

KC

Air Cooled Condenser

User Maunal

Preface-About the product and manual

[To users]

Dear Kstar users! Thank you for purchasing Kstar KC series air-cooled centralized condenser! To ensure better use, please read this manual carefully before using it and ensure correct use and operation in order to achieve a lasting and reliable operation effect.

[Warranty]

This product is covered by our maintenance service with the purchase contract or relevant approved procedures.

[Exception clauses]

1. Free warranty period expires;
2. Disassembly or modification of the product without authorization;
3. Violation of product operation or use specifications;
4. Man-made failures;
5. Losses caused by force majeure or other external factors at client site.

[Note: Any of the above exemption clauses will not be covered by the warranty.]

[Customer service]

Shenzhen Kstar Science & Technology Co., Ltd. provides customers with a full range of technical support. You can contact local Kstar office or customer service center.

[Contact]

Service hotline: 400-700-9662

Company URL: www.kstar.com.cn

[Related description]

1. This manual is provided with the product. Please keep it properly for future reference. If this manual is lost or damaged, please request it directly from the manufacturer;
2. This manual is written for the KC series air-cooled centralized condenser products. The content may not be applicable to other models;
3. The copyright of this manual belongs to Shenzhen Kstar Science & Technology Co., Ltd. All rights are reserved. The content is subject to change without notice.

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Chapter 1 Product Overview

1.1 Introduction

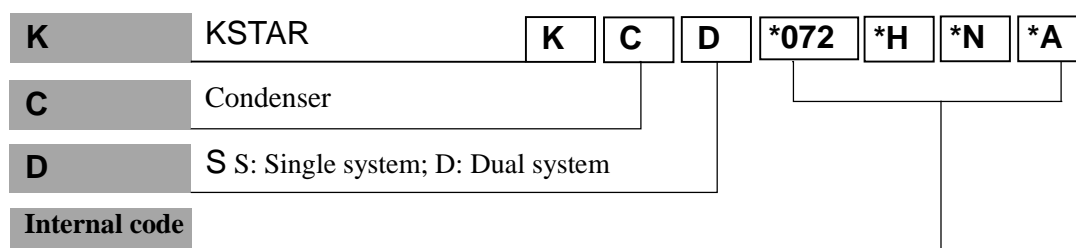
The KC series air-cooled centralized condenser is a new generation of high-efficiency energy-saving condenser independently designed and developed by Kstar and has single-system type and dual-system type. The single-system KC air-cooled centralized condenser is used to match the single-system indoor unit or single refrigeration system of the dual-system indoor unit. The dual-system KC air-cooled centralized condenser is used to match the dual-system indoor unit.

Features:

- ✓ Modular design, field splicing, easy maintenance.
- ✓ Small footprint with the same cooling capacity.
- ✓ Single and double refrigerant circuits, suitable for various systems.
- ✓ Enhanced heat transfer internal threaded tube, anti-corrosion fin coating optional.
- ✓ Marine grade corrosion-resistant aluminum, solid and beautiful.
- ✓ High-quality low-noise three-phase axial flow fan with built-in thermal protection.
- ✓ Integral protective cover prevents damage to the copper tube of the heat exchanger.
- ✓ IP55 standard electrical control box available.
- ✓ Stepless frequency conversion control of the fan.

1.2 Model Description

Taking KCD072HNA model as an example, the naming rules are shown in Fig.



KC air-cooled centralized condenser has 18 models, as shown in Table 1-1 below.

Table 1-1 Model list

No.	Type	Single system	Dual system
1		KCS032	KCD054
2		KCS036	KCD064
3		KCS042	KCD072
4		KCS048	KCD084
5		KCS054	KCD096
6		KCS064	KCD108
7		KCS072	KCD128
8		KCS084	KCD150
9		KCS096	KCD170
10		KCS108	-

1.3 Product Composition

The KC air-cooled centralized condenser consists of finned coils, axial fans, fan inverters, pressure sensors. The heat exchanger is located inside the condenser, and the appearance and location of other parts are shown in Fig. 1-2, 1-3.

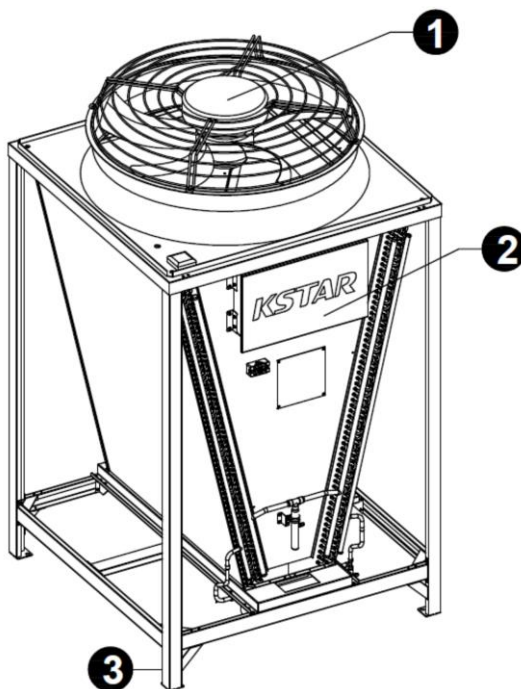


Fig. 1-2 Schematic diagram of single system of KC air-cooled centralized condenser (single fan)

