DAIKIN

Catalogue/Engineering Data

CA-DDM-E-201701

# Air Handling Units (DDM-E)

**Model:** DDM0505E-DDM1824E
**Air flow:** 2,000-66,000m$^3$/h

DAIKIN INDUSTRIES, LTD.

**Literature No.:** CA-DDM-E-201701
**Supersedes:** PUCA14-11

# Air handling expert from Europe and America

DAIKIN has been one of the largest professional corporations for air-conditioning and refrigeration equipment in the world, and especially built an internationally famous brand of air purification.

For many years, DAIKIN has supplied various types of air handling systems of high quality for clients and won a high reputation around the world. The new DDM-E series of combined type air handling units are R&D by introducing the advanced technology and production process and absorbing the advantages of former products from England. It adopted standard modulization design, simple structure and flexible combination, with 2,000-66,000m$^3$/h air capacity. It is of 24 kinds of functions to select, including mixed function, cooling coil, heating, filtering, humidifying, attenuator, heat recovery, fan section and others, and the combination of various function selection can meet different requirements for air handling.

## Contents;

# Nomenclature

D D M 0 5 0 6 - E 5

- Panel thickness: 50mm
- Design series: E
- Unit width 1M = 127mm
- Unit height 1M = 127mm
- DAIKIN Modular Air Handling Unit

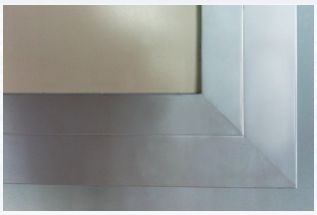
Note:

- Cabinet length = length module * 127 + transport segment module * 78 + 10
- Cabinet width = width module * 127 + 78
- Cabinet height (include base) = height module * 127 + 78 + base height
  Unit: mm

# Features

## Adopt patent structure design for cabinet

- For panel, adopt double layer metal wallboard, aluminum alloy sections, PVC thermal insulation bar with polyurethane thermal insulation materials filled in middle. Made by whole foaming in pressure, 50mm thickness , the surface of aluminum alloy sections is treated with oxidation coating, high corrosion prevention capacity.
- The cabinet is spliced by panels with aluminum alloy sections embedded mortise and tenon joint structure, adopt high strength bolt for outside fixing, easily to disassembly and assembly.



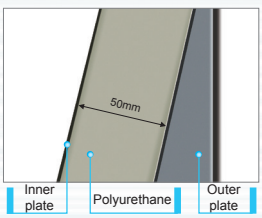
Section aluminum oxidation coating corrosion prevention

The panel is easy to disassemble and assemble

## Superexcellent heat insulation property

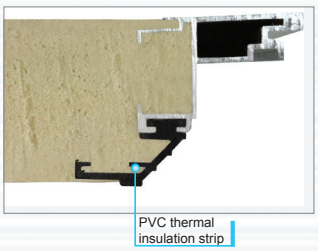
- The outer plate for panel is color-coated sheet (standard configuration), and the inner panel is aluminizing zinc plate (standard configuration). The service life of aluminizing zinc plate is 6 times of the one of galvanized plate, and the heat reflectivity is 2 times of the one of galvanized plate;
- Use thermal insulation material specially made to separate the inner plate and outer plate, and fill into polyurethane thermal insulation material, foam in fluoride-free evenly under high pressure, and the density is high to 50kg/m$^3$.

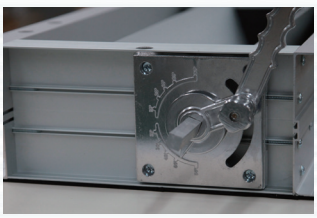
Internal level




## Superior cold bridge resistance performance

- Specially designed sections PVC panel structure, all metal components are connected with each other directly inside and outside the whole unit and no cold bridge totally;
- Fix the damper and other external parts by using thermal insulation materials, and no condensation will appear under high temperature.

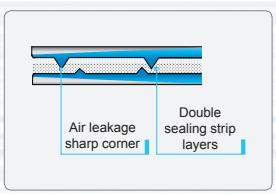


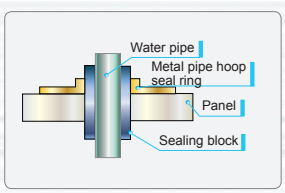



Post seal cotton between damper and panel

## Good impermeability

- Adopt double line contact air leakage protection design between panel, tight and stable, perpetual impermeability for air leak protection;
- The connecting places of cabinet and exposed parts shall be filled with pressure and wear resisting sealing strip, and fixed by mechanical method, to reduce the unit air leakage rate effectively;
- For access door with locks, adopt special impermeability design, distinguishingly treat the positive pressure and negative pressure segments of units. All the access door shall be equipped with integral ageing resistance seal ring.



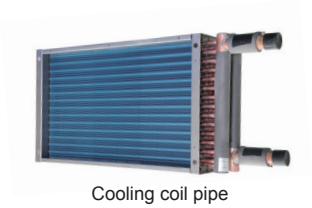

Header diagram

# Function instruction

## Cooling coil section

Applied for cooling and dehumidification process. The coils are formed by the fin and seamless copper pipe which are bound firmly with mechanical pipe-rising method, and the coil performance shall meet EN13053 standards.

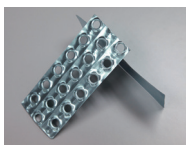
- All coils shall pass high pressure test by charging nitrogen before ex- factory , to ensure no leakage;
- Can set aluminum water eliminator behind cooling coil, to further avoid the water blowing problem;
- Optional: stainless cooling coil frames, anti-freezing switch.



Cooling coil pipe

- Cross reverse-flow arrangement of high quality copper pipe, increase air turbulent flow and improve heat transfer effect.

Cross reverse-flow arrangement

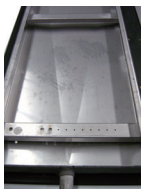


Aluminum cabinet

- The fins are corrugation aluminum pieces, which enlarge heat exchange area and optimize heat transfer effect, and it is convenient for the condensate water to drop, to avoid foaming water drop on fin surface;
- FPI is 9~14 selectable.

Cooling coil collector pipe

- Cooling coil collector pipe is seamless steel pipe;
- Set drain valve and air vent on header pipe, with thermal insulation seal ring, to eliminate cold bridge, reduce air leakage rate and facility access;
- Optional: copper.



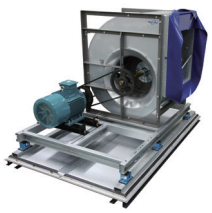
Drain pan

- Adopt high quality galvanized steel plate coating;
- Paste insulation for drain pan outer to prevent second condensation;
- V type double-tilt design, to ensure smooth water drainage;
- Precise design the drain pipe by condensation quantity;
- Optional: stainless.

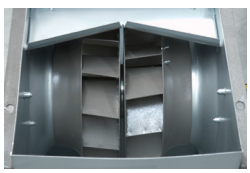
## Fan section

The fan section supply power for the whole system airflow. Fan section is composed of fan, motor, belt gear, base, damper and others.

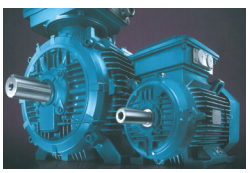
- The fan is of air movement and control association, USA (AMCA) authentication and professional software selection, so as to ensure every fan can operate safely and efficiently;
- Adopt full sealing squirrel cage three-phase asynchronous motor, with IP55 protection level and F grade insulation grade, adapt to severe application environment;
- Optional: metal belt guard, pressure sensor and start cabinet.



- Install the fan and motor on the same base, adopt flexible connection at air outlet of fan, for effectively vibration isolation.

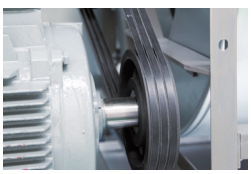


- The impeller shall be implemented strictly dynamic and static balance correction, smooth and steady, low noise.

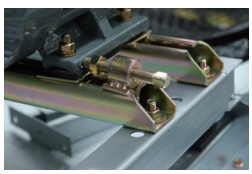


- For motor optional: single motor, double speed motor, variable frequency motor, flameproof motor and others.

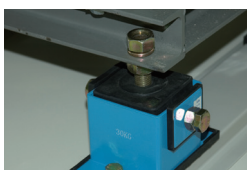
- For bearing, adopt the international famous brand ones of high assembly accuracy, to ensure the unit can operate continuously for long time.



