SHINKO

AIR HANDLING UNIT

FH

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)

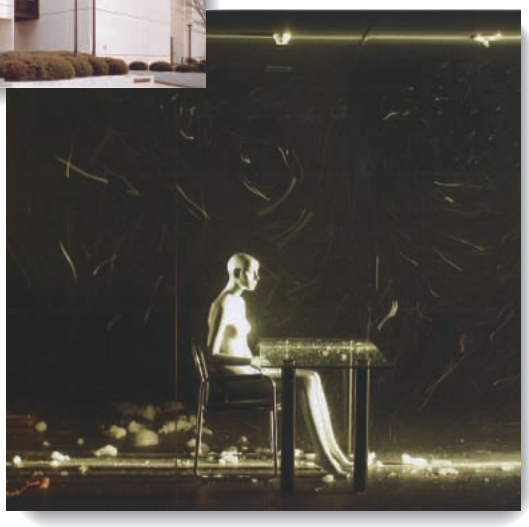
CENTRAL JAPAN
INTERNATIONAL AIRPORT
(Nagoya Japan)

HOTEL WINDSOR
(Australia)

SINKO Research & Development

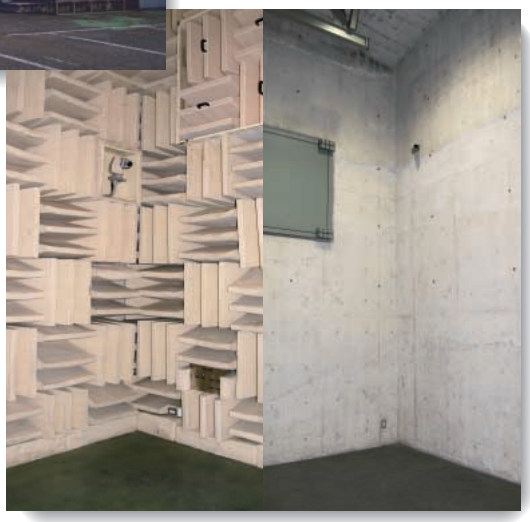
SINKO Laboratory is located in Neyagawa, Osaka, and it is recognized as one of the foremost industrial research centers in Japan's HVAC industry for developing and testing new systems.
Our laboratory features the most modern facilities comprising overall HVAC testing functions: an air movement test room, 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



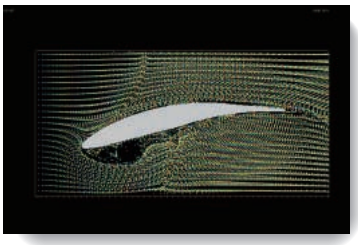
Visualized Airflow Test Room

R & D Center
Located in Hadano, Kanagawa

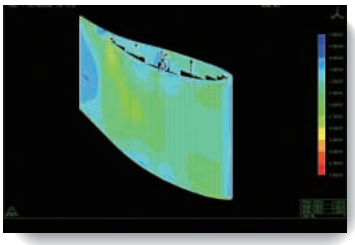


Insulated Acoustic Room
(Semi-Anechoic Wall)

