

HPAC

COOLBLADE



DX air-cooled HPAC

English

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This manual and the internal components of the air conditioning unit will use the following symbols:



User



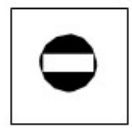
Installer



After-sales



Important



Forbid



Some content of the manual will use the following symbols:

Warning sign - Only professionals are allowed to make changes.



Prohibition sign - No modifications are allowed under any circumstances.

Professionals (Electrical): Possess specialized knowledge and extensive operational experience, able to avoid potential dangers when operating air conditioning units (IEV 826-09-01)

Each unit includes the following accessories:

- Installation Manual - User and Maintenance Manual
- Controller User Manual
- Circuit diagram
- Spare parts
- Quality Certificate - National Standard Executed by the Unit
- Warranty Terms

Model Number Coding Specification for Generator Sets

S A U 030 C

S - Single system unit
 D - Dual system unit
 A - Condensation form, air-cooled
 C - DX-V02 unit (The default represents the small cooling capacity DX (008-025) unit).

O - Supply fan unit (return air in front)
 F - Front air supply unit
 U - Downward air supply fan unit (upper return air)
 030 - Nominal cooling capacity under standard operating conditions(kW).

Overview

Overview of the COOLBLADE series units

The COOLBLADE series precision air conditioning units for technical rooms consist of components such as refrigeration systems, electric heating or finned heat exchanger systems, humidification systems, and dehumidification systems. The entire unit is centrally controlled by a microprocessor, achieving high precision and low energy consumption for superior effectiveness. It is an excellent product for energy saving and environmental protection in contemporary times. It is widely used in military, medical, financial, communications, and various fields of large data processing centers, making it your best choice. The COOLBLADE series precision air conditioning units use environmentally friendly refrigerant R410A. This series of units complies with the standards for unitary air conditioning systems for computer and data processing rooms (GB/T 19413-2010), has passed the 2006/42/CE certification, and has undergone performance testing before leaving the factory.

Appearance of the unit

The exterior color of this series of units is RAL7016, and the metal parts are made of galvanized steel plates. Our company's advanced installation technology allows the units to continue operating normally even during maintenance; at the same time, this series of units has excellent noise reduction performance, with double-layer soundproof panels available for the inner surface of the cover plates inside the units, where the soundproof panel is lined with specially made soundproof and insulation materials.

Compressor

Closed-type scroll compressor

Equipped with a motor overheat protection device and bearing locking function to prevent the compressor from operating under excessive temperature or insufficient lubrication, thereby protecting the compressor from damage.

Fan

EC Variable frequency fan

Single suction air inlet, featuring tilted blades; equipped with a brushless variable frequency motor, allowing the EC fan to achieve excellent performance under low power consumption and high static pressure conditions. Users can directly adjust the motor speed via the control panel to control the airflow of the unit or ESP.

Air filter

The air filter consists of a metal protective mesh, a synthetic treated regenerated polyester fiber filter medium, and a sheet metal frame. It meets the G4 efficiency requirements of the CEN-EN779 standard, with an average separation efficiency of 90.1% (ASHRAE). This filter is non-flammable.

The methods of supply air and return air

O - OVER: Blow air from above
 U - UNDER: Air supply from below
 F - FRONT: Sending air from the front

Evaporator

Using a finned heat exchanger as the indoor evaporator, it has a sufficiently large heat transfer area; the heat exchanger is composed of high-efficiency internally threaded copper tubes and specially shaped aluminum fins, possessing excellent heat exchange performance. At the same time, the heat exchanger is hydrophilic, facilitating the drainage of condensate. The heat exchanger is installed in front of the fan outlet, equipped with a collection tray and a drainage hose.

Electrical control box

The installation and wiring of the electrical control box fully comply with IEC204-1/EN60204-1 standards, connecting to the power junction box of the fan and compressor through contactors, and also includes a total circuit breaker to ensure electrical safety.

Controller

The microprocessor configured for the unit can perfectly control the operation of the compressor, the cooling capacity of the entire unit, and the alarm functions, and it can connect to the building's monitoring system. The controller can also precisely control the temperature and humidity of the indoor environment, while being able to monitor the operating status of the unit. Complies with EEC directive 89/336.

Airflow switch

An alarm signal will be triggered when the airflow cannot meet the indoor environmental requirements.

Electrode humidifier (H/T unit)

This humidifier can use untreated water as a source of steam, and it can turn on the humidification function based on indoor humidity while also controlling the salt content in the water.

Direct expansion unit

The direct expansion unit uses a compressor as the key refrigeration component, conducting heat exchange through air cooling or water cooling to achieve a refrigeration effect. The refrigeration system includes the following main components:

- Liquid receiver
- Dryer filter, sight glass
- Thermal expansion valve (electronic expansion valve)
- Shut-off valve
- High/low pressure switches (manual reset available)

Direct expansion air-cooled unit

All units are equipped with at least one refrigeration cycle, while some models have two refrigeration cycles. The compressor expels high-temperature, high-pressure refrigerant gas to the outdoor condenser for condensation. The refrigerant that is condensed into a liquid at the outdoor unit first enters the liquid receiver (installed indoors) to ensure an adequate flow of refrigerant passes through the expansion valve to be throttled before entering the indoor evaporator to exchange heat with the indoor air. In the evaporator, the refrigerant absorbs the heat from the indoor air, lowering the indoor air temperature. The liquid refrigerant that has absorbed heat evaporates into gas and then returns to the compressor for compression, continuing the cycle. To ensure that the compressor's discharge can be maintained at optimal pressure, we recommend the use of a condenser fan speed controller in the outdoor unit. Additionally, for units equipped with a liquid receiver, we have installed a check valve to prevent the liquid refrigerant in the receiver from flowing back into the condenser coil during winter when the outdoor pressure is too low, which would affect the heat exchange of the condenser. A low-pressure alarm device for the condenser is also installed to prevent the outdoor pressure from becoming too low.

Installation of outdoor air-cooled condensers

The indoor unit is designed to work with different models of outdoor units, including standard or low-noise types (where the condenser coil has been specially treated to reduce noise). Other information regarding the installation of outdoor units can be found in the manual for the outdoor air-cooled condenser.

Note 1: The outdoor unit and the indoor unit are sold separately.

Note 2: The indoor unit was charged with 1.5 bar of high-pressure nitrogen before leaving the factory, while the outdoor unit was charged with 8 bar of high-pressure nitrogen.

Note 3: Customers must correctly connect the refrigeration circuit between the indoor unit and the outdoor unit according to the requirements of the installation manual, and if necessary, refrigerant and refrigerating oil need to be charged.

The COOLBLADE series precision air conditioning units offer multiple supply and return air methods, depending on the position of the unit's supply and return air outlets, primarily featuring two forms: top air supply and bottom air supply.

Top air supply unit: The unit blows air from the top, usually drawing return air from the front of the unit.

SAO/DAO

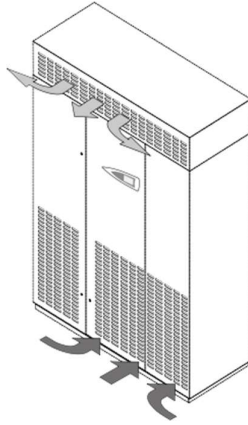


fig.1

1. The air supply is from the top, with a return air unit in front, equipped with an air outlet device

Downward air supply: The unit supplies air from the bottom and returns air from the top. The return air can be drawn directly from the indoor air or through an air inlet for the return air.

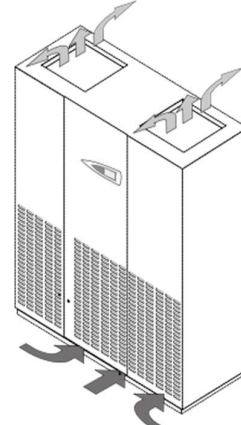


fig.2

2. The air supply is from the top, with a return air unit in front, equipped with an air outlet device.

SAU/DAU

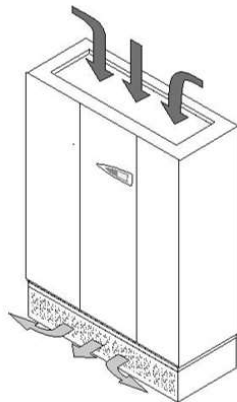


fig.3

3. Downward supply air and return air unit, equipped with a supply air outlet device

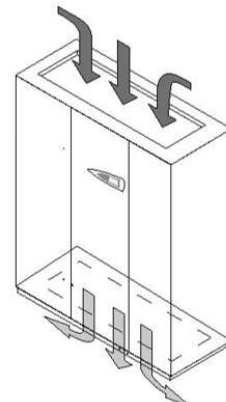


fig.4

4. Supply air from below and return air handling unit, with supply air from under the floor.

The unit nameplate is placed on the internal panel of the unit and contains the following parameters:

- Unit model and serial number
- Power supply specifications (voltage, phase, frequency)
- Operating current (including running current, full load current, and locked rotor current)
- High and low pressure switch settings (HP and LP)
- Refrigerant type (R410A)- Refrigerant charge for each circuit.

 VI25H000023				
Air Cooled Direct Expansion CRAC Unit				
Unit Model		DAU110C		
Configuration		0ECPEH0E0S0CIS0A000L0P0ES		
Serial No.		VI25H000023		
Manufacture Date		2025-09		
Total Cooling Capacity		102 kW		
Total Input Power		36.9 kW		
Heating Capacity		18.0 kW		
Humidifier Capacity		8.0 kg/h		
Unit Weight		925 kg		
AEER		4.07		
Power Supply		380/3/50 V/Ph/Hz		
Refrigerant/Ref. Charge		R410A	-- kg	
Maximum Pressure		HP 4.3 MPa	LP 2.8 MPa	
Current	Component	FLA(A)	LRA(A)	QTY
	Compressor	68	174	2
	Fan(s)	16.8	--	3
	Condenser Fan(s)	18	42	6
	E.L.Heater	27.3	--	3-stages
	Humidifier	9.1	--	1
	Total	93.9	--	--
 Climaveneta Chat Union Refrigeration Equipment Vietnam Co., Ltd Address: Factory B1, Road No01, Phuc Long Industrial Park, My Yen, Tay Ninh, Vietnam Tel: (+84) 272 398 6866 Place of Origin: Made in Vietnam				

The internal components of the unit can be accessed for corresponding operations by removing the panels from various directions. The front panel and side cover can be removed in two ways.:

Front panel

All front panels are secured with hinges and can be opened or closed using the locks on the panels. The front panels can be unlocked or locked with a key that works with the lock. Once the front panels are opened, the unit can be operated; inspections and maintenance can be carried out smoothly even in very confined spaces. After opening the front panels, all components of the unit can be accessed, and the number of front panels depends on the cooling capacity of the unit.

Side cover panel

All side panels can be removed, and the side panels are secured with screws. However, during routine maintenance, it is not necessary to remove the side panels, which means multiple units can be placed closely in a row without needing to leave space on the sides. Black plastic sealing caps are installed on the screw holes of the side panels.