- Adopt V type belt of international famous brand;
- The belt wheel is of taper sleeve structure, convenient for rapid assembly and access.



- Equipped with sliding rail adjustment system for motor, so as to adjust optimum installation, convenient for access.



- Spring absorber, can reduce vibration effectively.

## Heating coil section

Mainly used for improving the airflow temperature by heating air.
Optional: hot water coil, steam pipe coil, electrical heater.

### Steam coil

The unit is processed air heating according to the heat-transfer medium of high-temperature steam, suitable for places with steam such as chemical engineering, hospital, pharmacy and tobacco.

- Standard configuration with steel tube rolling aluminum sheet coil, the material of parent tube is steel, and with features of advantage processing technology, low thermal resistance, high strength and standard outer source nipple, optional flange connector.
- Optional: copper steam coil, stainless steel steam coil, stainless steel fin steam coil.

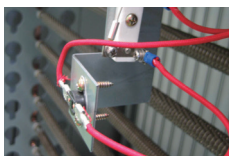
Steel pipe rolling aluminum coil

### Electrical heater

Heating the air by electric, heat capacity can be adjusted by grouping or stepless. It is suitable for small and medium constant temperature and humidity places such as operating room, pharmacy in hospital, electronic plant.

- Overheat protector and breezeless outage protector connectors are provided in electrical heating section. The potential safety hazard caused by overheating of heater should be avoided.

Electrical heating section



Overload protection device

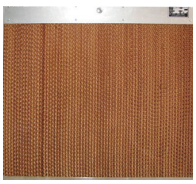
## Humidifier section

Process wet treatment to air so as to ensure its relative humidity of air.

- There are access door and drainage pan in this section; seal the entrance with insulator, so as to avoid cold bridge and air leakage; reserve enough absorb distance according to actual condition so as to ensure safety operation;
- Multi humidification way to adopt: including wet film humidification, dry steam humidification, secondary steam humidification, electrode (heat) humidification, high pressure spraying (tiny) humidification, washing spraying humidification and so on;
- The needed proportional plus integral control applied in constant temperature and humidity places.
- Optional: access window, waterproof access lamp, humidity sensor, humidity independent controller.

### Wet film humidification

- When the air crossing the high water-absorbing material, damp and hot exchange, and then the humidity in air will increase;
- The humidification distance is just the thickness of wet film, with small volume and well humidification effective.



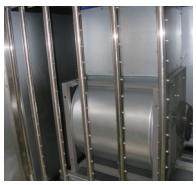
Wet film humidifier

Application:

- Suitable for the humidification of residential architecture, industry cooling, as its low humidification accuracy, it is not applied in constant temperature and humidity normally.

### Dry steam humidifier

- The clear steam will be sprayed from orience with metal silencing strainer after filtration, so as to improve the air humidity in air handling unit;
- Produced by all stainless steel, with characteristic of corrosion resistance, compact size and easily access.



Dry steam humidifier

Application:

- Constant temperature and humidity places or common civil use places;
- If it requires large humidification capacity, adopt multi-nozzle mast or fast suction dry steam humidifier;
- It is suitable for medical treatment and public health, industrial factory building and civil building.

### Electrode (heat) humidifier

- The humidifier host transforms the electric energy to thermal energy which heat the water to produce steam then conveyed into AC cabinet.

Electrode (heat) humidifier

Application:

- High control accuracy;
- It is suitable for medical treatment and public health, electron, industrial factory building and other constant temperature and humidity places.

### High pressure spraying (micro) fog humidifier

- Pressurize the water by pump, and convey to AC cabinet from the pipeline to eject from special nozzle, form tiny water drop (tinier water mist), and be absorbed after fully contact to air, to improve air humidity.

High pressure micro fog humidifier

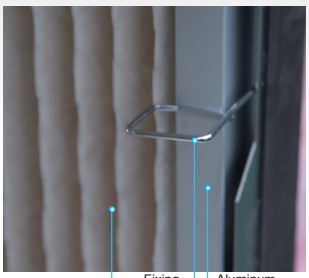
Application:

- The place required high humidification accuracy shall adopt high pressure micro fog humidification method;
- It is suitable for medical treatment and public health, electron, tobacco, office building, shopping mall and others.

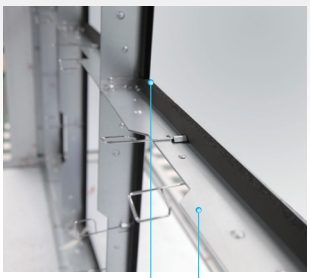
# Filter section

## Excellent filter design and installation

DDM-E series units filter section is designed according to EN1886 and EN779 standards.




- Adopt fast clip system, so as to ensure the air impermeability and filter collection efficiency lasting airtight, uniform specification and easy to change;
- Access orientation is from front for standard filter;
- Optional: side access.




- Adopt special sealing materials for the places among frames and between filter and frames, to effectively reduce air leakage rate;
- The standard material for filter installation frame is galvanized steel;
- Optional: stainless steel.


Filter section

## Complete filter types

■ Plate type filter

- The filtering grade is G3 and G4, aluminum alloy frame, 2 inch thickness, and 80%~90% filter efficiency (gravimetric method);
- The filtering material is high quality polyester synthetic fiber, of large clogging capacity, low resistance and good leak tightness;
- Optional: 4 inch thickness filter, INTERSEPT antibacterial agent.

■ Bag type filter

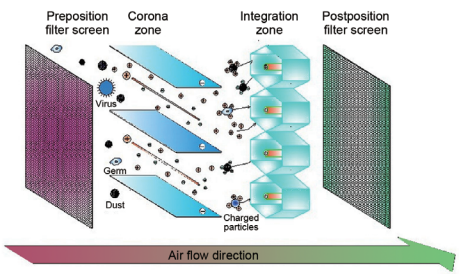
- The filtering grade is G3, G4 and F5~F9, aluminum alloy frame, 15 inch long bag, and 40%~95% filter efficiency (colorimetric method);
- The filtering material is high quality artificial fiber filter paper, of large clogging capacity, low resistance and good leak tightness;
- Optional: glass fiber filter material , INTERSEPT antibacterial agent.

■ HEPA

- The filtering grades are H10, H11, H12 and H13 respective, high strength metal frame, with 11.5 inch long and 85%~99.995% filter efficiency;
- The filter material is waterproof type superfine glass fiber filter paper, of large clogging capacity, low resistance and good leak tightness;
- Optional: thick fold type filter, PTFE ultra-low resistance filter, INTERSEPT antibacterial agent.

■ Electronic cleaning filter

- Adopt three levels filtering method, the first level is prefilter, to filter relative large dust particle and foreign matter;
- The second level is two-section type high voltage electronic dust collector, to utilize the principle of electron-positron attraction to electrical charge the suspending dust in air and kill bacteria and virus during the circulating air passing corona zone, and be absorbed by opposite electrode during passing dust collection zone, and can adopt ultraviolet light to kill bacteria and virus in lighting (ultraviolet light system is optional part);
- The third level is active carbon filter screen (optional), which can eliminate the peculiar smell in air and so on;
- Applicable for hospital operations department and ward and other medical places, shopping mall, supermarket, subway, railway station, airport and other public places.




Electronic cleaning principle

# Heat recovery section

Currently, the concept of energy saving and environment protecting become more and more popular. In HVAC system, the energy contained in the exhaust air of air-conditioning area (room) is considerable, so great energy-saving benefit and environmental benefit will be gained according to energy recycle.
Following provisions are from the 5.3.14 item in Unified standard for constructional quality acceptance of building engineering GB50189-2005:
If there are centralized exhaust systems in buildings and according with one of the following condition, exhausting and heat recovery unit should be installed. The rated heat recovery efficiency of exhausting and heat recovery unit (total and sensible heat) should be not less than 60%.

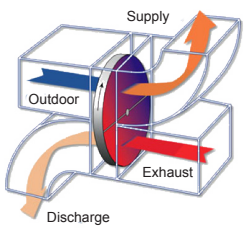
- For straight-flow air conditioning system of 3,000m$^3$/h or more supply air, and the temperature difference between fresh and exhaust air is 8°C or higher;
- For air conditioning system with 4,000m$^3$/h or more design fresh air, and the temperature difference between fresh and exhaust air is 8°C higher;
- For the system with independent fresh air and exhaust air.

The DDM-E unit series from DAIKIN will consider the initial cost and effectiveness fully in users' items, so as to provide various solutions of heat recovery to users, including wheel heat recovery, plate type heat recovery, and heat pipe heat recovery and so on.

