

Health Type FCU Product Overview and Selection Guide

TICA Overseas Sales Center

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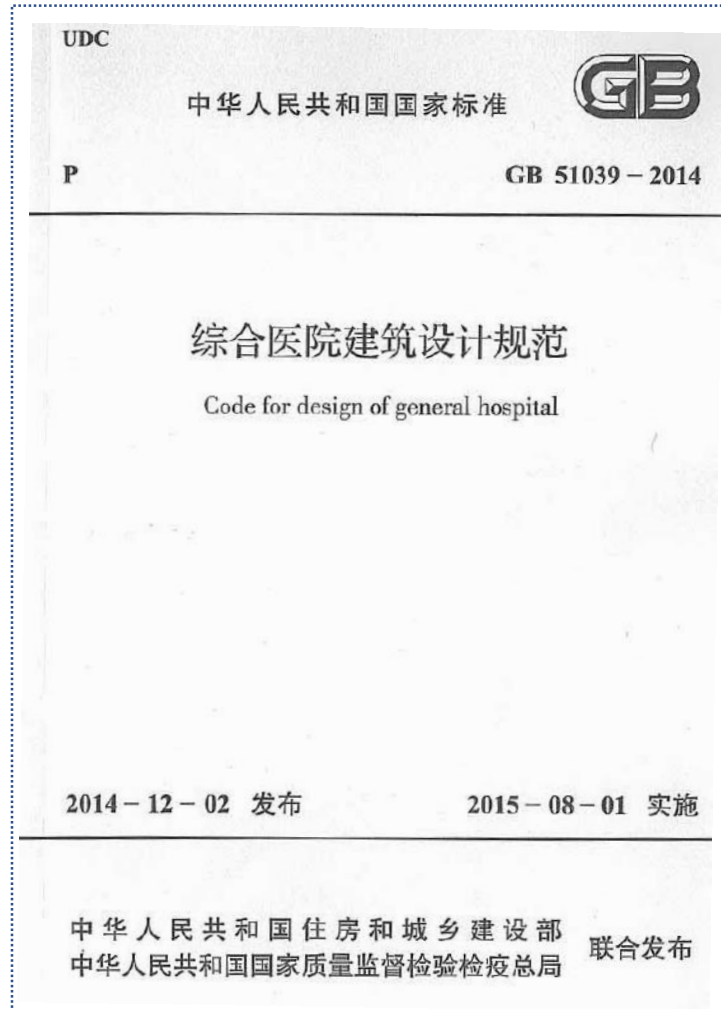


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PART 1 What Is Health Type FCU

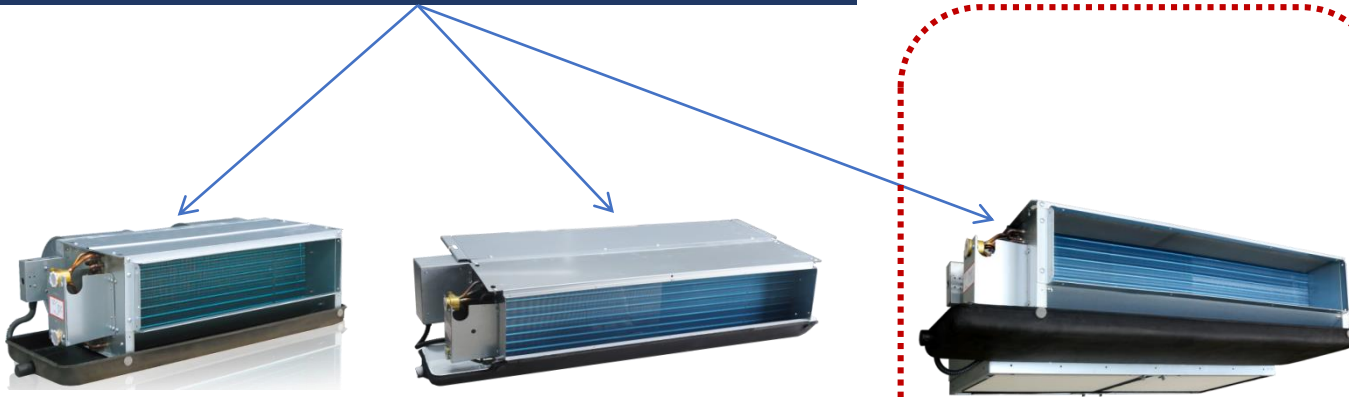
Design standard



- GB 51039-2014 Code for design of general hospital
- 7.1.11 The return air inlet of centralized air conditioning system and FCU unit must be equipped with the filter that has the **initial resistance** smaller than 50Pa, the primary pass rate of **microorganisms** no more than 10%, and the primary pass rate (by weight) of **particles** no more than 5%.

