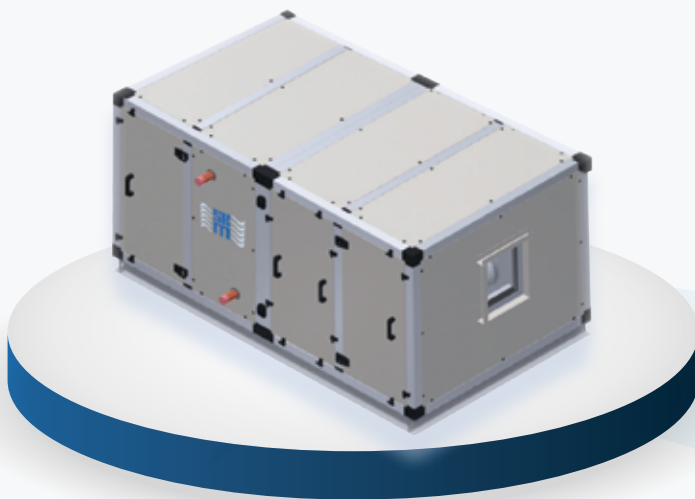


MAH Series

Modular Air Handling Units



MAH SERIES
1000-60000 CFM
(472-28317 l/s)





CERTIFICATE
N° 05.01.286



Air Handling Unit / Centrales de traitement d'air

Range Name / Nom de Gamme :

MAH

Granted on May 31, 2005 - Date 1ère admission 31 mai 2005

This document is valid at the date of issue - Check the current validity on:

Document valable à la date d'émission - Vérifier la validité en cours sur :

www.eurovent-certification.com

Participant/Titulaire

SKM Air Conditioning Equipment LLC
Industrial Area 13 - PO Box 6004
Sharjah, United Arab Emirates

This certificate is issued by Eurovent Certita Certification according to the certification rules:

ECP AHU - « Air Handling Unit » in force at established date.

Pursuant to the decision notified by Eurovent Certita Certification, the right to use the mark ECP shall be granted to the beneficiary company for the above Range in the conditions defined by the certification program mentioned.

Unless withdrawn or suspended, this certificate remains valid as long as the requirements for the certification program framework are met. The validity of the certificate is to be verified on www.eurovent-certification.com

THIS CERTIFICATE HAS BEEN ISSUED ON 28/01/2021
THIS CERTIFICATE IS VALID UNTIL 30/09/2021

Ce certificat est délivré par Eurovent Certita Certification dans les conditions fixées par le référentiel :

ECP AHU – « Centrales de traitement d'air » en vigueur à date d'édition.

En vertu de la décision notifiée par Eurovent Certita Certification, le droit d'usage de la marque ECP, est accordé à la société qui en est bénéficiaire pour la gamme visée ci-dessus, dans les conditions définies par le programme de certification mentionné.

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CE CERTIFICAT A ÉTÉ EMIS LE 28/01/2021
CE CERTIFICAT EST VALIDE JUSQU'AU 30/09/2021



Organisme accrédité n° 5-0517
Certification Produits et Services selon la norme NF EN ISO/CEI 17065:2012
Portée disponible sur www.cofrac.fr

Accreditation #5-0517 Products and Services Certification according to NF EN ISO/CEI 17065:2012 –
Scope available on www.cofrac.fr

COFRAC est signataire des accords MLA d'EA et MLA d'IAF,
COFRAC is signatory of EA MLA and IAF MLA,
list of EA members is available on www.european-accreditation.org/ea-members
list of IAF members is available on www.iaf.nu/articles/IAF_MEMBERS_SIGNATORIES/4

Paris, 28 janvier 2021

MANAGING BOARD MEMBER / MEMBRE DIRECTOIRE

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SKM reserves the right to change, in part or in whole the specifications of its Air Conditioning Equipment at any time in order to add the latest technology. Therefore, the enclosed information may change without any prior notice.

Introduction

SKM Air Handling Units are designed to a high engineering standard to provide the requirements of ventilation, heating, cooling, de-humidification and air distribution to a conditioned space.

SKM manufactures AHU in series namely MAH, applicable for indoor and outdoor installation which are ideal for large halls, schools, offices, banks, workshops, laboratories, restaurants, cinemas, hospitals, departmental stores, mosques and supermarkets, etc.

SKM AHU's are manufactured in a facility registered to ISO 9001 manufacturing quality standards.

SKM provides qualified service and stock of replacement parts in all major cities of the G.C.C. countries, Egypt, Jordan, and Pakistan. See back cover for details or call SKM.

SKM Air Conditioning LLC

You name it... We cool it.



Certification

Eurovent Certification

SKM Air Handling Units, MAH series are Certified by EUROVENT (Certification No: 05.01.286) according to the standards EN1886 and EN13053.

SERIES	MAH	MAH	MAH
Construction	Aluminum Profile	Aluminum Profile	Steel Pentapost
Panel Thickness (mm)	48	63	50
Insulation Material	Polyurethane	Polyurethane	Fiberglass
Insulation Density (kg/m3)	40	40	32
Thermal Conductivity (W/mK)	0.02	0.02	0.033
Casing Strength	D1	D1	D1
Casing Air Leakage Class at -400Pa	L1	L1	L1
Casing Air Leakage Class at +700Pa	L1	L1	L1
Thermal Transmittance Class	T3	T2	T4
Thermal Bridge Factor Class	TB2	TB2	TB3
Filter Bypass Class	F9	F9	F9

Table 1

AHRI CERTIFICATION (MAH Series)

Certified in accordance with AHRI standard 430 for Fan Performance.

Fan Performance According to AHRI-430



Configuration	Supply Fan Type	Geometry	Drive Type
Ducted Fan Discharge	Plenum Fan	Airfoil/Backwards-Inclined	Direct-drive
Ducted Fan Discharge	Housed Fan	Airfoil/Backwards-Inclined	Belt-drive
Ducted Fan Discharge	Housed Fan	Forward-Curved	Belt-drive

Table 1

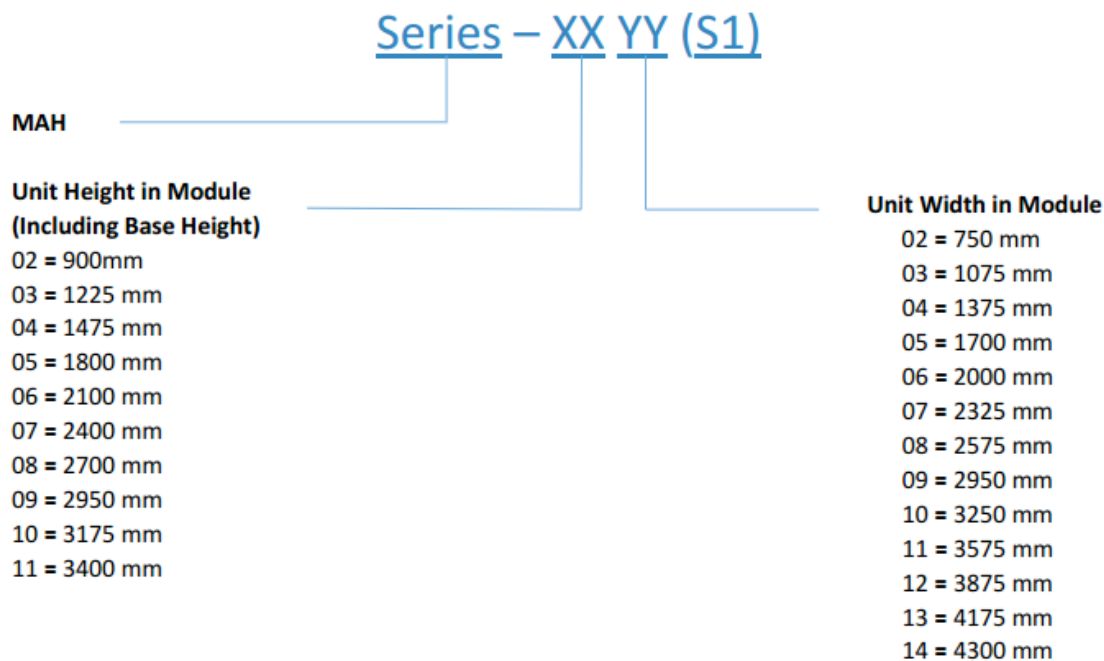
Coil Performance Certification According to AHRI-410



COIL	FUNCTION	FLUID TYPE
CWCOILS	Cooling	Water
DX COILS	Cooling	R-134a
DX COILS	Cooling	R-410A
DX COILS	Cooling	R-407C
HWCOILS	Heating	Water

Table 2

Nomenclature



The dimensions mentioned above is for the standard inline units only. For more details on the dimensions of other units including Heat Recovery system, please contact SKM.

Range

SERIES	CONSTRUCTION		Air Flow Range cfm
MAH	Aluminum Profile-48 mm Thick Panels	CW Coil without Heat Recovery	1000-60000 cfm
	Steel Pentapost-50 mm Thick Panels		
	Aluminum Profile-63 mm Thick Panels		
	Aluminum Profile-48 mm Thick Panels	CW Coil with Heat Recovery	1000-46250 cfm
	Steel Pentapost-50 mm Thick Panels		
	Aluminum Profile-63 mm Thick Panels		

Table 3

General Features

Modular Design

Units are manufactured in modular sections, completely assembled or knock down for onsite assembly.

Application Flexibility: Different sectional arrangements and fan discharge positions.

Simple connection: Suitable for both duct connection and free discharge applications.

Perfect Thermal Break: Utilize designed gaskets and profiles to provide an excellent thermal break, and ensures rigid and leak tight construction.

Conformity: Conformity with applicable European health and safety standards.

Main Component Features

Casing & Construction

AHU casings are constructed of framed modules, for maximum rigidity and strength.

Unit frames constructed of either extruded aluminum profile or hot dip coated galvanized steel profile. (Steel pentapost).

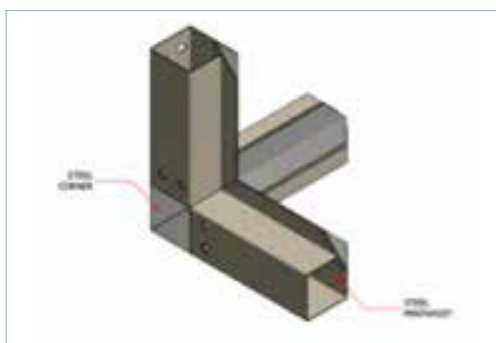


Figure 1: Steel Penta Post

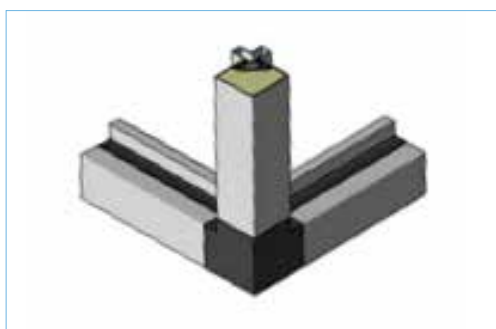


Figure 1: Aluminum Profile

Panels

Access and fixed panels are made of hot-dip galvanized steel conforming to JIS-G 3302 and ASTM-A-653. All panels shall be one piece double skin construction with insulation sealed between the inner and outer panels.

