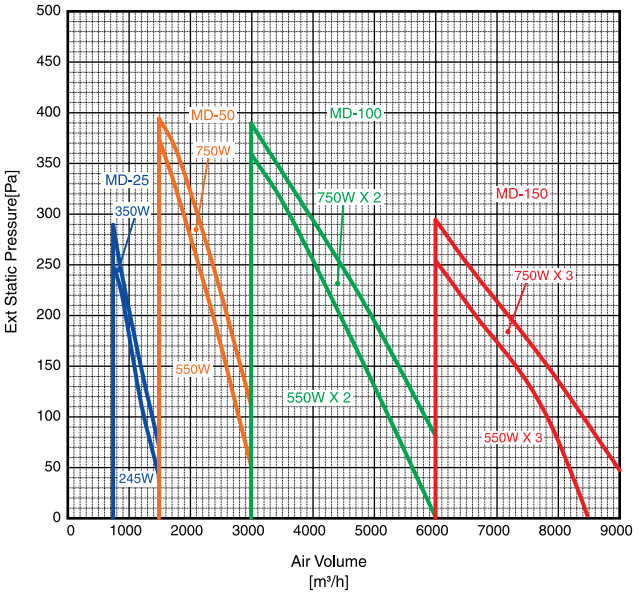


Motor Speed "HIGH" (Coil : 4Rows)

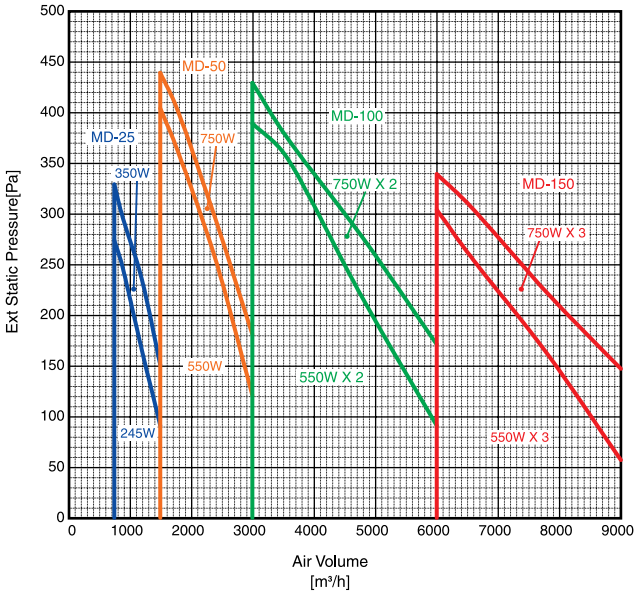


Unit Selection Chart : 6 Rows Coil

Motor Speed "MED" (Coil : 6Rows)



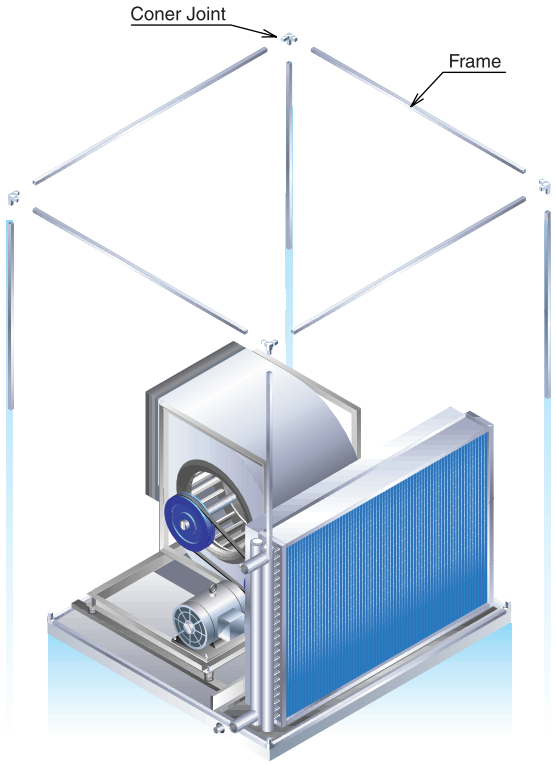
Motor Speed "HIGH" (Coil : 6Rows)

