

User Installation and Maintenance Manual



Direct expansion inter-row
air conditioner series
cooling unit machine

CRCK 0071-IN

CRCK 0101-IN

CRCK 0151-IN

CRCX 0201-IN

CRCX 0101-IN

CRCX 0151-IN

Air-cooled outdoor unit

C series

50Hz range

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Disclaimer:

This announcement refers to the implementation standards of size, weight, electric, water side, air side and Refrigerant connection (applicable)。

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The data in this manual is subject to change without notice。

The following symbols are used in part of the manual:

Warning sign - Only professionals can make changes

Prohibited signs- Never allowed operation

Requirements for operators (electrician) :

Have professional knowledge and rich operating experience, can avoid possible dangers when operating air conditioning units (IEV 826-09-01) 。

Follow the factory accessories of the unit

The content of the file must be consistent with the device.

The files of each unit must have the following content:

- Installation and maintenance manual;
- Circuit diagram;
- Follow the accessories of the unit;

Product description

C direct expansion system is divided into CRCK fixed frequency series and CRCX frequency conversion series, Outdoor units use C series condenser.

It is an innovative and efficient air conditioning unit for data centers, low energy consumption, can be used in high-energy high-density server rooms, its power can exceed 40 kW/m² per rack.

In the interline series, air conditioners and cabinets are placed side by side to form a cold aisle, the air conditioner and the computer cabinet are placed in the same row alternately, in order to fully absorb the heat emitted by the server.

The hot air in the hot aisle is first cooled, sent into the cold aisle, after entering the server, after absorbing the heat from the server, sent into the hot aisle, so cycle, cooling server, it has the characteristics of high efficiency, high reliability, high sensible heat ratio, large air volume, etc.。

Structure

Using galvanized steel plate sprayed with RAL9005 plastic powder, the overall structure of the unit is compact, save space.

Fan

Use the latest generation of EC brushless motors, excellent performance and low energy consumption. Adopt standardized N+1 dynamic management EC Fan operation allows to reduce speed to optimize power consumption. In addition, If a fan fails, The remaining fans will run at maximum speed to ensure cooling effect. The design of the fan allows quick replacement, to reduce downtime.

Filter

Renewable polyester fiber filter media made of synthetic resin (G4effectiveness) 。

Air source heat exchanger

Finned coil with large evaporation area, composed of a mechanical expansion tube and hydrophilic aluminum fins, has a large heat exchange area.

Electronic control panel

Comply with IEC 204-1/EN60204-I standard, equipped with fan contactor and overload protection.

Microprogram control system

Microprogram controller connected with monitoring system, control the refrigeration performance by adjusting the compressor of the direct expansion series unit.

Electric heater (Optional)

PTC heater is equipped with overheat protection, in case of overheating, the power supply will be cut off to activate the alarm.

Immersion electrode humidifier (Optional)

Adopt well-known brand electrode humidifier, large amount of humidification, efficient.

Condensate pump (Optional)

Compact size, large flow, high lift, Ensure



that the unit has the ability to overcome the height difference and drain water.

Extension kit (Optional)

When the length of the connecting pipe exceeds 40m, an extension component is required, ensure the normal startup and operation of the unit, improve the reliability of the unit.

Cryogenic components (Optional)

Air-cooled air conditioner when the outdoor environment temperature is lower than -10°C , increase the assembly of cryogenic components, ensure reliable operation of the unit above -35°C .

Series

Air-cooled direct expansion —CRCK

CRCK series unit is a single-cycle air-cooled direct expansion cooling unit, outdoor unit adopts C series condenser.

