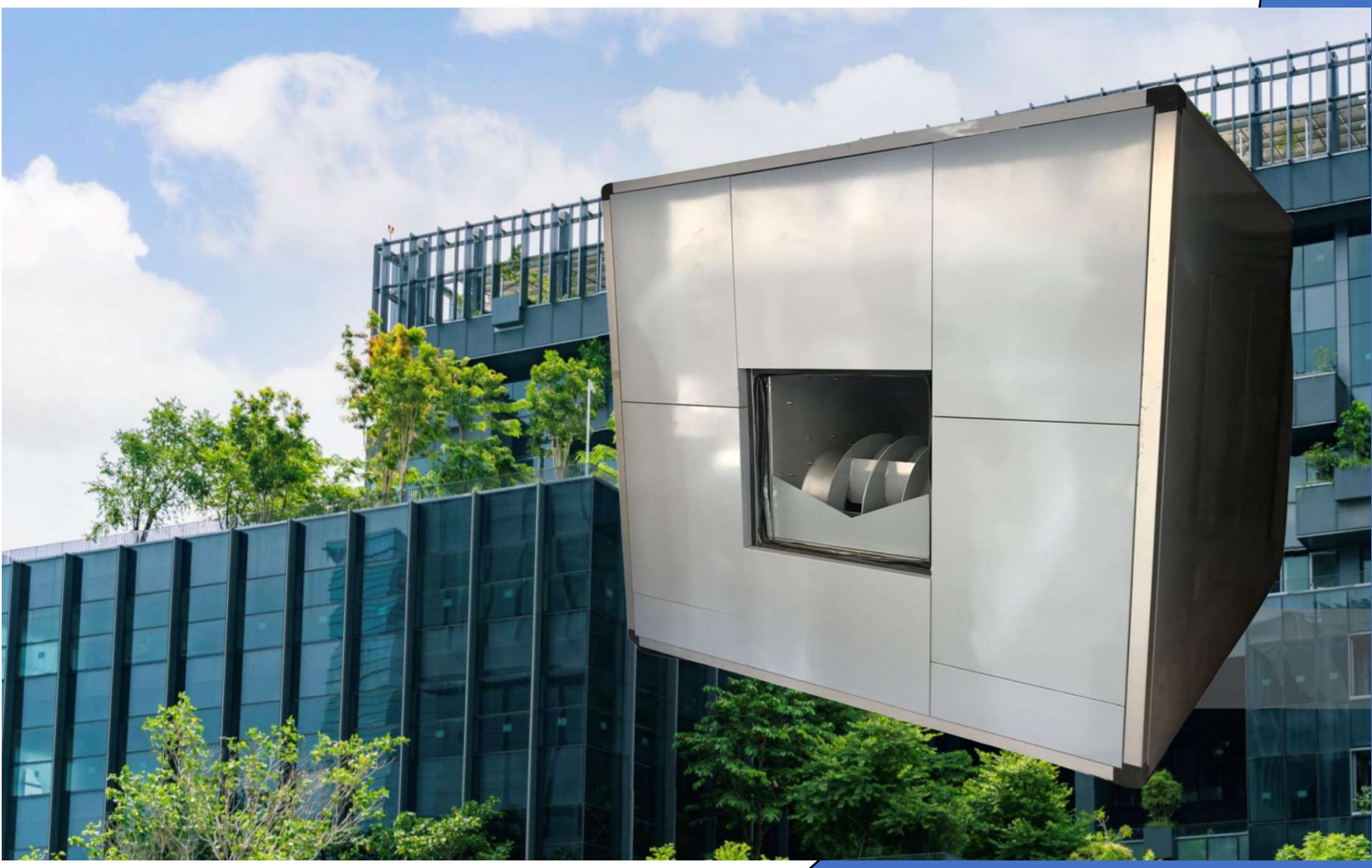
Central Air Handling Units

Modular Air Handling Unit

CG – AHU - M series



CG-AHU-M :
Standard Sizes UP to 72,250 CMH, 42,500 CFM
Nominal Cooling Capacity up to 300 RT for full fresh air applications

- Compact Design Suit All applications
- High Flexibility Of installations.
- Affordable Solution.
- Medium and High Static pressure.
- Much Acoustical proposal.
- High Performance Plug fans proposal.
- Hygienic version.