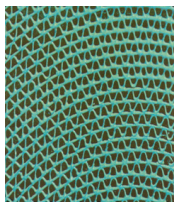
## Wheel heat recovery principle

Adopt specially-made cellular metal template with special adsorbing material on surface. As fresh air across half of wheel, exhaust air will across another half reel at the same time. The reel will keep low-speed rotation in cycle in the function of actuating unit, then exchange the energy and vapour to another side, so as to resave energy according to take advantage of the waste heat (waste cool) of exhaust air to process preheat (pre-cool) for fresh air.

- Optional wheel: Sensible wheel heat recovery
  Total heat recovery wheel
- The features of reel: high heat exchange efficiency, small volume, long service life and usable in large air flow unit.




Wheel recovery principle



Wheel with adsorbing material on surface

## Plate type heat recovery principle

Process heat transfer according to the cross flow between the heat and cool air, the two adjacent aluminum plate will form a supplying or exhausting channel, while process air supplying according one side of aluminum, and air exhausting according another side, so the heat will transmit from the heater side to the colder side.

- Optional plate: Standard sensible heat recovery
  Anticorrosion and sensible heat recovery
  High temperature sensible heat recovery
  Total heat recovery
- The features of plate: avoid cross contamination, flexibly usage, easy installation and needless access.

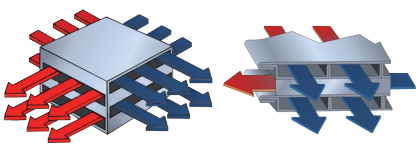


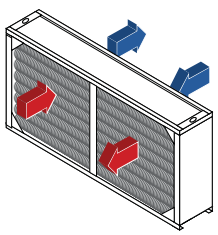
Plate type heat recovery principle

Plate type heat recovery

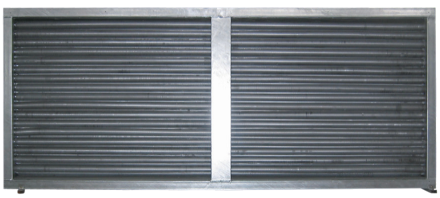
## Heat pipe heat recovery principle

Heat pipe is energy-efficient element. Rolling aluminum fin pipe by pure aluminum tube, wash it and process it to high vacuum, then add a certain amount of heat transfer material. The heat transfer material is R134a usually. When air conditioning system supplying heat, the heat transfer material in vacuum pipe shall be condensed in fresh air side and then evaporated in exhaust air side, and then recycling again and again. While supplying cooling, the recycling would be opposite, and then the heat recovery could be achieved.

- Optional heat pipe: Normal temperature sensible heat recovery
  Low temperature sensible heat recovery
- The features of heat pipe: high heat exchange capacity, quickly thermal response, small resistance loss.



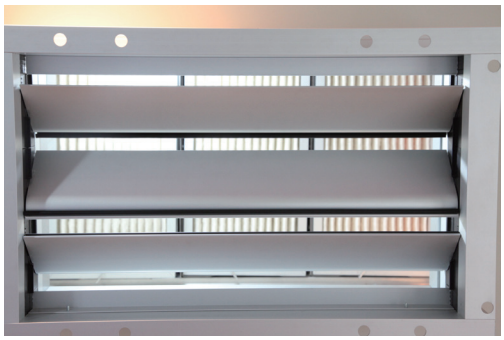
Heat pipe heat recovery principle



Heat pipe recovery

## Mixing box section

- Mix the adjust return and fresh air fully according to a scale, so as to avoiding airflow layered and ensure heat exchange and anti-condensation performance of the whole units;
- Design the air inlet direction and size according to users' requirements. Provide standard configuration of flange in air inlet, and the damper is optional;
- Provide with access door;
- Optional: access lamps, access window, manual damper, actuator, manual-power damper.



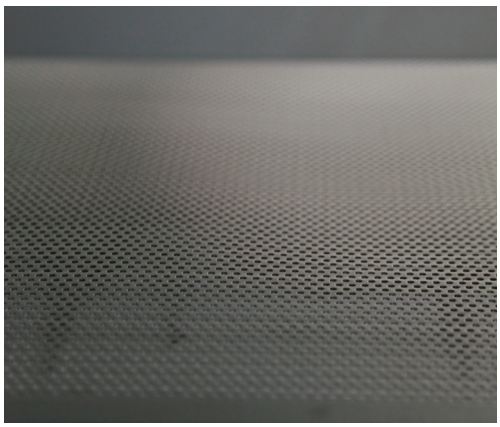
Aluminum alloy damper

- Damper can adopt aluminum and electrostatic powder spraying galvanized steel;
- The control way of damper is manually or with actuator;
- Optional: damper final controlling element;
- The leaf structure of aluminum alloy damper is two-sided airfoil, and sealed with disc rubber strip;
- The leaf structure of galvanize steel damper is ripple counter margin interlocked, and sealed with special rubber.

## Attenuator section

- Reduce unit noise, many types of attenuators can be selected, include dissipative attenuator, reactive attenuator and composite attenuator;
- Adopt expanded metal, internally clipped high quality sound absorption PE, B1 fireproofing grade, meeting fire safe requirements;
- Place on positive pressure sections of unit can exert better damping effect.

Attenuator section



The frame is perforation galvanized plate, optional: stainless steel

### Attenuator dynamic state insertion loss dB

| Length \ Octave | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz |
|---|---|---|---|---|---|---|---|---|
| 600mm | 6 | 9 | 12 | 22 | 30 | 29 | 21 | 12 |
| 900mm | 7 | 12 | 16 | 28 | 35 | 35 | 28 | 17 |
| 1,200mm | 7 | 15 | 20 | 34 | 40 | 40 | 34 | 21 |

# Parameter

## Length of various function sections

| Function section name | Diagram | Length | Remarks |
|---|---|---|---|
| Mixing box |  | 5M | With access function |
| Access section |  | 5M | - |
| Plate type filter section |  | 1M | Need taking into account access |
| Mixing filter section |  | 4M | Need taking into account access |
| UV lights section |  | 1M | Need taking into account access |
| HEPA section |  | 5M | Need taking into account access |
| Cooling coil section/cooling coil wet film humidifier section/ cooling coil heating section |  | 5M / 7M / 8M | Define the section length according to coil rows and combination |
| Steam/hot water heating coil section |  | 2M | - |
| Electric heating section |  | 2M / 4M | Define the section according to electric heating capacity |
| Burning section |  | 21M | Need taking into account access for the front and behind |
| Washing and spraying section |  | 16M | Need taking into account access for the front and behind |
| Humidifier section |  | - | Define the section length according to the humidifier design |
| Heat recovery section |  | Wheel/hot hose: 3M/4M<br>Plate type: 6M~10M | Need taking into account access for the front and behind<br>Define the section length according to the heat recovery design |
| Fan section |  | (2,000~6,000m³/h) 6M<br>(6,000~18,000m³/h) 8M<br>(18,000~30,000m³/h) 11M<br>(30,000~45,000m³/h) 13M | The section length is the recommended value of general unit type, and the specific length is related to fan model and motor power |
| Diffuser section |  | 5M | With access function |
| Attenuator section |  | See to attenuator section | Need taking into account access |

Note:

- The above length of function sections are standard;
- If you have special requirements for function sections and size, please contact the local sale office.
- Refer to page 17, 18 for the recommended configuration.