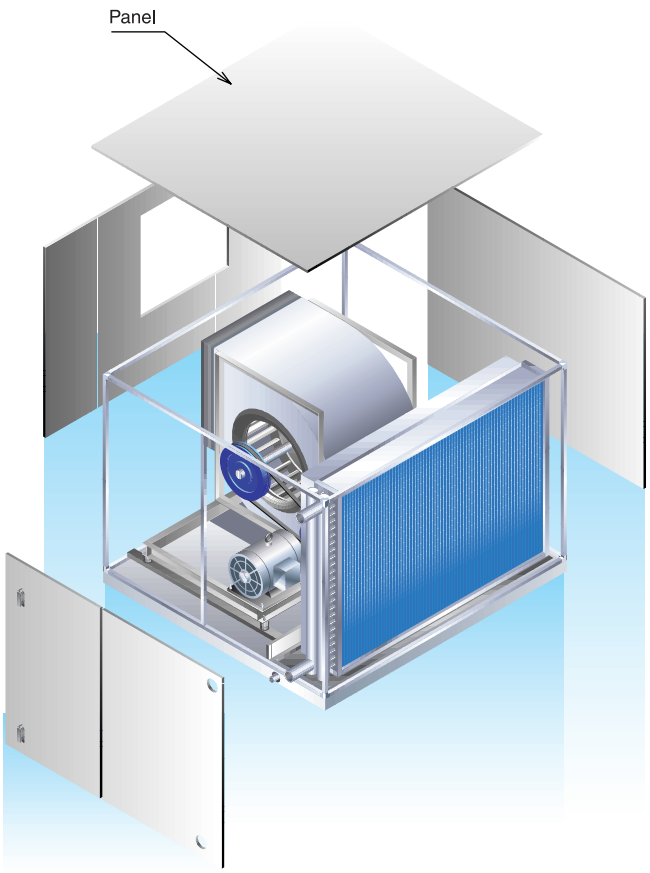


Note : Pressure drop of standard 25mm thick filter is included in unit internal static pressure.

Rigid and easy-to-assemble frame

Main Frame

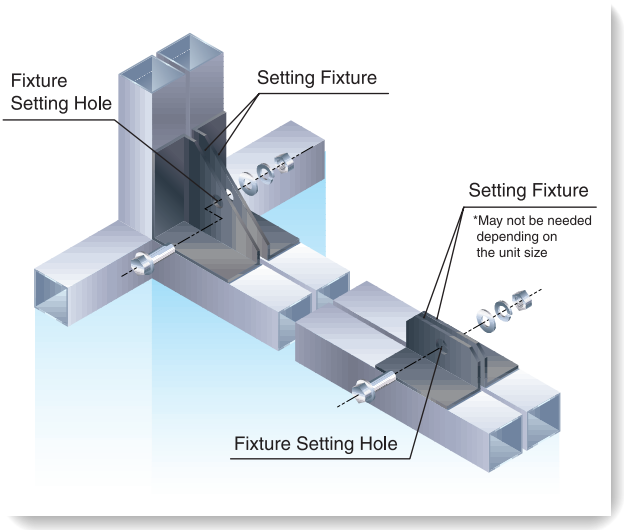




Features of COOL JOY Frame

- **The frame is constructed from the main frame and corner joint**
- **Easy to assemble at job site via knock-down transportation**
- **The main frame materials vary depending on the thickness of the casing panel**
  For 25mm thick panel : Aluminum frame
  For 50mm thick panel : Steel frame
- **Using triangular metal fittings for corner joints, the units can be assembled easily with nuts and bolts**

