



# TICA MODULAR AIR HANDLING UNIT

## TAC/TBC Series



GMP/FDA

$\pm 1^{\circ}\text{C}$   $\pm 5\%$

ISO Class 1

**AirPioneer**





Established in 1991, TICA is a national high-tech enterprise that is dedicated to becoming the world's leading supplier and service provider of smart and clean environment and green energy systems. TICA is also a market leader in China in terms of clean air processing in extreme environments, a practitioner of energy conservation in building and industrial environments, and a pioneer in low-temperature power generation and green and renewable energies. TICA owns five production sites in Nanjing, Tianjin, Guangzhou, Chengdu and Kuala Lumpur, eight plants, and a network of over 70 sales and service outlets around the world.

**In the industrial and biological clean room segment, TICA's market share has achieved over 40% in China.**

**Serving over 7,000 Grade-A Class 3 and Class 2 hospitals**

Infectious Hospital (Uzbekistan), SAI Hospital( Fiji), Brawijaya Hospital(Indonesia), etc.

**Serving over 5,000 GMP-certified pharmaceutical plants**

Bayer (Germany), Dexa Palembang(Indonesia), Merrymed Farm Factory (Uzbekistan), etc.

**Serving over 2,000 microelectronic manufacturers**

Western Digital (Malaysia), Longsheng Technology (Cambodia), Apex Circuit (Thailand), etc.



Nanjing Plant



Guangzhou Plant



Tianjin Plant



Chengdu Plant



Kuala Lumpur Plant



Smartt HQ, Montreal



Energy Base

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Invention of frameless full module air conditioning cabinet structure  
China's first ISO Class 1 ultra clean integrated environmental system  
China's first national brand with EUROVENT & AHRI certifications

## Great Originality, Fabulous Craftsmanship Over 30 Years' Professional Experience in Clean Air-Conditioning

1991

Registered TICA  
brand

1999

Purifying DX system  
solution



2014

ISO Class 1 ultra clean  
integrated environmental  
system



1998

Invented and patented the  
labyrinth structure  
ZL 98 1 11326.5



2013

Obtained EUROVENT  
certification



## Design

Modular design with free combination  
Energy-efficient module with low resistance



## Application

Focusing on low-carbon energy saving solutions  
Customization base on personalized demand



## Production

International first-class manufacturing production line  
Intelligent order design system



## Service

Professional sales service Ticare



### 2017

Obtained MIIT Champion Product Award



### 2021

Obtained eco-friendly zero-ODP insulation system & TUV certification



### 2016

Obtained AHRI certification



### 2019

Pioneered the manufacture of energy-saving heat recovery DX AHU



### 2022

Upgraded micro module series



# Introduction

## Overview

After more than 30 years of technological transformation for Air Pioneer, we have accumulated a lot of project experience and valuable suggestions from customers and engineers. The innovative micro module design, leads to a brand-new cabinet design concept, significantly improving the structural flexibility.

Therefore, Air Pioneer has higher energy-saving property and reliability, meeting the customization needs of more professional scenarios.



## Series A-TAC

Casing thickness: sandwich insulation panel 25mm

Installation type: horizontal / vertical / ceiling

Air flow range: 1,000 to 60,000m<sup>3</sup>/h

Higher flexibility and  
economical design

Commercial building  
application

Convenient installation



Series B - TBC

Casing thickness: sandwich insulation panel 50mm  
Installation type: horizontal / vertical / ceiling  
Air flow range: 1,000 to 360,000m<sup>3</sup>/h

Higher-level Casing performance

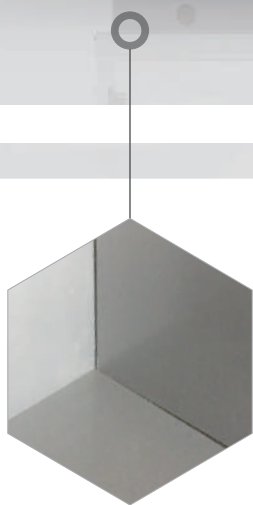
Critical industrial application

Ultra-strong installation adaptability

# Professional Design

TICA Air Pioneer modular air handling unit has a patented casing structure and excellent detailed design, as well as outstanding performance in the industry in terms of mechanical strength, air tightness, thermal insulation performance, and anti-cold bridge. (ZL 2014 2 0122442.9)

It also meets the EN1886 standard for casing performance and is certified by EUROVENT.



