

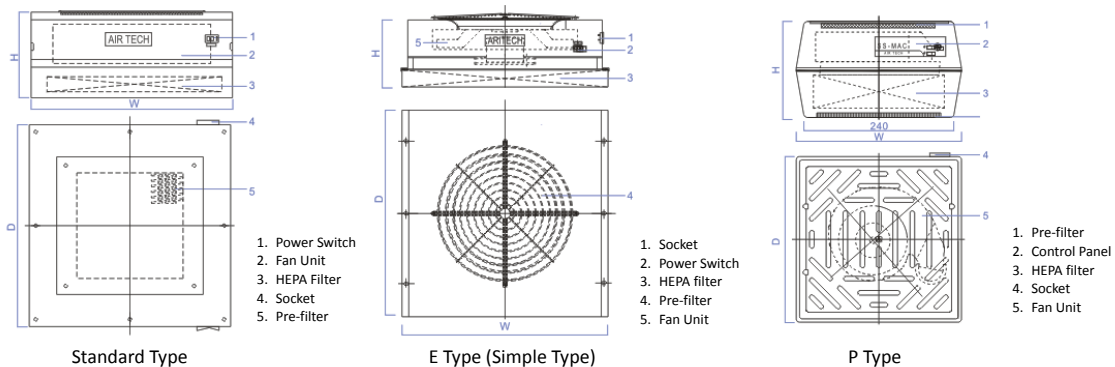
MAC Mini Air Clean Unit

Mini Air Clean Unit (MAC) is a kind of air purification product that enhance the partial cleanliness. For the purpose of purification, end user can install MAC on the different kinds equipment. Refer to different requirements, MAC can be divided into three types: Standard, E type, P type (ABS case).



Characteristic

- It adopts high performance AT fan with two gear speed.
- Use high quality HEPA filter, apply to various cleanliness requirement.
- May choose special filter for wiping off gaseous chemical pollutant.
- Low noise, low power consumption, light weight.
- The delicate structure make maintenance easier.
- The motor is with thermal protection.
- End user can install MAC by themselves vertically or horizontally.
- Suitable for quickly setting up kinds of clean bench, clean booth, pass box and clean chest.



Specifications

Model	Standard Type						E Type								P Type			
	MAC-201		MAC-500		MAC-800		MAC-200E		MAC-300E		MAC-600E		MAC-900E		MAC-60P			
Item	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L		
Adjustable Gear																		
Rated Air Volume (m3/h)	200	160	500	400	800	650	200	160	300	240	600	450	900	650	60	36		
Filter Efficiency	≥99.99%, @0.3μm																	
Noise (dB(A))	≤58						≤52		≤54		≤56		≤58		≤56		≤52	
Power Supply	AC220V, 1Φ, 50Hz																	
Consumption (W)	≤50		≤260		≤260		≤50		≤70		≤120		≤140		≤30			
Overall Dimension (mm)	365X365		535X535		660X660		400X400		500X500		610X610		1170X570		250X250			
WXDXH	X200		X280		X280		X200		X200		X200		X200		X145			
Size and Qty. of HEPA (mm)	305X305		484X484		610X610		400X400		500X500		610X610		1170X570					
	X50X①		X50 X①		X50 X①		X69 X①		X69 X①		X69 X①		X69 X①					
Weight (kg)	11		24		28		9		12		16		22		3			



