AIRSYS

FREECOOL

Intelligent Control Free Cooling Box

Air Volume:1000~3450m³/h

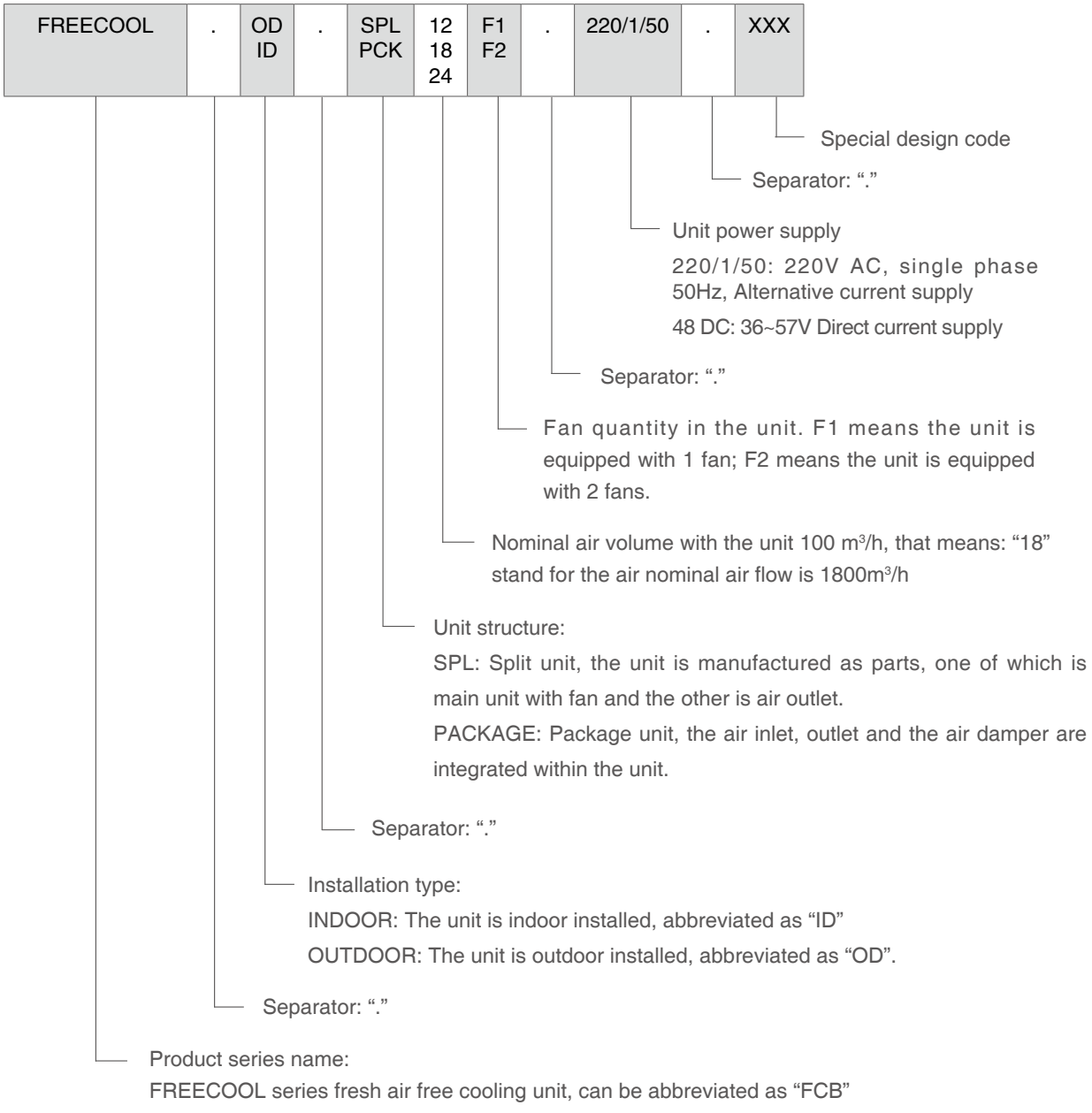
FREECOOL intelligent ventilation unit is applied in shelters and small data center. The unit introduces outdoor fresh air with lower temperature to cool equipment room. By using the FREECOOL unit, the running hours of other air conditioning units can be highly reduced, achieving power energy saving around 30~90%.The FREECOOL unit using EC fans can adjust the air volume automatically according to the temperature difference with the lowest power consumption.