Unit Finish

Powder coated finish in RAL 7032 color scheme.

Painted units are made of Zinc-coated galvanized steel thoroughly degreased and then phosphatized before application of an average 60 micron backed electrostatic polyester dry powder coated. This finish and coating can pass a 1000-hour, 5% salt spray testing at 95°F (35°C) and 95% relative humidity as per ASTM B 117.

Inner skin panels for double skin units are supplied in galvanized finish unless otherwise stated.

Insulation

For best thermal and acoustical performance, all panels are internally insulated.

Polyurethane foam insulation is standard for Aluminum profile construction and insulation conform to density of 2.5 lb/ft³ (40 kg/m³) according to the test standard ASTM D-1622-88 and thermal conductivity of 0.14 BTU in/(h.ft² .°F) (0.02W/mK) according to test standard ASTM C 518-56.

For units with steel pentapost construction, panels are insulated with fiber glass insulation of 2.0 lb/ft³ (32 kg/m³) density and 0.23 BTU in/(h.ft² .°F) (0.033W/mK) thermal conductivity, and it shall be conformed to HH-1-545B Type 1, SMACNA standard for duct liners and ASTM-C-423 and NFPA90A and 90B standards for fire resistance.

Base Frame

Since the AHU's are constructed from pentapost profile, which has inherent rigidity and stability, most sizes of AHU series do not require structure steel base frame. Sheet metal frame and sheet metal corner base which one provides as option for smaller units are with holes for vibration mounts are provided on each side of the unit. For larger units a steel structure is provided, coated with galvanized primer and black enamel finish. Structural steel complies in accordance to JIS-G-3103SS41 standard.

For units with sheet metal base frame, units will be shipped up to maximum frame lengths of 124" (3150mm). Above this, units shall be shipped in knockdown sections.

Figure 3a: Sheet metal Base Frame

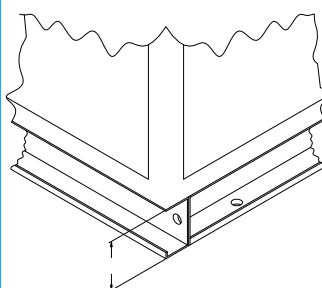


Figure 4: Chanel Base Frame

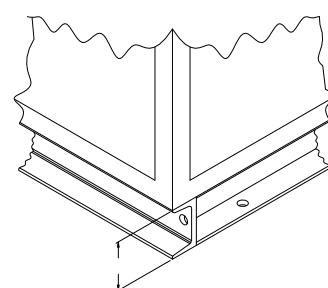
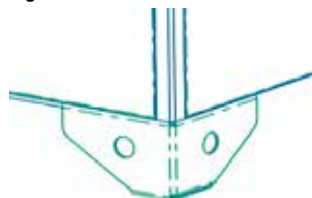
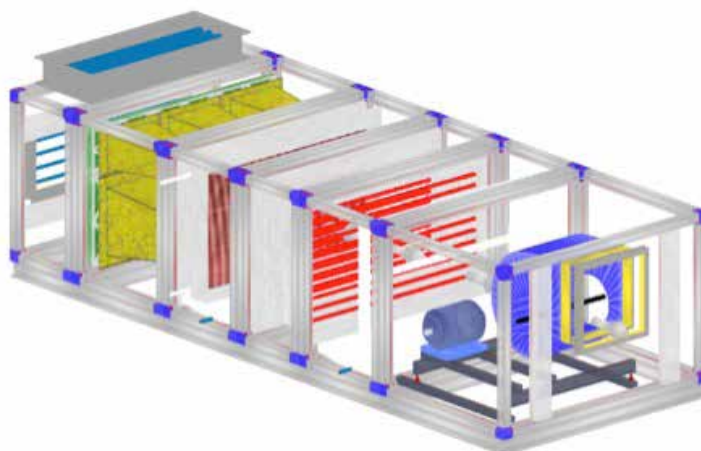


Figure 3b: Sheet metal Corner Base (optional)



Major Sections & Sub-Assemblies



Fan Section

Belt Driven Fans & Motors

Double inlet double width centrifugal belt driven fans are supplied as standard in SKM Air Handling Units. Fans used in SKM AHUs are tested in a registered laboratory in accordance with AMCA standard 210. All fans are statically and dynamically balanced in accordance to ISO 1940 and performance data according to DIN 24 166 tolerance class 2. The impellers can have forward curved backward curved or airfoil profiles depending on the requirements.

SKM fans use self-aligned ball or pillow block bearings that are greased for life. Pillow block bearings are provided with regreasing fittings. Fans are selected for best sound characteristics based on maximum fan efficiency. Different fan positions are available depending on the requirement. Refer to dimensional data for details.

Fan motors are totally enclosed fan-cooled (TEFC), foot-mounted, 4-poles, IP-55 protected and Class F insulated. Rating and operating characteristics of motors are in accordance with IEC 60034-1 & IEC 60085.

The motor is mounted on adjustable base so that belt tension can be easily adjusted. In order to limit transmission of noise and vibration, complete fan-motor-drive assembly is mounted on floating sub base with anti-vibration mounts.

Motors can be provided on either right or left hand side facing the unit from return air side. Section is sized to accommodate different motor sizes depending on the actual requirement of airflow and static pressure.

All fans are belt-driven by motors with a set of fixed pitch or variable pitch pulleys and matching belts. SKM provides variable pitch pulley with single or double groove systems.

Figure 5: Belt Driven Fans & Motors



Direct Driven Fans

Direct driven fans are Centrifugal type, designed for operation w/o casing, with motor for installation horizontally. Backward curved impellers are mounted directly on the motor rotor, statically and dynamically balanced in accordance with DIN ISO 21940-11. Fan motors are IP55 protected and class F insulated. A suitable speed variation system shall be required for the optimum adjustment of the desired operating point. (Not included in SKM standard supply). In order to limit transmission of noise and vibration, complete fan-motor assembly is mounted on floating sub base with anti-vibration mounts.

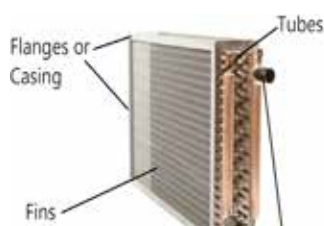
EC Fans

Electronically Commutated (EC) fans provide a compact and high efficient solution for air handling units. The high performance backward impeller with high efficient motor and electronics system all optimally adjusted to another, increasing system efficiency to maximum value. Fans with EC motors are integrated with variable speed drive (VSD) that allows simple speed control. Fans with EC motors provide easy installation and maintenance.



Coil Section

Variety of coils including chilled water, direct expansion, and hot water are available to meet a wide range of application requirements. Coil performance are certified in accordance with AHRI Standard 410. Coils are tested by air pressure while coils are submerged in water to a pressure of 300 psig (2060 kPa). Coils can be provided with moisture eliminator depending on the air conditions. Eliminator blades are made of PVC, with shape specially designed to trap water droplets blown off the coil. Coil connections can be provided on either right or left hand side facing the unit from return air side. Inlet and outlet connections are sealed against unit panel. SKM provides sweat connections for coils as standard.



Drain Pan

Cooling coil section is provided with insulated drain pan with MPT drain connection, in order to hold and remove the condensate formed during dehumidification. Drain pan is made of painted Zinc-coated steel sheet insulated from outside by fiberglass insulation for maximum protection against sweating and corrosion. The pan shall be sloped toward the drain connection. Drain pan is extended to include coil, headers and U-bends. Drain connection can be provided on left or right side as required. The pan shall be sloped towards the drain connection to meet ASHRAE standard 62



Filter Section

A wide variety of filtration systems are available to meet the different applications, which includes flat filters, V-filters, bag filters, HEPA filters, carbon filters and other types. Filters using in SKM air handling units are in accordance with ISO 16890 and EN779 standards.

Panel Filters: 2" (50mm) panel filters with aluminum washable media used as standard in SKM Air Handling units. ISO class ISO Coarse (EN class: G3).

Fine Filters: Bag Filter: 21" (534mm) deep high efficiency bag filters with synthetic media used as standard in SKM Air Handling Units. ISO class ePM1 %60 (EN class: F7) is our standard. Higher ISO class ePM1 %70 and ISO class ePM1 %85 (EN class: F9) available on request.

A combination of bag and flat filters are also available as an option.

HEPA Filter: Ultra high absolute HEPA (High Efficiency Particulate Air) filter with efficiency in excess of 99% when measured by using DOP (Diocetyl Phthalate) method. HEPA filters in SKM air handling units are 12" deep and H13 in accordance with EN1882 standards.



Pre Filter



Fine Filter



Hepa Filter



Combined Filter Section

Electric Heater Section

Electric heater batteries are available in a wide range of capacity (kW) and steps as an integral part of MAH units. It consists of finned-type heating elements constructed from 80/20 nickel chrome resistance wire, which is connected to terminal pins and centered in stainless steel grade 304L sheath metal tubes by compressed magnesium oxide. The fins are helical; mild steel galvanized and tightly wound around tubular heating elements. The terminal pins shall be insulated from metal tube by ceramic bushes. Electric heater elements are in accordance with IEC standards.

Controls and starter contactors are NOT included in this option. If required, heater control box can be supplied as option. Standard components included with the heater option are:

- Finned heating element attached to the heater frame
- Primary over temperature protection provided by auto reset high limit safety cut outs
- Secondary over temperature protection provided by manual reset high limit safety cut-out for positive break
- Junction box including the power and control terminals for heater wiring.

If Heater Control Box (HCB) opted, then heater control box can be provided which will include the below.

- 3-pole magnetic contactor per stage.
- Control fuse / breaker.
- Control switch.
- Power fuses / circuit breaker as per NEC.
- Factory installed air flow switch. Note that necessary controls for staging the heater for temperature control to be provided by others.

If opted Thyristor controller [SCR], then it will include the below options.

- Thyristor(s) for the heater
- Power contactor for thyristor
- Control fuse / breaker
- Control switch
- Power fuses / circuit breaker as per NEC.
- Factory installed airflow switch. Note that necessary controls for modulating the heater thyristor for temperature control to be provided by others.