Back cover plate

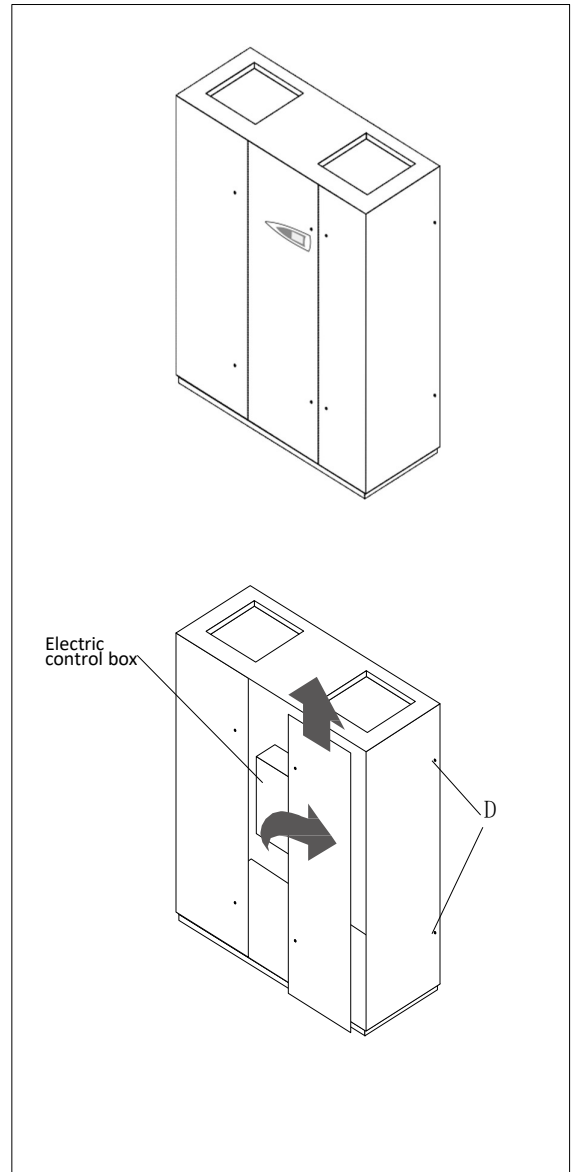
The rear cover is secured with self-tapping screws. In most cases, the rear cover is installed flush against the wall, so it does not need to be removed.

Medial plate

The high-speed fans and electric heaters inside the unit are blocked by the inner panel, which provides protection. The inner panel cannot be removed while the unit is still operating.



Warning: Before restarting the unit, be sure to check that all the outer cover panels have been properly reinstalled.

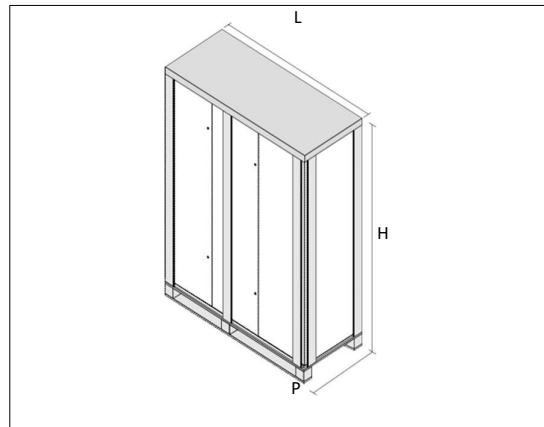


Do not tilt or lay the air conditioning unit on its side when moving it. It is best to unpack the unit at the installation site and try not to expose it outdoors for too long.

The unit can be moved in the following ways:

- Using a forklift; the unit's wooden base has openings for the forklift.
- Using a sling; when using a sling, be careful not to lift the edges of the unit.

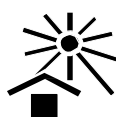
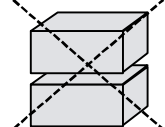
The air conditioning unit must be stored indoors, preferably retaining its original packaging; the storage environment's humidity must be below 85%, and the temperature below 50°C.



Packaging dimensions of the unit

Model	008	013	017	020	025	030	035	040	045	035	045	050	060	070	080	090	100	110
	SAU/O/F					SAU/O-C					DAU/O-C							
L mm	700		900			990			1430				1840			2280		2690
P mm	650		800			1090			1090				1090			1090		1090
H mm	2165		2165			2190			2190				2190			2190		2190
Net weight (kg)	169	184	264	269	279	373	378	383	435	445	445	455	632	672	687	731	746	1020

The following symbols are formulated according to the ISO 7000 standard and will appear on the packaging of the equipment unit, with their specific meanings as follows.:

 Fragile: Handle with care  Keep dry: The unit must be placed in a dry environment.  Center of gravity position: Indicates the position of the unit's center of gravity  Stay away from high-temperature heat sources: The unit must be kept away from heat sources.	 Movement Direction: Correct unit placement form when moving the unit  Temperature requirements: Environmental temperature requirements for storing and transporting air conditioning units  Hooks cannot be used: Hooks must not be used to move the unit.  Units cannot be stacked
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Unit Reception

When receiving the air conditioning unit, it is necessary to check whether the unit is intact and undamaged. If any damage caused by transportation is found, please immediately notify the carrier in writing. 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 placed in the correct position before installing the unit.

Model	008	013	017	020	025	030	035	040	045	035	045	050	060	070	080	090	100	110
	SAU/O/F					SAU/O-C				DAU/O-C								
Width mm	600		800			890			1330				1740			2180		2590
Depth mm	550		700			990			990				990			990		990
Height mm	1980		1980			1990			1990				1990			1990		1990
Weight kg	130	145	210	215	225	325	330	335	380	390	390	400	565	605	620	650	665	925

The air conditioning unit can be placed directly on the base and should be at least 5mm above the ground; otherwise, it may cause condensate leakage.

Warning: The air conditioning unit must be installed indoors and must not be used in harsh environments; when installing, elastic gaskets need to be placed around the bottom of the unit to reduce noise and vibration.

Installation Bracket (Optional) The installation bracket serves the following purposes:

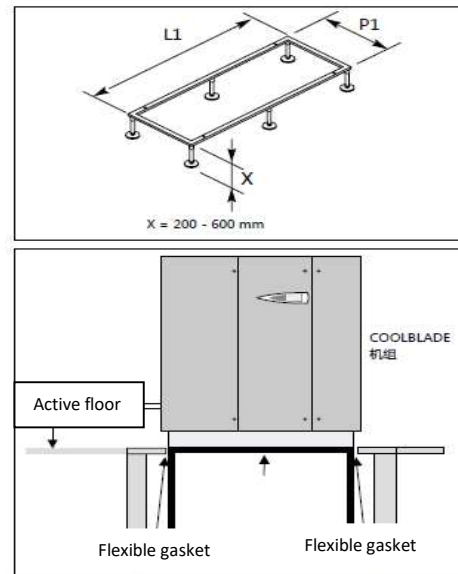
- Allows air conditioning units to be installed before laying the raised floor
- Effectively suppresses mechanical vibrations
- Facilitates convenient piping arrangement

The height of the installation bracket is adjustable. In the right diagram, X represents the height of the installation bracket, with an optimal range of 200 to 600 mm. To reduce noise and vibration, elastic pads installed under the unit should be at least 5 mm thick. The elastic pads must be installed between the unit and the top surface of the raised floor, while also ensuring insulation from the ground.

Note: The mounting bracket must be installed according to the instructions provided in the installation manual.

Recommended stent size

Mode I	00 8	01 3	01 7	020	025	030	035	040	045	035	045	050	060	070	080	090	100	110
	SAU/O/F					SAU/O-C					DAU/O-C							
L1 mm	600		800			850				1290			1700			2140		2550
P1 mm	535		685			950				950			950			950		950

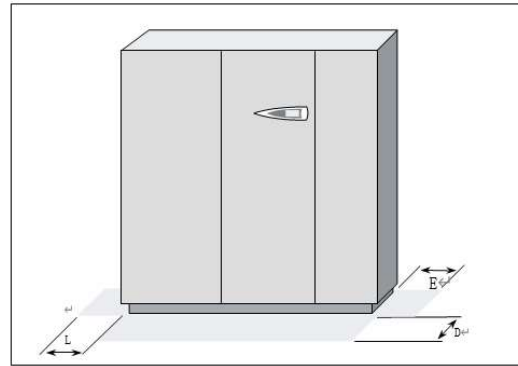


The installation of the COOLBLADE series units only requires leaving enough space directly in front of the unit. This space design ensures that customers can easily operate during installation or future maintenance. Additionally, thanks to the structural features of the COOLBLADE series, multiple units can be installed side by side or on a base frame without needing to leave space on the sides or at the back.

To facilitate maintenance or other operations of the unit, please ensure that at least 900mm of space is reserved in front of the unit.



Warning: Under no circumstances should all or part of its be returned to the air vent to block it.



Model	008	013	017	020	025	030	035	040	045	035	045	050	060	070	080	090	100	110
	SAU/O/F					SAU/O-C				DAU/O-C								
D mm	>900																	
E mm	0																	
L mm	0																	

Both air-cooled and water-cooled units of the COOLBLADE series must operate within the specified operating range shown below (this operating range assumes that the unit has been properly installed and operated).

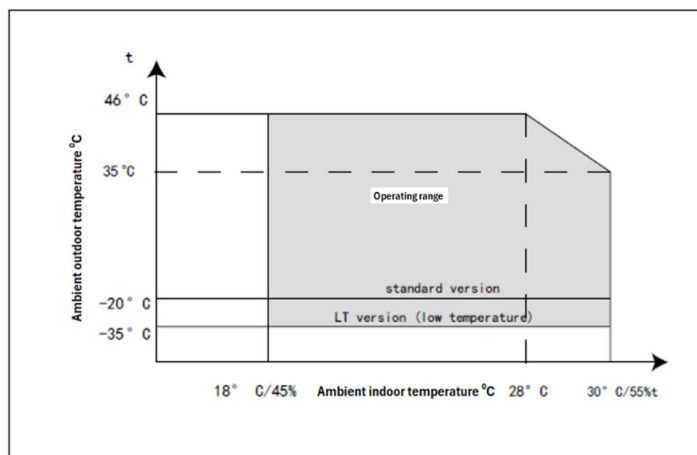
Environmental temperature and humidity control range:

The controllable environmental temperature is 22-30°C, and the humidity is 45-55%.

Outdoor environment:

From -20.0°C to 46.0°C, suitable for standard units. From -35.0°C to 46.0°C, the unit requires low-temperature components

To ensure the proper operation of the data center air conditioning, the unit must operate within the working condition range shown in the right-hand diagram.



The standard configuration of this series of units is equipped with G4 air filters, or optionally F5 filters, installed in front of the unit's return air inlet.