Horizontal Concealed FCUs

① For engineering projects



Ceiling concealed FCU

- ① Model: TCR
- ② 200-1400, 10 specifications
- ③ AC motor
- ④ Height: 230 mm
- ⑤ Optional air return plenum

Ceiling concealed - low noise FCU

- ① Model: TCRQ-Y
- ② 200-1200, 9 specifications
- ③ Brushless DC motor
- ④ Height: 230 mm
- ⑤ Standard air return plenum

Ceiling concealed health type FCU

- ① Model: TCRJ
- ② 200-1400, 10 specifications
- ③ Single-phase 3-speed motor
- ④ Standard bottom air return plenum

② For chillers



Horizontal concealed FCU TCRQ-N

③ For mini units

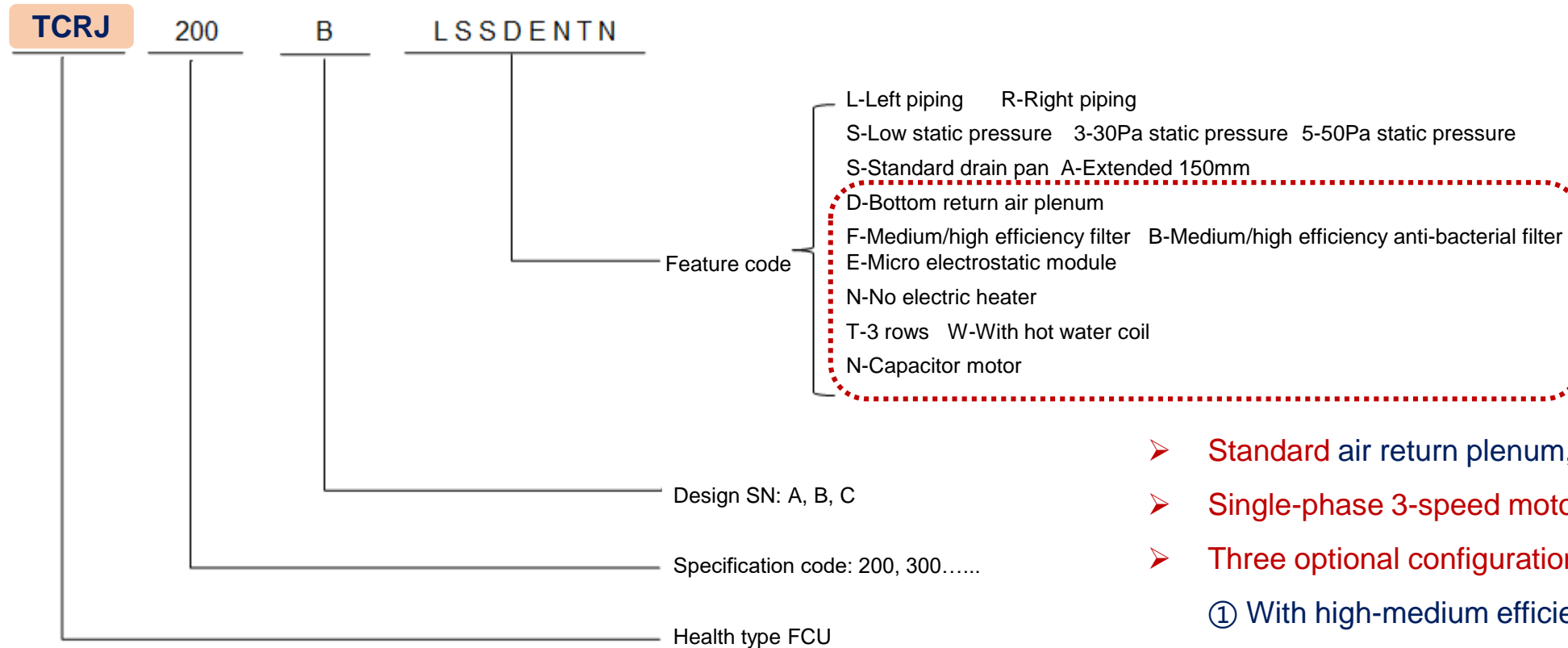


Ultra-thin and quiet mini FCU TCRS



Mini FCU TCRH

Nomenclature



- Standard air return plenum, bottom return air;
- Single-phase 3-speed motor;
- Three optional configurations:
 - ① With high-medium efficiency filter;
 - ② With high-medium efficiency anti-bacterial filter;
 - ③ With micro electrostatic module.