Electric Heater							
Model MAH/MAHE	Airflow	Option - 1		Option - 2		Option - 3	
	CFM	kW	No of Stages	kW	No of Stages	kW	No of Stages
0202	1000	3	1	6	1	6	2
0202S1	1250	3	1	6	1	6	2
0202S2	1500	6	1	9	1	9	2
0203	1750	6	1	9	1	9	2
0203S1	2000	9	1	12	1	12	2
0203S2	2250	9	1	12	1	18	2
0204	2500	12	1	15	2	24	2
0303	2917	12	1	15	2	18	2
0303S1	3333	15	2	18	2	30	2
0303S2	3750	18	2	24	2	36	2
0304	4167	18	2	24	2	36	2
0304S1	4583	18	2	24	2	36	2
0304S2	5000	24	2	30	2	48	2
0305	5417	24	2	30	2	48	2
0305S1	5833	24	2	30	2	48	2
0305S2	6250	30	2	36	2	60	2
0306	6667	30	2	36	2	60	2
0405	7583	36	2	48	2	72	2
0405S1	8167	36	2	48	2	72	2
0405S2	8750	36	2	48	2	72	2
0406	9333	36	2	48	2	90	2
0406S1	10208	48	2	60	2	90	2
0407	11083	48	2	60	2	90	2
0506	12000	60	2	72	2	108	3
0506S1	13125	60	2	72	2	108	3
0507	14250	72	2	90	2	126	3
0508	15938	72	2	90	2	126	3
0508S1	17250	72	2	90	2	126	3
0509	18750	90	2	108	3	126	3
0608	19479	90	2	108	3	162	4
0608S1	21083	90	2	108	3	162	4
0609	22917	90	2	126	3	162	4
0609S1	24292	90	2	126	3	162	4
0709	27083	126	3	144	4	216	6
0709S1	29250	144	4	180	5	270	6
0710	30333	144	4	180	5	270	6
0710S1	31958	144	4	180	5	270	6
0711	33583	144	4	180	5	270	6
0711S1	35208	144	4	180	5	324	6
0811	38750	144	4	216	6	324	6
0811S1	40625	180	5	216	6	324	6
0812	42500	180	5	216	6	324	6
0812S1	44375	180	5	270	6	324	6
0813	46250	216	6	324	6	324	6
0914	51333	216	6	324	6	-	-
1014	56146	216	6	324	6	-	-
1114	60958	216	6	324	6	-	-

Table 4

Humidifier Section

This system consists of immersed electrode steam generating cylinders, steam distribution pipe and necessary controls. Steam generating cylinders are mounted on to the AHU within a separate enclosure. The steam distributor passes through the unit casing to inject steam in the air stream to reach the required humidity conditions. ON/ OFF control for humidifier is provided as standard

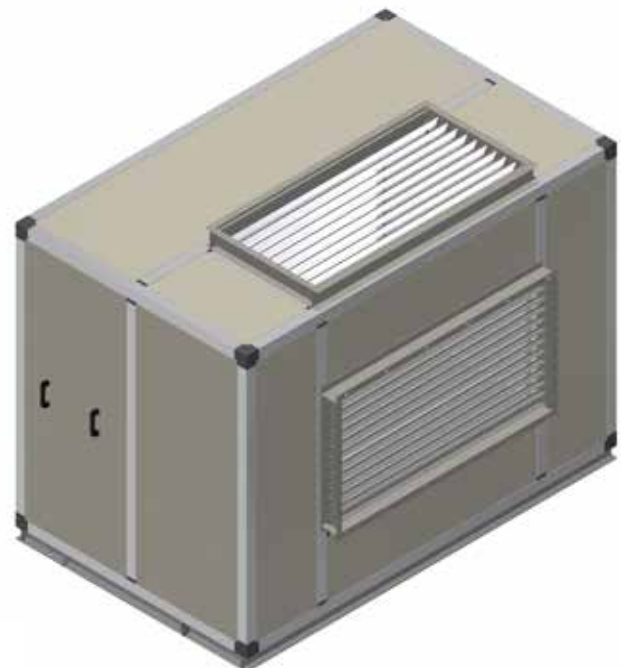
Humidifier			
Model MAH/MAHE	Airflow CFM	Option-1	Option-2
		Capacity kg/hr	Capacity kg/hr
0202	1000	5	10
0202S1	1250	5	10
0202S2	1500	5	10
0203	1750	5	15
0203S1	2000	5	15
0203S2	2250	8	15
0204	2500	8	15
0303	2917	8	15
0303S1	3333	10	18
0303S2	3750	10	18
0304	4167	10	18
0304S1	4583	10	18
0304S2	5000	15	25
0305	5417	15	25
0305S1	5833	15	25
0305S2	6250	15	25
0306	6667	18	35
0405	7583	18	35
0405S1	8167	18	35
0405S2	8750	18	35
0406	9333	18	35
0406S1	10208	25	45
0407	11083	25	45
0506	12000	25	45
0506S1	13125	25	45
0507	14250	25	45
0508	15938	35	70
0508S1	17250	35	70
0509	18750	35	70
0608	19479	35	70
0608S1	21083	35	70
0609	22917	35	70
0609S1	24292	35	70
0709	27083	35	70
0709S1	29250	35	70
0710	30333	45	90
0710S1	31958	45	90
0711	33583	45	90
0711S1	35208	45	90
0811	38750	45	90
0811S1	40625	70	90
0812	42500	70	90
0812S1	44375	70	90
0813	46250	70	90
0914	51333	70	90
1014	56146	70	90
1114	60958	70	90

Table 5

Mixing Box Section

Mixing box with fresh air and return air dampers are available to mix the outside fresh air with recirculated return air. Both the return and fresh air dampers are sized to handle 0-100% of the total supply air.

SKM air handling units are equipped with multi blade, low leakage, and heavy duty dampers to control the air flow rate by introducing resistance to air flow in the system. Dampers are available with parallel blades and opposed blades.



Plenum Sections

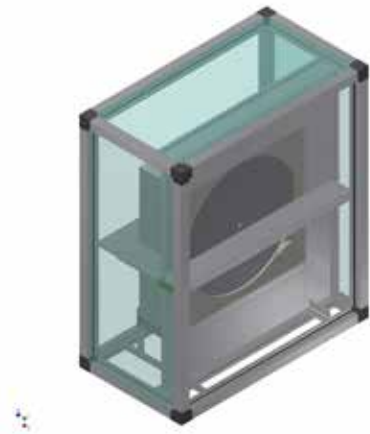
Empty plenums can be supplied either for future use or for particular applications like access, end vertical assembly, end bottom plenum for bottom return air applications and etc. Standard sizes are listed in the dimensional data.

Sound Attenuator Section

Sound attenuator can be provided in both supply and return air side. The standard design is with specially designed vertical splitters consisting of sound absorbing material parallel to the air stream matching unit cross section. Two different media depths of 24" (600mm) [SAT1] and 48" (1200mm) [SAT2] are available as standard. Outer skin of the splitters are constructed of perforated galvanized steel. The insulation material of splitters are fiberglass.

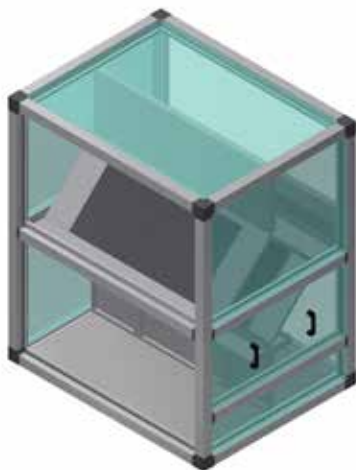
Heat Recovery Section

• Rotary Heat Recovery System (Thermal Wheel)



Heat recovery wheels are available to recover either sensible heat only or both sensible and latent heat to meet the requirements. Thermal wheels constructed of Aluminum, coated with heat transfer material (Molecular sieve) which shall rotate by an electric motor at constant speed. The heat wheel rotates between the fresh and return air streams, and two fan sections are required (supply and exhaust fan)

• Fixed Plate Heat Recovery System



Fixed plates heat exchangers consists of layers of Aluminum plates, which are separating the exhaust and supply air streams. The exhaust air passes through the exchanger from end to end and the supply air stream individual passages formed by the plates within the exchanger. This system recovers sensible heat only.

• Heat Pipe System

Heat pipe shall be consisting of two coils, pre-cooling and reheating, connected together without any moving part in between them and containing phase change fluid.

According to the arrangement of the heat pipe coils with respect to other components, it can be used for either dehumidification (horseshoe type arrangement) or for heat recovery (vertical arrangement).

For dehumidification function (Horseshoe Heat Pipe), pre-cooling coil is located in the incoming air flow allows the evaporator cooling coil to work cooler and condense more moisture. Re-heat coil located after the evaporator coil, reheats the supply air and brings about a more comfortable temperature and relative humidity.

This entire function of humidity reduction is performed while saving energy.

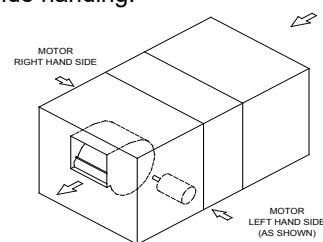
For heat recovery function (Vertical Heat Pipe), heat pipe coils are installed between the fresh and return air streams and two fan sections are required; supply and exhaust fan. This system recovers sensible heat only.

• Run around Coil System

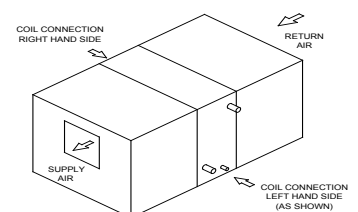
This system comprises of two coils; one placed in the supply air stream and other in the exhaust air stream. The coils are to be connected in a closed loop via piping and circulating pump (supplied by others). Water or glycol is circulated as a heat transfer medium.

Unit Handling

In order to decide the unit handling for (Motor, Coil etc) SKM units, Person has to stand viewing along the direction of air flow. For Unit with heat recovery, the handling of Components based on each air stream separately. In such case its required view each air stream (Both supply and exhaust) separately to decide handling.