FREECOOL unit can work in cooperate with existing air conditioner units, which achieves when the unit supplies full cooling capacity, the existing air conditioners would completely stop.

The FREECOOL unit can be maximally connected to 2 air conditioner units.

The unit is available in various installation positions: outdoor and indoor, packaged and split, and different power supply: 220VAC, 48VDC, offering more options for application environment.

Unit identification



Working range

Working range of power supply:
35VDC~57VDC(Direct current units)
220V±15%(Alternate current units)
Working Environment
Temperature: -30℃~55℃
Humidity: 5~95%
Storage Environment
Temperature: -40℃~70℃
Humidity: 5~95%

Applications

Various telecommunication base station
Advanced technology electronic devices switching room
Power distribution station
Industrial process control center

Product configuration

Standard components

Cabinet is made of folded steel plate painted with grey powder of epoxy resin.

Backward curved, EC centrifugal fan directly coupled with 48V DC motor. (Only available for FREECOOL.DC units)

Backward curved,centrifugal fan directly coupled with 220V AC motor. (Only available for FREECOOL.AC units)

G4 washablemain air filter

G2 nylon pre-filter

Control box, includes: contactor, relay and circuit breaker etc.

Gravitational Pressure Relief Valve (air discharge)(Only available for SPLIT units)

Electric motorized air damper with actuator (Only available for PACKAGE units).

Rain hood at air inlet (Only for indoor installed units)

Rain hood at air outlet (Only for SPLIT type units)

Micro control system, include:
- Micro-processor
- Room temperature sensor
- Outdoor temperature sensor

Optional components

G4 disposable filters
Differential pressure switch for filter clogged.
Electric heater (Only available for packaged units with single fan)
Supply air temperature
Electric motorized air discharge valve
Inverter for 24V to 48V
RS232 communication interface card
RS485 communication interface card
PCOWEB internet communication card
Clock card
Contactor for existing air conditioners (Maximum for 2 existing air conditioners)
Humidity sensor