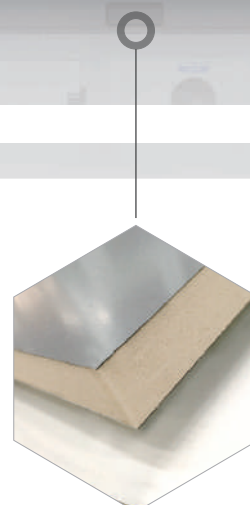
Flat and clean inside

Casing inside is flatly and seamlessly spliced  
No corners with possible dust deposition



High-efficiency heat exchanger

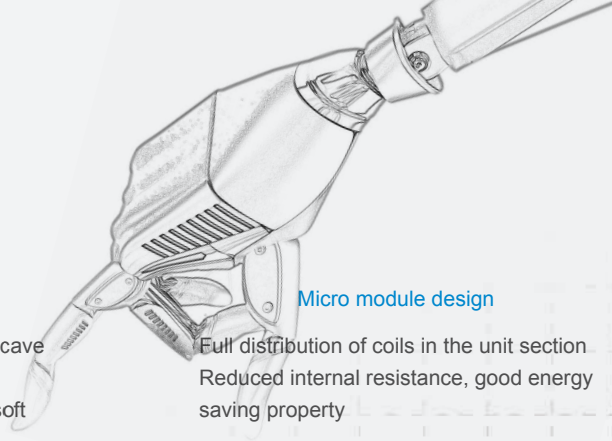
Obtained AHRI certification for heat exchanger and RoHS certification for copper pipe  
High-efficiency heat exchange, high reliability



Sandwich insulation panel

50kg/m<sup>3</sup> high-density polyurethane  
Lower heat loss, high strength without deformation



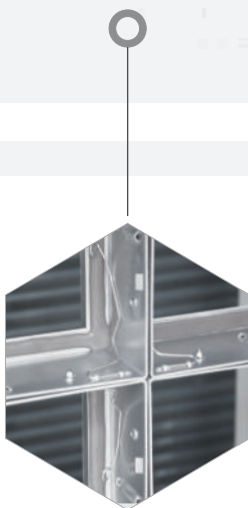
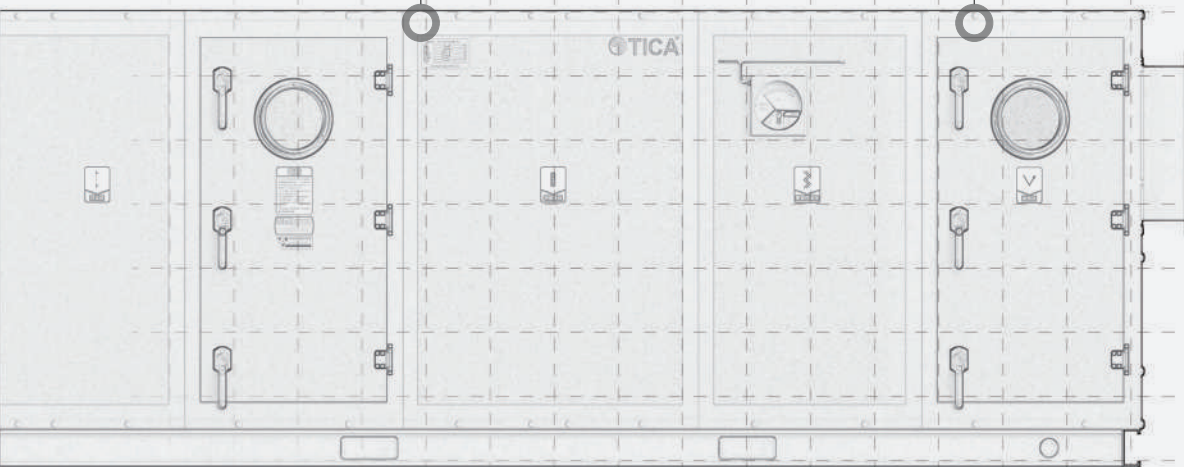
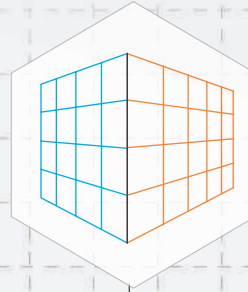
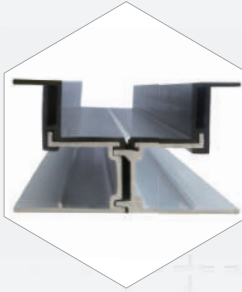


**Self-developed casing structure**

A labyrinth sealing structure, with the concave and convex modules interlocked  
 Aluminum-plastic composite profile with soft and hard co-extrusion sealing strip