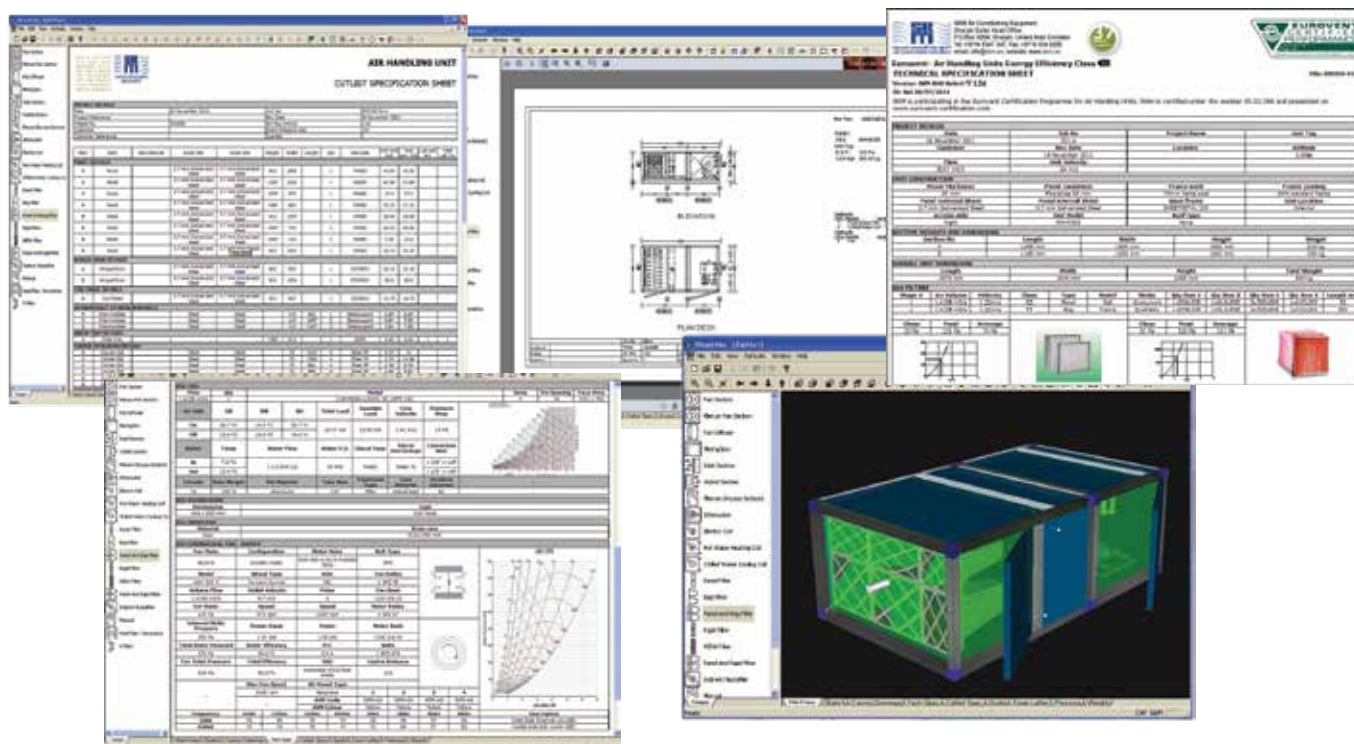
Motor Handling



Coil Handling

Software

SKM Visual AHU Software is a powerful tool for the proper technical selection and economic evaluation of Air Handling Units. This software has a unique 3D visualization and is fully customizable. The program performs technical verification and selection for each section until the whole unit is completed. In each section, options related to that particular section can be added. The output of Visual AHU Software is an economic offer including all the technical data, drawing, psychrometric diagram and fan performance curves.



Motor Data

Rated Power Supply (V/Ph/Hz)		Motor Size (kW)															
		0.55	0.75	1.1	1.5	2.2	3	4	5.5	7.5	11	15	18.5	22	30	37	45
380-415V / 3Ph / 50Hz	FLA (A)	1.38	1.9	2.56	3.41	4.84	6.56	8.64	11.1	15	22	29.2	36.1	41.7	56.3	68.1	81.6
	LRA (A)	7.3	9.7	14.8	18.8	27.1	42.6	53.6	79.9	101	132	207	271	275	372	477	612
440V / 3Ph / 50Hz	FLA (A)	1.25	1.73	2.33	3.1	4.4	5.96	7.85	10.1	13.6	20	26.5	32.8	37.9	51.2	61.9	74.2
	LRA (A)	6.65	8.81	13.5	17	24.6	38.8	48.7	72.7	91.4	120	188	246	250	338	433	556
380-400V / 3Ph / 60Hz	FLA (A)	1.1	1.6	2.3	3.2	4.5	5.8	7.8	10.8	14.1	20.3	27.2	34.2	42	55.4	75	87
	LRA (A)	7	10	16	25	37	42	56	93	113	149	229	267	345	405	600	636
460V / 3Ph / 60Hz	FLA (A)	1	1.4	2	3.1	4.5	5.7	7.8	11	13.5	19.1	25.5	33.9	40.3	52	79	82
	LRA (A)	7	9	14	24	37	42	56	95	108	140	215	265	331	380	632	599
220V / 3Ph / 60Hz	FLA (A)	2.2	2.9	4.2	5.7	7.9	10.6	13.9	19.2	25.3	36.4	49.2	61.7	74.7	98.7	129.9	150.7
	LRA (A)	14	18	29	44	64	77	99	166	203	266	414	482	613	721	1040	1101

Notes:

- AHU starter panel is optional
- Star- Delta starter should be provided for the motors 11kW and above
- VFD driven motors are optional and to be specified.
- Refer motor terminal box for wiring connection.
- Values are subjected to tolerance as per IEC.

Table 6

Option Code

Sl#	Option Codes Description					
1	Unit Construction & Panels					
	DSU+OSG0.7+IS G0.7+2SF-40	Al Profile with Nylon Corners, 0.7 mm GI Outer Skin, 0.7 mm GI inner Skin,Double Skin Unit With PU Insulation	DSU+OSG1.0+ ISG0.7+2SF-40	Al Profile with Nylon Corners, 1.0 mm GI outer Skin with 0.7 mm Inner Skin PU Insulation		
	DSU+OSG1.0+IS G1.0+2SF-40	Al Profile with Nylon Corners, 1.0 mm GI outer Skin with 1.0 mm GI Inner Skin PU Insulation	DSU+OSG1.2+I SG1.0+2SG-32	Steel Pentapost with Steel Corners, 1.2 mm GI Outer Skin, 1 mm GI inner Skin,Double Skin Unit With FG Insulation		
	DSU+OSG1.5+IS G0.7+2SG-32	Steel Pentapost with Steel Corners, 1.5 mm GI Outer Skin, 0.7 mm GI inner Skin,Double Skin Unit With FG Insulation	DSU+OSG1.5+I SG1.0+2SG-32	Steel Pentapost with Steel Corners, 1.5 mm GI Outer Skin, 1 mm GI inner Skin,Double Skin Unit With FG Insulation		
	DSU+OSG1.2+IS G0.7+2SG-32	Steel Pentapost with Steel Corners, 1.2 mm GI Outer Skin, 0.7 mm GI inner Skin,Double Skin Unit With FG Insulation				
	For Stainless Steel Materials refer below for option codes.					
	Casing Material	Skinning	Sheet Thickness (mm)			
			0.7	1	1.2	1.5
	SS304	Inner Skin	ISS3040.7	ISS3041.0	-	-
		Outer Skin (For FG insulation, OSS3040.7& OSS3041.0 Not Possible)	OSS3040.7	OSS3041.0	OSS3041.2	OSS3041.5
	SS316	Inner Skin	ISS3160.7	ISS3161.0	-	-
		Outer Skin (For FG insulation, OSS3160.7& OSS3161.0 Not Possible)	OSS3160.7	OSS3161.0	OSS3161.2	OSS3161.5
	Perforated GI	Inner Skin (For Whole AHU Inner Skin or Only For Fan Section)	ISPG0.7	ISPG1.0	-	-
	DSU	Double Skin Unit	2SF-40	Two Inch Polyurethane Foam Injection Insulation-40 kg/m3		
	2SG-32	2" thick Fibre glass insulation for evaporator section-32 kg/m3	BEP	Powder Coated Decorative Finish External Only-RAL 7032, 60 microne Thick		
	2SG-48	2" thick Fibre glass insulation for evaporator section-48 kg/m3	SSF	Stainless Steel Fasteners. SS316L		
	2SR-70	2" (50mm) thick Rock Wool insulation with density 70kg/m3				
	2SR-100	2" (50mm) thick Rock Wool insulation with density100kg/m3				
2	Fan Section					
	FADH	Forward Curve Centrifugal Fan	FBG	Fan Belt Guard		
	FRDA	Backward Curved Airfoil Centrifugal Fan	FAVM	Spring vibration isolators-Under Fan Motor Subbase		
	FRDH	Backward Curve Centrifugal Fan	MMC	Standby motor with manual change over.		
	FRPF	Backward Curved Centrifugal Direct driven fan.	STP	Starter Panel		
	PGFE	Protection against corrosion for fans	ECM	EC Fans		
3	Coil Section					
	CCW	Chilled Water Cooling Coil	EFAP	Cooling coil with pre-coated aluminum fins.		
	CHW	Hot Water Heating Coil	EFC	Cooling coil with copper fins		
	CDX	Dx - Cooling Coil	EFCA	Cooling Coil with Aries Coated Copper Fins		
	MPT	MPT coil connectors.	SDP	Stainless steel drain pan (Grade 304)		
	FPT	FPT coil connectors.	SSP	Stainless Steel Drain Pan (Grade 316)		
	GPT	Flanged coil connectors	DXE	Moisture Eliminator (PVC Blade)		
	EFAA	Cooling Coil with Aries Coated Aluminium Fins	SSRC	Stainless Steel 304 Frame for Coil		

