

AHU Plus Air Handling Units

Air handling units are referred to as AHU (Air Handling Unit) or A/C Plant Equipment. The air handling unit is the overall name of the devices, which take the air from atmosphere or interior space, and pass it through various conditions to bring to the desired climactic conditions and directs the conditioned air to the desired location. Air handling units may be produced in a variety of models and features according to the configuration of the process and characteristics of the project.

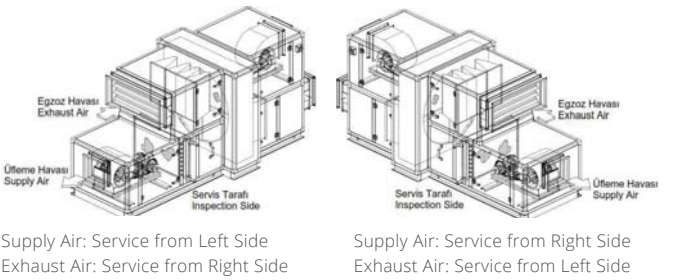
► Structure of the Cell Construction

Casing of module cells of our air handling units are manufactured from natural anodized aluminum profile and plastic corner elements. Cell panels are 42 mm or 50 mm thick, and the outer wall is electrostatic powder coated and the inner wall is manufactured from galvanized sheet (in hygienic-based devices, the inner wall sheet is from 304 grade stainless sheet). AHUPlus air handling units are indispensable for central ventilation and local air conditioning applications due to its high efficient and energy saving 70 kg/m³ dense rock wool filled panels, modern casing structure, static and dynamic balance adjustment, silent, efficient double suction radial or optionally plug-in fans. Our standard electric motors are 380V-50 Hz. All double-walled panels are mounted to the aluminum casing with special torch tip M6 bolts. Service and inspection covers are the standard, having an air-handling unit lock with zero gap rigid hinges, which does not protrude inside the cell, having compression feature that does not allow air leakage. The covers have double-walled rigid structure so that they do not rub against frames. Under the cells, there are full-length frame feet with 180 mm height made of 3 mm galvanized sheet.

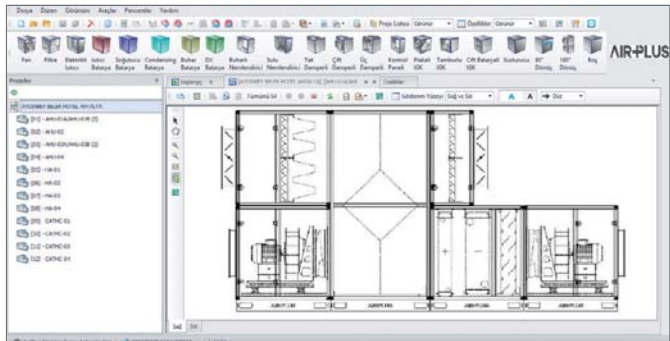
► Usage Features

The basic characteristics required in the Air Handling Units include doing air conditioning by highly productive operating with minimal energy, air tightness, thermal bridges' having a construction that will minimize the heat dissipation, dynamic forces' not causing vibration, wide service network, and ease of shipment and installation. Selection of AHU Plus series units are made based on lower operating costs and productivity. In order to support these priorities, our products are manufactured with energy-saving fans, efficient heat recovery heat exchangers and coils, and the internal structure of the air handling unit that provides air flow at an optimum level. With our optionally applied automation systems, this efficiency can be increased to higher levels. The interface of Airplus AHU Design Program was developed to support the selection and design of air handling units. The program makes psychometric diagram, heat recovery selection, fan selection, electric motor selection, battery selection, and heat exchanger selection. It is possible to printout the selections in pdf format.

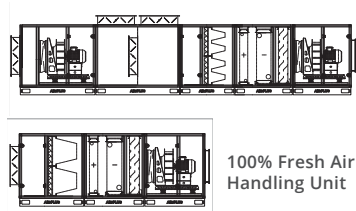
The battery connections, service doors and electrical connections (automation panel, if equipped) are found on the service side.