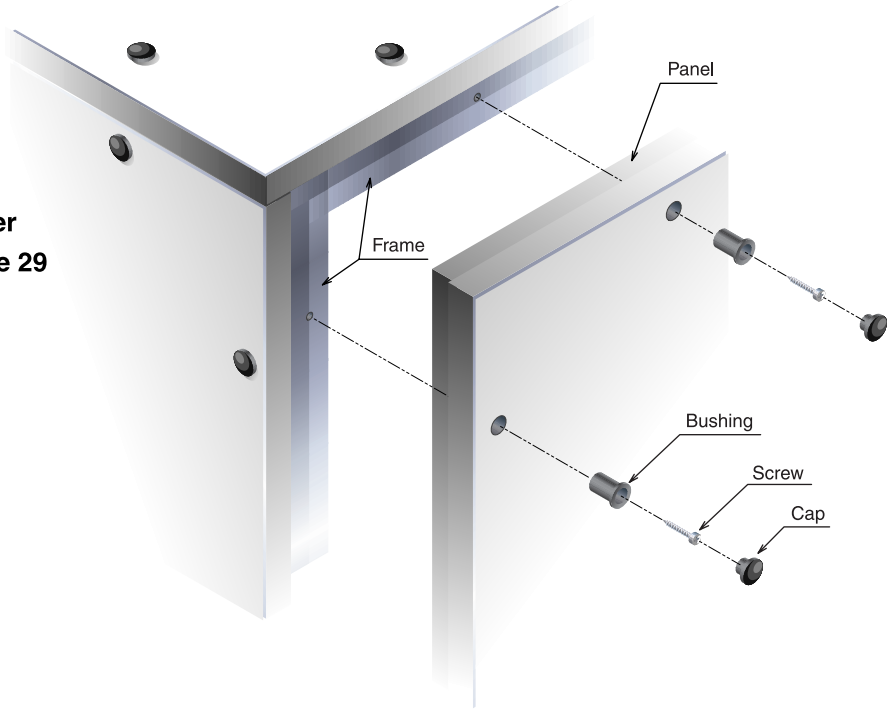
Setting Fixture



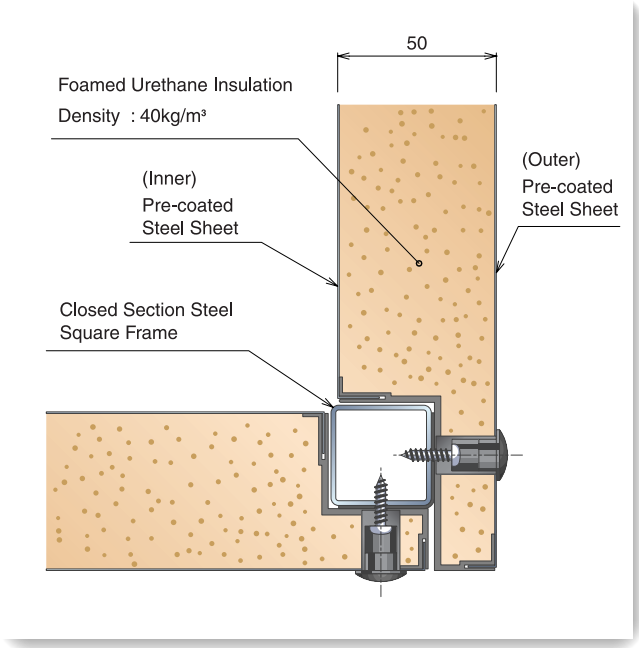
The panel uses an external screw structure that shows great resistant-to-condensation performance in severe environments

Features of COOL JOY Panel

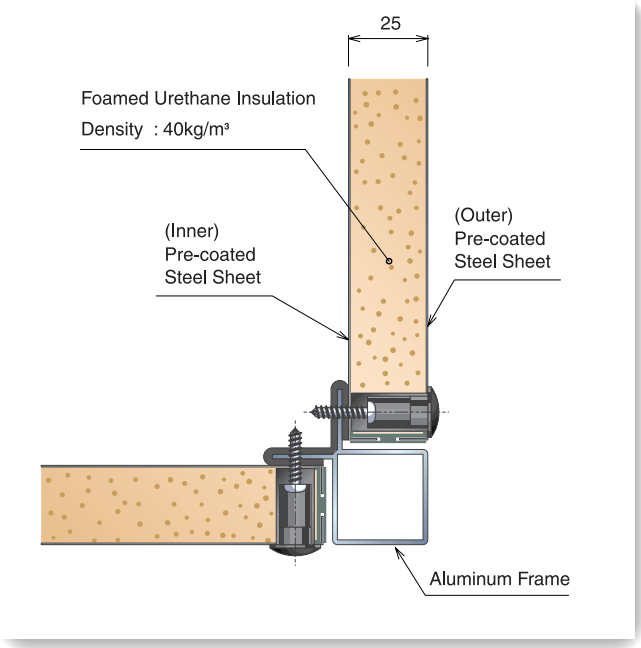
- **The panel can be disassembled easily from the outside using the external screws**
- **Since the top of the screws are not exposed, it is effective against dew condensation as per Insulation limit Diagram on Page 29**