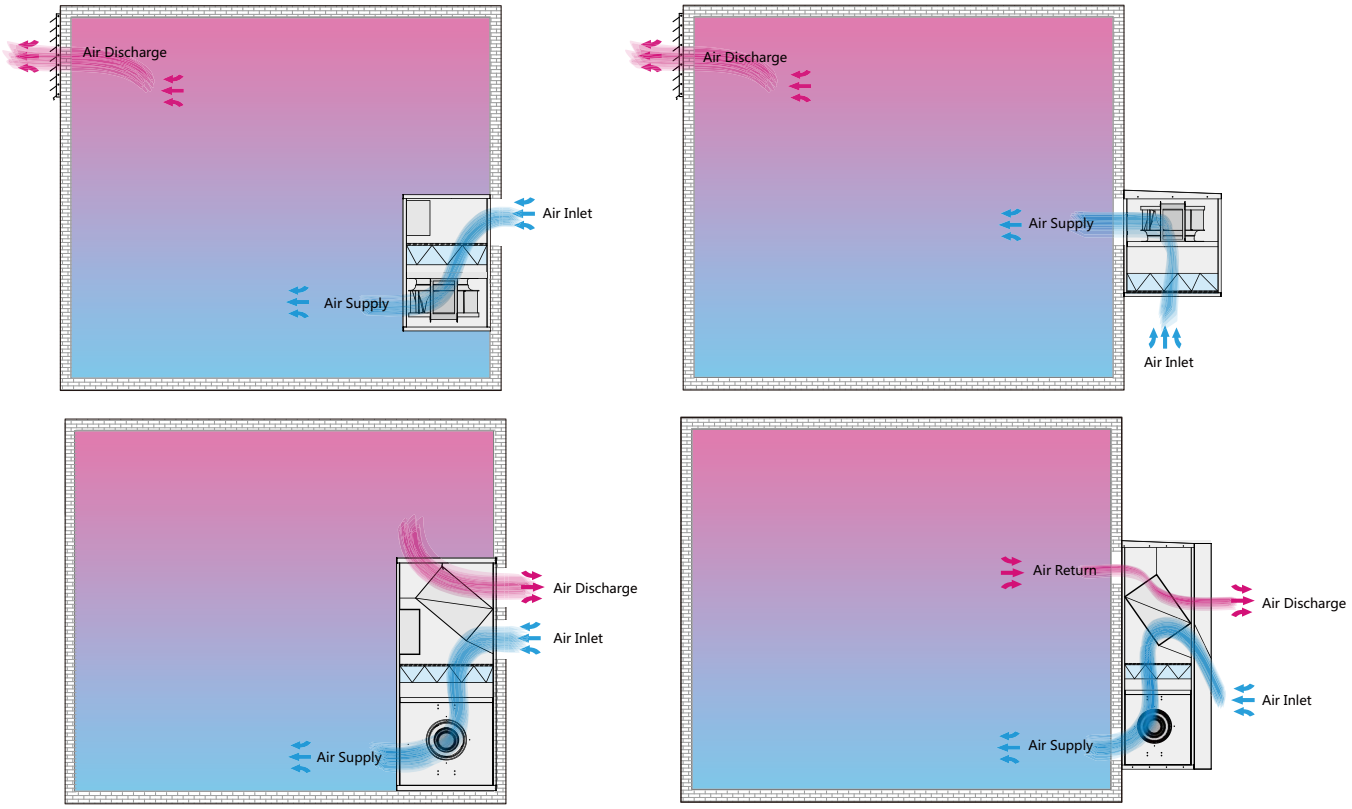
Operation principle

When FCB is applied in shelters, FCB will be the main cooling provider which will control air conditioners to work in cooperate, supplying required cooling capacity.

When the outdoor temperature is lower than room temperature, FCB turns on to bring fresh air outdoor to cool the room. When FCB cannot provide enough cooling capacity, FCB will turn on the air conditioner to supply cooling in assist.

When air conditioner fails and the room temperature is higher than emergency setting temperature, FCB will switch on in emergency mode.

Below drawings show the air flow path of both package type and split type FCB.



Product highlights

High energy efficiency

Using the FREECOOL unit, the running hours of other air conditioning units can be highly reduced.

Good structure design andeasy maintenance

The main components such as: fan, motor, damper, controller and other related components can be accessed and maintained in front of the unit.

Strong structure

The unit passed a transportation test to confirm the structure is strong enough to be able to transport on low grade ways.

Corrosion-proof

The unit framework is provided with corrosion protection treatment.The treatment is sufficient to provide protection for 15 years life cycle for inland installation.

If necessary, the treatment for sea air environment can be supplied as option.

Smaller dimensions

The unit has a smaller dimension because of compact optimized structure design. Its volume is the smallest among the products with similar performance.

Flexible installation

There are 4 types of installation structures for this series product, which includes: indoor installed packaged type, indoor installed split type, outdoor installed packaged type, and outdoor installed split type, which can meet all the installation demands of the most application.