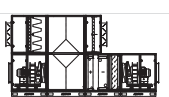
In the corners of the frame feet, there are eyebolts for crane transport and blade slots for Forklift transport. All the automation holes required on the air handling units are drilled during the production phase (differential pressure switch, NTC temperature sensor, freeze thermostat, etc.). The motor leads were taken into the switch box outside the cell. According to customer request, all automation can be placed on the panel and the device can be delivered after all settings can be made. The cell merging elements are manufactured from an aluminum alloy material. Number of inter-cellular usage varies according to the model sizes. The internal illumination lamp and sight glass are located in the aspirator, ventilator and filter cells of the air handling unit. Thanks to these accessories, it is possible to control insides of the cells without deactivating the system.



Air Handling Unit with Mixture Cell



Air Handling Unit with Heat Recovery Cell



Type Switch for Unit Selection

AHUPlus Version	Panel Thickness	Unit Type	Air Flow	Cell Module
AHUPlus-H: Hygienic Air Handling Unit AHUPlus: Comfort Air Handling Unit	50: Panel Thickness 50 mm 42: Panel Thickness 42 mm	20-40-60-80-...-800-960: Unit Type	Y: Air Flow Horizontal D: Air Flow Vertical	HG1: Air Intake Cell HG2: Air Intake Cell K1: Mixture Cell BS: Empty Cell PF: Panel Filter Cell



AHU Plus Air Handling Unit Details

► Casing

The extruded main and intermediate record aluminum profiles having a special structure are resistant to high pressures. It is manufactured with natural anadised coating in order to prevent corrosion. Durable plastics connecting parts having hygienic character and sealed structure are used for master record connecting and intermediate record caps



► Panel

In order to protect it against corrosion outdoors, the exterior is made as electrostatic powder coated, rockwool insulated in density of 70 kg/m³ between 0.9 mm galvanized sheets (in hygienic air handling units, the interior surface sheet is of 304 grade stainless), with a panel thickness of 42 mm or 50 mm, and with cast seal for sealing. The panels have the feature of demountability from outside the unit thanks to the torch tip bolt. The interior surfaces of the unit construction completely have been designed without any recesses or protrusions.



► Access door

To the filter, fan, humidifier cells and the empty cells required for maintenance located on the air handling unit, double wall access doors with 42 or 50 mm thickness are installed. In all access doors, the air handling unit door handles with lock are used, with spaceless rigid hinge and having compression feature in a way it will not allow air leakage, and not forming a protrusion in the cell. Special-shaped cast gaskets are used to ensure leaktightness. Optionally, the sight glass having hygienic character, and lighting inside the cell are being used in the doors.



► Damper

It is manufactured from the body composed of resistant, and natural eloxal coated aluminum fins having aerofil structure, working in the opposing direction, and natural eloxal coated profiles made of aluminum material. Gasket is used on the fin sides and in the body to ensure leaktightness. The plastics sprockets, which make sure the motion of the fins are hidden in the body, and there are fin reclining parts for sealing. Dampers can be controlled manually or with servo motor. Optionally, a servo motor can be installed for automation.



► Filters

The condition that the air flows indicated in the technical catalogues of the filters must be equal or higher than the selected air handling unit flow rate is important with regard to the productivity of the filter. By considering this criterion, the cell sections of AIRPLUS air handling units have been determined. The filters are of cassette type, and installed in an easily dismountable (compressive) way. The filter housing bodies feature the airtight cast gasket. The filter cells have access doors. Filters as required are used, and generally the filter types are coarse filter, bag filter, metal filter, activated carbon filter, compact filter, and hepa filter.



► Cell Merging

The cell merging element are manufactured from a corrosion-resistant aluminum alloy material. These parts, which are used for merging the cells from outside, have a high-strength structure. Number of inter-cellular usage varies according to the model sizes.



► Distribution Board & Automation

MCC and DDC boards are made in the device as the standard in AIRPLUS DX air handling units, and depending upon the customer demand in the air handling units. Two types of automatic control are being applied. Temperature and humidity control for the basic applications contains the electronic control board, channel type temperature and humidity sensors, differential pressure switches, valve servomotors, and damper servomotors. Optionally, frequency converters can be added. For the applications requiring fine control, an advanced microprocessor control system having a computer software specifically designed to meet the requirement, and a touch panel are employed. The location and device information such as flow, temperature, humidity, filter impurity, and pressure differences between the locations, etc. can be controlled via microprocessor, and this control system can be integrated with the building management system.