Product R&D platform

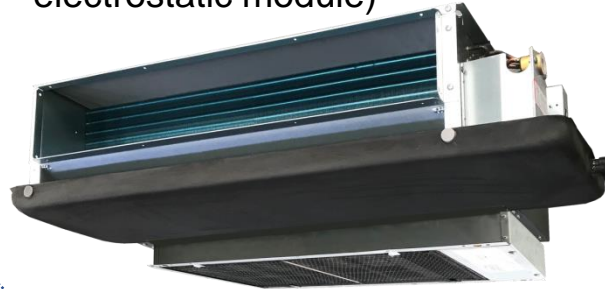
Ceiling concealed FCU TCR



Health type FCU TCRJ- F/B (with filter)



Health type FCU TCRJ- E (with micro electrostatic module)



Compared with TCR-G FCU, the exterior appearance:

- Same length
- Width + 100 mm
- Height + thickness of filter/micro electrostatic module

★ Reduced impact of fan speed on filter/micro electrostatic module; guaranteed initial resistance; lower noise

Difference between health type FCU and purification type FCU

Health type FCU



- Particle primary filtration efficiency > 95%
- Microorganism filtration efficiency > 90%

★ Primary pass efficiency

Design of hospital projects complies with GB 51039-2014

Code for design of general hospital

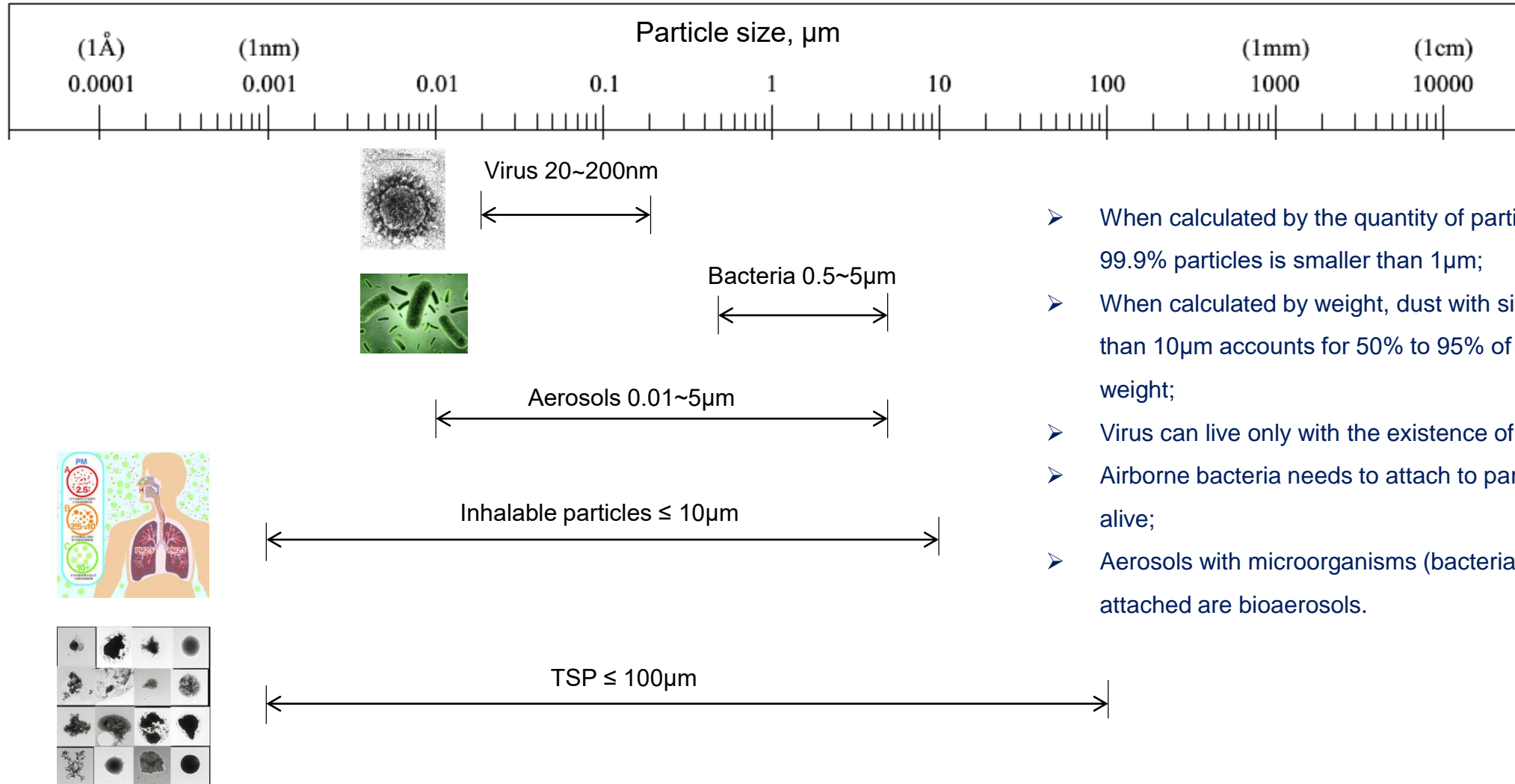
Purification type FCU



- PM2.5 filtration efficiency: 96% (in a cycle of 120 min)
- Formaldehyde filtration efficiency: 90% (in a cycle of 60 min)

★ Cyclic efficiency

PART 2 Features of Health Type FCU



- When calculated by the quantity of particles, size of 99.9% particles is smaller than 1 μm ;
- When calculated by weight, dust with size smaller than 10 μm accounts for 50% to 95% of the total weight;
- Virus can live only with the existence of host;
- Airborne bacteria needs to attach to particles to be alive;
- Aerosols with microorganisms (bacteria, virus) attached are bioaerosols.

Size of bioaerosols in the air is analyzed by using the six-stage viable particle sampler.