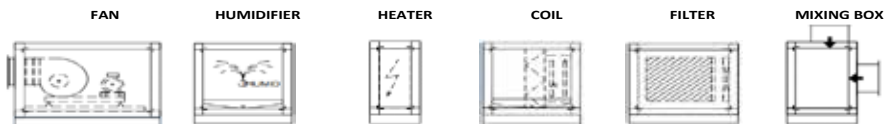
Table 7

Option Code

Sl#	Option Codes Description								
4	Filter Section								
	Filter Depth	Filter Type	EN Class						
			G3	G4	F5	F7	F8	F9	H13
	2"	Flat Filter-Aluminum	FIP2-G3	-	-	-	-	-	-
	2"	Vee Filter-Aluminum	FIPV	-	-	-	-	-	-
	2"	Synthetic Pleated Filter	-	FIP2-G4W	FIP2-F5				-
	15"	Bag Filter	-	-	-	FIBG0-F7	FIBG0-F8	FIBG0-F9	
	21"	Bag Filter	-	-	-	FIBG1-F7	FIBG1-F8	FIBG1-F9	-
	12"	Rigid Filter	-	-	-			FIMP12-F9	-
12"	Hepa Filter	-	-	-	-	-	-	FIHP	
5	Combined Filter Section								
	Filter Depth	Filter Type	G3 + F7	G3 + F8	G3 + F9	G4 + F7	G4 + F8	G4 + F9	
	2" + 21"	Aluminum Flat Filter + Bag Filter	FPB1-G3F7	FPB1-G3F8	FPB1-G3F9	FPB1-G4F7	FPB1-G4F8	FPB1-G4F9	
	2"+15"	Aluminum Flat Filter + Bag Filter	FPB0-G3F7	FPB0-G3F8	FPB0-G3F9	FPB0-G4F7	FPB0-G4F8	FPB0-G4F9	
	Filter Depth	Filter Type	F5 + F7	F5 + F8	F5 + F9				
	2" + 15"	Synthetic Pleated + Bag Filter	FPB0-F5F7	FPB0-F5F8	FPB0-F5F9				
	2"+12"	Synthetic Pleated + Rigid Filter	-	-	FIMP12-F5F9				
	SSFR 304	SS304 Filter Rack	SSFR 316	SS316 Filter Rack					
6	Mixing Box Section								
	BMX-AI	Mixing box with fresh air and return air dampers. AI Blades.	DFC-AL	Full face air intake damper, AL blades					
	BMX-S304	Mixing box with fresh air and return air dampers. SS304.	DFC-S304	Full face air intake damper, SS 304 blades					
	BEX	Exhaust Box Section	MDA	Motorized Damper Actuators					
	BRX	Return Box Section							
7	Electric Heater Section Section								
	CEHF	Electric heater section							
8	Steam Humidifier Section								
	HSIG	Steam Humidifier Section only	CDP-H	Condensate drain pan					
	HSI-xx	Steam Humidifier Kit-xx Kg/Hr steam Generator							
9	Heat Recovery Section								
	RRC	Run Around Coil System	RPR	Heat Pipe System					
	RHP	Fixed Plate Heat Recovery System	RPRV	Heat Pipe System (Vertical arrangement-Heat Recovery)					
	RHR	Rotary Heat Recovery System (Thermal Wheel)							
10	Other Sections								
	PEM1	Empty plenums (575mm length)	SAT1	Sound Attenuator Section. Media Depth: 24" (600 mm)					
	PEM2	Empty plenums (750mm length)	SAT2	Sound Attenuator Section. Media Depth: 48" (1200 mm)					
	PEM3	Empty plenums (950mm length)	UVL	UV Lamps					
11	ACCESSORIES								
	MAF2	Dial type manometers	QDL	Access Doors (with SS Hinges, Latches & Grip Handles)					
	MAF3	Magnehelic type Manometers	QDL-P	Hinged Access Doors (with Plastic Hinges & Q turn Handles)					
	PMAF	Provisions for Manometers	QDL-P1	Hinged access door (with Plastic Hinges, latches & Grip Handles)					
	BLF	Bulk Head Light	QDL-1	Hinged access door (with stainless steel hinges & Q-turn handles)					
	DPS	Differential Air Pressure Switch	ATC	Weather proof top cover					
	IW	Inspection Window							

Table 8

Dimensional Data



Unit Model	Airflow (cfm)	Unit Height	Unit Width		Section Length*	Section Length	Section Length	Section Length**	Section Length***	Section Length
0202	1000	900	750	MOTOR LOCATION BACK	1075	750	375	750	850	405
0202 S1	1250	900	850		1075	750	375	750	850	405
0202 S2	1500	900	975		1075	750	375	750	850	405
0203	1750	900	1075		1075	750	375	750	850	405
0203 S1	2000	900	1175		1075	750	375	750	850	405
0203 S2	2250	900	1275		1075	750	375	750	850	405
0204	2500	900	1375		1075	750	375	750	850	405
0303	2917	1225	1075		1175	750	375	750	850	405
0303 S1	3333	1225	1175		1175	750	375	750	850	405
0303 S2	3750	1225	1300		1175	750	375	750	850	405
0304	4167	1225	1375		1175	750	375	750	850	405
0304S1	4583	1225	1500		1175	750	375	750	850	505
0304S2	5000	1225	1600	MOTOR LOCATION SIDE	1175	750	375	750	850	505
0305	5417	1225	1700		1175	750	375	750	850	505
0305S1	5833	1225	1800		1175	750	375	750	850	505
0305S2	6250	1225	1900		1175	750	375	750	850	505
0306	6667	1225	2000		1175	750	575	750	850	505
0405	7583	1475	1700		1375	750	575	750	850	505
0405S1	8167	1475	1800		1375	750	575	750	850	505
0405S2	8750	1475	1900		1375	750	575	750	850	505
0406	9333	1475	2000		1375	750	750	750	850	505
0406S1	10208	1475	2150		1375	750	750	750	850	505
0407	11083	1475	2325		1375	750	750	750	850	505
0506	12000	1800	2000		1700	750	750	750	850	605
0506S1	13125	1800	2150		1700	750	750	750	850	605
0507	14250	1800	2325		1700	750	750	750	850	605
0508	15375	1800	2575		1700	750	750	750	850	605
0508S1	17250	1800	2750		1700	750	750	750	850	605
0509	18750	1800	2950		1700	750	750	750	850	605
0608	19479	2100	2575		2075	750	750	750	850	705
0608S1	21083	2100	2750		2075	750	750	750	850	705
0609	22917	2100	2950		2075	750	950	750	850	705
0609S1	24292	2100	3100		2075	750	950	750	850	705
0709	27083	2400	2950		2300	750	950	750	850	805
0709S1	29250	2400	3175		2300	750	950	750	850	805
0710	30333	2400	3250		2300	750	950	750	850	805
0710S1	31958	2400	3375		2300	750	950	750	850	805
0711	33583	2400	3575		2300	750	950	750	850	805
0711S1	35208	2400	3725		2300	750	950	750	850	805
0811	38750	2700	3575		2300	750	950	750	850	905
0811S1	40625	2700	3725		2300	750	950	750	850	905
0812	42500	2700	3875		2300	750	950	750	850	905
0812S1	44375	2700	4025		2300	750	950	750	850	905
0813	46250	2700	4175		2300	750	950	750	850	905
0914	51333	2750	4300		2600	750	950	750	850	1005
1014	56146	2975	4300		2600	750	950	750	850	1005
1114	60958	3200	4300		2600	750	950	750	850	1005

Possible Fan positions:



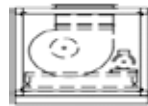
Position 1
(Top Horizontal Discharge)



Position 2
(Bottom Horizontal Discharge)



Position 3
(Upblast Leaving Air)



Position 4
(Upblast Entering Air)



Position 5
(Downblast Entering Air)

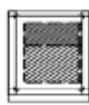


Position 6
(Downblast Entering Air)

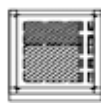
Different Filter Arrangements



Aluminum Flat Filter



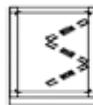
Bag Filter



Bag + Aluminum Flat Filter



Aluminum Flat + Pleated Filter

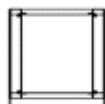


VEE Filter



Hepa Filter

Filter Type	Filter Depth	Section Length (mm)
Aluminum Flat Filter	2"	575
Vee Filter	2"	750
Bag Filter	15"	575
	21"	750
Mini Pleated Filter	4"	575
Synthetic Pleated Filter	2"	575
Synthetic Mini Pleated Filter	2"	575
Hepa Filter	12"	950
Aluminum Flat + Bag Filter	2" + 15"	575
Aluminum Flat + Bag Filter	2" + 21"	850
Synthetic Pleated + Bag Filter	2" + 21"	850
Flat + Mini Pleated Filter	2" + 4"	575



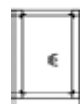
Plenum Section



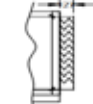
Hot Water Coil
575 mm



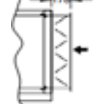
DX Coil
750 mm



UV Lamp- 575 mm



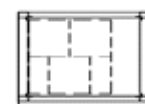
Sand Trap Louver



Full Face Damper



Filter in Neck



Sound Attenuator

SAT1	950 mm
SAT2	1375 mm

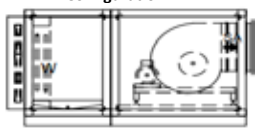
* Fan section lengths specified above are standard dimensions, they are variable and change according to fan sizes.

** Unit connection flanges sizes not included in dimensional data.

*** Filter section lengths specified above for filters withdraw from front side (clean air side). Length of filter section is 1175 mm for filter withdraw from rear side (air dirty side) and when filter section is provided as first section in AHU configuration.

Table 9

Dimensional Data

				Configuration 1	Configuration 2	Configuration 3
						
				Fan Section, Coil Section And Pre Filter In Neck	Fan Section, Coil Section And Pre Filter In Section	Fan Section, Coil Section And Combined Pre & Fine Filter In Section*
Unit Model	Airflow (cfm)	Unit Height	Unit Width	Unit Length		
0202	1000	900	750	1825	2400	2675
0202 S1	1250	900	850	1825	2400	2675
0202 S2	1500	900	975	1825	2400	2675
0203	1750	900	1075	1825	2400	2675
0203 S1	2000	900	1175	1825	2400	2675
0203 S2	2250	900	1275	1825	2400	2675
0204	2500	900	1375	1825	2400	2675
0303	2917	1225	1075	1925	2500	2775
0303 S1	3333	1225	1175	1925	2500	2775
0303 S2	3750	1225	1300	1925	2500	2775
0304	4167	1225	1375	1925	2500	2775
0304S1	4583	1225	1500	1925	2500	2775
0304S2	5000	1225	1600	1925	2500	2775
0305	5417	1225	1700	1925	2500	2775
0305S1	5833	1225	1800	1925	2500	2775
0305S2	6250	1225	1900	1925	2500	2775
0306	6667	1225	2000	1925	2500	2775
0405	7583	1475	1700	2125	2700	2975
0405S1	8167	1475	1800	2125	2700	2975
0405S2	8750	1475	1900	2125	2700	2975
0406	9333	1475	2000	2125	2700	2975
0406S1	10208	1475	2150	2125	2700	2975
0407	11083	1475	2325	2125	2700	2975
0506	12000	1800	2000	2450	3025	3300
0506S1	13125	1800	2150	2450	3025	3300
0507	14250	1800	2325	2450	3025	3300
0508	15938	1800	2575	2450	3025	3300
0508S1	17250	1800	2750	2450	3025	3300
0509	18750	1800	2950	2450	3025	3300
0608	19479	2100	2575	2825	3400	3675
0608S1	21083	2100	2750	2825	3400	3675
0609	22917	2100	2950	2825	3400	3675
0609S1	24292	2100	3100	2825	3400	3675
0709	27083	2400	2950	3050	3625	3900
0709S1	29250	2400	3175	3050	3625	3900
0710	30333	2400	3250	3050	3625	3900
0710S1	31958	2400	3375	3050	3625	3900
0711	33583	2400	3575	3050	3625	3900
0711S1	35208	2400	3725	3050	3625	3900
0811	38750	2700	3575	3050	3625	3900
0811S1	40625	2700	3725	3050	3625	3900
0812	42500	2700	3875	3050	3625	3900
0812S1	44375	2700	4025	3050	3625	3900
0813	46250	2700	4175	3050	3625	3900
0914	51333	2750	4300	3350	3925	4200
1014	56146	2975	4300	3350	3925	4200
1114	60958	3200	4300	3350	3925	4200

* Lengths specified above are for filters withdraw from front side (clean air side). Additional +425 mm should be added for filter withdraw from rear side (air dirty side).