Contents

Introduction

S S Air Technology Modular Air Handling Units are designed to a high engineering standard and are ideal where the requirements for commercial / industrial applications, such as shopping mall, Hotels, office buildings, banks, Shops and industrial facilities applications.

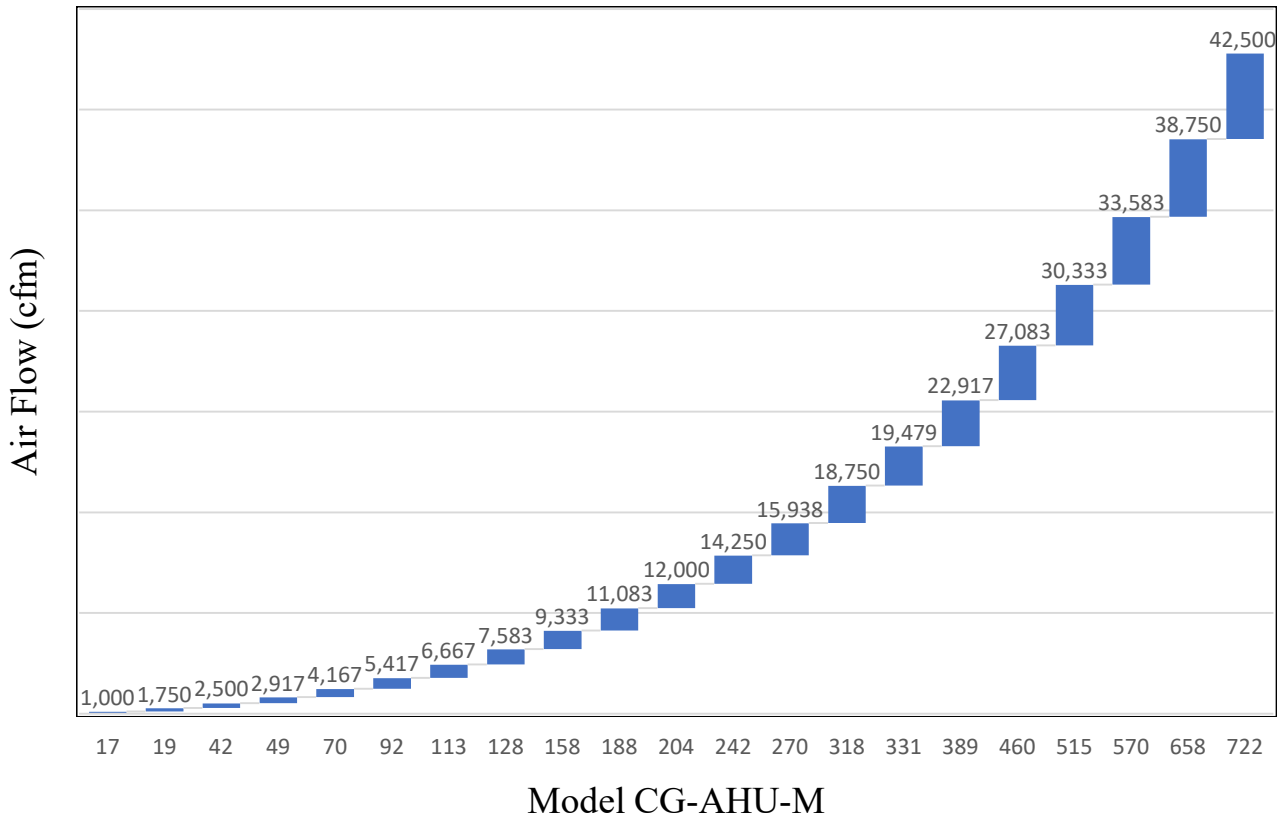
CG-AHU-M Units are available in 16 models to deliver from 1000 cfm (4721/s) to 42500 cfm (20058 l/s) nominal air flow rate against a total static pressure up to 8.0 inwg (2000 Pa).

Mechanical characteristics and rating performances are in according to Eurocent standard rules of approvals.

CG-AHU-M Units are manufactured in a facility registered to ISO 9001 manufacturing quality standards, and coil performances are certified in accordance with AHRI Standard 410.