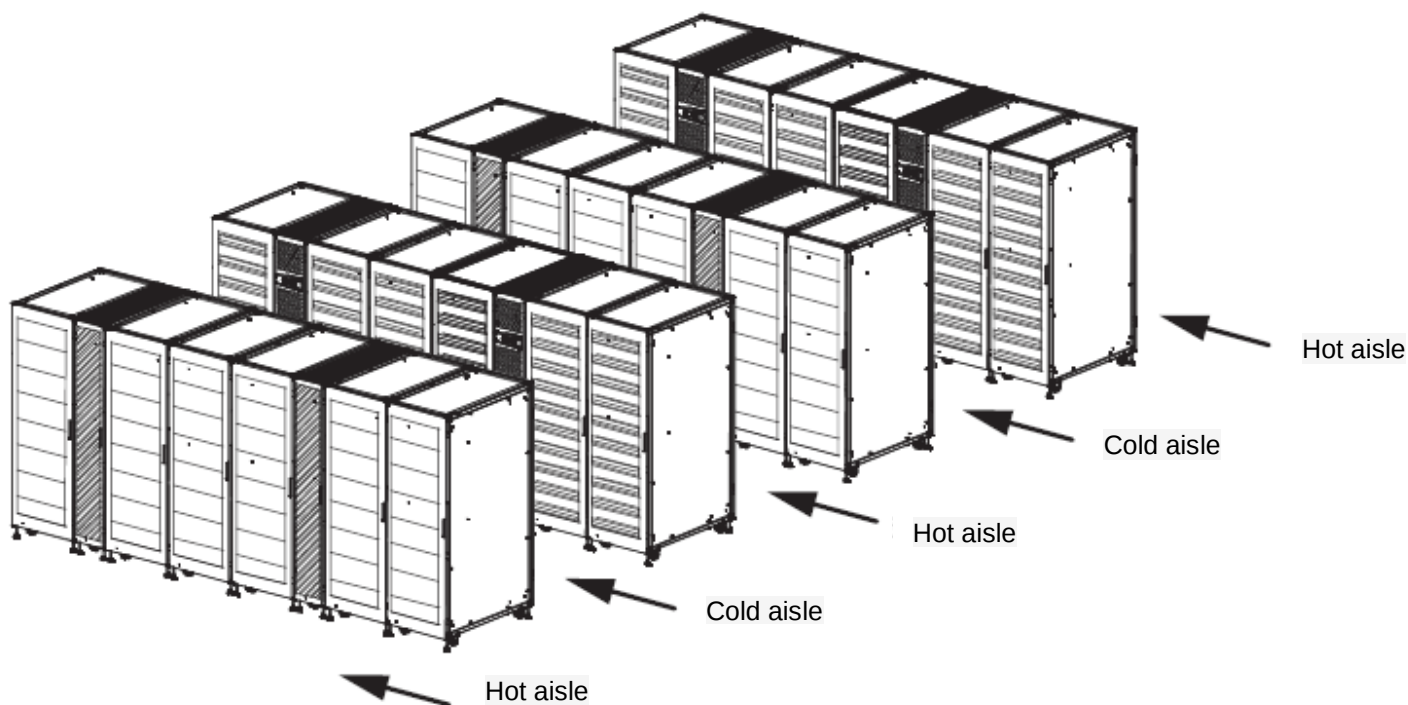
Air-cooled direct expansion unit—CRCX

CRCX series unit is a single-cycle air-cooled direct expansio



Air supply form

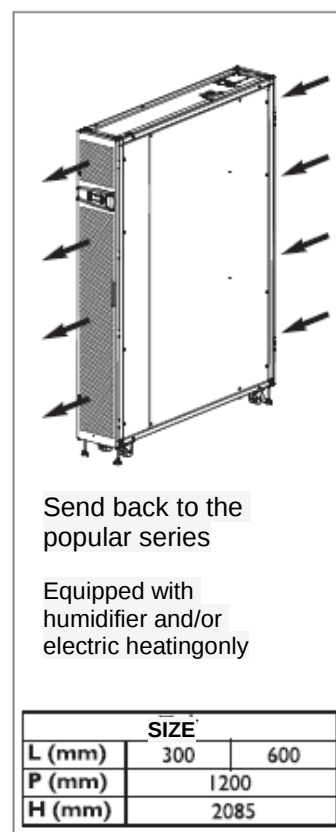
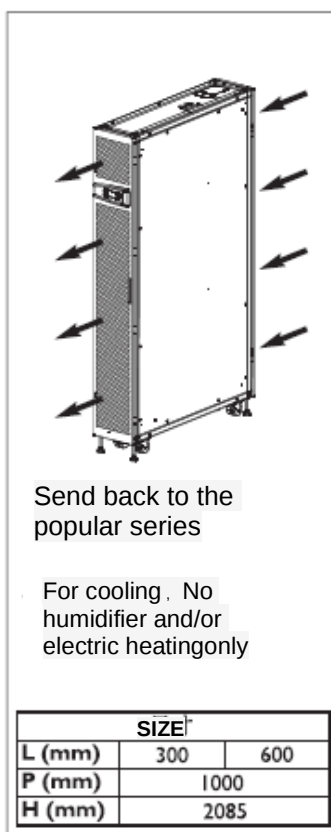
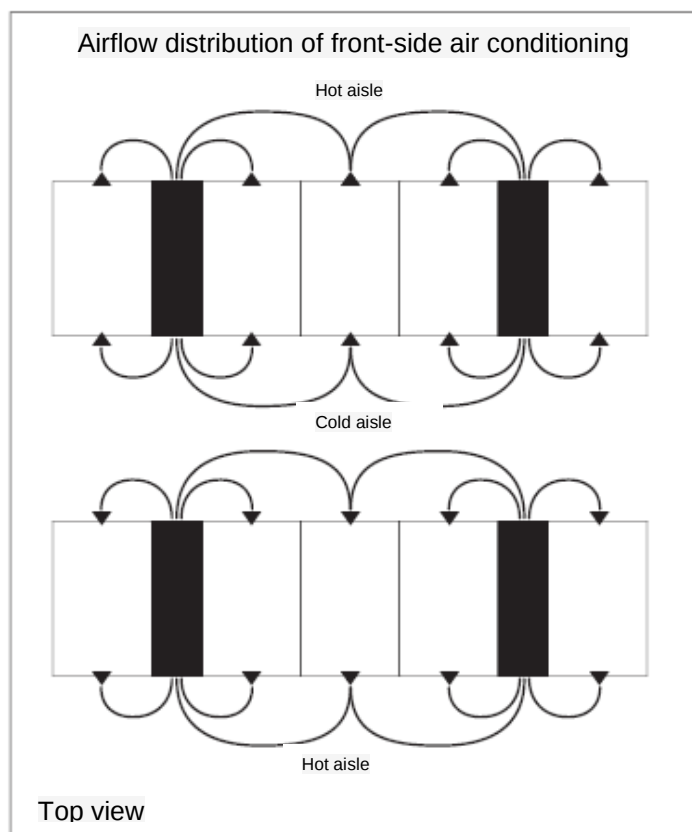
Front delivery line series



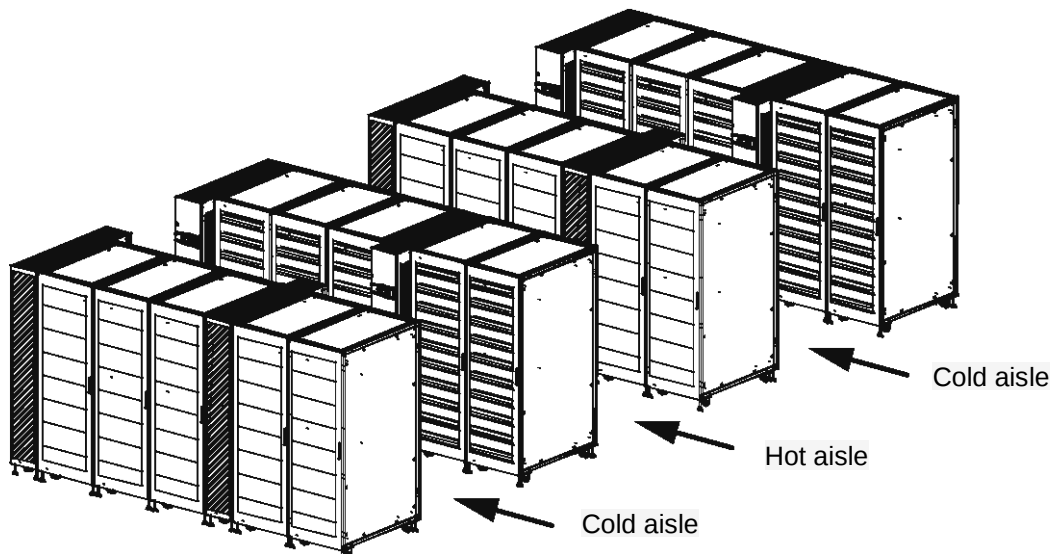
Air conditioning units and computer racks are placed in the same row and distributed alternately, to form hot and cold channels.

The electronic equipment of the computer rack uses its own fan to suck in cold air, at the same time, the hot air is discharged to the hot aisle.

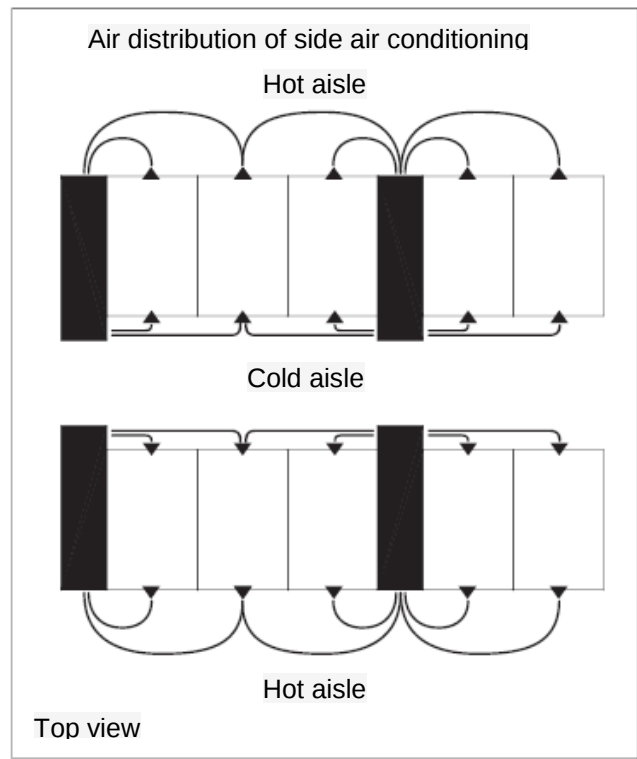
Hot air from the rack is discharged to the hot aisle, inter-row air conditioner cools it.



Remarks: The net height of the unit is 2000mm, support foot height 0-180mm, the factory support feet are adjusted to 85mm, the factory height of the unit is 2085mm.
Series between sides



Air conditioning units and computer racks are placed in the same row and distributed alternately, to form hot and cold channels.
The electronic equipment of the computer rack uses its own fan to inhale cold air, discharge hot air into the hot aisle at the same time.
Computer rack discharges hot air into hot aisle, the inter-row air conditioner sucks it in and cools it down.
In the side wind series, air is sent directly to the front of the rack, reduced the chance of mixing hot and cold air, but to ensure the best distribution of air installed at the end of each row of air conditioners.



Right air supply

A diagram of a server rack with arrows indicating air being supplied from the right side into the front of the rack.

Bilateral air supply

A diagram of a server rack with arrows indicating air being supplied from both the left and right sides into the front of the rack.

Left air supply

Remarks: The net height of the unit is 2000mm, support foot height 0-180mm, the factory support feet are adjusted to 85mm, the factory height of the unit is 2085mm.

Nameplate

The nameplate of the C series air conditioner is placed on the panel inside the unit, provide the following information:
The category and serial number of the unit;
Power parameters (Voltage, Phase number and frequency) ;
Unit cooling capacity, Power etc.

机组名称 Unit Type	风冷直膨行间机房空调 Air-cooled DX In-row CRAC																										
型号 Model	CRCK ****-IN																										
机型配置 Model Configuration	--																										
生产任务号/生产日期 Unit Serial/Manufact.Year	--																										
制冷量 Cooling Capacity	-- kW																										
室内机输入功率 Indoor Rated Power Input	-- kW																										
再加热量 Reheating Capacity	-- kW																										
加湿量 Humidifier Capacity	-- kg/h																										
运行重量 Operating Weight	-- kg																										
能效比 EER	--																										
制冷剂/充注量 Refrigerant/Refri. Charge	R410A	-- kg																									
电源供给 Power Supply	380/3/50 V/Ph/Hz																										
最大允许压力 Maximum Pressure	HP=4.3MPa	LP=2.8MPa																									
电流 Current	<table><thead><tr><th>组件/Components</th><th>FLA(A)</th><th>LRA(A)</th><th>QTY</th></tr></thead><tbody><tr><td>压缩机/Compressor(s)</td><td>--</td><td>--</td><td>--</td></tr><tr><td>风机/Fan(s)</td><td>--</td><td>--</td><td>--</td></tr><tr><td>电加热器/Heater</td><td>--</td><td>--</td><td>--</td></tr><tr><td>加湿器/Humidifier</td><td>--</td><td>--</td><td>--</td></tr><tr><td>总计/Total</td><td>--</td><td>--</td><td>--</td></tr></tbody></table>			组件/Components	FLA(A)	LRA(A)	QTY	压缩机/Compressor(s)	--	--	--	风机/Fan(s)	--	--	--	电加热器/Heater	--	--	--	加湿器/Humidifier	--	--	--	总计/Total	--	--	--
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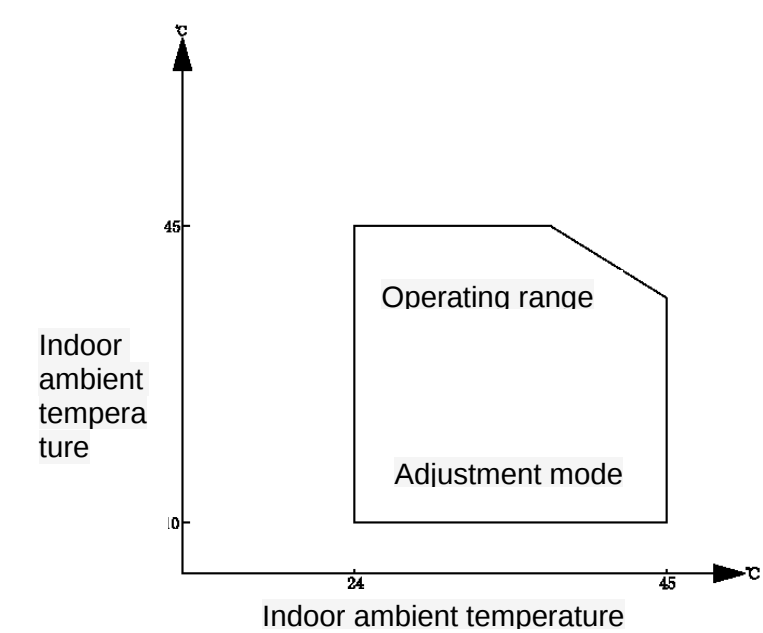