Install positioning

1. Check whether the installation site can support the weight of the unit. Information on the unit's weight can be found in the technical specification sheet (Fan-cooled precision air conditioning unit parameter sheet).
2. According to the design requirements, the air conditioning unit should be installed on a level indoor foundation. A sturdy base helps distribute the weight evenly. When selecting an installation location, necessary maintenance space and airflow space should be considered.
3. Children, unauthorized personnel, and animals are not allowed to enter the installation site of the air conditioning unit.
4. When the compressor is running, the air conditioning unit may produce vibrations. To prevent such vibrations, it is recommended to install the unit on a vibration-damping base, similar to using vibration-damping pads to position the unit on an elevated floor base.
5. The air conditioning unit should not be installed in offices or other noise-sensitive rooms.
6. The unit must not be installed in environments with flammable or explosive gases.

Refrigeration circuit connection

The following is the recommended refrigeration circuit for an equivalent total pipeline length of 50 meters. To achieve optimal performance, the pipe walls and diameters should be selected according to the table.

Model	Pipe Diameter X Wall Thickness (mm)	
	Gas pipe	Liquid pipe
SA 008	12×1	10×1
SA 013	16×1	12×1
SA 017	19×1	16×1
SA 020	19×1	16×1
SA 025	19×1	16×1
SA 030C	19×1	16×1
SA 035C	22×1.2	16×1
SA 040C	22×1.2	16×1
SA 045C	22×1.2	19×1
DA 035C	19×1	16×1
DA 045C	19×1	16×1
DA 050C	19×1	16×1
DA 060C	19×1	16×1
DA 070C	22×1.2	16×1
DA 080C	22×1.2	16×1
DA 090C	22×1.2	19×1
DA 100C	28×1.5	19×1
DA 110C	28×1.5	19×1

1. The refrigerant piping connections are located near the compressor and are labeled as 'gas pipe' and 'liquid pipe'; for dual-circuit units, they are labeled 'gas pipe 1' and 'gas pipe 2' respectively.

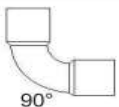
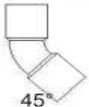
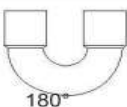
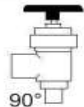
2. Pipes must be connected by welding. For dual-loop units, do not weld the loops to the wrong external unit.

Connection between indoor and outdoor units

Installation Instructions						
Series	STD			Increase extension components (The effective pipe length range is increased, while the positive and negative drop range remains unchanged)		
	Effective length of pipe	Positive gap	Negative gap	Effective length of pipe	Positive gap	Negative gap
SAO/U、DAO/U...C (EC Fan)	≤50M	≤25M	≤5M	≤50-80M	≤25M	≤5M
Notes:1. Positive height difference: the vertical distance where the outdoor unit is higher than the indoor unit; negative height difference: the vertical distance where the outdoor unit is lower than the indoor unit;2. If the positive height difference exceeds the recommended range, you can consult the factory. If the negative height difference exceeds the range, the unit cannot be used;3. When there is a positive height difference, add an oil trap bend for every 3-5 meters the refrigerant pipe rises.						

Low Temperature and Extended Component Instructions						
		Storage tank	Oil separator	Check valve	Solenoid valve	Note
SAU/O/F008-025（EC FAN）	STD	×	×	×	×	The installation position of the additional components is yet to be determined (it could be inside or outside the unit). As non-standard optional parts, you need to consult with technical support before placing an order.
	Low-temp. component	√	×	√	√	
	Extension Component	√	√	√	√	
SAO/U、DAO/U030-110C（EC FAN）	STD	√	×	×	×	
	Low-temp. component	√	×	√	√	
	Extension Component	√	√	√	√	
Note: √ indicates configured, × indicates not configured						
1. The oil separator is installed at the outlet of the exhaust pipe.						
2. The storage tank is installed on the liquid line coming out of the condenser.						
3. When the unit requires both low-temperature components and extended components, you can choose the extended components.						
4. If the unit is equipped with an electronic expansion valve, there is no need to install a solenoid valve.						

Effective length equivalent for elbows, shut-off valves, and check valves:

Pipe diameter	 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

The selection of the power supply input wire gauge needs to take into account factors such as the total length of the power cable and the installation method of the unit. The power supply input wire gauge is chosen based on the maximum input current of the air conditioning unit. This helps to avoid excessive voltage drop (the input voltage fluctuation range must be within 90%-110% of the rated voltage).

The table below lists the minimum wire gauge required for the unit:

Note:

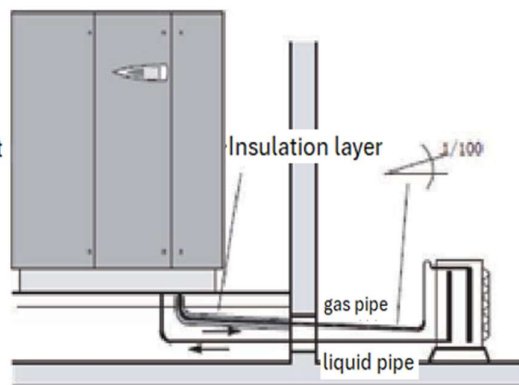
An auxiliary fuse must be installed before the power input of the unit to prevent electrical accidents caused by power short circuits (current can reach up to 10kA).

Electrical parameters of the entire unit when configuring the EC fan																		
Mod.	Unit power supply	B				R				H				T				Isolation switch
		FLI (kW)	FLA (A)	SA (A)	mm ²	FLI (kW)	FLA (A)	SA (A)	mm ²	FLI (kW)	FLA (A)	SA (A)	mm ²	FLI (kW)	FLA (A)	SA (A)	mm ²	--
SAF/O/U 008	380V/3 N/50	3.2	6.3	26.8	6	10.2	16.9	37.4	6	5.5	16.5	37.0	6	10.2	16.9	37.4	6	4P/80A
SAF/O/U 013	380V/3 N/50	4.9	10.4	33.8	6	11.9	21.0	44.4	6	7.2	20.6	44.0	6	11.9	21.0	44.4	6	4P/80A
SAF/O/U 017	380V/3 N/50	6.0	13.6	65.8	6	13.0	24.2	76.4	6	9.8	19.3	71.5	6	13.0	24.2	76.4	6	4P/80A
SAF/O/U 020	380V/3 N/50	6.2	16.8	76.8	6	13.2	27.4	87.4	6	10.0	22.5	82.5	6	13.2	27.4	87.4	6	4P/80A
SAF/O/U 025	380V/3 N/50	9.4	16.8	102.8	6	16.4	27.4	113.4	6	13.2	22.5	108.5	6	16.4	27.4	113.4	6	4P/80A
SAU/O030C	380V/3 N/50	14.9	25.8	126.0	6	23.9	39.4	126.0	10	18.6	31.5	131.0	6	23.9	39.4	131.0	10	63
SAU/O035C	380V/3 N/50	16.7	28.9	126.0	6	25.7	42.5	126.0	10	20.4	34.6	131.0	6	25.7	42.5	131.0	10	63
SAU/O040C	380V/3 N/50	18.8	33.5	153.0	6	27.8	47.1	153.0	10	22.6	39.2	158.0	10	27.8	47.1	158.0	10	63
SAU/O045C	380V/3 N/50	18.8	33.5	153.0	6	27.8	47.1	153.0	10	22.6	39.2	158.0	10	27.8	47.1	158.0	10	63
DAU/O035C	380V/3 N/50	18.1	29.2	100.0	6	19.8	31.0	100.0	6	21.9	34.9	106.0	6	21.9	34.9	106.0	6	63
DAU/O045C	380V/3 N/50	20.1	33.0	106.0	6	20.8	33.0	106.0	6	23.9	38.7	112.0	10	23.9	38.7	112.0	10	63
DAU/O050C	380V/3 N/50	22.9	38.4	121.0	10	22.9	38.4	121.0	10	26.6	44.1	127.0	10	26.6	44.1	127.0	10	63
DAU/O060C	380V/3 N/50	29.8	51.6	151.0	16	36.4	58.7	151.0	16	35.8	60.7	160.0	16	36.4	60.7	160.0	16	100
DAU/O070C	380V/3 N/50	33.4	57.8	154.0	16	38.2	61.8	154.0	16	39.4	66.9	164.0	25	39.4	66.9	164.0	25	100
DAU/O080C	380V/3 N/50	37.6	67.0	186.0	25	40.3	67.0	186.0	25	43.6	76.1	195.0	25	43.6	76.1	195.0	25	100
DAU/O090C	380V/3 N/50	37.6	67.0	186.0	25	40.3	67.0	186.0	25	43.6	76.1	195.0	25	43.6	76.1	195.0	25	100
DAU/O100C	380V/3 N/50	45.0	80.6	214.0	25	45.0	80.6	214.0	25	51.0	89.7	223.0	25	51.0	89.7	223.0	25	125
DAU/O110C	380V/3 N/50	48.5	86.2	220.0	25	48.5	86.2	220.0	25	54.5	95.3	229.0	25	54.5	95.3	229.0	25	125

B = Cooling only
 R = Cooling only, standard electric heating (dehumidification function)
 H = Cooling only, humidifier
 T = Cooling only, standard electric heating, humidifier
 ※ The cable cross-sections in the table are designed based on the YJV copper core current-carrying capacity in air: ambient temperature 40°C, using the maximum rated conductor temperature (90°C)
 ※ The condenser matching is based on an outdoor temperature of 46°C, please select the specific model according to the actual project situation
 ! The above data values do not include external units. If an external unit is used and the power supply is provided by the internal unit, please add the current of the external unit to the maximum load current

Insulate the internal piping inside the unit.
The gas pipe must be insulated.
The liquid pipe does not require insulation.

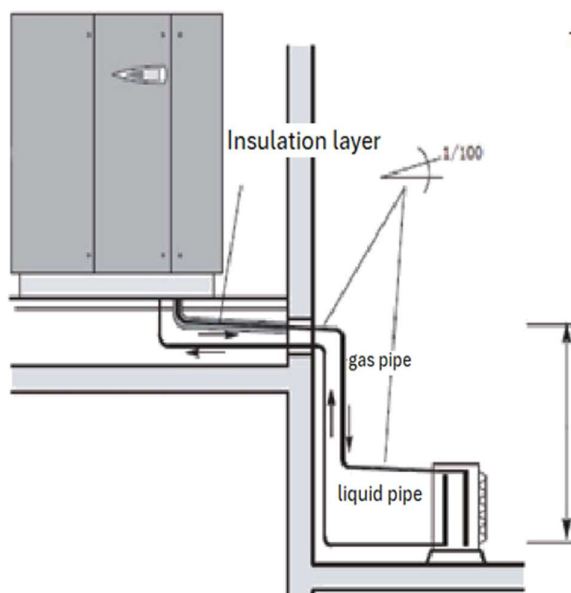
indoor unit



Insulate outdoor piping
The gas pipe does not require insulation.
The liquid pipe must be insulated.

Insulate the internal piping inside the unit.
The gas pipe must be insulated.
The liquid pipe does not require insulation.