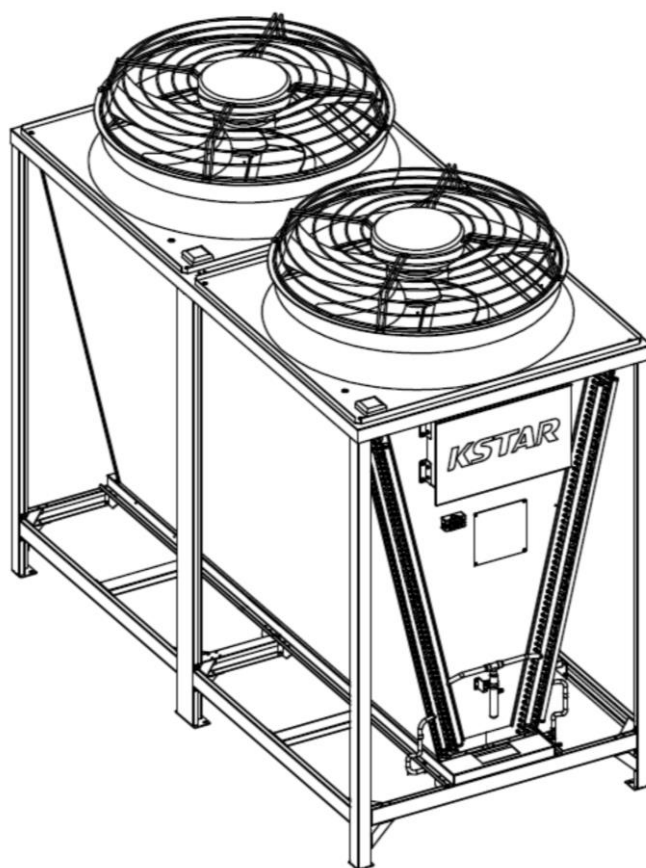


Fig. 1-3 Schematic diagram of dual system of KC air-cooled centralized condenser (two fans)

Description: 1-External fan; 2-Electric control box; 3-Support feet.

1.4 Storage Requirements

The storage environment of the condenser should meet GB/T19413-2010 and JB/T7659.5-1995. See Table 1-2 for details.

Table 1-2 Storage requirements

Content	Requirements
Storage environment	Clean (no dust), well-ventilated, indoor
Ambient temperature	-40 °C~+60 °C
Storage time	No more than 6 months; the performance needs to be re-calibrated after 6 months

1.5 Operating Environment Requirements

The condenser operating environment should meet GB/T19413-2010 and JB/T7659.5-1995. See Table 1-3 for details.

Table 1-3 Operating Environment Requirements

Item	Requirements
Installation position	The equivalent distance between the indoor unit and standard condenser is 30m; height difference * ΔH : $-5\text{m} \leq \Delta H \leq 10\text{m}$;
Ambient temperature	Normal temperature type: $-20^{\circ}\text{C} \sim +45^{\circ}\text{C}$; fluorine pump type: $-40^{\circ}\text{C} \sim +45^{\circ}\text{C}$
Operating power	$380\text{V} \pm 10\%$, 50/60Hz
Altitude	$\leq 1000\text{m}$; derated for use above 1000m.
Protection	IP55
Note: “*”: The condenser has a positive drop above the indoor unit, and a negative drop below it	

◆ Note

1. When the equivalent distance between the indoor unit and standard condenser is within 30m, please refer to the specific requirements for the equivalent length of the refrigerant connecting pipe in the *Precision Air Conditioner User Manual*.

2. When the equivalent distance between the indoor unit and the standard condenser exceeds 30m, please consult Shenzhen Kstar Science & Technology Co., Ltd. for details.

1.6 Structural Parameters

1.6.1 Shape

The dimensions of the condenser are shown in Fig. 1-4, and the specific structural parameters are shown in Table 1-4.

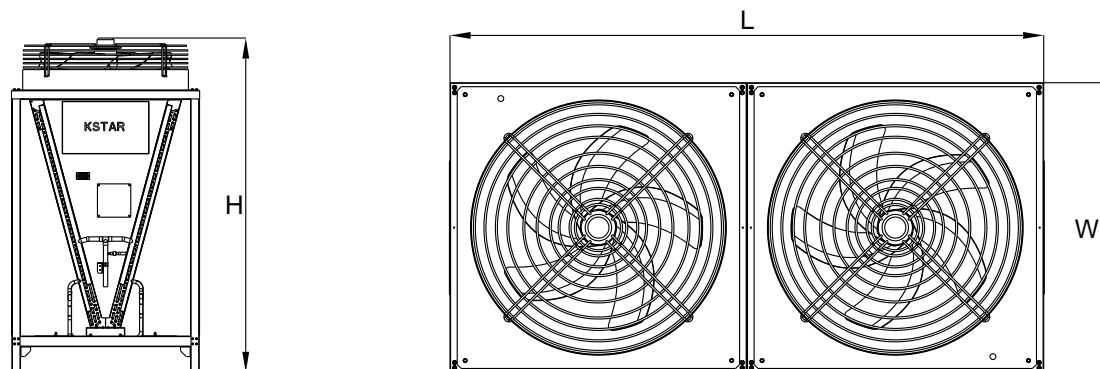


Fig. 1-4 Structure of KC air-cooled centralized condenser

Table 1-4 Structural parameters

Model	Number of fans (PCS)	Weight (kg)	Dimensions (mm)			Liquid pipe interface (mm)	Air pipe interface (PCS)
			L	W	H		
KCS032	1	124	1125	1100	1960	15.88	19.05
KCS036	1	134				15.88	19.05
KCS042	1	138	1125	1100	1960	15.88	19.05
KCS048	1	138				15.88	19.05
KCS054	1	152	1125	1100	1960	15.88	19.05
KCD054		215				15.88×2	19.05×2
KCS064	1	168	1125	1100	1960	15.88	22
KCD064		226				15.88×2	19.05×2
KCS072	1	172	1125	1100	1960	15.88	22
KCD072		232				15.88×2	19.05×2
KCS084	1	245	1125	1100	1960	15.88	25.4
KCD084		245				15.88×2	19.05×2
KCS096	1	285	1125	1100	1960	15.88	19.05
KCD096		287				15.88×2	19.05×2
KCS108	2	430	2250	1100	1960	19.05	25.4
KCD108	2	430	2250	1100	1960	15.88×2	19.05×2
KCD128	2	452	2250	1100	1960	15.88×2	22×2
KCD150	2	464	2250	1100	1960	15.88×2	22×2
KCD170	2	490	2250	1100	1960	15.88×2	25.4×2

1.6.2 Mounting Base

1.6.2.1 Outdoor unit mounting base

The outdoor unit mounting base is shown in Fig. 1-5. The specific sizes of bases/mounting holes of each model are shown in Table 1-5.