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Made in China

Operating range

The following is the operating parameter range of the unit (The following parameter ranges are only for units that have been correctly installed and maintained) :



Operating environment of the air conditioner meets the requirements of GB4798.3-2007, see the table below for details.

Environmental requirements

Operating environment

The following is the operating parameter range of the unit (The following parameter ranges are only for units that have been correctly installed and maintained) :

Operating environment requirements: the operating environment of the air conditioner meets the requirements of GB4798.3-2007, see the table below for details.

Operating environment requirements

Project	Claim
Ambient temperature	Indoor: 24℃~45℃ Outdoor: Air-cooled: -10℃~+46℃ (Normal type) -35℃~+46℃ (Low temperature type)
Altitude	<1000M, more than 1000M, please consult Clement Company
Operating voltage range	380V±10%

Storage environment: Meet the requirements of GB4798.1-2005, table below.

Storage environment requirements

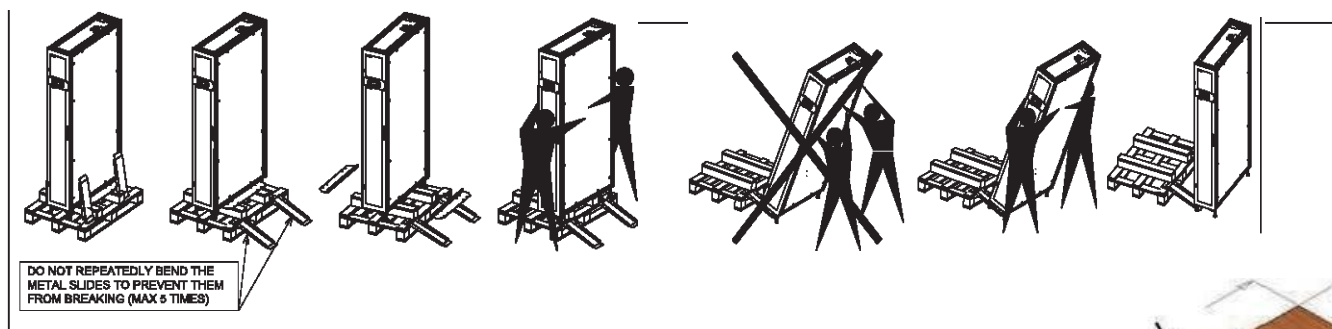
Project	Claim
Storage environment	Indoor, clean (No dust, etc.)
environment humidity	5%~85%RH (No condensation)
Ambient temperature	-20℃~54℃
Storage time	The total transportation and storage time does not exceed 6 months, need to re-calibrate performance after 6 months

Transport and unpacking

Transport and handling

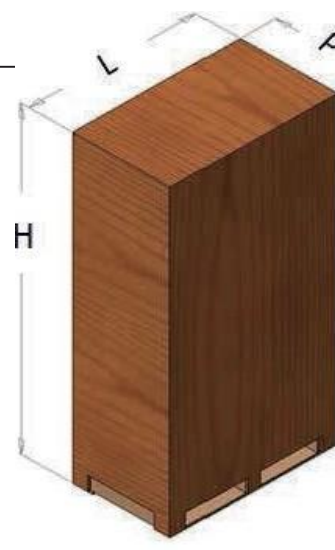
Choose railway transportation and shipping as much as possible. When choosing auto transport, Choose roads with better road conditions, prevent excessive bumps.

Please confirm the lifting capacity of the handling equipment before moving the unit, the position of the center of gravity of the unit should be fully considered when moving the unit horizontally, in order to better use forklifts or similar handling equipment.



Lifting of the unit: Use a forklift to insert the fork into the bottom space of the wooden box, pass the sling under the unit, use spacers to ensure that the sling is tight and will not damage the unit. The weight and size parameters of the unit are shown in the table below:

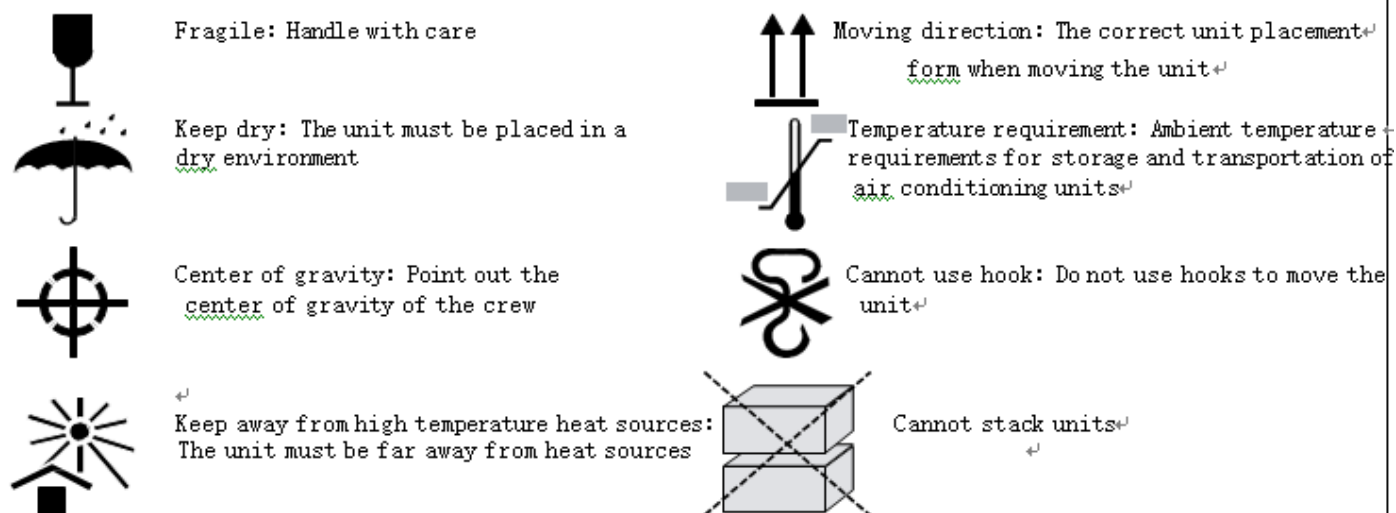
Product number	Dimensions			Equipment net weight (kg)
	L	P	H	
CRCX 0101-IN	300	1200	2000	240
CRCX 0151-IN	600	1200	2000	270
CRCK 0071-IN	300	1200	2000	210
CRCK 0101-IN	300	1200	2000	245
CRCK 0151-IN	600	1200	2000	265
CRCK 0201-IN	600	1200	2000	315



*1.The above weight is for single cooling unit, when configuring heating and humidification, the weight is increased by 10kg on the basis of the single cooling unit;

2.If you need other sizes of units, please consult Clement.

The following symbols are based on the ISO 7000 standard, will appear on the outer packaging of the unit, the specific meaning is as follows:



Unpacking and inspection

1. Move the unit to the installation site as much as possible before unpacking, unboxing steps;
2. Remove the surrounding wooden packaging materials (if any) and protective materials such as plastic films at one time on site;
3. The unit is fixed on the bottom tray of the package with M8 bolts, optional open wrench, ratchet wrench or socket for disassembly.