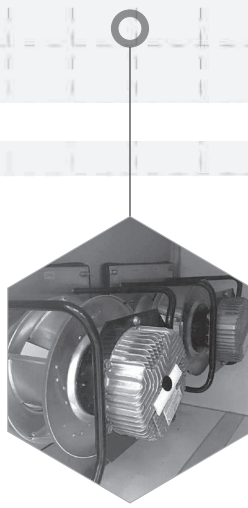
**Micro module design**

Full distribution of coils in the unit section  
 Reduced internal resistance, good energy saving property



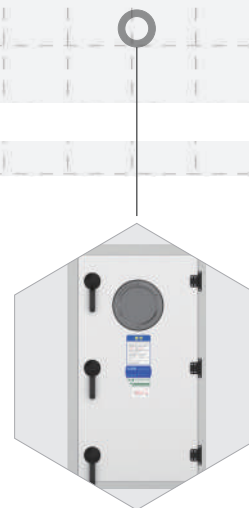
**Highly-sealed filter installation frame**

Highest level of EN1886 airtightness  
 Supply clean air after filtering



**High-efficiency and energy saving fan**

EC fan with higher energy efficiency  
 Cleaner without volute and belt dust



**Access door**

Full-size door with large space, more convenient repair  
 Seamless foaming of door leaf, with good airtightness  
 Pressure relief design for door handle, ensuring operation safety

# Model Selection

Select unit models according to air flow and air face speed of the coil. 

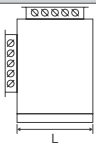


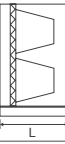
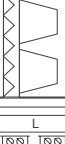
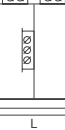
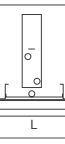
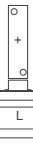

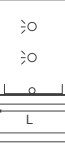
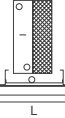
Model	Air flow (x1000m <sup>3</sup> /h)													
	02	04	08	16	24	40	64	128	256	512				
012012	■	■												
014017		■	■											
016023		■	■	■										
020026			■	■	■									
022028			■	■	■									
026031				■	■	■								
028038					■	■	■							
035048						■	■	■						
047063							■	■	■					
050079								■	■	■				
067086									■	■	■			
074102										■	■	■		
096120											■	■	■	
099138												■	■	■

Note: Unit facing velocity (m/s) 

## Unit dimension and filter size

Model	Internal dimensions (H × W)	External dimensions (H × W) (mm)		Number of filters		
	mm	TAC	TBC	24"*24"	20"*24"	12"*24"
012012	612*612	662*662	712*712	0	0	2
014017	714*867	764*917	814*967	0	1	1
016023	816*1173	866*1223	916*1273	0	1	2
020026	1020*1326	1070*1376	1120*1426	2	0	2
022028	1122*1428	1172*1478	1222*1528	2	2	0
026031	1326*1581	1376*1631	1426*1681	4	0	2
028038	1428*1938	1478*1988	1528*2038	6	0	0
035048	1785*2448	1835*2498	1885*2548	8	4	0
047063	2397*3213	2447*3263	2497*3313	15	5	0
050079	2550*4029	2600*4079	2650*4129	24	0	4
067086	3417*4386	3467*4436	3517*4486	35	0	7
074102	3774*5202	3824*5252	3874*5302	48	0	6
096120	4896*6120	4946*6170	4996*6220	80	0	0
099138	5049*7038	5099*7088	5149*7138	88	0	8