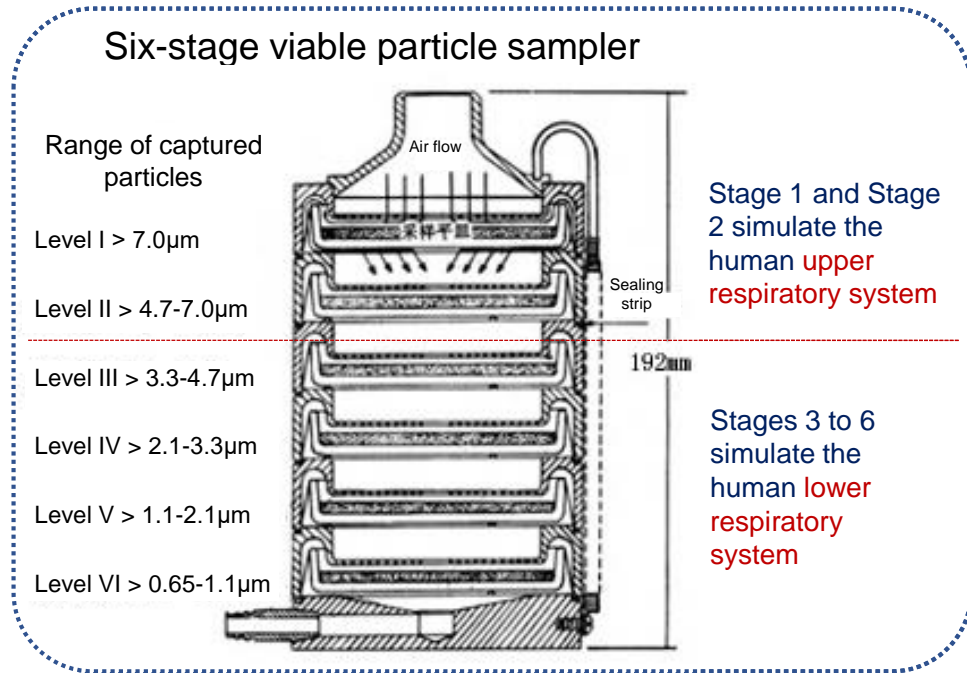


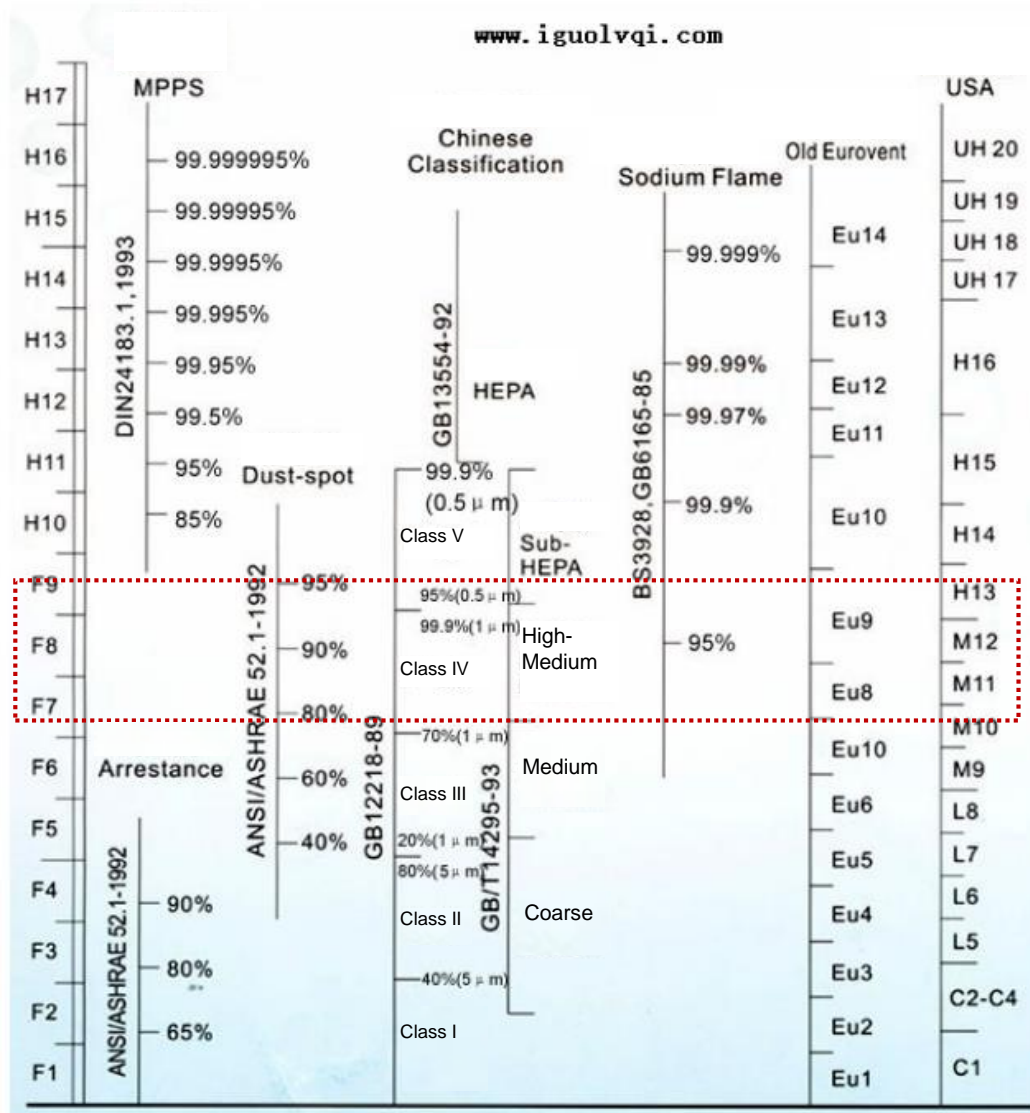
Table 3-3 Size distribution of bacterial aerosols in various places on campus

Place in campus	Average percentage of concentration of bacteria of difference levels in the sampler					
	Level I (>7.0 μ m)	Level II (4.7~7.0 μ m)	Level III (3.3~4.7 μ m)	Level IV (2.1~3.3 μ m)	Level V (1.1~2.1 μ m)	Level VI (0.65~1.1 μ m)
Stadium	13.37	13.66	21.97	23.27	25.71	2.01
Lab	10.87	14.26	18.26	17.82	33.28	5.51
Male dorm	15.28	15.94	14.05	16.99	33.23	4.51
Female dorm	25.32	10.71	12.36	22.35	23.40	5.87
Classroom	9.95	11.29	14.96	19.94	35.84	8.02
Canteen	18.54	12.92	18.77	25.88	22.32	1.56
Library	4.92	11.18	16.78	20.92	33.98	12.22
Outdoors	29.34	13.75	15.64	21.71	17.83	1.73

Conclusion:

- The main size distribution of bioaerosols: $\geq 1.1 \mu\text{m}$, level I-V
- The control and removal of bioaerosols can refer to that of low-level industrial purification (0.5 μ m) and particulate pollutants (PM2.5).