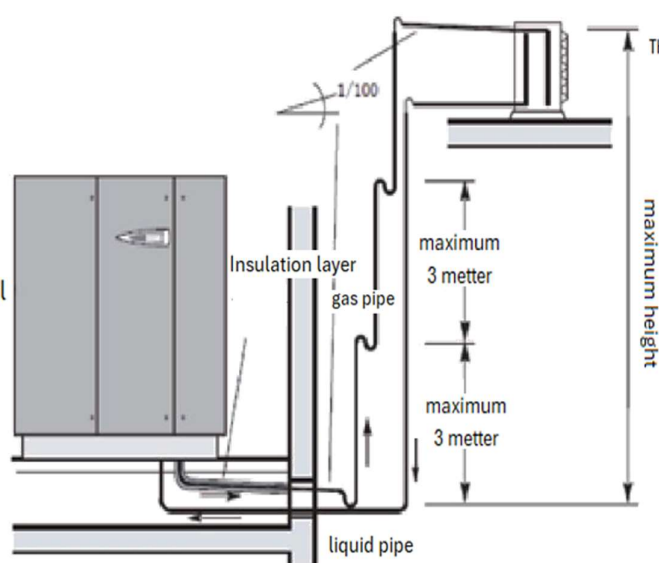
indoor unit



Insulate outdoor piping
The gas pipe does not require insulation.
The liquid pipe must be insulated.

Insulate the internal piping inside the unit.
The gas pipe must be insulated.
The liquid pipe does not require insulation.

cooling coil



Insulate outdoor piping
The gas pipe does not require insulation.
The liquid pipe must be insulated.

Note: Do not expose the liquid pipe to direct sunlight. A minimum clearance of 30 mm must be maintained between the gas pipe and the liquid pipe.

The COOLBLADE series air-cooled precision air conditioning units are filled with a small amount of refrigerant at the factory, which cannot be used for operation or pressure maintenance. Therefore, after the unit arrives on site, it is first pressurized, and during installation, an appropriate amount of refrigerant needs to be added to the refrigeration system.

Refrigerant	Refrigeration oil model		
R410A	Copeland compressor	Japanese-style scroll compressor	rotary compressor
	Emkarate RL32-3MAF	FVC68D	FV50S

1. Open any valve on the unit to ensure all components in the system have expelled internal high-pressure gas.
2. Connect a high-efficiency vacuum pump to the charging valve on the compressor suction and discharge piping.
3. Connect the refrigerant charging machine to the system's charging valve.
4. Begin the vacuum process. Stop vacuuming only when the absolute pressure inside the unit drops below 10 Pa (0.07 mm Hg) to remove air and moisture from the system.
5. Vacuuming must be carried out slowly and maintained for a long period, and the system pressure should not be quickly reduced below 10 Pa. Once the absolute pressure meets the requirement, maintain it for 100 seconds and confirm that the system's absolute pressure does not exceed 200 Pa.
6. Typically, if the system contains a lot of moisture or for large units, vacuuming must be repeated several times. Once the system's absolute pressure reaches the required level, inject high-pressure nitrogen into the system and repeat the vacuum process.
7. Charge a small amount of refrigerant into the system.
8. Start the compressor while slowly charging refrigerant into the system. Carefully observe the sight glass; stop charging when the suction and discharge pressures stabilize within the appropriate range and no bubbles appear in the sight glass.
9. Before charging the refrigerant, consider local environmental requirements for refrigerant leakage. For units equipped with stop valves, partially close the stop valve during refrigerant charging to prevent the condenser fan from abrupt stops or starts, which could affect its lifespan. Ensure that the system's subcooling is approximately 3~5°C and superheat is about 5°C.
10. Japanese scroll compressors (including Ta Mitsubishi inverter compressors, Matsuyou fixed-speed compressors, Kowa Mitsubishi fixed-speed compressors) use Showa FVC68D lubricating oil (spare part number N8051304). For Mitsubishi LN28YQAMC and LN51YRMMC rotary compressors, FV50S lubricating oil is used (spare part number N8051302). If the connecting pipe is within 30 meters, additional oil is unnecessary. For longer pipes, calculate the refrigerant in the portion exceeding 30 meters according to the table 'Refrigerant charge per meter of piping' and multiply by 10% to determine the extra oil required. If the compressor is equipped with an oil sight glass, use its level as a reference after the system is stable. Note: To ensure the quality of lubricating oil, it is recommended to purchase it through official channels from the equipment manufacturer.
11. Emerson Copeland compressors use Emkarate RL32-3MAF lubricating oil (spare part number N8051303). If the connecting pipe is within 30 meters, no additional oil is needed. For longer pipes, calculate the refrigerant exceeding 30 meters according to the table 'Refrigerant charge per meter of piping' and multiply by 10% to determine the extra oil required. If the compressor is equipped with an oil sight glass, use its level as a reference after the system is stable.
12. Oil filling precautions: Before starting, after balancing high and low-side pressures, add refrigerating oil through the needle valve on the copper pipe welded to the inlet of the oil separator (see Attachment 2) using a high-pressure oil gun or oil pump. The amount of oil depends on the amount of refrigerant charged. After starting, a small amount of oil can be slowly added through the needle valve on the suction pipe. Supplement the oil gradually according to the refrigerant charge and monitor the oil sight glass once the system stabilizes.
13. Refrigerant charge should first be added from the high-pressure liquid line side (between the condenser outlet and the receiver) before starting the unit. After starting, a small amount can be supplemented from the needle valve on the piping between the expansion valve and the evaporator. Direct charging into the compressor suction pipe is prohibited.
14. When releasing refrigerant on-site, do not release too fast to avoid taking out excessive lubricating oil. Do not leave site piping exposed to air for more than 30 minutes. Do not leave supplemental lubricating oil exposed to air for more than 30 minutes.

Indoor unit evaporator volume and refrigerant charge

Model	Evaporator volume [dm ³]	Refrigerant charge [kg]	Tube length 30m	Refrigerant Type
SA008	1.7	0.9	1.49	R410A
SA013	2.5	1.8	2.32	R410A
SA017	3.5	2.7	5.34	R410A
SA 020	5.3	2.7	5.34	R410A
SA 025	5.3	5.1	5.34	R410A
SA 030C	6.1	3.1	5.34	R410A
SA 035C	8.1	4.1	5.34	R410A
SA 040C	8.1	4.1	5.34	R410A
SA 045C	9.8	4.9	6.81	R410A
DA 035C	9.8	4.9	5.34X2	R410A
DA 045C	9.8	4.9	5.34X2	R410A
DA 050C	13.1	6.6	5.34X2	R410A
DA 060C	13.4	6.7	5.34X2	R410A
DA 070C	17.8	8.9	5.34X2	R410A
DA 080C	17.8	8.9	5.34X2	R410A
DA 090C	22.8	11.4	6.81X2	R410A
DA 100C	22.8	11.4	6.81X2	R410A
DA 110C	34.9	17.5	6.81X2	R410A

* The refrigerant charge amounts listed in the table are theoretical values; the actual charge amounts are as indicated on the unit's nameplate.

Outdoor unit condenser volume and refrigerant charge amount

Model	Condenser volume [dm ³]	Refrigerant charge [kg]	Refrigerant Type
C14	3.4	1.7	R410A
C17	3.4	1.7	R410A
C24	5.3	2.7	R410A
C29	7.9	4.0	R410A
C33	10.2	5.1	R410A
C42	9.6	4.8	R410A
C49	10.5	5.3	R410A
C58	15.8	7.9	R410A
C74	15.8	7.9	R410A
C82	23.6	11.8	R410A

Note: The refrigerant charge amounts listed in the table above are theoretical values; the actual charge should be as indicated on the unit's nameplate.

When the distance between the indoor and outdoor units exceeds 30 meters, it is necessary to add refrigeration oil according to the pipe length.

Charging of refrigerant/refrigeration oil

Liquid pipe diameter[mm]	Add refrigerant according to the pipe length [kg/m] ⁽²⁾	Refrigeration oil charge[l] ⁽¹⁾
10	0.070	0.05
12	0.101	0.08
14	0.137	0.12
16	0.178	0.15
18	0.227	0.19
22	0.339	0.25

(1) : When the distance between the indoor and outdoor units exceeds 30 meters, additional refrigeration oil should be added every 10 meters. For Emerson Copeland scroll compressors, the recommended refrigeration oil is Emkarate RL32-3MAF; for Mitsubishi LN28YQAMC and LN51YRMMC rotary compressors, the recommended refrigeration oil is FV50S. Japanese scroll compressors are recommended to use FVC68D refrigeration oil.

(2): Refers to the distance between the indoor and outdoor units.

Debugging process

- Close the auxiliary circuit breaker
- Close all circuit breakers inside the electric control box
- Power on the unit and close the load switch;

Check if the unit control panel is powered on, and check whether the two indicator lights related to phase sequence protection (RSF) are both on: the yellow light indicates power is on, and the green light indicates correct phase sequence.

- If the green indicator light is not on, disconnect the unit's power, swap any two of the three-phase power lines, and restart the commissioning. (Only applicable for units with oil heating strips)
- Before the unit officially operates, it needs to be powered on for at least 12 hours so that the heating strip can fully heat the refrigerant oil at the bottom of the compressor, as refrigerant oil that is too cold will affect lubrication and cooling performance. When the unit is stopped, refrigerant may leak into the compressor oil sump, causing significant damage to the compressor. Therefore, even during shutdown, the unit's power should not be turned off, which helps prevent compressor damage due to insufficient lubrication.
- Open the system's shut-off valves and check whether the indoor and outdoor units (air-cooled units) are already connected through the piping.



When installing an air-cooled air conditioning unit, if the connection pipe length between the indoor unit and the outdoor unit exceeds 30 meters, an oil separator needs to be installed. The purpose is to prevent the compressor from being damaged due to a lack of refrigerant oil.

The oil separator has the following functions:

- Prolong the working life of the compressor
- Using an oil separator ensures that the finned heat exchanger surfaces of both the indoor and outdoor units hardly attract refrigerant oil, which greatly improves the heat exchanger's heat transfer performance, thereby optimizing the overall system performance and reducing the unit's energy consumption.