► Frame

Under the cells, there are 180 mm high frame feet made of 3 mm thick galvanized sheet. There are eyebolts for crane transport and blade slots for forklift transport on the corners of the frame feet.



► Accessories

The differential pressure switch, temperature sensor, humidity sensor, freezing thermostat, air quality sensor, limit switch, motorized valve, servo motor, maintenance switch, siphon, rainscreen roof, air grill, etc.



Cell Modules

Forming the Air Handling Unit

Air Intake Cell (HG1)

All the bodies and blades of the damper in the air intake cell are manufactured from aluminum profile produced with the extrusion method. The opposing blades in the damper have an aerodynamic structure having the feature of decreasing the frictional resistance of air. The blade mechanism of the damper consists of the high strength plastics toothed wheels. The on/off positions of the damper can be carried out manual or servo motor. In the standard, the dampers are out of the cell, and the dampers can also be taken into the cell according to customer demand.

Air Intake Cell (HG2)

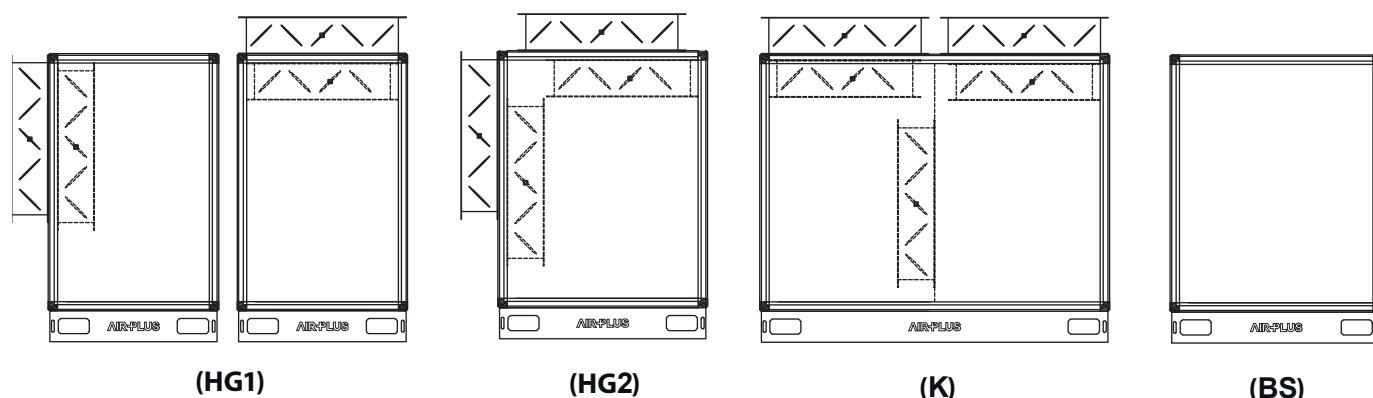
All the bodies and blades of the two dampers in the air intake cell are manufactured from aluminum profile produced with the extrusion method. The opposing blades in the damper have an aerodynamic structure having the feature of decreasing the frictional resistance of air. The blade mechanism of the damper consists of the high strength plastics toothed wheels. The on/off intermediate positions of the damper can be carried out manual or proportional servo motor. In this way, mixture of fresh air and indoor air in required measure is realized. In the standard, the dampers are out of the cell, and they can also be taken into the cell according to customer demand.

Mixture Cell (K)

All the bodies and blades of the dampers in the mixture cell are manufactured from aluminum profile produced with the extrusion method. The opposing blades in the damper have an aerodynamic structure having the feature of decreasing the frictional resistance of air. The blade mechanism of the damper consists of the high strength plastics toothed wheels. The on/off intermediate positions of the damper can be carried out manual or proportional servo motor. In this way, mixture of fresh air and indoor air in required measure is realized homogeneously in the mixture cell. In the standard, the dampers are out of the cell, and the dampers can also be taken into the cell according to customer demand.

Empty Cell (BS)

It is used as the separator when the air handling units are separated into modules of suitable sizes, or as the input cell to carry out intra-cellular cleaning.