EC fan (Optional)

Fan is a core component in the unit. FREECOOL.DC unit is equipped with EC centrifugal fan with the following features:

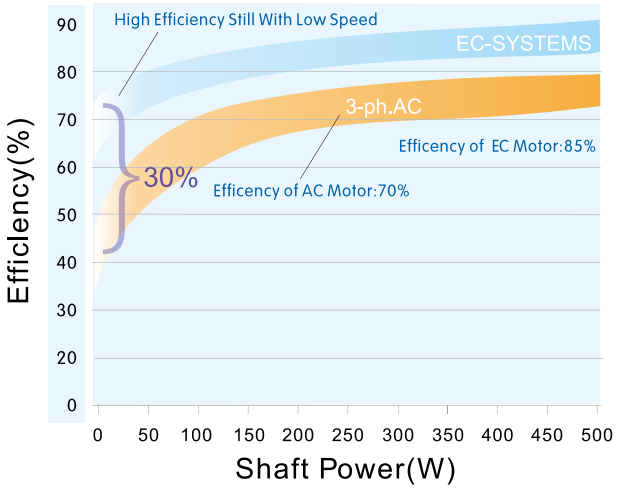
High efficiency of motor

Fan rotation speed is adjustable; the energy consumption at low rotation speed is much lower than the high speed.

Emergency free cooling is available when the AC power fails.

Comparing with axial fan, it would not lose much air volume due to pressure drop.

EC FAN



Intelligent Control

FREECOOL unit is controlled by microprocessor. All the components in the unit work fully automatically, realizing maximum energy saving without manual operation.

All protections and alarmsare automatically raised.

Random restart when power recovered

After a power failure, when the power is recovered, the unit will restarts automatically with a random time delay between 1 to 60 seconds to avoid many equipment started at the same time.

Control to the other air conditioner

The FREECOOL unit is able to control other air conditioner.

When the FREECOOL unit can fully meet the cooling demand of base station, the controller can send a signal to stop the other air conditioner in the base station

Completely auto protection

The controller monitors the running status of all the components and will stop the running of relative component andraise an alarm if any failure.

Emergency free cooling

When AC power fails, the unit can keep working as emergency free cooling by 48VDC supplied by battery in shelters(Only available for the FREECOOL.DC units)

Data log

The controller has a bigger memory to log the running data of a year. All these data can also be sent to the remote control and monitoring system so that the customers cananalyze the working performance and energy saving amount accordingly.

Remote control and monitoring (Optional)

The unit can be installed with a RS232 or RS485 communication card to realize remote control and monitoring by the BMS system with open communication protocol.

PCOWEBinternet communication (Optional)

The unit can be equipped with a PCOWEB internet communication card with TCP/IP protocol and Ethernet work to realized remote control and monitoring. Each computer can be connected to the web server by Ethernet network and understand the working status and control the unit in time everywhere.

Humidity control (Optional)

Humidity sensor (optional) can prevent fromintroducing high humidity inside. With humidity sensor, free cooling unit will turn off when the humidity of outdoor air is higher than humidity limitation to avoid the BTS equipment working at high humidity air environment, which may cause failures and damages of electronic devices.

Control functions

Parameters display

Current control temperature setting
Outside air humidity
Outside Air Temperature
Supply Air Temperature
Damper Position
Software Version

Working status display

Main Fan Speed
Main Fan Hours Run
Heater working status (Option)
Heater working hours (Option)
Heater startup times (Option)