Note

4. When receiving the air conditioning unit, check whether the unit is intact, if there is any damage to the unit due to transportation, please notify the shipping party in writing immediately.
5. Focus on checking whether the control panel on the front panel of the unit is damaged, at the same time, if the side cover is installed incorrectly, it must be installed in the correct position before installing the unit.

Installation

Unit operating range			
Series	Indoor temperature range	Outdoor temperature range	
		standard	Add cryogenic components
CRCK-IN、CRCX-IN	24~45℃	-10~46℃	-35~46℃

Installation Notes						
Series	Standard machine			Add extension components (The effective pipe length range increases, and the positive and negative drop range remains unchanged)		
	Effective tube length	Positive drop	Negative drop	Effective tube length	Positive drop	Negative drop
CRCK-IN、CRCX-IN	≤50M	≤25M	≤8M	≤50~80M	≤25M	≤8M
1. Positive drop: The vertical distance between the outdoor unit and the indoor unit; Negative drop: The vertical distance between the outdoor unit and the indoor unit; 2. If the positive drop is out of range, please consult the factory, units with negative drop out of range cannot be used; 3. When there is a positive drop, an oil trap will be added every time the air pipe rises 4-5m.						

Description of low temperature and extended components					
		Liquid storage tank	Oil separator	Check valve	The electromagnetic valve
CRCX -IN	Standard machine	×	√	×	The unit comes standard with electronic expansion valve, no need to configure solenoid valve
	Cryogenic components	√	√	√	
	Extension kit	√	√	√	
CRCK -IN	Standard machine	×	×	×	
	Cryogenic components	√	×	√	
	Extension kit	√	√	√	
Remarks: √Indicates configuration, ×Means not to configure					
1. The oil separator is installed at the outlet of the exhaust pipe;					
2. The liquid storage tank is installed in the liquid path from the condenser;					
3. IN series components are installed in the indoor unit as standard options, can place an order directly;					

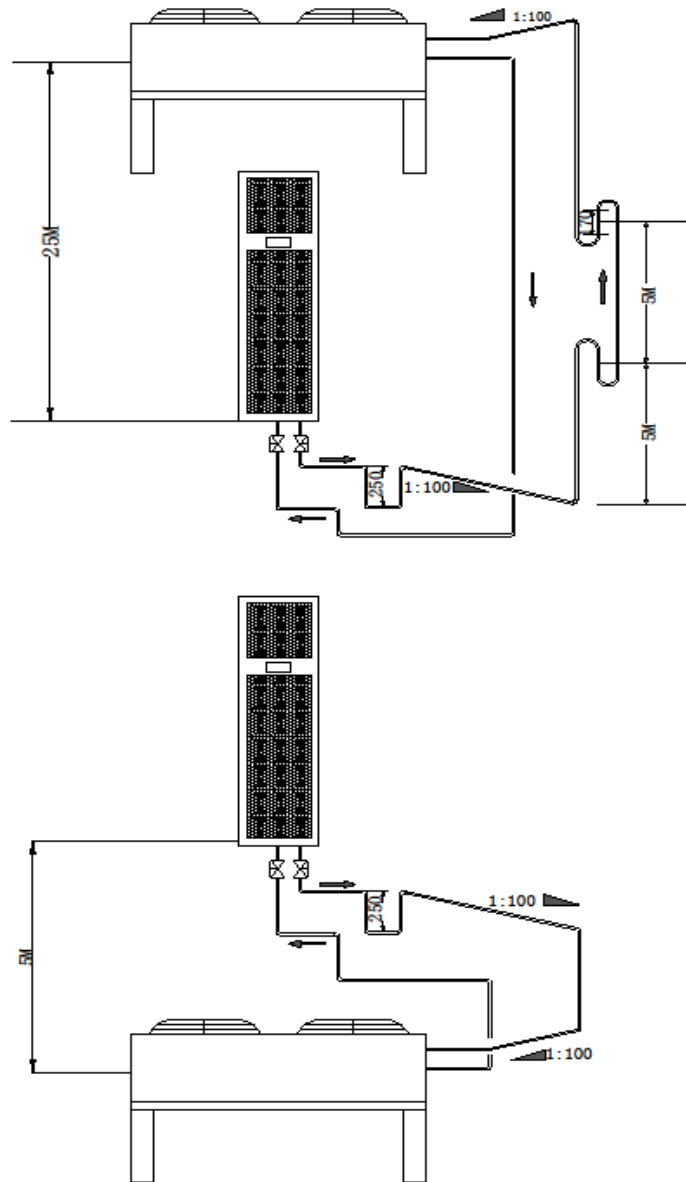
● System installation diagram and requirements

The installation method of air-cooled unit is shown in the figure.



Note

1. When the condenser is higher than the compressor (See picture), note the installation of reverse bends on the inlet and outlet pipes of the condenser, avoid backflow of liquid refrigerant during shutdown;
2. When installing reverse bending, it must be ensured that the top elbow of the reverse bend is higher than the highest row of copper tubes in the condenser;
3. The one-way equivalent connecting pipe needs to be equipped with extension components when it exceeds 50M.



Indoor units should be placed horizontally, to ensure that the unit can work normally with refrigerant, electrical components, and water collecting pan, installed in the server cabinet, form a layout of hot and cold aisles, both the front and rear of the unit must ensure a maintenance space of more than 600mm.

The following points should be avoided:

1. Install in the pit or vent;
2. Obstacles can cause exhaust backflow;
3. Installed in harsh atmospheric environment;
4. Installed in a confined space where the sound can be amplified by mixing or resonance;
5. Installed in a corner where dust or other materials are easy to accumulate, which will easily block the air duct and reduce efficiency;
6. The air from the unit enters the room through doors and windows, causing discomfort to users;
7. The air outlet of the unit is blocked by other air currents in the opposite direction;
8. The unit is exposed to sunlight.

● Pipe connection

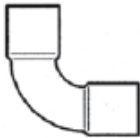
Indoor and outdoor units are connected by copper pipe welding, there are refrigeration pipe joints and labels on the top and bottom of the unit, You can choose to connect the pipe from the top or from the bottom according to the needs of the project. When welding, correctly connect the gas pipe and liquid pipe of the indoor unit

according to the label instructions, and pay attention to the protection label and insulation cotton.
 The horizontal part of the exhaust pipe should be inclined downwards after being led out from the compressor, with an inclination of at least 1:100. If the exhaust pipe is in a place affected by cooling equipment (including under the raised floor), heat insulation should be considered.
 Considering the influence of the pipe diameter on the system pressure drop, the pipe diameter of the connecting copper pipe of the indoor and outdoor units should be selected according to the recommended pipe size in the table.。

Recommended pipe size (unit: mm)

型号/model	管径 X 壁厚 (mm)	
	气管/gas pipe	液管/liquid pipe
CRCX0101-IN	19X1.0	16X1.0
CRCX0151-IN	19X1.0	16X1.0
CRCK0071-IN	19X1.0	16X1.0
CRCK0101-IN	19X1.0	16X1.0
CRCK0151-IN	22X1.2	19X1.0
CRCK0201-IN	22X1.2	19X1.0
Note: The above pipe diameters are applicable to one-way equivalent total pipe length of less than 50m; if it is greater than 50m, it is necessary to configure the extension components, the relevant connecting pipe size, please consult with Clemente's technical personnel.。		

When the one-way equivalent connecting pipe length of indoor and outdoor units exceeds 50M, extension components are required, the algorithm of equivalent length is as follows:

弯管的等效长度, 开关, 止回阀 Nominal diameter (mm)					
	90°	45°	180°	90°	
12	0,50	0,25	0,75	2,10	1,90
14	0,53	0,26	0,80	2,20	2,00
16	0,55	0,27	0,85	2,40	2,10
18	0,60	0,30	0,95	2,70	2,40
22	0,70	0,35	1,10	3,20	2,80
28	0,80	0,45	1,30	4,00	3,30
35	1,10	0,55	1,75	5,00	4,50

● Other pipe connection size and joint specifications

Other pipe connection size and joint specifications		
Condensing pipe Condensate pipe (no water pump)	[mm]	ID19/OD26
Condensing pipe Condensate drain (water pump)	[mm]	OD9.8
Humidifier drain	[mm]	ID32/OD38
Humidifier inlet pipe (threaded joint)	[mm]	ID=6, 3/4"G

Description: ID: The inside diameter of, OD: Outer diameter

● Accounting of refrigerant and refrigerating oil

Indoor unit model Charge	0071	0101	0151	0201
Outdoor unit model	M29	M33	M49	M58
Standard charge	9	10.56	16	17.8
Note: 1. The reference value of the refrigerant quantity in the table is the standard unit, without low temperature components. The charging quantity of the unit when the component is extended is only for on-site charging reference. The specific charging quantity can be adjusted according to the on-site situation and the operation status of the unit; 2. If the outdoor unit model is different from the recommended one, please contact Clement; 3. If the connecting pipeline of indoor and outdoor units exceeds 10M, additional refrigerant charge and refrigerating oil are required. 4. Charge according to the type of refrigerant indicated on the nameplate of the unit. This series of units use R410A, lubricating oil: FV50S.				

