



TICA Air-cooled DX Air Handling Unit

TICA PRO LLC

CONTENTS

PART 1 Products

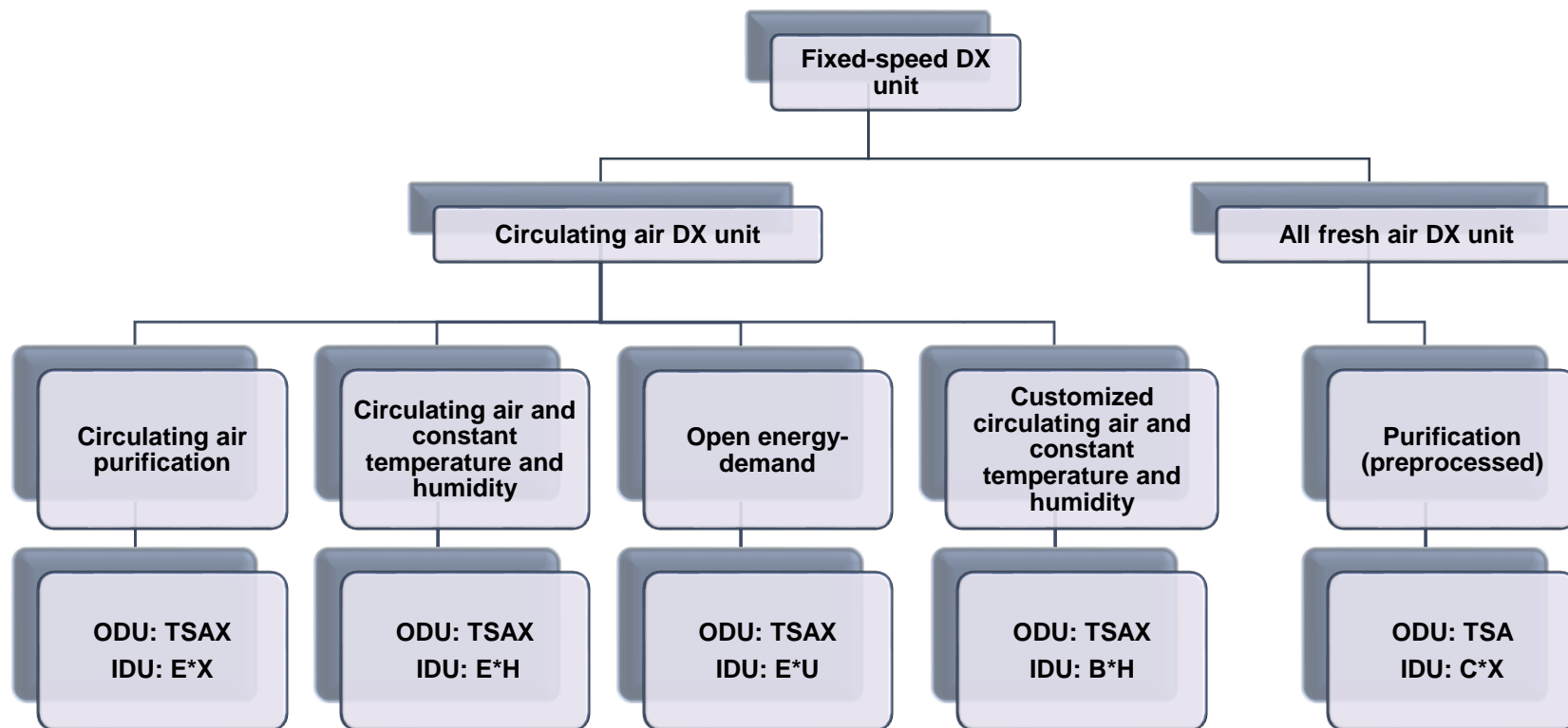
PART 2 Product Overview

PART 3 Product Features

PART 4 Applications

PART **Products**












With the same IDUs and ODUs but different control configurations (E*X indicates basic configuration, E*H indicates advanced configuration, and E*U indicates no control functions)





Customized PLC control
(for Chinese market)

Models of Circulating Air DX Unit (2021)

Horse power	3HP	6HP	5HP	7.5HP	10HP	12.5HP	15HP	20HP	25HP	30HP	40HP	50HP	60HP	75HP	110/125HP
ODU	1 set 	2 sets (dual system) 	1 set 	1 set (dual system) 					2 sets (4-system) 			3 sets (6-system) 			
Refrigerant	R410A		R22	R22	R22/R410A					R22/R410A			R22/R410A		R410A
Cooling and heating type ODU	Heat pump		Cooling-only/heat pump	Cooling-only/heat pump	Cooling-only/heat pump					Cooling-only/heat pump			Cooling-only/heat pump		Heat pump
Constant temperature and humidity (E*H)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Purification (E*X)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Open energy-demand control (E*U)	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Customized models (B*H)	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗

Notes: ● indicates the latest models; ● indicates the obsolete models; ● indicates models available only in the Chinese market;

Models of All Fresh Air DX Unit (2021)

Horse power	5HP	7.5HP	10HP	12.5HP	15HP	20HP	25HP	30HP	40HP	50HP	110HP	125HP
ODU	1 set 	1 set (dual system) 						2 sets (4-system) 			1 set 	
Refrigerant	R22	R22	R22/R410A					R22/R410A			R410A	
Cooling and heating type ODU	Cooling-only/heat pump	Cooling-only/heat pump	Cooling-only/heat pump					Cooling-only/heat pump			Heat pump	
Fresh air pre-handling	√	√	√	√	√	√	√	√	√	√	√	√

Notes: ● indicates the latest models; ● indicates the obsolete models; ● indicates models available only in the Chinese market;