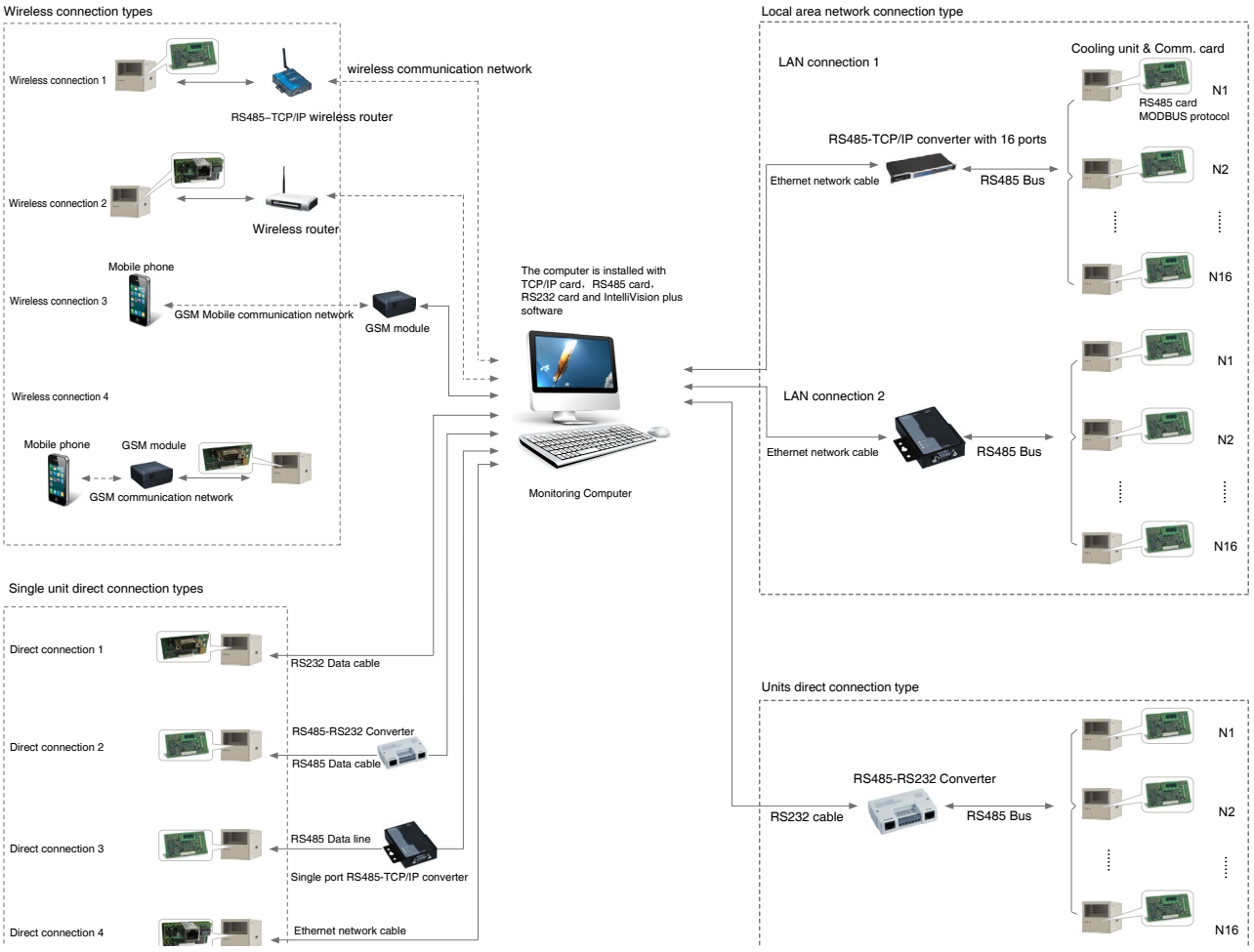
Alarm display

Controller fail alarm
Supply fan failure
Filter clogged alarm
Low temperature alarm
High temperature alarm
Fire/smoke alarm
Temperature sensor failure

Remote control and monitoring

The remote monitoring and control system can be easily connected with the units to realize remote real time monitoring and control and save the running data.