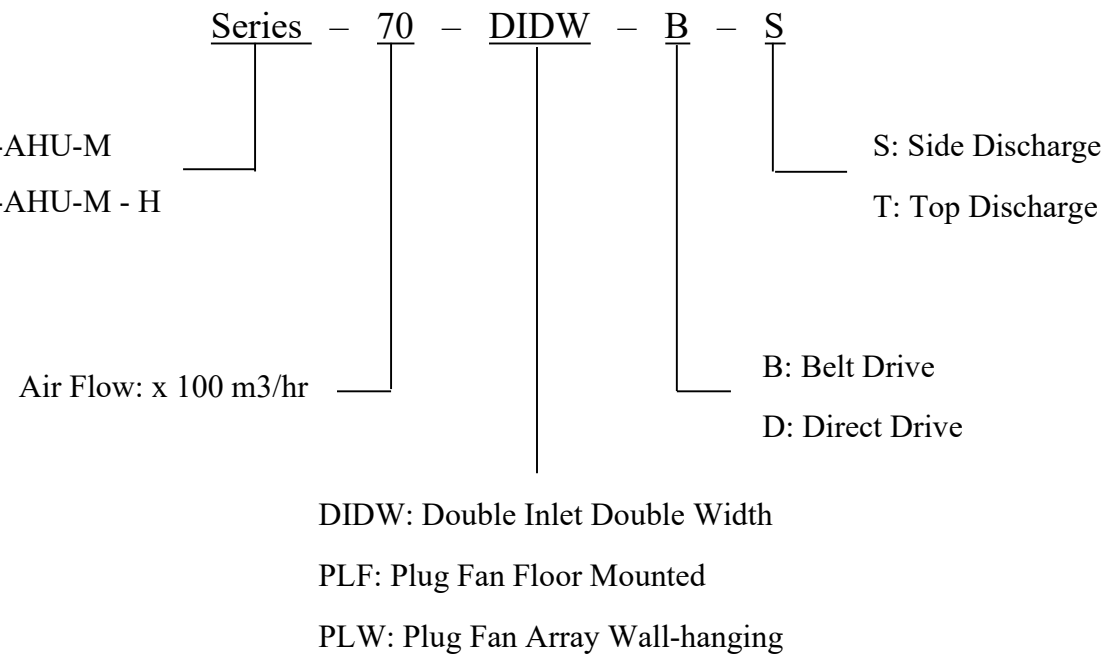
S S Air Technology provides qualified service and stock of replacement parts as most of unit components are manufactured in the factory premises where rest of limited types of spare parts depend on outsource chains.

Series Models and Air flow range



Nomenclature

S S Air Technology CG-AHU-M series Air Handling Units are based on Standard Module sizes.



General Features

- Modular construction
- Application flexibility
- Excellent sealant.
- Comapact design.
- Optional Internal surfaces of the units are made of wear-resistant materials
- Easy for maintenance
- Easy for cleaning inside the units and its components
- Conformity with applicable European and ARI standards
- CG-AHU-M series unit consists of a wide choice of a combination, but not limited to the following sections: cooling coil, heating coil, evaporative cooling humidifier, filter section, mixing section with dampers, plenums, etc.
- CG-AHU-M-H series unit design for hygenic applications such as medical facilities, clean room, electronics, laboratories and relevant others.

Component Features Casing & Construction

Fig1: Aluminum profile with sealant connectors system.

UNIT Frame

- Extruded aluminum profile with sealant connectors system.
- Aluminum profile frames are joined by means of strong nylon corners.

Panels

- Panels shall be double-skin construction with polyurethane foam insulation sandwiched between the inner and outer panels.
- Panel thickness is 50 mm, powder-coated galvanized sheet (GI) outer skin and blind inner skin for the complete unit.
- CG-AHU-M-H Panel thickness is 50 mm, powder-coated galvanized sheet (GI) outer skin and blind anticorrossive aluminum or stainless steel for complete unit.
- Access panels are provided for all sections to facilitate access to all internal components for maintenance and cleaning.
- Removal of any panels shall not affect the structural integrity of the units.

Access Doors

- Suitable access doors are provided for all sections to facilitate access to all components for maintenance and cleaning.
- Hinged access doors with handles and safety limit switch for the fan section. Hinged or lift-off access panels for all other sections.
- Viewports along with light are provided upstream to the fan section components door and optional for all access doors.

Finish

- Powder-coated finish, standard color RAL 7040.