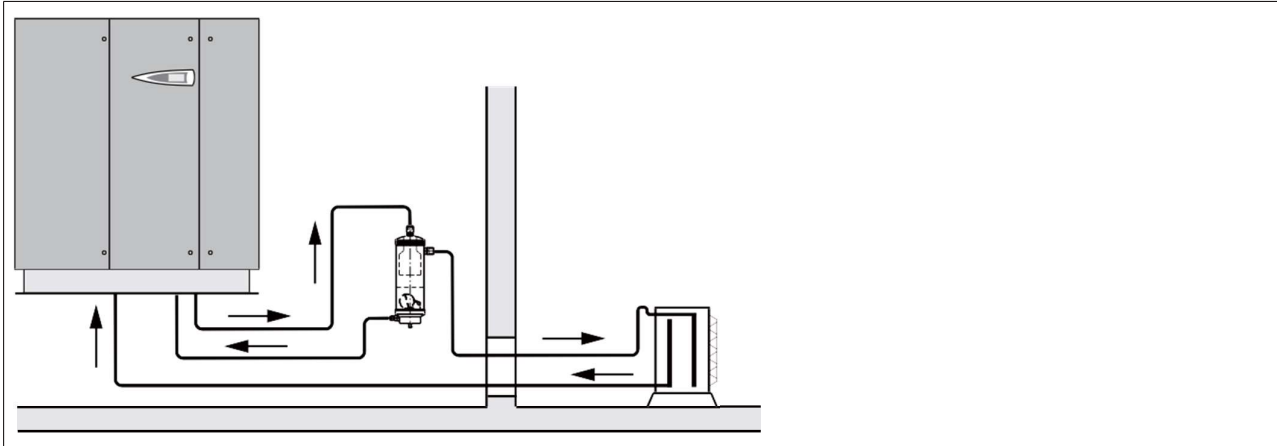
The selection of an oil separator needs to consider the following factors:

- The total cooling load of the unit
- The type of refrigerant used
- The diameter of the compressor discharge pipe; the connection pipe at the inlet of the oil separator needs to match the diameter of the compressor discharge pipe

The oil separator models are shown in the table below:

Unit Model	Oil Separator Model
SA 008	A-WZ55855
SA 013	A-WZ55855
SA 017	A-WZ55855
SA 020	A-WZ55855
SA 025	A-WZ55855
SA 030C	A-WZ55877
SA 035C	A-WZ55877
SA 040C	A-WZ55877
SA 045C	A-WZ55877
DA 035C	A-WZ55855
DA 045C	A-WZ55855
DA 050C	A-WZ55855
DA 060C	A-WZ55877
DA 070C	A-WZ55877
DA 080C	A-WZ55877
DA 090C	A-WZ55877
DA 100C	A-WZ55889
DA 110C	A-WZ55889

The oil separator is installed vertically on the pipeline between the compressor and the condenser. The oil separation efficiency is optimal when the operating temperature of the oil separator is close to the exhaust temperature of the compressor. Therefore, when choosing the installation location of the oil separator, it should be placed as far away from the cooling source as possible; otherwise, the refrigerant gas may condense inside the oil separator, making it unable to separate the refrigeration oil. We recommend insulating the surface of the oil separator during installation.



As shown in the refrigeration system flowchart above, the return oil pipe of the oil separator needs to be connected to the compressor suction pipe, as close to the compressor as possible (Note: the oil separator is installed in the indoor unit; the above diagram is a schematic).

In certain cases, it may be necessary to install a sight glass on the oil separator connection line to check whether the oil separator is functioning properly. Before the oil separator is installed into the system, it must be partially filled with refrigerant oil, and the type of refrigerant oil must be the same as that used in the compressor.

Indoor air condensate



The condensate produced by the air conditioning unit during the dehumidification process needs to be discharged outdoors. A collection tray is installed at the bottom of the indoor unit's evaporator to collect the condensate, and at the bottom of the tray, a hose connects the condensate to the drainage system. The unit comes standard with a hose, and during installation, the drainage hose only needs to be connected to the drainage system through a rubber or plastic pipe (with an inner diameter of 19mm).

Power wiring



During installation, the power supply must be connected correctly in strict accordance with national standards and the installation manual requirements. This can prevent accidents and ensure that the unit operates long-term, stably, and efficiently.

Operation inside the electric control box

Before performing any operations inside the electrical control box, please ensure that the power switch is turned off.

The main load switch is in the off position. A protective cover is installed on the main load switch.

If you need to remove the protective cover, simply turn on the load switch and then loosen the fastening screws.

Power Wiring - Wire Specifications - Protective Devices

- Check whether the power specifications (rated voltage, phase, frequency) match the power specification label on the electric control box. The input voltage fluctuation range should be between 90% and 110% of the rated voltage; exceeding this range will void the warranty.

- Securely fasten the end of the power supply cable to the terminals of the main load switch using screws, and connect the yellow-green grounding wire to the grounding point of the unit's electric control box (marked with the PE symbol).

Internal operation of the electric control box

Open the outer cover of the electric control box (secured to the box with screws) to expose the internal electrical components, which can then be operated. It should be noted that the internal electrical components are very sensitive to static electricity from the human body, so discharge any static electricity from your body to the ground before touching any electrical components.

Outdoor Unit (Condenser) Power Connection



The outdoor unit (condenser) can have its power supply line directly connected to the main load switch of the indoor unit, which means that the fan speed of the outdoor unit (condenser) is not adjustable. If the customer is using a unit with an outdoor unit (condenser) fan speed adjustment function, then the power wiring of the outdoor unit (condenser) can be connected to the electrical control box. (The connected power line is not provided by us).

The specifications for the power connection cable can be referenced in the circuit diagram (attached inside the indoor unit); whether it is a dual-system unit or a single-system unit, only one power connection is needed between the indoor and outdoor units. Depending on the current signal, the fan speed controller can output different voltage values to the outdoor unit, allowing the outdoor fan to operate at the most energy-efficient speed. For low-temperature units, the fan speed controller is provided as a standard component.

Condensing fan airspeed adjustment

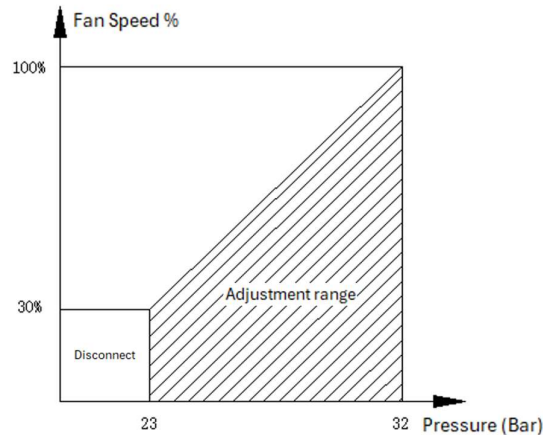
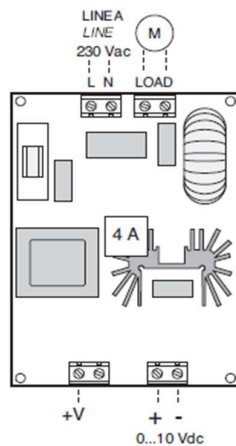


We offer two types of condensers: a switch type and a speed-regulating type. The switch type has no speed control function and only has on and off modes; for the speed-regulating type, we provide a fan speed controller that adjusts the speed of the outdoor unit or the dry condenser fan according to the current actual load of the unit, thereby maintaining condensation pressure, reducing power consumption, and lowering noise.

The fan speed regulator of the variable-speed condenser is installed on the outdoor unit, and relevant parameters are preset before leaving the factory (as shown in Figure 2). If you need to change the parameters, please contact our after-sales department colleagues (changes are not recommended). Changing them on your own may cause improper malfunctions.

If you need to understand the specific control methods, please refer to the control manual.

The switch-type condenser does not have a speed regulation function. The relevant parameters are preset before leaving the factory. When the condensing pressure reaches the set value, the fan runs at full speed; when the condensing pressure is below the set value, the fan does not operate.



Thermal Expansion Valve Calibration (Air-Cooled Unit)

For air-cooled units, the thermal expansion valve can be calibrated using the adjustment screw on the expansion valve during installation.

- Check if the subcooling is appropriate (3-5°C)
- Check if the superheating is appropriate (around 5°C)
- Check if the thermal sensing bulb is positioned correctly and wrapped with insulation material.

If the actual superheating of the unit is greater than 5°C, increase the valve opening; if the actual superheating is less than 5°C, decrease the valve opening.

 Note: Only qualified personnel may adjust the expansion valve.



The COOLBLADE series units are equipped with the following control switches:

- High-voltage switch F1: manual reset, one per cycle.
- Low-voltage switch F2: automatic reset, one per cycle.
- Air filter blockage probe F4 (differential pressure switch)
- Temperature probe BT2 or indoor environmental temperature and humidity probe BH1 (for units with indoor air humidity control function)

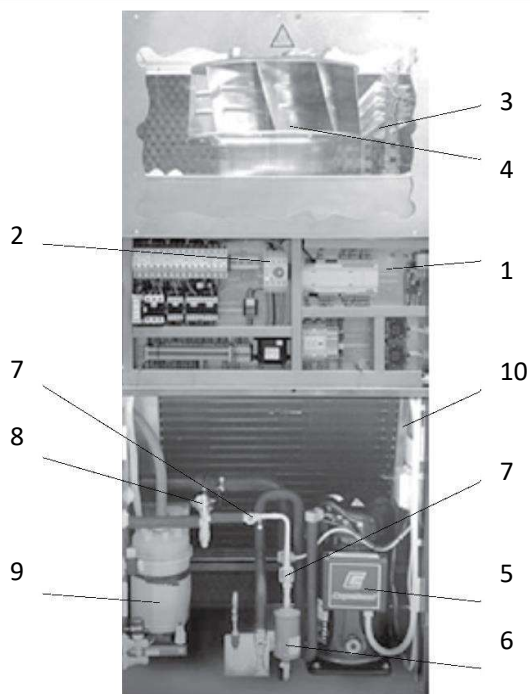
Some series of units are equipped with the following control switches:

- Electric heating overheat protection (for units with electric heating)

The following control switches are optional:

- Flow probe, consisting of the following parts:
 - a) FSD device installed on the dedicated connector inside the electrical control box
 - b) FLOE sensor installed at the monitoring point- Smoke/fire detection probes SFFS and SFFF
- Unit outlet air temperature probe (installation method see installation manual)

1. CPU
2. Main Load Switch
3. Electric heating
4. EC FAN
5. compressor
6. Dry filter
7. Ophthalmoscope
8. Thermal expansion valve
9. Humidifier
10. Indoor temp. sensor



The sampling points of the air flow switch and the sampling points of the air filter clogging probe are independent of each other, as shown in the right figure (this figure is for illustration only, the positions vary for different models).

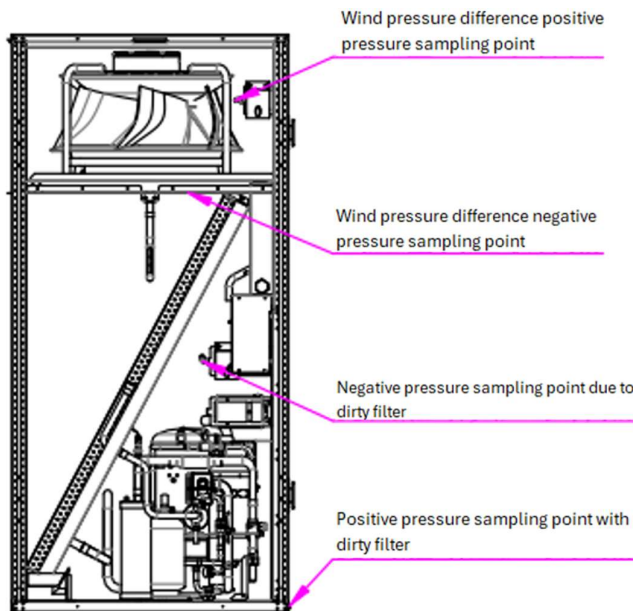
For the supply air fan unit:

1) Airflow switch sampling point location

- The sampling point in the positive pressure area is set near the fan air outlet
- The sampling point in the negative pressure area is set in front of the air outlet.