Analysis on Physical Filter

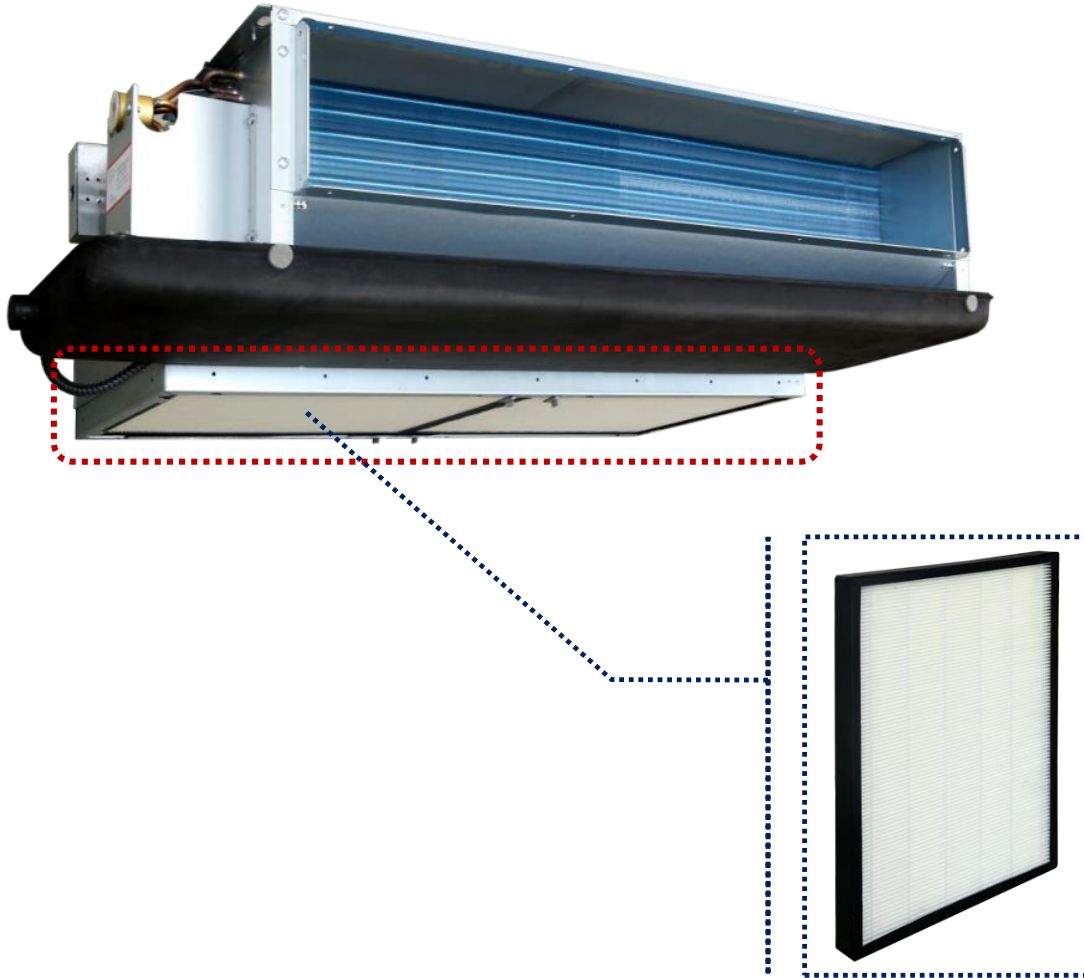


Heat	Grade	Final resistance for test (Pa)	Average weighing efficiency to manmade dust (A_m) %	Average efficiency to 0.4 μ m particles (E_m), %	Minimum efficiency to 0.4 μ m particles ^a
Coarse	G1	250	$50 \leq A_m < 65$	-	
	G2	250	$65 \leq A_m < 80$	-	
	G3	250	$80 \leq A_m < 90$	-	
	G4	250	$90 \leq A_m$	-	
Medium	M5	450	-	$40 \leq E_m < 60$	
	M6	450	-	$60 \leq E_m < 80$	
High-Medium	F7	450	-	$80 \leq E_m < 90$	35
	F8	450	-	$90 \leq E_m < 95$	55
	F9	450	-	$95 \leq E_m$	70

^a The minimum efficiency refers to the minimum value of the static electricity elimination efficiency, initial efficiency, and all efficiencies in the dust holding test.

Conclusion based on analysis on filter:

- Main size distribution of bioaerosols falls with the scope that can be processed with **high-medium efficiency filter**.
- **Physical filter** is sufficient to effectively remove bioaerosols.