Insulation

- All panels are internally insulated with polyurethane foam insulation with a density of 2.5 lb/ft3 (40 kg/m3) and thermal conductivity of 0.14 BTU.in/ft2 E (0.02 W/mK).

Gaskets

- closed cell gaskets liner between the panel and frame to ensure excellent leak-tightness and sealant effect.
- CG-AHU-M series are totally closed cell type, and they will not aid the growth of bacteria or fungus, preventing contamination

Base Frame and Floor Panel

Epoxy coated carbos sheet metal or structural steel base frame.
Provision for drainage through floor panels for required section, others section can be provided upon request.

Fig. 2: Drainable Floor Panel. (optional)

Major sections and sub-assemblies:

Fan Section

- Direct-driven centrifugal plug fans are supplied as standard for CG-AHU-M-H hyginic applications.
- Direct-driven fans are centrifugal, designed for casing operation, with a horizontally installed floor mounted or wall hanging bracket motor. 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 S S Air Technology standard supply). To limit transmission of noise and vibration, the complete fan-motor assembly is mounted on a floating sub-base with anti-vibration mounts
- In the CG-AHU-M series, units are supplied with either belt-driven centrifugal fans or direct-driven centrifugal fans depending on the requirement.

Fig. 3: Fan Section

Options

- Units can be provided with standby fans upon request.
- The fans shall be equipped with a flow measuring device as an option. With the flow measuring device, it is possible to measure/monitor the flow easily after the fan is installed.

DIDW – Backward Curved Belt derive Scroll type Fans

DIDW – Backward Curved Fans					
Model CG-AHU-M	Air Flow m3/hr	Fan Diameter	Q. ty	Motor Range (Kw)	
				Min(pa-200)	Max(pa-1000)
17	1,700	250	1	0.25	1.5
		310		0.25	2.2
29	2,975	250	1	0.37	2.2
		310		0.37	2.2
		350		0.25	2.2
42	4,250	250	1	0.75	2.2
		310		0.37	2.2
		450		0.55	3
49	4,958	250	1	1.1	3
		450		0.55	3
70	7,083	310	1	2.2	4
		350		1.5	4
		500		0.75	5.5
		560		1.1	5.5
92	9,208	350	1	2.2	5.5
		560		1.1	7.5
		630		1.1	11
113	11,333	350	1	4	7.5
		450		2.2	7.5
		500		1.5	7.5
128	12,891	450	1	1	11
		560		1.5	7.5
		630		1.5	11
		710		2.2	11
158	15,866	500	1	3	7.5
188	18,841	500	1	4	11
		560		2.2	11
		630		2.2	15
		710		2.2	11
204	20,400	500	1	7.5	15
242	24,225	560	1	4	15
		630		4	15
		710		3	15
270	27094	560	1	5.5	15
		630		5.5	15
		710		4	15
318	31875	630	1	11	18.5
		710		5.5	18.5
331	33114	630	1	11	18.5
		710		5.5	18.5
389	38958	710	1	7.5	18.5
460	46,041	560	2	4	15
		630		4	15
		710		3	15
515	51,566	560	2	5.5	15
		630		5.5	15
		710		4	15
570	57,091	560	2	5.5	15
		630		5.5	15
		710		4	15
658	65,875	630	2	11	18.5
		710		5.5	18.5
722	72,250	710	2	7.5	18.5

Plug Fans Array

Plug Fans Array					
Model CG-AHU-M	Air Flow m3/hr	PLF/PLW Fan Diameter	Q. ty	Motor Nominal (KW) Up to 1000 pa static presser	No. of Poles
17	1,700	250	1	0.55	2
		310		1.1	2
29	2,975	250	2	0.55	2
		310	2	1.1	2
		350	1	2.2	2
42	4,250	310	2	1.1	2
		350	1	2.2	2
49	4,958	450	2	1.5	4
		500	2	2.2	4
70	7,083	500	3	2.2	4
		560	2	3.0	4
92	9,208	500	3	2.2	4
		560	2	3.0	4
113	11,333	500	3	2.2	4
		560	2	3.0	4
128	12,891	560	3	3.0	4
158	15,866	560	4	3.0	4
188	18,841	560	4	3.0	4
		630	2	5.5	4
204	20,400	500	5	2.2	4
		630	2	5.5	4
242	24225	560	5	3.0	4
		630	2	5.5	4
270	27,094	560	5	3.0	4
		710	2	7.5	4
318	31,875	560	4	3.0	4
		710	2	7.5	4
331	33,114	560	6	3.0	4
		710	2	11	4
389	38,958	710	2	11	4

- **PLF**:Plug Fan-Floor mounted
- **PLW**:Plug Fan-Wall hanging
- Size 630 and 710 are only provided with PLF arrangement
- Direct derive plug fans shall provided with VSD inverter as optional to adjust fans speed.