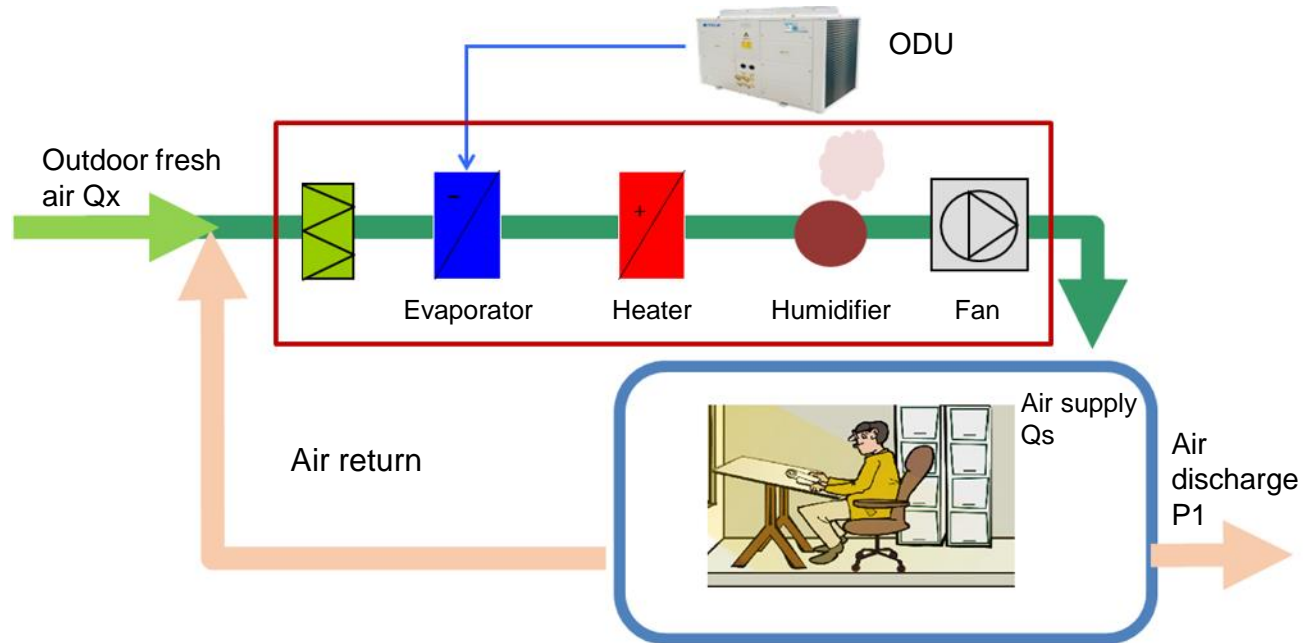
PART **Product Overview**

Constant temperature and humidity units E*H

Control range: temperature 20-26°C, humidity 45%-65%.

Accuracy: temperature $\pm 1^\circ\text{C}$ (heat pump heating $\pm 2^\circ\text{C}$), humidity $\pm 5\%$ (heat pump heating $\pm 10\%$).

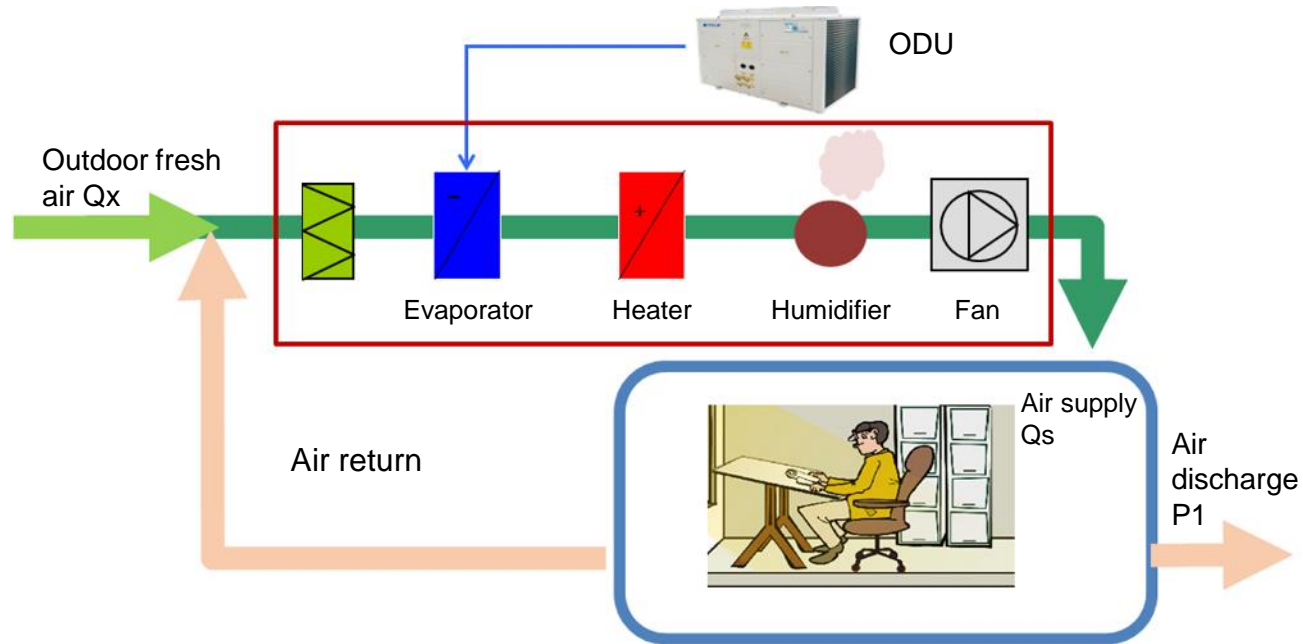
Applicable to places requiring constant temperature and constant humidity like hospitals and pharmaceutical factories.



Energy-saving design:
The humidity control upper limit mode can be enabled when cooling;
Compressors can be enabled preferentially instead of electric heating when heating.

Purifying units E*X

- They have less function modules compared with the standard constant temperature and humidity units and are intended for purifying/comfort scenarios with lower requirements for accuracy or humidity.
- With similar control programs as the constant temperature and humidity units, they could ensure similar control accuracy under the same configurations.



Main Configurations

Heating	Optional or unavailable
Humidification	Optional or unavailable
Sensor	Temperature/temperature and humidity probe
Controller	Wired controller

Open energy-demand units E*U

Some customers who have requirements for non-standard units have maintained long-term cooperative relationships with controller manufacturers, so they don't need the energy-demand control logic for air conditioning units.

IDU control:

Having no temperature and humidity control; electric heater, humidifier, and indoor fan controlled by customers; RS485 Modbus protocol adopted between customer's controller and TICA control cabinet.

Comes with fan air loss protection, fire valve protection, fan overload, anti-freezing protection in cooling mode, and sensor fault alarm. Any other extra protection functions are optional for customers. Has no touch screen and wired controller; and optional temperature and humidity sensor.

ODU control:

Customers can set on/off status or number of compressors enabled via RS485 communication protocol. ODU comes with program control like control over outdoor fan, EXV, defrosting and protection.