Unit connection flanges sizes not included in dimensional data.

Table 10

Dimensional Data

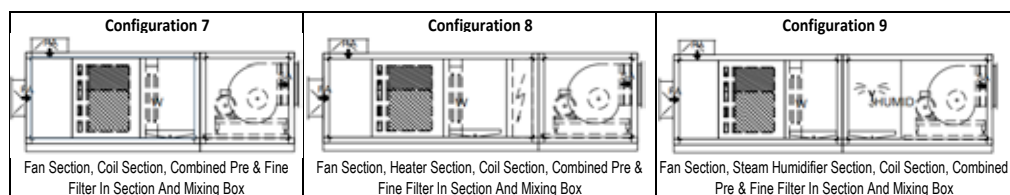
				Configuration 4	Configuration 5	Configuration 6
				Fan Section, Heater Section, Coil Section And Combined Pre & Fine Filter In Section *	Fan Section, Steam Humidifier Section, Coil Section And Combined Pre & Fine Filter In Section *	Fan Section, Steam Humidifier Section, Heater Section, Coil Section And Combined Pre & Fine Filter In Section *
Unit Model	Airflow (cfm)	Unit Height	Unit Width	Unit Length		
0202	1000	900	750	3050	3425	3050
0202 S1	1250	900	850	3050	3425	3050
0202 S2	1500	900	975	3050	3425	3050
0203	1750	900	1075	3050	3425	3050
0203 S1	2000	900	1175	3050	3425	3050
0203 S2	2250	900	1275	3050	3425	3050
0204	2500	900	1375	3050	3425	3050
0303	2917	1225	1075	3150	3525	3150
0303 S1	3333	1225	1175	3150	3525	3150
0303 S2	3750	1225	1300	3150	3525	3150
0304	4167	1225	1375	3150	3525	3150
0304S1	4583	1225	1500	3150	3525	3150
0304S2	5000	1225	1600	3150	3525	3150
0305	5417	1225	1700	3150	3525	3150
0305S1	5833	1225	1800	3150	3525	3150
0305S2	6250	1225	1900	3150	3525	3150
0306	6667	1225	2000	3350	3525	3350
0405	7583	1475	1700	3550	3725	3550
0405S1	8167	1475	1800	3550	3725	3550
0405S2	8750	1475	1900	3550	3725	3550
0406	9333	1475	2000	3725	3725	3725
0406S1	10208	1475	2150	3725	3725	3725
0407	11083	1475	2325	3725	3725	3725
0506	12000	1800	2000	4050	4050	4050
0506S1	13125	1800	2150	4050	4050	4050
0507	14250	1800	2325	4050	4050	4050
0508	15938	1800	2575	4050	4050	4050
0508S1	17250	1800	2750	4050	4050	4050
0509	18750	1800	2950	4050	4050	4050
0608	19479	2100	2575	4425	4425	4425
0608S1	21083	2100	2750	4425	4425	4425
0609	22917	2100	2950	4625	4425	4625
0609S1	24292	2100	3100	4625	4425	4625
0709	27083	2400	2950	4850	4650	4850
0709S1	29250	2400	3175	4850	4650	4850
0710	30333	2400	3250	4850	4650	4850
0710S1	31958	2400	3375	4850	4650	4850
0711	33583	2400	3575	4850	4650	4850
0711S1	35208	2400	3725	4850	4650	4850
0811	38750	2700	3575	4850	4650	4850
0811S1	40625	2700	3725	4850	4650	4850
0812	42500	2700	3875	4850	4650	4850
0812S1	44375	2700	4025	4850	4650	4850
0813	46250	2700	4175	4850	4650	4850
0914	51333	2750	4300	5150	4950	5150
1014	56146	2975	4300	5150	4950	5150
1114	60958	3200	4300	5150	4950	5150

* Lengths specified above are for filters withdraw from front side (clean air side). Additional +425 mm should be added for filter withdraw from rear side (air dirty side).

Unit connection flanges sizes not included in dimensional data.

Table 11

Dimensional Data

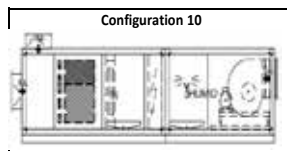


Unit Model	Airflow (cfm)	Unit Height	Unit Width	Unit Length		
0202	1000	900	750	3060	3435	3810
0202 S1	1250	900	850	3060	3435	3810
0202 S2	1500	900	975	3060	3435	3810
0203	1750	900	1075	3060	3435	3810
0203 S1	2000	900	1175	3060	3435	3810
0203 S2	2250	900	1275	3060	3435	3810
0204	2500	900	1375	3060	3435	3810
0303	2917	1225	1075	3160	3535	3910
0303 S1	3333	1225	1175	3160	3535	3910
0303 S2	3750	1225	1300	3160	3535	3910
0304	4167	1225	1375	3010	3385	3760
0304S1	4583	1225	1500	3210	3585	3960
0304S2	5000	1225	1600	3210	3585	3960
0305	5417	1225	1700	3210	3585	3960
0305S1	5833	1225	1800	3210	3585	3960
0305S2	6250	1225	1900	3210	3585	3960
0306	6667	1225	2000	3210	3785	3960
0405	7583	1475	1700	3235	3810	3985
0405S1	8167	1475	1800	3235	3810	3985
0405S2	8750	1475	1900	3235	3810	3985
0406	9333	1475	2000	3235	3985	3985
0406S1	10208	1475	2150	2935	3685	3685
0407	11083	1475	2325	2935	3685	3685
0506	12000	1800	2000	3460	4210	4210
0506S1	13125	1800	2150	3460	4210	4210
0507	14250	1800	2325	3460	4210	4210
0508	15938	1800	2575	3460	4210	4210
0508S1	17250	1800	2750	3460	4210	4210
0509	18750	1800	2950	3460	4210	4210
0608	19479	2100	2575	4035	4785	4785
0608S1	21083	2100	2750	4035	4785	4785
0609	22917	2100	2950	4035	4985	4785
0609S1	24292	2100	3100	4035	4985	4785
0709	27083	2400	2950	4460	5410	5210
0709S1	29250	2400	3175	4460	5410	5210
0710	30333	2400	3250	4460	5410	5210
0710S1	31958	2400	3375	4460	5410	5210
0711	33583	2400	3575	4460	5410	5210
0711S1	35208	2400	3725	4460	5410	5210
0811	38750	2700	3575	4535	5485	5285
0811S1	40625	2700	3725	4535	5485	5285
0812	42500	2700	3875	4535	5485	5285
0812S1	44375	2700	4025	4535	5485	5285
0813	46250	2700	4175	4535	5485	5285
0914	51333	2750	4300	5035	5985	5785
1014	56146	2975	4300	5035	5985	5785
1114	60958	3200	4300	5035	5985	5785

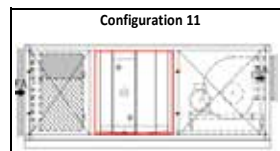
Unit connection flanges sizes not included in dimensional data.

Table 12

Dimensional Data



Configuration 10
Fan Section, Steam Humidifier Section, Heater Section,
Coil Section, Combined Pre & Fine Filter In Section And
Mixing Box



Configuration 11
Fan Section, Coil with Horse Shoe Heat Pipe Section,
Combined Pre & Fine Filter In Section*

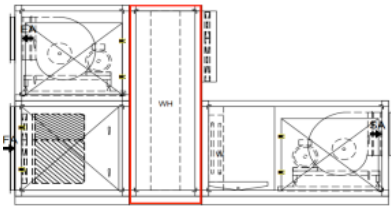
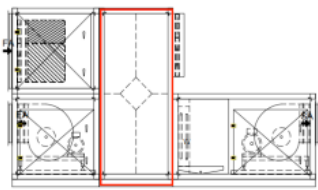
Unit Model	Airflow (cfm)	Unit Height	Unit Width	Unit Length	Unit Model	Airflow (cfm)	Unit Height	Unit Width	Horse Shoe Heat Pipe Section Length	Unit Length
0202	1000	900	750	3435	MAH-0202-HP	1000	900	750	950	2875
0202 S1	1250	900	850	3435	MAH-0202 S1-HP	1250	900	850	950	2875
0202 S2	1500	900	975	3435	MAH-0202 S2-HP	1500	900	975	950	2875
0203	1750	900	1075	3435	MAH-0203-HP	1750	900	1075	950	2875
0203 S1	2000	900	1175	3435	MAH-0203 S1-HP	2000	900	1175	950	2875
0203 S2	2250	900	1275	3435	MAH-0203 S2-HP	2250	900	1275	950	2875
0204	2500	900	1375	3435	MAH-0204-HP	2500	900	1375	950	2875
0303	2917	1225	1075	3535	MAH-0303-HP	2917	1225	1075	950	2975
0303 S1	3333	1225	1175	3535	MAH-0303 S1-HP	3333	1225	1175	950	2975
0303 S2	3750	1225	1300	3535	MAH-0303 S2-HP	3750	1225	1300	950	2975
0304	4167	1225	1375	3385	MAH-0304-HP	4167	1225	1375	950	2975
0304S1	4583	1225	1500	3585	MAH-0304S1-HP	4583	1225	1500	950	2975
0304S2	5000	1225	1600	3585	MAH-0304S2-HP	5000	1225	1600	950	2975
0305	5417	1225	1700	3585	MAH-0305-HP	5417	1225	1700	950	2975
0305S1	5833	1225	1800	3585	MAH-0305S1-HP	5833	1225	1800	950	2975
0305S2	6250	1225	1900	3585	MAH-0305S2-HP	6250	1225	1900	950	2975
0306	6667	1225	2000	3785	MAH-0306-HP	6667	1225	2000	950	2975
0405	7583	1475	1700	3810	MAH-0405-HP	7583	1475	1700	950	3175
0405S1	8167	1475	1800	3810	MAH-0405S1-HP	8167	1475	1800	950	3175
0405S2	8750	1475	1900	3810	MAH-0405S2-HP	8750	1475	1900	950	3175
0406	9333	1475	2000	3985	MAH-0406-HP	9333	1475	2000	950	3175
0406S1	10208	1475	2150	3685	MAH-0406S1-HP	10208	1475	2150	950	3175
0407	11083	1475	2325	3685	MAH-0407-HP	11083	1475	2325	950	3175
0506	12000	1800	2000	4210	MAH-0506-HP	12000	1800	2000	950	3500
0506S1	13125	1800	2150	4210	MAH-0506S1-HP	13125	1800	2150	950	3500
0507	14250	1800	2325	4210	MAH-0507-HP	14250	1800	2325	950	3500
0508	15938	1800	2575	4210	MAH-0508-HP	15938	1800	2575	950	3500
0508S1	17250	1800	2750	4210	MAH-0508S1-HP	17250	1800	2750	950	3500
0509	18750	1800	2950	4210	MAH-0509-HP	18750	1800	2950	950	3500
0608	19479	2100	2575	4785	MAH-0608-HP	19479	2100	2575	950	3875
0608S1	21083	2100	2750	4785	MAH-0608S1-HP	21083	2100	2750	950	3875
0609	22917	2100	2950	4985	MAH-0609-HP	22917	2100	2950	950	3875
0609S1	24292	2100	3100	4985	MAH-0609S1-HP	24292	2100	3100	950	3875
0709	27083	2400	2950	5410	MAH-0709-HP	27083	2400	2950	950	4100
0709S1	29250	2400	3175	5410	MAH-0709S1-HP	29250	2400	3175	950	4100
0710	30333	2400	3250	5410	MAH-0710-HP	30333	2400	3250	950	4100
0710S1	31958	2400	3375	5410	MAH-0710S1-HP	31958	2400	3375	950	4100
0711	33583	2400	3575	5410	MAH-0711-HP	33583	2400	3575	950	4100
0711S1	35208	2400	3725	5410	MAH-0711S1-HP	35208	2400	3725	950	4100
0811	38750	2700	3575	5485	MAH-0811-HP	38750	2700	3575	950	4100
0811S1	40625	2700	3725	5485	MAH-0811S1-HP	40625	2700	3725	950	4100
0812	42500	2700	3875	5485	MAH-0812-HP	42500	2700	3875	950	4100
0812S1	44375	2700	4025	5485	MAH-0812-HP	42501	2700	4025	950	4100
0813	46250	2700	4175	5485	MAH-0813-HP	46250	2700	4175	950	4100
0914	51333	2750	4300	5985	-	-	-	-	-	-
1014	56146	2975	4300	5985	-	-	-	-	-	-
1114	60958	3200	4300	5985	-	-	-	-	-	-