2) Sampling point locations for air filter blockage

- The sampling point in the positive pressure area is set in front of the filter
- The sampling point in the negative pressure area is set near the front side of the evaporator



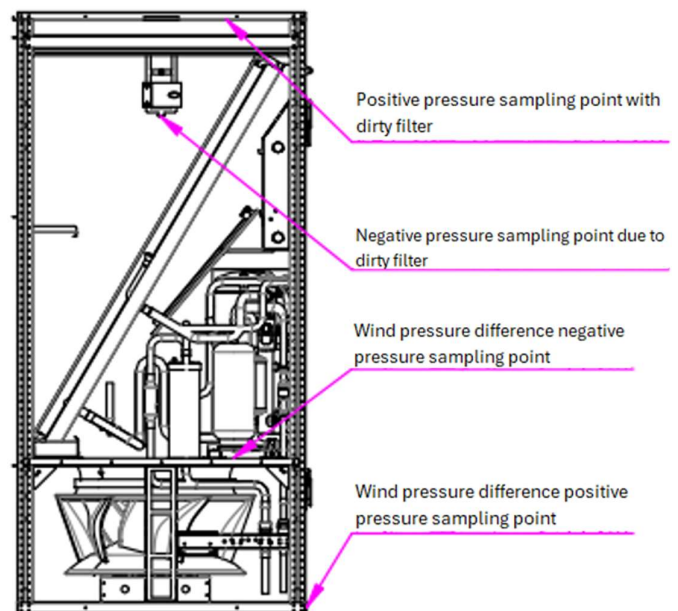
For the downstream air handling unit:

1) Airflow switch sampling point location

- For the positive pressure area, the sampling point is set near the fan outlet
- For the negative pressure area, the sampling point is set in front of the air outlet

2) Air filter blockage sampling point location

- For the positive pressure area, the sampling point is set before the return air filter
- For the negative pressure area, the sampling point is set after the return air filter



Calibration of pressure switch and electric heating over-temperature



After starting the air conditioning unit, the following parameters need to be adjusted:

- Indoor ambient temperature (cooling or heating setpoint)- Relative humidity (humidification or dehumidification setpoint)
- Air filter dirt accumulation alarm setpoint, refer to "Air Filter Dirt Accumulation Alarm Switch Setting Value"

Note: The settings of the control and safety switches must not be changed.

CODE	Description
F1	High voltage switch
F2	Low voltage switch
TH13	Electric heating overheat protection

COD E	Alarm Set Value	Difference	Reset
F1	40.5bar	±1.2	Manual reset 33.3 bar
F2	4.5bar	±0.35bar	Automatic reset, 5.5±0.5 bar
TH13	105/144°C	-	Manual reset

Airflow probe setpoint calibration



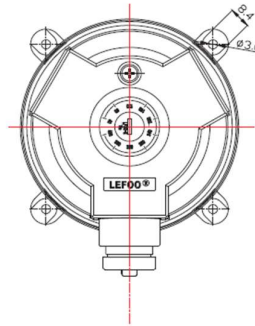
When the fan of the unit (a unit with only one fan) or one of its fans stops operating, the air flow differential pressure switch is activated. The differential pressure switch is set to 50 Pa when the unit leaves the factory. The pressure difference at the fan's inlet and outlet depends on the air flow velocity. After the unit is installed, the differential pressure switch may need to be recalibrated; check whether the contacts are closed during fan operation.

Adjust the settings according to the following steps:

- Simulate a fault (stop the fan or one of the fans) to check if the differential pressure switch is activated.
- If the differential pressure switch is not activated, gradually increase the set value of the differential pressure switch.

Operation method for changing the differential pressure switch setting:

Unscrew the two protective bolts, remove the outer protective cover, and rotate the adjustment knob. The adjustment range is 30~300 Pa. If it is necessary to replace the differential pressure switch, first remove the fastening bolts, then disconnect the plastic hoses connected to the positive and negative pressure monitoring points, and disconnect the power wires. The new differential pressure switch can then be installed by reversing these steps.



Air filter dirty/fault alarm switch set value



The set value of the air filter alarm switch when the unit leaves the factory is 300 Pa. Calibration of the alarm switch should take into account the pressure drop across the inlet and outlet air and the airflow speed.

The air filter clogging alarm switch can be calibrated according to the following steps:

- Install a clean air filter on the unit.
- Start the air conditioning unit.
- Gradually cover the surface of the air filter with cardboard or wooden boards.

When 50%-60% of the air filter surface is covered, check whether the alarm switch is activated; If the alarm switch does not go off, the pressure set value is too high and needs to be gradually reduced; If the alarm switch is triggered before 50% of the surface area is covered, gradually increase the set value.

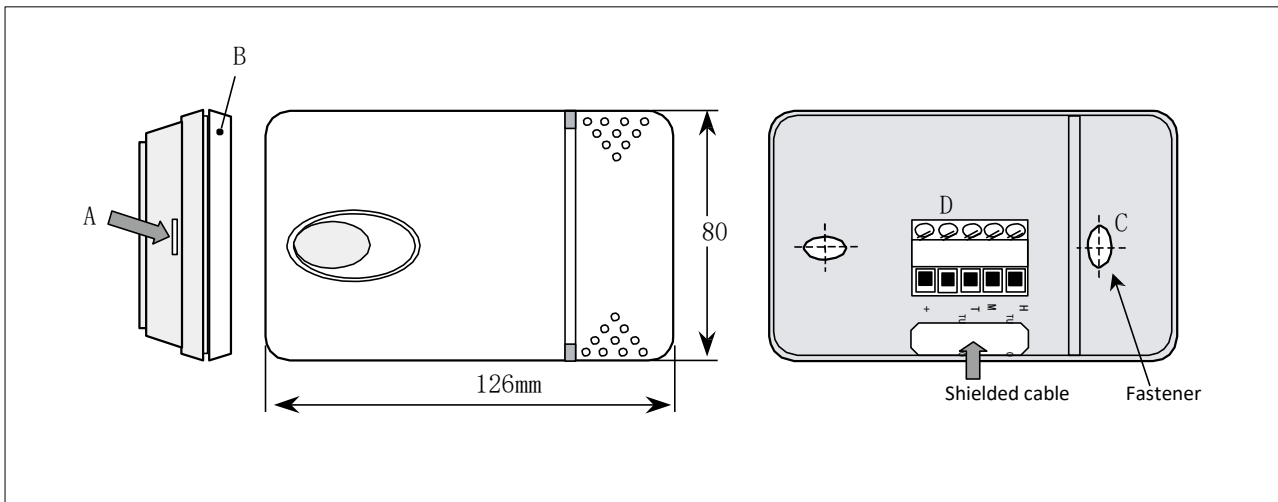
Indoor temperature and humidity sensor

U I A

If you need to replace the indoor temperature and humidity sensor, you can refer to the diagram below.

Use a screwdriver to press at point A and remove the white plastic cover B to expose the fastening bolt C and wiring terminal D.

Connecting the indoor temperature and humidity sensor requires using shielded wire; the wiring method can be referred to in the circuit diagram.



Electric Heating and Electric Heating Maintenance Statement

U I A

Electric heating

The heating power of the TC electric heater is 3 kW.

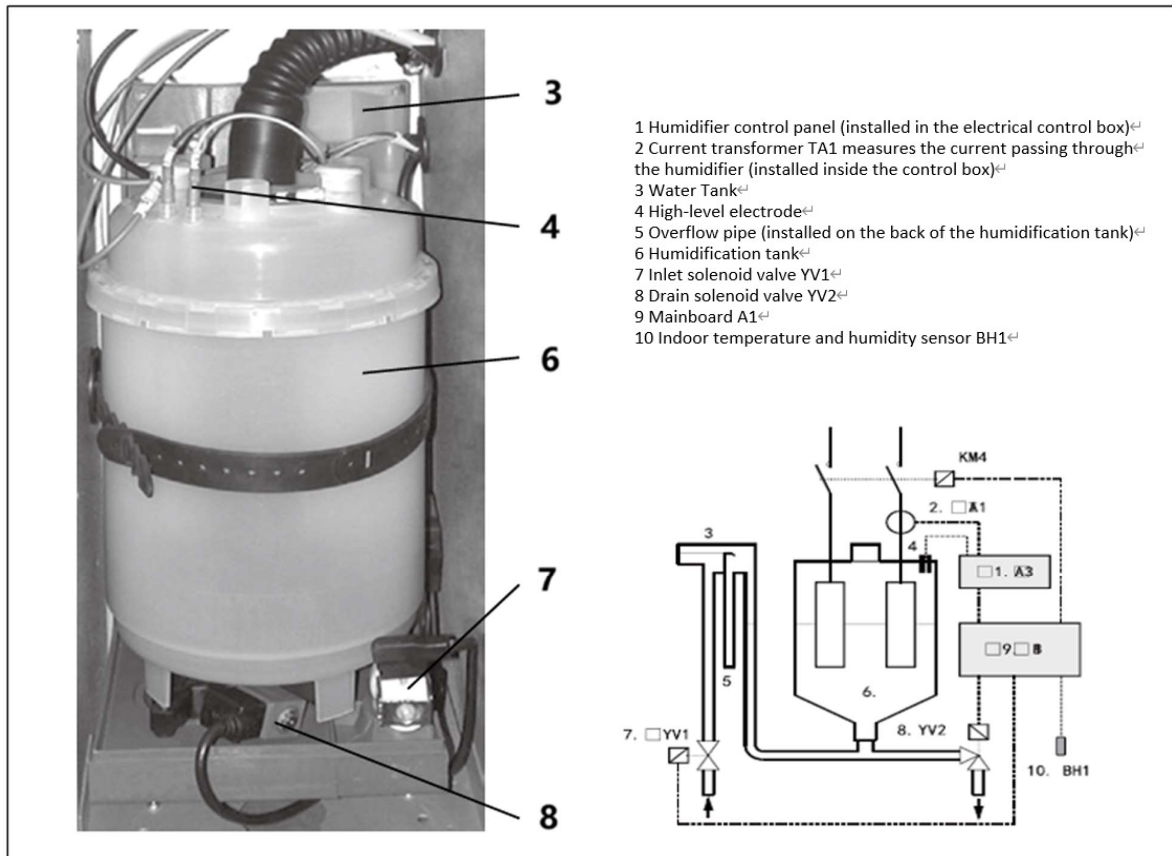
The specific wiring method for the electric heater can be referred to in the circuit diagram.