Reference value of standard charge amount of refrigerant for 10m connecting pipe system (unit: kg) , When the connecting pipe exceeds 10M, the method of adding refrigerant and freezing oil is as follows:

Pipe diameter			10	12	16	18	22	28	35	42
R410A	Intake pipe	gr/m	-	-	3.9	5.1	8	13.6	21.6	30
	Liquid pipe	gr/m	59	90	160	209	327	-	-	-

Lubricating oil is added according to 10% of the weight of the gas in the pipeline between the indoor unit and the indoor unit.

Power wiring

Open the back door of the indoor unit, you can see the interfaces of the electric control box. There are certain differences in the layout of the electric control box of different units, please check the circuit diagram and indication label for details. After confirming that the power supply has been turned off, L1~L3, N, and PE are respectively connected to the corresponding ends of the external power supply. When the unit is equipped with a main power cord, the specifications of the power cord must comply with the regulations of the country and local electricians. Refer to the circuit diagram (see attached factory accessories) and the indication label to complete the control line connection. In order to facilitate the customer to install the power inlet, the unit has wiring holes at the bottom and top. Customers can choose the bottom or top inlet according to different application scenarios. .



Note

1. After the wire is connected, it needs to be fixed with a tie on the nearby electric control box to avoid pulling the power cord off when the electric control box is pulled;
2. The power supply voltage must be within $\pm 10\%$ of the nominal voltage on the nameplate, and the unbalanced voltage between phases must not exceed 3%. If the requirements are not met, please contact the local power company. The damage caused by the power supply not meeting the above requirements is not covered by the warranty;
3. The manufacturer does not bear any consequences caused by improper installation.

The cross-sectional area of the power cord is related to the length of the power source and the installation type. It must match the maximum current of the unit, please refer to the following table.

Corresponding condenser							
condenser Mod.	condenser power supply	Fan qty.	FLI (kW)	FLA (A)	LRA (A)	Power cord mm ²	Signal connection line mm ²
M29	220V/1N/50	2	0.6	2.5	4.4	3*1.5	Shielded wire 2*1
M33	220V/1N/50	2	1.3	6	11	3*2.5	Shielded wire 2*1
M49	220V/1N/50	2	1.3	6	11	3*2.5	Shielded wire 2*1
M58	220V/1N/50	3	1.9	9	16.5	3*2.5	Shielded wire 2*1

Indoor unit electrical parameters										
		B				R				Isolation switch
Mod.	Unit power supply	FLI (kW)	FLA (A)	SA (A)	Wire diameter (mm ²)	FLI (kW)	FLA (A)	SA (A)	Wire diameter (mm ²)	
CRCX0101-IN	380V/3N/50	7.1	34.4	62.9	10	10.7	50.7	62.9	16	4P/ 63A
CRCX0151-IN	380V/3N/50	10.5	40.3	79.2	10	17.7	51.2	79.2	16	4P/ 63A
CRCK0071-IN	380V/3N/50	5.16	21.8	70.6	6	8.8	38.1	70.6	10	4P/ 63A
CRCK0101-IN	380V/3N/50	6.62	26.9	109	10	10.2	43.2	109.0	16	4P/ 63A
CRCK0151-IN	380V/3N/50	10.60	28.2	130	10	17.8	39.1	130.0	10	4P/ 63A
CRCK0201-IN	380V/3N/50	13.2	38.2	136	10	20.4	49.1	136.0	16	4P/ 63A
		H				T				Isolation switch
Mod.	Unit power supply	FLI (kW)	FLA (A)	SA (A)	Wire diameter (mm ²)	FLI (kW)	FLA (A)	SA (A)	Wire diameter (mm ²)	
CRCX0101-IN	380V/3N/50	9.4	44.6	73	16	10.7	50.7	73.1	16	4P/ 63A
CRCX0151-IN	380V/3N/50	12.8	50.5	89	16	17.7	51.2	89.4	16	4P/ 63A
CRCK0071-IN	380V/3N/50	7.4	32	81	10	8.8	38.1	80.8	10	4P/ 63A
CRCK0101-IN	380V/3N/50	8.9	37.1	119	10	10.2	43.2	119.0	16	4P/ 63A
CRCK0151-IN	380V/3N/50	12.8	38.4	140	10	17.8	39.1	140.0	10	4P/ 63A
CRCK0201-IN	380V/3N/50	15.5	48.4	146	16	19.2	49.1	146.0	16	4P/ 63A

B=Cooling only

R=Cooling only +Standard electric heating
(dehumidification function)

H=Cooling only + humidifier

T=Cooling only +Standard electric heating +
humidifier

※ Cable section: The ambient temperature is 45℃, the maximum rated temperature of the conductor (95℃), the current carrying capacity during continuous operation

The above data value does not include the external unit. If the external unit power is supplied by the internal unit, please add the external unit current to the maximum load current

⚠ Caveat: All operations must be carried out by professionals, the selection of components and materials must be in accordance with relevant national standards, and the expected use and operating conditions of the system must be taken into account during operation.

Pay attention to the following points in field wiring operation:

- 1.The circuit connection adopts double insulated cables that comply with national standards. If local or national standards require that a leakage circuit breaker be installed upstream of the distribution cabinet, type B equipment should be used, with a critical value of $I_d \cdot 100 \text{ mA}$;
- 2.The start-up delay of the unit prevents the start-stop problem caused by the leakage circuit breaker detecting

excessive starting current;

3. Do not lead the ground wire from the water pipe;

4. The upstream of the power cord should be installed to prevent short circuit and leakage equipment, and the installation part should be isolated from other equipment;

5. The power supply of the unit can only be turned on after all installation work is completed.;

6. Ensure that the grounding money has been effectively connected to ensure that the phase sequence of the three-phase power is correct;

7. Before starting the unit, check the tightness of all electrical components and cable connections, as these may cause looseness during handling and transportation.。

Debugging

Check and confirm before commissioning:

1. The power supply voltage is the same as the rated voltage on the device nameplate;
2. There is no open circuit or short circuit in the electrical circuit of the system;
3. The power cables and ground cables to the disconnect switch, indoor unit and outdoor unit have been connected;
4. The circuit breaker or fuse is rated correctly;
5. The control cable is connected;
6. All cables and circuit connectors have been tightened, and the tightening screws are not loose.

After all the above contents are checked and confirmed to be correct, you can start debugging. The debugging steps are as follows:

1. Disconnect the corresponding air switch of each component, close the main air switch and check the control voltage;
2. Close the fan air switch, manually control the display panel to turn on the fan, confirm the direction of the fan, set the fan speed, you should be able to feel a significant change in the fan speed;
3. When configuring the heater, close the electric heating air switch, change the temperature setting, start the heater (or manually start the electric heater), the corresponding contactor should be closed, and you can feel hot air blowing;
4. When configuring the humidifier, close the humidification air switch, change the humidity setting value, start the humidifier (or manually start the humidifier), the corresponding contactor should be closed, the water injection solenoid valve should be opened, there is water into the humidification tank, and the multimeter detects the humidification. The connection line of the humidifier should have current, indicating that the humidifier has been turned on; Check whether there is leakage in the water injection pipe or drain pipe, and whether the drainage is smooth;

Humidification trigger method: Adjust the humidity setting value so that it is higher than the indoor relative humidity by more than 10%. At this time, the control system should be able to trigger the humidification demand and the humidifier starts to work. When the set value is lower than the humidity in the computer room, if the humidifier stops working, it indicates that the humidification function is normal.



Note

After the test, adjust the temperature and humidity settings back to the default settings or initial settings.

5. Confirm that the refrigerant or nitrogen stored in the unit has been evacuated, connect the high and low pressure composite pressure gauge to the corresponding needle valve interface of the liquid pipe and suction pipe, and vacuum the refrigeration system loop to -30in.Hg (vacuum time is more than 3 hours), And keep it for 4 hours, the pressure should not rise, and the sight glass indicates the "Dry" state (if the system needs additional refrigerating oil, it needs to be vacuumed while adding refrigerated oil)。

After the vacuum inspection is completed, connect the high and low pressure composite pressure gauge to the refrigerant bottle (pay attention to the emptying of the air inside the strap), statically charge an appropriate amount of liquid refrigerant (usually, it can be charged until the pressure in the tank is balanced with the system pressure), static Keep the refrigerant bottle upside down during charging.