## List for quick selection of the unit types in common use

| Type | Air flow $m^3/h$ | | | | Cabinet size | |
|---|---|---|---|---|---|---|
| | Face velocity m/s | | | | Height (not include base) | Width |
| DDM-E | 2.25 | 2.5 | 2.75 | 3 | mm | mm |
| DDM0505-E5 | 1,474 | 1638 | 1,802 | 1,966 | 713 | 713 |
| DDM0507-E5 | 2,478 | 2,754 | 3,029 | 3,305 | 713 | 967 |
| DDM0607-E5 | 3,123 | 3,470 | 3,817 | 4,165 | 840 | 967 |
| DDM0609-E5 | 4,389 | 4,876 | 5,364 | 5,852 | 840 | 1,221 |
| DDM0709-E5 | 5,295 | 5,883 | 6,472 | 7,060 | 967 | 1,221 |
| DDM0809-E5 | 6,201 | 6,890 | 7,579 | 8,268 | 1,094 | 1,221 |
| DDM0811-E5 | 7,989 | 8,877 | 9,765 | 10,652 | 1,094 | 1,475 |
| DDM0912-E5 | 10,181 | 11,313 | 12,444 | 13,575 | 1,221 | 1,602 |
| DDM1112-E5 | 12,778 | 14,198 | 15,617 | 17,037 | 1,475 | 1,602 |
| DDM1113-E5 | 14,064 | 15,626 | 17,189 | 18,752 | 1,475 | 1,729 |
| DDM1114-E5 | 15,350 | 17,055 | 18,761 | 20,466 | 1,475 | 1,856 |
| DDM1115-E5 | 16,635 | 18,484 | 20,332 | 22,181 | 1,475 | 1,983 |
| DDM1315-E5 | 18,326 | 20,362 | 22,398 | 24,434 | 1,729 | 1,983 |
| DDM1316-E5 | 21,563 | 23,959 | 26,355 | 28,750 | 1,729 | 2,110 |
| DDM1416-E5 | 23,384 | 25,982 | 28,580 | 31,178 | 1,856 | 2,110 |
| DDM1517-E5 | 25,730 | 28,589 | 31,448 | 34,306 | 1,983 | 2,237 |
| DDM1617-E5 | 27,681 | 30,757 | 33,833 | 36,908 | 2,110 | 2,237 |
| DDM1620-E5 | 33,241 | 36,934 | 40,628 | 44,321 | 2,110 | 2,618 |
| DDM1622-E5 | 33,241 | 36,934 | 40,628 | 44,321 | 2,110 | 2,872 |

Note:

- As the unit types is too many, just list the quick selection of the unit types in common use;
- Refer the type selection of DAIKIN Smart Tools selection software for specific types.

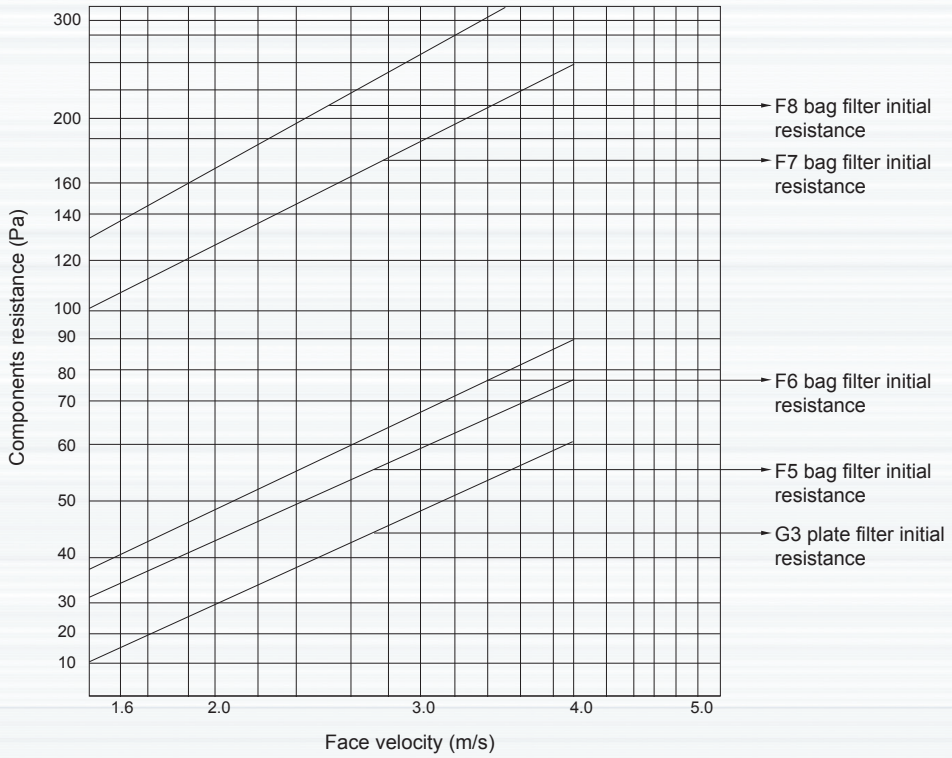
## Performance parameter of common units

| Working condition / Unit | | Mixing working condition (30% fresh air) DB 29.1°C RH 56% | | Fresh air working condition (100% fresh air) DB 34°C RH 63.7% | | Fresh air working condition (100% fresh air) DB 0°C RH 48% | | Mixing working condition (30% fresh air) DB 14.1°C RH 62% | | New air working condition (100% fresh air) DB 0°C RH 48% |
|---|---|---|---|---|---|---|---|---|---|---|
| Unit | Nominal air flow | 4 row of cold water coil | | 6 row of cold water coil | | 2 row of cold water coil | | 2 row of cold water coil | | 1 row of cold water coil |
| Type | | Total cooling capacity | Water flow | Total cooling capacity | Water flow | Heating capacity | Water flow | Heating capacity | Water flow | Heating capacity |
| DDM-E | $m^3/h$ | kW | l/s | kW | l/s | kW | l/s | kW | l/s | kW |
| DDM0505-E5 | 2,000 | 9.0 | 0.43 | 27.4 | 1.30 | 15.0 | 0.36 | 10.0 | 0.24 | 8.2 |
| DDM0507-E5 | 3,000 | 18.6 | 0.89 | 46.8 | 2.23 | 26.7 | 0.64 | 18.6 | 0.44 | 12.2 |
| DDM0607-E5 | 4,000 | 24.4 | 1.16 | 61.8 | 2.94 | 34.4 | 0.82 | 23.9 | 0.57 | 16.3 |
| DDM0609-E5 | 5,000 | 35.6 | 1.70 | 82.5 | 3.93 | 47.7 | 1.14 | 34.1 | 0.81 | 20.4 |
| DDM0709-E5 | 6,000 | 42.7 | 2.03 | 99.0 | 4.71 | 57.3 | 1.36 | 40.9 | 0.97 | 24.5 |
| DDM0809-E5 | 8,000 | 54.2 | 2.58 | 127.8 | 6.09 | 72.5 | 1.73 | 51.6 | 1.23 | 32.7 |
| DDM0811-E5 | 10,000 | 73.4 | 3.50 | 165.0 | 7.86 | 95.4 | 2.27 | 68.2 | 1.62 | 40.8 |
| DDM0912-E5 | 12,000 | 92.1 | 4.39 | 202.2 | 9.63 | 118.3 | 2.82 | 84.8 | 2.02 | 49.0 |
| DDM1112-E5 | 15,000 | 115.1 | 5.48 | 252.8 | 12.04 | 147.9 | 3.52 | 106.0 | 2.52 | 61.2 |
| DDM1113-E5 | 18,000 | 136.1 | 6.48 | 290.7 | 13.84 | 171.8 | 4.09 | 125.0 | 2.98 | 73.5 |
| DDM1114-E5 | 20,000 | 153.5 | 7.31 | 323.0 | 15.38 | 194.1 | 4.62 | 138.9 | 3.31 | 81.7 |
| DDM1215-E5 | 22,000 | 168.9 | 8.04 | 359.1 | 17.10 | 220.5 | 5.25 | 152.8 | 3.64 | 89.8 |
| DDM1215-E5 | 25,000 | 190.5 | 9.07 | 399.3 | 19.01 | 238.6 | 5.68 | 173.6 | 4.13 | 102.1 |
| DDM1316-E5 | 27,000 | 214.9 | 10.23 | 440.7 | 20.99 | 266.3 | 6.34 | 194.1 | 4.62 | 110.2 |
| DDM1416-E5 | 30,000 | 237.0 | 11.29 | 479.2 | 22.82 | 295.8 | 7.04 | 212.0 | 5.05 | 122.5 |
| DDM1517-E5 | 33,000 | 264.5 | 12.60 | 515.5 | 24.55 | 325.4 | 7.75 | 237.2 | 5.65 | 134.7 |
| DDM1617-E5 | 35,000 | 280.5 | 13.36 | 549.9 | 26.19 | 350.8 | 8.35 | 251.6 | 5.99 | 142.9 |
| DDM1620-E5 | 40,000 | 336.4 | 16.02 | 624.9 | 29.76 | 407.2 | 9.70 | 299.7 | 7.14 | 163.3 |
| DDM1622-E5 | 45,000 | 375.9 | 17.90 | 687.2 | 32.72 | 465.3 | 11.08 | 339.9 | 8.09 | 183.7 |