Reverberation Chamber



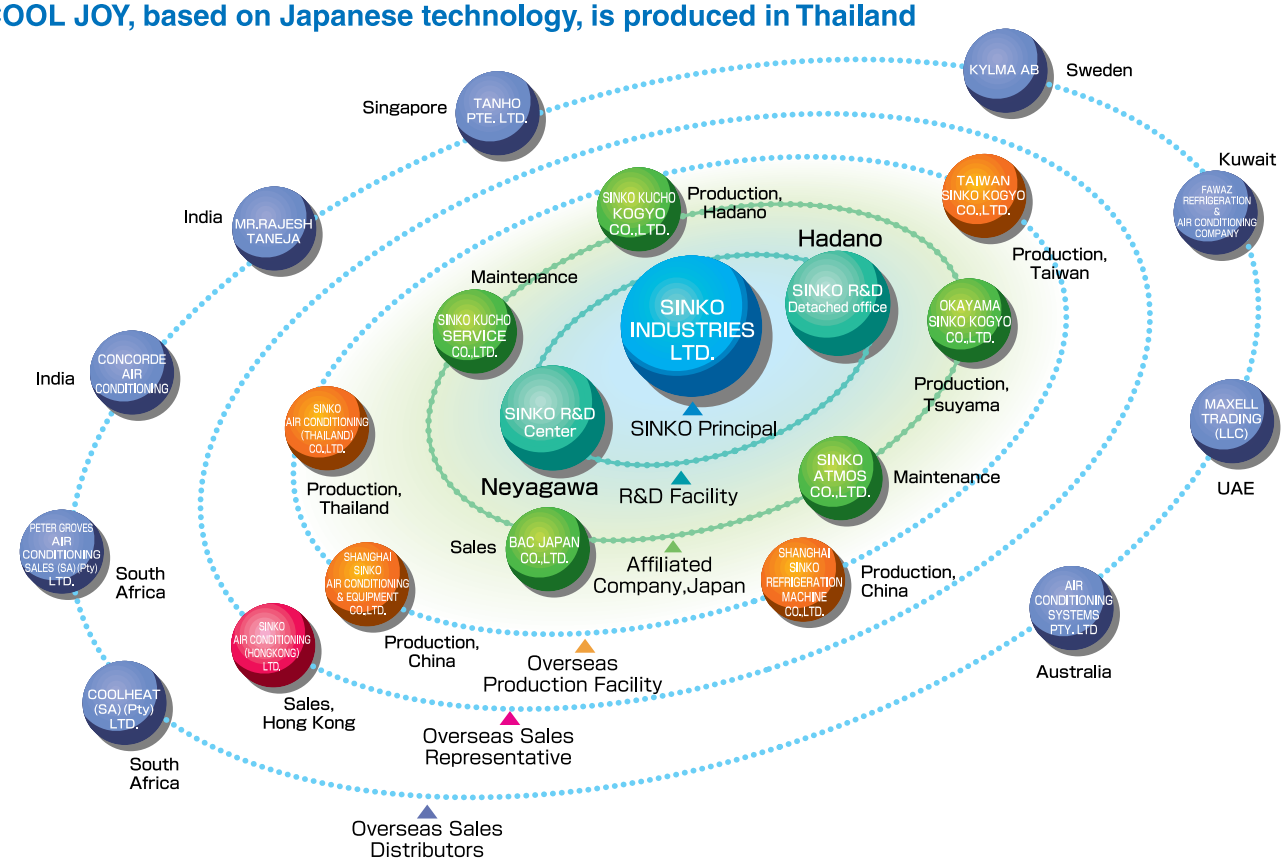
Fluid Analysis



Struture Analysis

SINKO Group Companies

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



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

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

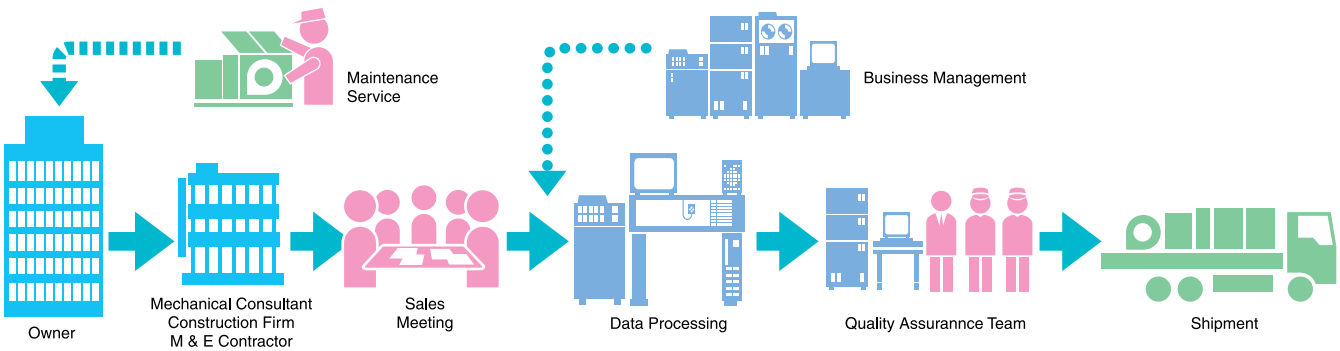
Overseas Group Companies

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

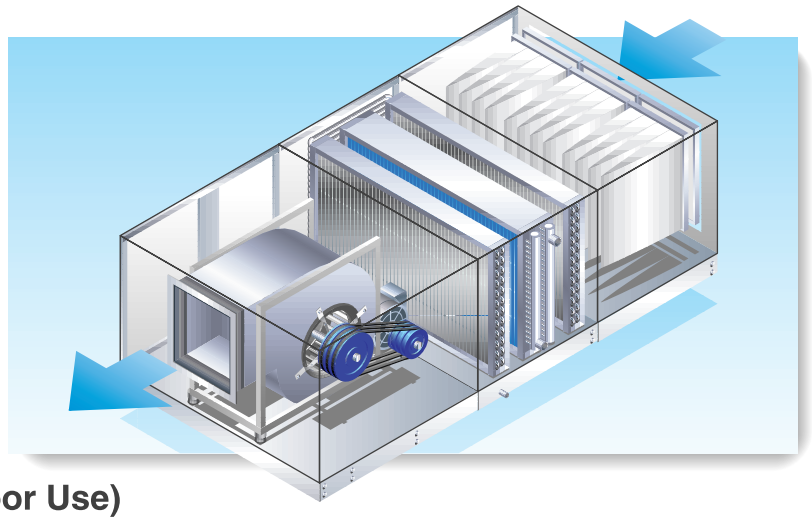
SINKO quickly responds to your various needs in the planning, production, and maintenance phases.



Fresh air Intake Type

FH

Energy-saving model with built-in heat pipe



Standard Specifications (Indoor Use)

Main Component	Main Part Name	Standard Specifications
Casing	Panel	50mm thick double skinned casing panel with foamed Urethane insulation ·Internal/external panel : 0.5mm thick pre-coated steel sheet ·Density of polyurethane foam : 40[kg/m³]
	Main Frame	Steel
	Access Door	50mm thick double skinned casing panel with foamed Urethane insulation ·Internal/external panel : 0.5mm thick pre-coated steel sheet ·Density of polyurethane foam : 40[kg/m³]
	Base	Steel , Epoxy paint finished
Drain Pan	Drain Pan	Stainless steel 304
Fan & Motor	Fan	Forward wheel
	Motor	TEFC type , IP55 , Class F
	Vibration Isolator	Spring Vibration Isolator
Coil	Water Coil	Max.working pressure : 0.98 [MPa] Maximum face velocity : 3.0 [m/s]
	Main Tube	AHU Size FH-50~215 : 3/8"dia copper tube
		AHU Size FH-235~665 : 5/8"dia copper tube
	Fin	AHU Size FH-50~215 ·Aluminum , 0.115mm thickness , Bare surface ·Fin spacing : 11FPI
		AHU Size FH-235~665 ·Aluminum , 0.15mm thickness , Bare surface ·Fin spacing : 8 , 9 , 11FPI
	Header	Steel , Epoxy paint finished "Air vent with plug" and "Drain plug" is attached.
	Take-off pipe	20A~80A : Steel , MPT , Epoxy paint finished 100A , 125A : Steel , Steel pipe flanges , Epoxy paint finished
	Casing	Steel , Epoxy paint finished
Filter	Pre-filter	20mm panel type , Non-woven type EN779 Classification : G3 Size : (W)592×(H)592 , (W)592×(H)287 , (W)287×(H)592
	Main-filter	Bag type EN779 Classification : F6 , F7 , F8 Size : (W)592×(H)592 , (W)592×(H)287 , (W)287×(H)592

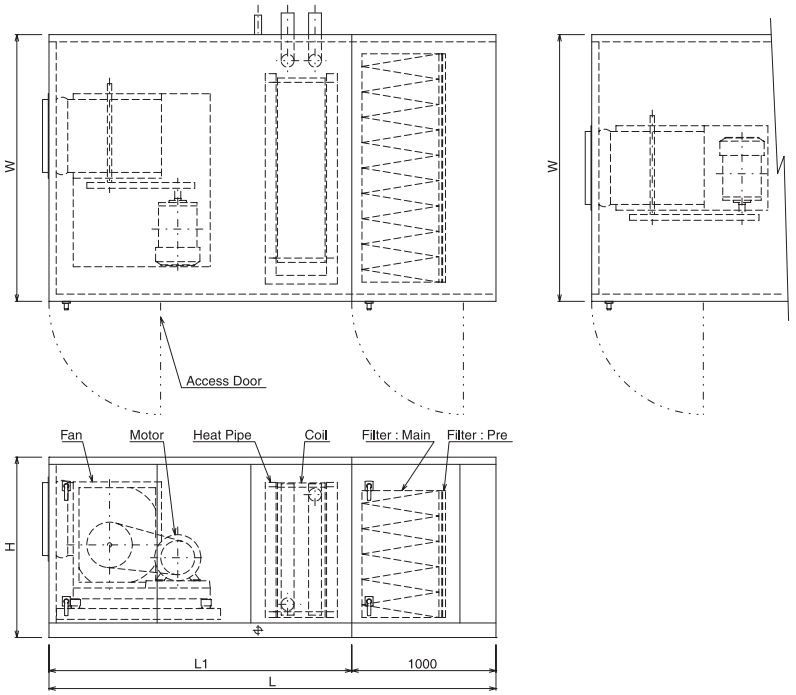
Optional Specifications

Main Component	Main Part Name	Optional Specifications
—	—	Use : Outdoor
Casing	Panel	Thicker pre-coated steel sheet available on request
	Access Door	Thicker pre-coated steel sheet available on request
Fan	Fan	Backward wheel
Coil	Water coil	Coil for higher working pressure available on request
	Fin	Pre-coated Aluminum Fin
	Header	Copper tube