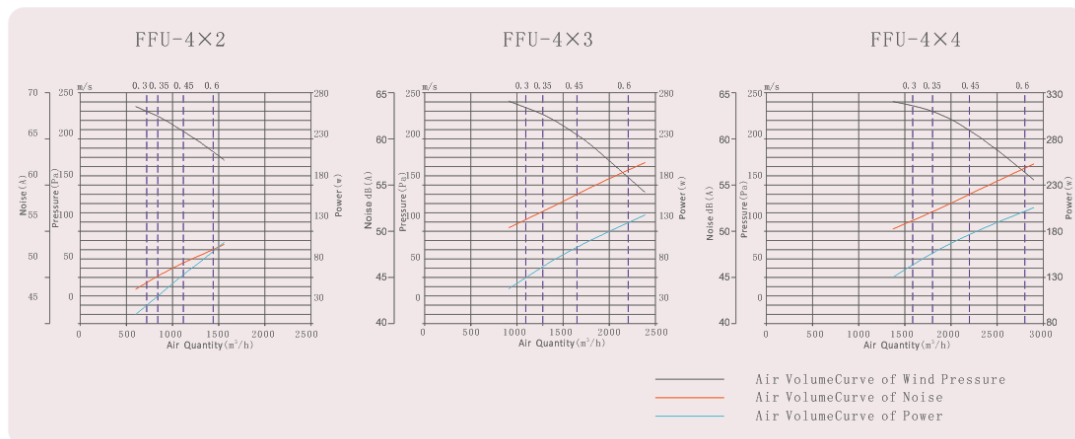
FFU Fan Filter Unit

Fan Filter Unit (hereafter called FFU) is air clean equipment with fan built-in, which is usually put on the modular T-Grid. It has extensive application in electronics and biological industries that require air clean environment.

Characteristics

- It adopts AT fan with low noise and high efficiency which AIRTECH JAPAN especially designed for FFU. It has the feature of energy-saving with low carbon, no maintenance, high reliability and long life.
- Optimized capacity and distributaries guided whirl tube reduce the overall height and enhance the uniformity of air blow-out.
- Large suitable interval of air velocity and volume (see the operating curve) can satisfy the requirements of different types of clean environment. It is also suitable for use where high air velocity is required for Class A area of biology and pharmacy.

Operating Curve



- It adopts low resistivity filter that can provide 75-120Pa excess pressure outside the product under rated airflow, which meets the need of high resistivity of return air in the clean room.
- Multi-optional and flexible layout
 - ◎ Filter:
Standard configuration: HEPA (H13、H14)
Optional: ULPA (U15、U16)
 - ◎ Fan:
Standard configuration: AT Fan DCBL motor
Standard configuration: AT Fan AC motor
 - ◎ Material of case:
Standard configuration: Al-Zn coated steel sheet
Optional: SUS304 or SUS430
 - ◎ Optional configuration: pre-filter, fault alarm, single stand outlet (with plug)

© Control mode of FFU is optional:

1. DCBL motor:

- Single control:

Standard configuration: speed controller

Optional: three/five speed controller or variable speed controller

- Group control:

Cloud technology computer monitoring and control system

The master-slave control system

2. AC motor:

- Single control:

Standard configuration: terminal block or speed controller

Optional: three/five speed controller

- Group control:

Cluster computer monitoring and control system

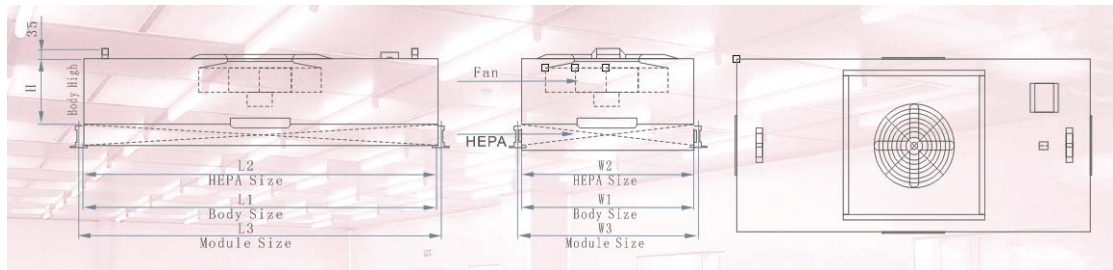
The master-slave control system

Specification

Model	FFU-4X2	FFU-4X3	FFU-4X4
Size of the case (LXWXH)	1175X575X215 mm	1175X875X215 mm	1175X1175X290 mm
Size of HEPA	1170X570X69 mm	1170X870X69 mm	1170X1170X80 mm
Air Velocity	0.35-0.45 m/s		
Rated Power	85-100 W	100-115 W	160-175 W
Noise	48-52 dB(A)	52-54 dB(A)	54-58 dB(A)
Lose of Pressure of Filter	88-120 Pa		
Excess Pressure Outside the Product	50-120 Pa		
Power Source	AC220V, 1 Φ , 50Hz		
Filter Efficiency	\geq 99.995% (@0.3 μ m)		
Optional UPLA Efficiency	99.9995% (@0.1-0.2 μ m)		
Standard Control Mode	Two speed Controller		
Optional Control Mode	Three/Five Speed Controller Variable Speed Controller Master-slave Control System Computer Monitoring System		
Material of Case	Al-Zn Coated Steel Sheet		
Optional Material	SUS304/SUS430		
Complete Weight	29kg	43kg	50kg
Optional Parts	EBM Fan Power Cord Fault Alarm Pre-filter		