# Sections

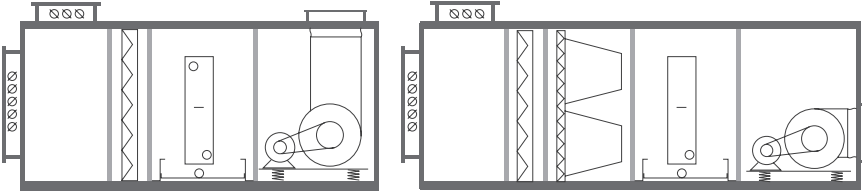
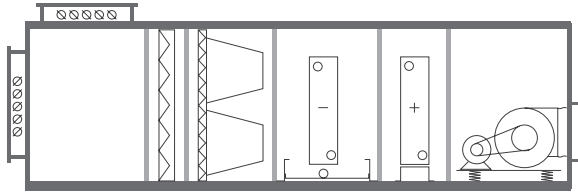
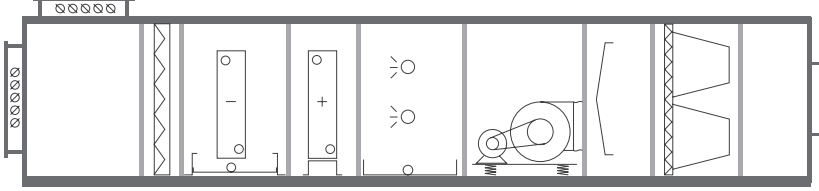
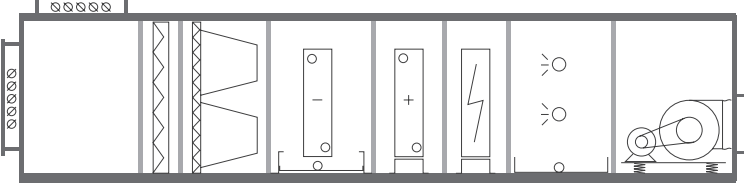
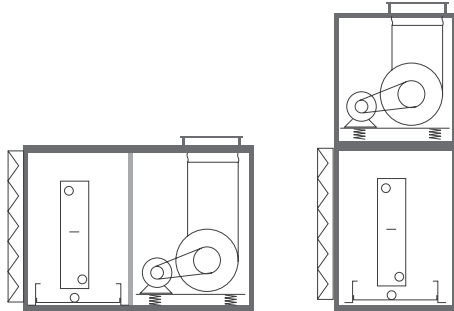
Section	Legend	Dimensions (mm) (reference value)
Mixing box		010013-020028: L=500    022028-023033: L=600 026031-035044: L=700    035048-042060: L=900 047055-050069: L=1000    050074-067072: L=1200 067086-074090: L=1400    074102-099138: L=1600
Exterior filter		Installed outside the box, taking up no box space
Primary filter		L=100, optional primary and medium efficiency filters * Placed in the mixing section or outside, taking up no space alone
Bag/HEPA filter		Bag / HEPA: L=400
Primary+Bag filter		L=500
3-way damper		Model 010013-035051: L=1200 Model 035055-057076: L=1500 Model 067072-099138: L=1800
Cooling coil		Coils (rows 1-6): L=600, L (staggered with coil)=1000 Coils (rows 8-10): L=700, L (staggered with coil)=1200 * Standard drain pan: width < 49 modulus -- Pipe diameter: DN32 49 modulus < Width < 68 modulus -- Pipe diameter: DN50 Width > 69 modulus -- Pipe diameter: DN50 (2 pcs)
Heating coil		Coils (row 1): L=200, L (staggered with coil)=500 Coils (rows 2-4): L=300, L (staggered with coil)=600
Electric heater		Electric heating capacity: 200kW L=300, < 200kW L=200 * Insufficient box space or air speed less than 3.0m/s, L=700
Steam humidifier		L=600 * Placed behind the fan section, L=900, with drain pan, drain pipe diameter: DN32
Wet film humidifier		L=600 * Share section length with the cooling coil section, with drain pan, drain pipe diameter: DN32

Function section	Simple diagram	Dimensions (mm) (reference value)
Water Mist humidifier		L=900, water eliminator required * With standard drain pan: width < 49 modulus -- Pipe diameter: DN32 49 modulus < Width < 68 modulus -- Pipe diameter: DN50 Width > 69 modulus -- Pipe diameter: DN50 (2 pcs)
Spray section		L=2100 *Double-row spray nozzle
Heat recovery section		*Customizable according to the specific requirement
Dehumidification section		*Customizable according to the specific requirement
Fan section		L=700~3500
Diffuser section		010013-026035: L=500      028034-047058: L=600 047063-050074: L=800      050079-099138: L=1000
Silencing section		L=500/800/1100
Middle section		010013-026035: L=500      028034-099138: L=600 * Placed before the filter section, cooling coil section, heating section, silencing section and other function sections
Air outlet section		010013-020028: L=500      022028-023033: L=600 026031-035044: L=700      035048-042060: L=900 047055-050069: L=1000      050074-067072: L=1200 067086-074090: L=1400      074102-099138: L=1600
Other function sections	Eliminator section	* Shared with cooling coil section
	Evaporation & cooling section	L=900
	Self-purification high-efficiency cartridge filter section	L=1800
	Inflamer section	L=3000

Note

- The total length of the unit can be estimated from the length of each function section:  $L=L_1+\dots+L_n+T$  TAC series: T=50 TBC series: T=100.
- The section length is only for reference of length estimation. Contact TICA for detail information.