Coil Section

- A variety of coils, including chilled water, direct expansion, and hot water, are available to meet a wide range of application requirements. Coil performance is certified in accordance with AHRI Standard 410. Coils are tested by air pressure while submerged in water to a pressure of 300 psi.
- Coils are constructed from seamless copper tubes. Aluminum fins are provided as standard. Stainless steel coil frame for CG-AHU-M-H.
- Minimum fins per inch: 10 and Maximum fins per inch: 12
- Coils can be provided with a moisture droplet eliminator depending on the air conditions. Stainless steel eliminator frame for CG-AHU-M-H.. The eliminator can be pulled out for cleaning.
- Stainless steel, double-skin, insulated condensate drain pan
- Drain pans are slopped from three sides for complete drainage.

Figure 4: Coils are installed on rails and are free to be removed from the AHU for cleaning.

Figure 5: Eliminators installed on rails are removed from cleaning.

Figure 6: Stainless Steel, Double Skin Condensate Drain Pan.

Filter Section

A wide variety of filtration systems are available to meet different applications, which includes flat filters, bag filters, HEPA filters, and other types.
Filters used in S S Air Technoogy air handling units are in accordance with ISO 16890 and EN779 standards.

- **Pre-Filter**

Synthetic or Aluminum Washable pre-filters in accordance with ISO 16890 standard.

- **Fine Bag Filters**

Synthetic fine-filters in accordance with ISO 16890 Standard

Figure 7: Aluminum Washable Pre Filter

Figure 8: F7 - Fine Bag Filter

- **Hepa filter**

Ultra high absolute HEPA (High Efficiency Particulate Air) Filter with an efficiency in excess of 99%. HEPA filters in the S S Air Tehnology CG-AHU-M-H Hygienic AHU are in accordance with EN1882 standards

- Stainless steel filter rack
- Inspection Window
- Bulk head light manometer across filters provided as standard.

Fig 9: HEPA Filter Section

Filter				
Model CG-AHU-M	Air Flow cfm	Air Flow m3/hr	Cells 595x595 Q. ty	Cells 290x595 Q. ty
17	1,000	1,700	1	0
29	1,750	2,975	1	1
42	2,500	4,250	1	1
49	2,917	4,958	1	1
70	4,167	7,083	2	0
92	5,417	9,208	2	1
113	6,667	11,333	3	3
128	7,583	12,891	3	3
158	9,333	15,866	3	3
188	11,083	18,841	6	0
204	12,000	20,400	6	3
242	14,250	24,225	6	3
270	15,938	27,094	9	0
318	18,750	31,875	12	0
331	19,479	33,114	12	0
389	22,917	38,958	12	4
460	27,083	46,041	15	0
515	30,333	51,566	15	5
570	33,583	57,091	18	0
658	38,750	65,875	18	6
722	42,500	72,250	21	7

Electric Heater Section

Electric heater batteries are available in a wide range of capacities (kW) and steps as an integral part of HMAH units. They consist 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 the 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, a heater control box can be supplied as an 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 a Heater Control Box (HCB) is opted, then a heater control box can be provided, which will include the options below.

- 3-pole magnetic contactor per stage.
- Control fuse/breaker. Control switch.
- Power fuses/circuit breaker as per NEC, if the total load exceeds 48 amps.
- Factory-installed airflow switch. Note that necessary controls for staging the heater for temperature control must be provided by others.

If a thyristor controller (SCR) is opted, then it will include the options below.

- Thyristor(s) for the heater
- Power contactor for thyristor
- Control fuse/breaker. Control switch
- Power fuses/circuit breaker as per NEC, if the total load exceeds 48 amps
- Factory-installed airflow switch. Note that necessary controls for modulating the heater thyristor for temperature control must be provided by others.