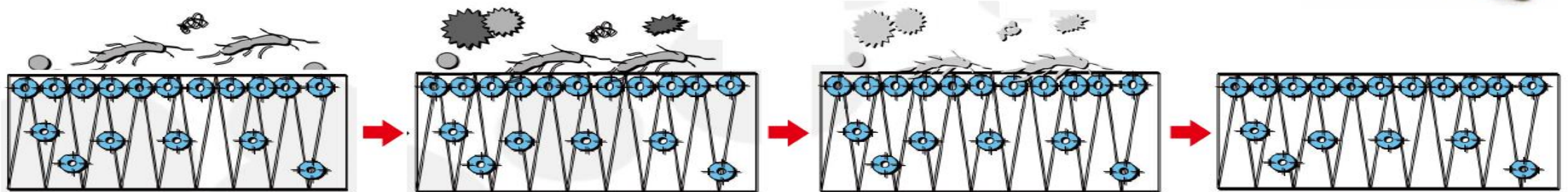
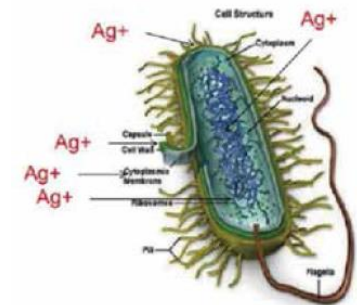
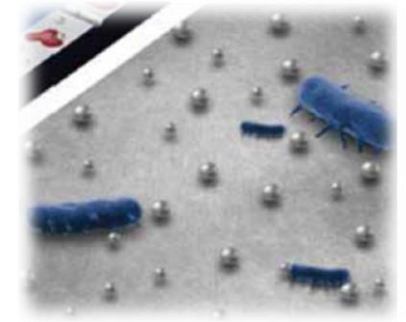
The health type FCU TCRJ is equipped with the **high-medium efficiency filter (no separating panel, low pressure loss)**, which can effectively filter the airborne dust particles and bioaerosols, meeting the requirements for primary pass efficiency stipulated in relevant national standard.

The high efficiency filter adopts the low-windage melt spinning cartridge material. Its folded structure expands the filtering area, prolongs the filter's service life, and requires fewer replacements.

Anti-bacterial high-medium efficiency filter is optional.

Silver ions are positive ions that are positively charged. Through the oxidizing action, they can sterilize and restrain the growth and reproduction of microorganisms or kill microorganisms. Over half airline companies in the world use silver water filters. NASA considers silver as the safest disinfectant.

- Silver ions can interfere with cell wall synthesis. Then, cells could be killed since the cell walls lost the completeness.
- Silver ions can damage cell membranes, a major component to support the livingness of bacterial cells. Bacteria with damaged cell membranes will die.
- Silver ions can interfere with nucleic acid synthesis, so as to hinder the replication of genetic information, including DNA synthesis, RNA synthesis, transcription from DNA template to mRNA, etc.
- Silver ions are effective in killing bacillus coli, staphylococcus albus, blastomyces albicans, Klebsiella pneumoniae, Methicillin-resistant Staphylococcus aureus (MRSA), pseudomonas, aspergillus niger and common viruses.