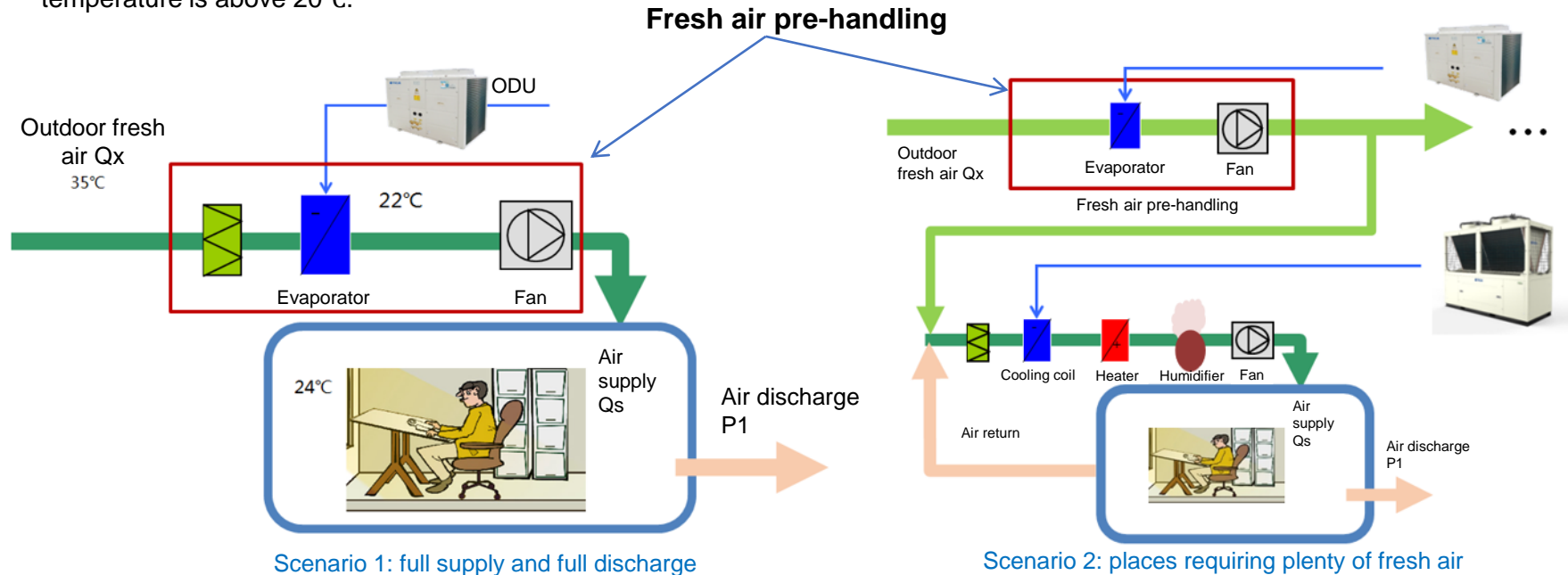


Fresh air pre-handling unit

Separate control for temperature and humidity; separate processing for fresh air; only pre-treats fresh air and not responsible for indoor heat and humidity load.

Intended for places with poisonous & harmful air, lower ventilation and no requirements for indoor temperature and humidity.

Control mode: heat the room when temperature is below 15°C, ventilate when temperature is 15-20°C and cool when temperature is above 20°C.



PART **Product Features**

High-quality components and reliable operation



Compressors of famous brands undergo long-term running test under various harsh operating conditions exceeding national standards to ensure unit stability and reliability



Electronic expansion valve implements throttling to ensure optimal operation of the unit under various harsh operating conditions



The newly optimized control logic ensures stable and reliable operation and excellent performance of the unit



Long piping design adopted to meet the air conditioning design requirements of buildings with a longer distance between the IDU and ODU



The newly designed electric control cabinet layout and interactive interface of touch screen simplify operations



7"/10" capacitive touch screen (optional) to achieve excellent operability

- Core configuration for DX units - refrigerant

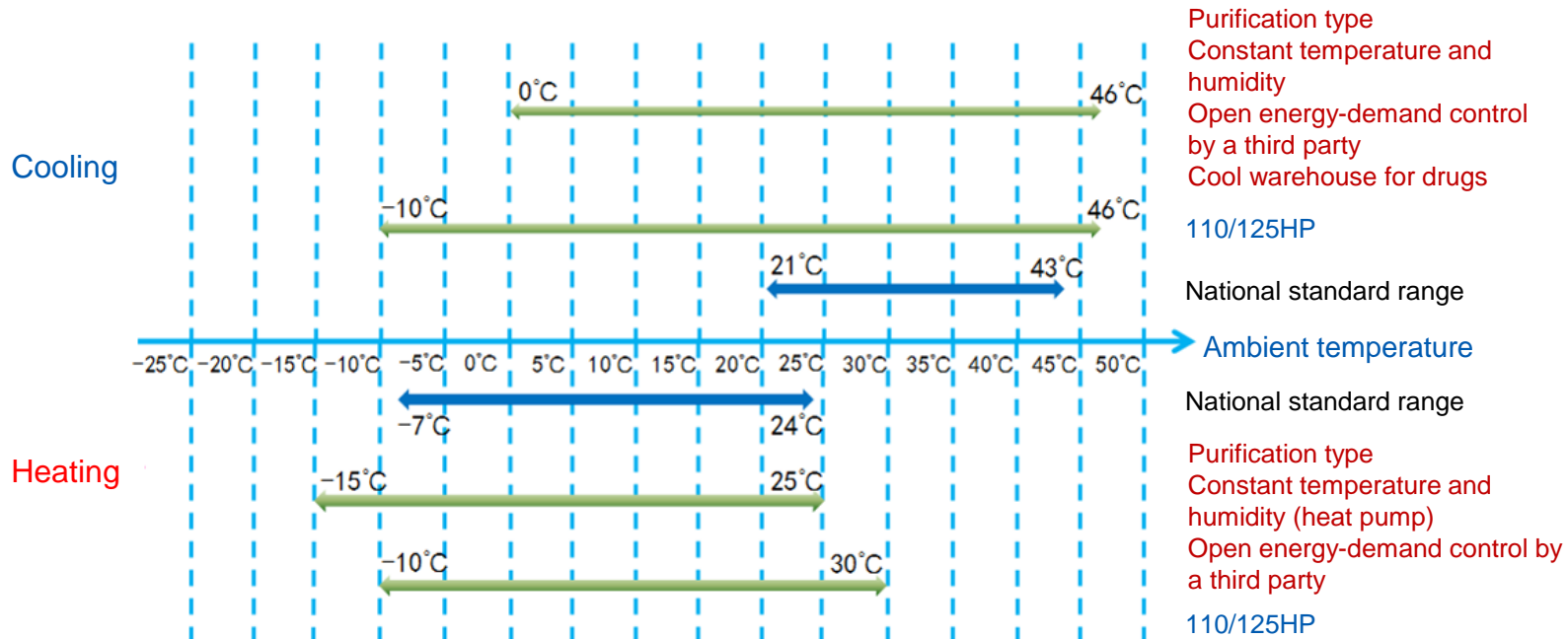
The DX units use eco-friendly **R410A** refrigerant

R410A is non-toxic, stable and does not harm the ozone layer (ODP=0).

R410A system operates under high pressure and therefore is more suitable for heating at low temperatures (R134a has negative pressure problem).