Electric Hreater								
Model CG-AHU-M	Air Flow CFM	Air Flow m3/hr	Option-1		Option-2		Option-3	
			KW	No of Stage	KW	No of Stage	KW	No of Stage
17	1,000	1,700	3	1	6	1	6	2
29	1,750	2,975	6	1	9	1	9	2
42	2,500	4,250	12	1	15	2	24	2
49	2,917	4,958	12	1	15	2	18	2
70	4,167	7,083	18	2	24	2	36	2
92	5,417	9,208	24	2	30	2	48	2
113	6,667	11333	30	2	36	2	60	2
128	7,583	12,,891	36	2	48	2	72	2
158	9,333	15,866	36	2	48	2	90	2
188	11,083	18,841	48	2	60	2	90	2
204	12,000	20,400	60	2	72	2	108	3
242	14,250	24,225	72	2	90	2	126	3
270	15,938	27,094	72	2	90	2	126	3
318	18,750	31,875	90	2	108	3	126	3
331	19,479	33114	90	2	108	3	162	4
389	22,917	38,,958	90	2	126	3	180	4
460	27,083	46,041	126	3	144	4	216	6
515	30,333	51,566	144	4	180	5	270	6
570	33,583	57,091	144	4	180	5	270	6
658	38,750	65,875	144	4	216	6	324	6
722	42,500	72,250	180	5	216	6	324	6

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.
- Damper blades are available in aluminum or stainless steel with opposed blades. Connectors are provided for motorized operation.

Humidifier Section

- This system consists of immersed electrode steam generating cylinders, steam distribution pipe, and necessary controls. Steam generating cylinders are mounted on the AHU within a separate enclosure. The steam distributor passes through the unit casing to inject steam into the air stream to reach the required humidity conditions.
- ON/OFF control for the humidifier is provided as standard. A stainless steel condensate drain pan is provided. An access door, view port, bulk head light, and air flow switch are provided in the humidifier section.

Steam Humidifie				
Model CG-AHU-M	Air Flow CFM	Air Flow m3/hr	Option-1 Capacity Kg/hr	Option-2 Capacity Kg/hr
17	1,000	1,700	5	10
29	1,750	2,975	5	15
42	2,,500	4,250	8	15
49	2917	4,958	8	15
70	4,167	7,083	10	18
92	5,417	9,208	15	25
113	6,667	11,333	18	35
128	7,583	12,891	18	35
158	9,333	15,866	18	35
188	11,083	18,841	25	45
204	12,000	20,400	25	45
242	14,250	24,225	25	45
270	15,938	27,094	35	70
318	18,750	31,875	35	70
331	19,479	33,114	35	70
389	22,917	38,958	35	70
460	27,083	46,041	35	70
515	30,333	51,566	45	90
570	33,583	57,091	45	90
658	38,,750	65,875	45	90
722	42500	72,250	70	90

Dirct Evaporative Cooling “DEC” Section

- Adiapatic Direct Evaporqative cooling media, comprise high effciecnt 85 % saturation effecicncy flute 5 cellulose paper wet decs with minimum 200mm thickness banck, housed in stainless steel frame enclosure, stainless steel sump pump and rigid plastic casing recirculating submersible pump with cstainless steell core, all plastic distription pipes and overjead cap water distriputer.
- Optional temperature sensor and timer on the working hours operations up on request

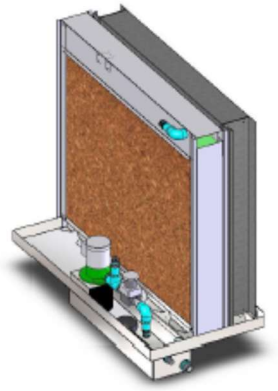


Fig 10: DEC section

Plenum BOX with dampers or (Access) Sections

Fig 11: Volume Damper

- Empty plenum sections can be supplied either for future use or for particular applications such as access, end vertical assembly, end bottom plenum for bottom return air applications, etc.
- Custom sizes to suit a particular requirement can be supplied as an option.