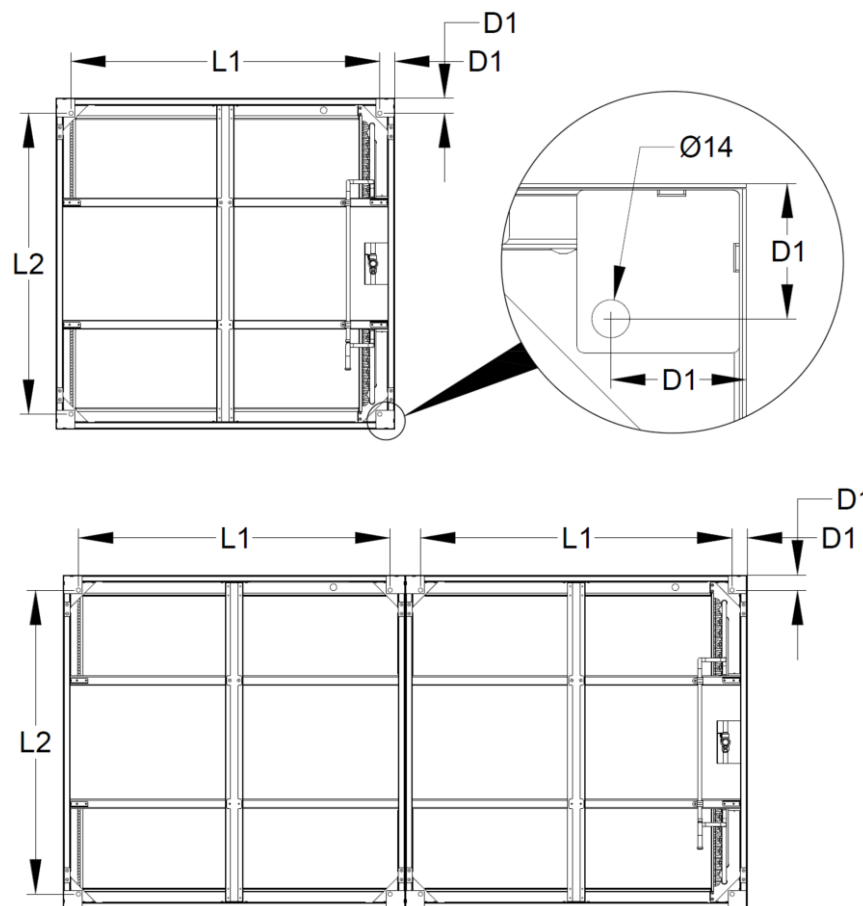


Fig. 1-5 Dimensions of the centralized machine vertical support foot vacancy

Table 1-5 Size of outdoor unit mounting hole base (unit: mm)

Model	Dimensions		
	L1	L2	D1
KCS032,KCS036,KCS042,KCS048,KCS054,KCD054,KCS064,KCD064,KCS072,KCD072,KCS084,KCD084,KCS096,KCD096,KCS108,KCD108,KCD128,KCD150,KCD170	1025	1000	47.5

◆ Note

The mounting holes are long flat holes. It is recommended to use M10×30 bolts to fix the mounting base.

Chapter 2 Installation of Condenser

2.1 Unpacking

When installing on site, first remove the packaging of the KC air-cooled centralized condenser, then remove the 4 fixing nuts, and move the condenser to the installation site.

◆ Check points

1. Check whether the condenser is under pressure.
2. When handling the condenser by hand, do not touch the copper tube in order to avoid bending and deformation of the copper tube and system leakage.

Inspection

When receiving the KC air-cooled centralized condenser, check the accessories according to the packing list, and check whether any part has obvious damage. If any part is missing or damaged, report to the carrier immediately. If you find any concealed damage, also report it to the carrier and the local office of the supplier.

2.2 Installation Requirements

2.2.1 Environment

1. In order to ensure the heat dissipation performance, please install the condenser outdoors where the air flow is smooth, avoid places where there are dust, snow and other conditions that may block the condenser coil, and also ensure that there is no steam or waste heat, acidic or alkaline gases around the unit.
2. Try to install the condenser far enough away from the residential area to avoid noise disturbing the residents. Please refer to the local environmental protection standards for the specific installation distance.
3. When installing on the roof, pay attention to the load-bearing of the floor, protect the waterproof layer of the roof, and comply with relevant local laws and regulations.
4. Make sure that the ground wire of the electric arc welder is not in contact with the condenser, so as to avoid breakdown of the welding spot in the coil by the arc.

2.2.2 Installation Space

There should be sufficient space for installation and maintenance around the installation location of the KC air-cooled centralized condenser.

◆ Space requirements

1. The KC air-cooled centralized condenser requires at least 800mm maintenance space at the front, rear, left, and right side.
2. There is no obstruction within at least 3000mm of the air outlet of the KC air-cooled centralized condenser.
3. The air outlet of the KC air-cooled centralized condenser should avoid short circuit of hot air, which will result in poor heat exchange effect, as shown in Fig. 2-5.

The specific requirements are shown in the figure below.