Note

1. Before vacuuming, make sure that the high-pressure nitrogen or refrigerant sealed in the system has been evacuated to avoid damage to the vacuum pump;
2. After the refrigerant is statically charged, it is forbidden to turn on the compressor immediately. Before starting up, make sure that the compressor crankcase heating belt is preheated for more than 12 hours. If the preheating time is not enough, heat the lower part of the compressor shell with other safe heat sources such as a thermoelectric hair dryer for about 30 minutes before starting to avoid the compressor starting with liquid. Operation, affecting the service life of the compressor;
3. Before turning on the compressor, please make sure that the ball valve in the refrigeration piping system has been opened, the solenoid valve and the electronic expansion valve coil are installed firmly and working normally, and ensure that the pipeline is unblocked when the compressor is turned on.

- 1) Change the temperature setting, start refrigeration (or manually start refrigeration), and measure the operating current of each phase of the compressor in real time.

Trigger refrigeration (compressor on) method:

Adjust the temperature setting to make it 5° C lower than the temperature of the indoor equipment room. The control system should be able to trigger the refrigeration demand and the compressor should run. After running for at least 3 minutes, adjust the set temperature to the room temperature + 5°C. If the compressor stops running at this time, it indicates that the cooling function is normal.

- 2) Check the operating current of the condenser fan and observe whether it runs smoothly;
- 3) Start the compressor, keep the refrigerant bottle upside down, and slowly charge refrigerant R410A until the suction superheat reaches about 8K, and the exhaust superheat is 25°C~35°C.

Observe the compressor suction pipeline to ensure that there is no "condensation" phenomenon in the pipeline and compressor casing to eliminate potential liquid shock hazards.



Note

1. The default suction superheat of the electronic expansion valve is 8K, no need to change on site;
2. After the test, adjust the temperature setting value back to the default setting value or initial setting value.

Condensate pump (optional)

For example, when the unit is equipped with a condensate pump, the customer needs to prepare a silicone hose with an inner diameter of 9.8mm to connect with the pump outlet.

The condensed water is concentrated to the drain pan under the unit, and the end of the drain pipe is connected to the sewage system rubber hose with an inner diameter of 19mm. When the unit is turned on, pour water into the drain pan to make the drain pipe full of water, and the water pump should start to drain.

Dual power supply (optional)

When the main power supply fails, the dual power supply ensures the safety and reliability of the power supply.

When the main power supply line fails, the system will automatically switch to the backup power supply.

This ensures redundancy of power supply and continuity of power supply in emergency situations.

Electric heating (optional)

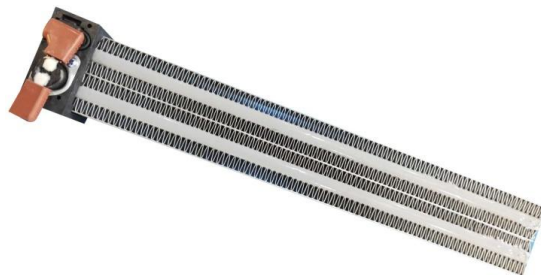
Please refer to the circuit diagram for the specific wiring method of the electric heating connection to the contactor.

If you need to replace the electric heater, first disconnect the power supply of the unit and wait for the electric heater to cool down before replacing it. After replacing the electric heater, make sure that the grounding wire is connected correctly.

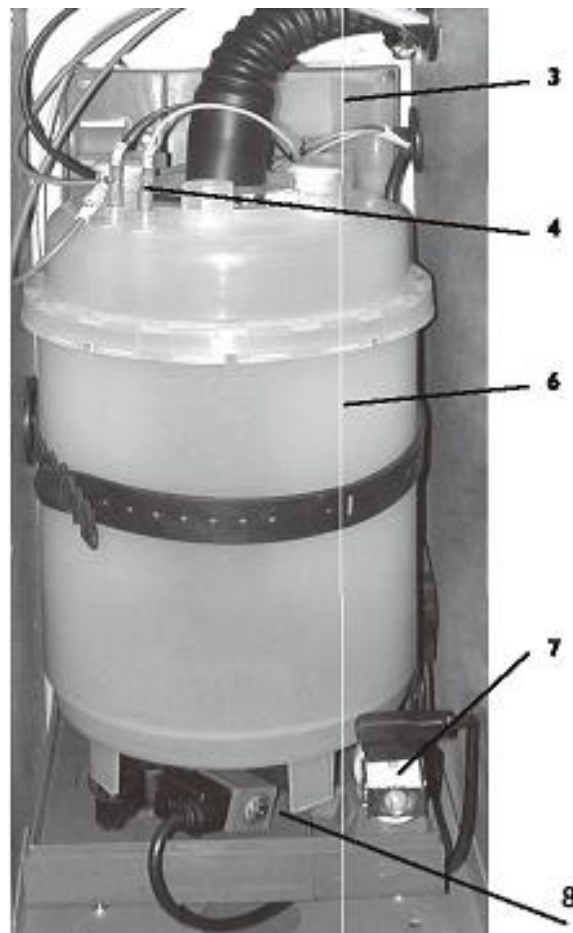
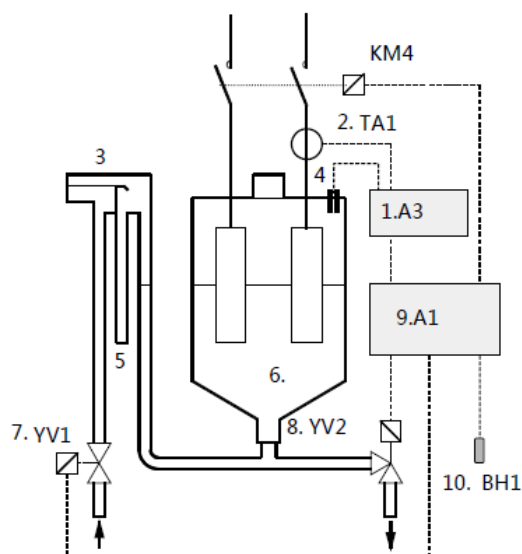
Humidifier (optional)

System Components

According to customer needs, the unit can be equipped with electrode type humidification.



- 1 Humidifier control board A3 (installed in the electric control box)
- 2 Current transformer TAI, the current measured through the humidifier is too small
(Installed in the electric control box)
- 3 Water tank
- 4 High water level electrode
- 5 Overflow pipe (installed on the back of humidification tank)
- 6 Humidification tank
- 7 Inlet solenoid valve YV1
- 8 Drain solenoid valve YV2
- 9 Motherboard A1
- 10 Indoor environment temperature and humidity probe BHI



Working principle of electrode humidifier

The current between the electrodes heats the water inside the humidification tank to evaporate the water and obtain water vapor. By controlling the water inlet and outlet solenoid valves to control the water level inside the humidifier and the salt content inside the water, the current transformer can detect and control the current between the electrodes to control the amount of steam produced.

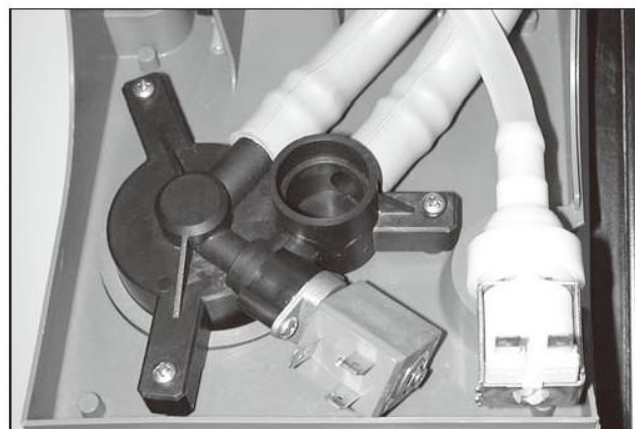
When the indoor level is lower than the set value, the main board controls the contactor of the humidifier to close (see the circuit diagram for details), power the humidifier, and the humidifier starts to work.

When the water level in the humidifier is too low and the electric shift value is less than the set value, the water inlet valve is opened to adjust the water level. Depending on the water supplied to the humidifier, the drain valve may be opened to adjust the salt concentration in the humidifier.

The humidifier needs to be regularly inspected and cleaned, the part of the humidifier that generates steam.

The following operations need to be performed once a year, preferably in summer.