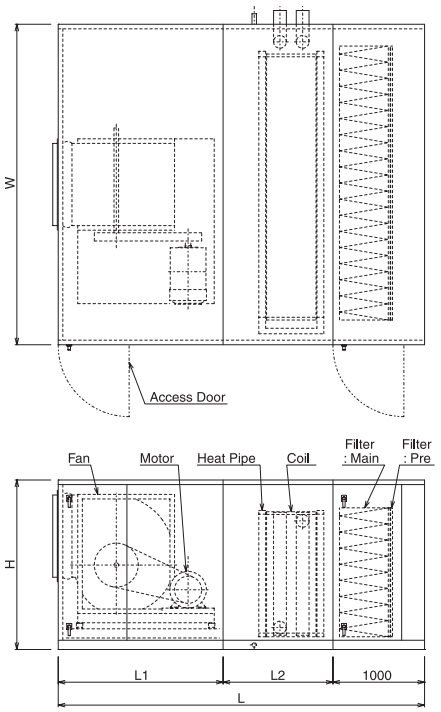
Note : Selection of optional components is subject to change in dimension from the standard.

Dimensions

FH-50~215 (Type1)



FH-235~665 (Type2)



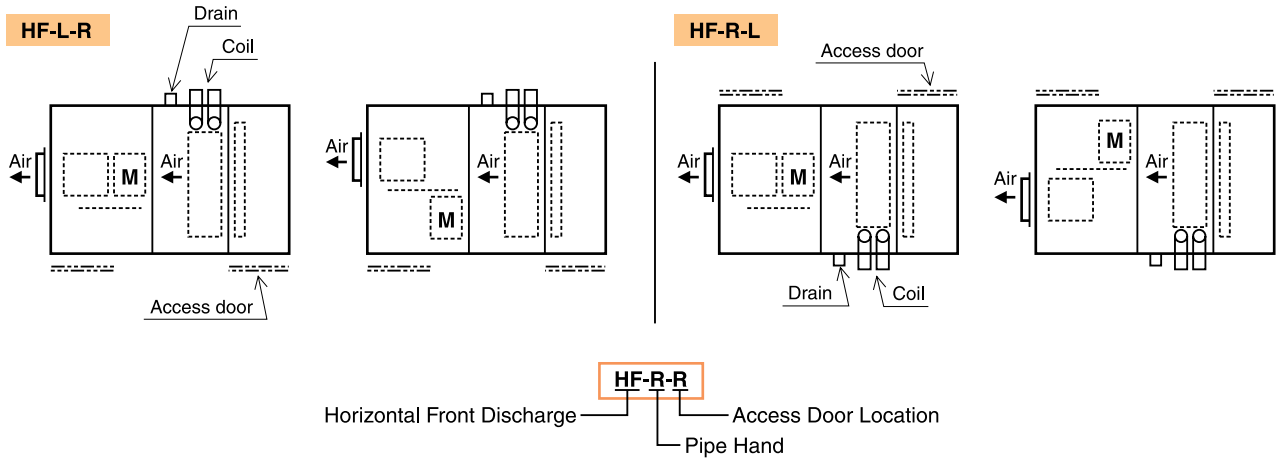
Model	Dimensions [mm]						Maximum Fan Model	Maximum Motor Size
	W	H	L	L1	L2	Type		
FH- 50	1350	950	2700	1700	-	1	FDA 250	5.5 kW
FH- 65	1450	1000	2750	1750	-	1	FDA 280	7.5 kW
FH- 85	1550	1000	2750	1750	-	1	FDA 280	7.5 kW
FH-100	1650	1050	3050	2050	-	1	FDA 315	11 kW
FH-120	1750	1150	3050	2050	-	1	FDA 355	11 kW
FH-135	1850	1250	3100	2100	-	1	FDA 400	11 kW
FH-150	1850	1250	3100	2100	-	1	FDA 400	15 kW
FH-165	1950	1250	3100	2100	-	1	FDA 400	15 kW
FH-185	2050	1300	3100	2100	-	1	FDA 450	15 kW
FH-200	2150	1300	3100	2100	-	1	FDA 450	15 kW
FH-215	2150	1300	3100	2100	-	1	FDA 450	15 kW
FH-235	2250	1400	3650	1450	1200	2	FDA 500	15 kW
FH-250	2250	1400	3700	1500	1200	2	FDA 500	18.5 kW
FH-285	2450	1400	3700	1500	1200	2	FDA 500	18.5 kW
FH-335	2700	1550	3750	1550	1200	2	FDA 560	18.5 kW
FH-365	2700	1550	3750	1550	1200	2	FDA 560	22 kW
FH-415	2900	1700	3750	1550	1200	2	FDA 630	22 kW
FH-450	3100	1700	3850	1650	1200	2	FDA 630	30 kW
FH-500	3100	1700	3850	1650	1200	2	FDA 630	30 kW
FH-535	3300	1850	4000	1800	1200	2	FDA710	30 kW
FH-585	3300	1850	4000	1800	1200	2	FDA 710	37 kW
FH-665	3500	1850	4000	1800	1200	2	FDA 710	37 kW

Cooling Capacity

On coil air temperature : DB39.2 [°C] / WB28.6 [°C] On coil water temperature : 7 [°C] Water temperature difference : 5 [K]