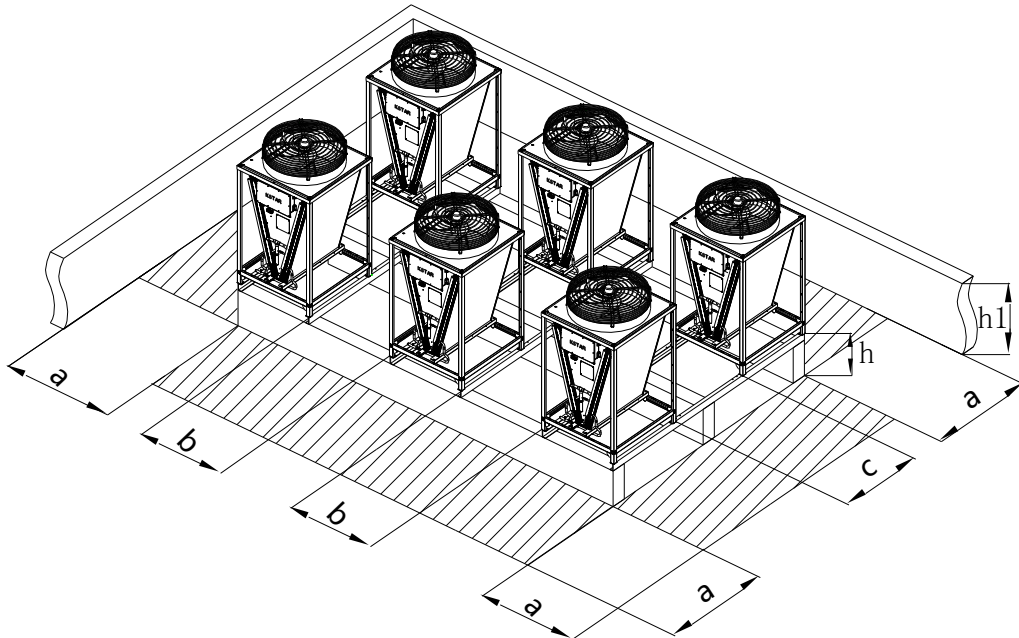


Fig. 2-1 KC*032~096 Schematic diagram of dispersion distribution

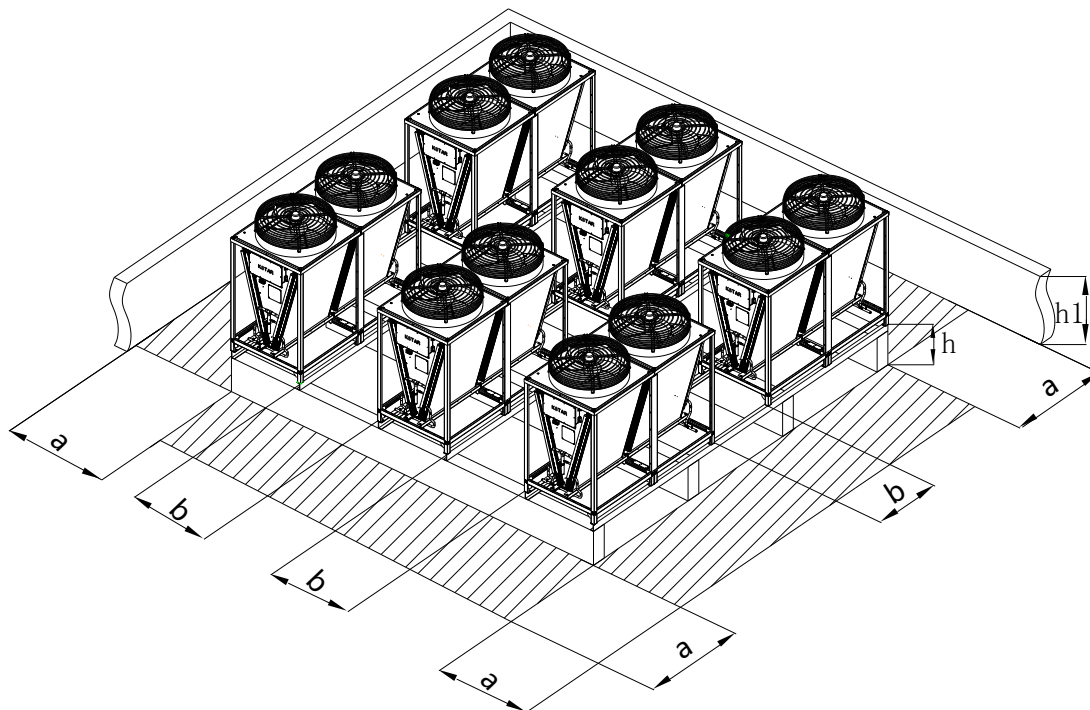


Fig. 2-2 KC*108~170 Schematic diagram of dispersion distribution

Table 2-1 Spread distribution tine space requirement (unit: m)

The number of condenser centralized installation is less than 30 units					
Model	h (Height of engineering mounting bracket)	h1	a	b	c
KC*032~096	$0 \leq h < 0.5$	≤ 1	≥ 1.5	≥ 1.4	≥ 1.0
	≥ 0.5			≥ 1.2	
KC*108~170	$0 \leq h < 0.5$			≥ 1.8	
	≥ 0.5			≥ 1.6	
The number of condenser centralized installation is 30-50 units					
Model	h (Height of engineering mounting bracket)	h1	a	b	c
KC*032~096	$0 \leq h < 0.5$	≤ 1	≥ 1.5	≥ 1.6	≥ 1.0
	≥ 0.5			≥ 1.4	
KC*108~170	$0 \leq h < 0.5$			≥ 2.0	
	≥ 0.5			≥ 1.8	