Filling and draining the humidifier In order to ensure the long-term stability of the humidifier, it is necessary to regularly fill



Water and drainage operations are as follows:

- Completely drain the water inside the humidifier (use the control board to operate)
- Disconnect the main load switch of the unit
- Remove the 3/4 pipe joint of the water inlet solenoid valve
- Clean the removed pipe joints
- Remove the drain pipe (as shown in the figure) and thoroughly clean the dirt inside the drain pipe and elbow

Humidification tank

Clean the inside of the humidification tank regularly to remove the scale accumulated on the surface of the electrode, and clean the water filter at the bottom of the humidification tank.

The steps to remove the humidification tank are as follows:

Thoroughly drain the water inside the humidifier (see the operation manual for the operation method)

Turn off the main load switch on the unit

Remove the steam outlet hose from the top of the humidification tank

Remove the power cord and electrode connector

Untie the fixing strap of the humidification tank

Remove the humidification tank upward

The humidification tank can be reused many times after being cleaned, but if the electrode is worn out, it cannot be used continuously, and a new electrode needs to be replaced. The humidification tank consists of a humidification tank body and a filter installed at the bottom. The humidification tank regularly cleans the inside of the humidification tank, removes the scale accumulated on the surface of the electrode, and cleans the water filter at the bottom of the humidification tank.

Humidifier power input

A male threaded joint is installed under the water inlet solenoid valve at the bottom of the humidification tank to connect

The pipe diameter is 6mm rubber pipe, and the plastic pipe needs to be connected to the installation site of the air conditioning unit

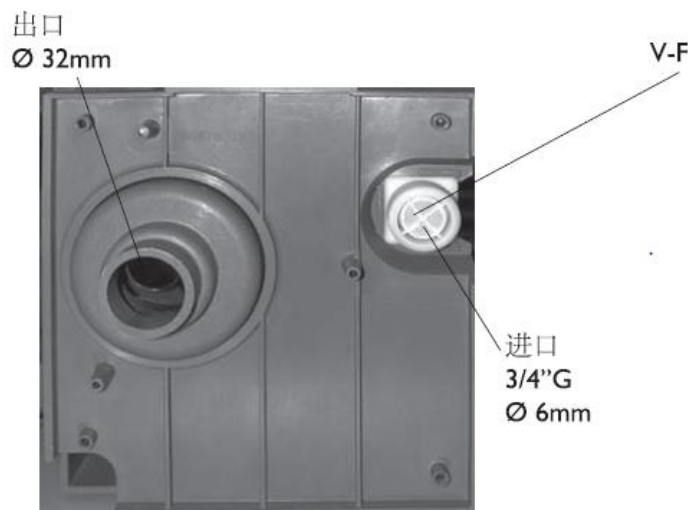
water supply system. As the picture shows:

V: Water inlet connector at the bottom of humidification tank, 3/4" G male threaded joint

F: Rubber hose, diameter 6mm

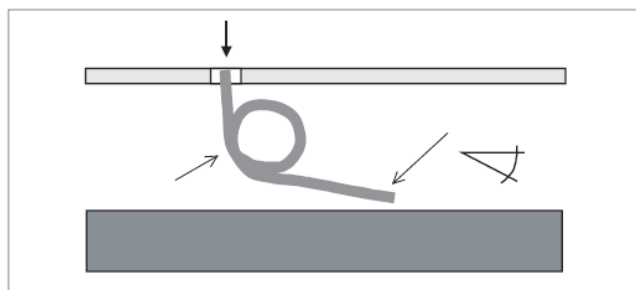
Use drinking water without any chemical treatment or demineralization as humidifier water

Source, water characteristics need to meet the following requirements:



Humidifier and condensate drain

There is a drain valve at the bottom of the humidifier to remove the condensate formed during the dehumidification process of the unit.

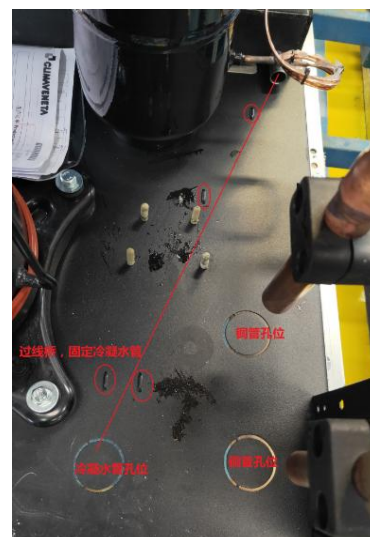


The unit has been installed with a drain hose, rubber or plastic hose is required for installation, The pipe diameter is 32mm, connect the hose to the drainage system.

⚠ Caveat: The temperature of the water discharged from the humidifier is very high, so be careful. The drain hose of the humidifier must not be bundled with any other wires, and the hose needs to be straight down to prevent touching the power cord.

A wire bridge is made on the bottom plate of the unit to fix the condensate drain pipe so that the condensate drain pipe fits the bottom plate

As shown on the right



Unit maintenance

In order to ensure the correct operation of the air conditioning unit, customers need to pay attention to the content involved in this section.

Only need to perform a few simple maintenance operations on the unit regularly to avoid serious damage to the unit. Only authorized institutions and professionals can operate the unit.

Maintenance operations can be summarized as follows:

Clean the air filter

Check and clean up the drain

Check the overall operating status of the unit

Spot check the operating conditions of pressure vessels

Check the overall operating status of the unit:

It is necessary to check the overall operating conditions of the unit on a regular basis. The purpose is to compare the difference between the current operating status of the unit and the operating status of the last inspection. Any differences found should be paid attention to and the reasons should be carefully checked.。

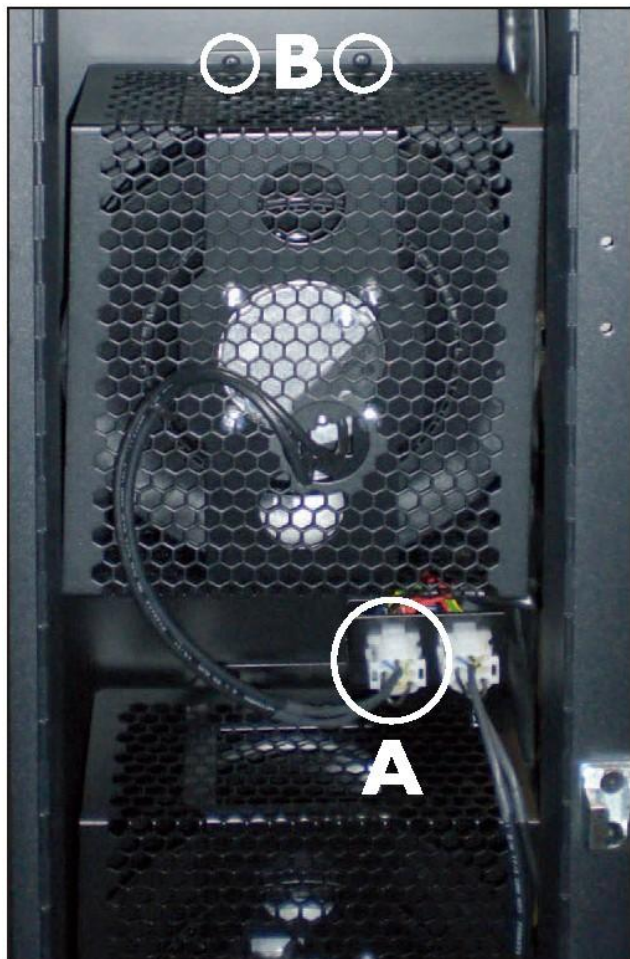
Regular inspection and cleaning of the unit can ensure long-term stable operation of the unit. Under normal circumstances, an overall inspection of the unit once a month can ensure the normal operation of the unit, except in special circumstances. If long-term and reasonable maintenance of the unit is maintained, it is unlikely that the unit will have a major failure and cause other work interruptions. 在机组连续运转 10 年后, A complete and comprehensive inspection of the unit is required.

Replace the fan

If you need to replace or maintain the fan, you do not need to cut off the power of the entire unit, open the front door of the unit, and remove the power plug of the failed fan (refer to photo part A). When the fan stops, unscrew the fan (refer to part B of the photo) and remove the fan.

⚠ Caveat: Ensure that the fan is completely stopped before removing it from the unit.

During the maintenance of the failed fan, the remaining fans will run at the maximum speed.



When replacing parts of the unit (compressor, pressure switch, accumulator, etc.), please refer to the list of important parts of the unit enclosed in the package.

In order to ensure the correct operation of the air conditioning unit, the customer needs to pay attention to the content involved in this section. Only need to periodically do a few protection and maintenance operations on the unit to avoid serious damage to the unit. Only authorized institutions and professionals can operate the unit.