Panel Filter Cell (PF)

In the air handling units, filtering process is started with coarse filtering (G3 or G4). The filters are mounted to a quick release sledge or body construction via access covers. The surfaces onto which the filters will seat have leak-proof seals, and the filter cassettes seat on these seals. Standard filter sizes such as 592x592x48 mm, 287x592x48 mm, and 287x287x48 mm are used. The holes required for the hose connections of the pressure gauges showing the differential pressure of filter group on the filter cells are suitably drilled at the factory. According to customer demand, the cell can be fitted and shipped with the differential pressure switches for automation.

Bag Filter Cell (TF)

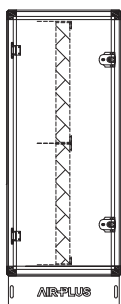
The bag filters are manufactured from synthetic fiber material with M5-M6-F7-F8 efficiency. They are manufactured from galvanic or plastics frame. In the highly productive filtration systems, they are used in the air handling units for the purpose of fine filtration after the prefilter. The filters have a quick release sledge or body construction via access covers. The surfaces onto which the filters will seat have leak-proof seals, and the filter cassettes seat on these seals. The holes required for the hose connections of the pressure gauges showing the differential pressure of filter group on the filter cells are suitably drilled at the factory. According to customer demand, the cell can be fitted and shipped with the differential pressure switches for automation.

Compact Filter Cell (KF)

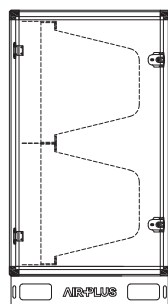
The compact filters are manufactured from fibre glass material with F7-F8-F9 efficiency. They are ideal for high air flow rate and make sure a long service life. In the highly productive filtration systems, they are used in the air handling units for the purpose of fine filtration. The filters are mounted to a quick release sledge or body construction via access covers. The surfaces onto which the filters will seat have leak-proof seals, and the filter cassettes seat on these seals. The holes required for the hose connections of the pressure gauges showing the differential pressure of filter group on the filter cells are suitably drilled at the factory. According to customer demand, the cell can be fitted and shipped with the differential pressure switches for automation.

Carbon Filter Cell (CF)

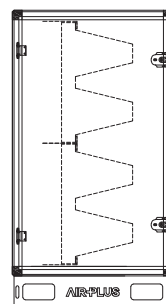
The activated carbon filters are used in the air handling units in order to detain the odors in the ventilating systems. Provides high efficiency and flow-rate in small sizes with cartridges filled with granule activated carbon. According to requirement, the number of cartridges can be increased by using plates with 4, 8 or 16 holes. The filters have a sealed framework construction, which can easily be dismantled or mounted by rotating it. According to customer demand, the cell can be fitted and shipped with the differential pressure switches for automation.



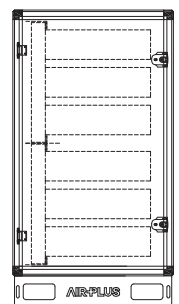
(PF)



(TF)



(KF)



(CF)

Hepa Filter Cell (HF)

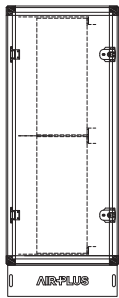
Hepa filters are manufactured from high quality fibre glass material with H11-H12-H13-H14 efficiency. They are used in air handling units for clean room applications, and blowing and exhaust ventilating systems in the medicine and nuclear plants. The filters are mounted to a unique and sealed quick release framework construction via access covers. According to customer demand, the cell can be fitted and shipped with the differential pressure switches for automation.

Heater Coil Cell (IB)

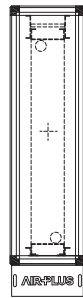
As the type with copper pipe and aluminum fins, our standard heating coils feature a framework made of galvanized steel sheet, and the steel collector. In the production of the coils, the copper pipes with 1/2" and 5/8" diameters are mechanically inflated and a tight contact is ensured with lamellas. The heater coil tubulures are extended to the outside of the body with airtight rubber seals. There are discharge and air relief cocks in the coils. It is mounted on the sledges so that the coils can be removed after the panel disassembled from the side of the unit. As the standard selection bases of the heater coils; they are selected as controlled by computer program so that the maximum coil surface air speed, minimum pitch gap, and waterside maximum pressure loss will be 3,2 m/sn, 2,1 mm, and 30 kPa, respectively. According to customer demand, the cell can be fitted and shipped with the temperature sensor and / or freezing thermostat for automation.