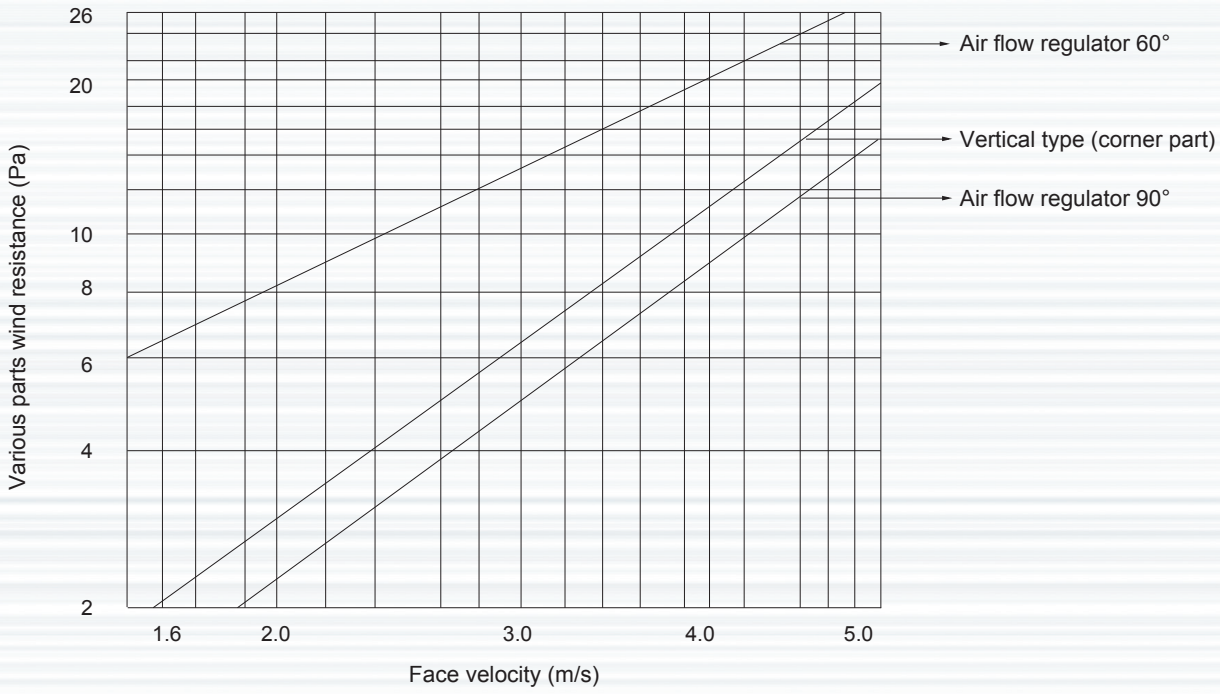
Note:
- EWT is 7°C with 5°C temperature difference, and EWT for heating is 60°C with 10°C temperature difference, 0.2MPa steam pressure;
- Coil is copper aluminum fin, FPI is optional 9~14 pieces, and the data in the table above are the ones of 12 FPI;
- As there are too many models, to list all the performance parameter;
- Refer the type selection of DAIKIN Smart Tools selection software for specific types.

## Resistance curve of air handling units

### Filter




### Damper

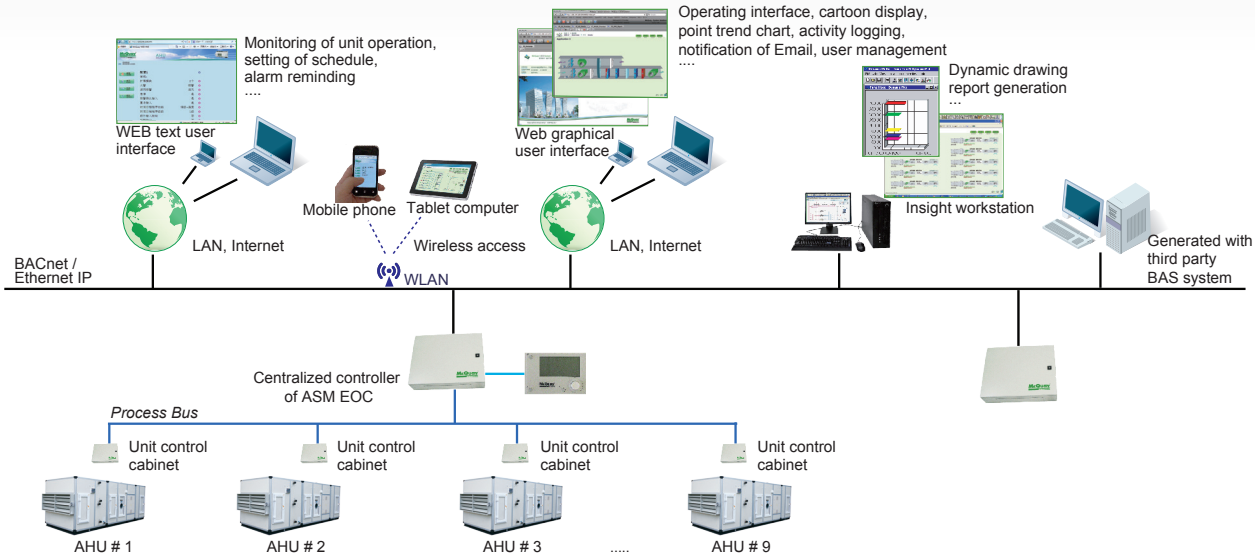


# Unit control

## Solutions to full range of system control

ASM ECO is the management system of air–handling unit which can be used as independent standard unit control system, or participates in group control system to monitor the air-handling unit. The flexible configuration provides optimized control scheme based on different application requirements of the air-handling unit, and it can be combined with the management system of CSM ECO computer lab to reduce energy consumption.

### Framework of air handling unit group control topography




### Centralized monitoring

Can realize communication and information overview of 9 sets of DAIKIN AHU units and facilitate operation & management of the unit.

### Flexible configuration

Using Micro Tech III as centralized controller can ensure high quality, and enable various aspects of the hardware more flexible.

### Consumption reduction and energy conservation

Reasonably control running of air handling unit; the failure monitoring system detects the alarm information in time. Possess TSP (timetable procedure) function.

### Wide application

Air handling unit with fresh air system, constant temperature & humidity system and heat recovery system can be used.

### Friendly interface

Different user interface operation experience; can be remote controlled by imaging; aiming at the third party BMS (Building Management System), provide BACnet IP or Modbus protocol option for integration.

### Method for consumption reduction & energy conservation of air handling unit

- Using variable-frequency regulating speed technology
  Use pressure difference signal feedback to achieve frequency control of motor and balance system air volume; be equipped with running status feedback of blower and failure warning to achieve linkage of unit and blower.

- Adopt wheel heat recovery technology
  Furthest improve efficiency of room heat recovery by controlling heat recovery system, to make effect of energy conservation more obvious; can receive failure feedback of equipment operation.

- TSP – timetable procedure
  Set corresponding timetable procedure according to the features of controlled area; automatically switch the operation mode to improve the efficiency of unit operation and reduce energy consumption of unit.

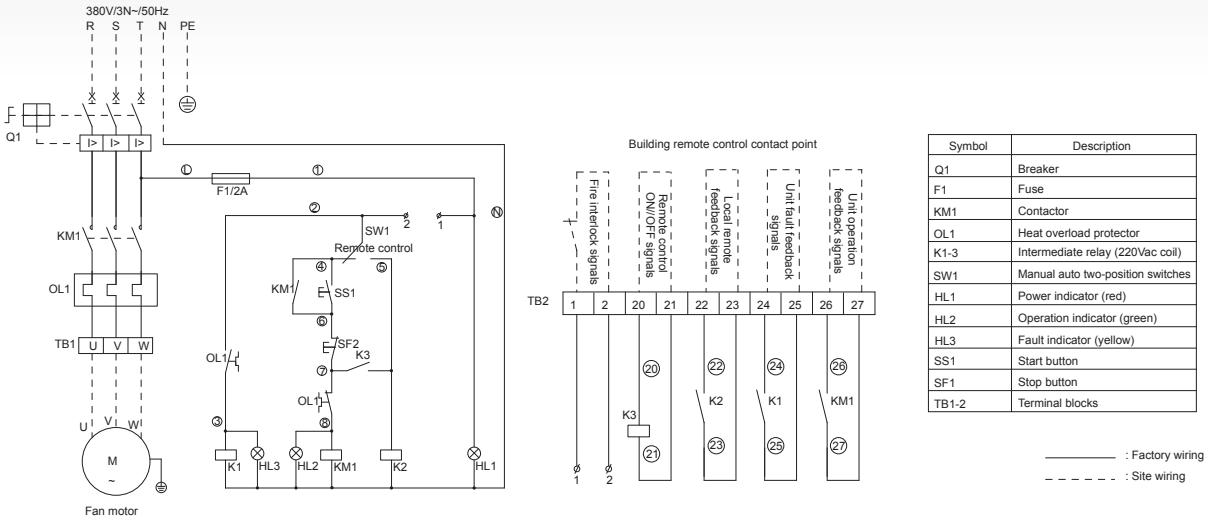
- Timeliness of alarm and trouble shooting
  The perfect warning system can conduct failure diagnosis for normal low alarm, output alarm signal in time and operate with the failure without impacting the system; shut down in time in case of high alarm.