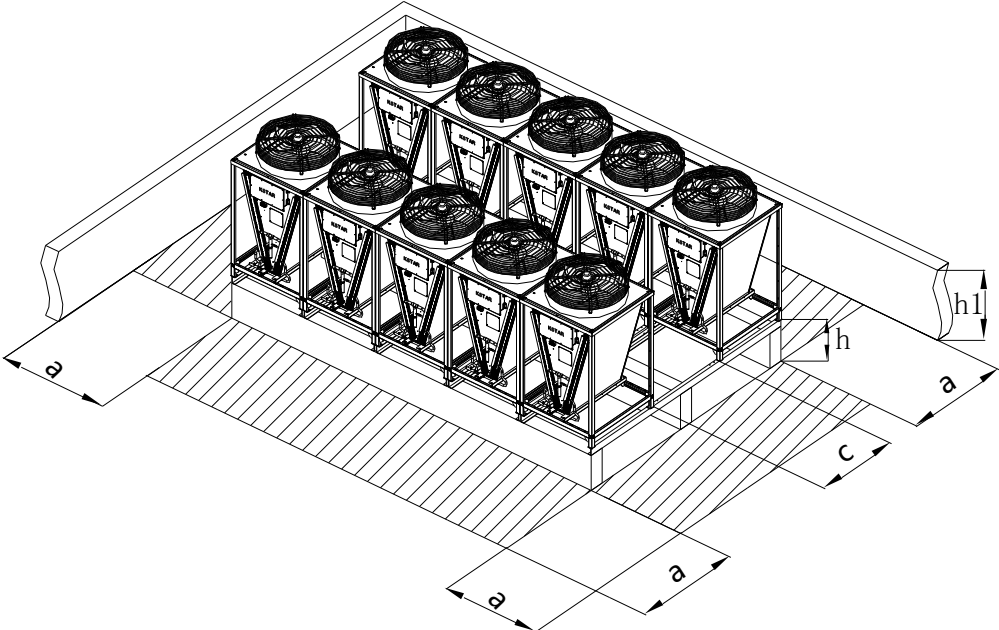


Fig. 2-3 KC*032~096 Schematic diagram of centralized installation

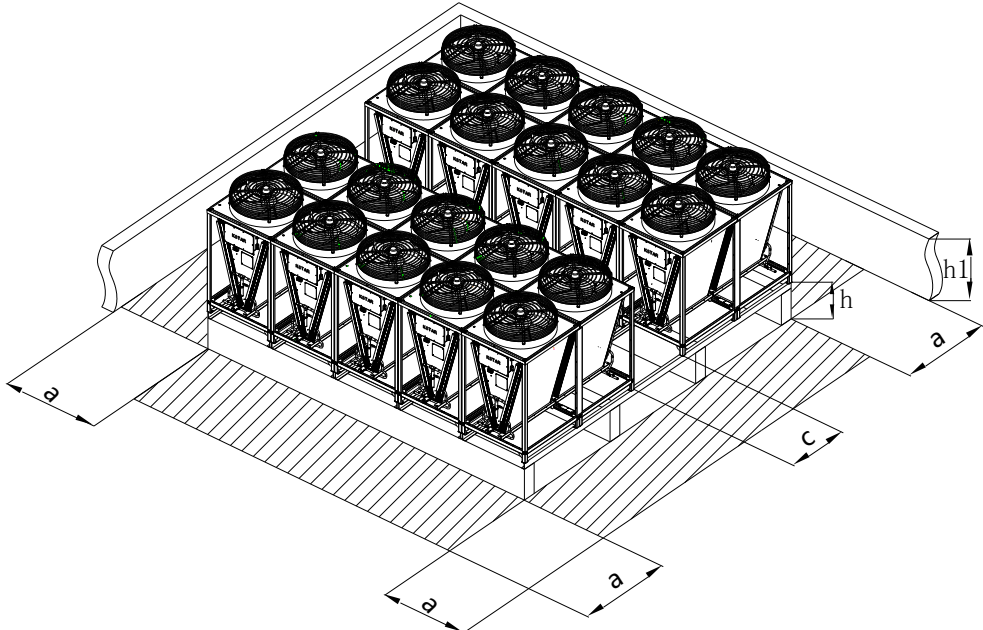


Fig.2-4 KC*108~170 Schematic diagram of centralized installation

Table 2-2 Space requirements for front and rear side-by-side installation (单位: m)

The number of condenser centralized installation is less than 30 units				
Model	h (Height of engineering mounting bracket)	h1	a	c
KC*054~096	$0.5 \leq h < 1.0$	≤ 1	≥ 1.5	≥ 1.8
	≥ 1.0			≥ 1.4
KC*108~170	$0.5 \leq h < 1.0$			≥ 2.0
	≥ 1.0			≥ 1.6
The number of condenser centralized installation is 30~50 units				
Model	h (Height of engineering mounting bracket)	h1	a	c
KC*054~096	$0.5 \leq h < 1.0$	≤ 1	≥ 1.5	≥ 2.0
	≥ 1.0			≥ 1.6
KC*108~170	$0.5 \leq h < 1.0$			≥ 1.8
	≥ 1.0			≥ 1.8

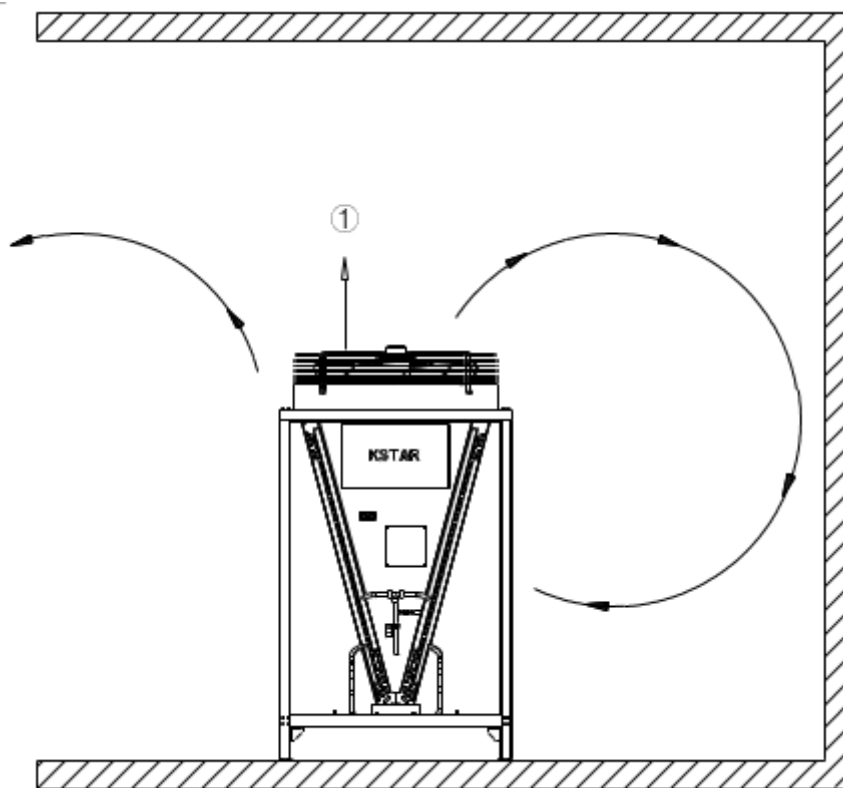


Fig. 2-5 Schematic diagram of installation of hot air short circuit

Description: ①- Wind outlet;