Electric Heater Cell (EB)

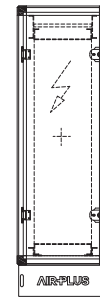
It is used in the air handling units in order to give heat to the location side in cold climates. In electric heaters, the body and resistances consist of galvanized sheet, and 304 grade stainless pipe, respectively. Electrical insulator is used between the heater resistances and the body. The heaters are placed to a unique quick release framework construction via access covers. The electric heaters can be manufactured gradually. According to customer demand, the cell can be fitted and shipped with the temperature sensor and limit thermostat for automation.



(HF)



(IB)



(EB)

Cooler Coil Cell (SB)

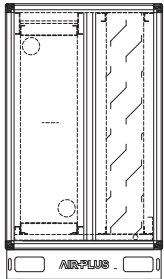
In the room air conditioning with air handling unit, the cold water coils and direct expansion (DX) coils are used in cooling. As the type with copper pipe and aluminum fins, our standard cooler coils feature a framework made of galvanized steel sheet, and the copper or steel collector. The coils are manufactured by mechanically inflating the copper pipes with 3/8", 1/2" and 5/8" diameters and ensuring a tight contact with lamellas. Cooler coil tubulures are extended to the outside of the body with airtight rubber seals. There are discharge and air relief cocks in the coils. The coils are mounted on the sledges so that they can be removed after the panel disassembled from the side of the unit. There is a slanted condensation water pan manufactured from 304 grade stainless steel underneath the cooler coils, and the stainless drain pipe of this pan with 3/4" external thread is taken hermetically to outside of the body. The draining siphon is supplied with the device. A drift eliminator is placed on the air exit side of the cooler coil in order to prevent the condensation water from drifting together with the air in the air handling units having the cooler coil. The drift eliminator is made of polypropylene profile. As the standard selection bases of the cooler coils; they are selected so that the maximum coil surface air speed, minimum pitch gap, and waterside maximum pressure loss will be 2,7 m/sn, 2,1 mm, and 40 kPa, respectively. According to customer demand, the cell can be fitted and shipped with the temperature sensor for automation.

Heat Recovery Cell with Plate (P-IGK)

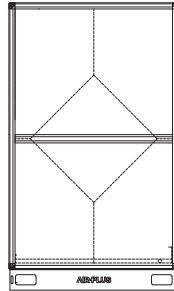
The heat recovery units with fixed plates used in the cross stream plate systems are generally made from aluminum plate as formed; the exhaust and fresh air pass through different sections so that they will not mix together, thus ensuring the heat flow. Thanks to the plate heat exchangers, energy efficiency in the rates of 45-65% (according to the outdoor air and indoor air conditions) is provided. Thanks to this energy efficiency obtained from waste energy, the operational costs are minimized. There is a slanted condensation water pan manufactured from 304 grade stainless steel underneath the plate heat exchanger, and the stainless drain pipe of this pan with 3/4" external thread is taken hermetically to outside of the body. The draining siphon is supplied with the device. In the supply circuit and the return air circuit, a G4 class cassette filter is found as the standard before the heat exchanger. If required, applications with by-pass damper are available. According to customer demand, the cell can be fitted and shipped with the temperature sensor and/or freezing thermostat for automation.

Heat Recovery Cell with Rotor (R-IGK)

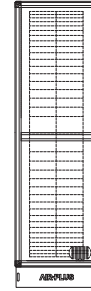
In the systems with rotor, heat recovery is provided thanks to the rotating heat recovery drum. In the systems with rotor, the cylinders of the rotating drum are filled with materials having air-permeable and very large internal surfaces. With the rotating movement of the heat exchanger drum, heat and humidity of the indoor return air are transported by the rotor, and heat and humidity are absorbed by the cool air. The efficiency ratio of the heat recovery does not fall below 70%. Apart from heat transfer carried out in winter, energy transfer and dehumidification process can be carried out also in summer. It is powered by a small engine in order to rotate the rotor at appropriate rpm.