If the electric heater needs to be replaced, first disconnect the power to the unit and wait for the heater to cool down before replacing it. After the electric heater is replaced, please ensure that the grounding wire is properly connected.



System Component

According to customer requirements, the air handling unit can be equipped with an electrode humidifier.



Working principle of a humidifier

The working principle of an electrode-type humidifier is to heat the water inside the humidifying tank through the current between the electrodes, causing the water to evaporate and produce steam. By controlling the inlet and outlet solenoid valves, the water level inside the humidifier and the salt content of the water can be regulated. A current transformer can detect and control the current between the electrodes, thereby controlling the amount of steam produced.

When the indoor humidity is below the set value, the main board controls the humidifier's contactor to close (see circuit diagram for details), supplying power to the humidifier, which then begins working.

When the water level inside the humidifier is too low, causing the current value to drop below the set value, the inlet water valve opens to adjust the water level.

Depending on the type of water supplied to the humidifier, the drain valve may activate to adjust the salt concentration inside the humidifier.

Routine maintenance for the humidifier involves regularly checking and cleaning the parts that produce steam.

The following operations need to be carried out once a year, preferably in the summer.

Humidifier bottle

Regularly clean the inside of the humidifier tank, remove scale accumulated on the electrodes, and clean the water filter at the bottom of the tank.

The steps for removing the humidifier tank are as follows:

- Completely drain the water inside the humidifier (refer to the user manual for instructions)
- Turn off the main load switch on the unit
- Remove the steam outlet hose from the top of the humidifier tank
- Disconnect the power cable and electrode connectors
- Loosen the straps securing the humidifier tank
- Lift the humidifier tank upward

The humidifier tank can be reused multiple times after cleaning, but if the electrode is worn, it cannot be used and needs to be replaced with a new one. The humidifier tank and the filter installed at the bottom form a complete humidifier unit.

Pour water into the humidifier and drain it

To ensure the humidifier operates stably over the long term, it is necessary to regularly perform water filling and draining operations.

The steps are as follows.:

- Completely drain the water inside the humidifier (using the control board)
- Turn off the main power switch of the unit
- Remove the 3/4-inch pipe connector on the water inlet solenoid valve
- Clean the removed pipe connector
- Remove the drain pipe and thoroughly clean the dirt inside the drain pipe and elbow.



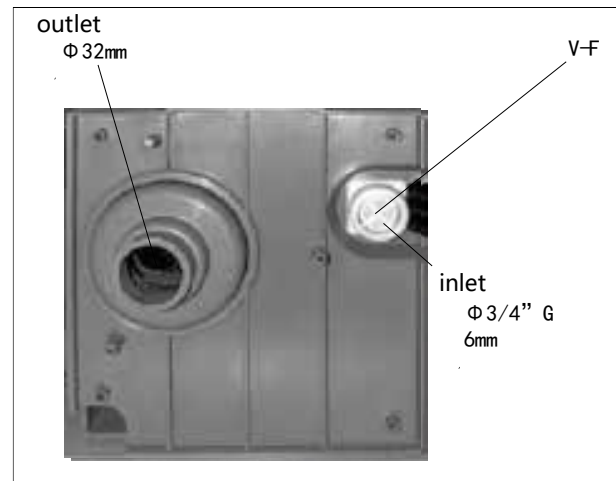
As shown in the figure, a 3/4" G threaded male connector is installed in front of the water inlet solenoid valve at the bottom of the humidifier to connect a 6mm rubber hose. The plastic pipe needs to be connected to the water supply system at the air conditioning unit installation site.

V: Water inlet connection at the bottom of the humidifier tank, 3/4"

G: Male threaded connector

F: Rubber hose, Φ6mm

Use drinking water that has not undergone any chemical treatment or mineral removal as the water source for the humidifier.
The water characteristics need to meet the following requirements.:



Water quality requirements				Scope	
				Min	Max
Pressure			bar	1	8
pH level	pH	-		7	8,5
Electrical conductivity at 20°C	$\delta_{R, 20^{\circ}\text{C}}$	-	$\mu\text{S/cm}$	300	1250
Solubility	TDS	-	mg/l	(¹)	(¹)
Residue of solid remaining at 180°C	R_{180}	-	mg/l	(¹)	(¹)
Total hardness of water	TH	-	mg/lCaCO ₃	100(²)	400
Temporary hardness		-	mg/lCaCO ₃	63(³)	300
Iron and manganese content		-	mg/lFe+Mn	0	0,2
Chloride content		-	ppmCl	0	30
Silicon content		-	mg/lSiO ₂	0	20
Chlorine content		-	mg/lCl	0	0,2
Calcium content		-	mg/lCaSO ₄	0	100
Metal impurities		-	mg/l	0	0

(¹) Based on the actual conductivity, usually: $\text{TDS} \approx 0.93 \times \sigma$; $R_{180} \approx 0.65 \times \sigma$

(²) Not less than 200% of the chloride content, unit: mg/l

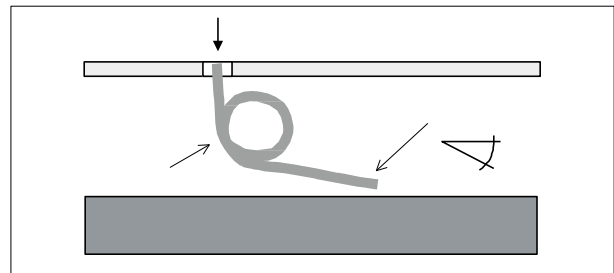
(³) Unit not less than 300% of the chloride content, unit: mg/l

Humidifier and condensate drainage

The humidifier is equipped with a drainage valve at the bottom to remove condensate generated during the humidification process. A drainage hose has already been installed with the unit. When installing, a rubber or plastic hose with a diameter of 32mm should be used to connect the hose to the drainage system. The external water pipe of the unit should have a certain slope to facilitate drainage, with a minimum slope of 1%.

Warning: The water discharged from the humidifier is very hot and requires caution. The humidifier's drainage hose must not be bundled with any other electrical wires, and the hose should be oriented vertically downward to prevent contact with electrical cables.

Note: The humidifier drain pipe and condensate drain pipe must be equipped with a water trap as shown in the figure below; otherwise, poor drainage may occur when the unit operates due to low internal air pressure of the unit.



Currently, our company uses the same pump for the condensate pump and the humidification pump. The condensate pump (humidification pump) consists of two parts: the pump and the float switch.

 The replacement of unit components (compressor, pressure switch, accumulator, etc.) must be carried out by relevant professionals.

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

Simply performing a few routine maintenance tasks on the unit regularly can prevent serious damage.

Only authorized organizations and professionals are allowed to operate the unit.

Maintenance operations can be summarized as follows:

- Clean the air filters
- Inspect and clean the condenser coils
- Inspect and clean the condenser coils for cooling water, remove scale
- Inspect and clean the drainage tray
- Inspect the humidification system
- Check the overall operation of the unit
- Check the operation of the pressure vessels

Clean the air filter

As more dust and impurities accumulate on the air filter, the airflow and air velocity of the unit will gradually decrease, which can lead to a reduction in the unit's cooling capacity and efficiency. For direct expansion units, a clogged air filter may trigger low-pressure switch alarms and cause damage to the compressor. Regular cleaning of the air filter dirt can prevent the above issues, and the cleaning interval depends on the local air quality.

The following suggestions apply in any situation:

- Check the air filter every week to ensure it is clean.
- Use a vacuum cleaner to clean the air filter every two weeks.
- Wash the air filter with soapy water every month.
- Replace the air filter every six months.

The above maintenance intervals may not apply to all environmental conditions; more frequent cleaning and replacement of the air filter may be necessary.

Please note that before handling the air filter, make sure the unit is turned off and disconnected from the power source.

Inspect and clean the condenser coil

In hot climates, air conditioning units need to operate at maximum load, so it is necessary to ensure that the condenser can meet the unit's heat exchange requirements. Since the condenser is installed outdoors or in an environment connected to the outdoors, it is possible for paper, leaves, or dust to adhere to the coil surface, thereby reducing the condenser's heat exchange capacity. Therefore, regular maintenance of the condenser is required.

If maintenance is not performed, it may cause high-pressure switch alarms or shutdowns of the unit. When there are many floating particles in the outdoor air or during autumn when leaves fall, it is necessary to frequently clean the condenser coils by spraying water or air to remove debris on the surface. Before cleaning the condenser, the unit needs to be turned off and the power disconnected.

Inspect and clean the condenser coils used for cooling water, and remove scale.

Check the inlet and outlet water temperatures of the dry cooler and compare them with the unit's condensing temperature to determine if fouling is affecting the heat transfer performance. Under good heat transfer conditions, the temperature difference between the outlet water and the condensing temperature is around 5.8° C. As the unit operates, this temperature difference gradually increases, indicating that scaling in the dry cooler is increasing and the heat transfer efficiency is gradually decreasing. Only qualified personnel should perform the cleaning, using chemical solutions for washing. Before cleaning the dry cooler, the unit must be shut down and the power disconnected.

Inspect and clean the drainage trough

During installation, it is necessary to ensure that the condensate and humidifier drainage systems are properly set up to prevent condensate from seeping onto the indoor floor.

When the humidifier drains, depending on the hardness of the water, the discharged water may contain a certain amount of scale. Scale can accumulate at the bottom of the drain pipe, blocking the drain pipe and elbows, so regular cleaning of the scale is required.

When cleaning the scale, a descaling agent (acidic solution) should be used.

Before cleaning the drain pan, the unit needs to be turned off and disconnected from the power supply.

Check the overall operating condition of the unit

It is necessary to regularly inspect the overall operation of the unit, with the goal of comparing the current operating status of the unit with that of the previous inspection. Any differences found need to be taken seriously, and the causes should be carefully examined. Regular inspections and cleaning of the unit can ensure its long-term stable operation. Generally, conducting a comprehensive inspection of the unit once a month is sufficient to ensure its normal operation, with exceptions in special circumstances. With proper long-term maintenance, the unit is unlikely to experience major malfunctions that could disrupt other work. After the unit has been in continuous operation for 10 years, it is necessary to perform a thorough and comprehensive inspection of the unit.

Check the operating condition of the pressure vessel

The pressure condition needs to be checked at least once a year. It is necessary to inspect the pressure vessel for surface rust, oxidation corrosion, and any obvious deformation, as these are potential hazards. As the surface of the pressure vessel gradually corrodes, the wall thickness decreases, and its mechanical strength and pressure-bearing capacity decline accordingly. If not addressed promptly, this may lead to accidents. The surface of the pressure vessel should be coated with anti-rust paint to protect it. If the pressure vessel shows obvious deformation, the unit must be stopped immediately, and the nearest after-sales service center of our company should be contacted.



The disassembly of the unit is carried out in accordance with the CE2002/96/CE standard.