2.2.3 Fixing

After the installation location and method of the condenser are determined, move the condenser to the installation location and fix it with M10×30 screws or expansion screws. The installation must be firm, and stainless steel screws are recommended.

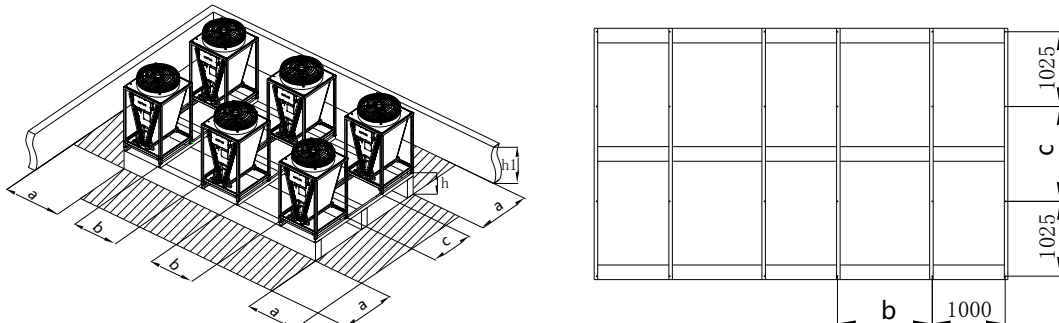


Fig.2-6 KC*032~096 Spread-out distribution base bracket dimensions

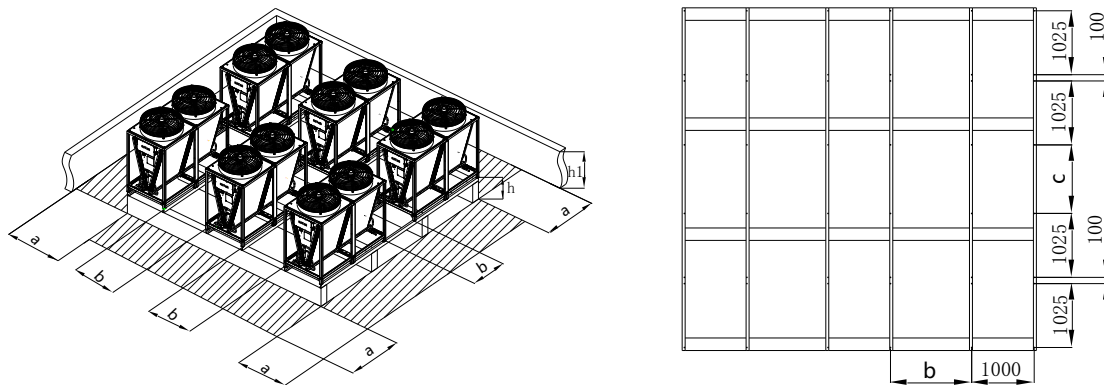


Fig.2-7 KC*108~170 Spread-out distribution base bracket dimensions

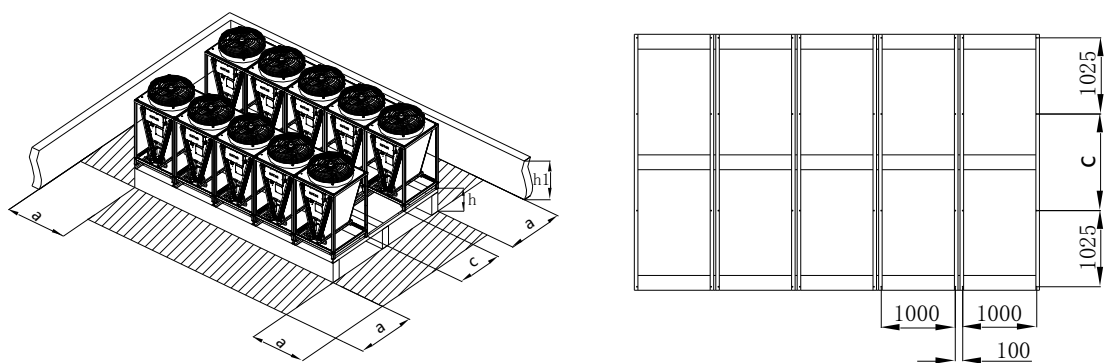


Fig.2-8 KC*032~096 Side-by-side mounting base bracket dimensions

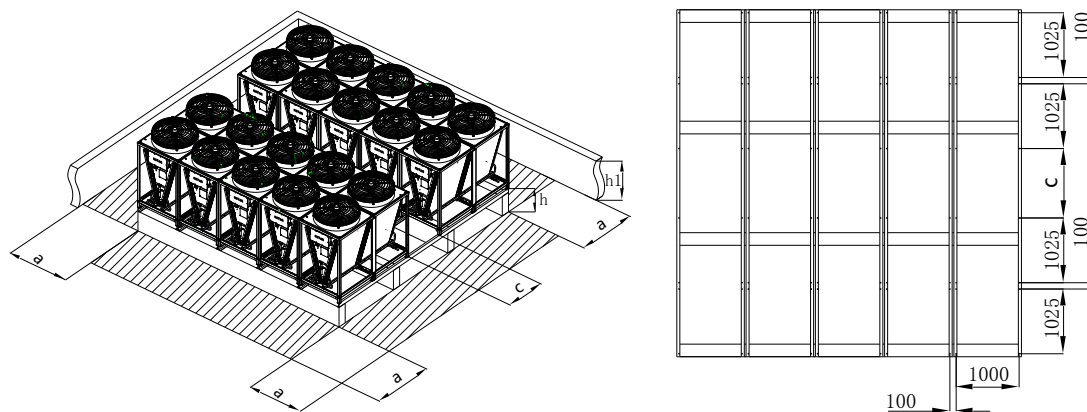


Fig.2-9 KC*108~170 Side-by-side mounting base bracket dimensions

2.2.4 Pipeline Connection of Indoor and Outdoor Units

See *Precision Air Conditioning User Manual*.

2.2.5 Cable Connection of Indoor and Outdoor Units

2.2.5.1. Determine the cable specifications

Select the power supply cable and signal cable specifications according to the rated operating current of the fan (see Table 2-1) and installation distance.

Table 2-3 Recommended cable diameter of KC air-cooled centralized condenser

Condenser model	Number of fans (PCS)	Full load current (A)	Recommended specifications for power supply cables (mm ²)	Recommended specifications for signal cables (mm ²)
KCS032,KCS036,KCS042,KCS048, KCS054,KCD054	1	2.5	1.5*4	0.5*2
KCS064,KCD064,KCS072,KCD072, KCS084,KCD084,KCS096,KCD096	1	5.0	1.5*4	0.5*2
KCS108,KCD108	2	5.0	2.5*4	0.5*2
KCS128,KCD128,KCS150,KCD150, KCS170,KCD170	2	10.5	2.5*4	0.5*2

◆ Note

The outdoor part of the cable between the indoor unit and the KC air-cooled centralized condenser must use a cable suitable for outdoor use, and the signal cable must use a twisted pair shielded cable.