Installation Notice

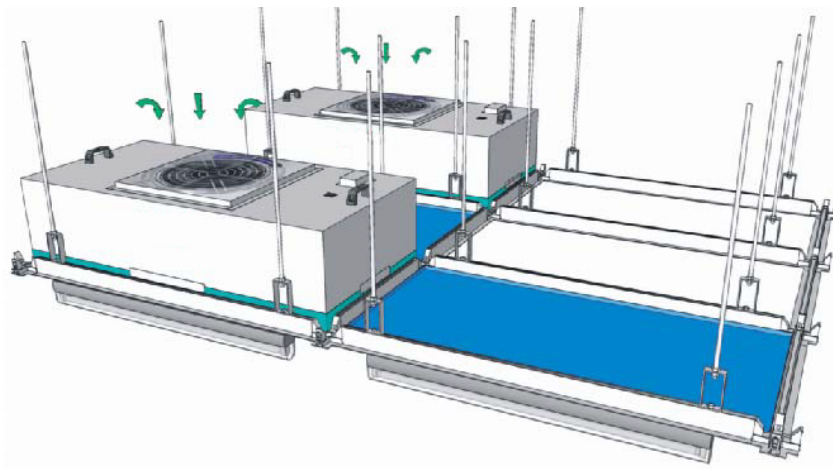
Diagram of Overall Size



Size of Corresponding Models and Filter

Model	Size of the Case			Size of Filter		Size of Models	
	L1	W1	H	L2	W2	L3	W3
FFU-4X2	1175	575	215	1170	570	1200	600
FFU-4X3	1175	875	215	1170	870	1200	900
FFU-4X4	1175	1175	290	1170	1170	1200	1200

Installation Diagram



Installation On-Site



Operation and Control of FFU with DCBL Motor AT Fan

Strengths of DCBL FFU: Energy saving more than 40%

System Composition:

FFU Driver

- New technology DC digital frequency conversion control system: Sensorless driving technology
- High reliability of DC motor body, high stability, not easy to malfunction.
- It's suitable for different group control software.
- The control system can make DC motor power factor up to 98% with PFC

Driver Specification:

- Input and output range:
- Power supply: AC 220V, 50/60Hz
- Power consumption: within 5 W
- Pilot light: Power, Communication, Alarm ,DSP status
- Key: power control, Motor speed setting, IP setting.

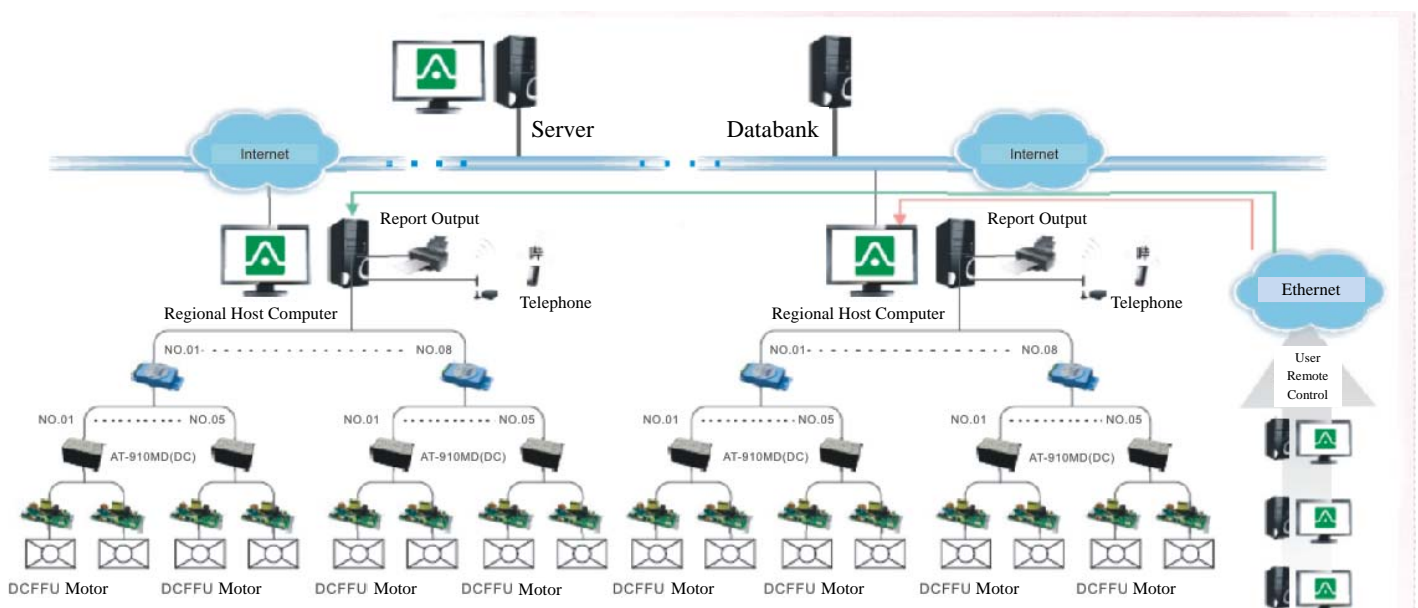
Communication specification:

- Communication format (Protocol): Modbus-RTU
- Communication port: RS-485
- The longest communication distance: 1200 m X 2(Double-decker structure)=2400 m (If add Repeater, it is able to extend distance).
- Power on and off memory
- When power on FFU run according to the previous setting speed, for the first time FFU run according to the factory default setting.
- When power on again after power outage, FFU run according to the memory setting.

System Protect:

- The driver with over-current, over- voltage, over- temperature protection, ensure equipment operating safely.

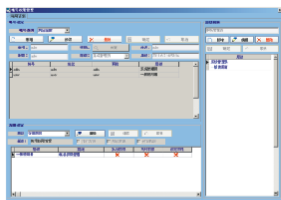
FFU cloud monitoring system



Software Specification

- **The stable line connection quality:**
By using RS-485 as communication interface, it has the advantages of anti-jamming and anti noise. Intelligent communication module and message retransmission mechanism make the control of Internet more stable and faster.
- **Communication quality monitoring:**
By using communication quality tools check timely, understanding the current connection quality is abnormal or not more easily and easier to construction and maintenance.
- **The users can do cloud monitoring by Ethernet.**
- **Supporting multiple screen display.**
- **The users can program the screen displaying of monitor by themselves. (Site Layout, dot chart and so on)**
- **Open-type communication format:**
 1. Using open-type communication style Modbus structure to communicate with bottom device.
 2. Double-decker structure: Contact with power driver though host system.
 3. Single-decker structure: Can contact with power driver directly.
- **Human-computer interface monitoring intuitively:**
Graphical control symbol can be distinguished and operated easily, and using without trouble.
- **History record trends: Running record...**
- **Floor management:**
Can know the current controlling and operating state of the device intuitively with flat floor management.
- **Alarm management:**
System logging, timely alarm system.
- **Information management:**
Account management, permission management, database maintenance function.
- **Function:**
Can set speed, can read the real speed, alarm joint, error code.