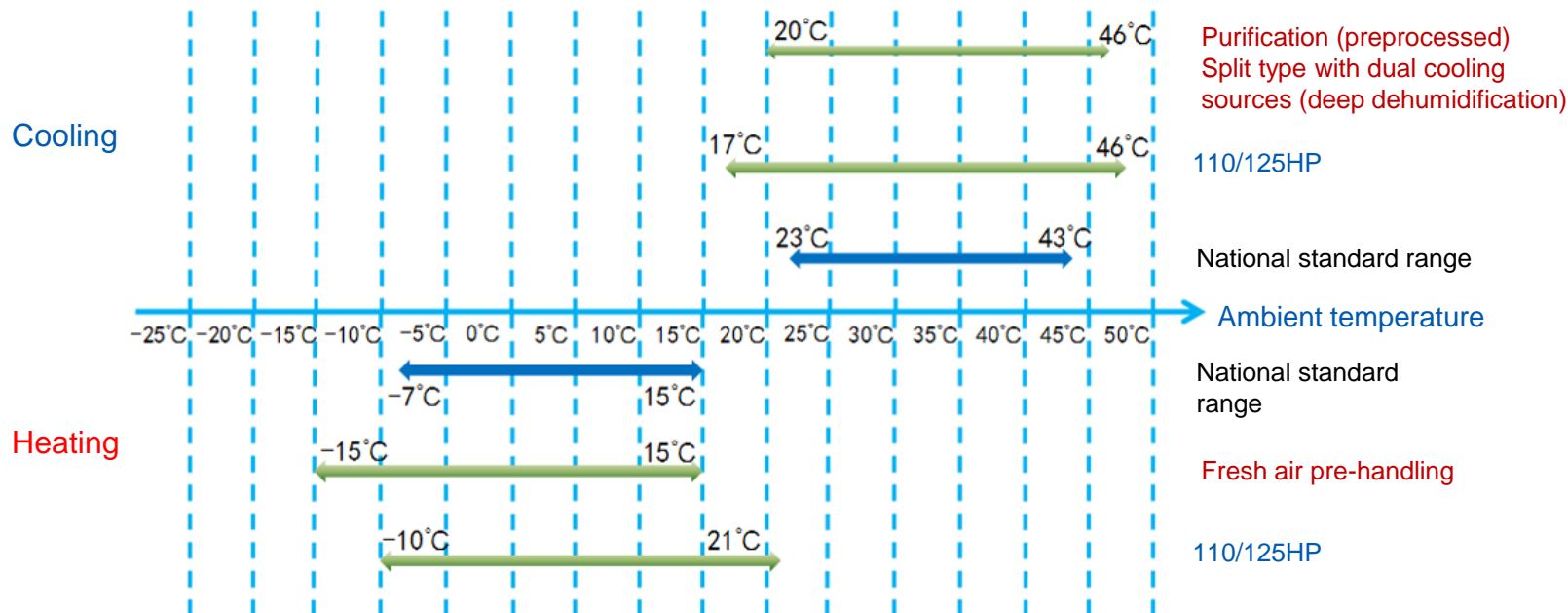


Wide operating range - circulating air units



Competitor	Cooling	Heating
SL	18°C~43°C	-7°C~21°C

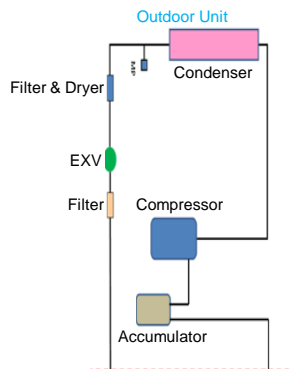
Wide operating range - all fresh air units



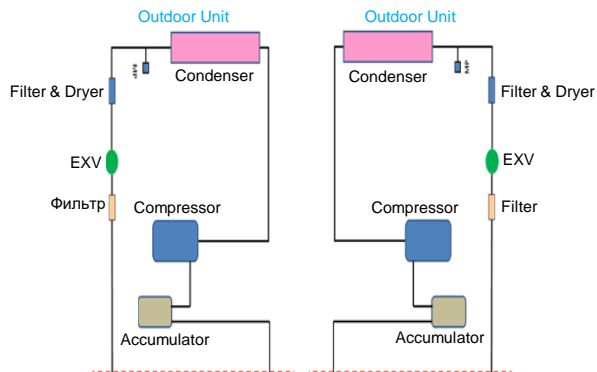
Competitor	Cooling	Heating
SL	23°C~43°C	-7°C~15°C



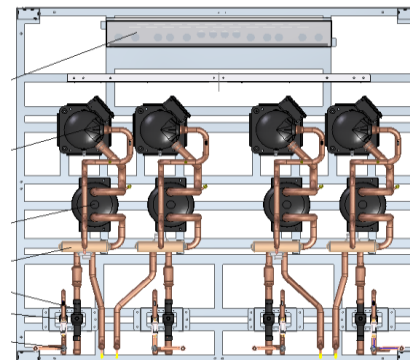
Single system



Dual system



110/125HP quadruple system



Filters (primary and medium)

Fan section

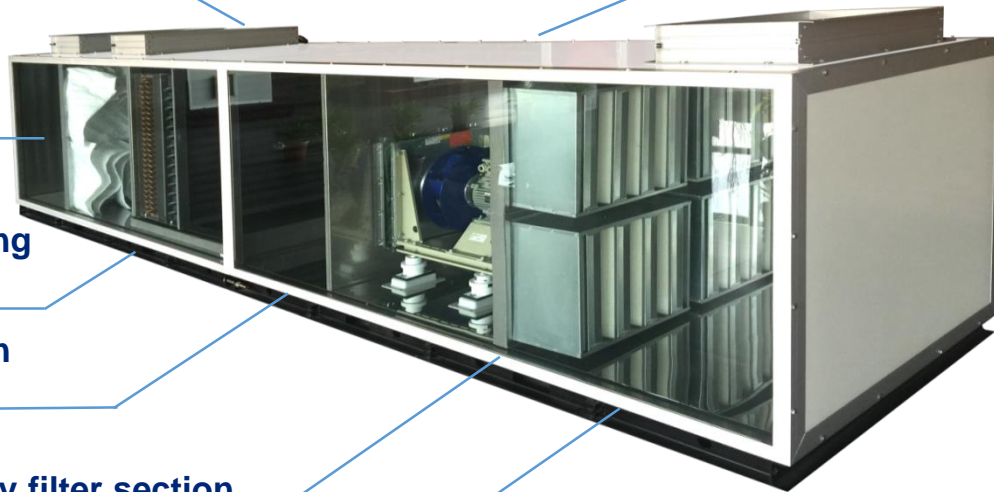
Air inlet section

Cooling coil section (cooling and heating)

Humidification section

High efficiency filter section

Air outlet section



Common function sections:

Mixing section

Filter section

Cooling coil section

Heating section

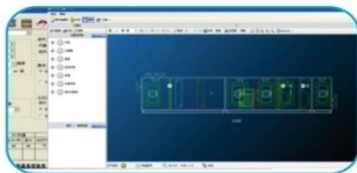
Humidification section

Silencing section

Heat recovery section

Air outlet section

...