* Lengths specified above are for filters withdraw from front side (clean air side). Additional +425 mm should be added for filter withdraw from rear side (air dirty side).

Unit connection flanges sizes not included in dimensional data.

Table 13

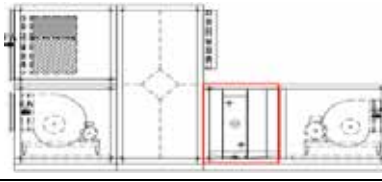
Dimensional Data

				CONFIGURATION -12		CONFIGURATION -13	
							
				Supply Fan Section, Coil Section, Combined Pre & Fine Filter In Section, Heat wheel Section, Return Fan Section And Return Air Filter In Neck*		Supply Fan Section, Coil Section, Combined Pre & Fine Filter In Section, Plate Heat Exchanger Section, Return Fan Section And Return Air Filter In Neck*	
Unit Model	Airflow (cfm)	Unit Height	Unit Width	Heat Wheel Section Length	Total Unit Length	Heat Plate Exchanger Section Length	Total Unit Length
MAH-0202-HR	1000	1700	750	650	4400	850	4600
MAH-0202 S2-HR	1500	1700	975	650	4400	850	4600
MAH-0203-HR	1750	1700	1075	650	4400	850	4600
MAH-0203 S1-HR	2000	1700	1175	650	4400	850	4600
MAH-0204-HR	2500	1700	1375	650	4400	900	4650
MAH-0303 S1-HR	3333	2350	1175	650	4600	900	4850
MAH-0303 S2-HR	3750	2350	1300	650	4600	900	4850
MAH-0304-HR	4167	2350	1375	650	4600	1050	5000
MAH-0304 S1-HR	4583	2350	1500	650	4600	1050	5000
MAH-0304 S2-HR	5000	2350	1600	650	4600	1050	5000
MAH-0305-HR	5417	2350	1700	650	4600	1050	5000
MAH-0305 S1-HR	5833	2350	1800	650	4600	1050	5000
MAH-0305 S2-HR	6250	2350	1900	650	4600	1050	5000
MAH-0306-HR	6667	2350	2000	650	4600	1300	5250
MAH-0405-HR	7583	2850	1700	650	5000	1350	5700
MAH-0405 S1-HR	8167	2850	1800	650	5000	1350	5700
MAH-0405 S2-HR	8750	2850	1900	650	5000	1350	5700
MAH-0406-HR	9333	2850	2000	650	5000	1350	5700
MAH-0406 S1-HR	10208	2850	2150	650	5000	1350	5700
MAH-0407-HR	11083	2850	2325	650	5000	1650	6000
MAH-0506-HR	12000	3500	2000	650	5650	1650	6650
MAH-0506 S1-HR	13125	3500	2150	650	5650	1650	6650
MAH-0507-HR	14250	3500	2325	650	5650	1650	6650
MAH-0508-HR	15938	3500	2575	650	5650	1650	6650
MAH-0508 S1-HR	17250	3500	2750	650	5650	1650	6650
MAH-0509-HR	18750	3500	2950	650	5650	1650	6650
MAH-0608-HR	19479	4100	2575	650	6400	1650	7400
MAH-0608 S1-HR	21083	4100	2750	650	6400	1650	7400
MAH-0609-HR	22917	4100	2950	750	6500	1650	7400
MAH-0609 S1-HR	24292	4100	3100	750	6500	1650	7400
MAH-0709-HR	27083	4725	3175	750	6950	-	-
MAH-0709 S1-HR	29250	4725	3175	750	6950	-	-
MAH-0710-HR	30333	4725	3375	750	6950	-	-
MAH-0710 S1-HR	31958	4725	3375	750	6950	-	-
MAH-0711-HR	33583	4725	3575	750	6950	-	-
MAH-0711 S1-HR	35208	4725	3725	750	6950	-	-
MAH-0811-HR	38750	5325	3775	750	6950	-	-
MAH-0811 S1-HR	40625	5325	3800	750	6950	-	-
MAH-0812-HR	42500	5325	3975	750	6950	-	-
MAH-0812 S1-HR	44375	5325	4025	750	6950	-	-
MAH-0813-HR	46250	5325	4175	750	6950	-	-

* Lengths specified above are standard dimensions, they are variable and change according to fan sizes.
Unit connection flanges sizes not included in dimensional data.

Table 14

Dimensional Data

CONFIGURATION -14	CONFIGURATION -15
	
Supply Fan Section, Coil Section, Combined Pre & Fine Filter In Section, Horse Shoe Heat Pipe, Heat Wheel Section, Return Fan Section And Return Air Filter In Neck	Supply Fan Section, Coil Section, Combined Pre & Fine Filter In Section, Horse Shoe Heat Pipe, Plate Heat Exchanger Section, Return Fan Section And Return Air Filter In Neck

Unit Model	Airflow (cfm)	Unit Height	Unit Width	Horse Shoe Heat Pipe Section Length	Total Unit Length	Horse Shoe Heat Pipe Section Length	Total Unit Length
MAH-0202-HRHP	1000	1700	750	950	4500	950	4800
MAH-0202 S2-HRHP	1500	1700	975	950	4500	950	4800
MAH-0203-HRHP	1750	1700	1075	950	4500	950	4800
MAH-0203 S1-HRHP	2000	1700	1175	950	4500	950	4800
MAH-0204-HRHP	2500	1700	1375	950	4500	950	4800
MAH-0303 S1-HRHP	3333	2350	1175	950	4700	950	5000
MAH-0303 S2-HRHP	3750	2350	1300	950	4700	950	5000
MAH-0304-HRHP	4167	2350	1375	950	4700	950	5000
MAH-0304 S1-HRHP	4583	2350	1500	950	4700	950	5000
MAH-0304 S2-HRHP	5000	2350	1600	950	4700	950	5000
MAH-0305-HRHP	5417	2350	1700	950	4700	950	5000
MAH-0305 S1-HRHP	5833	2350	1800	950	4700	950	5000
MAH-0305 S2-HRHP	6250	2350	1900	950	4700	950	5000
MAH-0306-HRHP	6667	2350	2000	950	4700	950	5000
MAH-0405-HRHP	7583	2850	1700	950	5100	950	5400
MAH-0405 S1-HRHP	8167	2850	1800	950	5100	950	5400
MAH-0405 S2-HRHP	8750	2850	1900	950	5100	950	5400
MAH-0406-HRHP	9333	2850	2000	950	5100	950	5400
MAH-0406 S1-HRHP	10208	2850	2150	950	5100	950	5400
MAH-0407-HRHP	11083	2850	2325	950	5100	950	5400
MAH-0506-HRHP	12000	3500	2000	950	5750	950	6050
MAH-0506 S1-HRHP	13125	3500	2150	950	5750	950	6050
MAH-0507-HRHP	14250	3500	2325	950	5750	950	6050
MAH-0508-HRHP	15938	3500	2575	950	5750	950	6050
MAH-0508 S1-HRHP	17250	3500	2750	950	5750	950	6050
MAH-0509-HRHP	18750	3500	2950	950	5750	950	6050
MAH-0608-HRHP	19479	4100	2575	950	6500	950	6800
MAH-0608 S1-HRHP	21083	4100	2750	950	6500	950	6800
MAH-0609-HRHP	22917	4100	2950	950	6700	950	6900
MAH-0609 S1-HRHP	24292	4100	3100	950	6700	950	6900
MAH-0709-HRHP	27083	4725	3175	950	7150	950	7350
MAH-0709 S1-HRHP	29250	4725	3175	950	7150	950	7350
MAH-0710-HRHP	30333	4725	3375	950	7150	950	7350
MAH-0710 S1-HRHP	31958	4725	3375	950	7150	950	7350
MAH-0711-HRHP	33583	4725	3575	950	7150	950	7350
MAH-0711 S1-HRHP	35208	4725	3725	950	7150	950	7350
MAH-0811-HRHP	38750	5325	3775	950	7150	950	7350
MAH-0811 S1-HRHP	40625	5325	3800	950	7150	950	7350
MAH-0812-HRHP	42500	5325	3975	950	7150	950	7350
MAH-0812 S1-HRHP	44375	5325	4025	950	7150	950	7350
MAH-0813-HRHP	46250	5325	4175	950	7150	950	7350

* Lengths specified above are standard dimensions, they are variable and change according to fan sizes.
Unit connection flanges sizes not included in dimensional data.