# Basic Configuration

System type	Basic features	Section configuration
Commercial unit	<ul style="list-style-type: none"> <li>· Temperature control</li> <li>· Applicable to commercial applications</li> </ul>	 <p>Mixing section + plate filter section + cooling coil section (heating section) + fan section</p> <p>Mixing section + plate filter section + bag filter section + cooling coil section + fan section</p>
	<ul style="list-style-type: none"> <li>· Temperature control</li> <li>· Apply to 4-pipe commercial applications</li> </ul>	 <p>Mixing section + plate filter section + bag filter section + cooling coil section + heating section + fan section</p>
Constant temperature and humidity unit	<ul style="list-style-type: none"> <li>· Temperature and humidity control</li> <li>· Applicable to process projects</li> </ul>	 <p>Mixing section + plate filter section + cooling coil section + heating section + humidification section + fan section + flow equalization section + bag filter section + air supply section</p>
Constant temperature and humidity with heat recovery unit	<ul style="list-style-type: none"> <li>· Temperature and humidity control as well as heat recovery</li> <li>· Applicable to process projects</li> </ul>	 <p>Mixing section + plate filter section + bag filter section + DX cooling coil + heat recovery section + electric heating section + humidification section + fan section</p>
Full fresh air unit	<ul style="list-style-type: none"> <li>· Focus on fresh air humidity treatment</li> <li>· Applicable to air-conditioning systems in comfortable projects</li> </ul>	 <p>External filter section + cooling coil section + fan section</p>



## Industry Solutions

Taking into account the real needs of application scenarios and summing up the experience in the subdivision fields, we have continuously improved the design of Air Pioneer according to the scenarios and are committed to providing users with extremely clean and refined energy-saving scenario application solutions.

ESOLUTIONS

# Industry Solutions



## Medical Operating Room

### Application features



Hygiene requirements for air supply:  
5~75cfu/m<sup>3</sup> bacterial concentration  
ISO 5~8.5 cleanliness



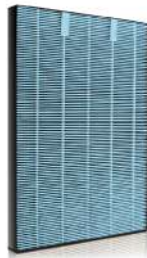
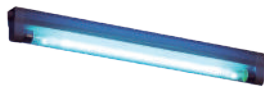
Frequent cleaning and  
disinfection inside the  
equipment



Low humidity in special  
operating department,  
requiring energy consumption  
for reheating

### Product features

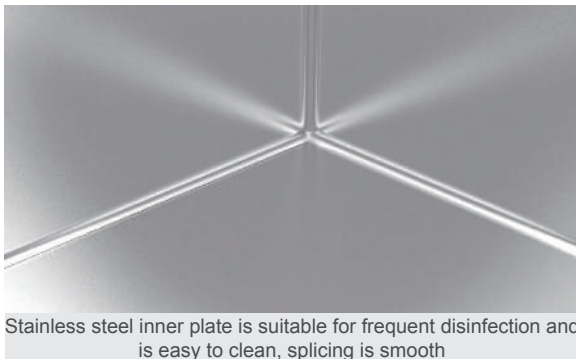
- Professional antibacterial configuration such as broad-spectrum high-efficiency UVC, silver ion antibacterial filter, and dust-free fan
- Stainless steel inner plate is suitable for frequent disinfection and is easy to clean, splicing is smooth
- The DX unit can provide low-humidity air supply and precise heat recovery, thereby guaranteeing the performance of the energy-saving system with temperature and humidity control typically used in hospitals.



Argenzil antibacterial filter + UV germicidal lamp



High efficiency impeller install to Electronically Commutated motor directly



Stainless steel inner plate is suitable for frequent disinfection and is easy to clean, splicing is smooth



TICA DX unit can reach low supply air temperature, which means can provide good dehumidifying performance even without a desiccant dehumidifier

\* Some functions are optional. Consult TICA factory for detailed configuration.