Model	Coil Face Area	Air Volume			8 Rows			9 Rows			12 Rows		
					Capacity		Water Side Pressure Drop	Capacity		Water Side Pressure Drop	Capacity		Water Side Pressure Drop
	[m²]	[l/s]	[m³/h]	[CFM]	Sensible [kW]	Total [kW]	[kPa]	Sensible [kW]	Total [kW]	[kPa]	Sensible [kW]	Total [kW]	[kPa]
FH- 50	0.280	700	2520	1487	21.85	45.52	9.8	22.99	48.92	26.5	25.04	53.27	18.6
		833	3000	1770	25.13	52.36	11.8	26.63	56.65	33.3	29.16	62.05	23.5
FH- 65	0.372	931	3350	1977	29.33	61.11	10.8	30.66	65.24	28.4	33.28	70.81	19.6
		1111	4000	2360	33.54	69.87	13.7	35.56	75.66	36.3	39.02	83.03	26.5
FH- 85	0.465	1164	4190	2472	36.85	76.78	14.7	38.58	82.08	39.2	41.78	88.90	27.5
		1389	5000	2950	42.29	88.10	17.7	43.79	91.22	7.8	48.96	104.18	35.3
FH- 100	0.554	1386	4990	2944	44.10	91.88	17.7	44.50	94.69	6.9	49.92	106.22	33.3
		1667	6000	3540	51.03	106.32	22.6	52.55	109.48	8.8	57.88	123.15	14.7
FH- 120	0.653	1633	5880	3469	51.35	109.26	27.5	52.96	112.69	10.8	58.42	124.29	17.7
		1944	7000	4130	60.12	125.26	34.3	62.34	129.87	13.7	68.05	144.79	22.6
FH- 135	0.743	1858	6690	3947	59.76	124.50	30.4	60.31	128.32	12.7	66.47	141.42	19.6
		2222	8000	4720	68.72	143.17	39.2	69.87	148.65	15.7	78.00	165.95	25.5
FH- 150	0.822	2056	7400	4366	64.90	138.08	32.4	66.90	142.33	12.7	73.56	156.50	20.6
		2500	9000	5310	77.30	161.04	42.2	80.17	167.02	16.7	87.50	186.17	27.5
FH- 165	0.939	2350	8460	4991	74.55	158.62	38.2	76.54	162.86	15.7	84.36	179.49	23.5
		2778	10000	5900	77.25	157.66	38.2	88.12	187.49	19.6	97.93	208.37	30.4
FH- 185	1.012	2531	9110	5375	82.08	170.99	47.1	82.76	176.08	18.6	91.14	193.91	28.4
		3056	11000	6490	80.18	157.22	40.2	96.93	206.24	24.5	107.73	229.21	38.2
FH- 200	1.123	2808	10110	5965	82.52	168.41	42.2	92.16	196.08	20.6	101.15	215.22	31.4
		3333	12000	7080	85.86	168.35	42.2	106.23	226.03	26.5	117.93	250.92	41.2
FH- 215	1.218	3047	10970	6472	88.32	180.25	42.2	100.09	212.95	21.6	109.76	233.53	33.3
		3611	13000	7670	91.67	179.75	42.2	115.09	244.87	27.5	126.89	269.98	42.2
FH- 235	1.299	3247	11690	6897	107.12	227.91	14.7	113.21	240.88	38.2	120.23	255.81	25.5
		3889	14000	8260	123.37	262.49	18.6	126.11	268.32	6.9	141.56	301.20	34.3
FH- 250	1.363	3408	12270	7239	112.43	239.22	16.7	115.20	245.11	6.9	126.48	269.11	29.4
		4167	15000	8850	132.18	281.24	21.6	135.12	287.48	8.8	151.67	322.71	40.2
FH- 285	1.533	3833	13800	8142	127.50	271.28	22.6	130.58	277.83	8.8	142.86	303.96	40.2
		4722	17000	10030	150.50	320.21	29.4	154.26	328.22	11.8	169.52	360.69	18.6
FH- 335	1.835	4589	16520	9747	153.87	327.38	29.4	157.22	334.50	11.8	169.36	360.35	17.7
		5556	20000	11800	173.43	361.32	34.3	183.27	389.93	14.7	200.85	427.33	22.6
FH- 365	2.038	5097	18350	10827	170.92	363.65	31.4	175.04	372.43	12.7	188.45	400.96	18.6
		6111	22000	12980	188.08	391.83	35.3	201.84	429.45	15.7	221.72	471.75	24.5
FH- 415	2.303	5758	20730	12231	193.08	410.81	35.3	198.05	421.38	13.7	213.21	453.63	20.6
		6944	25000	14750	201.92	420.66	36.3	230.99	491.46	17.7	251.96	536.08	27.5
FH- 450	2.493	6233	22440	13240	197.75	420.74	39.2	215.16	457.79	17.7	230.79	491.05	25.5
		7500	27000	15930	206.55	421.53	39.2	250.43	532.84	22.6	273.02	580.89	34.3
FH- 500	2.758	6897	24830	14650	215.37	448.68	40.2	238.67	507.80	18.6	255.51	543.64	28.4
		8333	30000	17700	225.66	451.31	41.2	278.26	592.05	24.5	303.35	645.43	37.3
FH- 535	2.961	7406	26660	15729	216.43	450.90	43.2	257.18	547.19	22.6	275.14	585.41	34.3
		8889	32000	18880	230.46	451.89	44.1	298.06	634.16	29.4	317.93	676.45	43.2
FH- 585	3.221	8053	28990	17104	235.74	481.10	44.1	279.66	595.02	24.5	299.19	636.57	35.3
		9722	35000	20650	245.55	481.47	44.1	326.00	693.61	31.4	339.91	723.21	44.1
FH- 665	3.685	9214	33170	19570	255.84	511.67	48.1	319.98	680.81	29.4	343.39	730.62	44.1
		11111	40000	23600	270.95	511.23	48.1	360.32	766.63	36.3	360.32	766.63	47.1

Piping / Access Door Arrangement



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

Sound Power Level

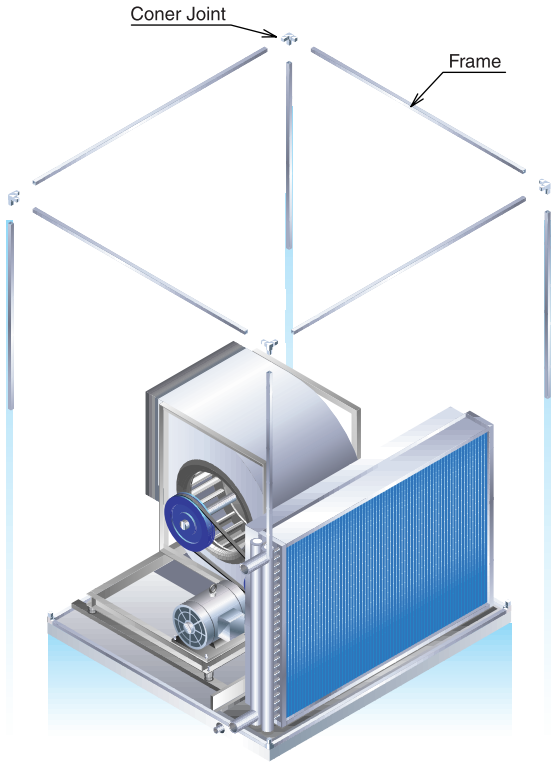
On coil air temperature : DB39.2 [°C] / WB28.6 [°C] Off coil air temperature : DB14.0 [°C] / WB13.5 [°C] Ext Static pressure : 350[Pa]