2.2.5.2 Connecting cables

Outdoor unit: Connect the power cables (PE/L1/L2/L3) and signal cables (A2+/B2-/GND) from the condenser output interface of the indoor unit electric control box to the condenser electric control box according to the wiring markings as shown in Fig. 2-10. For the detailed diagram of the output interface of the indoor unit condenser, please refer to the *Precision Air Conditioner User Manual*.

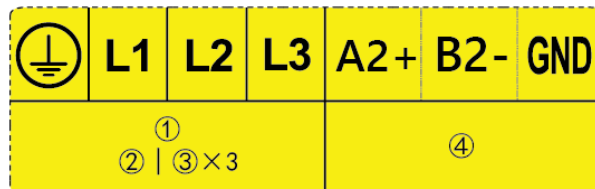


Fig.2-10 Wiring comparison of room temperature outdoor unit

Description: ①—Condenser; ②—GND; ③—Live wire; ④—Condenser 485 signal;

◆ **Note**

1. In order to ensure the high waterproof performance of the electric control box, it is necessary to apply sealant on the waterproof joint after the external power supply is connected.
2. The cables should not be in contact with high temperature objects (such as uninsulated copper tube, water pipes, etc.) in order to avoid damage to the insulation layer.
3. Please follow local regulations for wiring.

2.2.6 Pressure Maintaining, Leak Detection and Vacuuming

See *Precision Air Conditioner User Manual*

Chapter 3 Outdoor Fan Inverter

◆ Note

The content of this chapter is mainly for manufacturers or professional maintenance personnel. It is recommended that users do not operate without permission.

3.1 Fan Inverter

The wiring terminals are located on the control board of the electric control box of the fan. The distribution is shown in Fig. 3-1 and Fig. 3-2, and the specific definition is shown in Table 3-1 and Table 3-2.