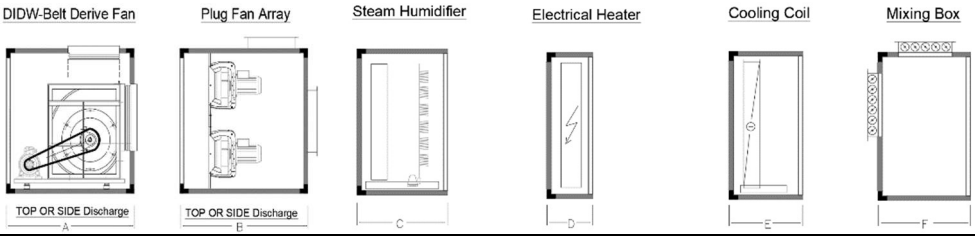
Hygienic Sealants

- The sealant, which is used inside the CG-AHU-M-H to seal some of the components against air or water leaks, is antibacterial, non-toxic, and does not contain any dangerous or allergenic components.

Sound Attenuator Section

Sound attenuators can be provided on both the supply and return air sides. 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. The outer skin of the splitters is constructed of perforated galvanized steel.The insulation material of the splitters is fiberglass. Installation rails are made of stainless steel.

Dimensional Data

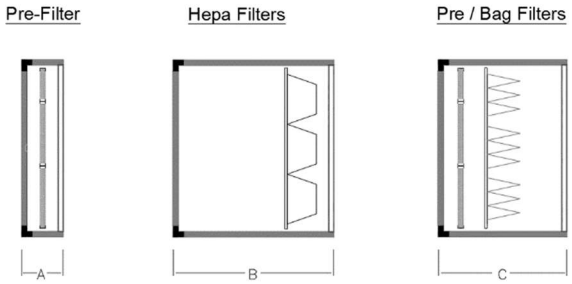


Unit Model	Airflow (cfm)	Air Flow m3/hr	Unit Height mm	Unit Width mm	Section Length mm (A)	Section Length mm (B)		Section Length mm (C)	Section Length mm (D)		Section Length mm (E)	Section Length mm (F)
						Side Discharge	Top Discharge		Standard	With HCB Option		Varies with Damper location and % of F/A
17	1,000	1,700	900	750	1075	600	700	750	375	375	650	275
29	17,50	2975	900	1075	1075	650	750	750	375	375	650	400
42	2,500	4,250	900	1375	1075	650	750	750	375	375	650	400
49	2,917	4,958	1225	1075	1175	800	950	750	375	375	650	400
70	4,167	7,083	1225	1375	1175	950	1050	750	375	375	650	400
92	5,417	9,208	1225	1700	1175	950	1050	750	375	375	650	400
113	6,667	11,333	1225	2000	1175	950	1050	750	375	575	650	400
128	7,583	12891	1475	1700	1375	900	1050	750	495	575	650	550
158	9,333	15,,866	1475	2000	1375	900	1050	750	375	750	650	550
188	11,083	18,841	1475	2325	1375	1100	1300	750	375	750	650	725
204	12,000	20,400	1800	2000	1700	1100	1300	750	375	750	650	725
242	14,250	24,225	1800	2325	1700	1100	1300	750	375	750	650	725
270	15,938	27,094	1800	2575	1700	1300	1500	750	375	750	650	725
318	18,750	31,875	1800	2950	1700	1300	1500	750	375	750	650	725
331	19,479	33,114	2100	2575	2075	1300	1500	750	375	750	650	725
389	22,917	38,958	2100	2950	2075	1300	1500	750	375	950	750	725
460	27,083	46,041	2400	2950	2300	N/A	N/A	750	575	950	750	1025
515	30,333	51,566	2400	3250	2300	N/A	N/A	750	575	950	750	1025
570	33,583	57,091	2400	3575	2300	N/A	N/A	750	575	950	750	1025
658	38,750	65,875	2700	3575	2300	N/A	N/A	750	575	950	750	1150
722	42,500	72,250	2700	3875	2300	N/A	N/A	750	575	950	750	1150