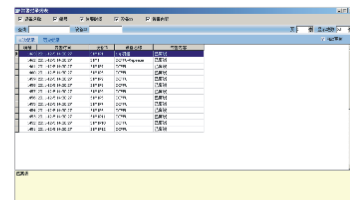
Account management



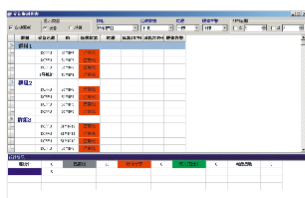
Equipment management



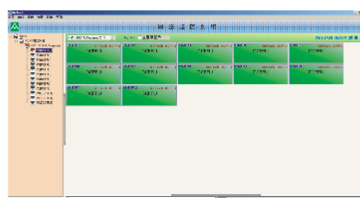
System alarm



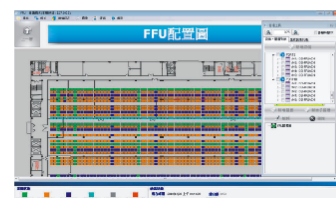
Running condition statistics

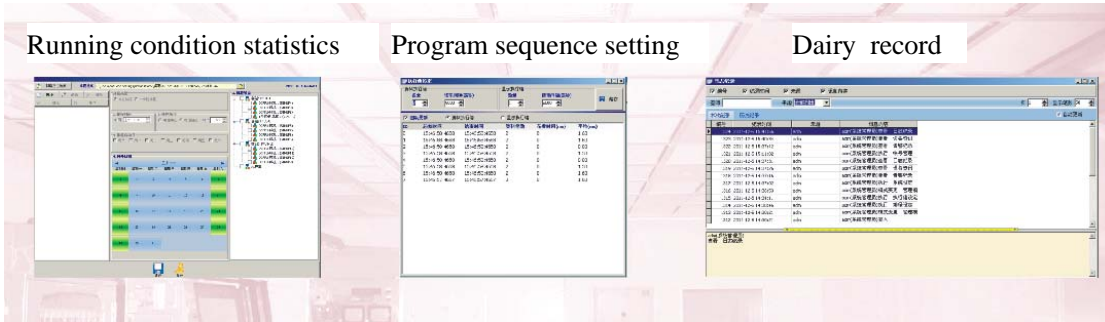


Monitoring system



Site layout





Operation and Control of FFU with AC Motor AT Fan

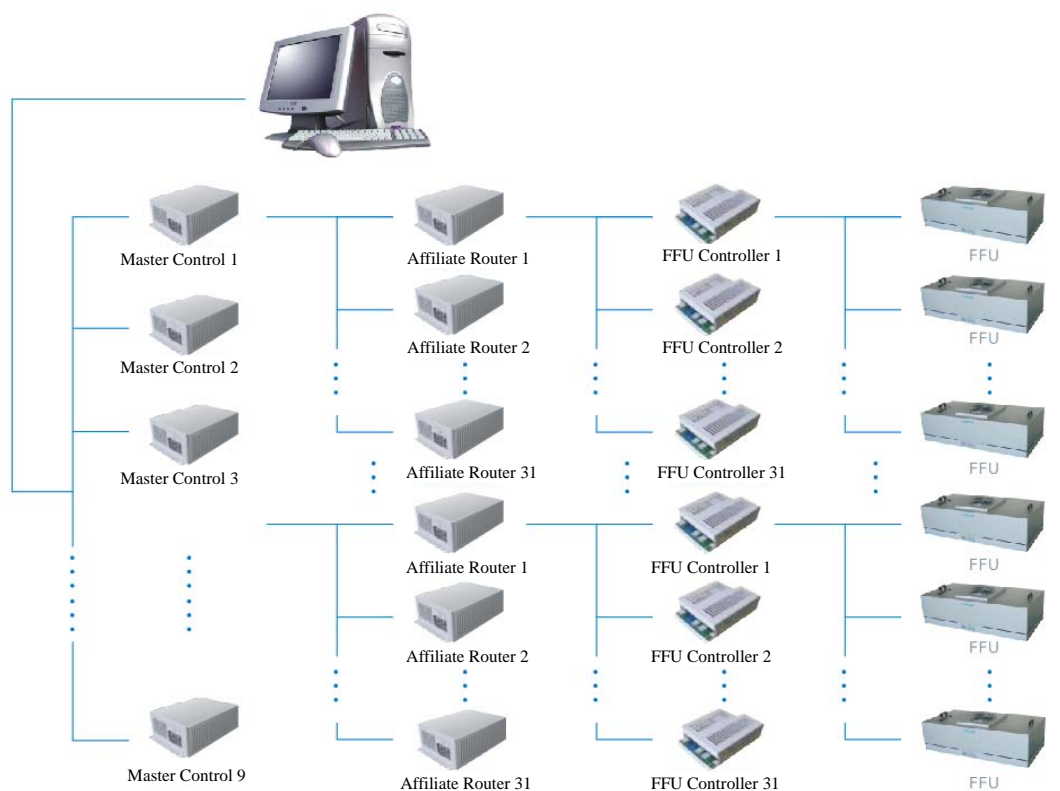
Group control system, System structure:

The control system designed based on RS485 bus, using master control (PC)----RS232/RS485 adapter, master router, affiliate router and FFU control modal four level structure. The master control (PC) can manage nine sets of master routers at most, and per master router can manage 31 sets of affiliate router, affiliate routers can not be more than 255sets. Each affiliate routers can control 31 sets of FFU. The system can control 7905 sets of FFU mostly.