Maintenance operations can be summarized as follows:

—Clean the air filter;

- Check and clean the condenser coil;
- . Check and clean the condensing coil for cooling water and clean the scale;
- Check and clean up the drain;
- . Check the humidification system;
- . Check the overall operating equipment;
- . Check the condition of the pressure vessel.

Clean the air filter

As more and more dust and impurities adhere to the air filter, the air flow and velocity of the unit will gradually decrease, which will lead to a decrease in the cooling capacity and efficiency of the unit. .

For direct expansion units, clogging of the air filter may cause low-pressure switch alarms and compressor damage. Regularly cleaning the dirt of the air filter can avoid the above problems. The interval between the cleaning process depends on the air condition of the local environment.

. Check whether the air filter is clean every week

. Change the air filter every six months

The above cleaning and maintenance intervals are not applicable to all environmental conditions, and the air filter needs to be cleaned and replaced more frequently if necessary.

It should be noted that before operating the air filter, ensure that the unit is turned off and disconnected from the power supply.

Check and clean the condensate coil

In the high temperature stage, when the unit is operating at maximum capacity, the condensing coil must be able to provide the maximum heat exchange capacity. Units usually installed outdoors suffer from dirt and blockage, such as paper, dry leaves and dust, which reduces the heat exchange capacity. The above phenomenon should be avoided.

Failure to perform regular maintenance on the unit will result in failure to start the high-voltage switch or even shutdown. In autumn or during the pollination period of poplars (deciduous season), it is necessary to check whether the heat exchanger of the unit is blocked.

Clean up the dirt accumulated on the coil, and flush the coil with a water gun. The above operations must be carried out when the power is cut off and the machine is stopped.

Check and clean the drain

It is necessary to ensure that the condensate and humidifier drainage system is complete during installation to prevent the condensate from leaking into the indoor floor.

When the humidifier drains, depending on the hardness of the water, the discharged water will contain a certain amount of scale. Scale will deposit on the bottom of the drain pipe, blocking the drain pipe and elbow, so it needs to be cleaned regularly.

A descaling agent (acid solution) is needed to clean up the scale

The unit needs to be shut down and disconnected from the power supply before cleaning the drain.

Check the overall operating status of the unit

The overall operation of the unit needs to be inspected regularly. The purpose is to compare the difference between the current operating status of the unit and the operating status of the last inspection. Any discrepancies found should be paid attention to and the reasons should be carefully checked. Regular inspection and cleaning of the unit can ensure long-term stable operation of the unit. Normally, an overall inspection of the unit every month can ensure the normal operation of the unit, except in special circumstances. If long-term and reasonable maintenance of the unit is maintained, it is unlikely that the unit will have a major failure and cause other work interruptions. After 10 years of continuous operation of the unit, a complete and comprehensive inspection of the unit is required.

Visually inspect the condition of the pressure vessel

Check the condition of the pressure vessel at least once a year (if the pressure vessel has been installed). Confirm that there is no rust, corrosion or visible deformation on the surface. If the above conditions are not paid attention to, long-term surface oxidation and corrosion will reduce the thickness of the pressure vessel and affect its mechanical strength. Use paint or other surface anti-corrosion products. If the product has surface deformation, please contact the nearest after-sales service center.

Unit disassembly

Unit disassembly is carried out in accordance with CE2002/96/CE standards.

If you need to disassemble the air conditioning unit, you need a professional to operate it.

Disassembling the unit according to the correct procedure can avoid refrigerant leakage and damage the environment, while avoiding unnecessary losses.

Troubleshooting

Alarm type	The reason	Solution
The unit cannot be turned on	Electric control box is not powered	Check the power supply, close the main load switch.

	The auxiliary circuit is not energized	Check auxiliary circuit; Check the fuse on the motherboard.
	Control panel does not display content	Check power.
Indoor temperature is too high	The indoor temperature setting on the control panel is incorrect	Check the settings in the control panel
	The air flow is too small or zero	Refer to "low air flow or no air flow".
	Indoor temperature and humidity probe failure	Check whether the wiring of the probe is correct, check whether the connection between the probe and the main board is correct.
	The indoor heat load is higher than the cooling capacity of the unit	Check indoor heat load.
	The controller has named the compressor to start, but the compressor does not start.	Refer to "The compressor does not start".
Indoor temperature is low	The indoor temperature and humidity setting of the control panel is incorrect	Check the settings of the control panel.
	The heater does not start	Check whether the electrical circuit breaker is normal; Check whether the electric heating is energized; If the electric heating overheat protection is activated, check the cause of activation and reset it.
Indoor humidity is high	The indoor environment humidity setting value of the control panel is incorrect	Check the settings in the control panel
	The equipment room is poorly sealed and leaks severely	Check whether the outside is flowing into the room, and make a good seal
	The compressor does not work during the dehumidification phase	Refer to "Compressor cannot be started"
	The control system is not working properly	Check control panel condition; Check whether the control panel and sensors are working properly
Indoor humidity is low	The indoor temperature and humidity setting on the control panel is incorrect	Check the control panel settings (refer to the control panel)
	Humidifier does not work	Check the water supply pressure of the humidifier; Check whether the control system and humidification system work normally (refer to the control panel)
	The control system is not working properly	Check the control panel; Check whether the control board and probe are working properly.
Low air flow or no air flow	The fan is not powered	Check the power input of the fan
	The air filter is dirty and blocked (the air filter is dirty and blocked and the alarm is on It is likely that the alarm signal has been issued)	Clean the dust and debris of the air filter; If the blockage is serious, the air filter needs to be replaced; Check whether the setting value of the air filter alarm switch F4 is correct.
	Fan circuit breaker tripped	Check the fan winding; after reset, measure the voltage and input power value
	EC fan wind speed setting value is low	Modify the fan speed setting value
Alarm type	The reason	Solution
Electric heating overheat protection alarm	Insufficient air flow	Refer to "low air flow or no air flow"
	The electric heating overheat protection is damaged or cut off	Check whether the wiring from the electric heating overheat protection to the motherboard is normal
	False positive	Reset the overheat protection

High compressor discharge pressure	There is air or water vapor in the refrigerant circuit, Check whether there are bubbles in the sight glass, or check whether the degree of subcooling is too high	Refill refrigerant after emptying the system
	Insufficient air flow or high outdoor temperature	Check whether the rotation of the outdoor fan is correct;
		Check whether the outdoor unit coil is blocked, if there is any debris blocked Clean the surface of the coil with a brush or water spray;
		Check whether the air outlet of the outdoor unit is blocked;
		Check whether the outdoor ambient temperature exceeds the design range.
	The amount of refrigerant injected is too large; the amount of liquid in the condenser is large; The refrigerant subcooling at the outlet of the condenser is too large	Release some refrigerant
	The valve on the high pressure side of the compressor is partially blocked or not opened	Check valve opening
High voltage switch alarm (The compressor discharge pressure is too high)	The condenser pressure control system is not working properly	Check whether the condensing fan and protection device work normally; Repair or replace the faulty fan; Check whether the setting values of the condensing fan pressure switch and wind speed regulator are normal. (Refer to "Condenser Pressure Control")
	High compressor discharge pressure	Refer to "Compressor discharge pressure is high"
The compressor discharge pressure is low	The condensing pressure control system does not work (Refer to the control panel manual)	Check whether the condenser pressure control system or the condensing fan and speed regulator work normally
	Low suction pressure	Refer to "Compressor suction pressure is low"
The compressor suction pressure is high	The return air temperature of the internal machine is too high	Check whether outdoor air flows into the room
	High compressor discharge pressure	Refer to "Compressor discharge pressure is high"
	The amount of refrigerant injected is too large	Release some refrigerant
	The compressor suction pressure is abnormal	Check whether the suction temperature and pressure sensor position are correct, and they must be kept warm and insulated
The compressor suction pressure is low (the coil is likely to be frosted)	Indoor temperature is low	Refer to "Indoor ambient temperature is low"
	No wind or wind speed is too low indoors	Refer to "Insufficient air flow or no air flow"
	The reservoir outlet check valve is not fully opened	Check the valve opening
	The filter drier is dirty	Check the filter drier and replace the filter drier if necessary. The temperature difference between the inlet and outlet of the filter drier shall not exceed 2 degrees.
	Insufficient refrigerant charge	Check whether the degree of subcooling is within a reasonable range, and charge the system with refrigerant if necessary
Low voltage switch alarm (The compressor	The electronic expansion valve is set incorrectly or malfunctions	Check the electronic expansion valve settings are correct (about 5 degrees)

suction pressure is low)		
	Clogged filter drier	Check the filter drier and replace the filter drier if necessary. The temperature difference between the inlet and outlet of the filter drier shall not exceed 2 degrees.
	Low compressor discharge pressure	Refer to "Compressor discharge pressure is low"



The company reserves the right to change product specifications without notice