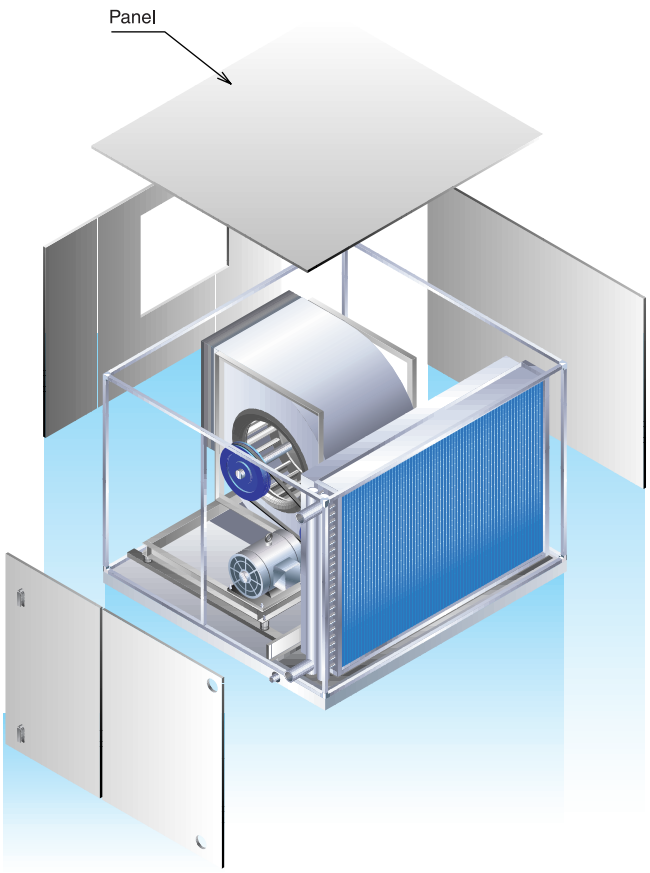
Model	Air Volume			Fan Model	Motor Size	Estimated PWL*							
						Octave Band Center Frequency [Hz]							
	[l/s]	[m³/h]	[CFM]			63	125	250	500	1000	2000	4000	8000
FH- 50	833	3000	1770	FDA 250	4kW	95	94	93	87	83	82	79	75
FH- 65	1111	4000	2360	FDA 250	5.5kW	95	94	94	88	83	82	79	76
FH- 85	1389	5000	2950	FDA 280	5.5kW	95	93	94	92	92	94	95	94
FH- 100	1667	6000	3540	FDA 315	7.5kW	98	95	98	94	97	96	96	95
FH- 120	1944	7000	4130	FDA 315	7.5kW	98	95	97	93	96	95	96	94
FH- 135	2222	8000	4720	FDA 355	11 kW	100	97	100	93	94	91	89	86
FH- 150	2500	9000	5310	FDA 400	11 kW	106	103	102	90	84	81	78	73
FH- 165	2778	10000	5900	FDA 400	11 kW	104	101	101	90	87	82	80	76
FH- 185	3056	11000	6490	FDA 400	11 kW	103	100	100	90	90	85	83	79
FH- 200	3333	12000	7080	FDA 450	11 kW	99	96	99	95	96	94	93	91
FH- 215	3611	13000	7670	FDA 450	11 kW	100	97	98	94	96	93	92	90
FH- 235	3889	14000	8260	FDA 500	11 kW	104	100	95	87	87	81	79	74
FH- 250	4167	15000	8850	FDA 500	11 kW	102	99	96	89	91	85	84	80
FH- 285	4722	17000	10030	FDA 500	11 kW	101	98	96	90	93	87	86	82
FH- 335	5556	20000	11800	FDA 560	15 kW	101	98	96	92	95	88	87	82
FH- 365	6111	22000	12980	FDA 560	15 kW	101	98	96	91	93	87	86	80
FH- 415	6944	25000	14750	FDA 630	18.5kW	98	95	94	94	86	81	74	68
FH- 450	7500	27000	15930	FDA 630	18.5kW	101	98	94	94	88	83	78	73
FH- 500	8333	30000	17700	FDA 630	18.5kW	101	98	94	93	88	83	79	74
FH- 535	8889	32000	18880	FDA 710	22 kW	108	105	94	89	85	86	80	74
FH- 585	9722	35000	20650	FDA 710	22 kW	106	103	92	86	82	82	77	70
FH- 665	11111	40000	23600	FDA 710	30 kW	105	101	90	85	80	80	74	67

*Sound data is discharge sound PWL of independent fan assembly.