# Industry Solutions

## Biopharmaceutical workshops

### Application features



Comply with GMP whole-process supervision



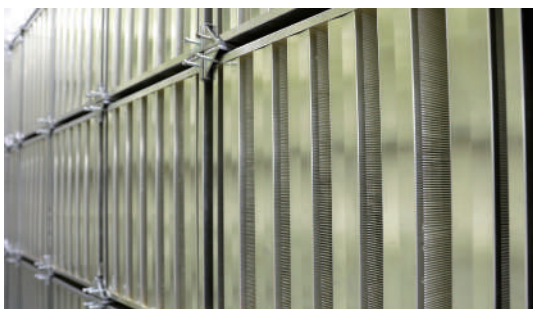
Microbial contamination is strictly controlled in the production process



The airtightness of HEPA meets the GMP cleanliness requirements

### Product features

- With the patented sealed HEPA mounting frame (ZL 2015 2 0338421.5), the air supply cleanliness after HEPA reaches ISO Class 5
- Ozone sterilization is used with a variable air flow fan to achieve disinfection mode switching, meeting GMP/FDA requirements
- 20+ large air-conditioning testing laboratories accredited by CNAS & ILAC MRA;
- Mature FAT testing solutions



Highly-sealed HEPA installation



120,000 m<sup>3</sup>/h large air flow testing



Ozone sterilization



Inverter motor



ILAC MRA certified testing laboratories

\* Some functions are optional. Consult TICA factory for detailed configuration.

# Industry Solutions

## Large air flow MAU for Semiconductor factories

### Application features



APC and AMC pollutants are strictly controlled



The demand for fresh air is complex and changeable



Large air flow and high air pressure fresh air devices are equipped

### Product features

- Primary, medium and high efficiency filters, as well as water spray filter and chemical filter are configured for purification in electronics plants.
- The multi-stage high-efficiency heat exchanger suitable for large load of fresh air can cope with complex and changeable working conditions and meet indoor constant temperature and humidity requirements.
- High-strength MAU box ensures no deformation under large air flow and large static pressure.



Activated carbon filter



Spray humidification



Large-capacity and multi-stage heat exchanger

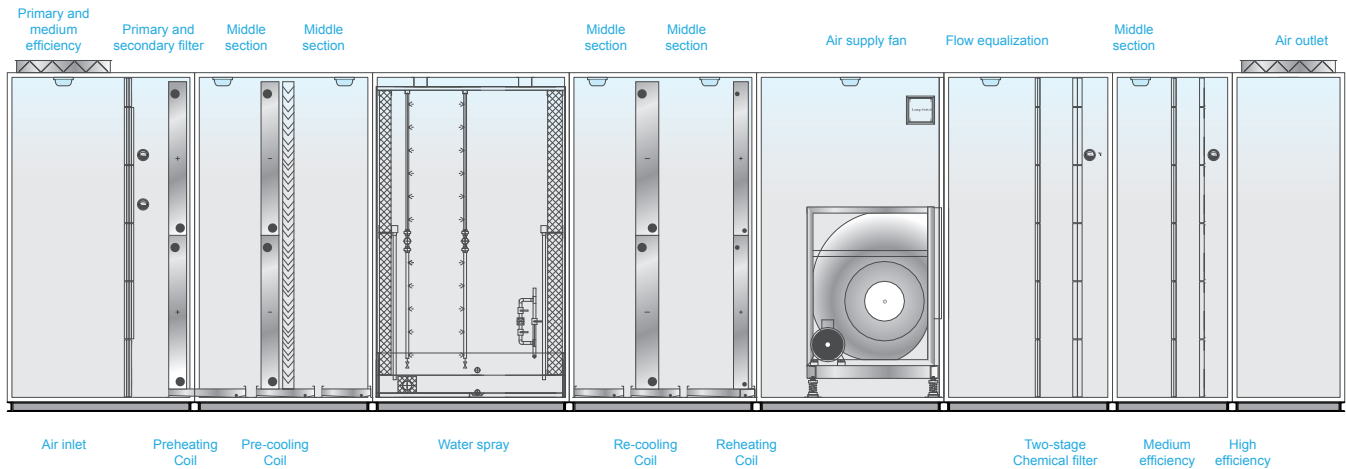


High-strength MAU box

\* Some functions are optional. Consult TICA factory for detailed configuration.

## Arrangement of full fresh air MAU function section in electronics plant

Air inlet + primary and medium efficiency + preheating + middle section + pre-cooling + middle section + water spray + middle section + re-cooling + middle section + reheating + fan + flow equalization + two-stage chemical + middle section + medium efficiency + high efficiency + air outlet