If it is necessary to dismantle the air conditioning unit, it must be carried out by professional personnel. Dismantling the unit according to the correct procedures will prevent refrigerant leaks that could harm the environment and also minimize unnecessary losses. Before dismantling the unit, the relevant dismantling contract must be signed.

The air conditioner's mainboard operation manual contains detailed fault descriptions. When the unit triggers an alarm, please refer to the alarm instructions in the control manual.

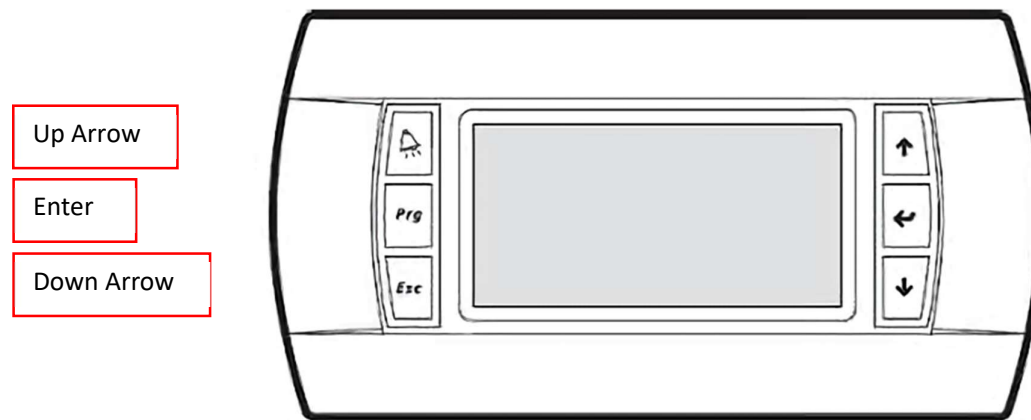
If necessary, contact the nearest after-sales service center of our company and specify the type of unit alarm that has occurred.

Alarm Type	Reason	Solution
The unit cannot start	The electric control box is not powered on.	Check the power supply
	The auxiliary circuit is not powered.	Check the auxiliary circuit Check the fuse on the motherboard
	The control panel did not send a startup command to the unit.	Check the DC power supply
The indoor temperature is relatively high.	The indoor temperature and humidity settings on the control panel are inaccurate.	Check the settings in the control panel
	Check the settings in the control panel for indoor environmental temperature and humidity sensor failure.	Check whether the probe's power wiring is correct. Check whether the connection between the probe and the motherboard is correct.
	The indoor heat load exceeds the cooling capacity of the unit.	Check the indoor heat load
	The controller has commanded the compressor to start, but the compressor did not start, or a certain compressor did not start.	Refer to 'Compressor cannot start'
The indoor temperature is relatively low.	The indoor temperature and humidity settings on the control panel are inaccurate.	Check the settings in the control panel
	The heater power is too low or the heater is not turned on	Check whether the circuit breaker for the electric heater is functioning properly. Check whether the electric heater is powered on. If the overheat protection of the electric heater is activated, check the cause of activation and then reset it.
The indoor humidity is relatively high.	The indoor temperature and humidity settings on the control panel are inaccurate.	Check the settings in the control panel
	Latent heat load exceeds the design value	Check the design latent heat load Check the air velocity and outdoor air condition Check whether outdoor air is entering indoors
	Is the compressor running during the dehumidification process?	Refer to 'Compressor cannot start'
	The control system is not working properly.	Check the condition of the control panel Check whether the control board and probes are functioning properly
The indoor humidity is relatively low.	The indoor temperature and humidity settings on the control panel are inaccurate.	Check the settings in the control panel
	Latent heat load is below the design value	Check the latent heat load value
	The accelerator did not start	Check the water supply pressure of the accelerator Check whether the control system and steam generation system are working properly
	The control system is not functioning properly.	Check the condition of the control panel Check whether the control board and probes are functioning properly
Electric heating overheats protection alarm	The wiring of the electric heating overheat protection is damaged or has been cut off.	Check whether the connection wire from the electric heater overheat protection to the mainboard is normal.
	False alarm	Reset the electric heating overheat protection

High compressor discharge pressure	If there is air or other high-boiling-point gases in the refrigerant circuit, check whether there are bubbles in the sight glass, and you can also check if the subcooling is too high.	Evacuate the system and then recharge it with refrigerant
	The refrigerant charge is excessive, the condenser has a large amount of liquid, and the subcooling at the condenser refrigerant outlet is too high.	Remove some refrigerant
	The valve part of the compressor exhaust being measured is blocked.	Check the valve opening
High-pressure switch alarm (compressor discharge pressure too high)	The condenser pressure control system is not operating normally.	Check whether the condenser fan and protective devices are functioning properly, and repair or replace any faulty fans. Check whether the set values of the condenser fan pressure switch and airspeed regulator are working normally.
	High compressor discharge pressure	Refer to 'High Compressor Discharge Pressure'
Compressor discharge pressure is low	The condensing pressure control system is not functioning properly (refer to the control manual)	Check whether the condenser pressure control system or the condenser fan speed regulator is working properly.
	Low inhalation pressure	Refer to 'Low Suction Pressure of the Compressor'
High suction pressure of the compressor	The heat load is higher than the design value	Check whether the heat load is within the design range Check the air velocity and the outdoor air condition Check whether outdoor air is flowing into the interior
	High compressor discharge pressure	Refer to 'High Compressor Discharge Pressure'
	Refrigerant charge is excessive	Remove some refrigerant
	The liquid refrigerant flows back into the compressor.	Check whether the superheat setting of the thermal expansion valve is correct. Check whether the sensing bulb of the thermal expansion valve is installed in the correct position and whether it has been insulated and protected.
Low suction pressure of the compressor (there is a high possibility of coil frosting)	The indoor ambient temperature is relatively low.	Refer to 'Indoor environment temperature is relatively low'
	The check valve at the outlet of the liquid accumulator is not fully open.	Check the valve opening
	Dry filter blockage	Check the dryer filter and replace it if necessary. The refrigerant temperature difference at the inlet and outlet of the dryer filter must not exceed 2° C.
	Insufficient refrigerant charge	Check whether the subcooling is within the reasonable range and add refrigerant to the system if necessary.
Low pressure switch alarm (low compressor suction pressure)	The thermal expansion valve is set incorrectly or has malfunctioned.	Check whether the superheat of the thermal expansion valve is correct (around 5°C).
	Dry filter blockage	Check the dryer filter and replace it if necessary. The refrigerant temperature difference at the inlet and outlet of the dryer filter must not exceed 2° C.
	Compressor suction pressure is low	Refer to 'Low Suction Pressure of the Compressor'

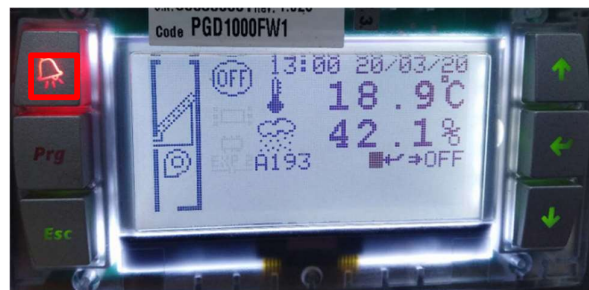
View fault alarm

Button Overview



View interface alarm

Refer to the alarm information that occurred currently.



When the 'alarm button' is illuminated, it means there is an alarm in the unit. To view the alarm details, simply press the 'alarm button' to display the specific alarm information and codes.

View historical alarm records

View previously occurred historical alarm records.

- Press the 'Program' button"
- Use the 'Down Arrow' key to find 'History'
- Press the 'Enter' key, then press the 'Up' or 'Down' arrow key"
- After finishing the check, press the 'Exit' button to return to the main screen of the unit.

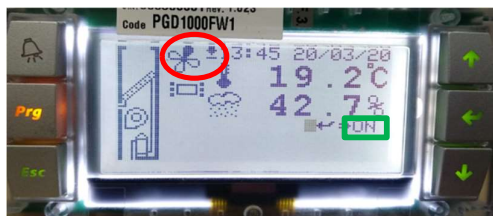
How to turn on and off the device

Startup operation

Ensuring that the unit has no alarms (the alarm button is not lit)

- Press the 'Enter' key
- Then press the 'Down Arrow' key

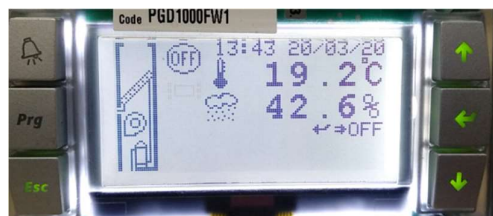
You will find that 'OFF' has turned into 'ON' and an icon will appear inside the red circle, indicating that the unit has successfully powered on.



Shutdown operation

- Press the 'Enter' key
- Then press the 'Down Arrow' key

You will find that when 'ON' changes to 'OFF,' it means the unit has successfully shut down.



Modification of setpoints for cooling, heating, humidifying, and dehumidifying

- Press the 'Program' button"
- After using the 'Down Arrow' key to find the 'Settings' menu, press the 'Enter' key.
- Then press the 'Down key' to find the setting point you want to modify in the following table.
- Press 'Enter', use the up and down keys to adjust the value you want to set, and then press 'Enter' again to confirm.
- After finishing the settings, press the 'Back' key to return to the main interface.

50.01	Cold setpoint	24	°C
50.02	Hot setpoint	24	°C
50.03	Dehumidification setpoint	55	%UR
50.04	Humidification setpoint	45	%UR

MODBUS settings

communication serial port

- Press the 'Program' button
- Use the 'Up Arrow' or 'Down Arrow' key to find the 'User' interface, then press the 'Enter' key.
- After pressing 'Up Arrow' to enter 1, press 'Enter'.
- After pressing the 'Up Arrow' key to input 2, then press the 'Enter' key.
- Press the 'Up Arrow' key to enter 3, then press the 'Enter' key.
- After pressing the 'Up Arrow' key to input 4, then press the 'Enter' key.
- Use the 'Up Arrow' key to find the 'Serial Port' interface, then press the 'Enter' key to enter.
- Use the up and down arrow keys to adjust the value you want to set, then press the 'Enter' key to confirm.
- After finishing the settings, press the 'Back' key to return to the main interface.

You only need to modify the parameter data in the list below. Only the 30.02 address is set according to each unit in order, and the range cannot exceed the value of 207.

30.01	Supervision presence configuration	Y
30.02	BMS address configuration	1-207
30.03	BMS protocol configuration (0: Standard - 1: Modbus - 2: GSM Modem - 3: LON - 4: BACnet - 5: TCP/IP - 6: WinLoad)	MODBUS
30.04	BMS baud rate configuration (0:1200 - 1:2400 - 2:4800 - 3:9600 - 4:19200 - 5:38400)	19200
30.05	ON/OFF configuration from BMS (0: disabled - 1: enabled)	Y

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The company reserves the right to change product specifications without prior notice.