The unit can be remote controlled by many kinds of methods as follows:
4 kinds of wireless network connection with computer
3 kinds of local direct connection with computer
3 kinds of LAN network connection with computer



Technical parameters

FREECOOL.OD/ID.PCK

Model		12F1	18F1	24F1	30F2	35F2
Air flow	m^3/h	1000	1450	2050	2650	3000
Cooling capacity						
△t=5℃	kW	1.7	2.4	3.4	4.4	5
△t=10℃	kW	3.1	4.8	6.8	8.7	9.9
△t=12℃	kW	3.8	5.7	8.1	10.5	11.9
Power supply				48VDC		
Fan				Single inlet backward curved EC centrifugal fan		
Qty.	n.	1	1	1	2	2
Power input	kW	0.06	0.19	0.22	0.3	0.4
Current	A	1.3	4.0	4.7	6.3	8.4
Power supply				220VAC (Only available for ID installation unit)		
Fan				Single inlet backward curved centrifugal fan		
Qty.	n.	1	1	1	2	2
Power input	kW	0.13	0.18	0.39	0.36	0.5
Current	A	0.55	0.76	2.1	1.52	2.2
Noise (*)	dB(A)	52	55	57	54	57
Dimensions						
W*D*H(ID)	mm*mm*mm		650*500*1100		750*600*1400	
Weight(ID)	kg	60	60	65	85	85
W*D*H(OD)	mm*mm*mm		650*500*1320		750*630*1620	
Weight(OD)	kg	65	65	68	115	115

* The noise of 1 meter away from the unit

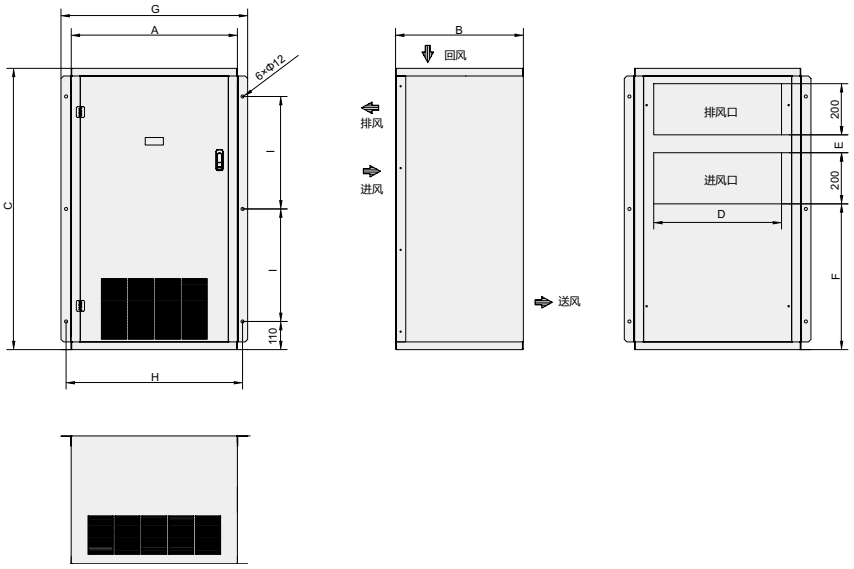
FREECOOL.OD/ID.SPL

Model		12F1	18F1	24F1	30F1	35F1
Air flow	m^3/h	1000	1750	2050	3030	3450
Cooling capacity						
△t=5℃	kW	1.7	2.9	3.4	5	5.7
△t=10℃	kW	3.3	5.8	6.8	10	11.4
△t=12℃	kW	4.0	6.9	8.1	12	13.7
Power supply				48VDC		
Fan				Single inlet backward curved EC centrifugal fan		
Qty.	n.	1	1	1	1	1
Power input	kW	0.06	0.19	0.23	0.26	0.39
Current	A	1.3	4.0	4.7	4.9	8.6
Power supply				220VAC(Only available for ID installation unit)		
Fan				Single inlet backward curved centrifugal fan		
Qty.	n.	1	1	1	1	1
Power input	kW	0.13	0.18	0.39	0.38	0.57
Current	A	0.55	0.76	2.1	1.7	2.7
Noise (*)	dB(A)	49	51	53	55	58
Dimensions						
W*D*H(ID)	mm*mm*mm		550*450*700		600*500*900	
Weight(ID)	kg	40	40	42	48	50
W*D*H(OD)	mm*mm*mm		550*550*600		610*610*630	
Weight(OD)	kg	38	38	40	45	45