## Main parameter estimation table for typical applications

Air flow (m <sup>3</sup> /h)	ESP (Pa)	Motor power (kW)	Pre-cooling capacity (kW)	Re-cooling capacity (kW)	Preheating capacity (kW)	Reheating capacity (kW)	Unit dimensions (L x W x H) (mm)
40000	800	45	550	340	610	105	12900×3007×2085
45000	800	55	610	380	700	115	12900×2854×2442
50000	800	75	685	425	770	130	12900×3160×2442
55000	800	75	750	467	850	145	13900×2905×2697
60000	800	75	810	500	920	155	14000×3313×2697
70000	800	90	950	590	1080	180	14000×3619×2850
80000	800	90	1090	680	1240	205	14000×3874×2850
100000	800	110	1370	850	1550	260	15200×3772×3717
120000	800	132	1630	1010	1850	310	15200×4486×3717
140000	800	160	1900	1150	2100	360	15400×4690×4074
180000	800	200	2450	1520	2750	450	15400×5098×4686

- Notes:
1. The above is a full fresh air unit for a chip plant. For other solutions, consult TICA factory.
  2. The motor power is the estimated value of the reserved margin. The current motor power is based on the resistance brought by the final-stage H13 high efficiency filter.
  3. The unit size is an estimated value, and the space of the machine room should be no smaller than the required size. For further dimension selection of the unit, consult TICA factory.
  4. The air inlet conditions in cooling season and heating season are 38°C/60% and -6°C/50%, respectively.
  5. The inlet and outlet temperatures of cold water are 14/20°C (pre-cooling) and 7/13°C (re-cooling), respectively, and the inlet and outlet temperatures of hot water are both 38/32°C.
  6. The recommended principle for size selection is that the windward fan speed of the coil does not exceed 2.5m/s.

# TICARE

## Customized service

As a professional clean processing system integrator and service provider, we provide air treatment design and product customization services that fit the users' business format for various extreme industrial environments and comfortable living environments, fully covering common needs. We are committed to providing users with the optimal clean environment solutions.

### Personalized customization and quick model selection

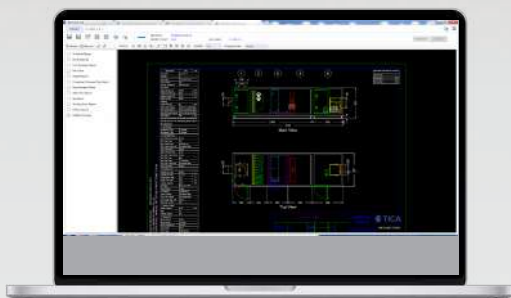
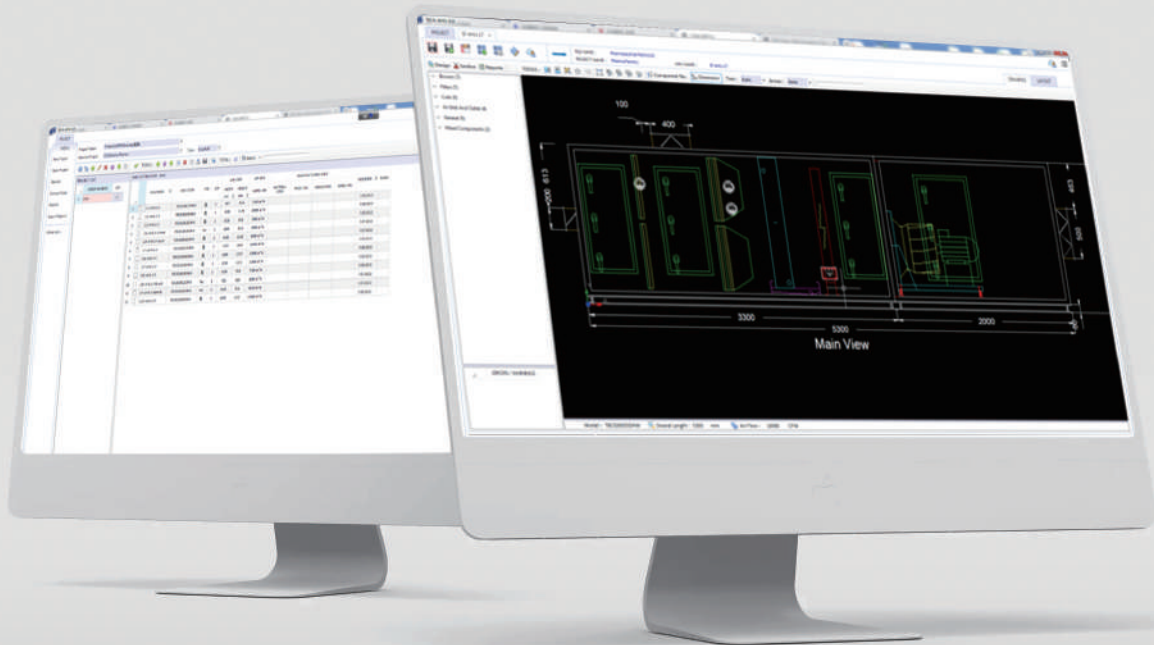
Specialized operating system, automatic association design, quick and accurate model selection, perfect project management, and quick feedback on customer needs.