(SB)



(P-IGK)



(R-IGK)

Evaporative Humidifier Cell (PN)

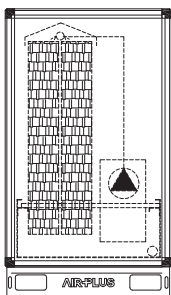
The dry air is humidified in evaporative way thanks to the humidification pads on the pool, which is made of stainless sheet found within the standard double wall cell structure. The humidifier pads have different thicknesses according to their humidification efficiencies. In case the speed of air passing above the pads is 2 m/s, at 65% efficiency, 85% efficiency, and 95% efficiency, the pad thickness is 100 mm, 200 mm, and 300 mm respectively. In these kind of humidification applications, a drift eliminator is used as the standard in case the speed of air passing above the pads exceeds 3,5 m/s. The circulation pump in this humidifier, which operates as a closed water circuit has too small capacity compared to the other applications. The access cover and sight glass for intervention purposes are found as the standard in the pump and in the other circuit components.

Aqueous Type Humidifier Cell (SN)

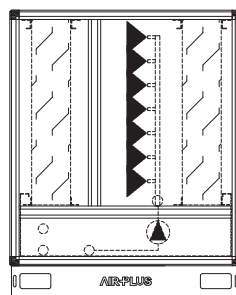
The aqueous type humidifiers have been designed both to detain dust and similar particles in the air, and to meet humidification needs, and to serve for the evaporative cooling purposes. A second cell construction exists in the double wall cell structure, and this cell is completely of 304 grade stainless sheet construction, and completely of watertight structure. There is a sealing intervention cover and sight glass to be able to intervene to inside the cell. There are water holder blades in order according to the air stream, and a drift eliminator at the air outlet. The water is pulverized in the cell thanks to the water sprays, thus the dry air is humidified. The pump and the other components are located outside the cell.

Steam Type Humidifier Cell (BN)

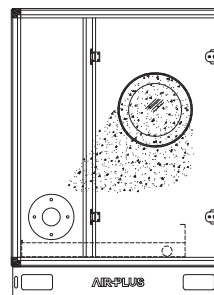
There is a sight glass in the cell. There are a standard steam hose, and a stainless steel steam nozzle application. Vaporific humidification diffusors from different trademarks can be used.



(PN)



(SN)



(BN)

Fan Cell (FH) / Double Suction with Radial Fan (FH1)

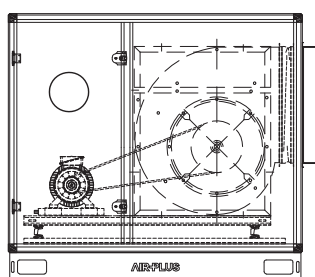
In the double suction radial fan and electric motor set, which are used in ventilator and aspirator cells in our air handling units, the power transfer is provided by the belt-pulley mechanism. Thanks to this system, the fan speeds can be adjusted as desired and optimum air flow and pressure settings can be done. In case the total differential pressure between the suction and force ports of the fan blades is below 900 Pa, or the total pressure over 900 Pa, leaned-forward dense-bladed fans are selected as the standard, or leaned-backward sparse-bladed fans are selected as the standard, respectively. In the fan cell, the fan, electrical motor and belt-pulley driving gear, strengthened C profile are connected onto the frame, and the whole system is installed as seated onto the sound absorbing spring-loaded vibration absorbers. The electrical motor is seated onto the belt tensioning fixings with special durable sheet construction in order to be able to tighten the belt, and standard holes suitable for the feet of an upper and lower engine power are put on these fixings. There is an airtight elastic connection (connector) having a sheet flange at both sides between the fan cell outlet and the blowing orifice of the fan. As standard, a flange made of galvanized sheet is placed on the fan cell outlet. The access doors arranged for comfortable access to the fan and the engine in the fan cell are manufactured based on spaceless hinge and compaction so that it will allow for easy intervention with the air handling unit lock, which does not form protrusion in the cell. A double-glazed sealed viewing window, and a moisture-proof illumination lamp are placed in the fan cell access covers, and in the cell, respectively.