●PANEL : 50mm thick double skinned



●PANEL : 25mm thick double skinned



Each unit is manufactured with carefully selected parts and strict quality control

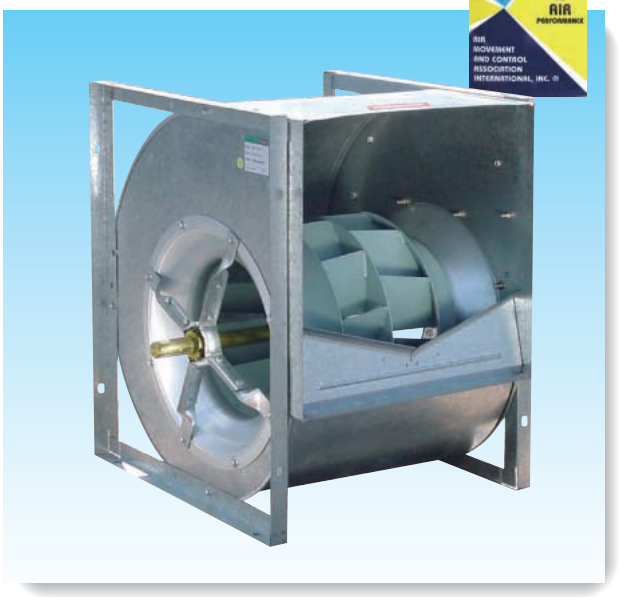
Fan Wheel

Forward Fan

Special forward impeller, and AMCA-certified fan.

Backward Fan

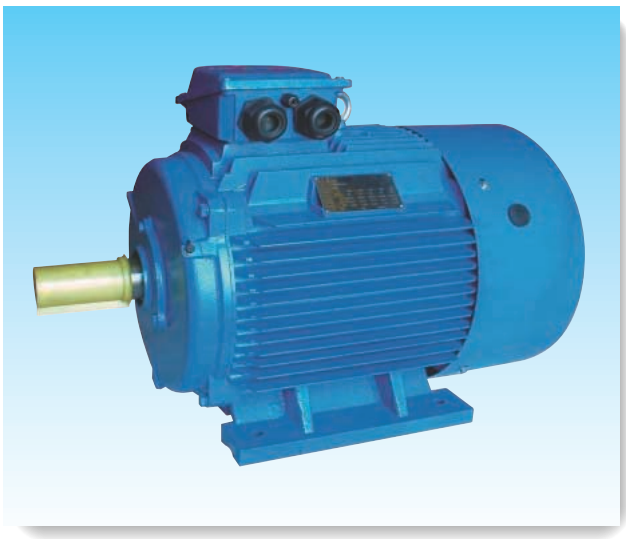
High efficiency, Low power consumption. With the special limit load characteristics, there is no concern of overloading. AMCA certified fan wheel.



Motor

Standard Motor

TEFC motor with waterproofing performance of IP55 ClassF.



Coil

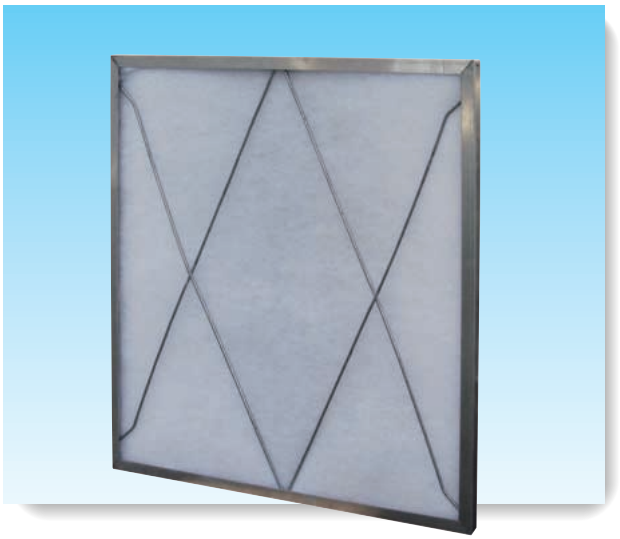
Cooling Coil

Copper tube and aluminum fin construction. Achieves a higher heat transfer coefficient and lower air resistance.