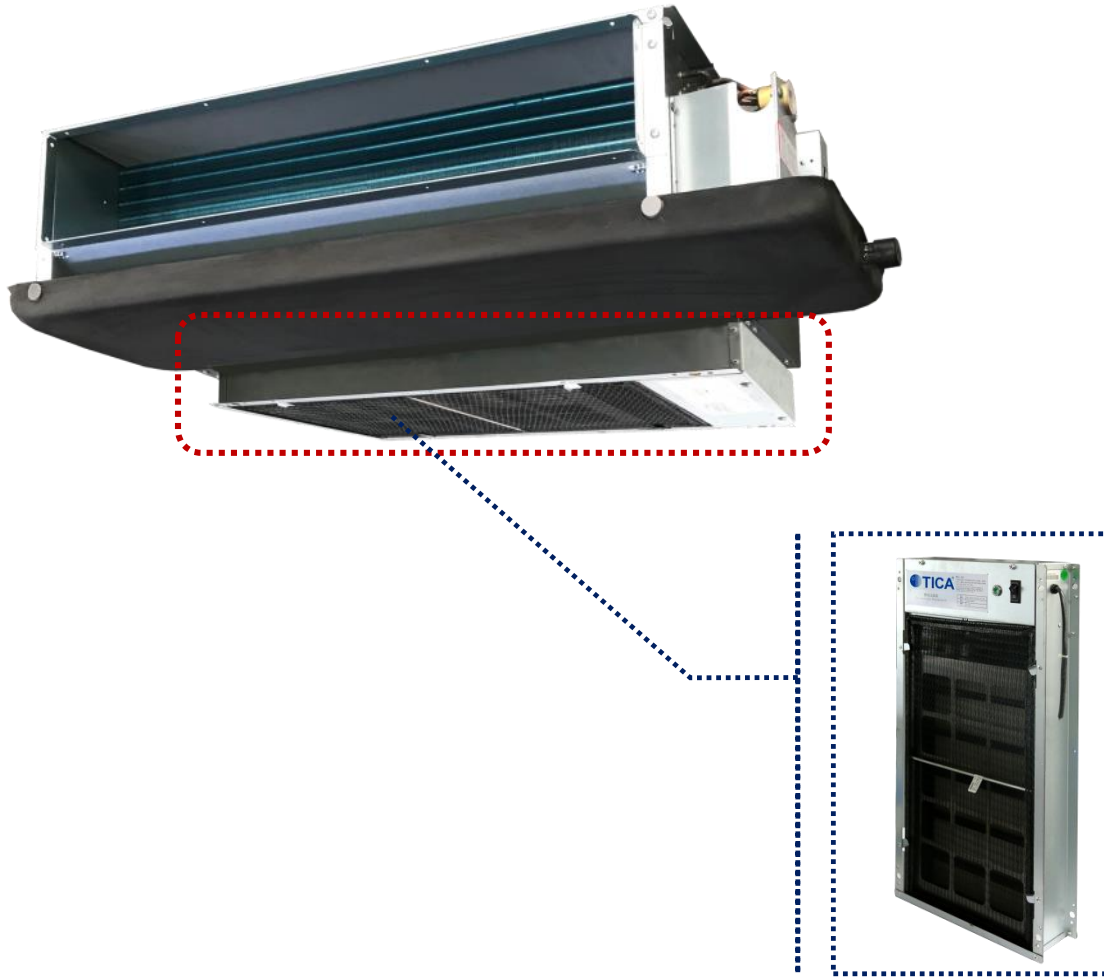


Antibiotic active substances are attached on the surface of the high-medium efficiency filter

Microorganisms come near the surface of the filter will be killed by the antibiotic active substances.

Broad spectrum and efficient inhibition of microorganism reproduction.

Unique slow release technique for long-term performance.



The health type FCU TCRJ is equipped with the **IFD micro electrostatic module** for efficient dust filtering and sterilization. The power consumption of a single micro electrostatic module is no greater than 5W and the windage does not exceed 18Pa, reducing system power consumption to the greatest extent.

- Ultra-thin modular design, less installation space required
- Safe use, no exposed high-voltage parts, no ignition or abnormal discharging
- Amount of ozone well below the 16mg/m³ as required by GB/T 18883-2002 Indoor air quality standard

Operating principles



PART 3 Application of Health Type FCUs

Recommended solution to public areas in hospitals:

- Fan coil solution: Standard configuration



High-medium efficiency filter
Optional **anti-bacterial filter medium**

- Fan coil solution: Advanced configuration



IFD micro electrostatic module

Standard compliance

GB 51039-2014 Code for design of general hospital

7.1.11 The return air inlet of centralized air conditioning system and FCU unit must be equipped with the filter that has the initial resistance smaller than 50Pa, the primary pass rate of microorganisms no more than 10%, and the primary pass rate (by weight) of particles no more than 5%.

Recommended solution to common public areas:

- Fan coil solution:



Standard: High-medium efficiency filter
Optional **anti-bacterial filter medium**



Advanced configuration: IFD micro electrostatic module

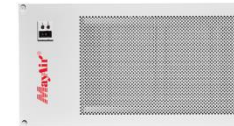
- AHU solution (**consult the factory for customization**)



TFD



Standard: High-medium efficiency plate type filter
Optional **anti-bacterial filter medium**



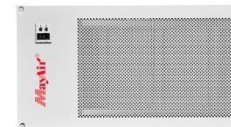
Advanced configuration: High-pressure static filter



TAD/TAC/TBC



Standard configuration: High-medium bag type filter
Optional **anti-bacterial filter medium**



Advanced configuration: High-pressure static filter

PART 4 Maintenance of Health Type FCU

Maintenance of Health Type FCU

- For optimal air supply volume and purification effects, it is recommended to replace the high-medium efficiency filter every three to six months.
- You can simply loosen the fastener to remove the filter. No tool is required.
- For the price of high-medium efficiency filter and high-medium efficiency anti-bacterial filter, consult the after sales service center.
- You are advised to clean and maintain the micro electrostatic module every three to six months.
- The high-medium efficiency filter and micro electrostatic module need to be maintained through the **return air inlet**. For this reason, reserve sufficient space during equipment installation.





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