Rigid and easy-to-assemble frame

Main Frame

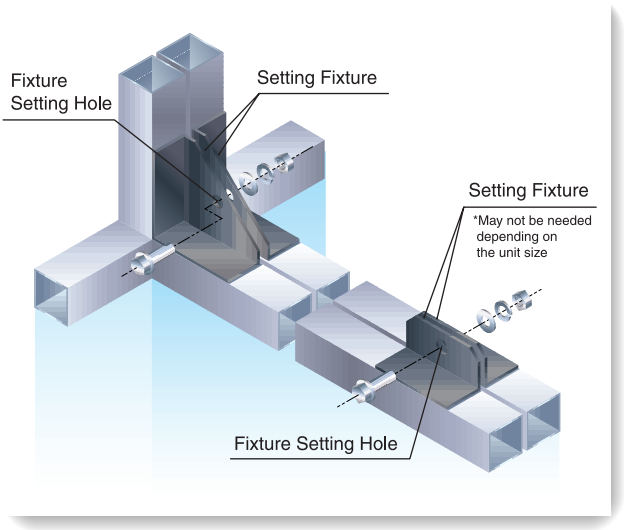




Features of COOL JOY Frame

- **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**

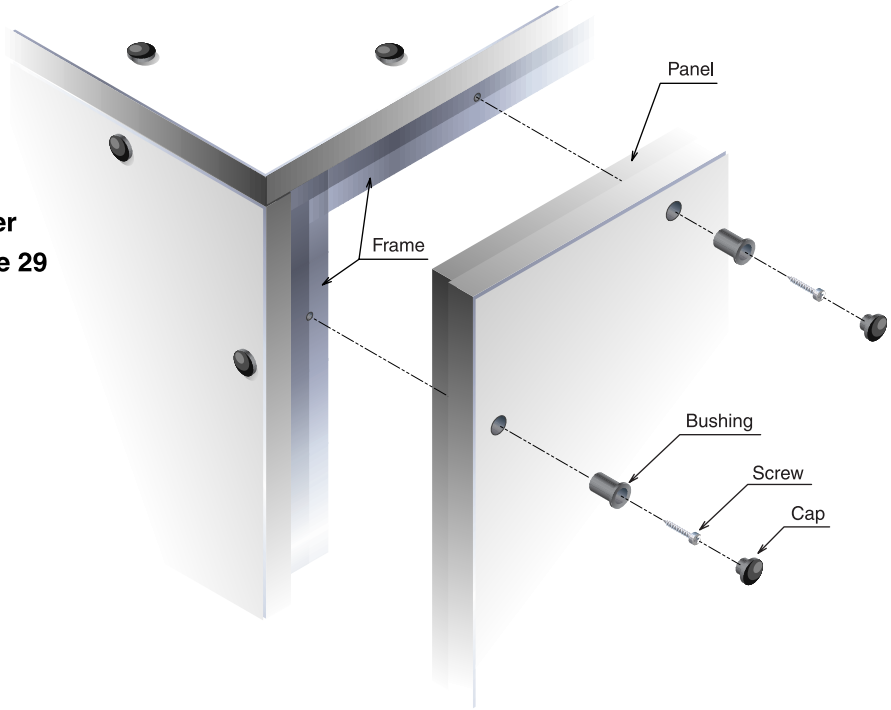
Setting Fixture



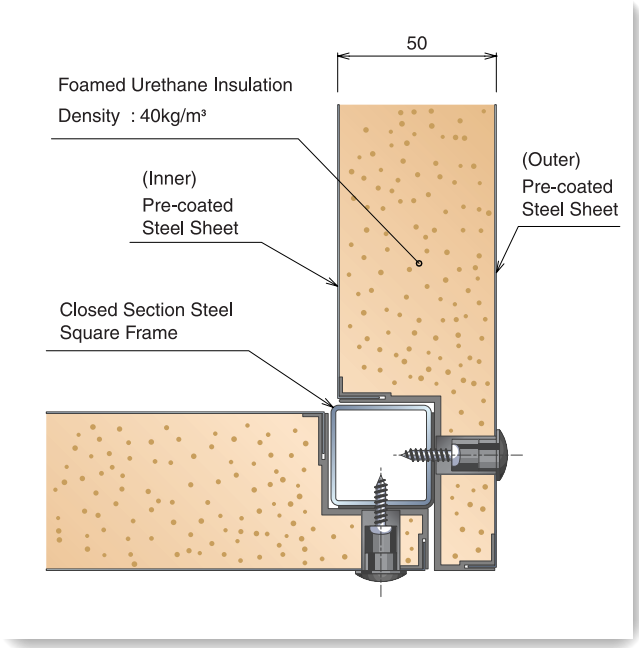
The panel uses an external screw structure that shows great resistant-to-condensation performance in severe environments

Features of COOL JOY Panel

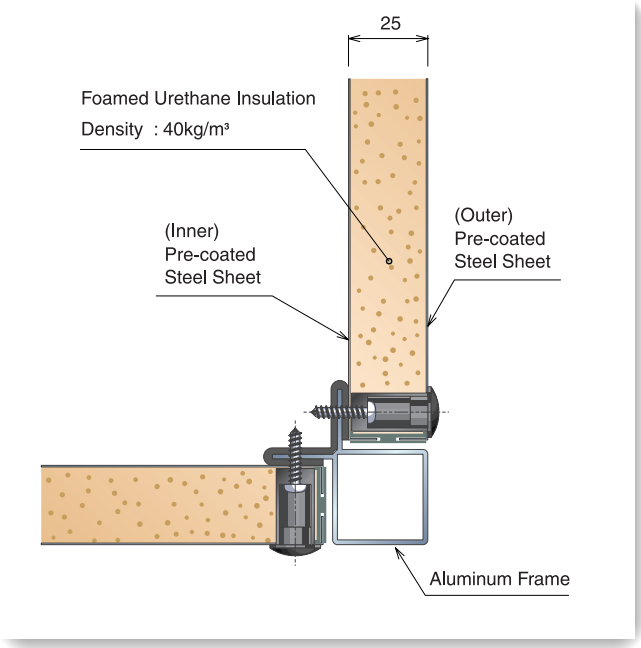
- **The panel can be disassembled easily from the outside using the external screws**
- **Since the top of the screws are not exposed, it is effective against dew condensation as per Insulation limit Diagram on Page 29**



●PANEL : 50mm thick double skinned



●PANEL : 25mm thick double skinned



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

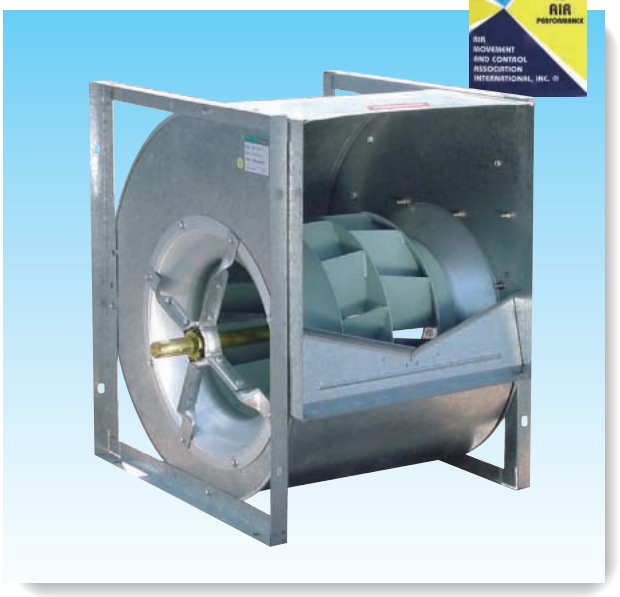
Fan Wheel

Forward Fan

Special forward impeller, and AMCA-certified fan.