Filter

Panel Type

Synthetic non-woven fiber or glass fiber is used as filter media. Both reusable and disposable types are available.



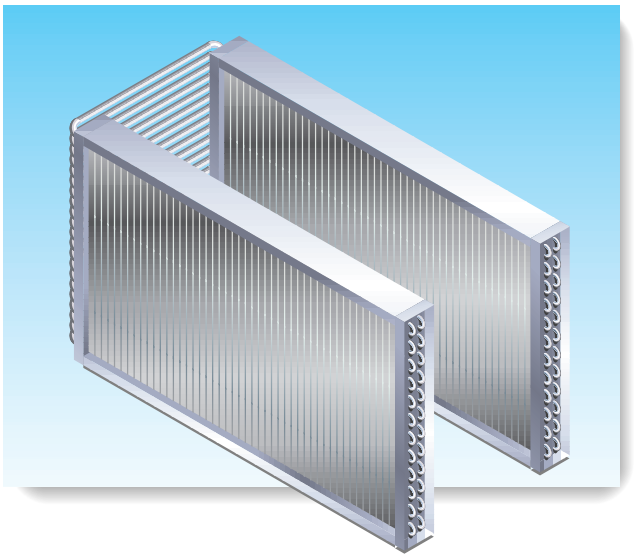
Bag Type

As the dust holding capacity is large, it requires less maintenance.

Heat Pipe

Heat Pipe

No running cost. Heat circulation pump or motor are not required for Heat Pipe.



Heat Exchanger

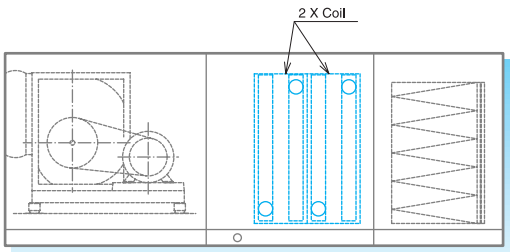
Heat Recovery Wheel

The rotor type heat wheel recovers heat from the exhaust air to the supply air. This system can be used in any air condition, and it decreases power consumption.

Optional arrangement of COOL JOY(RS,RG,FH,FE Series)

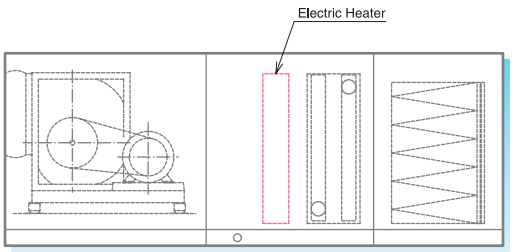
Two Coil Type

Unit is complete with several coils. Additional cooling coil can be installed when there is a requirement for larger cooling load.



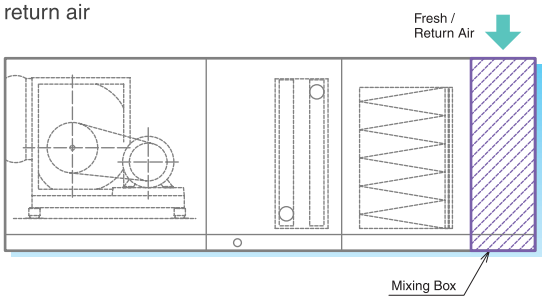
Electric Heater

Unit is complete with electric heater for heating or reheating



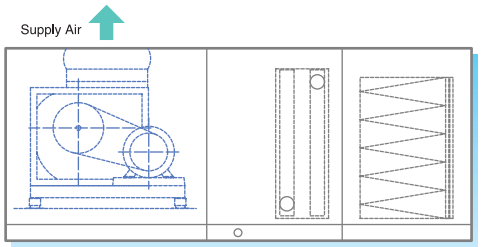
Mixing Box

Unit is complete with mixing box for taking in the fresh air and return air



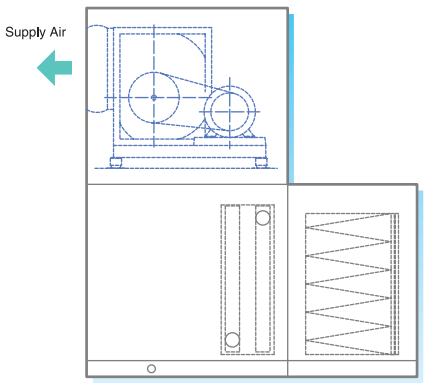
Upper Discharge

Designed to connect to SA duct from the upper side.