Table 15

GUIDE SPECIFICATIONS

1. Introduction

SKM Modular Air Handling Units designed to a high engineering standard to provide the requirements of ventilation, heating, cooling, de-humidification and air distribution to a conditioned space. To meet project requirements, units shall consist of combinations of different sections like fan, cooling coil, heating coil, humidifier, filter, heat recovery system, sound attenuator, mixing box, return air fan, plenums etc. as indicated on the equipment schedule.

Air handling units shall be manufactured in modular sections. Units normally shipped with each section fully assembled in the factory. The unit shall be however designed to be supplied in knockdown arrangement for quick site assembly, where shipping or plant room restrictions demand.

Units shall be installed at site as per Installation Operation & Maintenance Manual.

2. Certifications

2.1 Eurovent

MAH Series

Mechanical Characteristics according to EN 1886

Unit Performance according to EN 13053

2.2 AHRI

MAH Series

Fan Performance according to AHRI-430

Coil Performance according to AHRI-410

3. Range

SERIES	CONSTRUCTION		Air Flow Range cfm
MAH	Aluminum Profile - 48 mm Thick Panels	CW Coil without Heat Recovery	1000 - 60000 cfm
	Steel Pentapost - 50 mm Thick Panels		
	Aluminum Profile - 63 mm Thick Panels		
	Aluminum Profile - 48 mm Thick Panels	CW Coil with Heat Recovery	1000 - 46250 cfm
	Steel Pentapost - 50 mm Thick Panels		
	Aluminum Profile - 63 mm Thick Panels		

4. Unit Construction

4.1 Frame

Unit's frames shall be constructed of either extruded Aluminum profiles or hot dip coated galvanized steel profile (steel pentapost), with easily removable panels.

4.2 Panels

1. All panels shall be in one-piece, double-wall construction with insulation sealed between the inner and outer skin.
2. Outer and inner skin shall be with hot dipped galvanized steel, which is conforming to JIS-G 3302 and ASTM A653.
3. Unit frame and panels shall be thermal bridge protected to minimize the conduction path from the inside of the unit to the outside.
4. Removal of panels shall not effect on the structural integrity of the unit.
5. Units casing shall be in galvanized or painted finish as indicated

on the equipment schedule. Painted casing shall be made of hot-dip galvanized steel sheets. Fabricated steel shall be thoroughly de-greased and then phosphatized before application of an average 60 micron baked electrostatic polyester dry powder coating in RAL 7032 color scheme. This finish can pass 1000-hour, 5% salt spray test at 95°F (35°C) and 95% relative humidity (ASTM B 117).

4.3 Unit Base

1. Units shall be either with painted galvanized or with structural steel base frame, depending on the unit size.
2. All ceiling suspended units shall be provided with painted rigid steel structure base frame and only up to 8000 cfm air flow.

4.4 Insulation

1. Polyurethane foam insulation shall be standard for units with Aluminum profile construction.
2. Fiberglass insulation shall be standard for units with Steel pentapost construction.
3. Injected Polyurethane foam insulation have density of 2.5 lbs/ft³ (40 kg/m³) according to the test standard ASTM D-1622-88 and thermal conductivity of 0.14 BTU in/(h.ft² .°F) (0.020W/mK) according to test standard ASTM C 518-56.
4. The fiberglass insulation shall conforms to HH-1-545B Type 1, SMACNA standard for duct liners and ASTM-C-423 and NFPA90A and 90B standards for fire resistance.

5. FAN SECTION

5.1 Belt Driven Fans

1. Fans used in units shall be tested in a registered laboratory in accordance with AMCA standard 210.
2. Fans shall be statically and dynamically balanced according to ISO 1940.
3. Double inlet double width centrifugal belt driven fans shall be standard supply in SKM air handling units.
4. The impellers shall be forward curved, backward curved or airfoil profile depending on the requirements.
5. SKM fans use self-aligned ball or pillow block bearings that are greased for life. Pillow block bearings shall be provided with re-greasing fittings.
6. Flexible connection shall be provided between fan discharge and casing panel to avoid transmission of vibration to the connecting duct.
7. Fan motors shall be totally enclosed fan cooled (TEFC), foot mounted, 4 poles, IP-55 protected and with Class F insulation.
8. Rating and operating characteristics of motors shall be in accordance with IEC 60034-1 and IEC60085 standards.
9. Fan and motor shall be mounted on a common base assembly. The base assembly is isolated from the outer casing with factory installed vibration isolators.
10. Fans shall be belt-driven by motors, with a set of fixed pitch or variable pitch pulleys and matching belts.

GUIDE SPECIFICATIONS

5.2 Direct Driven Fans

1. Direct driven fans shall be Centrifugal type, designed for operation w/o casing, with motor for installation horizontally.
2. Backward curved impellers shall be mounted directly on the motor rotor, statically and dynamically balanced in accordance with DIN ISO 21940-11.
3. Fan motors shall be IP55 protected and class F insulated.
4. A suitable speed variation system shall be required for the optimum adjustment of the desired operating point. (Not included in standard supply).

6. COIL SECTION

1. All coil performance shall be certified in accordance with AHRI Standard 410 and tested by compressed air under water to the pressure of 300 psig (21.09 kg/cm²).
2. Coil circuiting shall be counter flow. (Direction of coil water/ refrigerant flow shall be counter to direction of unit air flow).
3. Coils shall be constructed from seamless copper tubes and are mechanically expanded into continuous corrugated Aluminum fins to provide continuous compression bond over the entire finned length for maximum heat transfer rates.
4. Chilled water coils shall be available up to 10 rows.
5. Coils shall be available up to 12 fpi.
6. All water coils shall be provided with air vents and drain plugs.
7. Coil connections shall be sealed against unit panels.
8. Coil connections shall be sweat type.
9. DX coil shall be provided with distributor. Expansion valve shall be provided if specified.
10. Supply and return water connections of coil section shall be labeled with "WATER IN" and "WATER OUT", respectively.
11. DX coil section shall be labeled with "LIQUID" and "SUCTION"
12. Coils shall be provided with moisture eliminator depending on the air conditions. Eliminator blades are made of PVC, with shape specially designed to trap water droplets blown off the coil.
13. The drain pan shall be sloped toward the drain connection to meet ASHRAE standard 62.
14. Cooling coil section shall be provided with insulated drain pan with MPT drain connection, in order to hold and remove the condensate formed during dehumidification.
15. Drain pan shall be made of painted Zinc-coated steel sheet insulated from outside for maximum protection against sweating and corrosion.
16. Drain pan shall be extended to include coil, headers and U-bends. Drain connection can be provided on either side or on both sides, as required.

7. FILTER SECTION

1. Filters using in SKM air handling units shall be in accordance with ASHRAE 52.2, ISO 16890 and EN779 standards.
2. Hepa filters in SKM air handling units shall be in accordance with EN1882 standards.
3. Standard Pre Filters shall be 2" (50mm) panel filters with Aluminum washable media, EN class: G3.

4. Standard Fin filters shall be 21" (534mm) deep high efficiency bag filters with synthetic media, EN Class: F7.
5. HEPA filters in SKM air handling units shall be 12" deep and H13 in accordance with EN1882 standards.

8. ELECTRIC HEATER SECTION

1. Electric heater element shall be in accordance with IEC standards.
2. Electric heater element shall be constructed from 80/20 nickel chrome resistance wire, which is connected to terminal pins and centered in stainless steel grade 304L sheath metal tubes by compressed magnesium oxide.
3. Standard components included with the heater shall be supplied :
 - (1) Finned heating element attached to the heater frame.
 - (2) Primary over temperature protection provided by auto reset high limit safety cut outs.
 - (3) Secondary over temperature protection provided by manual reset high limit safety cut-out for positive break.
 - (4) Junction box including the power and control terminals for heater wiring.

9. HUMIDIFIER SECTION

1. This system shall be consists of immersed electrode steam generating cylinders, steam distribution pipe and necessary controls. Steam generating cylinders mounted on to the AHU within a separate enclosure. The steam distributor passes through the unit casing to inject steam in the air stream to reach the required humidity conditions. ON/ OFF control for humidifier is provided as standard.

10. DAMPERS

1. To control the fresh, return and exhaust airflow rates in mixing box, exhaust box and economizer, units shall be provided with dampers.
2. Damper frame and blades shall be constructed of galvanized steel or aluminum in airfoil design.
3. Damper blades shall be constructed of stainless steel if so specified.

GUIDE SPECIFICATIONS

11. SOUND ATTENUATOR SECTION

1. Sound attenuator section shall be consisting of splitters with 24" (600mm) or 48" (1200mm) in length.
2. Outer skin of the splitters shall be constructed of perforated galvanized steel.
3. The insulation material of splitters shall be fiberglass.

12. HEAT RECOVERY SECTION

To conserve the energy consumption, one of the following heat recovery systems shall be provided:

12.1 Rotary Heat Recovery System (Thermal Wheel)

1. Heat wheels in SKM air handling units shall be capable of recovering both sensible and latent heat.
2. Heat wheels offered shall be constructed of Aluminum, coated with heat transfer material (Molecular sieve) which shall rotate by an electric motor at constant speed.
3. The heat wheel rotates between the fresh and return air streams, and two fan sections shall be required (supply and exhaust fan)

12.2 Fixed Plate Heat Recovery System (Plate Heat Exchanger)

1. Fixed plate heat recovery system shall be built from layers of Aluminum plates.
2. The exhaust air passes through the exchanger from end to end and the supply air stream individual passages formed by the plates within the exchanger.
3. This system shall recover sensible heat only.

12.3 Heat Pipe Systems

1. Heat pipe shall be consisting of two coils, pre-cooling and reheating, connected together without any moving part in between them and containing phase change fluid.
2. According to the arrangement of the heat pipe coils with respect to other components, it shall be used for either dehumidification (Horse shoe type arrangement), or for heat recovery (Vertical).
3. For dehumidification function (Horseshoe Heat Pipe), evaporator coil shall be installed between the Pre and Re heat coil of heat pipe.
4. For heat recovery function (Vertical Heat Pipe), heat pipes coils shall be installed between the fresh and return air streams and two fan sections shall be required; supply and exhaust fan. This system shall recover sensible heat only.

12.4 Run around Coil System

1. This system shall be comprise of two coils, one placed in the supply air stream and other in the exhaust air stream.
2. The coils shall be connected in a closed loop via piping and circulating pump (supplied by others).
3. Water or glycol shall be circulated as a heat transfer medium. This system shall recover sensible heat only.

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