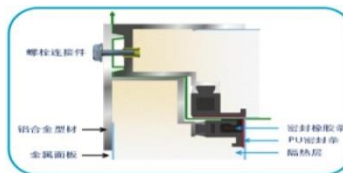
**Professional model
selection software**



**High quality, efficient
heat exchanger**



**Access door designed
using aviation technologies**



**Patented labyrinth
structure**



**Professional, energy
conserving fan technology**

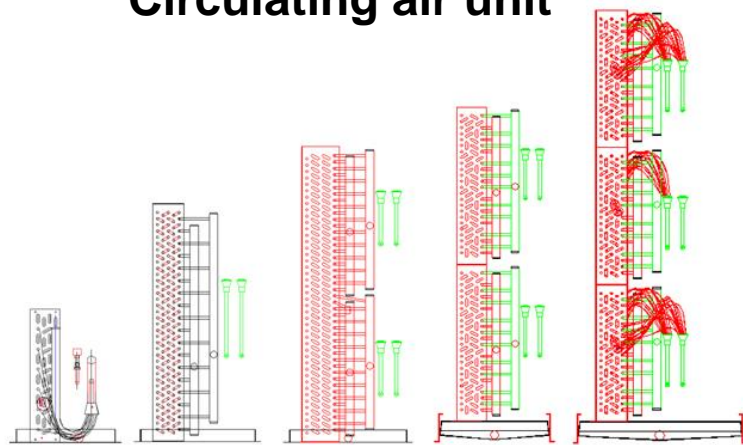


**China's only
AHRI&EUROVENT
certified enterprise**



Patented filter frame

Circulating air unit



5HP (with
throttle
apparatus)

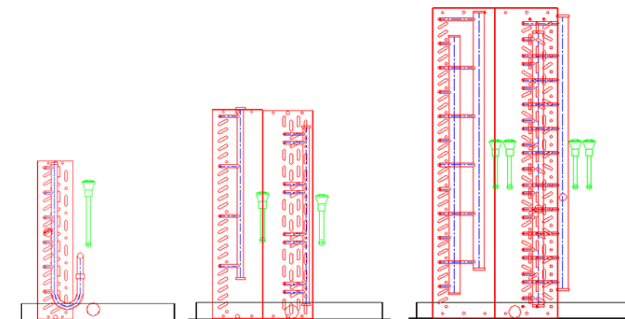
6-25HP

30HP

40-50HP

60-75HP

All fresh air unit



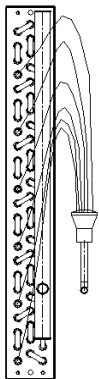
5HP

7.5-25HP

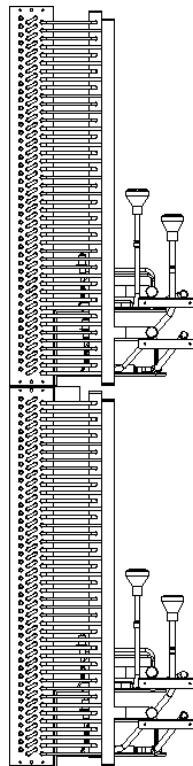
30-50HP

Single coil and multi-system design to ensure accurate temperature control

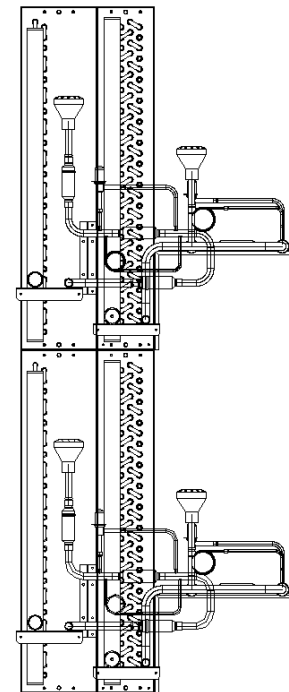
Difference between up and down layout and crossed layout



3HP circulating air



Circulating air and large DX unit
110/125HP (with throttle apparatus)

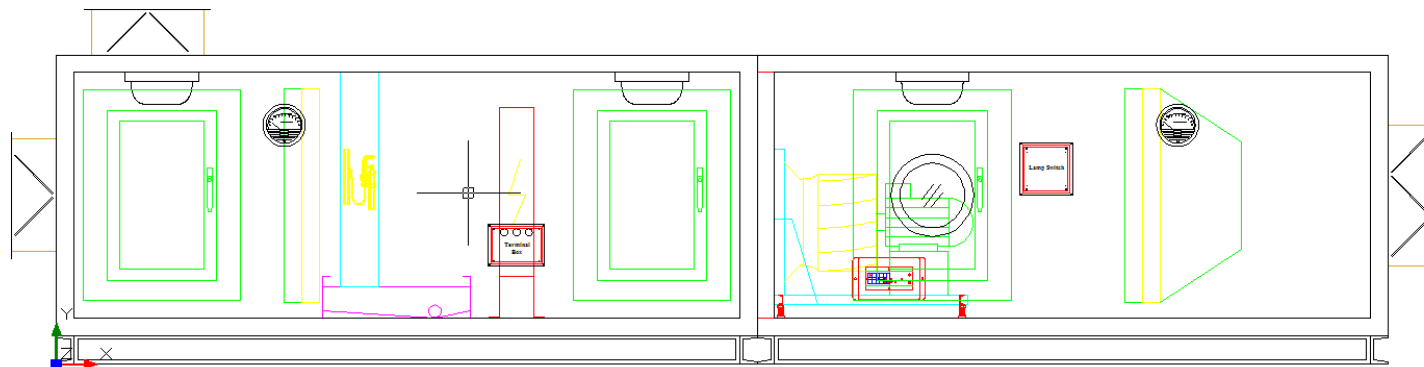


All fresh air and large DX unit
110/125HP (with throttle apparatus)

- IDU model selection for DX units - air flow selection

Fixed speed DX units (1): 70-110%* of catalog air flow

Fixed speed DX units (2): 110-120%* of catalog air flow (extra 10% for bypass)