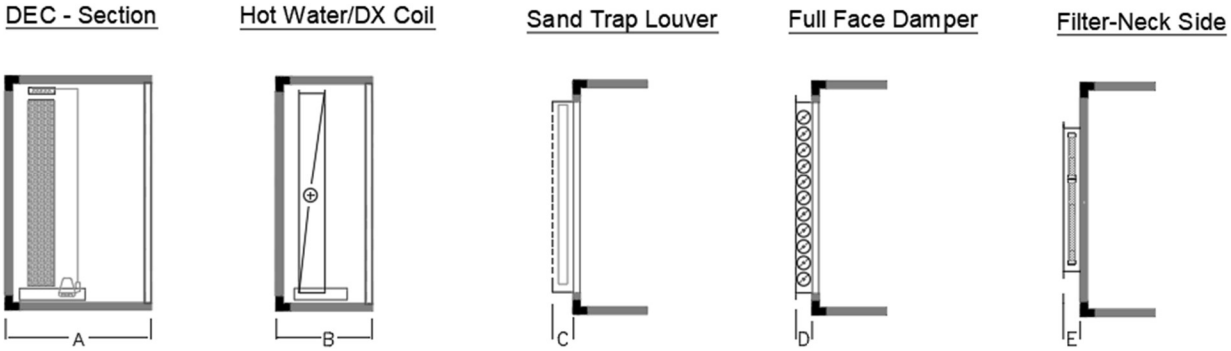
Notes:

- *Tabulated dimensions are tentative and subject to change by Clima Green - S S Air technology without notifications*
- *Precise selection and dimensional drawings shall provide up on request for specific design parameters.*

Different Filter Arrangements



Filter Type	Filter Thickness (mm)	Section Length (mm)
Pre Filter (A)	50	225
	100	375
Hepa Filter (B)	300	950
Pre Filter + Bag Filter (C)	50 + 375	750
	50 + 525	950



Additional Section	Thickness (mm)	Section Length (mm)
DEC-Section (A)	200	575 mm
How Water / DX-Coil (B)	150	575 mm
Sand Louver (C)	--	250 mm
Full Face damper (D)	--	200 mm
Filter Neck Side (E)	--	150 mm

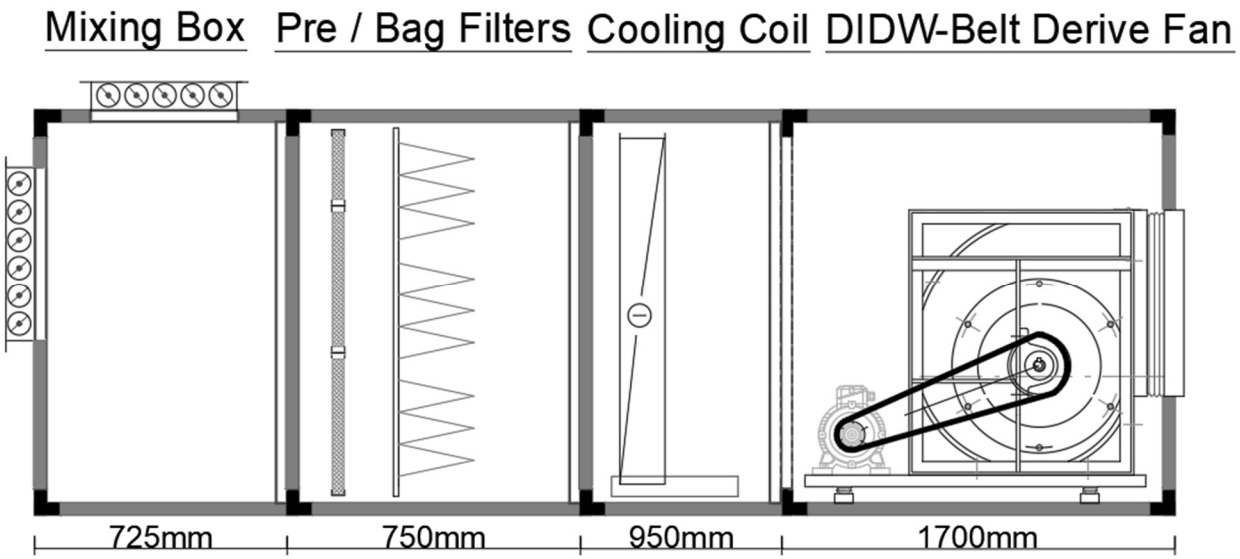
Example: Quick Selection

Given: 15,900 cfm supply air flow, AHU-Floor mounted complete with the following sections.

- DIDW belt derive fan – Side Discharge
- Air plenum mixing box.
- Pre-Filter and Bag Filter.
- Chilled Water-Cooling Coil.

Select model CG- AHU- M- 270- DIDW- S

Width: 2575 mm
Hight: 1800 mm
Overall length: 4125 mm



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