- Temperature compensation in winter/summer
  When the temperature in summer is too high or temperature in winter is too low, adjust the room temperature based on the setting point of outdoor temperature and corresponding gradient of temperature compensation, thus optimizing the system control.

# Electrical control

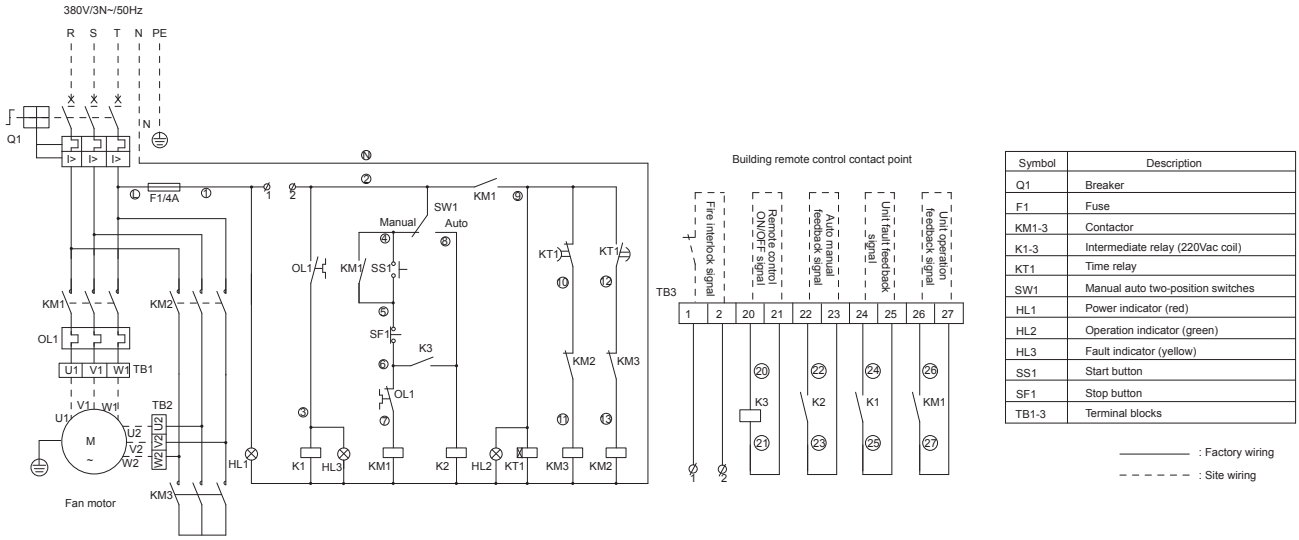
DDM-E series units are provided with various electrical control schemes, and all the main electrical control units are internationally famous brands to ensure precise, stable & reliable control.

## Schematic diagram for direct starting




| Symbol | Description |
|---|---|
| Q1 | Breaker |
| F1 | Fuse |
| KM1 | Contactor |
| OL1 | Heat overload protector |
| K1-3 | Intermediate relay (220Vac coil) |
| SW1 | Manual auto two-position switches |
| HL1 | Power indicator (red) |
| HL2 | Operation indicator (green) |
| HL3 | Fault indicator (yellow) |
| SS1 | Start button |
| SF1 | Stop button |
| TB1-2 | Terminal blocks |

## Schematic diagram for Star-Delta Starting

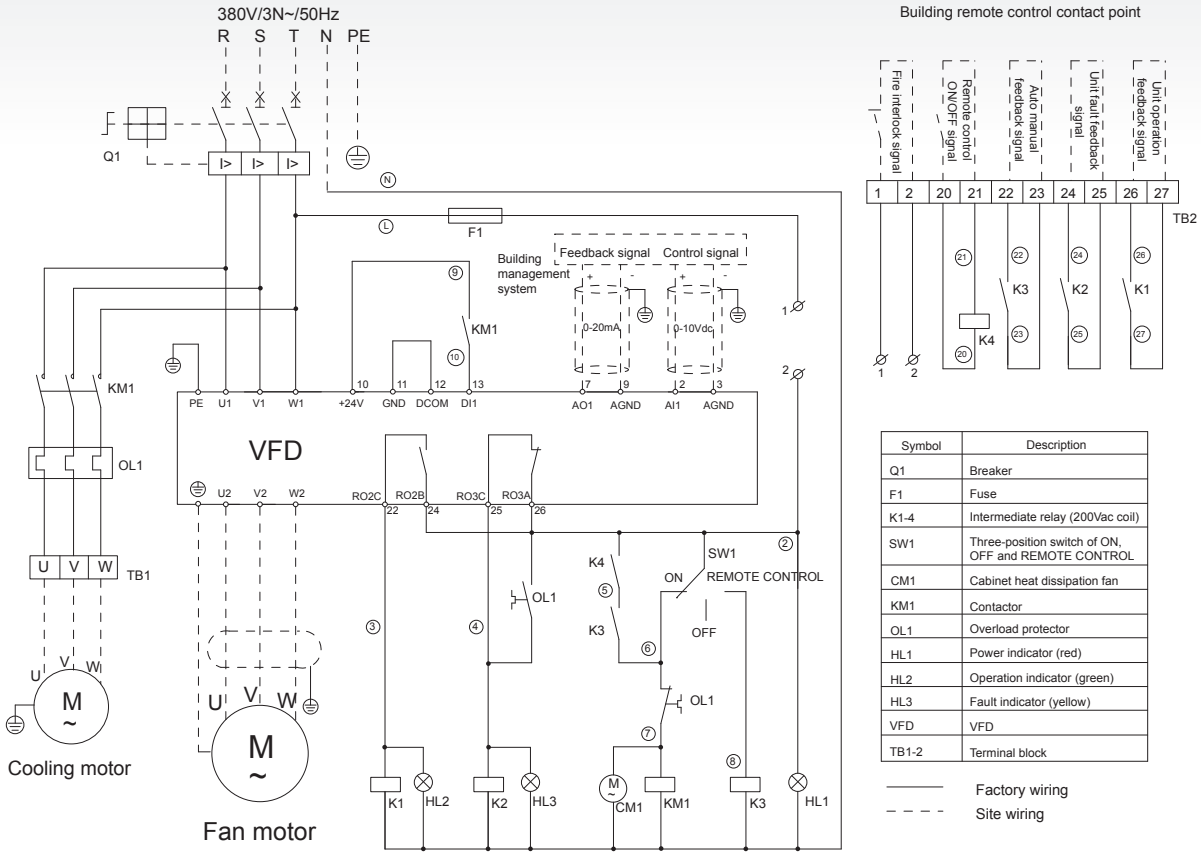



| Symbol | Description |
|---|---|
| Q1 | Breaker |
| F1 | Fuse |
| KM1-3 | Contactor |
| K1-3 | Intermediate relay (220Vac coil) |
| KT1 | Time relay |
| SW1 | Manual auto two-position switches |
| HL1 | Power indicator (red) |
| HL2 | Operation indicator (green) |
| HL3 | Fault indicator (yellow) |
| SS1 | Start button |
| SF1 | Stop button |
| TB1-3 | Terminal blocks |

## Functional features

- Remote/local start-stop control and status indication;
- Recommended motor startup mode: For rated power under 7.5KW, direct startup mode is recommended. For rated power 11~55KW, star-delta startup mode is recommended. For rated power of 75KW or above, other startup mode is recommended;
- Unit status indication: power, running, failure status;
- Overload, open phase, under-voltage, short circuit and other protection;
- Interlocked with fire signal;
- Other customer required functions.