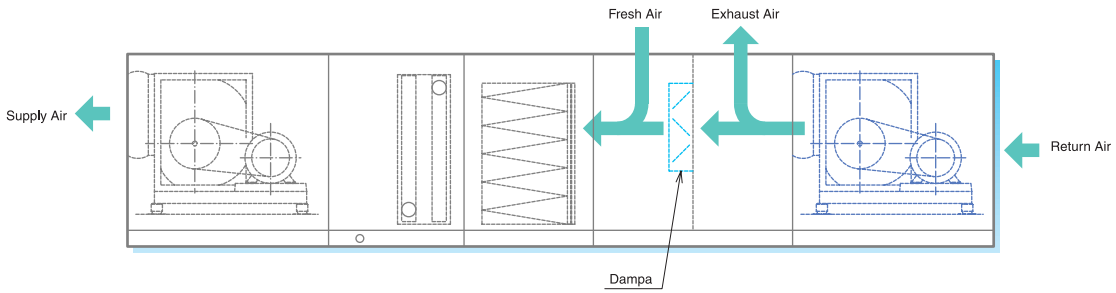
Vertical Mount

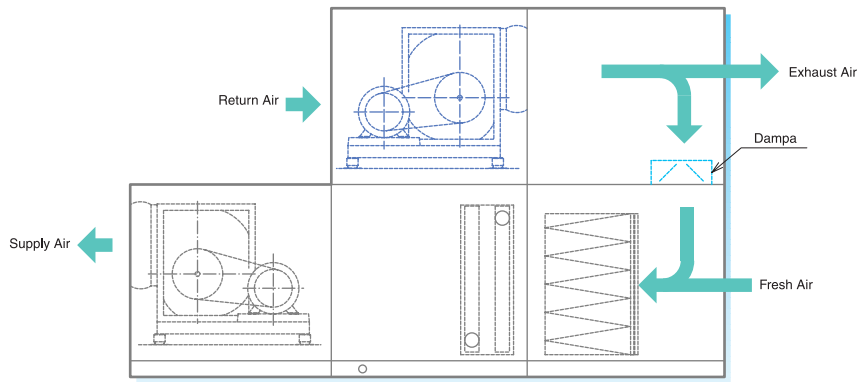
Saves space by setting the fan section on top of the coil section.



RA Fan Type

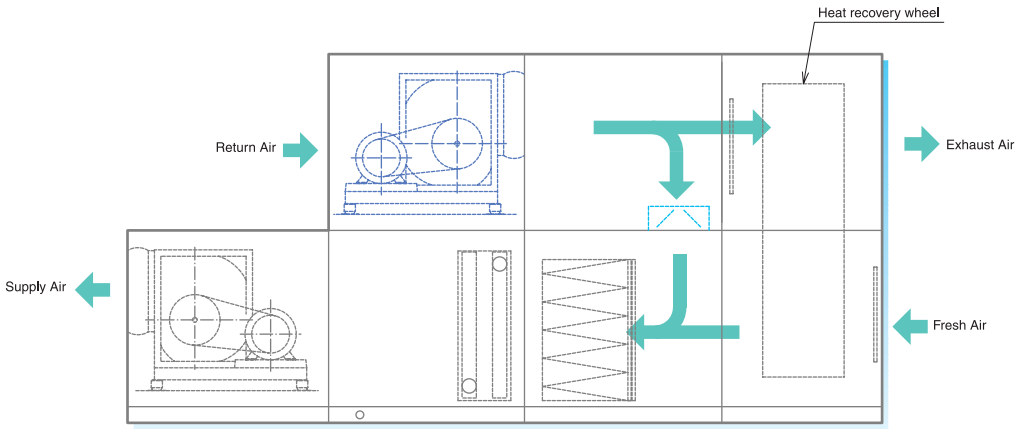
Unit is complete with RA fan OA and EA dampers can be added to balance the return and fresh air volume.