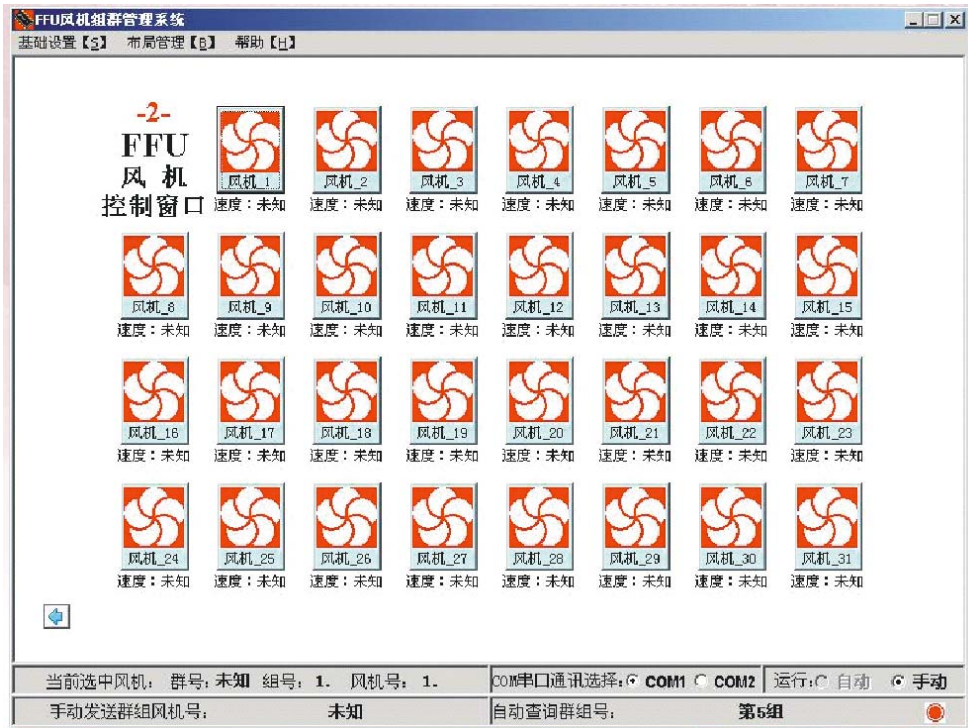
Characteristic:

- RS-485 control modal, integrated hardware configuration, less investment, installment easily
- Centralized controlling of FFU turn on, turn off and controlling speed, can pre set and modify parameters randomly, operate easily.
- Operating parameter display automatically, fault location and display , fault alarm, monitoring picture exchange randomly.
- Three grade operation rights of Cipher Management System, management is more normatively.

Graph of Group Control



Group Control Interface

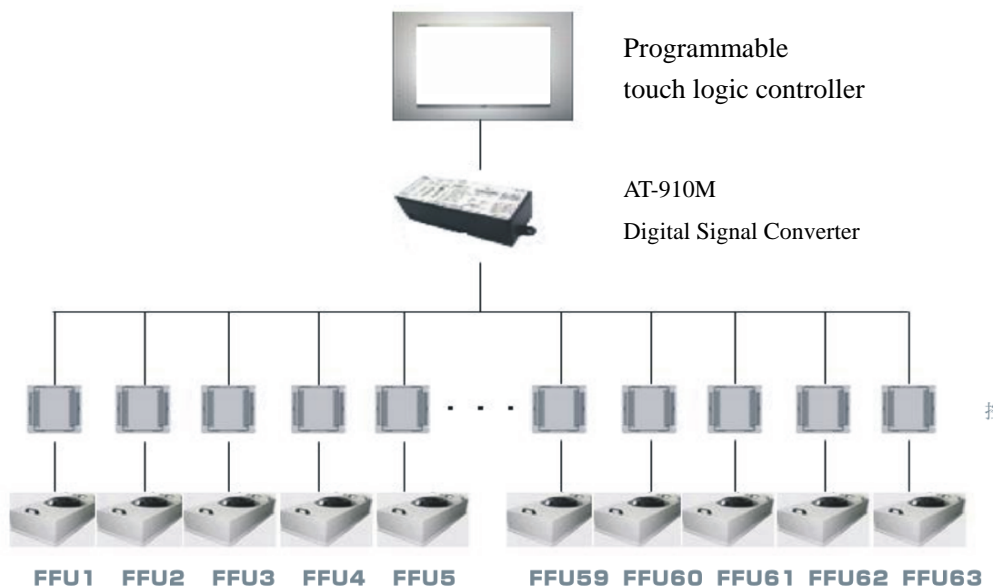


FFU Master-slave control system

Function:

- FFU Opening-closing control (group control, single control)
- FFU Gear position control (group control, single control)
- FFU Gear checking (group checking, single checking)
- FFU Default checking
- FFU Specification setting

Graph of Master-slave Control (FFU quantity ≤ 60 sets)



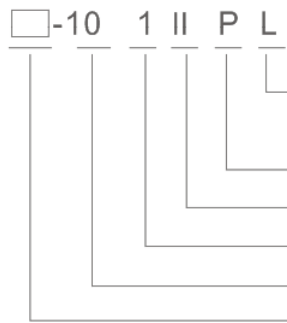
LC & KGF Series Air Filter Unit Without Fan

LC & KGF Series Air Filter Unit Without Fan is a kind of high efficiency filter terminal unit in the clean room. It is widely used in all kinds of newly build or rebuild clean room.