## Variable frequency startup control principle diagram




| Symbol | Description |
|---|---|
| Q1 | Breaker |
| F1 | Fuse |
| K1-4 | Intermediate relay (200Vac coil) |
| SW1 | Three-position switch of ON, OFF and REMOTE CONTROL |
| CM1 | Cabinet heat dissipation fan |
| KM1 | Contactor |
| OL1 | Overload protector |
| HL1 | Power indicator (red) |
| HL2 | Operation indicator (green) |
| HL3 | Fault indicator (yellow) |
| VFD | VFD |
| TB1-2 | Terminal block |

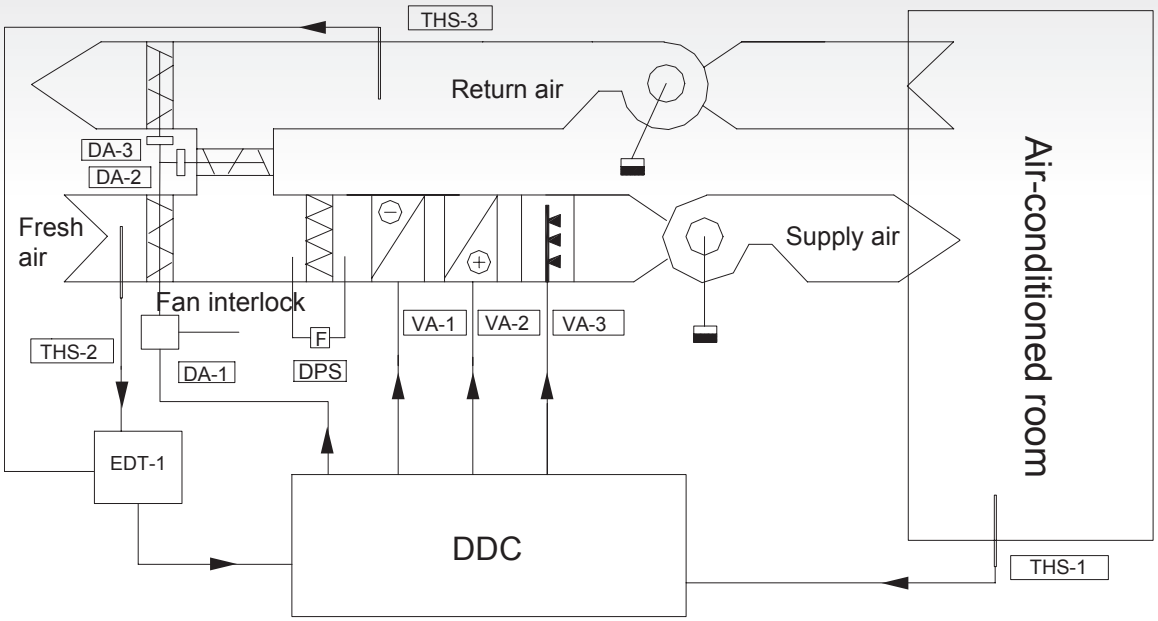
Factory wiring

Site wiring

### Functional features

- Remote/local start-stop control and status indication;
- Variable frequency helps to realize the real-time air volume and pressure adjustment for air-handling unit, thus to effectively reduce the energy consumption;
- Variable frequency startup mode reduces the impact to the power grid and the power capacity expansion cost;
- Overload, open phase, under-voltage, short circuit protection;
- Adopt the special frequency converter of international famous brands of HVAC products;
- Interlocked with fire fighting signal;
- Other customer required functions.

## Direct digital control with enthalpy difference control function and constant temperature and humidity function




## Symbol description

| Symbol | Name | Remarks |
|---|---|---|
| DDC | Direct digital controller | Analog input/output, switch input/output |
| VA-1/2/3 | Motorized valve | Analog control, optional spring-return |
| THS-1 | Room type temperature and humidity sensor | Combination type |
| THS-2/3 | Air-duct type temperature and humidity sensor | Combination type |
| EDT-1 | Enthalpy difference transmitter | - |
| DPS-1 | Differential pressure switch | - |
| DA-1/2/3 | Damper actuator | Analog control, switch control, optional spring-return |

## Functional description

DDC is direct digital controller, with configurable analog input/output, switch input/output. The system parameters, operation mode and process curve can be displayed on the controller directly.

- Temperature control: Use the room temperature sensor THS-1, to test the room temperature and the temperature signal is sent to the DDC controller to compare with the pre-set target value. According to the result, the DDC controller releases signal to adjust the opening of cold water valve or hot water valve so as to control the room temperature;
- Humidity control: Use the room humidity sensor, THS-1, to test the room humidity and the humidity signal is sent to the DDC controller to compare with the pre-set target value. According to the result, the DDC controller release signal to adjust the opening of humidifier so as to control the room humidity;
- Mixing air control: THS-2 and THS-3, the fresh/return air-duct temperature and humidity sensor respectively test the temperature and humidity of the fresh air and return air, the result is calculated by EDT-1, the enthalpy difference transmitter, and the enthalpy difference signal is entered into DDC. According to this signal,DDC releases the corresponding signal to control the opening of fresh air, return air and ventilation valve, respectively are DA-1,-2 and-3, thus to adjust the mixing ratio of fresh air and return air to reduce the energy consumption. Meanwhile, the room air condition can be improved. (Keep the lowest fresh air in winter and summer, while use the outdoor fresh air in transition season as far as possible.)

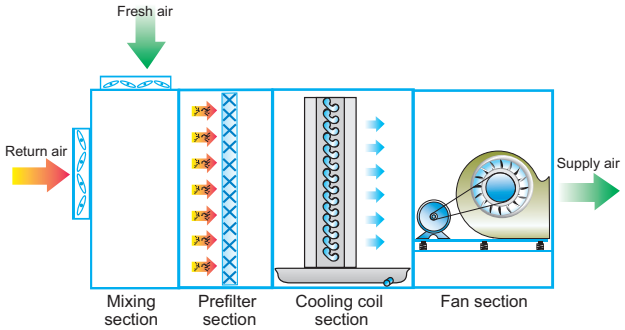
Remark: If there are any other control requirements for temperature and humidity, please contact DAIKIN.

# Common combination of function sections (recommend configuration)

With advanced structure, excellent performance, rich functions and flexible design, various function sections of DDM-E units series can meet different requirements for air handling of various places.
As a famous manufacturer of central air conditioning equipment and supplier of air purification system in the world, DAIKIN has over 50 years experiences for research, design, system application and innovation for air handling units, and provide specialized design solutions of air handing units used in various places, as follows.
For DDM-E series of units, we can provide you with special solution for your specific requirements, Please just submit your requirements to local DAIKIN sales branches.

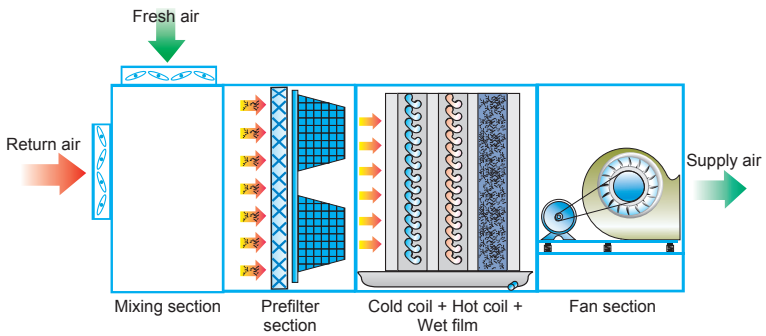
## Suitable for the unit used in general comfort place

Air handling unit with fresh return air mixing section, prefilter (G3/G4), cooling coil section (can add heat pipe or wet film humidification) and supply section, can meet the temperature control requirements for comfort places.