RA Fan and Heat Recovery Wheel

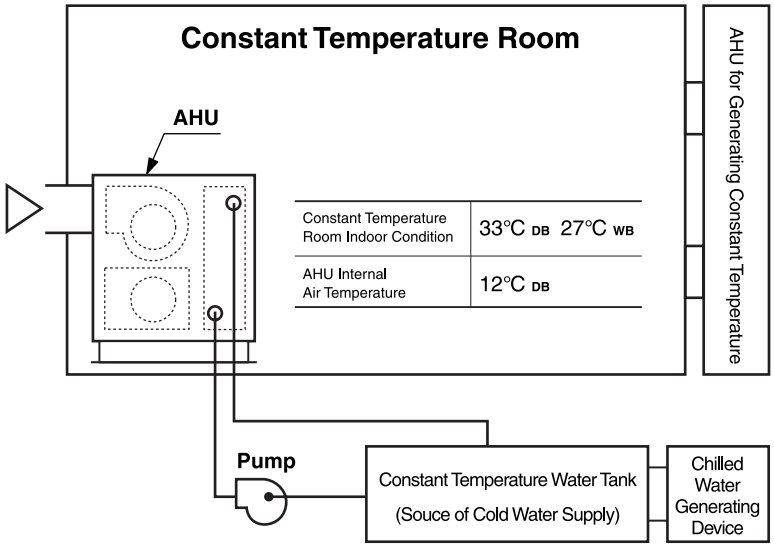
In addition to the RA fan, heat recovery wheel is added to recover heat energy of the fresh air and exhaust air effectively.



Insulation Limit vs AHU Components

AHUs will be installed at various locations such as plant rooms, ceiling space, or outdoors.
AHUs lined with certain insulation can have dew formation (while in cooling operation) on the outer surface of the unit, depending on the condition of the ambient air (such as temperature or humidity level).
Through laboratory testing, SINKO's AHUs have been verified to have high insulation performance.
Such performance is reported as "Insulation Limit vs AHU Components".

Insulation Limit Test Setup For AHU



$$R' = \frac{DB1 - t_1}{DB1 - t_2}$$

DB1 Constant temperature room indoor dry-bulb temperature(°C)

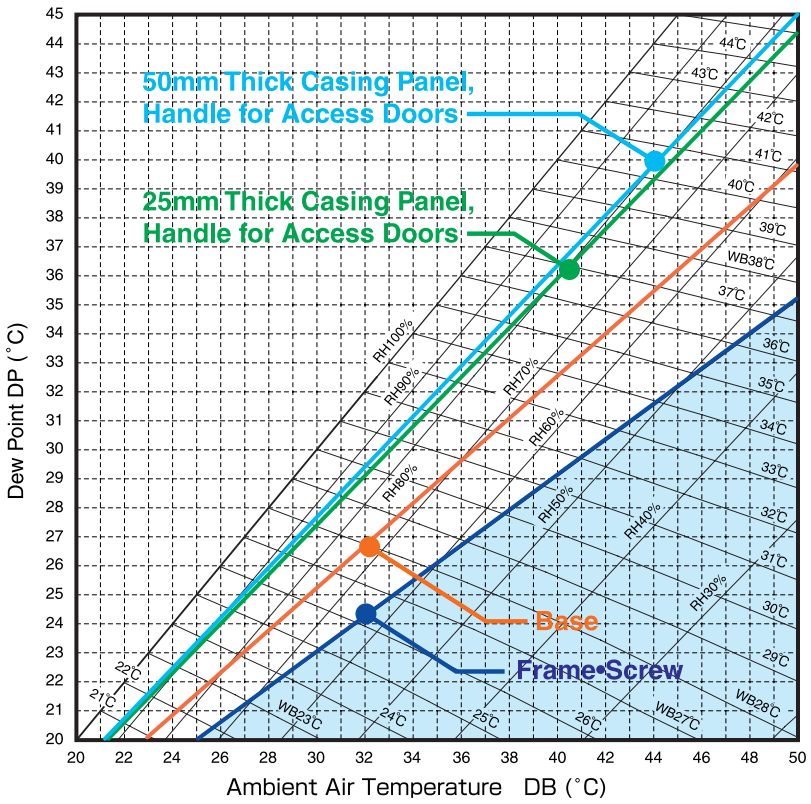
t_1 External surface temperature of component(°C)

t_2 AHU internal air temperature(°C)