Fan Cell (FH) / With Plug Fan (FH2)

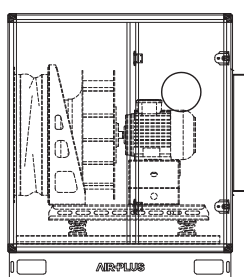
In the plug fan applications, the motor shaft is connected to the fan hub without interconnection. The motor speed is equal to the fan speed, and fine speed adjustment and therefore flow rate/pressure adjustment can be made by using the frequency inverter. The electrical motors are IP54 protection class, 2-4 pole, 380 V, 50 Hz and surface-cooled. The terminal box is IP55 protection class, and the motor is used according to IEC 34-6 conditions. The fan and the motor are installed as connected on the strengthened C-profile frame, and the whole system is installed as seated onto the castermid-based sound absorbing spring-loaded vibration absorbers. There is an airtight elastic connection (connector) having a sheet flange at both sides between the fan cell outlet and the blowing orifice of the fan.

Silencer Cell (SH)

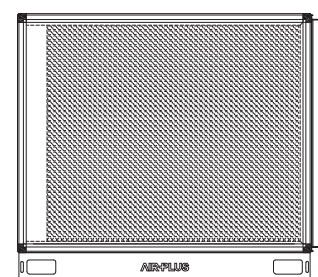
There are sound-absorbing backstages vertically mounted in the cell. As the sound-absorbing material, a rockwool plate is used, which is resistant to 650°C temperature, and of non-hygroscopic type. The backstage frames are manufactured from galvanized sheet. The sound-absorbing material surface is protected with the fiberglass in the shape of fabric, thus preventing erosion of the sound-absorbing material at high air velocities. The distance between the backstages and the air velocity are selected so that the sound of air will be suppressed at maximum level, and the pressure loss will be optimum. In the silencer cell, the maximum air pressure drop is maintained 50 Pa unless otherwise specified.



(FH1)



(FH2)



(SH)

The Cell Section and Flowrate Table of The Air Handling Unit Models

MODEL	External		Internal		Flowrate (m³/h) at Air Velocity (m/s)					
	Width (mm)	Height (mm)	Width (mm)	Height (mm)	1,5	2	2,5	3	3,5	4
AHUPlus-20	750	450	670	(mm)	1339	1785	2231	2677	3124	3570
AHUPlus-40	750	750	670	370	2424	3232	4040	4848	5656	6464
AHUPlus-60	1050	750	970	670	3509	4679	5849	7019	8189	9359
AHUPlus-80	1350	750	1270	670	4595	6126	7658	9190	10721	12253
AHUPlus-90	1050	1050	970	670	5081	6774	8468	10162	11855	13549
AHUPlus-120	1350	1050	1270	970	6652	8870	11087	13305	15522	17739
AHUPlus-150	1650	1050	1570	970	8224	10965	13706	16447	19189	21930
AHUPlus-160	1350	1350	1270	970	8710	11613	14516	17419	20323	23226
AHUPlus-200	1650	1350	1570	1270	10767	14356	17945	21534	25123	28712
AHUPlus-240	1950	1350	1870	1270	12824	17099	21374	25649	29924	34199
AHUPlus-250	1650	1650	1570	1270	13310	17747	22184	26621	31058	35495
AHUPlus-280	2300	1350	2220	1570	15225	20300	25375	30450	35524	40599
AHUPlus-300	1950	1650	1870	1270	15854	21138	26423	31708	36992	42277
AHUPlus-360	1950	1950	1870	1570	18883	25178	31472	37767	44061	50355
AHUPlus-420	2300	1950	2220	1870	22418	29890	37363	44835	52308	59780
AHUPlus-480	2600	1950	2520	1870	25447	33929	42412	50894	59376	67859
AHUPlus-490	2300	2300	2220	1870	26613	35484	44356	53227	62098	70969
AHUPlus-560	2600	2300	2520	2220	30210	40280	50350	60420	70489	80559
AHUPlus-600	3200	1950	3120	2220	31506	42008	52510	63012	73513	84015
AHUPlus-640	2600	2600	2520	1870	34292	45723	57154	68584	80015	91446
AHUPlus-700	3200	2300	3120	2520	37403	49870	62338	74805	87273	99740
AHUPlus-800	3200	2600	3120	2220	42457	56609	70762	84914	99066	113219
AHUPlus-960	3800	2600	3720	2520	50622	67496	84370	101244	118117	134991

Air Handling Unit

QUICK SELECTION CHART