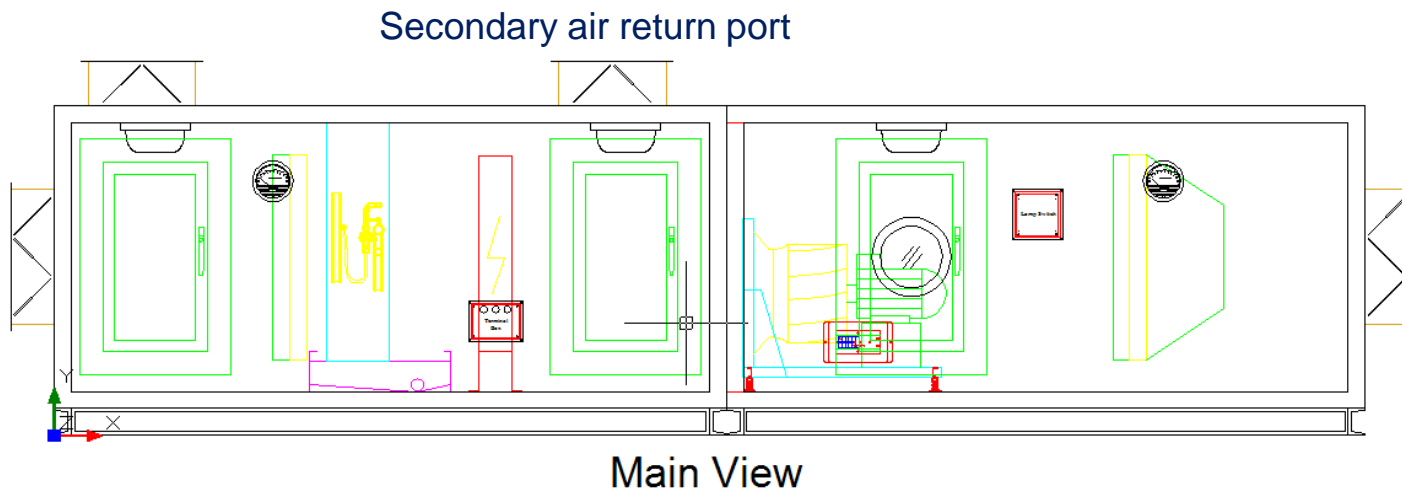


Main View

Note: When air flow is below 70%, coils have low air outlet temperature, which may easily cause freezing; when air flow is above 110%, it may lead to water splashing.

- IDU model selection for DX units - air flow selection

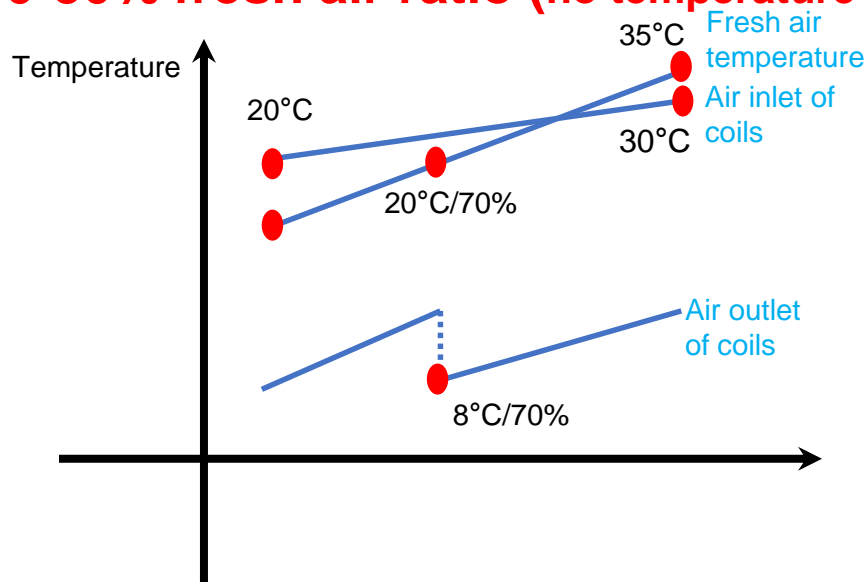
Common DX units (3): > 120%* of sample air flow (extra 20% for secondary air return) Note: Only applicable to air return units; secondary air return is not applicable to fresh air units



- IDU model selection for DX units - fresh air ratio

Common DX fresh air units: standard 100% fresh air

Common DX constant temperature and humidity units: standard 0-30% fresh air ratio (no temperature and humidity requirements < 40%)



The higher the fresh air ratio, the greater the fluctuation of air inlet temperature would be. As a result, the low temperature coil becomes more susceptible to freezing, and the high temperature coil is more likely to trigger high pressure alarm, resulting in lower control accuracy;

Allowed **air inlet temperature of coils is 20-30°C**;

The air outlet temperature gets lower as the air flow decreases, **so coils cannot operate at variable air flow.**

Four standard modes are available: Cooling, Heating, Auto, and Ventilation

Control functions

Ensures constant temperature and humidity control with temperature accuracy at $\pm 1^{\circ}\text{C}$ and relative humidity accuracy at $\pm 5\%$ (electric heater and humidifier required) and offers four modes: Cooling, Heating, Auto and Ventilation. The Auto mode allows the unit to run either in cooling or heating mode based on preset values, and the Ventilation mode only enables fan to ventilate the room. Energy-saving mode available: When a room does not require control over constant temperature and humidity, the Energy-saving mode can be enabled when cooling so that either control over humidity or control over temperature can be realized.

Optional functions

Ultraviolet disinfection, ozone sterilization, and fresh air preheating.

Other control functions:

- Power-off memory
- Automatic startup after power restoration
- Timed power-on/off
- Remote power-on/off
- Fire control linkage
- Air valve linkage
- Constant air supply

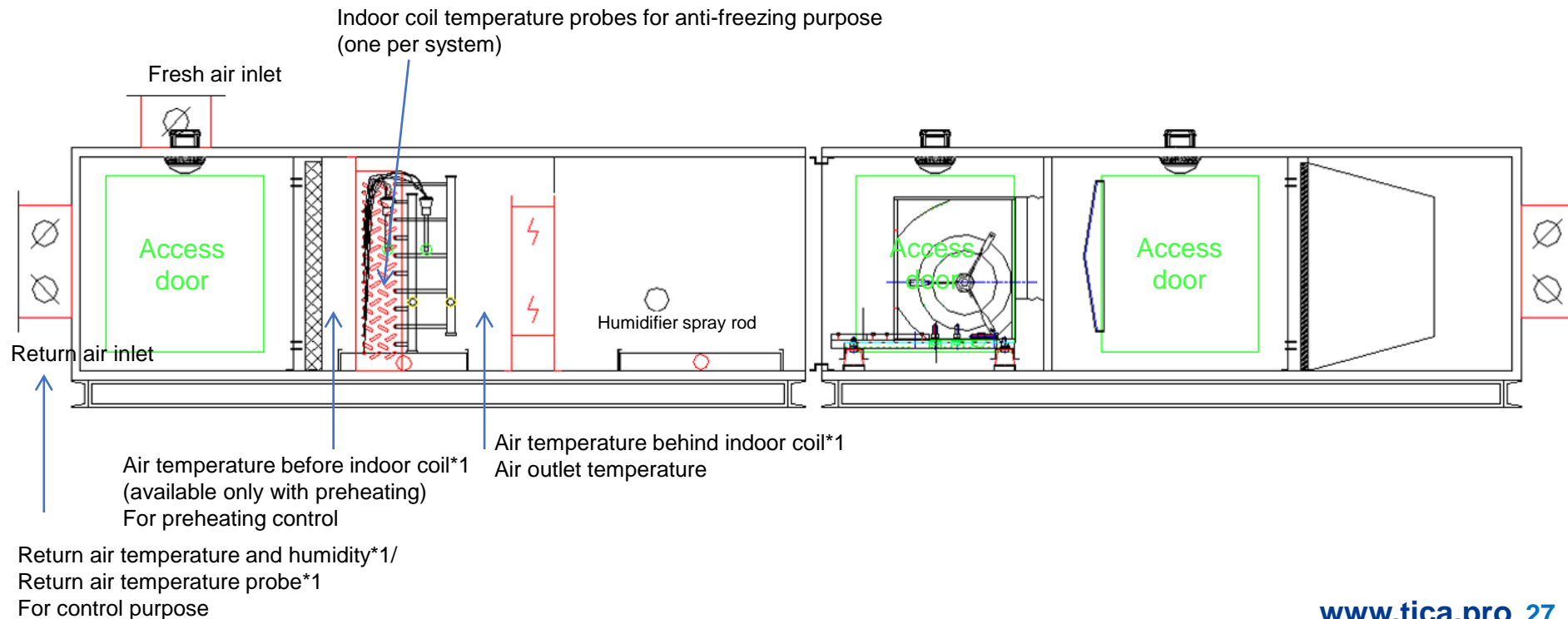
Protection control:

- Air loss protection
- ODU overload, high pressure, low pressure and discharge protection
- Overload protection of fan, electric heater and humidifier
- Emergency stop button
- Anti-freezing protection of IDU heat exchanger

Control in cooling mode:

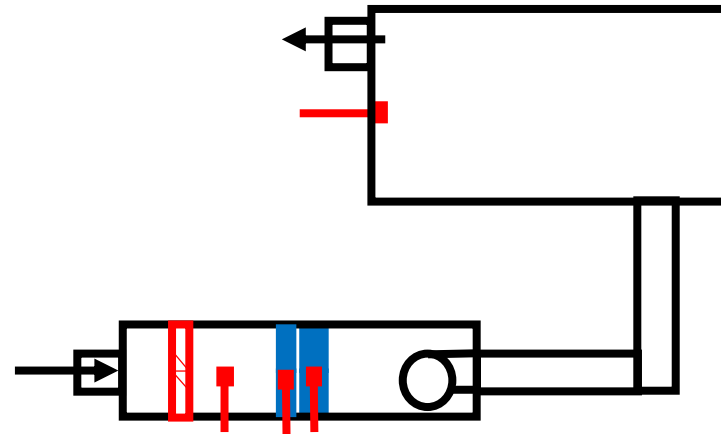
- Separate control of temperature
- **Control on maximum humidity** (humidifier disabled)
- Constant temperature and humidity

Constant temperature and humidity E series: humidity priority control, compressor priority; temperature control by electric heater; humidifier enabled in winter;



Preheating control: Preheating is only required when air inlet temperature is below 0°C.

- Preheating control of heat pump: **The air can only be heated to 8°C by using an electric heater. If the air needs to be heated to an even higher temperature, coils can be used.**
- Preheating control for cooling only mode: Increase load when the fresh air temperature is below 15°C and indoor temperature T minus set temperature T is below 2°C; reduce load when the fresh air temperature is above 16°C or indoor temperature T minus set temperature T is above 0°C.
- Third party control: No third party control; only standard control comes with the units.



Model			EHH/EVH/ECH	EHX/EXV/ECX	EHU/EVU/ECU	CHX/CVX/CCX
Product features			Standard constant temperature and humidity	Purification type	Open energy-demand control	Fresh air pre-handling (≤50HP)
Control object			Air return	Air return	Air return	Fresh air
Maximum fresh air ratio optional			30%	30%	30%	100%
Temperature and humidity control	Temperature	Scope	20℃~26℃	20℃~26℃	/	/
		Precision	Cooling-only: ±1℃; heat pump: ±2℃	±2℃	/	/
	Humidity	Scope	45% to 65%	45% to 65%	/	/
		Precision	Cooling-only: ±5%; heat pump: ±10%	±10%	/	/
Operating mode			Auto/Cooling/Heating/Ventilation	Auto/Cooling/Heating/Ventilation	/	Cooling/Heating/Ventilation
Man-machine interface	7" screen/wired controller	Installed on control cabinet door/external	7" capacitive screen on cabinet door	External wired controller	N/A	External wired controller
	Switch between Chinese and English for touch screen display		Yes	N/A	N/A	N/A
Control cabinet	Main controller type		Single-chip microcomputer	Single-chip microcomputer	Single-chip microcomputer	Single-chip microcomputer
	Cabinet installation method		Shipped separately and installed by a third party	Shipped separately and installed by a third party	Installed with the unit/bulk items shipped separately	Installed with the unit, bulk items shipped separately
	Outdoor control cabinet		Optional	Optional	Optional	Optional
	Comes with ODU power air switch		Optional	Optional	N/A	N/A
Fan	Fixed speed		Comes with "direct start" or "star-triangle start"	Comes with "direct start" or "star-triangle start"	N/A	Comes with "direct start"
	Comes with a variable-frequency startup cabinet		Optional	Optional	N/A	Optional
Discharge fan	Fixed-speed fan	Passive interlocking signal	Standard	Standard	N/A	Can be turned on or off with a fan
		Active control signal	N/A	N/A	N/A	N/A
	Comes with a variable-frequency startup cabinet		Optional	Optional	N/A	N/A
Air valve	Fresh air valve	Switching value	Can be turned on or off with a fan	Can be turned on or off with a fan	N/A	Can be turned on or off with a fan
		Analog	N/A	N/A	N/A	N/A
	Return air valve	Switching value	Can be turned on or off with a fan	Can be turned on or off with a fan	N/A	Can be turned on or off with a fan
		Analog	N/A	N/A	N/A	N/A
	Exhaust valve	Switching value	Can be turned on or off with a fan	Can be turned on or off with a fan	N/A	Can be turned on or off with a fan
		Analog	N/A	N/A	N/A	N/A
	Air supply valve	Switching value	Can be turned on or off with a fan	Can be turned on or off with a fan	N/A	Can be turned on or off with a fan
		Analog	N/A	N/A	N/A	N/A