Test Result

Component Name	Insulation Coefficient R'
External Panel (25mm)	0.15
External Panel (50mm)	0.13
Base	0.27
Frame	0.39
Screws	0.39
Handle For Access Doors	0.15

Insulation Limit AHU Components at 12°C AHU Internal Air Temperature



Note:
Condensation will not be generated if AHU is installed where the ambient air condition is within the range of ▭.

AHU Specification Check Sheet

Please write a check mark in ☐ and fill in ( ) with specification. Date:

Project Name

Item No. **Quantity( )Units**

AHU Specifications

AHU Mdel	☐CJ-RS ☐CJ-MD ☐CJ-FH ☐CJ-FE	AHU Size	( )
Discharge/ Pipehand	☐H-R ☐V-R ☐H-L ☐V-L	Location of Installation	☐Indoor ☐Outdoor
Power Source	( )v	Frequency	☐50Hz ☐60Hz

Air Supply Side Fan Specifications (Design conditions)

Air Volume ( )	☐m³/h ☐l/s ☐ft³/min	Static Pressure	☐Static Pressure ☐External Static Pressure ( ) ☐Pa ☐inWg
Fan Type	☐Forward Wheel ☐Backward Wheel	Discharge Air Velocity	☐Yes ☐No ( ) ☐m/s ☐ft/min

Coil (Design conditions)

Entering Air Conditions	☐Total Supply Air Volume	☐Outside Air, Return Air Volume Specified	
	Total Supply Air Volume ( ) ☐m³/h ☐l/s ☐ft³/min	Outside Air Volume ( ) ☐m³/h ☐l/s ☐ft³/min	Return Air Volume ( ) ☐m³/h ☐l/s ☐ft³/min
	DB ( ) ☐°C ☐°F	DB ( ) ☐°C ☐°F	DB ( ) ☐°C ☐°F
	☐ WB ( ) ☐°C ☐°F ☐ RH ( ) %	☐ WB ( ) ☐°C ☐°F ☐ RH ( ) %	☐ WB ( ) ☐°C ☐°F ☐ RH ( ) %

Capacity	☐ Capacity ( ) ☐kW ☐Btu•h	☐ Leaving Air Temperature ☐ WB ( ) ☐°C ☐°F
Chilled Water	Entering Temperature ( ) ☐°C ☐°F	☐ Chilled Water Fiow Rate ( ) l/m
	☐ Leaving Temperature ( ) ☐°C ☐°F	☐ Temperature Rise ( ) ☐°C ☐°F
Face Air Velocity	Requirement ☐Yes ☐No ( ) ☐m/s ☐ft/min	

Heat Recovery Wheel

☐Yes ☐No	Heat Exchange Efficiency Total Heat ( )%	Outside Air Volume ( ) ☐m³/h ☐l/s ☐ft³/min	Return Air Volume ( ) ☐m³/h ☐l/s ☐ft³/min

Heat Pipe (Precool/Reheat)

☐Yes ☐No	☐Pre-Cool Capacity ☐Reheat Capacity ( ) ☐kW ☐Btu•h	Pre-Cool/Reheat Temperature Difference ( ) ☐°C ☐°F

Return Air Fan

☐Yes ☐No	Return Air Volume ( ) ☐m³/h ☐l/s ☐ft³/min	Static Pressure ☐ Static Pressure ☐ External Static Pressure ( ) ☐Pa ☐inWg

Filter

Bag Type	☐Yes ☐No	Efficiency	☐60% ☐80% ☐90%	Panel Type	☐Yes ☐No

SINKO INDUSTRIES LTD.

2-57-7,NIHONBASHI HAMACHO
CHUO-KU,TOKYO 103-0007 JAPAN

TEL:(81-3)5640-4167
FAX:(81-3)5640-4306

http://www.sinko.co.jp/skeng/index.html
Mail:intnl@sinko.co.jp

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