### Model selection functions

A variety of standardized modules, directly providing models for selection; A variety of function section configurations, meeting requirements for process design; A large-capacity model database, coping with various scenario requirements.

### Professional model selection software

The heat exchanger model selection software passes AHRI certification. The whole model selection software passes. Eurovent certification.



### Output of professional model selection reports

The model selection results can be output through a complete set of reports, including the technical parameter detail list of each function section of the unit, the coil model selection detail list, enthalpy/humidity chart, operating conditions, fan curve, weight report and unit dimension diagram.



## Core Components

Air Pioneer's key components, are all selected from well-known brands, bringing users a reliable and convenient experience.



# Component

# Core Components

## Fan section

Intelligent selection of optimal model, speed, and motor

- The fan impeller and belt pulley are corrected by static and dynamic balance before delivery, and operate stably.
- A damping device is equipped to greatly reduce the operating noise.
- The impeller and frame are made of high-strength alloy steel plate, with high structural strength.
- A variety of inverter fans are available.



Centrifugal fan

- Double inlet forward/backward
- Belt-driven, with good aerodynamic performance
- Variable speed motor is optional



Plug fan

- Direct-drive, easy to clean, small vibration, and low noise
- Variable speed motor is optional



## Coil section

- All coils will undergo a pressure test before delivery to ensure worry-free operation.
- Zigzag-shaped circuit can effectively prevent the problem of freezing cracks due to uncompleted drainage in winter.
- All fins are made of hydrophilic aluminum foil to improve heat exchange efficiency and anti-oxidation effect.
- The drain pan is V-shaped with an inclination angle of over 5° to ensure rapid drainage.
- With a variety of circuit forms and AHRI-certified professional selection software, the water resistance can be flexibly optimized.



Cold/hot water coil

- High-quality copper pipes and hydrophilic aluminum fins
- Adoption of integrated mechanical expansion pipe



Steam coil

- Excellent cavitation resistance and water hammer resistance
- Optional aluminum fins/steel fins



### Filter section

- Micro modular design of imperial units, with full distribution of filters in the unit height direction
- Uniform air flow, reducing the average air speed of the section and improving the filtration efficiency
- Airtight installation and overhaul frame, ensuring low leakage rate and convenient overhaul



**Plate filter**

Filtration efficiency:  
MERV7-MERV9



**Bag filter**

Filtration efficiency:  
MERV7-MERV13



**HEPA filter**

Filtration efficiency:  
E10-E12/H13-H14

### Anti-bacterial filter section

The requirement of healthy ventilation in public places can be met by the optional antibacterial filter section:

- It is recommended to choose a media filter with silver ions to prevent secondary pollution from bacterial reproduction.
- A high-voltage electrostatic sterilization filter is equipped to capture particulate matter and kill microorganisms.
- Photocatalyst degrades toxic and harmful gases in the air, effectively killing a variety of bacteria.



**Anti-bacterial filter**

· Meltblown PP plus chemical ion coating



**Plate type electrostatic**

· Microorganisms are killed through high pressure ionization and adsorption.



# Core Components

## Heat recovery

- Modern air conditioning increasingly uses heat recovery systems.
- It not only directly saves operating costs, but also indirectly plays a role in ecological protection.



Rotary type heat recovery



Heat pipe type heat recovery



## Humidification section

Humidification is an essential function in order to provide healthy air with the right humidity.

The following performance should be considered when choosing a humidifier:

- Saturated efficiency
- Humidification cleanliness
- Control precision
- Absorption distance



Wet film humidification



Dry steam humidification







Reference Projects

A faint, circular image of a camera lens is visible in the background, centered on the page.

# Reference Projects

## Hotel&Commercial Building

The Park Semarang



Holiday Inn Bandung



Plaza Ambarrukmo



AI-Khora



## University

Mangosuthu University of Technology



Durban University of Technology



## Industrial Cooling

Proton Automobile



Sinar Meadow Factory



## Semi-Conductor Factory

T&W Electronics



Longsheng Technology



Apex Circuit (Thailand) Co., Ltd.



Silterra



Jinko SOLAR



Western Digital



Foxconn CTTV



LONGI KUCHING





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Note: Due to constant improvement and innovation of TICA's products, the product models, specifications and parameters contained in this document are subject to change without prior notice.