Backward Fan

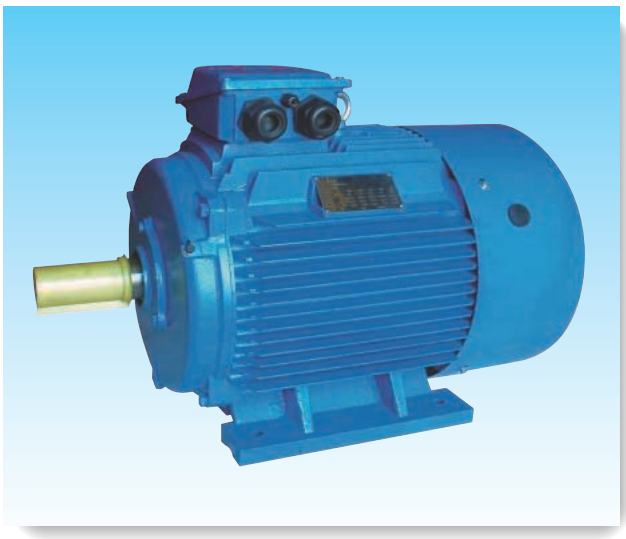
High efficiency, Low power consumption. With the special limit load characteristics, there is no concern of overloading. AMCA certified fan wheel.



Motor

Standard Motor

TEFC motor with waterproofing performance of IP55 ClassF.



Coil

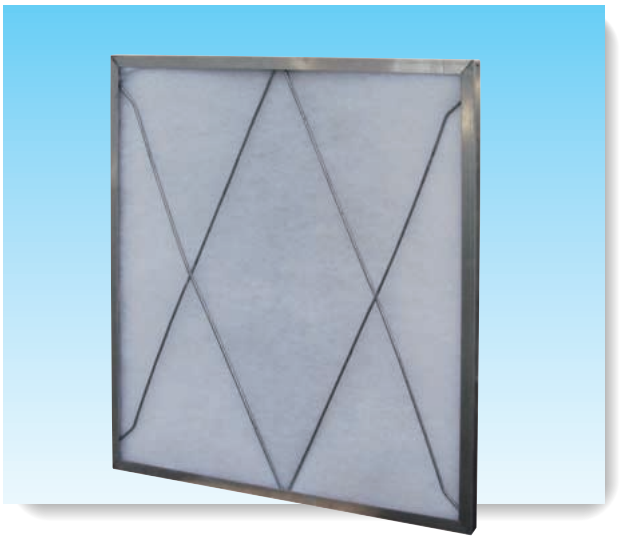
Cooling Coil

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.



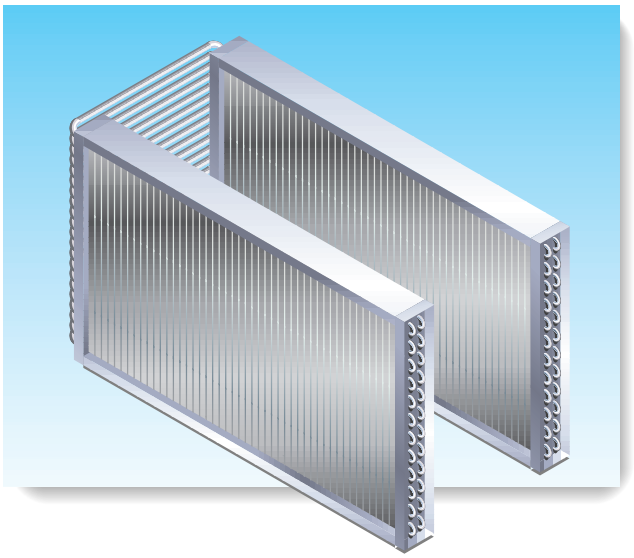
Bag Type

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

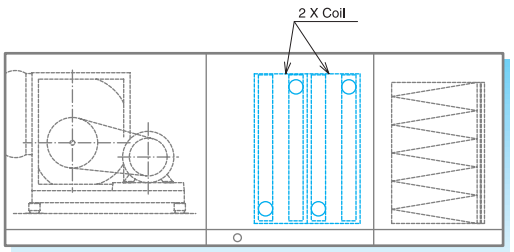
Heat Recovery Wheel

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)

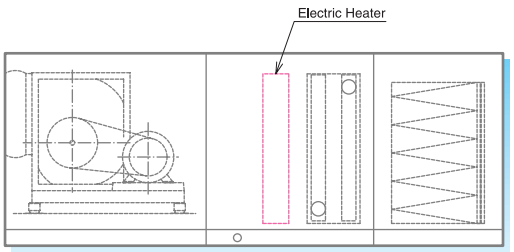
Two Coil Type

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



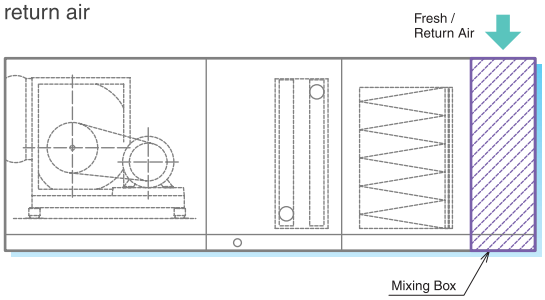
Electric Heater

Unit is complete with electric heater for heating or reheating



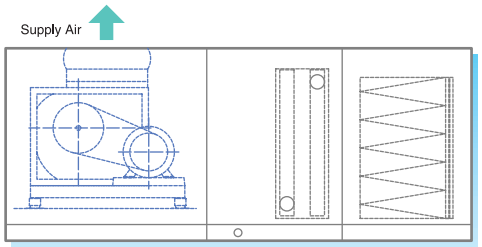
Mixing Box

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



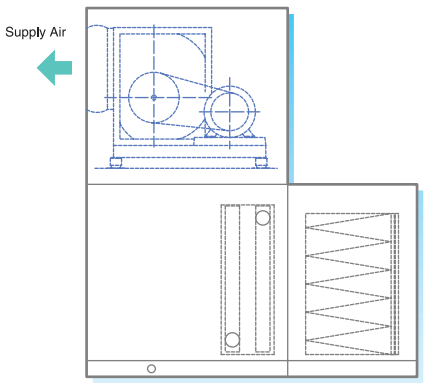
Upper Discharge

Designed to connect to SA duct from the upper side.