* The noise of 1 meter away from the unit

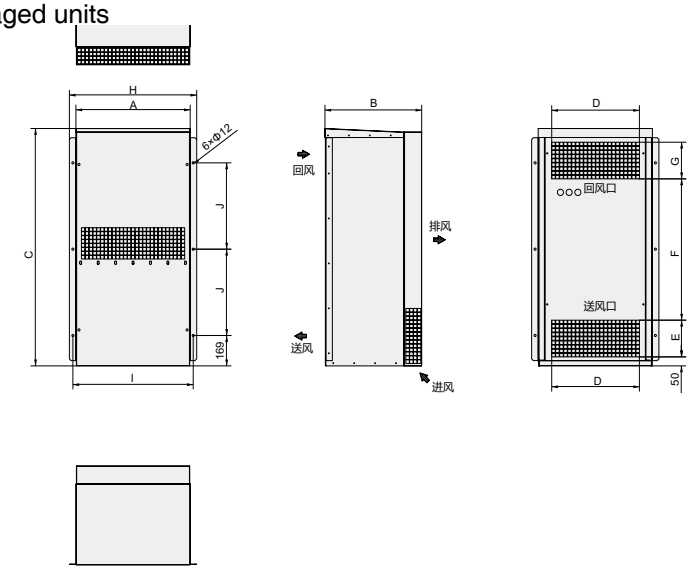
Dimensions drawing

Indoor installed packaged units



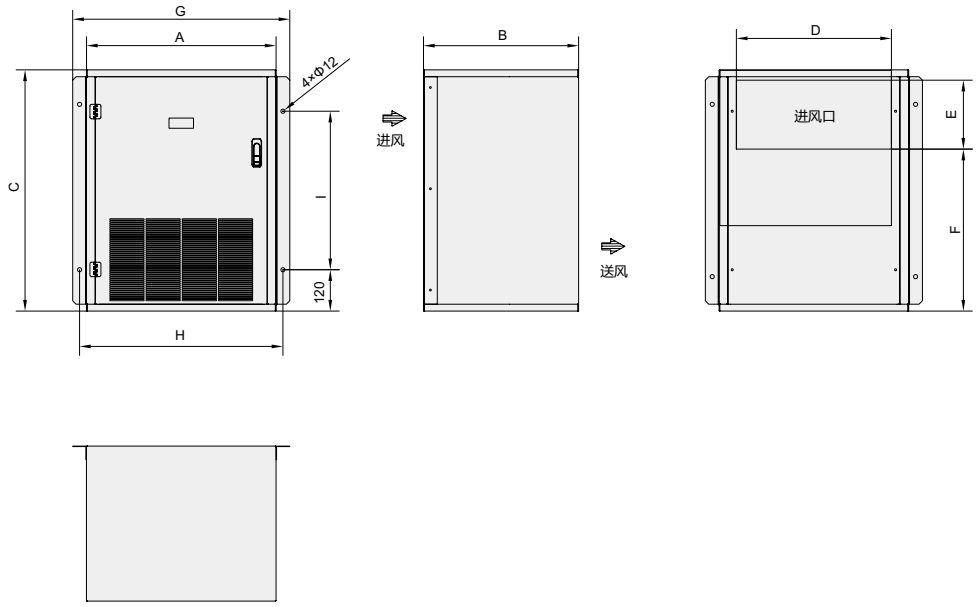
Model	A	B	C	D	E	F	G
FCB.ID.PCK.12F1	650	500	1100	500	70	570	730
FCB.ID.PCK.18F1	650	500	1100	500	70	570	730
FCB.ID.PCK.24F1	650	500	1100	500	70	570	730
FCB.ID.PCK.30F2	750	600	1400	560	120	820	830
FCB.ID.PCK.35F2	750	600	1400	560	120	820	830
FCB.ID.PCK.45F2	750	600	1400	560	120	820	830