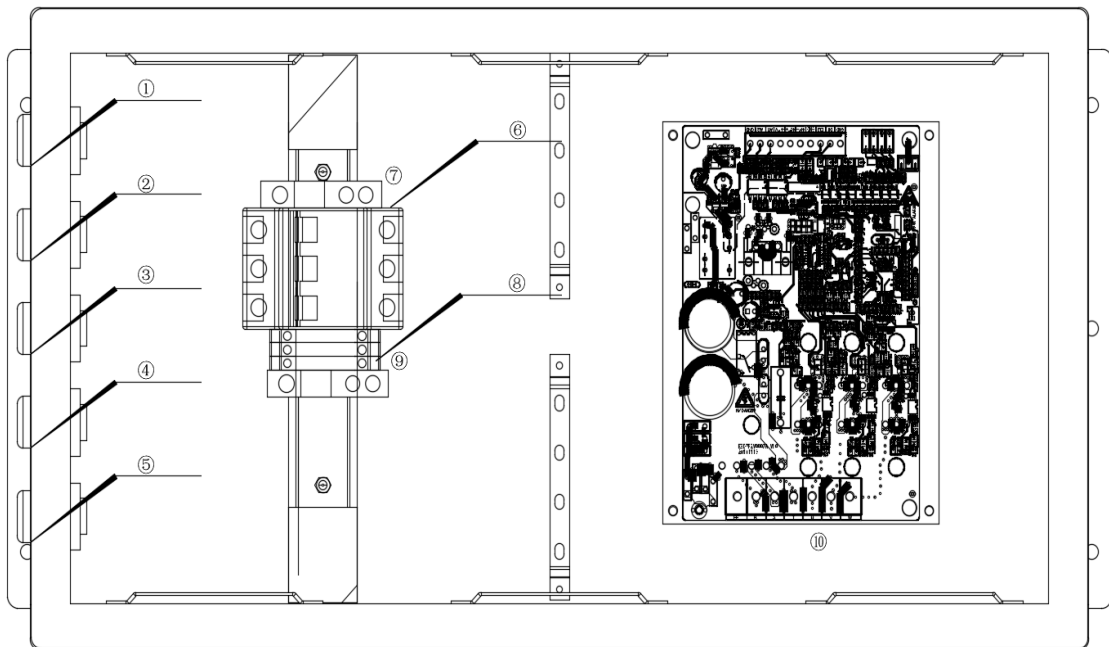


Fig. 3-1 Electric control box of outdoor unit

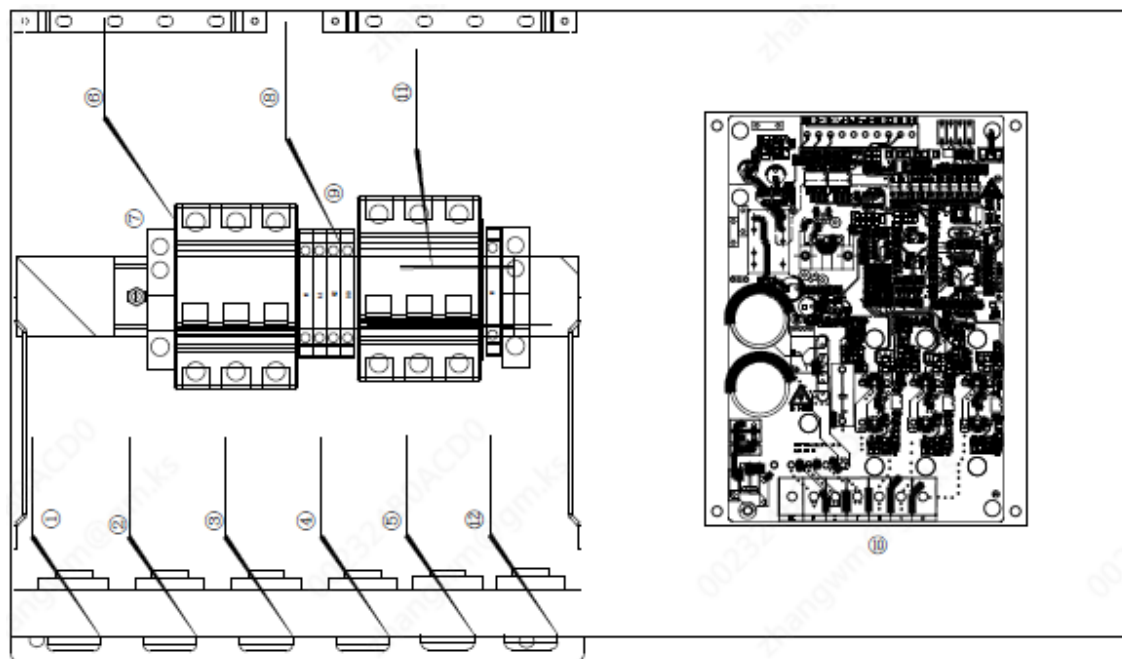


Fig. 3-2 Electric control box of outdoor unit with fluorine pump

Table 3-1 Definition of electric control box

Item	Description	Item	Description
①	Customer power inlet	②	Customer 485 signal inlet
③	Sensor 1/2 inlet	④	Fan 1/2 signal inlet
⑤	Fan 1/2 power inlet	⑥	QF1 circuit breaker D10
⑦	Fixing part *2	⑧	Gray 2.5 terminal *3
⑨	X1 terminal block	⑩	MCU1 inverter
⑪	Fluorine pump switch	⑫	Fluoride pump outlet

Table 3-2 Inverter port configuration

Terminal No.	Port type	Interface description
AI1~AI2	Analog input interface	Pressure sensor
+5V		Analog +5V voltage output (Imax=50mA)
GND		Analog GND
DI1	Digital input interface	Digital input (digital level signal)
DI2		Digital input (digital level signal)
GND		In-board GND
485+/485-	Communication port	Standard RS485 communication

Chapter 4 Maintenance and Troubleshooting

The maintenance of the unit is important to its performance and service life. Please check the KC air-cooled V-type condenser regularly, and maintain it in time if there is a problem.

◆ **Note**

Equipment maintenance must be completed by professional operators.

Except for the items that require live debugging, the power of the indoor unit must be cut off during maintenance and the air switch of the condenser must be disconnected.

When troubleshooting, if you encounter a failure that cannot be judged, please consult our technical staff in time.

4.1 Maintenance

4.1.1 Refrigeration System

Check whether the refrigeration pipes are firm. If not, use fastening objects to prevent the refrigeration pipes from vibrating with the wall, the ground or the equipment frame.

Carefully check all refrigeration pipes and fittings for oil stains to ensure that there is no leakage.

4.1.2 Heat Exchanger

Clean the fins and coils of the heat exchanger regularly.

When the air flow of the condenser is obstructed, it should be cleaned with compressed air or fin cleaning agent (weak alkaline). When using compressed air, the blowing should be in reverse airflow direction.

Check whether the fins are reversed or damaged. If there is any reversal, perform maintenance in time.

In winter, avoid the accumulation of snow from affecting the air intake of the condenser.

4.1.3 Fan

Check whether the fan is operating normally and whether there are abnormal noises, vibrations, bearing jams and other problems.

4.1.4 Fan Inverter

Check whether the fan inverter is working normally. If not, please repair or replace it in time. For maintenance methods, refer to Chapter 3 Setting and Using of Fan Inverter, etc.

4.1.5 Pressure Sensor

If the pressure sensor fails, please replace with voltage type pressure sensor that meets the requirements of use.

◆ **Note**

1. All KC air-cooled centralized condensers use voltage type pressure sensors when delivered. It is recommended that users buy directly from our company.

2. If other voltage type pressure sensors are chosen, the selected type must meet the requirements of use.

4.2 Troubleshooting

When the RUN indicator of the inverter is always in green, it means the machine is running; when the green light flashes, it means the machine is stopped. When the Alarm indicator of the inverter flashes in red, it means that the machine has a failure. In case of failure, please seek technical support from our company.