Model			EHH/EVH/ECH	EHX/EVX/ECX	EHU/EVU/ECU	CHX/CVX/CCX
Product features			Standard constant temperature and humidity	Purification type	Open energy-demand control	Fresh air pre-handling (≤50HP)
With preheating			Optional	N/A	N/A	Optional
Reheating	PTC electric heater	1:2:4	Standard	Standard	N/A	N/A
		1:1:1:1	N/A	N/A	N/A	N/A
	Steam/hot water		N/A	N/A	N/A	N/A
Humidification	Humidifier type	Electrode/electric heating	Standard	Standard	N/A	N/A
		Other forms	N/A	N/A	N/A	N/A
	Humidifier signal	Analog	Standard	Standard	N/A	N/A
		Switching value	N/A	N/A	N/A	N/A
Ultraviolet disinfecting light control			Optional	N/A	N/A	N/A
Ozone sterilization control			Optional	N/A	N/A	N/A
Monitoring dry contact		Operating status	Optional	Optional	N/A	N/A
		Fault state	Optional	Optional	N/A	N/A
Dry contact of interlocking signal	Passive fire valve interlocking		Standard	Standard	N/A	Standard
	Passive firefighting monitoring interlocking		Standard	Standard	N/A	Standard
	Passive rotary heat recovery interlocking		N/A	N/A	N/A	N/A
	Passive rotary dehumidifier interlocking		N/A	N/A	N/A	N/A
	Electrostatic precipitator		N/A	N/A	N/A	N/A
			N/A	N/A	N/A	N/A
Mobile APP + cloud data			Optional	Optional	N/A	N/A
Timed on/off			Standard	Standard	N/A	Standard
RS485 centralized control interface			Standard	Standard	Standard	Standard
Dry contact remote start/stop			Standard	Standard	Standard	Standard
Intelligence panel		Communication	N/A	N/A	N/A	N/A
		Hard-wired	N/A	N/A	N/A	N/A
Protection functions	Wind break protection (including the differential pressure switch)		Standard	Standard	Standard	Configured when an electric heater is available
	Over-temperature protection of electric heater		Standard	Standard	N/A	Configured when an electric heater is available
	Primary/medium/high efficiency filter alarm (excluding the differential pressure switch)		Standard	Standard	N/A	N/A
	Antifreeze switch of the hot water coil		N/A	N/A	N/A	N/A
	Overheat protection of steam heating		N/A	N/A	N/A	N/A
	Emergency stop button		Cabinet door + IDU cabinet	Cabinet door + IDU cabinet	N/A	N/A

Product Features | Man-machine interface

7" capacitive touch screen: exquisite, versatile and easy to operate
Screens can be installed separately; two screens allowed for one unit;
and one-tap switch between Chinese and English

Provides a login to prevent unauthorized access



120Hz LCD controller
Displaying texts and pictures
RS485 communication



Circulating air units



All fresh air units

Simple and versatile control

Clear and simple layout with operating indicators and emergency stop button on the front surface;
Comes with IDU fan motor and electric heater air switch to facilitate maintenance

A wide range of functions

Multiple contacts: discharge fan, exhaust valve, fresh air valve, fire valve, fire protection, RS485 monitoring, and dry contact monitoring
Various protections: emergency stop, air loss protection, alarm when filter is dirty or blocked, high/low pressure alarm, and anti-freezing protection



7" touch screen wired controller

24-bit true color LCD monitor
Fast and smooth A8 processor
IPS full view HD LCD
Highly sensitive and good transmittance
10 M/100 M adaptive Ethernet ports
USB Device 2.0 port

Enthalpy control

Comes with humidity sensor and adopts enthalpy-based control during refrigeration, thus expanding the range of air outlet temperatures and ensuring reliable operation



PART Applications

The largest supplier of integrated clean room equipment for operating room in China

Serving **over 4000** Grade-A Class 2 and Class 3 hospitals



Peking Union Medical
College Hospital

Shanghai Children's
Hospital

General Hospital of
Beijing Military Region

Lanzhou Military
General Hospital

Beijing Tongren
Hospital

Shanghai Ruijin
Hospital

Navy General
Hospital

Air Force General
Hospital

Shanghai Huashan
Hospital

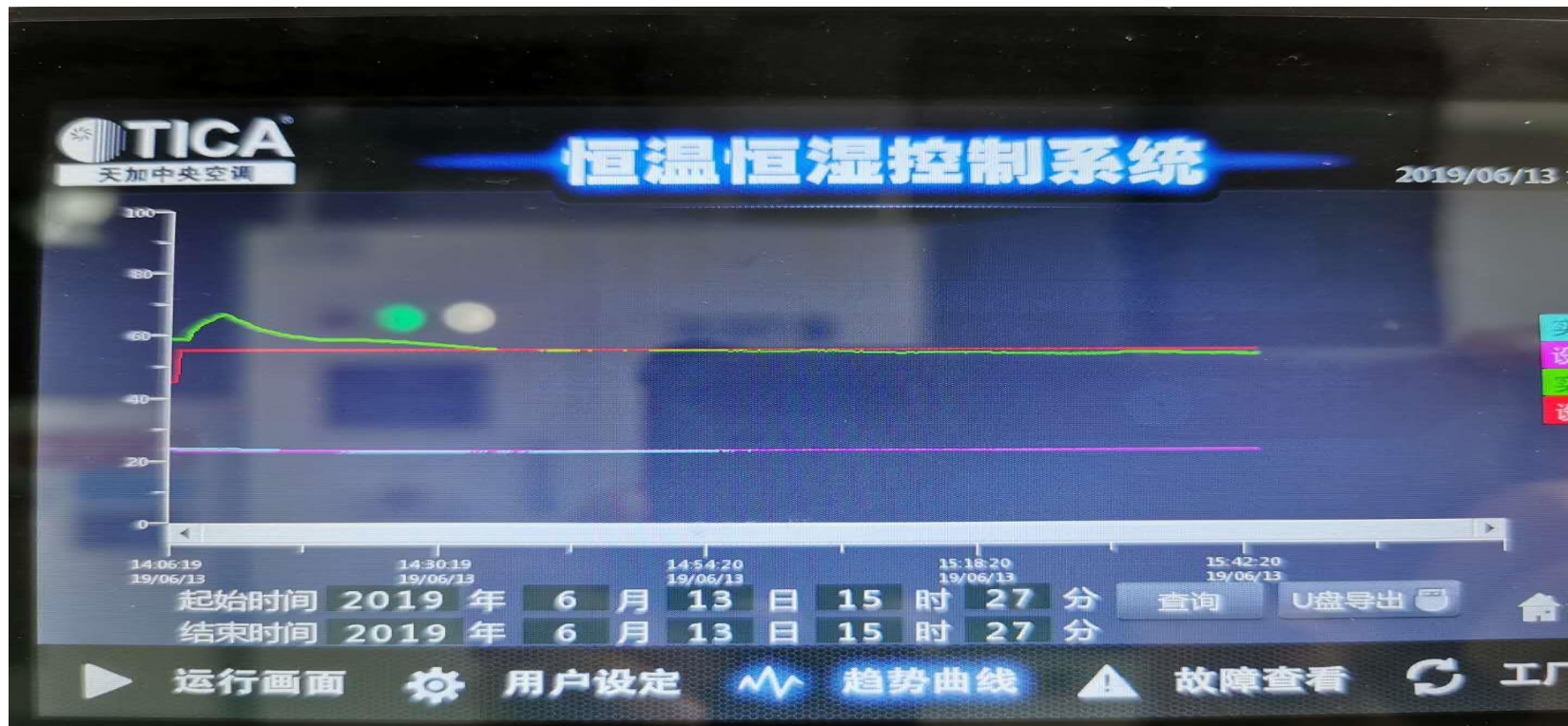
Shanghai Changhai
Hospital

International Peace
Maternity and Child
Health Hospital

Jiangsu Province
Hospital

Project: Changzhou Zhongyi Medical Equipment

Latest control accuracy: temperature and humidity accuracy at $\pm 1/\pm 5\%$.





We strive for excellence!

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