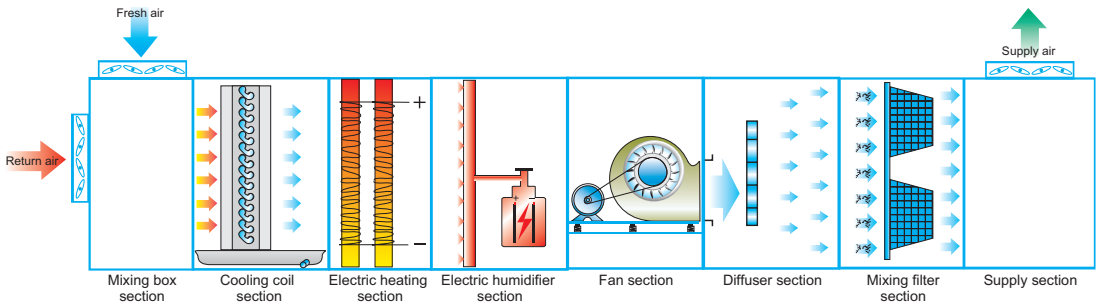

## Suitable for the units for advanced comfort places

Equipped with prefilter (G3/G4) and attenuator filter (F5/F6), cooling coil section, heating section, wet film humidifier section and fan section. For double layers of air purification treatment, better cleanliness, accuracy control for the supply air temperature, and primarily adjustment for air humidity. It can be used for the places with general requirements for air cleanliness, temperature and humidity.



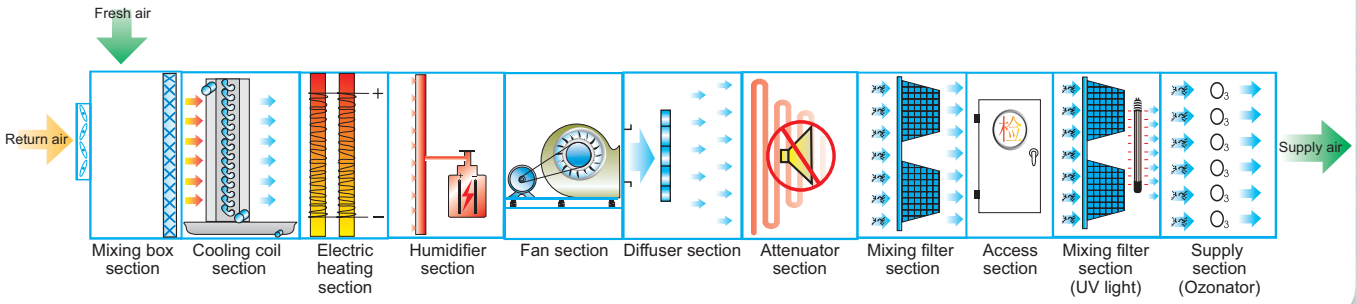

## The units fit for the places of purification requirements below 10,000 grades (constant temperature and humidity)

Equipped with primary filter (G4) and cooling coil dehumidification coil, and equipped with stepless regulation electrical heating, the humidification capacity can proportionally controlled and output. Fan section, mixing filter and filter section are with optional differential pressure display, equip with high quality intelligent programmable logic controller. The intelligent control scheme can be used for various purification engineering of different requirement for constant temperature and humidity control.



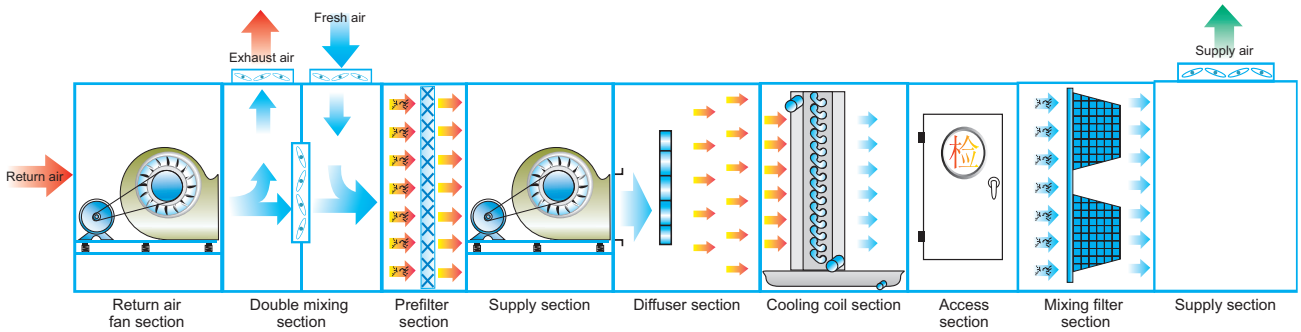
## Suitable for the places required 100 grade and 1,000 grade of high quality purification constant temperature and humidity control

Equipped with high quality primary filter (G4) and attenuator filter (F8) containing INTERSEPT antibacterial agent. Equipped with ultraviolet sterilizing lamp in filter section to kill the bacteria filtered from the filter, and fit ozonator or negative-ion generator at air outlet section to fully improve the indoor air quality, and equip electric heating and clean steam humidifier at the same time. Clean type attenuator and backward-curved fan (can equip with variable frequency motor) combine with the efficient or super efficient filter at the end of clean room, maintain constant positive and negative requirements of clean room, meet the requirements of clean room engineering for high cleaning class, constant temperature and humidity, and low noise control.




## The units suitable for the places of centralized processing fresh air exhaust

Air handing units with primary and mixing filters, work by air return fan and air supply fan together, exhaust air by dividing section concentrated, can control the positive and negative pressure of clean room precisely, suitable for the air handling process of concentration exhausting air.




## The recovery unit suitable for energy conservation and environment protection places

Equip with heat recovery, recover part of cold (hot) capacity in exhaust air, and process pre-cooling (heating) treatment to fresh air, and hereby reduce the energy consumption for supply air treatment and meet energy-saving effect. For heat recovery, it can select the wheel type, plate type or heating plate type and the placement types are longitudinal (left and right) type and vertical (up and down) type. Can set the mixing of part return air and fresh air inside, and flexibly configure the function sections at supply and return air side according to the requirements.

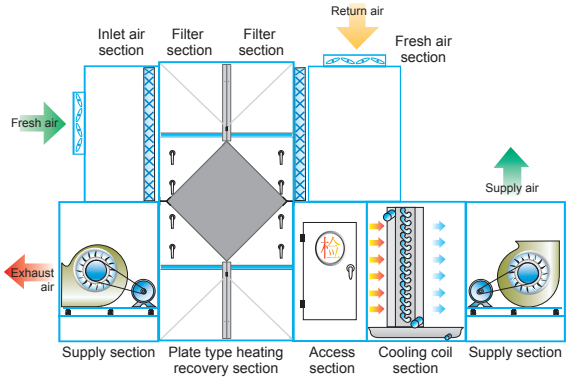
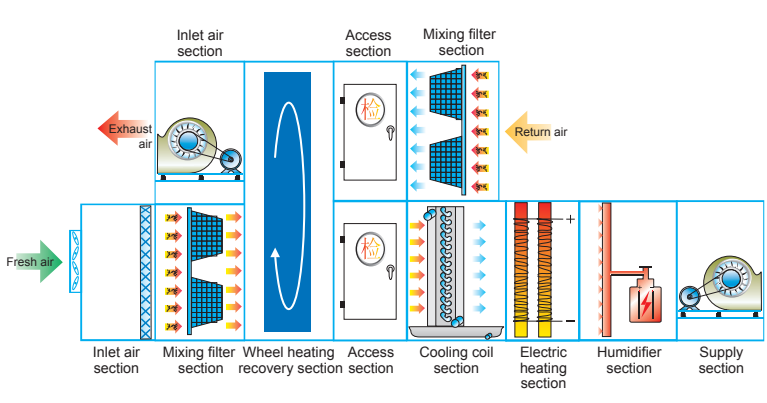



Plate type heating recovery




Wheel heating recovery

**Warning**

- Daikin Industries, Ltd.'s products are manufactured for export to numerous countries throughout the world. Daikin Industries, Ltd. does not have control over which products are exported to and used in a particular country. Prior to purchase, please therefore confirm with your local authorized importer, distributor and/or retailer whether this product conforms to the applicable standards, and is suitable for use, in the region where the product will be used. This statement does not purport to exclude, restrict or modify the application of any local legislation.
- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorized parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the User's Manual carefully before using this product. The User's Manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any enquiries, please contact your local importer, distributor and/or retailer.

The air conditioners manufactured by Daikin Industries have received **ISO 9001 series** certification for quality assurance.

**Certificate Number. FM 661837**

The airconditioning factories of Daikin Industries have received environmental management system standard **ISO 14001** certification.

**Certificate Number. EMS 80362**

## Cautions on product corrosion

1. The units should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the unit close to the sea shore, contact your local distributor.

**Dealer**

**DAIKIN INDUSTRIES, LTD.**

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Printed with soy ink.

**Literature No.:** CA-DDM-E-201701

**Supersedes:** PUCA14-11