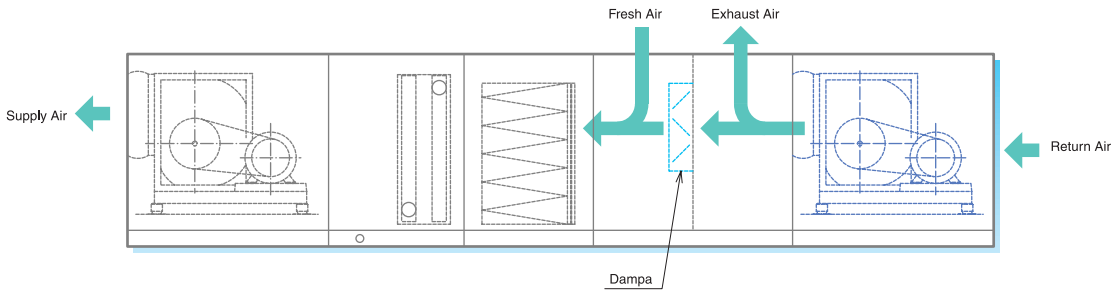
Vertical Mount

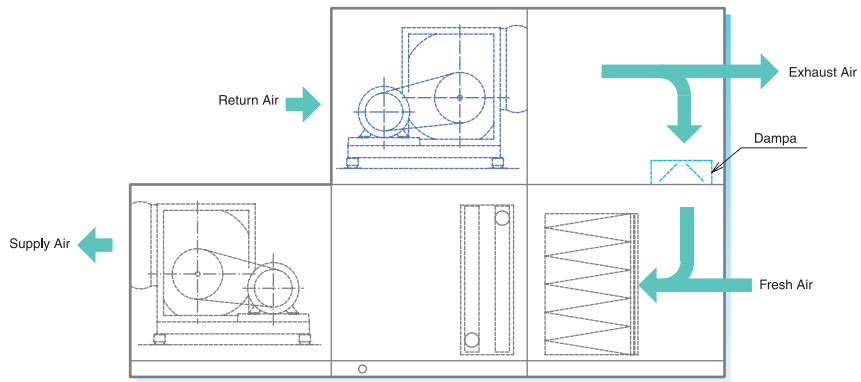
Saves space by setting the fan section on top of the coil section.



RA Fan Type

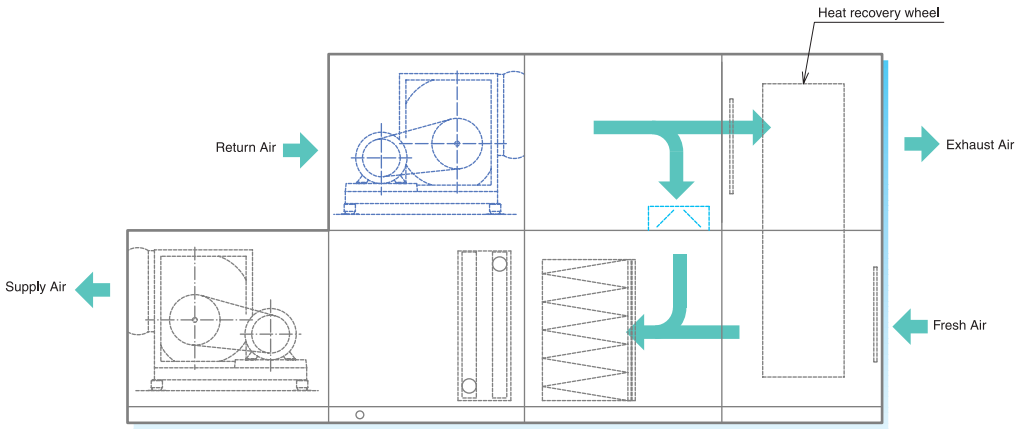
Unit is complete with RA fan OA and EA dampers can be added to balance the return and fresh air volume.





RA Fan and Heat Recovery Wheel

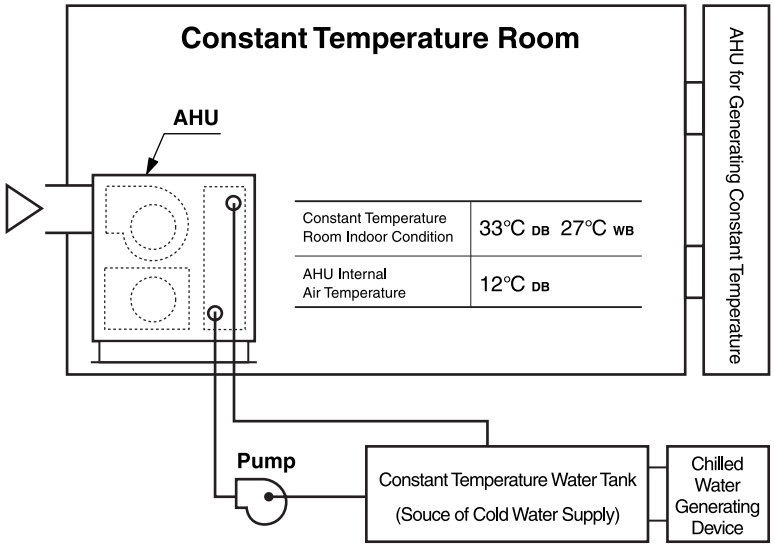
In addition to the RA fan, heat recovery wheel is added to recover heat energy of the fresh air and exhaust air effectively.



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)

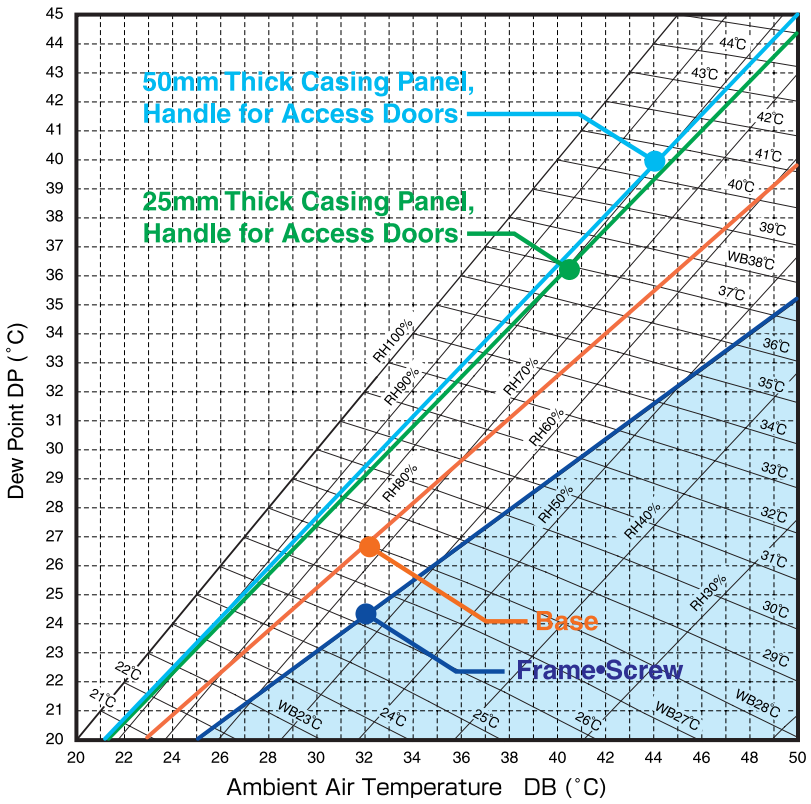
t_1 External surface temperature of component(°C)

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

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