LC-P & KGF-P Series Air Filter Unit Without Fan, is a kind of high efficiency filter terminal unit in the clean room for biological pharmacy industry . It is widely used in all kinds of clean room with cleanliness-grade for biological pharmacy industry which meet GMP requirements.



Model



L: Sealing form (L means HEPA filter is knife edge gel seal, blank means HEPA filter is mechanical seal)

P: with PAO test port

Air supply mode: (I: top sending, II: side sending)

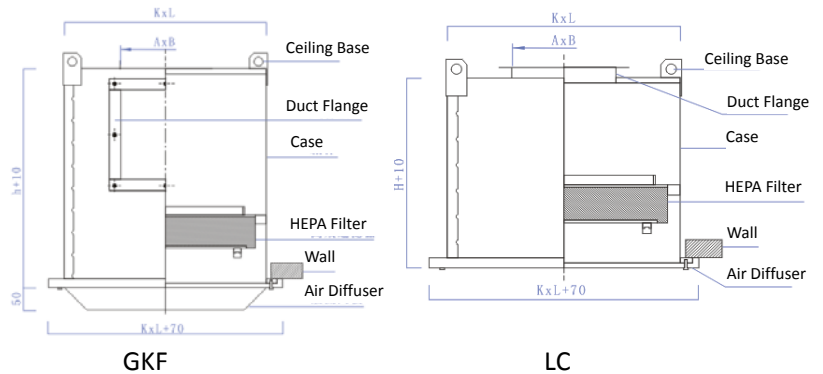
Improved code (I: the first time improve)

Air Volume (05: 5*100m³/h, 10: 10*100m³/h...)

Product characteristic code

Characteristic

- Simple and reliable structure, easy installation.
- HEPA filter is at bottom, replacing easily.
- Filter efficiency: $\geq 99.99\%$ ($\geq 0.3\mu\text{m}$ of dust)
- P style: filter efficiency $\geq 99.995\%$ ($\geq 0.3\mu\text{m}$ of dust)
- Initial resistance: $\leq 230\text{Pa}$.



Specifications

Model		Rated Volume	HEPA Size	Overall Size	Flanges Size	Ceiling Size	Weight
Top Inlet	Side Inlet	(m ³ /h)	(mm)	KXLXH(mm)	AXB(mm)	(mm)	(Kg)
□-051 I	□-051 II	500	400X400X80(H13)	450X450X360/480	200X200	460X460	20
□-051 I P	□-051 II P		400X400X80(H14)				20
□-051 I PL	□-051 II PL		400X400X105(liquid seal)				22
□-101 I	□-101 II	1000	610X610X69(H13)	660x660X360/480	320X250	670X670	36
□-101 I P	□-101 II P		610X610X69(H14)				36
□-101 I PL	□-101 II PL		610X610X105((liquid seal)				39
□-151 I	□-151 II	1500	630X630X80(H13)	680X680X360/480	400X250	690X690	43
□-151 I P	□-151 II P		630X630X80(H14)				43
□-151 I PL	□-151 II PL		630X630X105(liquid seal)				47
□-201 I	□-201 II	2000	915X610X80(H13)	965X660X360/480	630X250	975X670	53
□-201 I P	□-201 II P		915X610X80(H14)				53
□-201 I PL	□-201 II PL		915X610X105(liquid seal)				58
□-251 I	□-251 II	2500	1220X610X80(H13)	1270X660X360/480	630X250	1280X670	60
□-251 I P	□-251 II P		1220X610X80(H14)				60
□-251 I PL	□-251 II PL		1220X610X105(liquid seal)				65
□-301 I	□-301 II	3000	1260X630X80(H13)	1310X680X360/480	630X250	1320X690	65
□-301 I P	□-301 II P		1260X630X80(H14)				65
□-301 I OL	□-301 II PL		1260X630X105(liquid seal)				70