Outdoor installed packaged units



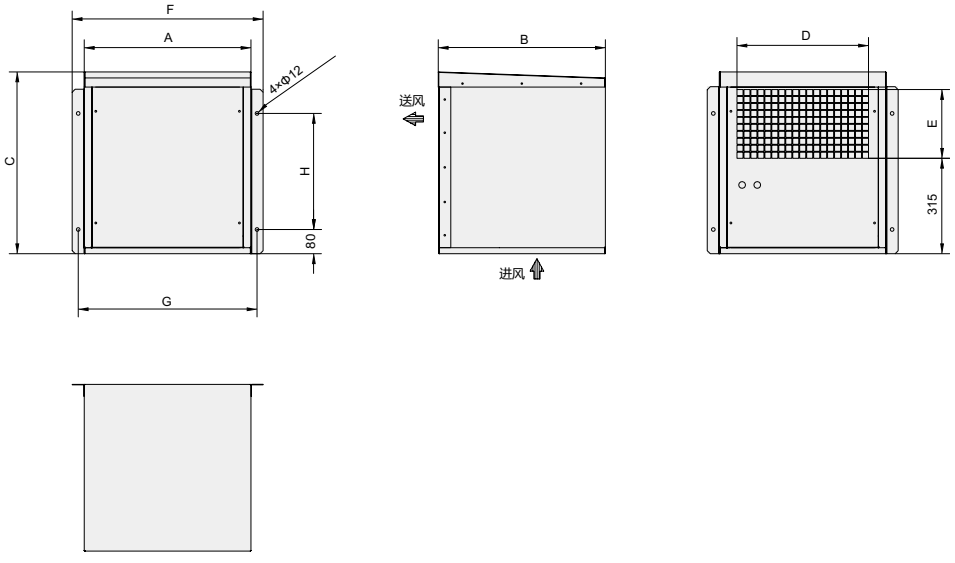
Model	A	B	C	D	E	F	G	H	I
FCB.OD.PCK.12F1	650	550	1320	500	785	200	55	500	730
FCB.OD.PCK.18F1	650	550	1320	500	785	200	55	500	730
FCB.OD.PCK.24F1	650	550	1320	500	785	200	55	500	730
FCB.OD.PCK.30F2	750	630	1620	600	820	470	50	340	830
FCB.OD.PCK.35F2	750	630	1620	600	820	470	50	340	830
FCB.OD.PCK.45F2	750	630	1620	600	820	470	50	340	830

Indoor installed split units



Model	A	B	C	D	E	F	G
FCB.ID.SPL.12F1	550	450	700	450	200	470	630
FCB.ID. SPL.18F1	550	450	700	450	200	470	630
FCB.ID. SPL.24F1	550	450	700	450	200	470	630
FCB.ID. SPL.30F1	600	500	800	500	310	560	680
FCB.ID. SPL.35F1	600	500	800	500	310	560	680

outdoor installed split units



Model	A	B	C	D	E	F
FCB.OD.SPL.12F1	550	550	600	420	225	630
FCB.OD. SPL.18F1	550	550	600	420	225	630
FCB.OD. SPL.24F1	550	550	600	420	225	630
FCB.OD. SPL.30F1	610	610	630	480	255	690
FCB.OD. SPL.35F1	610	610	630	480	255	690

AIRSYS

AIRSYS is a cooling product and solution provider for ICT (Information & Communication Technology) industry.

The products include:

Air conditioner and Chiller for IT room and large data center

Intelligent Control system (BAS) for IT room and data center

Air conditioning equipments for telecom shelters

Intelligent control system for shelter cooling.

Air conditioner and heat exchanger for telecom cabinets

The solution include:

- Cooling system design
- System integration
- Installation and Commissioning
- Operation and Maintenance

AIRSYS is also a global leader in providing cooling solution for Medical Imaging System.

AIRSYS Refrigeration Engineering Technology (Beijing) Co. Ltd.

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